Improving Business Practices and the Boundary of the Entrepreneur: A Randomized Experiment Comparing Training, Consulting, Insourcing and Outsourcing[*]

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Abstract

Many small firms lack the finance and marketing skills needed for growth. A standard approach is to train the entrepreneur in these skills. However, rather than requiring entrepreneurs to learn everything, an alternative is to move beyond the boundary of the entrepreneur and link firms to these skills in a marketplace through insourcing workers, or outsourcing tasks to professionals. We conducted a randomized experiment in Nigeria to test the relative effectiveness of these different approaches to improving business practices. Insourcing and outsourcing both dominate business training; and do at least as well as business consulting at one-half of the cost.

Keywords: Business Support Programs; Business Practices; Firm Growth; Entrepreneurship; Boundary of the Entrepreneur, Boundary of the Firm; Insourcing; Outsourcing; Business Services Marketplace.

JEL Codes: O12, L26, L24, M31, M41.

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1. Introduction

Growing a successful firm requires a large variety of skills, leading Lazear (2004) to conjecture that entrepreneurs need to be jacks-of-all-trades. He notes (p. 208) that "even if individuals are not endowed with the complete set of skills necessary to start a business, they can acquire those skills". This notion underlies the vast amounts of money that governments around the world spend on providing business training, aiming to teach the entrepreneur to develop the finance/accounting and marketing/sales skills they lack and that are needed for firm growth. However, given all the other tasks they need to do, it is difficult for entrepreneurs to take much time away from their firms, and so many courses are relatively short in length and result in only modest improvements in business practices (McKenzie and Woodruff 2014). Lasting improvements are further hampered by entrepreneurs' limited time and attention for making changes on their own. These approaches also go against conventional wisdom in places like Silicon Valley where entrepreneurs expect to relinquish control over some business functions in order to grow their firms.

At start-up, the entrepreneur is typically synonymous with the firm. But as the firm grows, the boundary between the entrepreneur and the firm widens, and the entrepreneur must make decisions as to what activities of the business to carry out herself and what to hire others to do. That is, there is a boundary within the firm (which we refer to as the 'boundary of the entrepreneur') as well as at the firm's edge – i.e., the traditional 'boundary of the firm' discussed in the theory of the firm literature about what activities to do inside the business versus contract out (Coase 1937; Williamson 1979; Grossman and Hart 1986). An alternative to training an entrepreneur to develop finance and marketing skills herself is to hire someone who already has these skills, either as an employee within the firm (insourced worker) or as an outside service provider (outsourced professional). Figure 1 uses application data from more than 8,000 Nigerian firms who applied to government programs to show how the likelihood of an entrepreneur doing the finance or marketing activities of the firm varies with the number of workers in the firm. Although the entrepreneur is the main person in charge of financial accounts and marketing when the firm has only a couple of workers, by the time firms reach 10 to 20 workers, half of them have someone other than the entrepreneur implementing these business practices. This suggests that if the goal is to help small firms grow, rather than training entrepreneurs in finance and marketing, it may be

more effective to give them access to a marketplace for business services where they can hire skilled specialists.

We test this idea through a randomized experiment in Nigeria, carried out as part of a government program intended to help small firms grow. We randomly assigned a sample of 753 firms (each with 2-15 workers) into a control group and four treatment groups. The first treatment group used the common approach of *training* the entrepreneur, providing a mix of 25 hours online and 12 days in-class business training. The second treatment group used another approach that has been gaining popularity in which the government pays for business consultants to provide personalized *consulting* to the entrepreneurs, with firms receiving 88 hours of support. The third and fourth treatments supported the entrepreneur to use an online marketplace for business services, with a declining subsidy over nine months. The *insourcing* treatment group was linked to Human Resource (HR) service providers, who helped the entrepreneur recruit an accounting or marketing specialist to join her firm as a full-time employee (insourced worker). The *outsourcing* treatment group was linked to Accounting and Marketing service providers, who could be contracted by the entrepreneur to carry out relevant business functions via their external specialists (outsourced professional). The training, insourcing and outsourcing treatments were designed to be of equivalent cost to the government, while the consulting treatment cost twice as much.

We carried out two rounds of follow-up surveys, at one and two years after the start of these interventions. This includes detailed measurement of 41 different business practices, representing both traditional activities (in finance/accounting, marketing/sales, operations/HR), and also more novel activities (in digital marketing). The training treatment does not have a significant impact on business practices, nor on firm growth. In contrast, the other three treatments result in statistically significant improvements on a range of business practices (including a physically verified subset) and these effects persist well over a year after the interventions ended. Most firms given the insourcing or outsourcing treatments chose to hire marketing specialists and, in line with this business support, we find the largest improvements occur in the areas of marketing and digital marketing practices. The insourcing and outsourcing interventions also result in an increase in product innovation activities and, two years after the intervention, the outsourcing treatment results in a statistically significant increase in profits and sales (0.23 s.d.). The estimated impacts on profits and sales are smaller and not statistically significant for insourcing (0.12 s.d.) and

consulting (0.18 s.d.), but we cannot reject equality of impacts across these treatments. Thus, insourcing and outsourcing both dominate business training, and do at least as well as consulting at one-half of the cost. This highlights the benefit of moving beyond the boundary of the entrepreneur, to help firms hire skilled specialists in an open market.

Given these benefits, the question arises of why more firms do not use a marketplace for business services on their own. Firms report several informational frictions, as well as concerns about their ability to finance the initial costs and uncertainty about the expected returns. The support provided by the insourcing or outsourcing program helps overcome these constraints, and revealed preference suggests that many firms find it beneficial. Approximately one-third of them continue to pay for their same insourcing or outsourcing services over one-year after all subsidies ended. And firms in both of these treatments, as well as those in the consulting treatment, are more likely to have returned to a business service market to purchase services. This highlights the need for government policy aimed at improving the efficiency and reach of marketplaces for business services, although we show in an additional experiment that simply providing information and quality ratings is not enough by themselves to get firms to purchase these services.

This paper contributes to two main literatures. The first is literature on the importance of management and better business practices in small firms, and of the potential effectiveness of training and consulting interventions in improving these practices. Across a range of countries, firms with better management and business practices are more profitable, more likely to survive, and grow faster (Bloom and Van Reenen 2007; McKenzie and Woodruff 2017). Yet many standard business training courses have delivered only modest improvements in these practices[1], making it hard for individual studies to detect effects on firm outcomes, even if the average impact of such programs across studies is positive (McKenzie 2020). Most of these courses have been 5 days or fewer and cost US$200-500. Our training is thus more intensive, and at a cost of $2,000 it is more

[1] Greater impacts have been found from some programs that deviate from just teaching traditional business skills, such as using behavioral-based rules of thumb (Drexler et al. 2014; Arráiz et al. 2019), psychology-based personal initiative training (Campos et al. 2017), applied and specialized marketing skills (Anderson et al. 2018), kaizen production training (Higuchi et al. 2019), and local customization of best practices (Dalton et al. 2020). The volatility of firm profits and sales, however, means that most randomized experiments have very wide confidence intervals for the effects of training on firm financial performance, as is also the case in our experiment.

expensive than many of the programs studied in the literature[2]. Yet we still find modest impacts. As an alternative, personalized consulting offers the promise of directly advising the entrepreneur on implementing better practices that are also relevant to her firm – rather than just training owners on general business skills or know how. Expensive and intensive consulting has improved management practices in larger firms (Bloom et al. 2013; Iacovone et al. 2019) and in smaller firms with an average of 14 workers (Bruhn et al. 2018); though it did not help tailors running micro firms in Ghana (Karlan et al. 2015). In our study, we also find consulting leads to lasting improvements in business practices but at a higher cost than insourcing or outsourcing, which are new interventions not previously tested in the literature.

Secondly, our paper contributes to a broad literature on the boundary of the firm, and the role of the entrepreneur within the firm. As a firm grows, the entrepreneur makes decisions on whether to do certain business activities herself (i.e., within the boundary of the entrepreneur) or get others to do them (i.e., beyond the entrepreneurial boundary) – and if so, whether to keep these tasks inside versus outside the business (i.e., move beyond the boundary of the firm). The theoretical literature identifies four main factors that influence the extent to which entrepreneurs should be willing to have others do tasks: (i) the transaction costs involved, such as whether they require extensive firm-specific (or entrepreneur-specific) knowledge (Williamson 1979); (ii) how verifiable the tasks are and whether they are subject to ex-post holdup problems (Grossman and Hart 1986; Holmstrom and Milgrom 1994); (iii) whether these tasks are one of the core competencies of the firm (Coase 1937); and (iv) the capability of firm owners/entrepreneurs relative to providers in the market (Demsetz, 1988, Barney 1999).[3] Empirical studies note that finance/accounting and marketing/sales are the tasks most frequently done by others, with the main reason being access to higher quality expertise (Kamyabi and Devi 2011a; McGovern and Quelch 2005). This descriptive work also highlights most small-medium enterprises (SMEs) use a mix in which some activities

[2] Our training program is based on the IFC's Business Edge content, which has been used with over 200,000 entrepreneurs around the world. Campos et al. (2017) evaluate a 12 half-days version of Business Edge training in Togo, finding a 6 percentage point improvement in business practices, and no significant impact on profits and sales.
[3] There are also related literatures on managerial span of control (Graicunas 1937; Urwick 1956; Lucas 1978), knowledge hierarchies (Garicano 2000) and delegation to others (Bloom et al. 2012) which consider factors that determine whether time-constrained managers solve problems themselves or delegate them to less skilled subordinates. We use insights from this literature to examine alternative mechanisms in terms of how entrepreneurial time-use and staff headcount (total employment) change with our interventions. However, we view our insourcing and outsourcing interventions primarily as a way to bring higher quality human capital into the firm (i.e., more advanced skills through breadth in function, depth in expertise, or both), rather than as a way to help managers spread their existing human capital and time over a greater scale of operations.

are done in-house and others outsourced (Everaert et al. 2007). However, many SME owners and managers are not aware of the range of business services available and, thus, never use an external marketplace (Kamyabi and Devi 2011b). Critically, none of this existing literature examines interventions that encourage a shift in the boundary of the entrepreneur, nor distinguishes between performing such tasks inside versus outside the boundary of the firm. Ours is the first study to experimentally isolate such approaches for improving business practices and growing firms.

2. Experimental Design and Interventions

2.1 Context: The Growth and Employment Project in Nigeria

The Growth and Employment (GEM) project was a multi-year government program in Nigeria funded by the World Bank, with the objective of increasing firm growth and employment. It aimed to do this indirectly through improving the investment climate, and directly by offering programs to improve the performance of firms in five economic sectors: light manufacturing (including agri-business); construction; hospitality and tourism; information and communication technologies (ICT); and entertainment. To facilitate promotion and recruitment activities, the Business Innovation and Growth (BIG) platform was launched on February 9, 2016 (see Appendix 1 for a detailed timeline). Firms interested in receiving business support under GEM had to apply online through this platform. After applying online, a first screening was done to ensure firms met three eligibility criteria: (i) operated in a targeted sector; (ii) had between 2 and 100 employees; and (iii) provided all necessary information. They were then invited on a rolling basis in batches to attend induction workshops. Here firms were administered a more detailed diagnostic questionnaire that determined which programs they were eligible for. This was implemented independently by KPMG, and doubles as our baseline survey.

2.2 Rationale for Government Support of Growth-Oriented Firms

The GEM project provided direct support to growth-oriented firms to help them enhance management skills and business capabilities. Government support to small and medium enterprises to improve management practices has been an important part of the historical development of many advanced economies. Giorcelli (2021) provides several examples, including government-sponsored management training in the U.S. during World War II; training and consulting offered to European firms as part of the Marshall Plan; and management training programs provided by

the government in Japan. Government support to help firms improve management was also extensively used in Korea and Singapore, and continues in the present in many countries (Ezell and Atkinson 2011). For example, in 2014 the United Kingdom launched a Growth Vouchers program, which was intended to provide up to 20,000 firms (from 0 to 49 workers in size) with a £2,000 subsidy[4] to enable them to purchase business advisory services in the areas of finance, marketing, human resources, and digital technology (BIS 2014).

There are several rationales offered for why public funds should be used to improve the management skills and business capabilities in private firms. A first argument comes from the strategic management literature, which argues that improving skills and strengthening capabilities of firms are critical for innovation and productivity, and that the government has a direct interest in doing this as a way of increasing overall economic performance (e.g., Teece and Pisano 1994; Porter and Ketels 2003). A second rationale comes from a government focus on employment creation and growth in the economy. The GEM project operational documents directly referenced the work of Bloom and Van Reenen (2007) as showing that better business practices are associated with higher sales growth and employment growth. Thirdly, as with the GEM project, this support may be offered as part of a strategy to support and grow specific sectors that are considered to have broader benefits to the economy.

A review of the rationale for government support of such programs by the European Commission (Atherton et al. 2002) noted that the above rationales can be as important as market failure reasons in explaining why governments provide the services. Nevertheless, they highlight that information asymmetries can explain why more firms do not use the market to improve management skills and business capabilities. Ezell and Atkinson (2011, p.16) quotes Petar Sotjic, Director of the U.K. Business Support Policy in charge of its Manufacturing Advisory Service (MAS) as saying "The market failure we are trying to address is the information asymmetry market failure. SMEs do not always know what they do not know, and they do not know how useful business expertise can be.

[4] Note that in almost all cases government support is provided in the form of grants or partial subsidies, rather than loans. One reason for this is financial market frictions that make it difficult for small firms to borrow from banks for uncollateralized intangible investments (like human capital training) combined with a reluctance from governments to be directly responsible for lending to and collecting from SMEs. But it is also the case that the very uncertainties about the potential value of training or consulting services – which these interventions are intended to overcome – will make firms reluctant to borrow for an activity that they are unsure will be worth the money. And result-dependent loans would involve a myriad of monitoring challenges and moral hazard issues, so instead governments aim to gather some result-dependent return in the form of future increased tax revenues from firms that have grown.

And even when the SME manufacturer knows it has a problem, it does not always know how to procure the right solution. After they have worked with MAS, they understand … the value of external expertise in general, so when they have to pay the full rate in the future, they now know what to look for and have greater confidence in approaching the market".

These frictions may be even more important in developing country markets, where firms tend to be smaller, and information more opaque. Glückler and Armbrüster (2003) note that consulting services suffer from considerable transaction uncertainty, since they involve an intangible product, require access to confidential information, and the end product is co-produced. They emphasize that the main ways to overcome these uncertainty and trust concerns are through personal experience, and through recommendations from trusted partners. But this limits the number of firms likely to access these services. We surveyed business service providers in Lagos and Abuja (Appendix 8; see also Anderson and McKenzie 2021), and word-of-mouth was the main way of acquiring customers for 77% of GEM providers, with advertising only used by 16%. The result is that in our setting, most business service providers are not known by most firms. This suggests a potential role exists for the government in helping to build the market for business services.

2.3 Sample and Randomization

Our experiment works with firms that attended induction workshops held in Abuja and Lagos from March to December of 2016. To qualify for the programs in our experiment, firms needed to pass a second screening step demonstrating they: (i) were not already insourcing or outsourcing both their marketing function and finance function; (ii) had between 2 and 15 workers; and (iii) received a score of 5.0 to 8.0 (out of 10) in terms of their baseline business practices[5]. This resulted in an experimental sample of 753 firms. Our initial plan was to continue enrolling induction batches until we reached a sample size of 2,000 firms, but concerns about other components of the overall

[5] This was done based on the induction workshop diagnostic questionnaire, which measured practices at a more basic level and with less detail than we use in our follow-up measures explained below. 73% of firms that attended the induction workshops had scores in the 5.0 to 8.0 range. The 24% of firms that received lower scores were not eligible for support (if they scored below 4.0) or were eligible for basic online training only (if they scored in the 4.0 to 5.0 range). The government team did this to focus the program on growth-oriented firms, and it was thought that a foundation of at least some basic business practices was needed to be able to benefit from the different skill-building interventions that aimed to improve these skills. For example, the Business Edge training content is designed for firms that already have a reasonable baseline level of skills and are looking to improve. The remaining 3% of firms whose business practices were already above 8.0 (out of 10) were instead directed towards personalized consulting services and some grant windows.

GEM project led to the government's program implementors not inducting new batches that we could use. The consequence of this smaller sample size is lower statistical power for detecting effects on firm outcomes like sales and profits than originally anticipated.

We conducted a stratified random assignment, where firms were randomly assigned within each of the seven[6] induction batches to one of four treatment groups (described further below) and a control group. Random assignment was done by the authors using Stata and was done privately. This resulted in a sample of approximately 150 firms in each of the five groups (152 insourcing, 150 outsourcing, 152 training, 149 consulting, and 149 control firms).

Table 1 provides pre-specified balance checks on a set of baseline variables, showing balance on observables across our five groups. It also provides context for the types of entrepreneurs and firms in our experiment. The entrepreneurs have an average age of 38 years and 44% are female. They are highly educated, with 87% having completed undergraduate education and 48% having a post-graduate degree. Their firms are heterogeneous in terms of sector, with half of them in light manufacturing (e.g., paint manufacturing, garment making, processed food), and the remainder relatively equally distributed across the other four GEM sectors – 15% in ICT (e.g., software development); 13% in hospitality and tourism (e.g., catering, travel agencies); 12% in entertainment (e.g., TV and film production); and 12% in construction (e.g., architects). These are all relatively young existing enterprises, with an average firm age of 4.3 years. Most firms are at least partially formal (86% have their business name registered with the Corporate Affairs Commission).[7] They have between 2 and 15 full-time workers at baseline, with a mean of 4.3 paid staff. Average sales in the past month were US$3,265 – although the standard deviation is twice this (US$6,653) and the 10-90 percentile range is US$246-7,397.[8] At baseline only 4 percent of firms have used an HR service provider in the last 12 months; 34% currently had someone other

[6] There were seven induction batches from Lagos and Abuja, plus one firm from Abuja that attended an induction workshop held in a different state and was assigned to training. This firm is effectively in its own stratum.

[7] Firms were not required to be registered to take part in the program, but did need to have CAC registration to be eligible for performance or matching grants after the program. There are several levels of CAC registration. The most basic is registration of the business name, which is involves payment of a small fee and ensures uniqueness of the company's name among formal firms in the country. Firms can then choose to complete more paperwork and pay additional fees to incorporate formally as a company. Companies are then required to file an annual return with the CAC and may be delisted as inactive if this is not done.

[8] We use an exchange rate of US$1 = 365 Naira for exchange rate conversions in this paper.

than the entrepreneur doing their finance/accounting; and 20% currently had someone other than the entrepreneur in charge of their marketing/sales.

2.4 Details of the Interventions and Take-up

The program was overseen by a project implementation unit set up under the Nigerian Federal Ministry of Industry, Trade and Investment. As such the interventions reflect how these programs operate in the context of government implementation, including delays in starting programs (the time between applying and starting an intervention was 3-12 months for most firms), and sometimes delays of several months in payment to providers and firms (see Appendix 2). In the control group, firms were told that due to the high number of applicants, random selection was used as a fair way to choose which firms could access the program, and that they were not chosen.

In all four treatment groups, firms were allocated points based on attendance and task completion, with firms given a Total Points target (a priori) that they needed to achieve in order to become eligible to apply for grants.[9] Firms were told that if they achieved the Total Points score necessary for eligibility they would be entered into a random draw for grants (after the program ended). In practice, program implementation delays meant that none of the firms in our study knew whether they would receive a grant, nor had any received a grant, until after the conclusion of our final follow-up survey. Nevertheless, we note that the possibility of a grant may, and was indeed intended to, increase the incentive of firms to comply with the interventions. It was not intended to incentivize data collection, and indeed we have similar response rates for the control group that was not eligible for points (or the possibility of grants) as for the treatment groups (Appendix 3).

Next, we summarize the four treatment interventions, with further details on their content and implementation provided in Appendix 2. All four treatments were offered free to firms. The cost of offering each treatment was designed to be approximately the same (US$2,000) for business training, insourcing and outsourcing, while business consulting was anticipated to be twice this (US$4,000).

[9] There were two types of grants potentially available: (a) matching grants that could pay for technical services; and (b) performance grants that could pay for goods and equipment. Both were typically for 10 million Naira (US$27,000).

Business Training

Firms in this treatment group were provided with a mix of online and in-class training based on the IFC Business Edge curriculum adapted to the local context. Courses were managed and implemented by the Enterprise Development Centre (EDC) of the Pan-Atlantic University in Lagos. This organization has been operating in Nigeria since 2003. The program includes five core modules on financial management, general operations, writing a business plan, marketing management, and human resources; as well as optional modules on enterprise governance, personal productivity, and tourism/hospitality. Each topic had an online and in-person component. The online module had to be completed first before an individual could attend the in-person training session on that subject. The full program consisted of: (a) completing (at least) 5 online modules, each lasting approximately 5 hours and validated by a short online test (~25 hours total); and (b) attending 12 days of in-person training. Most firms took training between April and July 2017, with 93% of firms starting an online course and 69% attending at least one in-person training. These take-up rates are in-line with the average take-up rate of 65% for in-person business trainings reported in McKenzie and Woodruff (2014)'s review of training experiments. In terms of compliance, 75% of firms completed at least 5 online modules and 61% completed all 12 days of in-person training (see Appendix 2).

Business Consulting

Firms in this group were offered 11 days (88 hours) of personalized business consulting spaced over six to nine months, meeting at least once per month. The consultants were from local Nigerian companies that applied to work with the GEM project. Each consultant was screened based on qualifications and expertise, then given five to ten days of training on value-added consultancy support (designed and delivered by Growbridge Advisors). The final set of consultants was then selected based on a written test and face-to-face observation of a consulting visit. A total of 14 consulting companies were each allocated a small number of treatment group firms to work with. An initial visit of approximately 8 hours was used to review the current business situation and key metrics, conduct a needs assessment, prioritize and evaluate available opportunities, and define a growth strategy.

This first phase took place between January and April 2017 for most firms. 95% of firms offered this treatment received a visit, and 93% submitted growth plans (to complete phase one). The

consultant then proposed a list of business areas where it could advise the entrepreneur over the following 80 hours. These areas were personalized to each firm, but typically focused on management, finance and accounting, marketing and sales, operations, and human resources. 84% of firms started this second phase (roughly between May and August 2017), and 82% completed it (finishing in January and February 2018). The consultants would advise the firm owners on changes to make, but would not do the tasks for them. This was part of the rationale for spacing out the engagement over time, so firm owners had time to apply the advice given and carry out changes in their firm between consultant visits. Appendix Table 2.2 details the most common areas covered during this consulting intervention (e.g., business planning, developing a sales/marketing strategy, setting breakthrough goals, identifying and mitigating key financial risks, etc).

Insourcing and Outsourcing

These two interventions were newly designed for this experiment, which included custom building an online marketplace for business services. We decided to focus on finance/accounting and marketing/sales specialists for two main reasons. First, from the viewpoint of an entrepreneur, "don't run out of money" and "don't run out of customers" are fundamental to business success. Such themes dominated our field interviews with Nigerian firms during the intervention development stage. Secondly, we wanted to make use of existing service providers and facilitate firms trying out (and continuing to use) a real market solution. Human Resource service providers (for insourcing a worker), as well as Accounting and Marketing service providers (for outsourcing tasks), are among the most common business service companies operating in many countries. These three types of providers were vetted by the program team. If they met a minimum quality threshold then their details were entered onto an online marketplace (see Appendix 2).

Subsidy to Firms. In both the insourcing and outsourcing treatments, firms received a total subsidy of 480,000 Naira (US$1,315) to cover costs related to a service provider and a worker (insourcing) or professional (outsourcing). These subsidies were paid from the GEM project to the firm, and then the firm was responsible for all payments to service providers and workers or professionals. In addition, the subsidies were paid to firms on a monthly basis and at a decreasing rate. The reasoning behind this declining subsidy was to get the firm used to paying a larger and larger share of the worker's wages (or professional's fees) over time. That way it was not such an adjustment

for the firm to keep the worker (or professional) on when the subsidy ended. This approach also gave workers (or professionals) sufficient time to demonstrate their added value to the firm.

For the insourcing treatment, we used market research to determine how much would be needed to hire a worker full-time. This involved talking with both HR service providers and with growth-oriented small firms that had been part of a previous government project (the YouWin! Business plan competition) to find out how much firms like those in our program would pay an entry-level finance/accounting or marketing/sales worker. We received estimates of 30,000 to 70,000 Naira per month. And for the outsourcing treatment, when speaking with Accounting and Marketing service providers, we received estimates of 40,000 to 60,000 Naira per month to have a professional work at the business one day a week. We therefore set the subsidy to start at 70,000 Naira per month in the first three months, with this intended to cover the full cost of the insourced worker or outsourced professional, and then had the subsidy declining over time (Appendix 2). Firms in these treatments were told they should aim to pay at least 50,000 Naira for the service, with any left-over money used to help pay for materials like accounts books or marketing flyers.[10]

Marketplace 1: Insourcing a Worker. Firms in the insourcing treatment group were given access to an online marketplace where they could choose an HR service provider to help them recruit one accounting specialist or one marketing specialist, who would be hired by the firm as a full-time worker to carry out the relevant business function. This worker was required to spend at least 5 days per week (approximately 40 hours) at the business site implementing activities for the firm. The firm could choose any HR provider they liked from the marketplace and choose the type of worker they wanted, then the provider would screen candidates and provide a shortlist to the firm for interviews. After meeting with the provider and signing a service agreement, the firm received its first subsidy payment of 140,000 Naira (US$380). This was intended to cover the service fee of the HR provider (usually one month's wage of the worker), as well as the first month of wages for the worker – the wage was mutually agreed upon between the worker and firm. The worker then had to develop a workplan with the firm's entrepreneur, and each month report back on a dashboard their completed activities, their work attendance, and confirmation they had been paid

[10] This guidance (and the power of round numbers) appears to have anchored most firms on paying exactly 50,000 Naira per month. In both treatments, we had approximately 75% of firms pay the insourced worker or outsourced professional exactly 50,000 Naira, 5% of firms pay less than this, and 20% of firms pay more than this. The maximum amount of the subsidy therefore does not appear to have been a binding constraint on the amount paid by firms in hiring workers or contracting professionals, but instead seems to have been a competitive rate in the market.

by the firm. Firms were then paid monthly subsidies that started at 70,000 Naira and ended after 8 months at 20,000 Naira (see Appendix 2).

Marketplace 2: Outsourcing a Professional. Firms in the outsourcing treatment group were given access to a different online marketplace where they could choose an Accounting or Marketing service provider, who would be contracted by the firm to perform tasks in the respective functional area. In this way, a firm outsources either finance/accounting or marketing/sales tasks to an external professional with specialized skills. The professional was required to spend at least 1 day per week at the business site implementing tasks in person. This decision on the minimum time requirement (8 hours per week) was based on the cost of such services in the Nigerian market, and on what providers told us their typical level of engagement would be with firms the size of those in our sample. The firm's entrepreneur signed a formal service agreement detailing the tasks that the professional would provide and the fee they would pay for these services. Based on this agreement, the professional developed a workplan (with input from the entrepreneur) then reported monthly on a dashboard about the tasks done, work dates, and confirmation that payments were received from the firm. Firms were paid monthly subsidies over 9 months, starting at 70,000 Naira in month one and ending at 20,000 Naira in month nine (see Appendix 2).

Distinctions with Consulting. We see three key conceptual differences between the insourcing and outsourcing specialists versus the general consultants. The first consists of who does the work. In a standard consulting engagement, the consultant provides advice and suggestions on what to do, but does not typically carry out a business function for the firm. For example, the consultant might advise the firm to reach out to customers for ideas on product improvements, whereas with insourcing or outsourcing, it would be the specialist who actually does this for the firm. The second, and related distinction, is that consulting engagements are normally intended to be a temporary arrangement: the consultant comes and provides advice and suggestions for improvement, then leaves at the end of the contracted period. In contrast, by shifting who does the finance/accounting or marketing/sales function of a firm, insourcing and outsourcing offer the potential to become a permanent part of the way the firm is organized: the firm hires someone to lead its digital marketing activities, and they take on this function for the firm on an ongoing basis. A third conceptual difference is that because of this longer-term relationship – and, hence, the possibility of recurring financial payments – there is greater alignment of incentives in the case of

an insourced worker or outsourced professional. For instance, in an effort to retain her new position and salary, an insourced specialist is likely going to perform her ongoing tasks at a high standard and achieve targets which, in turn, benefits the firm through greater sales. Likewise, an outsourced specialist is motivated to effectively implement business activities and demonstrate tangible results so that the firm continues the new organizational arrangement and its payment of fees. By contrast, since a consultant follows more of a short-term 'advise-pay-leave' relationship, there tends to be less accountability for delivering results linked to future firm sales or profits.

Intervention Compliance. Insourcing and outsourcing firms attended subsidy program signing events in March 2017 where they provided their bank account details for receiving the subsidies, and then received their first subsidy payments in March/April 2017. Thus, after hiring a worker or contracting a professional, the 8 to 9 month subsidy ended between December 2017 and March 2018 for most firms. Take-up and ongoing usage were high in both treatment groups (see Figure 2 for monthly usage rates). For insourcing, 97% of firms hired a worker, and 82% went on to keep their worker the full 8 months. And for outsourcing, 95% of firms contracted a service provider, and 85% continued to use them the full 9 months.

In terms of functional areas, the majority of firms chose a specialist in marketing over accounting. Among firms taking up the intervention: 77% of outsourcing firms selected a Marketing service provider to contract a marketing/sales professional; and 83% of insourcing firms used their HR provider to hire a worker specialized in marketing and sales. Table 3 summarizes administrative data on the 30 most common tasks done by insourced workers or outsourced professionals.[11] Consistent with firms' human capital choices, the activities carried out by workers or professionals largely focused on marketing, including: the traditional 4Ps of marketing; salesforce and selling tactics; new product development; and digital marketing and social media. In contrast, most finance and accounting tasks (like record-keeping, preparing financial statements, and costing) were done by only 15 to 20 percent of specialists and lie outside the top 30 tasks.

2.5 Boundary of the Firm and Choice of Specialist

During the monitoring visits (for insourcing and outsourcing), we directly asked entrepreneurs why they chose a marketing/sales or finance/accounting specialist. The most common reason given

[11] These activities were part of the workplans developed in these firms, and submitted along with the requests for payment each month.

for choosing a 'marketer' was a desire to grow sales and build brand awareness, while the most common reason for choosing an 'accountant' was to help the firm get its financial records in order. In Appendix Table 2.3 we examine the choice of marketer versus accountant through the lens of the boundary of the firm.[12] We analyze how this choice correlates with: (i) the entrepreneur's views of the *firm-specific knowledge* needed for managing its customers and cash; (ii) how much the entrepreneur feels she can *verify and trust* the work done by marketers and accountants; (iii) the *core competencies* of the firm in marketing/sales and finance/accounting practices; and (iv) relative *capabilities* of the entrepreneur. We find empirical support for task verification and firm competencies. Entrepreneurs are more likely to choose an accountant (over a marketer) if they believe they can verify the work done by this specialist and if they (ex ante) have poorer business practices.

In addition, we examine whether other entrepreneur and business characteristics are correlated with the choice between a marketer and accountant. Here we find the strongest correlates are gender and industry: female entrepreneurs and firms in the construction, ICT, entertainment and hospitality sectors are all relatively more likely to choose a marketing specialist (versus an accountant) than male entrepreneurs and firms in the manufacturing sector.

2.6 Comparison of Additional Human Capital across Interventions

Table 2 compares the additional human capital available under the four different treatments, which the entrepreneur can use to help build skills in her firm (either personally or organizationally): (i) business trainer; (ii) business consultant; (iii) insourced worker; and (iv) outsourced professional. This comparison uses data collected from a monitoring survey of the insourcing and outsourcing treatments, and from requests for details from the training agency (EDC) and the consulting advisory company (Growbridge). An important caveat is that these comparisons measure formal schooling, experience and certified skills, but do not capture any possible advantage that younger specialists may have in using new digital marketing tools such as social media.

The four treatments differ considerably in the skill level of the additional human capital and the intensity with which the intervention provided it. The common approach of training the entrepreneur lies at one extreme (higher experience; lower intensity). The business trainers all have

[12] In future work it would be useful to have a treatment arm that gives firms the choice between insourcing and outsourcing, then examines correlates of this choice. We did not have sufficient sample size to include such a group.

some form of skill certification, average over 15 years of work experience, and have an average age of 49 years. 82% have post-graduate education, and they are paid just over 1 million Naira (US$2,960) per month. However, the trainers do not work directly in the firms – instead, firms only receive 12 days (84 hours) of their time in a group classroom setting.

At the other extreme lies insourcing (lower experience; higher intensity). The insourced workers hired by firms are much younger (average age 29 years), with 3.5 years of work experience on average. And only 24% of these workers have a formal skill certification, while just 32% have post-graduate education. Firms paid these employees 50,000 Naira (US$136) per month on average, but had them working inside the firm for an average of 42 hours per week (1,455 hours in total if they stayed on for the full subsidy period).

Between these two extremes lies consulting (high experience; medium intensity) and outsourcing (medium experience; high intensity). The interventions differ considerably in the amount of contact time with firms: an outsourced professional spent a total of 678 hours on average versus only 88 total hours by a business consultant. That said, despite having similar years of work experience (12.6 and 12.7), it is the business consultants who tend to be more senior than the outsourced professionals. Consultants are five years older on average, and they are more likely to have post-graduate education (88% versus 59%) as well as a formal skill certification (80% versus 67%). However, the median monthly pay is similar for these two types of specialists at 130,000-135,000 Naira (US$360), although the mean is higher for outsourcing (207,000 versus 159,000 Naira). These salary levels are in line with our intervention as firms in the outsourcing treatment paid their professionals a mean of 52,224 Naira per month (in exchange for working 1.1 days per week).[13] This amount is similar to what firms in the insourcing treatment paid their hired workers, but the difference is that outsourced professionals also worked with other clients so their total monthly income would be higher.

We emphasize that a further key difference across the interventions is in the expectations of how this outside human capital should be used. With business training, the trainers do not directly carry out any activities for the firm, and instead try to increase the skills of the entrepreneur. In contrast, with an insourced worker or outsourced professional, the functional specialist directly implements

[13] As noted, firms were told they should aim to pay at least 50,000 Naira per month, and we find 75% of firms paying exactly this, with the 10-90 percentile range being 50,000 to 60,000 Naira.

tasks for the firm and is responsible for carrying these out on an ongoing basis. Business consulting is a more of a mix: consultants work directly with the entrepreneur (often at the firm), but it is on a time limited basis and typically involves more advising than doing.

Finally, the four interventions also differ in the principal-agent relationships they involve, and the implied incentives for this human capital to exert effort. In the training and consulting interventions, the provider is hired and paid directly by the government. They still have reputational concerns to consider, since negative feedback from entrepreneurs to the government may jeopardize their chances of future government contracts, but this is more indirect than the direct relationships in insourcing and outsourcing. With insourcing, the hired workers join the firm and have an incentive to contribute to the long-term success of the company to enhance their own employment likelihood in the future. With outsourcing, this effect is not quite as strong as with insourcing, but the outsourced professional only works with a small number of clients at a time and therefore has incentives to work hard and retain the customer's ongoing business. In practice, our qualitative view is that there was general happiness and few complaints from entrepreneurs in any of the treatments about the quality of the services provided – instead the main complaints were related to delays in implementation or payment of subsidies from the government.

Comparison of Service Bundles. As the above discussion highlights, when treatment groups are compared, we are comparing bundled interventions that differ in the human capital they use, specific advice and help provided to firms, and intensity. To maintain ecological validity, we are comparing these services in the way the market bundles or provides them, which we believe is the most appropriate comparison for both thinking about what is the most cost-effective way for governments to support building business skills, as well as thinking through the realistic options that would be available for a small firm deciding to improve business skills. For example, we see from Table 2 that training involves 84 hours of instructor time, with instructors who are paid approximately 1 million Naira ($3,000) per month, whereas insourcing involves 1,455 hours of time with workers paid approximately 50,000 Naira ($137) per month. Our analysis then examines which bundle delivers better returns from spending $2,000. An alternative could be to hold constant the hours and person providing the service, and just vary the form it is provided in. But hiring a person like the training instructor to only work 84 hours in total is not how entrepreneurs in the market would choose to insource marketing or accounting services; plus it is unlikely that

workers with the skill levels of the training instructors would agree to join a small firm. Likewise, entrepreneurs are unlikely to sit through 1,455 hours of business courses, even if we could get someone like the insourced worker to teach it instead of the training instructor. Similarly, it is more likely a firm will be interested in asking "I want to spend 50,000 Naira per month, should I insource or outsource the service?", than "Should I insource a worker for five days a week – or outsource the same function for one day a week – by paying a business instructor five times the cost?".

3. Measuring Impacts

3.1 Data Collection

Baseline surveys were collected during the induction workshops. Our main data on firm outcomes then come from two rounds of follow-up surveys. The first follow-up survey took place between March and June 2018, which corresponds to a period of about one year since after the interventions started. Thus, the time between an intervention ending and the first follow-up survey is about: 8-9 months for firms in the training treatment; 2-4 months for firms in the consulting treatment; and 2-4 months for firms in the insourcing and outsourcing treatments. The second follow-up survey took place one year later (between February and June 2019), which corresponds to two years after interventions started and 14-21 months after interventions ended depending on treatment group.

The first follow-up survey had a response rate of 88.6%, and the second follow-up survey had a response rate of 86.1%. 93% of firms completed at least one of the follow-up surveys. In addition, we were able to collect data on business closure for many of the firms not answering the survey, so we have operating status for 96.4% of firms in the second follow-up survey. We cannot reject equality of attrition rates across the five experimental groups (Appendix Table 3.1). Further, the sample of survey non-attritors remains balanced on baseline observables (Appendix Table 3.2).

We supplement these two follow-up surveys with several other data sources. We used administrative data on program take-up and activities uploaded by firms for describing adoption and compliance in Section 2. Monitors also conducted two visits with all insourcing and outsourcing firms to verify the presence of hired workers or contracted professionals, and also to collect data on these specialists and their activities (used in Section 2.4).[14] A survey of business

[14] Since the firms were spread throughout the two cities and traffic and travel times can be bad, the monitors would call in advance to arrange a time to visit. This would also ensure for outsourcing that they could be there during the time the outsourced professional was also at the firm. Two monitoring visits also took place with firms receiving the

service providers was used to compare the characteristics of providers in the GEM project to other providers in the marketplace. Finally, in October 2019, we used independent raters to score firms on the quantity and quality of their social media presence (described in Section 5).

3.2 Measurement of Main Outcomes

Appendix 4 details the construction of our main outcome measures: (i) Business Practices; and (ii) Firm Growth.[15]

Business Practices. A particular focus of the follow-up surveys was detailed measurement of business practices. We measured 41 different business practices, representing both traditional activities (in finance/accounting, marketing/sales, operations/HR) and also more novel activities (in digital marketing). A concern in collecting such data through surveys, especially after skill-building interventions, is the possibility of experimenter demand effects whereby entrepreneurs may say they are using particular practices because they think it is the desirable answer. Our surveys took several precautions to mitigate this possibility. First, the survey was conducted by an independent survey company (Kantar TNS RMS) and not framed as measuring the impacts of the GEM project. Firms were told the purpose was to "help better understand the growth process of enterprises in priority sectors, the challenges your business faces, and your use of different market services and government programs". Second, enumerators were trained to probe each answer and only record the firm doing the practice if they could provide specific examples or evidence. For example, when asking whether the firm conducted structured research on customers, the firm then needed to provide details of how this was done and what they learned about the needs of current or existing customers based on this research. Third, we identified a subset of practices that could be objectively verified through the use of photographs and physical observation (e.g., observing whether the firm had a balance sheet, used certain marketing materials, recorded maintenance checks, etc.). These verification checks measured the existence of practices, but did not attempt to ascertain the accuracy or quality of how they were implemented. Finally, for digital marketing practices, this verification occurred by collecting and auditing digital footprints (e.g., Twitter

consulting treatment to verify consulting was occurring, but there was no attached survey. Monitors also attended a subset of training sessions to verify training was taking place.

[15] Our main outcome measures and hypotheses were predefined in a pre-analysis plan, which was registered in the AEA Social Science Registry prior to beginning the first follow-up survey.

handles, Facebook page addresses, Instagram pages, Website URLs, etc.). We discuss in section 5.2 how we were able to also measure the quality, as well as quantity, of these digital practices.

These 41 business practice measures are then formed into six indices (see Appendix 4 for components): Finance and Accounting (10 practices); Marketing and Sales (9 practices); Operations and HR (11 practices); Verified Traditional Practices (10 of 30 practices); Verified Digital Marketing Practices (11 practices); Overall Index (41 practices). Each index takes the form of the proportion of business practices used by firms and therefore ranges from 0 to 1. The mean firm in the control group implemented 47.3% of the 41 practices at the time of the first follow-up, and 45.1% at the time of the second follow-up. This shows that firms had room to improve their business practices.

Firm Growth. We used multiple measures of sales, profits and employees to proxy for firm growth. Two measures of firm sales were included (total sales last month; total sales last year), with each winsorized at the 99th percentile then transformed using the inverse hyperbolic sine (IHS) function. Similarly, two measures of firm profits were used (total profits last month; total profits last year). Both were winsorized at the 99th percentile then IHS transformed. These 4 measures were also combined to construct a fifth measure: an overall Sales/Profit Index (computed by summing up the standardized z-score of each measure). As an additional proxy of growth, we also included two measures of firm employees. The first was total employment (sum of all wage/salary workers, casual/daily workers, apprentices/interns and unpaid workers) winsorized at the 99th percentile. The second was an IHS transformation of this total employment value. Overall, we have 7 variables as outcome measures of firm growth.

Other Measures. In addition to the detailed measurement of business practices and firm growth, our follow-up surveys included measures of: firm survivorship; ongoing use of a market for professional business services; and possible mechanisms related to the boundary of the entrepreneur (e.g., time allocation) and boundary of the firm (e.g., financial investment, product innovation, social media technology). Firms that closed (non survivors) are coded as earning zero sales and profits, having zero employees, and using no business practices.

3.3 Estimating Impacts

We estimate the intention-to-treat effect of being offered one of the four treatments through the following pre-specified ANCOVA specification for firm *i* in follow-up survey round *t*:

$$Y_{i,t} = \beta_0 + \beta_1 Insourcing_i + \beta_2 Outsourcing_i + \beta_3 Training_i + \beta_4 Consulting_i + \pi Y_{i,0} + \gamma M_{i,0} + \sum_{s=1}^{8} \theta_s 1(i \epsilon s) + \varepsilon_{i,t} \quad (1)$$

Where $Y_{i,t}$ is the outcome variable of interest; $Y_{i,0}$ is the baseline value (where available); $M_{i,0}$ is a dummy variable indicating whether or not this baseline variable is missing for a particular firm if it is measured for some firms; *Insourcing*, *Outsourcing*, *Training*, and *Consulting* are dummy variables for being offered one of these respective treatments; $1(i \epsilon s)$ are randomization strata dummies (the induction batches); and $\varepsilon_{i,t}$ is the error term. Since random assignment is at the individual firm level, robust (Eicker-White) standard errors are used. $\beta_1, \beta_2, \beta_3$ and β_4 then provide intent-to-treat effects, which are the effect of being offered a specific treatment relative to the control. Testing $\beta_j = 0$ for a given treatment *j* provides a test of whether a particular treatment has affected firm outcomes or not. In addition, we also carry out the joint test that none of the treatments had any effect ($\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$), and that all four treatments had equal effects ($\beta_1 = \beta_2 = \beta_3 = \beta_4$).

As noted, our sample size is smaller than originally planned, which reduces our statistical power. This is less of an issue for binary outcomes like use of business practices, but is more of a challenge for outcomes like sales, profits and employment, which are heterogeneous and heavily skewed. We therefore use two approaches to help potentially improve power. The first is to employ the post-double selection lasso approach of Belloni et al. (2014). This uses a disciplined way of selecting baseline control variables to add to equation (1) to the extent that they are strong predictors of future outcomes. Moreover, this method also selects variables that predict treatment status, which can help account for chance imbalances and any imbalances caused by selective attrition. Second, while our main interest lies in examining the trajectory of treatment impacts in order to determine whether impacts persist well after the interventions end, we also attempt to boost power by pooling both rounds of data on firm growth (sales, profits, employees) and examining average impacts over the two years (McKenzie 2012).

3.4 Multiple Hypothesis Testing

We estimate many different treatment effects given our use of multiple outcomes, four treatments, and two rounds of surveys. We use three different approaches for dealing with multiple hypothesis testing. First, we aggregate different outcomes in a domain into pre-specified standardized aggregate indices. In particular, we use an aggregate index of 41 different business practices, and an overall sales/profit index that aggregates our four measures of firm sales and profits. This enables us to examine whether the average impact of a given treatment on these key main outcomes is significant or not. Second, since we are also interested in the individual outcomes, for each treatment we take the set of all 26 main outcome-survey round estimates across Tables 4 and 5, and calculate sharpened q-values that hold constant the false discovery rate (Anderson 2008). These estimates are reported in Appendix Table 9.1. Similarly, we correct for the full set of 26 mechanism outcome-survey round estimates in Tables 6, 7 and 9, and provide sharpened q-values in Appendix Table 9.2. Third, following Young (2019), we conduct a Wald omnibus test of overall experimental significance. This tests the joint hypothesis that all treatment effects on business practices and firm growth are zero. The corresponding p-values are 0.006 for survey round 1, and 0.008 for survey round 2. That is, we can reject the null that all treatments are jointly irrelevant.

4. Impacts on Main Outcomes

We begin by examining effects on business survival. This is not because business survival was expected to be one of the main outcomes of the program, but rather because our interpretation of impacts on all other outcomes will be affected if there are large survival differences across treatment groups. Survival rates were high, with 97.7 percent of control group firms interviewed in our first follow-up survey and 90.2 percent of those in our second follow-up surviving. The interventions do not appear to have had large effects on either the selection of which firms survive (Appendix Table 3.3 shows balance on baseline observables for the second round survivors); or on the survival rate (Appendix Table 3.4 shows statistically insignificant treatment impacts of 2 to 4 percentage points). Nevertheless, we also carry out robustness checks which condition on survival to allow for any potential effect of these small survival differences.

4.1 Impacts on Business Practices

The most immediate impact expected from the four interventions is improvement in the business practices carried out at these firms. Table 4 reports the results (Appendix Table 5.1 shows similar results conditioning on firm survival). The first four columns examine impacts on practices related to more traditional business activities (in finance/accounting, marketing/sales, operations/HR), with column 4 showing results for the subset of these practices that could be objectively verified. The fifth column displays the treatment effects on more novel business activities in digital marketing, which were also verified by auditing a firm's digital footprint. And column 6 shows the impacts on our Overall Index of 41 practices.[16]

Three key results are evident. First, business training had no significant impact on any of the business practice indices over either time horizon. Second, in contrast, the other three treatments – which change the boundary of the entrepreneur – all significantly improve business practices: with fairly large impacts of 0.08 to 0.12 on the Verified Traditional Practices measure (column 4), and similarly strong impacts of 0.04 to 0.07 on the Overall Index (column 6). Further, these effects for insourcing, outsourcing and consulting continue to hold after adjusting for multiple hypothesis testing across outcomes and waves (see Appendix Table 9.1). Third, the improvements in practices persist over time, with magnitudes of similar size in the second follow-up as in the first follow-up (we cannot reject equality over time). That is, the improvements last over a year after the project has stopped subsidizing the insourcing and outsourcing or providing the consulting.

Although insourcing, outsourcing and consulting had similar impacts on our aggregate Overall Index measure of business practices, there are important differences in Table 4. First, across all treatments, there is no impact on Operations and HR practices at the time of the first follow-up (column 3). And by the second follow-up there is only a small significant effect on such business activities for consulting. However, a review of the disaggregated practices in Appendix Table 5.5 shows that most of this improvement is externally focused on comparison of suppliers in the market (versus internal systems and processes).

[16] Point estimates using post-double selection lasso are identical for 9 out of the 12 "business practice by time period" outcomes, since no controls are selected. Point estimates after using this method differ by less than 0.005 for verified traditional practices in round 1, and for digital marketing practices in rounds 1 and 2. Given this, we do not separately show these results.

Second, consulting had relatively more impact on Accounting and Finance practices than insourcing and outsourcing, particularly over a longer time horizon (column 1). Among these practices, the ones changed most by consulting were tracking money inflows and outflows, preparing income statements, and preparing balance sheets – which all increased by 10 to 15 percentage points (refer to Appendix Table 5.2). And while firms in the consulting treatment did improve on practices related to marketing and sales (column 2), as well as digital marketing (column 5), these impacts were smaller and only significant at the 10% level by the second follow-up.

Third, recall that most firms assigned to insourcing (83%) and outsourcing (77%) chose a marketing/sales specialist rather than a finance/accounting specialist. Consistent with this, we find these two treatments had their largest and most lasting impacts on Marketing and Sales practices (column 2) and Digital Marketing practices (column 5). As a consistency check, we do see in Appendix Table 5.6 that firms that chose a finance/accounting specialist improve traditional finance and accounting practices relatively more, while those who chose a marketing/sales specialist improve more on both traditional marketing and sales practices and digital marketing practices.

Appendix Tables 5.3 and 5.4 delve deeper into which marketing and digital marketing practices changed the most. Among the more traditional marketing and sales practices, firms in both treatments achieve large and significant increases for activities related to customer selling: 15 to 17 percentage points on using a customer relationship management (CRM) system; 10 to 11 percentage points on implementing a customer loyalty program; and 14 to 21 percentage points for having a professional sales force. Among digital marketing practices, the insourcing and outsourcing treatments lead to significant improvements in social media activities: 13 to 17 percentage points on using a business website; 20 to 23 percentage points for having a business Facebook page; 12 to 14 percentage points on using Twitter for the business; and 12 percentage points for implementing a business Instagram account. Given their novelty and connection with extending the entrepreneurial boundary, we examine differences in these social media technologies in the mechanism results further below.

4.2 Impacts on Firm Growth

Better business practices are strongly correlated with greater firm performance in both the cross-section and over time (McKenzie and Woodruff 2017). We would therefore expect improvements in practices to start leading to firm growth for the insourcing, outsourcing and consulting treatments. However, the heterogeneity among firms in our sample, coupled with a smaller than anticipated sample size, makes measuring impacts on firm growth more challenging. Our pre-analysis plan specified that our primary measures would be the IHS transformations of firm sales and profits for two reasons. The first is an economic theory rationale: we believe the treatments are more likely to have a constant proportional treatment effect than a constant level treatment effect. That is, better business practices are more likely to help firms of different initial sizes grow by the same proportion, than by the same absolute amount. Second, these transformations help improve statistical power, by reducing the influence of large outliers. Table 5 shows the estimated treatment effects on firm sales, profits and employment for all four treatments.

Outsourcing. In the first follow-up survey, outsourcing has a positive and significant impact on yearly sales. This treatment also has a positive, but statistically non-significant, effect on the other measures of firm growth. The magnitudes of these impacts increase in the second year, and are statistically significant at the 5 percent level for outsourcing on four out of the five sales and profits measures. This includes our overall Sales/Profit Index: outsourcing increases sales and profits by 0.23 standard deviations.[17] Outsourcing also has a positive impact on firm employment, which is significant at the 10 percent level when using the IHS measure.

Insourcing. The impacts are less clear for the insourcing treatment in both survey rounds. The point estimates are all positive, but none are statistically significant from zero – although, at the same time, we can not reject that they are equivalent in size to those of outsourcing. The impact on the overall Sales/Profit Index is 0.12 standard deviations at the second follow-up.

Consulting. This treatment has impacts that mostly lie between insourcing and outsourcing in magnitude. There was a significant effect on monthly sales, yearly profits, and the IHS measure of

[17] Even after accounting for multiple hypothesis testing across outcomes and survey rounds, outsourcing has sharpened q-values below 0.10 for impacts on yearly sales in both rounds, and on monthly sales, yearly profits, and the profits and sales index in round 2 (Appendix Table 9.1).

employment in the second follow-up. The impact on our overall Sales/Profit Index is 0.18 standard deviations for consulting, although it is not statistically significant.

Training. The third row of each panel shows training does not have a significant effect on any of the sales, profits or employment measures. The point estimates are mainly negative in the first follow-up, and positive in the second follow-up (though smaller in size than the other treatments). This is consistent with the lack of impact found on business practices, but the large standard errors mean we cannot reject that training has the same impacts on firm growth as the other treatments.

Robustness. Appendix 6 examines robustness of these results. We continue to see significant impacts of outsourcing on sales and profits when we condition on survival (Appendix Table 6.1), use post-double selection lasso to select controls (Appendix Table 6.2), and pool multiple rounds of data (Appendix Table 6.3). None of these approaches improves precision to the point of being able to detect significant impacts for the insourcing treatment; and consulting is only significant in some specifications. Nevertheless, we are still not able to reject that insourcing and consulting also have similar effects as outsourcing. In addition, Appendix Table 6.4 shows that these firm growth results are unlikely to simply be a reporting effect, with no impact on reporting errors. This table also emphasizes that impacts on sales and profits are quite noisy when measured in levels.

Taken together, these results provide some evidence that the improvement in business practices have translated into growth in firm sales, profits and employment, with this strongest for the outsourcing treatment. Interpreting the magnitude of the treatment effect is slightly complicated. The impact of outsourcing on the inverse hyperbolic sine of yearly profits and yearly sales is 1.39 and 1.27 respectively. This can be interpreted as a 255 to 302 percent change in profits and sales, or 199 to 239 percent using the small-sample bias-correction formula in Bellemare and Wichman (2020). These large impacts in part reflect large percentage changes from a small base at the bottom of the distribution – conditioning on survival (as in Appendix Table 6.1) reduces the impacts to 99 percent for yearly sales. The level impacts in Appendix Table 6.4 are less precise, but lower in magnitude: monthly sales increases 592,000 Naira ($1,621) or 49 percent of the control mean, and monthly profits increases 36,000 Naira ($98) or 16 percent of the control mean. The impact of outsourcing on employment is a 23 percent increase, or 0.4 workers, but the 95 percent confidence interval is [-1.1, +1.9] workers. We are therefore unable to rule out changes in one worker, which is what would occur if insourcing firms kept their worker on, but didn't change other hiring.

5. Mechanisms

Insourcing, outsourcing and consulting all improved business practices, and there is some evidence that this in turn led to firm growth, particularly for outsourcing. In this section, we further explore some of the mechanisms through which these changes occurred in our main outcomes.

5.1 Boundary of the Entrepreneur: Time Allocation

Insourcing, outsourcing and consulting all provide the firm with additional human capital during the period of the intervention, which can change the boundary of the entrepreneur and influence the allocation of time. Thus, we examine in Table 6 whether this leads to the entrepreneur changing the amount of time she devotes to the business, and whether it changes how she allocates her time amongst different business tasks. Column 1 shows control group entrepreneurs work an average of 45 to 47 hours per week (including zero hours for closed firms). None of the treatments have a significant impact on the amount of hours worked. The point estimates show modest changes, but the standard errors of three hours mean the confidence intervals for treatment effects are wide. For example, the effect of insourcing in the first survey round has a confidence interval of (-7.3, +4.5).

Columns 2-7 then examine how entrepreneurs spend their time, conditional on the firm operating. We hypothesized that having specialists (insourced workers or outsourced professionals) may cause entrepreneurs to concentrate their time on fewer functional areas of the business, but column 2 shows small and non-significant effects on the number of areas an entrepreneur works on. We also hypothesized that the entrepreneur would shift more of their activities towards growth and future oriented areas, and delegate more work to others. Columns 3-5 show point estimates consistent with this pattern, but the impacts are not statistically significant. Noting that insourcing and outsourcing mostly resulted in firms choosing marketing/sales specialists, we next examine in column 6 whether this crowds in or out the entrepreneur's own efforts in this area. We find that in the first survey round entrepreneurs are devoting significantly more of their time to marketing and sales activities (3 percent more, on a control base of 19 percent).[18] And as expected, column 7 shows negative (albeit non-significant) impacts on time devoted to finance and accounting functions.

[18] This result continues to hold after correcting for multiple hypothesis testing across our different mechanisms (Appendix Table 9.2).

We conclude from this that the insourced and outsourced treatments do not appear to significantly crowd out the entrepreneur spending time on her business, and that they seem to complement rather than substitute for the entrepreneur's time. Indeed, entrepreneurs tended to focus more attention on marketing and sales activities in the short run, possibly in an effort to learn about novel practices in this functional area from their insourced or outsourced marketing/sales specialist.

5.2 Boundary of the Firm: Investment, Innovation and Technology

Separate from influencing an entrepreneur's individual-level actions, moving beyond the boundary of the firm to acquire specialized human capital could also improve a firm's practices and growth through business-level channels. We next explore whether insourcing a worker or outsourcing a professional may stimulate growth by: (i) helping the firm attract new financing for investments in the business; (ii) spurring innovation in the development of new products; and (iii) enhancing access to new technologies such as social media. The results in Table 7 examine these mechanisms, which were only measured at the time of the second follow-up survey (or shortly after in the case of social media).

Financial Investment. We might expect a financial expert or accountant to not only improve record-keeping, but also help the firm in applying for loans or attracting other types of investments. However, only a small percentage of firms assigned to insourcing (17%) and outsourcing (23%) chose a finance/accounting specialist (over a marketing/sales specialist). Consistent with this choice, we find small and statistically non-significant changes in our investment index in column 1. This suggests that firms were not obtaining new financing or making new large investments.

Product Innovation. In contrast, column 2 shows that firms in the insourcing and outsourcing treatments have a significant increase of 7 to 8 percentage points in their innovation activities. This impact is robust to correcting for multiple testing across all our different mechanisms (Appendix Table 9.2). Further, Appendix Table 7.1 shows these innovation effects are largest in the areas of product improvements and product design, which are areas that specialists with marketing/sales expertise may be particularly helpful in implementing. This also accords with the main tasks done by insourced workers and outsourced professionals in Table 3, in which understanding customer needs and helping to introduce or improve products to meet them are among the top 10 activities.

Social Media Technology. We have found that one of the primary ways through which insourcing and outsourcing improved business practices was through increases in the amount of digital marketing, with the largest effects found for newer social media technologies like Facebook, Twitter and Instagram. There are several reasons why digital marketing activities may be well suited for extending beyond the boundary of the entrepreneur to be done by a specialist (be it inside or outside the firm's boundary). First, setting up novel social media technologies is unlikely to be a core competency of most firms, especially those run by older, less tech-savvy entrepreneurs. Second, implementing social media marketing does not require much firm-specific knowledge so these tasks could be effectively performed by a newly hired worker or contracted professional. Third, it is relatively easy for an entrepreneur-owner to verify the online, publicly viewable outputs of a worker's or professional's social media efforts. There is also a verifiable link between social media marketing and immediate customer sales. Fourth, in terms of existing capabilities, this is an area in which technology and consumer tastes have changed rapidly in recent years, and where entrepreneurs are unlikely to have learned specific skills during their formal education. And even if entrepreneurs can do some of these tasks themselves, the quality of what they do may be worse than could be done by marketing/sales specialists (who are also likely to be more efficient at implementing the newest social media approaches).

Our main business practice measures are simply binary indicators of whether a form of digital marketing was used by the firm or not – for instance, the firm has a Facebook page or Twitter handle. These indicators do not capture the effectiveness of a given digital marketing activity. Thus, we constructed a new social media measurement tool then contracted independent raters (blind to treatment status) to objectively verify and assess the four most common technologies used by firms in our sample: Website, Facebook, Twitter and Instagram. Each of the four technologies was reviewed and rated using twelve ordinal scales (1 = lowest score; 10 = highest score) that covered the key attributes of digital marketing effectiveness: Function (e.g., access, usability, recency); Information (e.g., content, value proposition, contact info); Emotion (e.g., aesthetics, enjoyment, engagement); and Action (e.g., differentiation, promotion, purchase). After scoring these forty-eight attributes, the raters completed two additional measures (scored on similar 1-10 scales) to provide a global quality assessment and global quantity assessment of a firm's social media marketing. This resulted in a total of 50 social media ratings per firm, each of which was scored by two independent raters (see Appendix 7 for more details). This took place in

October 2019, and provides social media effectiveness measures 2.5 years after the interventions started, and over 1.5 years after the interventions ended.

For analysis purposes, we combined certain social media ratings to construct seven indices: Website Effectiveness (12 ratings); Facebook Effectiveness (12 ratings); Twitter Effectiveness (12 ratings); Instagram Effectiveness (12 ratings); Global Quality Effectiveness (1 rating); Global Quantity Effectiveness (1 rating); and Overall Social Media Effectiveness (average of all 50 ratings). Columns 3-10 of Table 7 show the treatment impacts on these measures. Across the seven social media indices, there are no significant impacts for training, while consulting is only significant (at the 10% level) on two measures. By contrast, there is a consistent pattern of positive and significant effects for the insourcing and outsourcing treatments, which continue to hold after multiple testing corrections (Appendix Table 9.2). Column 3 shows that website effectiveness is significantly greater for insourcing (40.3%) and outsourcing (58.0%) relative to the control group (mean score of 2.1 out of 10). There is also a treatment impact on Facebook effectiveness for both insourcing and outsourcing, with an average improvement of 25.6% to 30.0% compared to control firms (see column 4). However, as shown in column 5, we find no significant effects on Twitter effectiveness – despite the earlier impacts found for the binary measure of having a business Twitter account. And in column 6, we see positive impacts of insourcing (15.4%) and outsourcing (26.5%) on Instagram effectiveness, though this is only significant for outsourcing. In addition, as displayed in columns 7 and 8, the independent raters also scored firms in the insourcing and outsourcing treatments significantly higher on the global quality and global quantity measures of social media marketing. Lastly, column 9 shows that both insourcing and outsourcing led to statistically significant improvements in overall social media effectiveness. The magnitudes are 0.6 points (24.8%) to 0.8 points (32.8%), relative to a control mean of 1.7 (out of 10), and so are substantial gains in relative terms. Column 10 shows that even when we condition on the subset of firms with some digital marketing presence, overall social media effectiveness is still significantly higher for firms that received outsourcing. The impact of insourcing is smaller, and we can neither reject that it is equal to zero, nor that it is equal to the impact of outsourcing.

6. Marketplace for Business Services

Using business service providers to access skilled specialists – such as HR providers (to insource workers), Accounting and Marketing providers (to outsource professionals), or Business

Consultancies (to obtain personalized consulting) – did significantly improve the business practices of firms in our sample. This raises the question of why firms needed the government's GEM project to get them to use these services, and why more firms do not use a marketplace for business services on their own?

6.1 Why don't more firms use the market for business services?

As discussed in Section 2.2, the market for business service provision involves considerable information asymmetries and transactional uncertainty. There are then multiple potential reasons why firms may not use the market for these services. Many of the reasons fall into two sets of issues. The first set are informational frictions. Firms may not know what services they need, may not know of providers in the market that can offer these services, may find it hard to tell good from bad providers, and be wary of trusting outsiders when information is incomplete. The second set of issues are cost-benefit calculations. Firms may not think the returns from using such services outweigh the costs, may not be able to afford the costs, or may have considerable uncertainty about what these returns are. Finally, with family-run firms, there may be pressure to hire relatives for positions instead of going to the market.

Our first follow-up survey asked firms to consider different reasons why SME owners in Nigeria (including themselves) might not go to the open market to obtain HR services that help them find a full-time employee (i.e., insourcing a worker), or to contract outside accounting and marketing service providers (i.e., outsourcing a professional). For each potential reason, firms were asked to rate whether this was a key reason for firms not using the service on a five point Likert scale ranging from '1' (not at all likely to be a key reason) to '5' (extremely likely to be a key reason). We then calculate the proportion of firms answering 4 or 5 on this scale (very likely or extremely likely to be a key reason). Table 8 summarizes their views.

Cost-Benefit Considerations. The two most common reasons firms give are lack of funding to pay the costs of these services (approximately half of firms think this), and uncertainty about what the returns are (approximately one-third of firms acknowledged this). At least one type of cost-benefit reason is considered "very likely" or "extremely likely" as a reason for not using a marketplace by: 56% of firms for marketing services; 63% of firms for accounting services; and 67% of firms for HR services. And interestingly, marketing is the service where the fewest firms think there is

a low expected return from using the service (only 12% say this is a key reason that stops firms from contracting a marketing professional).

Informational Frictions. Individual frictions are expressed by up to 20% of firms. But taken as whole, 47% of firms view some form of informational friction as "very likely" or "extremely likely" for explaining the lack of use of outside marketing services, while 49% do for accounting services and 59% do for HR services. In particular, across the three business services, 21% of firms believe it will be too difficult to judge the skills of outsiders (i.e., they can't assess service quality). Two other frictions impeding firms from going to the market include: concerns over trusting the new worker or professional (19% for marketing services up to 23% for HR services); and worries about time or hassle costs (20% to 24% depending on the service). Surprisingly, however, very few firms actually believe the supply of human capital is of low quality – only 9% of firms think accounting services are poor and just 11% of firms view marketing services to be low in quality.

The GEM intervention helps overcome both these informational and cost-benefit concerns. It provides firms with a list of screened providers, reducing search costs and acting as some signal of quality. Appendix 8 reports on a survey we did with 333 business service providers across the Nigerian market. We find that the GEM providers are larger and have more skilled staff on average than the typical non-GEM provider, but they serve similar customer markets and have similar quality guarantee policies. At least for accounting and marketing services, the GEM intervention may have helped screen providers who have some additional capacity to expand and serve new customers. Likewise, for consulting, the program's implementation partner (Growbridge) screened, trained and tested providers to ensure high quality consultancy support. In addition, across interventions, the GEM project also required all providers to start their services by first doing a diagnostic, to help the firm assess what type of help they could use. It then subsidizes the initial costs of using these services (overcoming financial frictions) and gives firms a chance to learn whether these services deliver value, reducing uncertainty about the returns.

6.2 Potential returns from using a business services marketplace?

Are these services worth it for firms? We have noted how challenging measuring the returns are for us, even with hundreds of firms to look at, so for participant firms themselves it may also be difficult to isolate the benefits of these services. Using the estimated treatment effect on levels of monthly profits in the second survey round of $98 per month, the outsourcing treatment would

cover the costs of the subsidies ($1,315) in just over one year, and the costs of the full program ($2,000) in under two years.[19] Insourcing had slightly smaller impacts on profits when using the inverse hyperbolic sine, but similar impacts on levels of profits, so the calculation is not too different for that treatment. Given that consulting is twice as expensive as insourcing and outsourcing, and the impacts on firm growth outcomes are similar, it may take twice as long to recoup the value of these services. But overall, all three business services appear to have returns that could pass a cost-benefit test, but with a large degree of uncertainty still.

Revealed preference then offers another view of whether firms benefited enough from these services to pay for them themselves after the program is over. Table 9 shows that firms which received training are not more likely to subsequently go and hire expertise than the control group. By contrast, firms in the insourcing, outsourcing and consulting treatments are more likely to be using business service providers relative to control firms. This continues to be true in the second follow-up survey, so that well over a year after the program has stopped subsidizing these services, firms which received treatment are 14 to 19 percentage points more likely to be paying for outside HR, accounting, marketing or consulting services on their own. This remains significant after multiple testing corrections (Appendix Table 9.2).

We also asked firms directly in the second follow-up survey (over a year after subsidies ended) whether they still had the worker or professional hired through the GEM project. Insourcing firms report still keeping 37 to 48 percent of the workers hired through the program.[20] Moreover, 84 percent of those who left quit, rather than were fired. And unlike wage subsidy programs for young workers (Groh et al. 2016) or for microenterprises to hire non-specialist workers (de Mel et al. 2019), data on when workers left show no spike when the subsidy ended but rather steady churn throughout the year. Outsourcing firms report still retaining the original service provider in 29 to 36 percent of cases. Here there is more of a spike in dissolution rates at the time the subsidy ended, with 46 percent of the churn occurring in the three months after the subsidies ended. The main reason firms gave for stopping the use of an outsourced professional was that firms had completed

[19] Real interest rates on small enterprise loans in Nigeria are approximately 20%, so the total cost of a 2-year $2,000 loan would be $2,443. The $98 per month increase in profits would thus approximately cover the monthly loan repayments, and so long as returns last into a third year, be a profitable investment.

[20] These data have some inconsistencies, with some firms confusing workers, accounting or marketing service providers, and consultancies. The lower number codes firms as not retaining the worker if they claim not to have hired the worker, while the higher number conditions on firms that report hiring a worker.

all the tasks they had for them. Even in these cases, the outsourced professionals helped set up systems and transfer knowledge that could continue adding value to the firm, so that the original support may have passed a cost-benefit test (even if firms do not think further usage was needed).

6.3 Would it be enough to just provide information and quality ratings?

If firms lack information about the availability of business service providers and struggle to distinguish their quality, then this raises the possibility of overcoming these frictions by simply providing more information and reputation mechanisms. We conducted an additional experiment to test this possibility. We put together a sample of 1,054 firms with 2 to 15 workers in Lagos and Abuja in the same industries as our GEM firms. Anderson and McKenzie (2021) serves as an extended appendix on this Business Services choice experiment and describes the sampling and experimental protocols in more detail.[21] Firms were randomized into a control group of 297 firms, and an information treatment group of 757 firms. Firms in the information treatment group were then shown an online business services marketplace, which contained details of the names, services offered, brand, and contact details of real HR, accounting, and marketing providers in their city. They were asked to short-list and rank their top three choices in each provider category, using an incentivized choice which put them in a draw to win funding to spend on their preferred choice.

Firms in the information group were further randomized into one of four sub-treatments that varied the information and quality signals provided: (i) *information only*, which displayed the business name and basic service description of each provider; (ii) *quality ratings only*, which just included quality ratings provided in the form of an average customer star rating out of five; (iii) *quality ratings + negative comments*, which added any negatively valenced feedback given by customers; and (iv) *quality ratings + all comments*, which displayed each provider's average star rating as well as all comments left by customers. The quality ratings were obtained by us sending real business owners to every service provider in the experiment to act as mystery shoppers and then rate their interactions. We find that firms do respond to the quality ratings provided, with the average star rating (out of 5) of their top three-ranked providers increasing by 0.2 to 0.4 stars when quality ratings are displayed during their decision – as opposed to just information. Firms who receive the quality ratings treatment are also less likely to choose low-quality (3 star or lower)

[21] This second experiment is registered at the AEA trial registry at https://www.socialscienceregistry.org/trials/5707.

providers and more likely to choose the top-ranked (5 star) providers. Providing quality ratings of business services therefore does change firm preferences over providers.

We then conducted a six-month follow-up survey, which tests whether providing information or different quality signals about business service providers is enough to get more firms to use this market for business services. Table 10 shows the results. We find that use of the market for business services is low in the control group, with only 10 percent of firms using a service provider during the prior six months. Further, none of the four treatments has a significant impact on either contacting or using these services. Our estimated treatment effects are all very close to zero in magnitude, with 95 percent confidence intervals of approximately ±3 to 5 percentage points. Therefore, alleviating information and quality concerns in this way does not (on its own) seem to be sufficient to get more firms to use professional business services.

This lack of impact of information and quality ratings alone is consistent with the idea that firms need to see the value of these services through demonstration or trusted network peers. In our main experiment, we did find firms being more likely to return to purchase services from the market after being involved in the program, suggesting a potential role for the government in helping build demand for this incipient market. Atherton et al. (2002) and Ezell and Atkinson (2011) argue that public support for these services can then in fact be "market-making", by helping SMEs understand the value of these services and building future demand. In future work, it would therefore be useful to attempt to measure whether this direct support to some firms brings externalities in the form of encouraging trusted peers of the supported firms to also try these services.

7. Conclusions

Our primary research question centers on how best to help small firms grow. We propose that instead of training entrepreneurs in finance/accounting or marketing/sales, it may be more effective to extend the boundary of the entrepreneur by giving them access to a marketplace for business services where they can acquire the expertise of skilled specialists – who are either hired into the firm or contracted from outside to perform tasks (i.e., beyond the boundary of the firm). We empirically test this hypothesis through a randomized controlled field experiment in which 753 firms were randomly assigned into one of five experimental groups: training, consulting, insourcing, outsourcing, and a control group.

Our results show that insourcing and outsourcing interventions clearly dominate training in terms of helping firms to improve their business practices and grow. Moreover, these new market-based solutions appear to impact firm practices and growth through novel mechanism channels, namely greater product innovation and social media technology. Insourcing and outsourcing of specialized human capital (e.g., marketing/sales or finance/accounting specialists) also perform favorably on a value-for-money basis compared to personalized consulting services. For firms seeking to grow, moving beyond the entrepreneurial boundary – as well as considering the boundary of the firm in designing business support policies – can improve impact.

The results suggest two possible directions for future government support to firms. The first approach is to replace spending on training with direct support to firms so they can effectively use a marketplace for business services, as was done in our experiment. A caveat here is that while using these services may be individually beneficial for the firms receiving the support, the public case for support depends also on factors we cannot measure, such as the extent to which greater social media marketing and new product introduction increases consumer welfare, and the extent to which it crowds out sales to other firms in the economy.[22] These same considerations also apply to spending money on training, so conditional on wanting to spend money on direct support, insourcing and outsourcing deserve consideration.

A second approach is for the government to more indirectly help the market for business services function better. While reducing information and search frictions, and quality concerns, by helping set up marketplaces for these services with directories and quality rating systems may be a useful first step, our second experiment shows it may not be enough on its own. Coupling such a marketplace with initial financial support to try the market, as well as peer feedback mechanisms to help build trust and provider reputations, seems a useful area for further experimentation.

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[22] Our sample size, coupled with the heterogenous mix of firm sectors and their geographic spread throughout two large cities means that the firms in our study are not direct competitors to one another, and we do not have data on non-program firms to assess any such crowd-out. However, our finding that firms are introducing new products is consistent with the finding of McKenzie and Puerto (2021) that firms that improve business practices can grow the whole market in developing countries through better meeting new customer needs.

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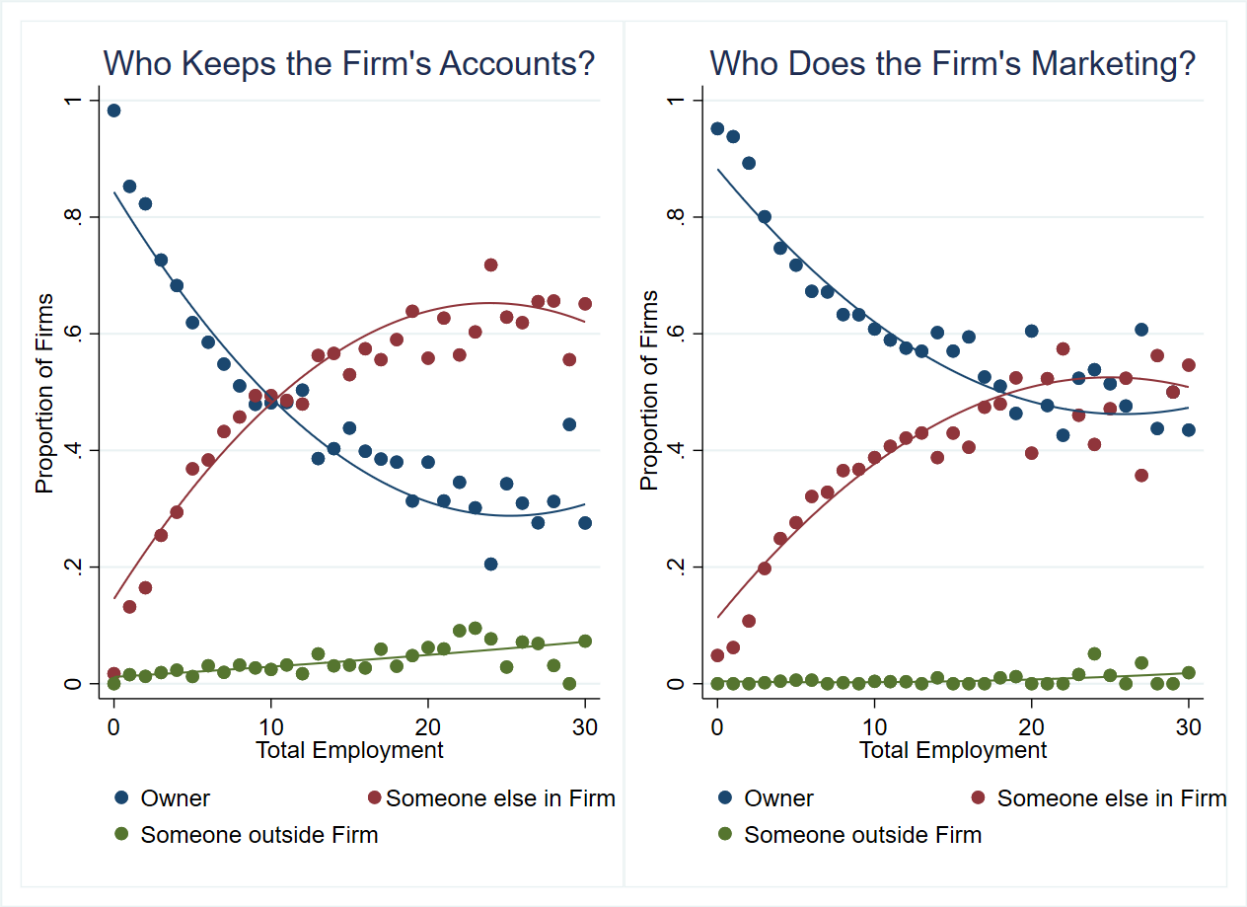
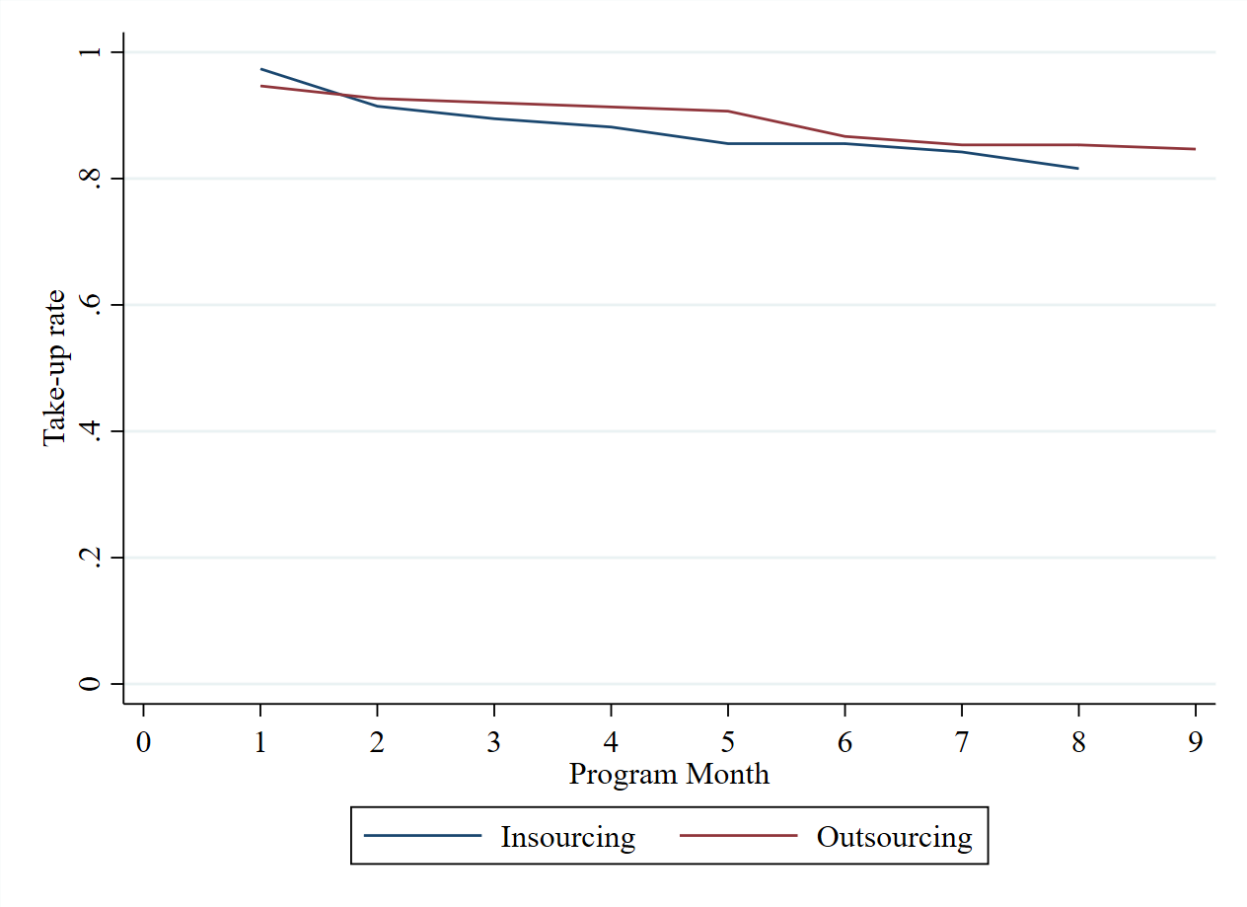
Figure 1: Entrepreneurs are less likely to do the finance and marketing tasks in larger firms



Source: Own analysis of baseline data on 8,071 Nigerian firms who applied for different forms of support under the Growth and Employment (GEM) program and who attended induction workshops. Quadratic fit lines added.

Figure 2: Take-up and Monthly Usage Rates of Insourcing and Outsourcing Subsidies



Source: Program administrative data on monthly subsidy usage. The insourcing subsidy was available for a maximum of 8 months plus an initial one-month salary paid to the HR provider. The outsourcing subsidy was available for a maximum of 9 months.

Table 1: Baseline Summary Statistics and Balance by Treatment Assignment

	Total	Control	Insourcing	Outsourcing	Training	Consulting	Joint Orthogonality F-test
Last month sales in USD ($1 = 365N)	3265	3885	3591	3646	2954	2251	1.507
	[242]	[645]	[641]	[567]	[461]	[321]	
Sales in best month in USD	7581	9477	9050	6353	8207	4777	1.446
	[725]	[1916]	[2122]	[1177]	[1734]	[676]	
Sales in worst month in USD	1108	1264	1135	1315	867	963	1.135
	[81]	[207]	[191]	[192]	[139]	[165]	
Sales in average month in USD	2942	3817	2776	2798	2821	2503	0.977
	[227]	[664]	[459]	[457]	[489]	[443]	
Full-time employees	4.3	4.2	4.2	4.4	4.4	4.2	0.183
	[0.097]	[0.206]	[0.198]	[0.228]	[0.254]	[0.196]	
Baseline finance practices	16.6	16.9	16.5	16.3	16.4	16.6	1.161
	[0.095]	[0.218]	[0.208]	[0.217]	[0.217]	[0.203]	
Baseline marketing practices	8.6	8.5	8.9	8.5	8.3	8.6	1.923
	[0.067]	[0.139]	[0.150]	[0.149]	[0.158]	[0.151]	
Baseline HR practices	7.6	7.6	7.7	7.7	7.5	7.5	0.389
	[0.066]	[0.150]	[0.146]	[0.147]	[0.148]	[0.144]	
Baseline overall business practices	6.3	6.4	6.4	6.2	6.2	6.3	1.478
	[0.027]	[0.063]	[0.059]	[0.062]	[0.060]	[0.055]	
Baseline insources or outsources accounting	0.34	0.28	0.32	0.36	0.39	0.34	1.134
Baseline insources or outsources marketing	0.20	0.19	0.22	0.19	0.19	0.21	0.209
Baseline used an HR consultant in last 12 months	0.04	0.01	0.03	0.07	0.05	0.03	1.705
Baseline Sector is Construction	0.10	0.11	0.08	0.09	0.11	0.08	0.472
Baseline Sector is ICT	0.15	0.15	0.13	0.15	0.14	0.16	0.188
Baseline Sector is Entertainment	0.12	0.15	0.09	0.09	0.16	0.12	1.418
Baseline Sector is Hospitality	0.13	0.12	0.18	0.11	0.15	0.10	1.333
Baseline Sector is Manufacturing	0.50	0.46	0.52	0.55	0.44	0.54	1.398
Baseline location in Lagos	0.58	0.58	0.59	0.59	0.58	0.58	n.a.
Baseline firm age	4.3	4.1	4.6	4.1	4.8	4.1	1.088
Baseline business name registration with CAC	0.86	0.89	0.90	0.84	0.84	0.84	1.115
Baseline percent of sales within state	29.5	30.0	29.8	28.3	29.6	29.6	0.124
Baseline Owner is Female	0.44	0.42	0.49	0.48	0.40	0.40	1.204
Owner's Age at Baseline	37.7	37.9	37.6	37.9	38.0	36.9	0.545
Owner is married at baseline	0.67	0.65	0.76	0.67	0.64	0.64	1.833
Baseline owner has completed undergraduate education	0.87	0.89	0.86	0.87	0.82	0.91	1.292
Baseline owner has masters or more education	0.48	0.50	0.45	0.45	0.52	0.46	0.490
Baseline owner has previously had salaried job	0.79	0.77	0.80	0.75	0.83	0.77	0.901
Sample Size	**753**	**149**	**152**	**150**	**153**	**149**	

Notes: n.a. denotes not applicable, since location is part of stratification batch.

Standard errors in parentheses, not shown for binary variables.

F-test of joint orthogonality controls for stratification batch fixed effects. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 2: Comparison of Additional Human Capital in Different Treatments

	Insourcing	Outsourcing	Trainers	Consultants
Proportion Male	0.50	0.76	0.45	0.57
Mean Age	28.9	40.8	49.2	45.0
Mean Years of Work Experience	3.5	12.6	15.5	12.7
Proportion with Post-graduate Education	0.32	0.59	0.82	0.88
Proportion with Formal Skill Certification	0.24	0.67	1.00	0.80
Proportion belonging to a Professional Association	0.18	0.50	0.64	0.81
Mean Days per Week in Firm	4.9	1.1	.	.
Mean Hours per week in Firm	42	17	.	.
Total program hours with firm	1455	678	84	88
Mean monthly pay	51335	207189	1080750	159286
10th percentile pay	50000	50000	1080750	100000
Median pay	50000	135000	1080750	130000
90th percentile pay	60000	500000	1080750	300000

Notes:
Formal skill certification denotes a professional skill certification, such as chartered accountancy, or professional certified marketer.
Monthly pay is in Naira (US$1 = 365N), and is the wage this worker is paid by their employer. For insourcing this is the study firm, whereas for outsourcing the employer is their professional service provider.
Total program hours with firm is amount of time spent under full compliance

Table 3: Thirty most common tasks done by insourcing and outsourcing workers

Task	Proportion for Insourcing	Proportion for Outsourcing
Implement sales tactics such as building rapport and closer relations when they interact with customers	0.84	0.72
Do research on customers by exploring the needs of an existing or potential clients	0.83	0.74
Implement sales tactics such as implementing a customer relationship management system	0.83	0.74
Use digital marketing such as social media to market their products/services	0.83	0.76
Implement sales tactics such as taking time to understand customer needs	0.82	0.69
Participate in activities to increase awareness of the market segment to stimulate demand	0.82	0.74
Do research on suppliers to ensure that they are getting the stock/materials for the best price	0.82	0.63
Introduce or improve products/services to provide more benefits to customers	0.82	0.71
Initiate promotions of products/services to get people to buy more or to attract new customers	0.82	0.72
Have a salesforce mainly focused on increasing the top line revenues of the company	0.81	0.74
Develop partnerships, where the firm may benefit from additional advertising and cross-promotions	0.81	0.75
Develop better packaging material, content and designs to attract customers	0.81	0.71
Implement sales tactics, such as push strategies, e.g., cold calling and door-to-door sales	0.81	0.71
Encourage word of mouth by putting referral and rewards systems in place	0.81	0.76
Do research on competitors by visiting businesses similar to theirs	0.81	0.71
Do research on marketing dynamics such as assessing the market opportunities of the products/services	0.81	0.71
Use marketing tactics such as changing the prices of products/services to increase total sales	0.81	0.69
Contact a customer after he/she bought a product/service to ask if he/she was satisfied with the purchase	0.80	0.70
Assessing the margins and profitability of products/services they currently offer	0.80	0.68
Create opportunities for endorsements by people of influence to friends/family, by nonprofits to supporters	0.79	0.71
Use digital sales such as allowing customers to use digital transactions to pay for products/services	0.76	0.64
Use in-store demonstrations and sample products or road shows and events to showcase products	0.75	0.71
Use digital marketing such as a 3rd party e-commerce platforms to sell products/services	0.72	0.66
Use digital marketing such as running their own business website	0.70	0.73
CAC Registration (including both business name, company registration, and annual reporting)	0.69	0.65
Use digital sales such as selling products/services directly on their own business website	0.67	0.64
Other: Market Research	0.62	0.45
Other: Digital Marketing/Sales	0.61	0.46
Other: Sales Tactics	0.61	0.45
Other: Marketing Tactics	0.59	0.51

Source: administrative data from dashboard on activities submitted by insourcing workers and outsourcing service providers.
Proportions are conditional on taking up the intervention.

Table 4: Impact on Business Practices

	Traditional Business Practices			Verified	Verified	
	Finance & Accounting	Marketing & Sales	Operations & HR	Traditional Practices	Digital Marketing	Overall Index
Panel A: Impacts in First Follow-up Survey (One-year after intervention started)						
Assigned to Insourcing	0.094***	0.074**	0.024	0.109***	0.079***	0.065***
	(0.033)	(0.033)	(0.025)	(0.029)	(0.024)	(0.021)
Assigned to Outsourcing	0.064*	0.068**	0.022	0.099***	0.099***	0.064***
	(0.033)	(0.031)	(0.025)	(0.028)	(0.025)	(0.020)
Assigned to Training	-0.002	-0.030	-0.015	0.017	0.011	-0.007
	(0.034)	(0.034)	(0.026)	(0.026)	(0.024)	(0.022)
Assigned to Consulting	0.075**	0.019	0.013	0.083***	0.051**	0.041*
	(0.033)	(0.033)	(0.025)	(0.029)	(0.023)	(0.021)
Mean of Control Group	0.631	0.588	0.645	0.225	0.221	0.517
Sample Size	670	670	670	670	670	670
P-value: all treatments zero	0.003	0.004	0.535	0.000	0.000	0.000
P-value: all treatments equal	0.012	0.004	0.425	0.002	0.004	0.001
Panel B: Impacts in Second Follow-up Survey (Two-years after intervention started)						
Assigned to Insourcing	0.043	0.083**	0.048	0.117***	0.079***	0.063**
	(0.038)	(0.038)	(0.034)	(0.028)	(0.024)	(0.029)
Assigned to Outsourcing	0.060	0.099***	0.033	0.100***	0.083***	0.070**
	(0.037)	(0.036)	(0.031)	(0.027)	(0.024)	(0.028)
Assigned to Training	-0.006	-0.016	-0.018	0.039	0.008	-0.005
	(0.040)	(0.037)	(0.033)	(0.026)	(0.024)	(0.028)
Assigned to Consulting	0.093**	0.070*	0.052*	0.122***	0.044*	0.065**
	(0.038)	(0.036)	(0.031)	(0.029)	(0.024)	(0.027)
Mean of Control Group	0.635	0.551	0.606	0.174	0.219	0.498
Sample Size	678	678	678	678	678	678
P-value: all treatments zero	0.041	0.002	0.108	0.000	0.000	0.003
P-value: all treatments equal	0.062	0.005	0.099	0.010	0.006	0.010
P-value: equality of 1 & 2 year effects	0.485	0.780	0.777	0.620	0.944	0.865

Notes:

Regressions control for stratification batch fixed effects and baseline value of outcome.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

Finance & Accounting is the proportion of 10 practices in this area that the firm uses; **Marketing & Sales** is the proportion of 9 practices in this area that the firm uses; **Operations &HR** is the proportion of 11 operations and human resources practices the firm uses; **Verified Traditional practices** is the proportion of 10 of these first 30 traditional practices that we could physically verify as implemented; **Verified Digital Marketing** is the proportion of 11 practices in this area that the firm uses; and **Overall index** is the proportion of all 41 practices that the firm uses. Equality of 1 & 2 year effects tests the joint hypothesis that the 1 year and 2 year treatment effects are equal for the different treatments over time, but not necessarily equal across treatments.

Table 5: Impact on Firm Growth

	I.H.S. Monthly Sales	I.H.S. Yearly Sales	I.H.S. Monthly Profits	I.H.S. Yearly Profits	Sales & Profits Index	Total Employment	I.H.S. Employment
Panel A: Impacts in First Follow-up Survey (One-year after intervention started)							
Assigned to Insourcing	0.378	0.547	0.206	0.620	0.084	-0.127	0.047
	(0.405)	(0.446)	(0.564)	(0.545)	(0.078)	(1.020)	(0.103)
Assigned to Outsourcing	0.242	0.826**	0.357	0.501	0.095	-0.345	0.091
	(0.395)	(0.404)	(0.541)	(0.582)	(0.070)	(1.042)	(0.100)
Assigned to Training	-0.573	-0.233	-0.288	0.202	-0.055	-0.280	0.018
	(0.482)	(0.518)	(0.584)	(0.572)	(0.085)	(1.010)	(0.110)
Assigned to Consulting	-0.172	-0.097	0.158	-0.635	-0.047	0.081	0.068
	(0.432)	(0.493)	(0.558)	(0.626)	(0.084)	(1.024)	(0.103)
Mean of Control Group	13.186	15.186	11.242	13.278	0.128	9.597	2.543
Sample Size	670	670	670	670	670	675	675
P-value: all treatments zero	0.242	0.033	0.777	0.224	0.119	0.991	0.892
P-value: all treatments equal	0.144	0.031	0.640	0.146	0.075	0.971	0.889
Panel B: Impacts in Second Follow-up Survey (Two-years after intervention started)							
Assigned to Insourcing	0.798	0.705	0.652	0.471	0.124	0.155	0.123
	(0.613)	(0.658)	(0.611)	(0.690)	(0.119)	(0.712)	(0.127)
Assigned to Outsourcing	1.182**	1.266**	0.775	1.393**	0.228**	0.425	0.210*
	(0.590)	(0.584)	(0.617)	(0.589)	(0.110)	(0.754)	(0.124)
Assigned to Training	0.469	0.725	0.090	0.656	0.087	0.494	0.112
	(0.634)	(0.634)	(0.652)	(0.641)	(0.117)	(0.772)	(0.126)
Assigned to Consulting	1.079*	0.935	0.760	1.194*	0.182	0.877	0.245**
	(0.582)	(0.604)	(0.613)	(0.626)	(0.113)	(0.714)	(0.120)
Mean of Control Group	11.620	14.088	9.925	12.274	-0.123	6.723	2.105
Sample Size	678	678	678	678	678	693	693
P-value: all treatments zero	0.259	0.294	0.571	0.116	0.268	0.769	0.289
P-value: all treatments equal	0.593	0.681	0.684	0.304	0.518	0.777	0.586
P-value: equality of 1 & 2 year effects	0.300	0.478	0.967	0.040	0.350	0.956	0.714

Notes:
Regressions control for stratification batch fixed effects and baseline value of outcome.
Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.
I.H.S. denotes the inverse hyperbolic sine transformation. Firms that are closed are coded as having zero profits and sales.
Monthly sales is real (January 2018) sales in the past month; **Yearly Sales** are real sales in the past year; **Monthly profits** and **Yearly profits** are real profits in the past month and past year respectively. **Sales and Profits Index** is the average of standardized z-scores of these first four sales and profits measures. **Total Employment** is total number of workers.

Table 6: Impacts on Owner Time Use

	Owner's hours	Time concentration	Growth-focused Activities	Time on external and future activities	Delegation	Percent of time sales & marketing	Percent of time accounting & finance
Panel A: Impacts in First Follow-up Survey (One-year after intervention started)							
Assigned to Insourcing	-1.414	0.012	0.223	4.074*	0.058	3.172**	-0.474
	(2.977)	(0.019)	(0.154)	(2.453)	(0.092)	(1.435)	(0.931)
Assigned to Outsourcing	-1.061	0.006	0.142	3.622	0.044	3.403**	-1.113
	(3.175)	(0.019)	(0.160)	(2.575)	(0.084)	(1.400)	(0.948)
Assigned to Training	-0.659	-0.006	0.047	1.526	-0.017	1.100	-1.630*
	(3.398)	(0.018)	(0.157)	(2.615)	(0.092)	(1.370)	(0.923)
Assigned to Consulting	-2.487	0.007	0.045	-0.342	-0.061	2.917**	0.880
	(3.177)	(0.020)	(0.160)	(2.567)	(0.090)	(1.420)	(1.007)
Mean of Control Group	46.5	0.407	2.222	30.5	3.397	19.7	14.4
Sample Size	670	627	627	663	663	626	626
P-value: all treatments zero	0.951	0.864	0.592	0.230	0.674	0.059	0.079
P-value: all treatments equal	0.941	0.753	0.583	0.226	0.509	0.377	0.055
Panel B: Impacts in Second Follow-up Survey (Two-years after intervention started)							
Assigned to Insourcing	3.634	-0.004	0.054	1.033	0.082	-0.490	-0.915
	(2.979)	(0.020)	(0.152)	(2.272)	(0.085)	(1.592)	(0.940)
Assigned to Outsourcing	1.473	-0.016	0.034	2.957	0.092	0.045	-0.717
	(2.850)	(0.018)	(0.148)	(2.113)	(0.088)	(1.602)	(0.945)
Assigned to Training	0.365	-0.004	-0.065	3.612	0.054	-3.041**	-0.170
	(2.978)	(0.020)	(0.158)	(2.269)	(0.089)	(1.510)	(0.966)
Assigned to Consulting	4.148	-0.010	-0.018	1.149	-0.061	-1.452	0.410
	(3.000)	(0.018)	(0.145)	(2.163)	(0.084)	(1.532)	(0.999)
Mean of Control Group	44.9	0.386	2.091	28.4	3.336	22.9	14.0
Sample Size	678	632	632	632	632	632	632
P-value: all treatments zero	0.522	0.912	0.952	0.470	0.391	0.156	0.605
P-value: all treatments equal	0.528	0.893	0.875	0.593	0.289	0.138	0.482

Notes:

Regressions control for stratification batch fixed effects.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

Owner's hours are hours worked in the firm by the owner in past week; **Time concentration** is number of different functional areas out of 13 categories in which owner allocates 5% or more of time (lower scores means more concentrated); **Growth-focused activities** is number of growth-focused functional areas that owner spends 5% or more of time on; **Time on external and future activities** is percent of time on external and future-focused activities; **Delegation** is index measure of five questions on delegation**. Percent sales and marketing**, and **percent accounting and finance** are percent of owner time devoted to these areas of the firm.

Table 7: Impacts on Financial Investment, Product Innovation and Social Media Quality

	Investment Index	Innovation Index	Website Effectiveness	Facebook Effectiveness	Twitter Effectiveness	Instagram Effectiveness	Global Quality Effectiveness	Global Quantity Effectiveness	Overall Social Media Effectiveness	
									Unconditional	Conditional
Assigned to Insourcing	0.030	0.083**	0.843**	0.954***	0.273	0.392	0.695**	0.596**	0.616**	0.349
	(0.027)	(0.032)	(0.360)	(0.338)	(0.207)	(0.283)	(0.296)	(0.282)	(0.240)	(0.278)
Assigned to Outsourcing	-0.035	0.068**	1.211***	1.118***	0.259	0.676**	0.807***	0.875***	0.817***	0.725***
	(0.025)	(0.032)	(0.370)	(0.343)	(0.205)	(0.282)	(0.304)	(0.295)	(0.249)	(0.276)
Assigned to Training	-0.029	-0.003	-0.035	0.242	-0.000	0.300	0.134	0.070	0.126	-0.107
	(0.026)	(0.031)	(0.322)	(0.336)	(0.202)	(0.276)	(0.287)	(0.273)	(0.230)	(0.279)
Assigned to Consulting	-0.024	0.049	0.400	0.576*	0.105	0.088	0.544*	0.315	0.298	-0.085
	(0.026)	(0.031)	(0.347)	(0.341)	(0.198)	(0.284)	(0.297)	(0.278)	(0.230)	(0.268)
Mean of Control Group	0.306	0.351	2.089	3.722	1.460	2.547	3.337	3.237	1.670	2.827
Sample Size	678	678	753	753	753	753	753	753	753	508
P-value: all treatments zero	0.057	0.011	0.002	0.004	0.494	0.136	0.023	0.013	0.004	0.004
P-value: all treatments equal	0.036	0.020	0.004	0.038	0.480	0.233	0.095	0.029	0.018	0.002

Notes:

Regressions control for stratification batch fixed effects. Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels. **Investment index** is the average of dummies for taking new loan financing, new equity financing, and making a big investment (100,000 Naira or more); **Innovation index** is the proportion of 17 innovative activities being done by firms; **Website, Facebook, Twitter,** and **Instagram Effectiveness** are averages of 12 ratings on each of these forms of social media; **Global Quality** and **Global Quantity** are single question ratings; and **Overall Social Media Effectiveness** is an average of these 50 ratings of functional and aesthetic quality. The Unconditional estimates code firms with no social media as 0, conditional estimates are for firms with some social media or website presence

The investment index and innovation index were measured in round 2 only; Social media quality measured in October 2019.

Table 8: Why don't more firms use the market for business services?

	Outsourced Marketing	Outsourced Accounting	HR services
Information, trust, and search frictions			
Do not know of any business service provider offering this service (i.e. they lack information about the market).	0.15	0.14	0.15
Do not know what kind of expertise their business needs (i.e. they can't assess their internal needs).	0.17	0.18	0.11
Find it difficult to judge the skills of outsiders (i.e. they can't assess the quality of the marketing service they're buying).	0.21	0.21	0.21
Believe there is a lack of qualified workers (i.e. they just don't think there is a supply of talent in the market).	0.11	0.09	0.15
Are not confident they will find someone they can trust (i.e., so they won't be able to delegate responsibilities).	0.19	0.22	0.23
Worried it will take too much time or hassle to find a service provider (i.e., search costs are high).	0.20	0.21	0.24
Any information, trust or search friction	**0.47**	**0.49**	**0.59**
Cost-benefit considerations			
Think there is a low expected return from using service (i.e. they don't think it will increase their business performance).	0.12	0.18	0.23
Think returns are possible but highly uncertain (i.e. Service can increase performance but the payoff is unpredictable).	0.28	0.31	0.35
Lack the money to pay for these services (i.e., they cannot afford the upfront costs or the cost to 'test out' a new service)	0.46	0.51	0.55
Any cost-benefit reason	**0.56**	**0.63**	**0.67**
Other			
Under pressure to hire family/friends instead	0.18	0.17	0.21

Notes: numbers shown are proportion of firms in first follow-up survey who think the reason is very likely or extremely likely as a reason more firms do not use the market for this professional business service.

Table 9: Impacts on Continued Use of the Market for Business Services

	Use Professional Services	
	Round 1	Round 2
Assigned to Insourcing	0.252***	0.136**
	(0.060)	(0.055)
Assigned to Outsourcing	0.347***	0.191***
	(0.057)	(0.056)
Assigned to Training	-0.065	0.004
	(0.057)	(0.052)
Assigned to Consulting	0.228***	0.185***
	(0.060)	(0.056)
Mean of Control Group	0.346	0.235
Sample Size	670	678
P-value: all treatments zero	0.000	0.000
P-value: all treatments equal	0.000	0.002

Notes:
Regressions control for stratification batch fixed effects.
Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.
Professional Services is a dummy variable of whether they used HR, accounting, or marketing professional services in the past year.

Table 10: Impacts of Information on Business Service Provider Usage

	Contacted a Provider		Use of Business Service Provider		
	HR	Mktg/Acct	HR	Mktg/Acct	Either
Panel A: Pooled Information Treatment					
Any Information Treatment	0.052	-0.049	-0.006	0.006	-0.008
	(0.034)	(0.039)	(0.023)	(0.016)	(0.025)
Panel B: By Type of Information Treatment					
Information Only	0.093*	-0.011	0.037	0.009	0.030
	(0.050)	(0.053)	(0.036)	(0.023)	(0.038)
Ratings Only	0.080	-0.019	-0.025	-0.009	-0.033
	(0.049)	(0.052)	(0.027)	(0.019)	(0.031)
Ratings + Negative Comments	-0.005	-0.068	-0.013	0.001	-0.012
	(0.046)	(0.051)	(0.029)	(0.021)	(0.034)
Ratings + All Comments	0.038	-0.094**	-0.022	0.018	-0.017
	(0.046)	(0.047)	(0.027)	(0.023)	(0.032)
Sample Size	695	690	698	698	698
Control Mean	0.20	0.29	0.07	0.03	0.10
P-value: test all jointly zero	0.197	0.259	0.404	0.822	0.538

Notes:
Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.
Contacted a Provider is a binary outcome taking value one if they contacted this type of provider in the past six months*;*
Use of Business Service Provider is a binary outcome taking value one if they hired this type of provider in the past six months.
HR denotes Human Resources providers, and Mktg/Acct denotes marketing and accounting providers.
The final column is for hiring either type of provider.

Online Appendices

Appendix 1: Timeline

Appendix 2: Further Details on Interventions

Appendix 3: Survey Response Rates, Attrition, and Survival Impacts

Appendix 4: Measurement of Key Outcomes

Appendix 5: Which Business Practices Improve Most?

Appendix 6: Robustness of Firm Performance Results

Appendix 7: Impacts on Components of Mechanisms

Appendix 8: Comparison of GEM and non-GEM Business Service Providers

Appendix 9: Sharpened q-values

Appendix 1: Timeline

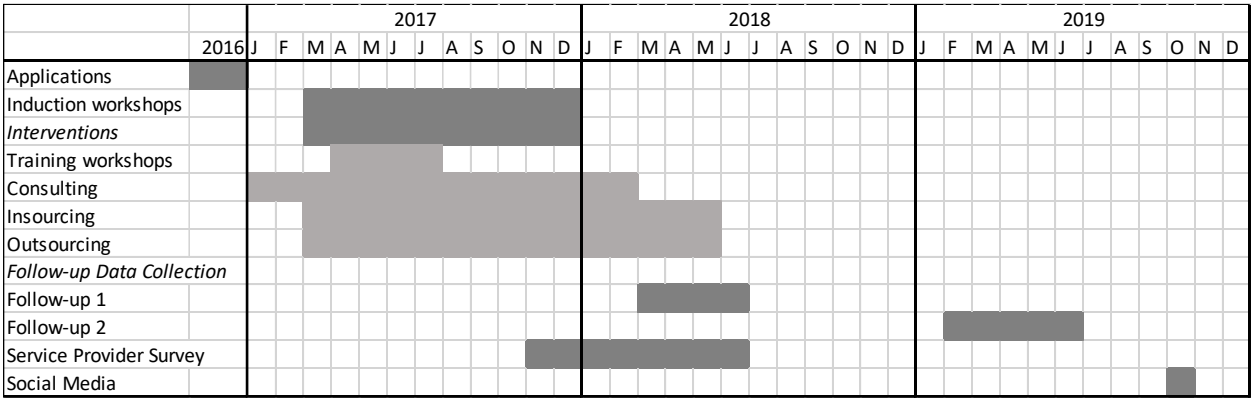
Applications

February 9, 2016: BIG Platform launched to start receiving applications
December, 2016: BIG Platform registrations close for the first year

Induction workshops
Lagos workshops held in March, May, August and December 2016
Abuja workshops held in May, August, and November 2016
One firm located in Abuja also attended the Enugu induction workshop in November 2016

Interventions
Training workshops: April/May 2017 to June/July 2017 for most firms.
Consulting: Phase 1 (Needs assessment and growth plan) – January-April 2017 for most firms
Phase 2 (80 hours assistance) – May 2017-February 2018
Insourcing and Outsourcing:
Subsidy Program signing events – March 13 and 24, 2017
Subsidies received – March/April 2017 to December/March 2018 for most firms

Surveys
First follow-up: March-June 2018 - corresponds to approximately one year after interventions started
Second follow-up: February-June 2019 (86% in February/March) - corresponds to approximately two years after interventions started, and over one year after interventions ended
Business Service Provider survey – 333 providers interviewed November 2017-June 2018
GEM Project closing: March 29, 2019.
Social media quality measured: October 2019.



Appendix 2: Further Details on Interventions

Business Training

The Business Edge training program is an internationally accredited management training program developed by the International Finance Corporation (IFC). It has been used in 56 countries around the world to train more than 200,000 individuals. Only firms that are recognized by IFC can deliver the Business Edge training, and all trainers must have completed a training program led by a certified Master Trainer. The Enterprise Development Centre (EDC) of the Pan-Atlantic University in Lagos was set up in 2003, and is accredited for delivering this training.

The GEM project operational team decided on a blended approach that would combine some online training with in-person training based on a discussion of what they thought would be easiest for entrepreneurs to attend, and in discussion with the EDC technical team. The topics chosen then covered the main Business Edge topic areas at the time, along with some additional modules thought to be potentially relevant for firms in certain industries. The topics and main sub-topics covered under each topic are as follows:

- *Marketing Management*: caring for customers; achieving success in marketing; assessing marketing opportunities; developing a competition strategy; positioning yourself in the market; establishing your marketing mix strategy; preparing your product strategy; working out your pricing strategy; creating your distribution strategy; developing an integrating marketing communication strategy; improving your selling skills; gaining consumer insights; marketing services.
- *Financial Management*: controlling costs; working with budgets; using and analyzing financial statements; controlling business assets; basics about financial management; Working with Excel or other software.
- *Human Resources*: recruiting for key management positions; planning for human resources; establishing compensation and benefits; appraising performance; performing effective job design.
- *General and Operations*: Auditing quality; controlling physical resources; planning and controlling work.
- *Writing a Business Plan*: evaluating investment decisions; developing a business plan; pitching your idea.
- *Governance*: managing risks; planning for business continuity; managing relationships; implementing enterprise governance.
- *Personal Productivity Skills*: motivating people; managing changes; managing time; communicating effectively.
- *Tourism and hotel management*: running a sustainable accommodation business; caring for guests; saving costs in the accommodation business; marketing accommodation services; motivating and retaining hotel staff.

Each topic consisted of an online learning component, followed by in-person training. The online courses included a main lesson, activities, and an end of module assessment. In class training was taught in a participatory manner to groups of approximately 20 firms at a time, with in-class

activities and examples drawn from the businesses of those in class. Note that none of the modules focuses on digital marketing. The reason for this was that the Business Edge curriculum did not include digital marketing as a topic. This is one of the potential advantages of the market-driven approach of using consultants, insourced workers, and outsourced professionals: rather than having a fixed top-down curricula that may be slow to update, they can adapt more quickly to adopt new business practices that emerge, such as the rise of digital and social media marketing.

Appendix Table 2.1 shows the take-up rates by topic for the online and in-person components of this training course. The business plan module was a pre-requisite for applying for any form of grant, and was the most likely to be completed module.

Appendix Table 2.1: Training Take-up

	Online Courses	In-person Courses
Topics		
Financial Management	0.83	0.55
General Operations	0.71	0.48
Business Plan	0.83	0.67
Marketing Management	0.69	0.47
Human Resources	0.52	0.25
Enterprise Governance	0.31	0.14
Personal Productivity	0.62	0.49
Tourism/Hospitality	0.15	0.03
Any Course	0.93	0.69
Number of Courses	4.65	3.09
Completed Requirements	0.75	0.61

Note: Completed Requirements denotes completed at least 5 courses online, 12 days in-person

Consulting

Selection of consultants: An expression of interest was issued by the GEM project, and 113 consulting firms responded. These were screened on their qualifications, capacity and expertise. Fifty firms were invited to five or ten-day training program based on the length and breadth of experience. They were then assessed based on a paper-based test and an observation of a consulting service, and 27 firms selected to provide services to the project (24% of those applying). Of these 27, 14 served firms in Lagos and Abuja in our experiment, while the remainder served firms in other parts of the country. The GEM project operational team decided on 9 months for the length of consulting intervention, because they wanted to make sure firms had a substantial enough engagement and enough time between visits for entrepreneurs to implement suggestions being made by the firms.

Main activities provided: the GEM project required the accredited business development service providers (consultants) to undertake support in two phases.

Phase 1) Articulate a growth strategy, formulate a road map for success and agree on the scope of consultancy support.

The MSME and consulting firm worked together to review the current business situation, key metrics, assess individual business need using standardized business diagnostic tools, evaluate specific/realistic opportunities for growth and identify the growth barriers (8 hours). Once completed, the consultant would upload a report through the BIG platform, which the firm would first approve. Feedback and eligibility checks were undertaken by UK firm Growbridge Advisors to ensure that submission provided relevant tailored support aimed at overcoming identified barriers to growth and to facilitate growth with time-bound action plans.

Phase 2) Implementation of the Scope of Support

The GEM framework of support provided a menu of tasks across management, finance, sales and marketing, operations and human resources with outlined deliverables and required documentation. Once completed, the consultant would upload a report through the BIG platform, which the firm would first approve. This would include documentation to support the claim that this activity had been completed. For example, to support the claim that the firm had set breakthrough goals, this would document what these goals are; to help to develop a brand/image, examples could include the definition of the brand and the key message it wants to communicate, a new logo or name integrated into the website and promotional materials and/or recommendations for the realignment of the brand to keep it current. KPMG / Growbridge Advisors then checked these materials, and if approved, a predefined set of points were allocated to the firm for each activity. The points provided a pathway for the opportunity to subsequently apply for a Matching Grant towards Technical Assistance or a Performance Grants to pay for goods, equipment and further support.

Appendix Table 2.2 uses the set of 118 firms in the consulting treatment that had approved activities to summarize the most common tasks undertaken. We include all tasks undertaken by 25% or more of these firms. The most common activities are in finance, followed by sales and marketing, with relatively fewer operations, human resources, and general management tasks.

Appendix Table 2.2: Most Common Activities undertaken with Consultants

Name of Task	Proportion of firms
Developing a full Business Plan	0.96
Develop a (new or refined) Sales & Marketing strategy with clear materials - Sales and Marketing	0.84
Setting breakthrough goals (people/financial/customer/operations/product/service).	0.77
Identifying Key Financial Risks including separating personal and business finances and Mitigating these Risks	0.69
Developing a brand/image	0.66
Developing new high growth business models	0.62
Developing and understanding a Profit & Loss statement	0.58
Ensuring that resource needs (human, equipment, etc.) are profiled over 12 months, and this profile collates to the cash flow budget	0.58
Embedding Quality Assurance processes	0.57
Reducing inefficiencies (reducing production costs by optimizing production processes/supply chain /understanding production times)	0.57
Presenting the Business Plan to financiers	0.56
Developing and understanding a Cash Flow Forecast	0.53
Applying for finance to investors and financial institutions bodies	0.52
Developing and setting budgets	0.52
Developing and understanding a Balance Sheet	0.51
Managing working capital and understand cash vs. profits	0.51
Setting up a system to measure the performance/ productivity of each employee	0.50
Applying for funding to grant making bodies	0.48
Developing the organization structure/ hierarchy with reporting procedures	0.43
Setting up a registry with customers/clients and potential customers/clients i.e.CRM system	0.41
Creating winning business by hiring, coaching and keeping the best people	0.37
Improving the effectiveness and flexibility of the business to deliver growth through scalable processes	0.36
Re-thinking the positioning of the business (target market, differentiation, comparative advantages, routes to market)	0.36
Developing and update website (concept, design, recruitment of an IT firm/person)	0.35
Developing a social media strategy (concept, design, recruitment of an IT firm/person)	0.34
Expanding to a new geographical location (City/State/Country)	0.32
Getting More for less (selecting and negotiating with existing/new suppliers to get a better price on raw materials/inputs/services)	0.32
Learning about Business laws and taxation	0.30
Hiring and the selection of a Sales Team or Third party firm	0.29

Human resource planning including a review of key personnel (skills audit)	0.28
Understanding the importance of transaction reporting and financial tools such as Excel and accounting software & implementing	0.28
Developing a strategy for e-commerce/ e-marketing	0.25
How to recruit effectively (job description, offer published, analysis of the CV, interview techniques, appraisals)	0.25
Learning about business contracts and legal documentation including the protection of assets	0.25
Learning about the role and responsibility of the Director	0.25
Calculating and monitoring product margins, waste and capacity utilization	0.25
Developing a training program for each key staff member	0.25

Notes: Tasks are standardized categories as assessed by program implementors. Proportion is out of the 118 firms in the consulting treatment who submitted proof of activities done with consultants.

Insourcing and Outsourcing

Process of Vetting Service Providers:

Our project team searched various online directories (eg. Vconnect.com, Finelib.com), and contacted industry associations in marketing and accounting to obtain a list of approximately 250 firms. These firms were contacted by email and phone, and asked to submit expressions of interest (EoIs). 85 firms submitted EoIs, which were then scored out of five points based on:

a. The details of their placement history (HR firms only);
b. Relevant experience;
c. Size of typical clients;
d. Key staff CVs;
e. Locations of operations; and
f. Timeliness in responding.

Firms achieving a score of 2 or more were contacted for an interview, which were held at the firms' offices, with key members of their staff present. Interviews were then scored out of five points based on their ability to talk through examples of relevant experiences and references given of previous clients. Firms that scored above 6.5 in the combined score of EoI and Interview were selected as partner firms. This resulted in 52 firms being selected, which fall into the following categories (noting that several providers operated in both Lagos and Abuja): Human Resources 23 (15 Lagos, 8 Abuja); Accounting Firms 17 (9 Lagos, 8 Abuja); Marketing Firms 20 (13 Lagos, 7 Abuja).

Workplans:

After a firm had hired a worker using the HR specialist, or hired a marketing or accounting company, a workplan had to be created that would set out the tasks to be done by this specialist worker. At least 20 different activities had to be part of this work plan, and then points were allocated to firms upon completion of this specified activities.

The choice of an eight-to-nine month period for insourcing and outsourcing was done for two reasons: The first is to enable comparison over a similar time frame as the consulting intervention. Second, given the cost of the training, the anticipated cost of an insourced worker, and the desire to ensure the subsidy declined over time, it was calculated that the $2,000 amount would cover this length of time. A declining subsidy scheme was used based on the experience of using wage subsidies in Groh et al. (2016) and de Mel et al. (2019). In Groh et al.'s study, the subsidy was held constant over time, and firms found it a large change from having a subsidy that covered 100% of the employee's wage to 0%, resulting in a large spike in worker dismissals when the subsidy ended. De Mel et al. had a two-tier subsidy, intended to make the transition from subsidized to nonsubsidized labor less drastic with the goal of increasing the likelihood the worker

would stay with the firm. Our hope was that a smoother decline in the subsidy would get firms used to covering more and more of the worker's or professional's cost over time, so that it would be even less of an adjustment when the subsidy ended, increasing the chances of retention.

Installment schedules:

For insourcing, business owners would receive payments according to the following schedule:

Month 1	HR firm fee + worker salary	140,000 Naira
Month 2	Worker salary	70,000 Naira
Month 3	Worker salary	70,000 Naira
Month 4	Worker salary	60,000 Naira
Month 5	Worker salary	50,000 Naira
Month 6	Worker salary	40,000 Naira
Month 7	Worker salary	30,000 Naira
Month 8	Worker salary	20,000 Naira

For outsourcing, business owners would receive payments according to the following schedule:

Month 1	Professional service	70,000 Naira
Month 2	Professional service	70,000 Naira
Month 3	Professional service	70,000 Naira
Month 4	Professional service	70,000 Naira
Month 5	Professional service	60,000 Naira
Month 6	Professional service	50,000 Naira
Month 7	Professional service	40,000 Naira
Month 8	Professional service	30,000 Naira
Month 9	Professional service	20,000 Naira

Note that in each case the subsidy payment was made to firms in our experiment, and then it was their responsibility to in turn make payments to their workers or accounting and marketing professionals. Subsidies were paid upon reporting of attendance and tasks on a dashboard.

Choice of Accounting vs Marketing

Appendix Table 2.3 examines the correlates of the decision of a firm receiving insourcing or outsourcing to choose accounting compared to marketing. Based on the boundary of the firm literature, we consider the following factors in the choice to get someone else to do a task versus for the entrepreneur to do it him or herself:

- From the transaction costs literature (Williamson, 1979), firm owners should be more willing to have others do a task if they do not require extensive firm-specific knowledge. We measure whether the owner thinks the way the firm spends and generates cash is very

firm-specific as a measure of accounting specificity, and whether the type of customers and customer acquisition strategies are firm specific as a measure of marketing specificity.

- From the task-verifiability and hold-up literature (Grossman and Hart, 1986; Holmstrom and Milgrom, 1994), we measure whether they think they can verify the work of internal and outside accounting and marketing workers, and whether they think providers and workers can be trusted. We also control for whether the firm is formally registered, to account for the possibility that less formal firms may be more reluctant to open their books to others.
- From the core competencies (Coast, 1937) and capabilities literature (Barney, 1999) we include the baseline level of finance practices, baseline level of marketing practices, overall business practices score, and education level of the owner.

We then also examine the role of owner characteristics (gender and age), industry, and whether the firm already has someone other than the other doing accounting or marketing at baseline.

Column 1 shows our full specification. Since many of these variables are correlated with one another, we also use lasso as a data reduction tool to select a subset of coefficients that can predict this choice, reporting the post-lasso marginal effects in column 2. We see the strongest predictors of the accounting versus marketing choice are the gender of the owner, industry, and starting level of business practices. Among the different boundary of the firm covariates, there is suggestive evidence to support a role for task-verifiability and hold-up problems.

Grants

Firms were incentivized to participate in the interventions through a points system, with firms that accrued enough points being eligible to apply for grants. They were told that grants were not guaranteed, and that they would still need to then submit a business plan explaining how they would use the grant, and then there would be a random draw among all of those with suitable plans. In all four treatments, the same weighting of points for attendance (15%) versus task completion (85%) were used. Attendance here refers to attending the training courses, meeting with the consultant, or having the insourced worker or outsourced professional show up in the firm. The task completion points were allocated based on carrying out tasks associated with each treatment. For the training treatment, this meant points were allocated for completing the in-class activities and exercises, as well as for learning the material taught and being tested on it via an end-of-module assessment test. For the insourcing and outsourcing treatments, points were awarded for the worker or professional carrying out tasks such as those listed in Table 3, while for the consulting treatment, points were awarded for completing tasks as noted in Appendix Table 2.2.

In all four groups the point assignment was such that any firm that fully participated in its allocated treatment and carried out the tasks associated with that activity would earn enough points to be grant-eligible. One small exception occurred with the points for business training, where all firms could receive attendance and activity completion points, but they would only get points for the test assessment if their score was in the top 25% of participants. Overall, we had 129 insourcing firms, 134 outsourcing firms, 93 training firms, and 122 consulting firms earn enough points to be eligible to apply for a grant. For insourcing, outsourcing and consulting, the majority of these (104 to 122

firms) had earned enough points to be eligible for both types of grants, whereas in training only 26 firms earned enough points to be eligible for performance grants. The lower points for the training firms reflects less treatment compliance (only 61% attended all 12 days of business training, in line with the 65% business training take-up rate reported in McKenzie and Woodruff (2014) for a range of business training experiments), as well as the effect of the test assessment only giving points to the top-scorers. We view this as a feature of business training compared to the other approaches: with insourcing or outsourcing, the hired worker or professional comes to the business and carries out the tasks for the owner, whereas with training the entrepreneur has to travel to attend training, learn theoretical material and how to apply it to her business, and then find the time to carry out the tasks herself.

Even once they were eligible for grants, firms still had to put together a business plan explaining how they would use the money, apply for the grants, pass a screening which scored the business plans (and only considered those with a high enough score), and then be selected. The grants occurred after the period of our final follow-up survey, and given the above conditions, were not guaranteed nor anticipated by the firms. Matching grants were paid to 29 of the firms in our sample (4 insourcing, 4 outsourcing, 20 training, and 1 consulting). Performance grants were paid to 212 of the firms in the sample (67 insourcing, 81 outsourcing, 13 training, and 51 consulting). Most performance grants were for either 7 million or 12 million Naira, while most matching grants were for 10 million. Matching grants required fewer points for eligibility, needed the firm to contribute matching funding of 50 percent of total project costs, and were to be used for funding technical assistance costs such as external consultancy services. Performance grants required more points to be earned, but could be used for goods, equipment and technical assistance. The grants were made to firms right at the time of the closing of the project (in two tranches, starting in March 2019) and thus are after our final follow-up survey. The only role of the grants in the experiment is therefore as an incentive to encourage firms to participate in their assigned program. In future work it would be useful to test how strong this incentive effect is, by varying whether those receiving treatments have the possibility to earn points towards possible grants, and/or by varying whether the control group is also eligible to earn points if they improve their business practices.

Appendix Table 2.3: Correlates of Choice of Accounting vs Marketing

Dependent variable: Chose Accounting rather than Marketing for Insourcing or Outsourcing

	(1)	(2)
Baseline finance practices	0.003	
	(0.016)	
Baseline marketing practices	0.011	
	(0.016)	
Baseline overall business practices	-0.105*	-0.072**
	(0.060)	(0.030)
Way firm spends and generates cash not very firm-specific	-0.017	
	(0.057)	
Type of customers and customer acquisition strategies not very firm-specific	0.056	0.044
	(0.056)	(0.046)
Believes can verify work of internal accountant	0.168*	0.119
	(0.088)	(0.073)
Believes can verify work of internal marketing worker	-0.147	
	(0.104)	
Believes can verify work of outside accountant	-0.013	
	(0.077)	
Believes can verify work of outside marketing firm	0.018	
	(0.079)	
Believes marketing and accounting workers can be trusted	-0.021	
	(0.053)	
Believes marketing and accounting providers can be trusted	0.050	0.044
	(0.052)	(0.049)
Owner is Female	-0.144***	-0.126***
	(0.050)	(0.048)
Owner's Age at Baseline	-0.004	-0.004
	(0.003)	(0.003)
Owner has masters or more education	0.015	
	(0.050)	
Baseline Sector is Construction	-0.181**	-0.182**
	(0.088)	(0.090)
Baseline Sector is ICT	-0.268***	-0.256***
	(0.081)	(0.080)
Baseline Sector is Entertainment	-0.330***	-0.337***
	(0.121)	(0.118)
Baseline Sector is Hospitality	-0.154*	-0.147*
	(0.086)	(0.081)
Baseline registration with CAC	0.026	
	(0.073)	
Baseline insources or outsources accounting	0.052	
	(0.056)	
Baseline insources or outsources marketing	0.031	
	(0.061)	
Full-time employees	0.003	0.007
	(0.009)	(0.008)
insourcing	-0.030	
	(0.050)	
Sample Size	253	253

Notes:

Marginal effects from probit estimation shown, column 2 shows variables selected by lasso.

Sample restricted to insourcing and outsourcing firms that took up treatment and answer round 2 survey.

Appendix 3: Survey Response Rates, Attrition, and Survival Impacts

Appendix Table 3.1 shows attrition rates by survey round and treatment status. We consider four different measures of attrition: whether or not the firm was surveyed, whether we were able to collect data on whether the firm is still operating or not (which was possible in some cases even when interviews did not take place), and whether we know the profits and sales, and business practices of the firms. Firms which are closed are coded as having zero profits and sales, and no business practices, so firms which are closed but not interviewed will still have outcome data on these outcomes.

Appendix Table 3.1: Attrition Rates

	Overall	Control	Insourcing	Outsourcing	Training	Consulting	p-value
Panel A: First Follow-up							
Survey Attrition	0.114	0.154	0.112	0.073	0.118	0.114	0.262
Survival Attrition	0.100	0.134	0.105	0.073	0.085	0.101	0.492
Profits/Sales Attrition	0.110	0.148	0.112	0.073	0.111	0.107	0.347
Business Practices Attrition	0.110	0.148	0.112	0.073	0.111	0.107	0.347
Panel B: Second Follow-up							
Survey Attrition	0.139	0.174	0.151	0.140	0.137	0.094	0.284
Survival Attrition	0.036	0.040	0.059	0.033	0.026	0.020	0.453
Profits/Sales Attrition	0.100	0.114	0.105	0.093	0.111	0.074	0.703
Business Practices Attrition	0.100	0.114	0.105	0.093	0.111	0.074	0.703
Sample Size		149	152	150	153	149	

Notes:
P-value is for F-test of equality of attrition rates across the five treatment groups, after conditioning on randomization strata (induction batches).
Survey attrition takes value 1 if the firm was not interviewed, and 0 otherwise. **Survival attrition** takes value 1 if we do not know operating status, and 0 otherwise. **Profit/sales attrition** and **Business Practices attrition** take value 1 if we do not know these outcomes (which are coded as zero for closed firms).

Appendix Table 3.2 compares balance on baseline observables for the sample of survey non-attritors in the second follow-up (balance looks similar for those answering the first follow-up). Comparing to Table 1 and examining the joint orthogonality tests, we see that survey attrition has not changed baseline balance much, and we cannot reject equality of means in baseline variables across treatment groups (with only baseline industry being entertainment significant at the 10 percent level).

Appendix Table 3.3 likewise shows that the sample of firms that are found to be surviving at the time of the second follow-up survey appears balanced on baseline observables (with only baseline industry being manufacturing significant at the 10 percent level in the joint orthogonality tests).

Appendix Table 3.2: Baseline Balance for Sample Answering Second Follow-up Survey

	Control	Insourcing	Outsourcing	Training	Consulting	Joint Orthogonality F-test
Last month sales in USD ($1 = 365N)	4021	3719	3837	2781	2330	1.563
Sales in best month in USD	8582	9915	6773	8167	4828	1.170
Sales in worst month in USD	1276	1139	1335	821	972	1.243
Sales in average month in USD	3998	2782	2757	2776	2497	1.191
Full-time employees	4.2	4.2	4.3	4.6	4.2	0.552
Baseline finance practices	16.8	16.5	16.3	16.3	16.5	1.074
Baseline marketing practices	8.5	8.8	8.5	8.3	8.6	1.155
Baseline HR practices	7.5	7.7	7.7	7.6	7.4	0.586
Baseline overall business practices	6.3	6.3	6.2	6.2	6.3	1.011
Baseline insources or outsources accounting	0.29	0.32	0.34	0.39	0.33	0.883
Baseline insources or outsources marketing	0.17	0.20	0.21	0.21	0.23	0.362
Baseline used an HR consultant in last 12 months	0.01	0.03	0.07	0.05	0.03	1.899
Baseline Sector is Construction	0.11	0.07	0.09	0.11	0.08	0.371
Baseline Sector is ICT	0.13	0.14	0.16	0.12	0.17	0.463
Baseline Sector is Entertainment	0.15	0.09	0.09	0.19	0.13	1.955*
Baseline Sector is Hospitality	0.14	0.15	0.09	0.15	0.10	0.986
Baseline Sector is Manufacturing	0.48	0.55	0.57	0.43	0.53	1.495
Baseline location in Lagos	0.59	0.62	0.61	0.58	0.59	n.a.
Baseline firm age	4.12	4.73	4.40	4.89	4.16	0.868
Baseline business name registration with CAC	0.89	0.89	0.85	0.82	0.84	1.219
Baseline percent of sales within state	30.5	29.8	29.5	30.0	30.2	0.060
Baseline Owner is Female	0.43	0.48	0.48	0.41	0.39	0.811
Owner's Age at Baseline	37.9	37.8	38.6	38.2	37.0	0.853
Owner is married at baseline	0.63	0.75	0.69	0.65	0.64	1.317
Baseline owner has completed undergraduate	0.88	0.83	0.85	0.80	0.90	1.408
Baseline owner has masters or more education	0.49	0.47	0.43	0.49	0.44	0.324
Baseline owner has previously had salaried job	0.75	0.81	0.73	0.83	0.78	1.057
Sample Size	**123**	**129**	**129**	**132**	**135**	

Notes: F-test of joint orthogonality controls for stratification batch fixed effects. N.a. denotes not applicable.
***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Appendix Table 3.3: Baseline Balance for Sample Surviving in Second Follow-up

	Control	Insourcing	Outsourcing	Training	Consulting	Joint Orthogonality F-test
Last month sales in USD ($1 = 365N)	3590	3791	3824	3141	2310	1.241
Sales in best month in USD	7907	9050	6256	8281	4601	1.198
Sales in worst month in USD	1047	1039	1298	861	954	0.870
Sales in average month in USD	3653	2905	2741	3037	2613	0.571
Full-time employees	4.2	4.1	4.4	4.5	4.2	0.408
Baseline finance practices	16.9	16.4	16.2	16.4	16.5	1.551
Baseline marketing practices	8.5	8.9	8.4	8.4	8.6	1.536
Baseline HR practices	7.6	7.7	7.6	7.6	7.5	0.236
Baseline overall business practices	6.4	6.3	6.2	6.2	6.3	1.196
Baseline insources or outsources accounting	0.30	0.30	0.34	0.40	0.33	1.163
Baseline insources or outsources marketing	0.18	0.21	0.20	0.18	0.23	0.341
Baseline used an HR consultant in last 12 months	0.01	0.03	0.07	0.04	0.03	1.822
Baseline Sector is Construction	0.11	0.08	0.10	0.12	0.09	0.379
Baseline Sector is ICT	0.15	0.14	0.15	0.15	0.16	0.057
Baseline Sector is Entertainment	0.16	0.08	0.10	0.17	0.11	1.751
Baseline Sector is Hospitality	0.13	0.15	0.10	0.14	0.10	0.717
Baseline Sector is Manufacturing	0.46	0.55	0.56	0.42	0.54	1.992*
Baseline location in Lagos	0.59	0.61	0.58	0.58	0.57	n.a.
Baseline firm age	4.19	4.71	4.33	4.99	4.23	0.895
Baseline business name registration with CAC	0.89	0.90	0.83	0.84	0.83	1.213
Baseline percent of sales within state	30.6	30.2	28.7	30.3	29.2	0.140
Baseline Owner is Female	0.42	0.48	0.49	0.38	0.42	1.166
Owner's Age at Baseline	38.2	37.8	38.2	38.4	37.1	0.663
Owner is married at baseline	0.64	0.77	0.68	0.66	0.65	1.653
Baseline owner has completed undergraduate	0.88	0.83	0.85	0.82	0.90	1.180
Baseline owner has masters or more education	0.48	0.47	0.45	0.50	0.44	0.372
Baseline owner has previously had salaried job	0.77	0.80	0.73	0.83	0.78	0.968
Sample Size	**129**	**132**	**137**	**139**	**138**	

Notes: F-test of joint orthogonality controls for stratification batch fixed effects. N.a. denotes not applicable.
***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Appendix Table 3.4 displays the treatment impacts on firm survival. The first follow-up (round 1) measures survival 1.5 to 2 years after the baseline. At this point in time, 97.7% of control group firms for which we have data are still alive. Column 1, using our base specification in equation (1), shows that the survival rate is 2.3 percentage points higher for the outsourcing group, which is statistically significant at the 10 percent level, with smaller and nonsignificant differences for the other treatments. However, survival status is missing for 75 of the 753 firms in this follow-up. We use two different approaches to examine robustness. First, column 2 uses the post-double selection lasso of Belloni et al. (2014) to control for any baseline observables that either strongly predict selective attrition or help predict the survival outcome. This in fact chooses none of the baseline controls in Table 1, which is consistent with the balance we observe on non-attritors.[23] Second, we note that 63 of the 75 firms with missing survival status in round 1 had survival measured at the second follow-up (when additional effort went into tracking attritors). Of these 63 firms, 45 were still alive. Column 3 assumes these firms were also alive in round 1 and re-estimates survival on this imputed measure, resulting in very similar estimates.

Columns 3 through 6 of Appendix Table 3.4 carry out the corresponding estimation and robustness checks for survival at the second follow-up (round 2), which was conducted 2.5 to 3 years after baseline. Here for the imputation in column 6, we assume that firms which were closed in round 1 and not observed in round 2, remain closed. 90.2% of the control firms remain alive at the time of this second follow-up survey.[24] All four treatments have positive effects on survival of 2-4 percentage points, but none of the coefficients is statistically significant and we cannot reject the treatment effects are jointly zero. The robustness checks again show similar point estimates.

[23] Note that the standard errors change slightly as a result of using this method, even when no controls are added.
[24] This survival rate is higher than for the average micro firm in developing countries. McKenzie and Paffhausen (2019) report a death rate of 8.2% per year for small firms, but with death rates lower for larger and more profitable firms that have survived their first few years, and that have middle-aged owners – as is the case in our sample.

Appendix Table 3.4: Impact on Firm Survival

	First-Follow-up Survey			Second Follow-up Survey		
	Base Specification	PDS Lasso	Cross-Wave Imputation	Base Specification	PDS Lasso	Cross-Wave Imputation
Assigned to Insourcing	0.001	0.001	0.000	0.022	0.022	0.015
	(0.019)	(0.016)	(0.017)	(0.034)	(0.030)	(0.034)
Assigned to Outsourcing	0.023*	0.023	0.021*	0.043	0.043	0.043
	(0.013)	(0.015)	(0.012)	(0.031)	(0.030)	(0.031)
Assigned to Training	-0.006	-0.006	-0.006	0.030	0.030	0.030
	(0.019)	(0.015)	(0.018)	(0.032)	(0.030)	(0.032)
Assigned to Consulting	0.016	0.016	0.015	0.042	0.042	0.042
	(0.015)	(0.016)	(0.014)	(0.031)	(0.030)	(0.031)
Mean of Control Group	0.977	0.977	0.979	0.902	0.902	0.902
Sample Size	678	678	723	726	726	727
P-value: all treatments zero	0.029	0.294	0.029	0.653	0.601	0.605
P-value: all treatments equal	0.049	0.215	0.049	0.876	0.880	0.785

Notes:

All regressions control for stratification batch fixed effects. Robust standard errors in parentheses. *, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.

First follow-up survey conducted 2-9 months post-intervention; second follow-up survey 14-21 months post-interventions.

Base specification uses data from current survey round only, and includes no other controls.

PDS Lasso uses post double-selection lasso with baseline variables as inputs. No covariates were selected in either wave.

Cross-wave imputation assumes that firms that have missing survival status in round 1, but are observed open in round 2, were also open in round 1; and that firms which are closed in round 1, and that have missing survival status in round 2, remain closed.

Appendix 4: Measurement of Key Outcomes

The survey instruments and data will be made available in the World Bank's open data library:

Nominal Naira were converted into real (January 2018) Naira using the Consumer CPI of the Central Bank of Nigeria.

Key outcomes are measured as follows:

Table 4:

Index of ten Finance and Accounting practices, averaging the practices that a firm carries out (coded: '1' if the practice was implemented in the last three months; and '0' if not). This is the average of the following practices:

a. Records all money in to the business on a daily or weekly basis
b. Records all money out of the business on a daily or weekly basis
c. Prepared an income statement (profit and loss statement)
d. Prepared a balance sheet
e. Analyzed a statement of cash flow
f. Analyzed which products/services are the most profitable
g. Used cost-control methods
h. Prepared and used a budget
i. Set financial goals or financial performance targets
j. Conducted feasibility studies before starting a new venture or investment

Index of nine Marketing and Sales practices, averaging the practices that a firm carries out. Each practice is measured using a binary variable (coded: '1' if the practice was implemented in the last three months; and '0' if not). This is the average of:

a. Carried out structured research on customers
b. Carried out structured research on competitors
c. Carried out structured research on market potential
d. Promoted products/services
e. Changed prices to increase sales or profits
f. Used a branding strategy
g. Use a Customer Relationship Management (CRM) system
h. Used post-purchase loyalty programs
i. Has a professional sales force

Index of eleven Operations and HR practices, averaging the practices that a firm carries out. Each practice is measured using a binary variable (coded: '1' if the practice was implemented in the last three months; and '0' if not). This is the average of the following practices:

a. Uses a formal system to carry out maintenance checks
b. Uses a formal system to organize and clean the workplace regularly
c. Uses a formal system to carry out quality inspections
d. Uses electronic payments system in business
e. Compares the prices and quality of different suppliers
f. Uses a formal system to manage inventory
g. Uses an IT system for enterprise resource planning (ERP)

h. Uses a formal system to measure individual performance of employees
i. Provides formal training to employees
j. Uses a formal payroll system
k. Uses financial rewards for top performers

Index of the subset of ten 'verifiable' business practices, averaging the number of such practices that firms carry out. Each practice is measured using a binary variable (coded: '1' if the practice was implemented in the last three months and could be verified by the enumerator; and '0' if not). This is the average of:

a. Records all money in to the business on a daily or weekly basis
b. Records all money out of the business on a daily or weekly basis
c. Prepared an income statement (profit and loss statement)
d. Prepared a balance sheet
e. Prepared and used a budget
f. Promoted products/services
g. Use a Customer Relationship Management (CRM) system
h. Used post-purchase loyalty programs
i. Uses electronic payments system in business
j. Uses a formal system to measure individual performance of employees

Index of eleven Verified Digital Marketing practices, averaging the practices carried out. Each practice is measured as a binary variable (coded: `1' if the practice was implemented in the last three months, and '0' otherwise). This is the average of the following practices:

a. Has a functioning website
b. Used search engine marketing tools to improve customer traffic
c. Used e-commerce platform to sell products
d. Has a business facebook page/account
e. Has a business twitter profile
f. Has a business instagram profile
g. Has a business snapchat account
h. Has a business Tumblr account
i. Has a business Whatsapp account
j. Has a business Youtube account
k. Has a business Pinterest account

Overall business practices index of all forty-one business practices, averaging the binary outcomes, so that this aggregate index ranges between 0 and 1.

Note that the baseline survey conducted during the induction workshop had a different set of questions on business practices than the more detailed follow-up survey. These questions were used to construct a marketing index, accounting index, and HR index, as well as an overall score out of 10. Ancova estimation of the treatment effects on business practices will control for this baseline score out of 10, except for the marketing and sales practices index above, which will control for the baseline marketing measure; the accounting and finance index above, which will control for the baseline accounting index; and the HR and operations index above, which will

control for the baseline HR index. An advantage of Ancova estimation is that it only controls for these proxy measures to the extent that they are correlated with outcomes in the follow-up survey.

The baseline marketing index was based on whether the firm: had a website; used any form of social media; did any advertising; had a brand; had someone other than the owner involved in marketing or sales; could name competitors; had researched their competitors; had used special offers; had changed prices to attempt to boost sales; was selling in other states or exporting; had done customer research; and had a CRM system. The baseline accounting index was based on whether the firm records sales made; knows its breakeven point; tracks expenses; separates household and business accounts; uses accounting software; has someone other than the owner do record-keeping or manage the finances; has a budget; has an income statement; has a balance sheet; compares sales to forecasts; and reviews financial performance frequently. The baseline HR and operations index was based on how they select suppliers; whether they had negotiated prices with suppliers; had compared prices offered by different suppliers; monitored stock levels; records stock and inventory levels; uses an enterprise software; uses IT for payroll; uses the internet; uses an HR provider; provides training to employees; measures employee performance; rewards high performance of employees in different ways; has a system for dealing with poor performers; and used a structured checklist for helping recruit new employees.

Table 5:

Inverse hyperbolic Sine of Total sales in the last month, in Naira, winsorized at the 99th percentile. For firms not answering the exact value, the midpoint of the sales range they give, for those answering sales are in range above 10,000,000, sales are coded as the median of firms with sales in this range, or 12,000,000 if no other firms are in this range.
Inverse hyperbolic Sine of Total sales in the last year, in Naira, winsorized at the 99th percentile. For firms not answering the exact value, the midpoint of the sales range they give, for those answering sales are in range above 10,000,000, sales are coded as the median of sales for other firms with sales in this range, or 12,000,000 if no other firms are in this range.
Inverse hyperbolic Sine of Total profits in the last month, in Naira, winsorized at the 99th percentile. This is asked via a direct question. For those not answering the exact value, the midpoint of the profits range they give, for those answering profits are in range above 10,000,000, profits are coded as the median of profits for other firms with profits in this range, or 12,000,000 if no other firms are in this range.
Inverse hyperbolic Sine of Total profits in the last year, in Naira, winsorized at the 99th percentile. This is asked via a direct question. For those not answering an exact value, the midpoint of the profits range they give, for those answering profits are in range above 10,000,000, profits are coded as the median of profits for other firms with profits in this range, or 12,000,000 if no other firms are in this range.
Standardized profits and sales index is obtained by aggregating these different effects as a standardized z-score.
Total employment is the total number of workers (summing wage and salary workers, casual or daily workers, partners, apprentices and interns, and unpaid workers), winsorized at the 99th percentile.

Inverse hyperbolic sine of total employment is the inverse hyperbolic sine transformation of total employment as defined above.

Table 6:

Owner's Hours are hours worked in the last week, winsorized at the 99th percentile.
Time concentration is a count of the number of different functional areas out of thirteen categories (e.g., production, accounting, marketing, investments, partnerships) in which the owner allocates more than 5 percent of his or her time every two weeks. Each "functional area time" category is measured in total hours spent out of 100 during the previous two weeks. Lower scores on this composite will represent greater concentration in time use by the owner.
Growth-focused activities is a count of the number of growth-focused functional areas out of thirteen categories in which the owner spends more than 5 percent of their time every two weeks. The five growth-focused areas are marketing, sales, innovations, investments, and partnerships. Higher scores mean the owner spends more time on growth-focused activities.
Time on external and future activities is the average of the percentage of time spent on externally focused activities in the last two weeks, and of the percentage of time spent on future focused activities in the last two weeks.
Delegation is the average score of five questions used to measure how often the firm owner has delegated work over the last three months. Each of these questions is measured using an identical five-point scale (where 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Often, 5 = Always). The five composite questions are on how often the owner:

- Let someone else take responsibility.
- Gave up control over a certain duty
- Empowered someone to do more.
- Delegate a job to a different person or unit.
- Get someone to help you reach a business goal.

Percent of time sales and marketing: the sum of the number of hours out of 100 during the previous two weeks that are devoted to marketing and devoted to sales.
Percent of time accounting and finance: the sum of the number of hours out of 100 during the previous two weeks that are devoted to accounting and devoted to finance.

Table 7:

Investment index is the simple average of the following three channels for making new capital investments:

- New Loan Financing. This is measured by asking if the firm obtained any loans in the previous year from a formal source/institution
- New Equity Financing. This is measured by asking if the firm obtained any equity investments in the previous year
- Substantial Firm Investment. This is measured by asking if the firm invested more than 100,000 Naira into new equipment, technology, buildings, etc. in the previous year

Innovation index is the simple average of the following 17 innovation components.

- Firm introduced a new product or service
- Firm introduced a product or service that is new for its city
- Firm significantly improved an existing product or service

- Firm introduced a new or improved process
- Firm implemented new design or packaging
- Firm Introduced a new channel for selling
- Firm Introduced a new method of pricing
- Firm Introduced a new way of promoting
- Firm Changed or introduced new business processes
- Firm Changed the way work is organized in your firm
- Firm Introduced new quality control standards for suppliers
- Firm Opened a new shop or production location
- Firm Outsourced a production activity
- Firm Licensed a new technology
- Firm Brought in-house a production activity
- Firm Introduced a new in-house training program
- Firm Obtained a new quality accreditation

Social Media Measures: see Appendix 7.

Table 9:

Professional Services: a binary variable[25] taking value one if the owner has done any of the following:

- Used an HR specialist to find new employees in the last 12 months, or an HR consultant in the last 6 months
- Uses an outside accounting agency and meets at least monthly with them
- Uses an outside marketing agency and meets at least monthly with them
- Used a business consulting service for at least 8 hours or more in the past year

[25] Note our pre-analysis plan stated we would average the component measures. Given the confusion firms experienced in answering what type of service they had used, we instead create a binary variable of using any form of professional service.

Appendix 5: Which Business Practices Improve Most?

Recall that our primary specification codes firms that are closed as having zero business practices. Appendix Table 5.1 re-estimates the treatment effects in Table 4 for the sample of firms that are still operating. While we did not find significant treatment effects on business survival over the two-year horizon, these impacts conditional on survival should still be considered more descriptive in nature than those in Table 4.

Appendix Tables 5.2 to 5.5 show the round 2 treatment impacts at the individual practice level for each of the 41 business practices that make up our overall index of business practices.

Appendix Table 5.6 conducts an internal consistency check. We restrict the analysis to firms in the insourcing, outsourcing, and control groups, and then code whether those in insourcing or outsourcing chose an accounting worker or provider, or a marketing worker or provider. Although this choice is not random, once we condition on baseline practices, we would still expect firms choosing accounting to improve these practices relatively more, while those choosing marketing to improve these practices relatively more.[26] This is what we see.

[26] Theoretically one might not find this if firms that were already planning on improving in one area decide to choose the area in which improvements are not planned, or if the entrepreneur redirects their own time and effort towards improving the area in which they did not hire a worker or provider and is able to improve practices more than the specialist. We do not think either case is likely to be strong enough in practice to overcome the first-order effect of having a specialist in an area largely working to improve practices in that area.

Appendix Table 5.1: Impact on Business Practices Conditional on Survival

	Traditional Business Practices			Verified	Verified	
	Finance & Accounting	Marketing & Sales	Operations & HR	Traditional Practices	Digital Marketing	Overall Index
Panel A: Impacts in First Follow-up Survey (One-year after intervention started)						
Assigned to Insourcing	0.096***	0.074**	0.024	0.110***	0.080***	0.065***
	(0.031)	(0.032)	(0.023)	(0.030)	(0.024)	(0.019)
Assigned to Outsourcing	0.049	0.055*	0.006	0.094***	0.093***	0.051***
	(0.032)	(0.030)	(0.023)	(0.028)	(0.025)	(0.019)
Assigned to Training	0.002	-0.027	-0.011	0.018	0.012	-0.005
	(0.032)	(0.033)	(0.023)	(0.026)	(0.025)	(0.020)
Assigned to Consulting	0.065**	0.009	0.002	0.080***	0.048**	0.032*
	(0.032)	(0.032)	(0.023)	(0.029)	(0.024)	(0.019)
Mean of Control Group	0.646	0.602	0.661	0.231	0.227	0.530
Sample Size	659	659	659	659	659	659
P-value: all treatments zero	0.004	0.008	0.659	0.000	0.000	0.000
P-value: all treatments equal	0.010	0.006	0.509	0.004	0.007	0.001
Panel B: Impacts in Second Follow-up Survey (Two-years after intervention started)						
Assigned to Insourcing	0.027	0.073**	0.032	0.121***	0.078***	0.052**
	(0.031)	(0.034)	(0.025)	(0.029)	(0.024)	(0.022)
Assigned to Outsourcing	0.030	0.075**	-0.000	0.099***	0.077***	0.046**
	(0.031)	(0.032)	(0.024)	(0.028)	(0.024)	(0.022)
Assigned to Training	-0.026	-0.038	-0.042	0.034	-0.001	-0.025
	(0.034)	(0.034)	(0.026)	(0.027)	(0.024)	(0.023)
Assigned to Consulting	0.064**	0.045	0.020	0.122***	0.037	0.042*
	(0.032)	(0.032)	(0.025)	(0.030)	(0.024)	(0.021)
Mean of Control Group	0.710	0.616	0.678	0.195	0.245	0.557
Sample Size	627	627	627	627	627	627
P-value: all treatments zero	0.065	0.001	0.059	0.000	0.000	0.001
P-value: all treatments equal	0.051	0.001	0.029	0.006	0.002	0.001

Notes:
Regressions control for stratification batch fixed effects and baseline value of outcome.
Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.
Finance & Accounting is the proportion of 10 practices in this area that the firm uses; **Marketing & Sales** is the proportion of 9 practices in this area that the firm uses; **Operations &HR** is the proportion of 11 operations and human resources practices the firm uses; **Verified Traditional practices** is the proportion of 10 of these first 30 traditional practices that we could physically verify as implemented; **Verified Digital Marketing** is the proportion of 11 practices in this area that the firm uses; and **Overall index** is the proportion of all 41 practices that the firm uses. Equality of 1 & 2 year effects tests the joint hypothesis that the 1 year and 2 year treatment effects are equal for the different treatments over time, but not necessarily equal across treatments.
Estimation for sample of firms in operation at the time of the survey.

Appendix Table 5.2: Practice by Practice Impacts on Finance & Accounting Practices in Round 2

	Records money in	Records money out	Income Statement	Balance Sheet	Cash Flow Statement	Knows most profitable	Uses cost-control	Prepared a Budget	Sets Financial Goals	Conducts Feasibility Studies
Assigned to Insourcing	0.105**	0.077	0.098	0.008	0.024	0.052	0.047	0.019	-0.035	0.037
	(0.053)	(0.055)	(0.060)	(0.060)	(0.056)	(0.048)	(0.051)	(0.060)	(0.054)	(0.055)
Assigned to Outsourcing	0.071	0.081	0.047	0.084	0.046	0.040	0.079	-0.010	0.076	0.084
	(0.054)	(0.055)	(0.060)	(0.060)	(0.056)	(0.048)	(0.049)	(0.059)	(0.050)	(0.054)
Assigned to Training	0.086	0.073	0.018	0.025	-0.042	-0.026	0.011	-0.047	-0.041	-0.117**
	(0.054)	(0.056)	(0.061)	(0.060)	(0.058)	(0.051)	(0.053)	(0.061)	(0.054)	(0.058)
Assigned to Consulting	0.150***	0.151***	0.114*	0.110*	0.059	0.060	0.067	0.058	0.059	0.101*
	(0.051)	(0.053)	(0.060)	(0.060)	(0.055)	(0.046)	(0.049)	(0.059)	(0.050)	(0.053)
Mean of Control Group	0.682	0.659	0.447	0.424	0.674	0.788	0.758	0.492	0.750	0.674
Sample Size	678	678	678	678	678	678	678	678	678	678
P-value: all treatments zero	0.059	0.081	0.243	0.259	0.391	0.334	0.419	0.502	0.059	0.001
P-value: all treatments equal	0.367	0.322	0.348	0.272	0.283	0.296	0.532	0.345	0.033	0.000
P-value: In=Out=Consult	0.253	0.237	0.508	0.205	0.810	0.907	0.792	0.500	0.070	0.463
P-value: Insource = Outsource	0.504	0.944	0.395	0.202	0.691	0.792	0.496	0.616	0.028	0.373

Notes:

Regressions control for stratification batch fixed effects and baseline value of financial practices index.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

Practices are all dummy variables, and estimation is for second follow-up survey. **Records money in** denotes recording all money into the business on a daily or weekly basis; **Records money out** denotes recording all money leaving the business on a daily or weekly basis; **Income statement** denotes prepared an income statement or profit and loss statement; **Balance sheet** denotes prepared a balance sheet; **Cash flow statement** denotes analyzed a statement of cash flow; **Knows most profitable** denotes having analyzed which products/services are most profitable; **Uses cost-control** denotes using cost-control methods; **Prepared a Budget** denotes having prepared and used a budget; **Sets financial goals** denotes setting financial goals or financial performance targets; **Conducts feasibility studies** denotes conducting feasibility studies before starting a new venture or investment. Reference period for all practices is using them in past 3 months, except for balance sheet and financial goals (annual), and feasibility studies (six months).

Appendix Table 5.3: Practice by Practice Impacts on Sales and Marketing Practices in Round 2

	Customer research	Competitor research	Market Potential research	Product promotion	Price changes	Branding strategy	Uses CRM	Loyalty program	Sales force
Assigned to Insourcing	0.036	0.060	0.080	0.063	-0.010	0.064	0.152**	0.099*	0.206***
	(0.056)	(0.057)	(0.056)	(0.058)	(0.059)	(0.060)	(0.060)	(0.059)	(0.058)
Assigned to Outsourcing	0.076	0.132**	0.107*	0.066	-0.011	0.108*	0.171***	0.109*	0.135**
	(0.054)	(0.055)	(0.056)	(0.058)	(0.059)	(0.058)	(0.059)	(0.058)	(0.059)
Assigned to Training	0.003	0.085	0.026	-0.086	-0.142**	0.000	-0.032	-0.038	0.039
	(0.057)	(0.057)	(0.058)	(0.060)	(0.059)	(0.060)	(0.060)	(0.057)	(0.059)
Assigned to Consulting	0.072	0.122**	0.079	0.013	-0.015	0.079	0.120**	0.010	0.151**
	(0.054)	(0.054)	(0.056)	(0.059)	(0.058)	(0.058)	(0.059)	(0.057)	(0.059)
Mean of Control Group	0.697	0.652	0.652	0.614	0.636	0.538	0.455	0.356	0.356
Sample Size	678	678	678	678	678	678	678	678	678
P-value: all treatments zero	0.456	0.113	0.302	0.069	0.102	0.234	0.001	0.045	0.002
P-value: all treatments equal	0.491	0.494	0.523	0.035	0.077	0.293	0.002	0.031	0.041
P-value: In=Out=Consult	0.711	0.345	0.840	0.594	0.997	0.742	0.674	0.166	0.443
P-value: Insource = Outsource	0.447	0.174	0.616	0.951	0.986	0.452	0.747	0.858	0.228

Notes:

Regressions control for stratification batch fixed effects and baseline value of marketing practices index.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

Practices are all dummy variables, and estimation is for second follow-up survey. **Customer research** denotes carrying out structured research on customers; **Competitor research** denotes carrying out structured research on competitors; **Market Potential research** denotes carrying out structure research on market potential; **Product promotion** denotes promoting products through advertising or other means; **Price changes** denotes changing prices to increase sales or profits; **Branding strategy** denotes using a branding strategy; **Uses CRM** denotes uses a customer relationship management (CRM) system; **Loyalty program** denotes using a post-purchase loyalty program; **Sales force** denotes has a professional sales force. Reference period is last 3 months for all practices.

Appendix Table 5.4: Practice by Practice Impacts on Digital Marketing Practices in Round 2

	Firm website	Search engine tools	Uses e-commerce	Business Facebook	Business Twitter	Business Instagram	Business Snapchat	Business Tumblr	Business Whatsapp	Business Youtube	Business Pinterest
Assigned to Insourcing	0.128**	0.096*	0.072	0.233***	0.139**	0.122**	0.015	-0.000	-0.003	0.028	0.029*
	(0.057)	(0.051)	(0.058)	(0.059)	(0.054)	(0.060)	(0.015)	(0.001)	(0.061)	(0.029)	(0.018)
Assigned to Outsourcing	0.173***	0.082	0.087	0.203***	0.115**	0.122**	0.001	0.015	0.039	0.043	0.023
	(0.059)	(0.050)	(0.058)	(0.059)	(0.053)	(0.061)	(0.011)	(0.011)	(0.061)	(0.031)	(0.017)
Assigned to Training	0.011	-0.023	-0.052	0.094	0.017	0.046	0.007	0.000	-0.100*	0.015	0.015
	(0.055)	(0.045)	(0.055)	(0.060)	(0.050)	(0.061)	(0.013)	(0.001)	(0.060)	(0.028)	(0.015)
Assigned to Consulting	0.095*	0.036	0.010	0.161***	0.084	0.041	-0.007	0.007	-0.033	0.028	0.007
	(0.056)	(0.048)	(0.056)	(0.060)	(0.052)	(0.060)	(0.007)	(0.007)	(0.060)	(0.029)	(0.013)
Mean of Control Group	0.280	0.182	0.311	0.473	0.198	0.427	0.008	0.000	0.489	0.046	0.008
Sample Size	678	678	678	675	675	675	675	675	675	675	675
P-value: all treatments zero	0.011	0.076	0.083	0.001	0.036	0.169	0.151	0.557	0.189	0.674	0.395
P-value: all treatments equal	0.040	0.061	0.047	0.094	0.118	0.333	0.125	0.392	0.119	0.861	0.638
P-value: In=Out=Consult	0.423	0.468	0.343	0.466	0.620	0.298	0.156	0.224	0.475	0.881	0.428
P-value: Insource = Outsource	0.465	0.794	0.787	0.599	0.673	1.000	0.361	0.163	0.488	0.656	0.755

Notes:

Regressions control for stratification batch fixed effects and baseline value of digital marketing practices index.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

Practices are all dummy variables, and estimation is for second follow-up survey. **Firm website** denotes the firm having a website; **Search engine tools** denotes using search engine marketing tools to improve customer traffic; **Uses e-commerce** denotes using an e-commerce platform to sell products or services; **Business Facebook, Business Twitter, Business Instagram, Business Snapchat, Business Tumblr, Business Whatsapp, Business Youtube,** and **Business Pinterest** denote having a business profile or page on these different social media platforms.

Appendix Table 5.5: Practice by Practice Impacts on Operations & HR Practices in Round 2

	Maintenance Checks	Clean Workplace	Quality Inspections	Electronic payments	Supplier comparison	Inventory management	ERP system	Employee measures	Employee training	Formal payroll	Rewards performers
Assigned to Insourcing	0.053	0.046	0.017	-0.045	0.068	0.070	0.085*	0.056	0.044	0.102*	0.027
	(0.051)	(0.049)	(0.050)	(0.055)	(0.049)	(0.054)	(0.049)	(0.056)	(0.055)	(0.059)	(0.057)
Assigned to Outsourcing	-0.024	-0.004	0.041	-0.022	0.114**	0.081	0.037	0.055	0.063	0.078	-0.052
	(0.054)	(0.051)	(0.048)	(0.055)	(0.046)	(0.053)	(0.047)	(0.056)	(0.054)	(0.057)	(0.058)
Assigned to Training	-0.026	-0.034	-0.049	-0.109**	0.004	0.010	-0.006	0.033	-0.032	-0.027	0.035
	(0.053)	(0.053)	(0.052)	(0.054)	(0.051)	(0.056)	(0.046)	(0.056)	(0.057)	(0.057)	(0.057)
Assigned to Consulting	0.039	0.016	0.014	0.031	0.142***	0.084	0.047	0.035	0.064	0.026	0.072
	(0.051)	(0.050)	(0.049)	(0.052)	(0.044)	(0.053)	(0.048)	(0.055)	(0.054)	(0.057)	(0.054)
Mean of Control Group	0.750	0.773	0.780	0.712	0.758	0.697	0.174	0.303	0.689	0.371	0.659
Sample Size	678	678	678	678	678	678	678	678	678	678	678
P-value: all treatments zero	0.397	0.598	0.489	0.089	0.002	0.328	0.345	0.859	0.321	0.160	0.232
P-value: all treatments equal	0.266	0.437	0.338	0.058	0.012	0.477	0.327	0.961	0.268	0.130	0.153
P-value: In=Out=Consult	0.287	0.590	0.811	0.322	0.194	0.957	0.613	0.914	0.913	0.426	0.074
P-value: Insource = Outsource	0.133	0.312	0.603	0.675	0.288	0.826	0.342	0.977	0.722	0.687	0.169

Notes:

Regressions control for stratification batch fixed effects and baseline value of digital marketing practices index.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

Practices are all dummy variables, and estimation is for second follow-up survey. **Maintenance checks** denotes using formal system to carry out maintenance checks; **Clean workplace** denotes using formal system to regularly organize and clean workplace; **Quality inspections** denotes using formal system for quality inspections; **Electronic payments** denotes uses electronic payments in business; **Supplier comparison** denotes compares the prices and quality of different suppliers; **ERP system** denotes using an IT system for enterprise resource planning (ERP); **Employee measures** denotes uses a formal system to measure the performance of individual workers; **Employee training** denotes provides formal training to employees; **Formal payroll** denotes uses a formal payroll system; **Rewards performers** denotes uses financial rewards for top performers. Reference period for all practices is last three months.

Appendix Table 5.6: Internal Consistency Check of Type of Insourced/Outsourced Worker and Business Practice Change

	Survey Round 1			Survey Round 2		
	Finance & Accounting	Marketing & Sales	Digital Marketing	Finance & Accounting	Marketing & Sales	Digital Marketing
Hired a marketing worker or provider	0.068**	0.090***	0.109***	0.060*	0.116***	0.097***
	(0.030)	(0.030)	(0.022)	(0.034)	(0.033)	(0.021)
Hired an accounting worker or provider	0.150***	0.028	0.017	0.124***	0.110**	0.054
	(0.037)	(0.038)	(0.032)	(0.044)	(0.048)	(0.033)
Control group mean	0.631	0.588	0.221	0.635	0.551	0.219
Sample Size	394	394	394	393	393	393
P-value: marketing = accounting	0.010	0.071	0.003	0.093	0.891	0.171

Notes:

Sample restricted to firms in insourcing, outsourcing, and control treatment groups.

Regressions control for randomization stratification batch, and baseline level of practices.

Robust standard errors in parentheses, *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

Appendix 6: Robustness of Firm Performance Results

Appendix Tables 6.1 to 6.4 examine the robustness of our firm performance results to alternative specifications.

Appendix Table 6.1 conditions on whether firms are operating. In our main specifications, firms which are closed are coded as having zero profits, sales, and employment. Treated firms are slightly more likely to survive, albeit not significantly so (Appendix Table 3.4), and so part of the unconditional estimates capture the extensive margin impact of moving from zero profits or sales to a positive number. In the inverse hyperbolic sine transformation, this gets captured as a very large percentage change at the bottom of the distribution. Conditioning on survival therefore reduces the magnitude of the coefficients, but qualitatively we get similar results to our main specifications in Table 5, and continue to see significant round 2 impacts of outsourcing.

Appendix Table 6.2 attempts to improve power (and correct for any selective attrition) by using post-double selection lasso to control for baseline variables that either strongly predict the outcome variables or treatment status. In practice, only one outcome variable (yearly sales) has a control selected in round 1 (full-time employees) and so these results hardly change. For round 2, yearly sales has one control selected (owner's age), and the two employment outcomes have one control selected (full-time employees). The consequence is that the results do not change very much from those in Table 5.

Appendix Table 6.3 pools together multiple rounds of data in order to attempt to boost statistical power. The first seven columns pool together data from the first and second follow-up rounds. Since the point estimates were smaller in the first round than the second, the reduction in standard errors from more data is offset by the smaller average effect than is given by the point estimates in round 2, and so we do not detect find significant results from pooling that were not significant in round 2 before pooling. The last two columns use a different approach to pooling data to improve power. In the round 2 survey, firms were asked for the last month's sales and profits, and then also asked for monthly profits for October, November, and December 2018, and monthly sales for each of the six months from July 2018 through December 2018. We stack this data in a panel, and estimate the pooled average impacts on 4 months of profits and 7 months of sales. The results are again similar to those in Table 5 for round 2 only.

Appendix Table 6.4 considers two additional checks. The first is to examine whether treatments changed the reporting of profits and sales, by examining the number of reporting errors. We measure five such errors, which arise from firms reporting profits larger than sales, monthly totals larger than annual totals, or total wage and salary bills greater than total sales. Since the main impacts of insourcing and outsourcing were on marketing, rather than accounting, practices, we do not expect reporting accuracy to have changed with treatment. Column 1 shows marginally significant evidence of reporting improving with insourcing at the one year follow-up, but column 2 shows there are no significant treatment effects on reporting errors in the two year follow-up. We conclude that our results are unlikely to be driven by changes in reporting. The second check is to examine levels of profits and sales, rather than the inverse hyperbolic sine. As noted in the text, we think a proportional rather than level treatment effect makes more sense, and levels are

even more affected by outliers. We see very large standard errors, and imprecise impacts on levels of profits and sales.

Appendix Table 6.5 shows impacts on different components of total employment. The only outcome that is statistically significant is insourcing firms using fewer apprentices or interns, but we can also not reject that treatment effects are jointly zero for this outcome too.

Appendix Table 6.1: Impact on Firm Growth Conditional on Survival

	I.H.S. Monthly Sales	I.H.S. Yearly Sales	I.H.S. Monthly Profits	I.H.S. Yearly Profits	Sales & Profits Index	Total Employment	I.H.S. Employment
Panel A: Impacts in First Follow-up Survey (One-year after intervention started)							
Assigned to Insourcing	0.265	0.303	0.129	0.407	0.053	-0.300	0.028
	(0.367)	(0.420)	(0.555)	(0.535)	(0.073)	(1.024)	(0.095)
Assigned to Outsourcing	0.034	0.589	0.206	0.307	0.055	-0.632	0.028
	(0.366)	(0.371)	(0.534)	(0.569)	(0.065)	(1.040)	(0.094)
Assigned to Training	-0.578	-0.226	-0.274	0.229	-0.052	-0.359	0.024
	(0.446)	(0.475)	(0.575)	(0.549)	(0.077)	(1.015)	(0.100)
Assigned to Consulting	-0.280	-0.226	0.089	-0.739	-0.067	-0.160	0.020
	(0.397)	(0.454)	(0.546)	(0.608)	(0.077)	(1.022)	(0.096)
Mean of Control Group	13.384	15.422	11.401	13.477	0.168	9.825	2.604
Sample Size	659	659	659	659	659	664	664
P-value: all treatments zero	0.342	0.135	0.909	0.316	0.297	0.980	0.998
P-value: all treatments equal	0.214	0.094	0.804	0.199	0.182	0.969	1.000
Panel B: Impacts in Second Follow-up Survey (Two-years after intervention started)							
Assigned to Insourcing	0.694	0.505	0.498	0.369	0.098	0.010	0.073
	(0.464)	(0.407)	(0.522)	(0.562)	(0.083)	(0.731)	(0.106)
Assigned to Outsourcing	0.795*	0.747**	0.373	1.024**	0.147*	0.219	0.115
	(0.467)	(0.344)	(0.549)	(0.442)	(0.076)	(0.764)	(0.106)
Assigned to Training	0.151	0.310	-0.242	0.381	0.024	0.291	0.046
	(0.527)	(0.425)	(0.593)	(0.518)	(0.088)	(0.794)	(0.108)
Assigned to Consulting	0.591	0.333	0.331	0.751	0.089	0.518	0.136
	(0.462)	(0.401)	(0.550)	(0.515)	(0.086)	(0.737)	(0.104)
Mean of Control Group	12.759	15.513	10.989	13.499	0.120	7.488	2.345
Sample Size	627	627	627	627	627	642	642
P-value: all treatments zero	0.356	0.120	0.686	0.080	0.232	0.951	0.709
P-value: all treatments equal	0.545	0.241	0.604	0.184	0.329	0.916	0.809

Notes:

Regressions control for stratification batch fixed effects and baseline value of outcome.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

I.H.S. denotes the inverse hyperbolic sine transformation. Firms that are closed are coded as having zero profits and sales.

Monthly sales is real (January 2018) sales in the past month; **Yearly Sales** are real sales in the past year; **Monthly profits** and **Yearly profits** are real profits in the past month and past year respectively. **Sales and Profits Index** is the average of standardized z-scores of these first four sales and profits measures. **Total Employment** is total number of workers.

Appendix Table 6.2: Robustness of Firm Growth Results to Using PDS Lasso

	I.H.S. Monthly Sales	I.H.S. Yearly Sales	I.H.S. Monthly Profits	I.H.S. Yearly Profits	Sales & Profits Index	Total Employment	I.H.S. Employment
Impacts in Second Follow-up Survey							
Assigned to Insourcing	0.798	0.697	0.652	0.471	0.124	0.177	0.118
	(0.571)	(0.575)	(0.616)	(0.598)	(0.108)	(0.721)	(0.117)
Assigned to Outsourcing	1.182**	1.221**	0.775	1.393**	0.228**	0.478	0.215*
	(0.571)	(0.574)	(0.616)	(0.598)	(0.108)	(0.723)	(0.118)
Assigned to Training	0.469	0.681	0.090	0.656	0.087	0.352	0.093
	(0.573)	(0.576)	(0.617)	(0.599)	(0.108)	(0.721)	(0.117)
Assigned to Consulting	1.079*	0.998*	0.760	1.194**	0.182*	0.918	0.248**
	(0.571)	(0.573)	(0.613)	(0.596)	(0.108)	(0.721)	(0.117)
Mean of Control Group	11.620	14.088	9.925	12.274	-0.123	6.723	2.105
Sample Size	678	678	678	678	678	693	693
P-value: all treatments zero	0.224	0.274	0.551	0.132	0.262	0.759	0.221
P-value: all treatments equal	0.593	0.743	0.641	0.356	0.575	0.762	0.487

Notes:
Regressions control for stratification batch fixed effects and baseline value of outcome.
Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.
I.H.S. denotes the inverse hyperbolic sine transformation. Firms that are closed are coded as having zero profits and sales.
Monthly sales is real (January 2018) sales in the past month; **Yearly Sales** are real sales in the past year; **Monthly profits** and **Yearly profits** are real profits in the past month and past year respectively. **Sales and Profits Index** is the average of standardized z-scores of these first four sales and profits measures. **Total Employment** is total number of workers.
PDS Lasso selects from baseline variables in Table 1. Only yearly sales (selects owner's age), and the two employment measures (selects full-time employment) have any controls selected.

Appendix Table 6.3: Pooled Impacts on Firm Growth

	I.H.S. Monthly Sales	I.H.S. Yearly Sales	I.H.S. Monthly Profits	I.H.S. Yearly Profits	Sales & Profits Index	Total Employment	I.H.S. Employment	Recall Panel Round 2 I.H.S. Profits	Recall Panel Round 2 I.H.S. Sales
Assigned to Insourcing	0.599	0.635	0.431	0.548	0.105	-0.019	0.087	0.374	0.562
	(0.374)	(0.419)	(0.425)	(0.463)	(0.074)	(0.689)	(0.094)	(0.583)	(0.604)
Assigned to Outsourcing	0.719*	1.050***	0.567	0.951**	0.162**	-0.017	0.152	0.835	1.229**
	(0.368)	(0.376)	(0.420)	(0.438)	(0.069)	(0.721)	(0.093)	(0.545)	(0.554)
Assigned to Training	-0.039	0.260	-0.094	0.435	0.018	0.106	0.068	0.244	0.358
	(0.426)	(0.439)	(0.453)	(0.461)	(0.077)	(0.742)	(0.099)	(0.579)	(0.613)
Assigned to Consulting	0.474	0.426	0.470	0.301	0.070	0.496	0.161*	0.738	0.898
	(0.380)	(0.425)	(0.426)	(0.489)	(0.077)	(0.703)	(0.093)	(0.561)	(0.573)
Mean of Control Group	12.388	14.626	10.571	12.766	0.000	8.117	2.317	9.720	11.223
Sample Size	1348	1348	1348	1348	1348	1368	1368	2712	4746
P-value: all treatments zero	0.176	0.051	0.443	0.271	0.124	0.923	0.395	0.508	0.181
P-value: all treatments equal	0.295	0.150	0.465	0.459	0.214	0.838	0.627	0.622	0.341

Notes:

Regressions control for stratification batch fixed effects, baseline value of outcome, and survey round.

Robust standard errors in parentheses, clustered at the firm level. *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

Recall Panel Round 2 uses monthly recall of three additional months of profits, and six additional months of sales, asked in round 2 survey.

I.H.S. denotes the inverse hyperbolic sine transformation. Firms that are closed are coded as having zero profits and sales.

Monthly sales is real (January 2018) sales in the past month; **Yearly Sales** are real sales in the past year; **Monthly profits** and **Yearly profits** are real profits in the past month and past year respectively. **Sales and Profits Index** is the average of standardized z-scores of these first four sales and profits measures. **Total Employment** is total number of workers.

Appendix Table 6.4: Impacts on Other Sales and Profits Measures

	Reporting Errors Made		Level of Real Sales		Level of Real Profits	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Assigned to Insourcing	-0.106*	0.017	-50	152	-59	39
	(0.062)	(0.043)	(208)	(295)	(67)	(54)
Assigned to Outsourcing	-0.011	-0.047	-151	592*	-120*	36
	(0.066)	(0.038)	(211)	(358)	(62)	(53)
Assigned to Training	0.011	0.045	-243	251	-85	48
	(0.073)	(0.049)	(204)	(306)	(67)	(54)
Assigned to Consulting	0.033	-0.020	-219	395	-106*	80
	(0.072)	(0.041)	(210)	(311)	(65)	(55)
Mean of Control Group	0.254	0.114	1290	1211	389	220
Sample Size	667	648	670	678	670	678
P-value: all treatments zero	0.100	0.206	0.682	0.483	0.349	0.679
P-value: all treatments equal	0.061	0.125	0.714	0.598	0.687	0.890

Notes:

Reporting errors is the number of errors out of five**.**

Levels of Real Sales and **Real Profits** are in 1000s of real Naira, winsorized at the 99th percentile.

Regressions control for stratification batch fixed effects, baseline value of outcome, and survey round.

Robust standard errors in parentheses.. *, **, *** denote significance at the 10, 5, and 1 percent levels respectively.

Appendix 7: Impacts on Components of Mechanisms

Appendix Table 7.1 shows item-by-item impacts on the 17 different components of our innovation index. We see the main innovations are around products, product design, and channels for selling products.

Measurement of Social Media Quality

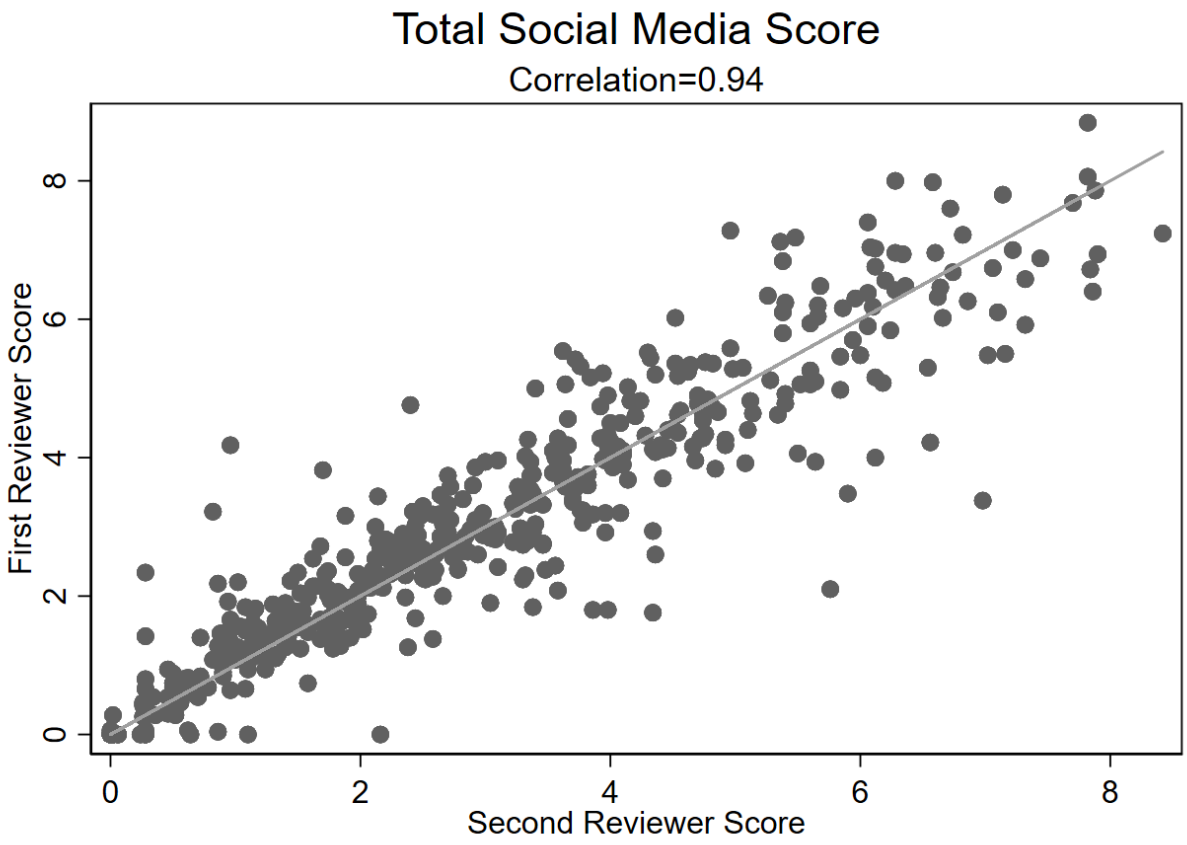
A team of five independent scorers was hired to assess the quality of the digital marketing currently being used by firms in the sample. Scorers were Nigerians living in Lagos, who were blinded to treatment status. The scorers are active social media users, with experience designing and managing websites. Each firm was scored by two scorers, who scored the websites and social media presence on the following 50 criteria, giving each a score out of 10:

- *Website:*
    - Functional – website works and loads quickly
    - Easy to navigate
    - Accessible/easily found through web search
    - Content presented effectively with no typographical errors
    - Clear from the front page what the business does
    - Easy for a first-time visitor to quickly find contact information for the company
    - Photos and images are professional and high-quality
    - Website provides an enjoyable user experience
    - Website leaves a positive impression about the company after using it
    - Website highlights key differentiating features why a customer should buy from this company and not another
    - Website encourages actions towards buying, including nudges or reminders to buy
    - Online transactions are provided and easy to do
- *Facebook:*
    - Functional – page operational, is specific to business, and loads quickly
    - Easy to navigate
    - Highly active in posting, with posts in past week
    - Content clearly presented with no typographical errors
    - Clear from main page what business does and its value proposition
    - Contact information easily found, and multiple ways of contacting business provided
    - Attractive and appealing photos used
    - Customer review section provided and active
    - Facebook page leaves a positive impression about the company
    - Prominent and accessible contact link provided
    - Facebook posts advertise specials or limited offers
    - Online orders possible from Facebook shop

- *Twitter:*
    - Functional – profile operational, is specific to business, and loads quickly
    - Highly active in posting, with tweets in past week
    - Average number of tweets per month
    - Tweets original content, not just retweets or re-postings
    - Twitter profile and banner clearly indicate what company does
    - Contact information easily found, and multiple ways of contacting business provided
    - Tweets profile employees or include a human touch
    - Highly interactive, with regular replies to customer comments
    - Twitter feed leaves a positive impression about the company
    - Twitter feed highlights key differentiating features of the company
    - Twitter posts advertise specials or limited offers
    - Twitter posts include call to action, or nudge towards buying
- *Instagram:*
    - Functional – page operational, is specific to business, and loads quickly
    - Highly active in posting, with posts in past week
    - Average number of posts per month
    - Clear from main page what business does and its value proposition
    - Contact information easily found, and multiple ways of contacting business provided
    - Multiple Instagram stories used to highlight different parts of the business
    - Attractive and appealing photos used
    - Regular replies to customers included among posts
    - Instagram page leaves a positive impression about the company
    - Instagram posts highlight key differentiating features of the company
    - Instagram posts advertise specials or limited offers
    - Instagram posts include call to action, or nudge towards buying
- *Overall impression of quantity of digital marketing presence*
- *Overall impression of quality of digital marketing presence*

Appendix Figure 7.1 shows that with the detailed scoring rubrics provided, there was a high correlation (0.94) between the scores assigned by independent scorers. We use the average of the score of the two reviewers in our analysis.

Appendix Figure 7.1: High Correlation in Social Media Scoring Across Scorers



Appendix Table 7.1: Impacts on Innovation Components

	Introduced new product	New for the city	Improved product	Introduced new process	New design or packaging	New channel	New pricing	New promoting	Changed processes
Assigned to Insourcing	0.141**	-0.018	0.190***	0.063	0.170***	0.120*	0.030	0.099*	0.085
	(0.063)	(0.047)	(0.062)	(0.058)	(0.061)	(0.062)	(0.062)	(0.057)	(0.063)
Assigned to Outsourcing	0.092	0.005	0.136**	0.097*	0.067	0.101	0.056	0.082	0.072
	(0.063)	(0.047)	(0.061)	(0.058)	(0.062)	(0.062)	(0.061)	(0.058)	(0.064)
Assigned to Training	-0.053	-0.042	-0.020	-0.055	-0.019	0.010	-0.019	-0.011	-0.020
	(0.060)	(0.045)	(0.058)	(0.053)	(0.064)	(0.062)	(0.061)	(0.060)	(0.064)
Assigned to Consulting	0.050	0.004	0.085	0.081	0.097	0.139**	0.037	0.031	-0.059
	(0.062)	(0.047)	(0.060)	(0.057)	(0.062)	(0.061)	(0.061)	(0.059)	(0.062)
Mean of Control Group	0.372	0.165	0.298	0.256	0.545	0.554	0.620	0.678	0.455
Sample Size	632	632	632	632	632	632	632	632	632
P-value: all treatments zero	0.016	0.807	0.002	0.028	0.013	0.062	0.728	0.196	0.096
P-value: all treatments equal	0.012	0.689	0.004	0.017	0.018	0.142	0.627	0.193	0.052

	Changed organization	New qualit control	New location	Outsourced activity	Licensed technology	Brought in-house	New Training	Quality accreditation
Assigned to Insourcing	0.072	0.052	0.081	0.085	0.029	0.096*	0.096	0.052
	(0.062)	(0.064)	(0.059)	(0.059)	(0.041)	(0.057)	(0.062)	(0.040)
Assigned to Outsourcing	0.060	0.047	-0.020	0.120**	-0.014	0.015	0.064	0.021
	(0.063)	(0.064)	(0.057)	(0.059)	(0.037)	(0.055)	(0.063)	(0.038)
Assigned to Training	0.033	0.027	-0.043	0.013	-0.013	0.015	-0.047	0.002
	(0.063)	(0.063)	(0.056)	(0.057)	(0.037)	(0.056)	(0.064)	(0.037)
Assigned to Consulting	-0.031	-0.015	0.053	0.024	-0.009	0.033	0.061	0.007
	(0.063)	(0.064)	(0.059)	(0.057)	(0.037)	(0.056)	(0.062)	(0.036)
Mean of Control Group	0.562	0.521	0.281	0.264	0.099	0.256	0.562	0.091
Sample Size	632	632	632	632	632	632	632	632
P-value: all treatments zero	0.430	0.781	0.173	0.193	0.827	0.512	0.147	0.699
P-value: all treatments equal	0.337	0.693	0.099	0.210	0.687	0.470	0.112	0.615

Notes:

Regressions control for stratification batch fixed effects.

Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels.

For outcome definitions, see Appendix 4.

Appendix 8: Comparison of GEM and non-GEM Business Service Providers

In order to compare the characteristics of the business service providers offering services in the GEM program to other providers in the market, we conducted a survey of 333 service providers (62 GEM service providers and 271 non-GEM service providers). This covered all four types of service providers in the program: accounting firms, marketing firms, HR providers, and general business consultants. The sample of non-GEM service providers was obtained through industry association lists, online searches, word of mouth, and business directories. Kantar TNS RMS surveyed these providers between November 2017 and June 2018.

Overall, we see the service providers selected for the GEM project tend to be larger than the non-GEM providers. There is an average of 46 workers for GEM providers compared to 28 for non-providers; 57 percent have multiple branches compared to 35 percent of non-GEM providers; and 66 percent are registered as companies versus 35 percent of non-GEM providers. They have slightly more skilled staff, with 78 percent of staff having university degrees compared to 71 percent of non-GEM firms, and an average of 12 workers who belong to professional associations, compared to 9 in non-GEM firms. However, they serve similar customer bases, with a similar mix of firms by employee size category. Their usual contracts are also similar in price and duration across the two groups, with an average duration of 65 to 67 days per year, and mean cost of one day per week of services of 94,000-104,000 Naira. This median cost is much lower, at 40,000 per month for GEM firms and 37,500 per month for non-GEM firms, with the amount firms in the GEM program reported paying of 50,000 per month lying between the median and mean of typical payments.

We asked providers what they recommend as the minimum size in terms of employment and revenue for a small business client seeking their services. The GEM firms report a mean (median) of 4.7 (3.5) employees, compared to 8.0(5.0) employees for non-GEM firms, with this difference not statistically significant. GEM firms recommend a mean (median) monthly revenue of US$2590 (US$1370), which compares to mean monthly sales in our baseline of $3,265. Non-GEM firms report higher minimum revenue levels needed, but not significantly so, with large heterogeneity (mean of $6200, median of $685).

GEM providers do not differ significantly from non-GEM providers in their willingness to offer some form of quality guarantee. This is typically a promise to redo work if unsatisfactory, with fewer than 3 percent of firms offering guarantees offering money-back.

When we consider the different types of providers, we see that the GEM accountants tend to be more likely to be sole proprietors with excess capacity than the non-GEM accounting firms interviewed, while the marketers and HR providers tend to be larger companies.

Appendix Table 8.1: Comparison of GEM and non-GEM Business Service Providers

	All Providers			Accounting Firms		Marketing Firms		HR Firms		Consulting Firms	
	GEM	non-GEM	p-value	GEM	non-GEM	GEM	non-GEM	GEM	non-GEM	GEM	non-GEM
Service Provider Age	13.4	11.1	0.046	15.6	14.0	11.1	8.4	14.2	10.7	13.2	10.9
Sole Proprietorship	0.26	0.34	0.199	0.75	0.42	0.00	0.28	0.15	0.35	0.22	0.31
Partnership	0.08	0.21	0.018	0.17	0.44	0.14	0.10	0.00	0.06	0.04	0.13
Company	0.66	0.44	0.002	0.08	0.12	0.86	0.62	0.85	0.60	0.74	0.56
Has Multiple Branches	0.57	0.35	0.001	0.58	0.51	0.43	0.21	0.46	0.35	0.70	0.28
Total Employment	46.1	28.2	0.070	21.7	26.8	40.4	26.9	107.1	27.0	27.9	36.2
Share of Staff with University Degree	0.78	0.71	0.041	0.80	0.74	0.72	0.70	0.87	0.69	0.77	0.70
Number of Staff with Professional Qual.	12.5	9.1	0.049	10.00	11.3	12.9	5.8	14.0	10.8	12.8	9.0
Annual Sales (USD)	188000	134000	0.300	39103	190000	387000	133000	245000	52087	134000	116000
Number of Customers in Typical Month	46.3	38.5	0.497	30.3	48.6	11.8	18.8	48.8	23.5	74.3	80.1
Percent of Customers <5 employees	21.3	21.3	0.992	18.3	17.8	30.7	24.3	13.1	20.8	21.7	23.7
Percent of Customers 5-20 employees	35.2	31.5	0.242	40.0	34.6	26.4	30.0	41.5	32.8	34.3	25.5
Percent of Customers 21-99 employees	25.5	28.9	0.280	24.5	32.5	25.0	23.9	33.3	32.5	22.2	26.8
Percent of Customers 100+ employees	17.7	22.6	0.170	10.0	18.7	21.5	24.5	31.5	26.8	11.3	22.0
Number of Services Offered	6.0	5.4	0.173	6.6	6.6	6.7	5.0	7.8	6.0	4.1	2.8
Average price charged for 1/day per week	93582	104000	0.772	114000	81337	98429	148000	64154	79782	96526	88855
Annual days in typical contract	67.2	65.1	0.852	70.5	64.7	91.4	83.2	65.5	42.9	51.6	56.7
Minimum Employment size recommended	4.7	8.0	0.405	3.6	4.9	5.1	5.8	6.1	16.6	4.2	7.7
Minimum sales level recommended (USD)	2586	6188	0.282	1137	6877	1722	5938	4249	1252	2929	12114
Offers a money-back guarantee	0.02	0.03	0.64	0.00	0.00	0.08	0.05	0.00	0.00	0.00	0.10
Word-of-mouth main way of getting customers	0.74	0.64	0.11	0.83	0.66	0.79	0.67	0.69	0.56	0.70	0.62
Says has excess capacity	0.37	0.31	0.386	0.67	0.26	0.43	0.22	0.23	0.42	0.26	0.51
Sample Size	**62**	**271**		**12**	**90**	**14**	**87**	**13**	**55**	**23**	**39**

We also used these provider surveys to understand how much information there is about these providers in the market, how they signal quality, and how they find customers. Anderson and McKenzie (2021) provides more details, which we summarize here. First, we conducted a brand recognition exercise among GEM applicants for the GEM providers. The median provider on the platform had only been heard of by 7 percent of firms in the program, and 75% of the 51 providers on the platform were only known by 10 percent or fewer of the firms. This highlights the information gap. Second, in terms of providing quality guarantees, we find it is very rare to use any form of money-back guarantee, with only 2 percent of providers offering a financial guarantee if customers are not satisfied. Just over half of providers say they will redo work if the customer is not satisfied, and 28 percent of the accounting firms say they will help clients if they fail an audit or have tax problems. We then asked the providers how they find the majority of clients. The most common method is through word-of-mouth, which is the main method for 66 percent of providers and 77 percent of the GEM HR, Accounting and Marketing firms. Only 16 percent of firms obtain most customers through advertising, and only 8 percent are walk-in customers. This reliance on word of mouth and lack of advertising is consistent with the lack of brand recognition, and shows firms using informal reputation as the main way of trying to overcome information and quality concerns.

Appendix 9: Sharpened q-values

Appendix Table 9.1 shows which main outcomes have sharpened q-values below 0.10, taking as a family the set of 26 outcome-survey round combinations for a given treatment reported in Tables 4 and 5.

Appendix Table 9.1: Sharpened q-values below 0.10 for main effects

Table	Outcome	Treatment	Round	p-value	q-value
4	Finance & Accounting Practices	Insourcing	1	0.0040	0.015
4	Marketing & Sales Practices	Insourcing	1	0.0263	0.074
4	Marketing & Sales Practices	Insourcing	2	0.0309	0.074
4	Verified Traditional Practices	Insourcing	1	0.0002	0.003
4	Verified Traditional Practices	Insourcing	2	0.0000	0.001
4	Verified Digital Practices	Insourcing	1	0.0010	0.007
4	Verified Digital Practices	Insourcing	2	0.0009	0.007
4	Overall Index of Business Practices	Insourcing	1	0.0020	0.009
4	Overall Index of Business Practices	Insourcing	2	0.0279	0.074
4	Finance & Accounting Practices	Outsourcing	1	0.0514	0.071
4	Marketing & Sales Practices	Outsourcing	1	0.0280	0.062
4	Marketing & Sales Practices	Outsourcing	2	0.0063	0.023
4	Verified Traditional Practices	Outsourcing	1	0.0004	0.003
4	Verified Traditional Practices	Outsourcing	2	0.0002	0.003
4	Verified Digital Practices	Outsourcing	1	0.0001	0.003
4	Verified Digital Practices	Outsourcing	2	0.0007	0.005
4	Overall Index of Business Practices	Outsourcing	1	0.0017	0.008
4	Overall Index of Business Practices	Outsourcing	2	0.0109	0.033
5	I.H.S. Monthly Sales	Outsourcing	2	0.0454	0.068
5	I.H.S. Yearly Sales	Outsourcing	1	0.0412	0.066
5	I.H.S. Yearly Sales	Outsourcing	2	0.0306	0.062
5	I.H.S. Yearly Profits	Outsourcing	2	0.0184	0.046
5	Sales & Profits Index	Outsourcing	2	0.0382	0.066
5	I.H.S. Employment	Outsourcing	2	0.0918	0.098
4	Verified Traditional Practices	Consulting	1	0.0049	0.066
4	Verified Traditional Practices	Consulting	2	0.0000	0.001

Notes: no outcome for training had a standardized q-value below 0.10

Sharpened q-values control false discovery rate across 26 outcome-round estimates for a treatment.

Appendix Table 9.2 shows which mechanisms have sharpened q-values below 0.10, taking as a family the set of 26 outcome-survey round combinations for a given treatment reported in Tables 6, 7 and 9.

Appendix Table 9.2: Sharpened q-values below 0.10 for mechanisms

Table	Outcome	Treatment	Round	p-value	q-value
6	Percent of Time Sales & Marketing	Insourcing	1	0.0274	0.078
7	Innovation Index	Insourcing	2	0.0107	0.069
7	Web Effectiveness	Insourcing	2	0.0195	0.072
7	Facebook Effectiveness	Insourcing	2	0.0049	0.066
7	Global Quality Effectiveness	Insourcing	2	0.0190	0.072
7	Global Quantity Effectiveness	Insourcing	2	0.0346	0.079
7	Unconditional Overall Social Media	Insourcing	2	0.0103	0.069
9	Use Professional Services	Insourcing	1	0.0000	0.001
9	Use Professional Services	Insourcing	2	0.0131	0.069
6	Percent of Time Sales & Marketing	Outsourcing	1	0.0154	0.032
7	Innovation Index	Outsourcing	2	0.0351	0.054
7	Web Effectiveness	Outsourcing	2	0.0011	0.006
7	Facebook Effectiveness	Outsourcing	2	0.0012	0.006
7	Instagram Effectiveness	Outsourcing	2	0.0168	0.032
7	Global Quality Effectiveness	Outsourcing	2	0.0082	0.023
7	Global Quantity Effectiveness	Outsourcing	2	0.0031	0.012
7	Unconditional Overall Social Media	Outsourcing	2	0.0011	0.006
7	Conditional Overall Social Media	Outsourcing	2	0.0089	0.023
9	Use Professional Services	Outsourcing	1	0.0000	0.001
9	Use Professional Services	Outsourcing	2	0.0007	0.006
9	Use Professional Services	Consulting	1	0.0002	0.005
9	Use Professional Services	Consulting	2	0.0009	0.012

Notes: no outcome for training had a standardized q-value below 0.10

Sharpened q-values control false discovery rate across 26 outcome-round estimates for a treatment.