

Rwanda's Export Growth Fund: Interim Evaluation and the Way Forward



Foreword



Hon. Prof. Jean-Chrysostome Ngabitsinze

Rwanda's economic growth in recent decades is a success story, which since the 1990s has put the country on the path towards becoming middle-income. Our tremendous development has been significantly driven by the robust growth of a strong export sector. Rwanda experienced an impressive average annual export growth rate of 14 percent from 2010 to 2019. This growth rate far exceeds the global average of 3.7 percent and surpasses the Sub-Saharan Africa average of 4.5 percent during the same period. Additionally, Rwanda's growth in both goods and services exports surpassed those of comparator countries in the region. The performance of our exporting firms helped Rwanda to expedite the process of structural transformation towards a modern economy by making our firms more productive and by increasing the quality of our products. A growing integration into global value chains has not only benefited Rwandan exporters but also their domestic trading partners, generating employment and wealth in our country.

The recent pandemic and disruptions in global supply chains, however, have emphasized the need to strengthen the resilience of Rwanda's export sector through a transition to modern manufacturing industries alongside highly productive and tradable services exports. The Ministry of Trade and Industry's (MINICOM) goal is to enable Rwandan firms to build up their business, produce goods that are competitive on international markets, and diversify their trading partners through facilitated market access. Our National Policies such as our Trade Policy and our Industrial Policy, as well as various Strategies, not only outline our vision but describe the actions MINICOM takes to create an enabling environment for exporters in line with our Made-in-Rwanda goals.

The Export Growth Fund (EGF) is a prime example of our agenda to support Rwanda's exporting firms. Together with our implementing partner, the Development Bank of Rwanda (BRD), we have designed a credit and grant support system for existing and prospective exporters, with the goal of improving the export performance of Rwandan firms. Through subsidized loans and matching grants for firms in high-promising industries, the EGF is intended to facilitate access to the necessary finance that enables investments in export activities.

To understand how the EGF has impacted our firms' exports and revenues, how much employment it has generated, and its impact on public resources through additional tax revenues, we have developed a close collaboration with the International Growth Centre (IGC). This report presents the results of a rigorous evaluation of the EGF's impacts on its existing beneficiaries since its inception in 2016. The researchers used modern economic tools combined with high-quality administrative firm-level data to understand the EGF's impact.

I am pleased to report that the EGF has been a success as expected. IGC's study found that, after only two years, the subsidized financial resources through the EGF increased firms' business revenues by 50%, their number of permanent employees by 30%, and increased the probability of exporting by 10 percentage points. At the same time, impacts on tax revenues suggest that the EGF actually paid for itself through generating additional revenues for Rwanda's public finances in less than five years of its eight active years.

Our collaboration with the IGC will not end here but will continue as we aim to understand ways to improve the design of the EGF and allow more firms to benefit from it. In a multi-year project, we will encourage additional promising exporters to benefit from the EGF. This will allow IGC researchers not only to obtain even more robust estimates of the impact of the EGF but also to accompany these firms over the next years to better understand its long-term impact.

Active data-driven policymaking has been a cornerstone of Rwanda's economic success story. This report stands as empirical proof of our successful agenda to foster strong export growth and support Rwanda's development path.

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Rwanda's Export Growth Fund: Interim Evaluation and the Way Forward

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Executive Summary

Rwanda's Export Growth Fund (EGF) is a program jointly developed by the Ministry of Trade and Industry (MINICOM) and the Development Bank of Rwanda (BRD) to increase the export performance of Rwandan firms. It offers subsidized loans at 10-12% interest rates relative to market rates of 17-19%. EGF recipients tend to be large firms and are highly concentrated in agriculture and manufacturing. In this study we offer preliminary evidence of the impact of such subsidized loans.

Our results suggest a large positive effect of the program on business revenues and employment. Receiving the EGF is associated with an increase of approximately 50% in business revenues and 30% in the number of permanent employees. In addition, obtaining the EGF is associated with a large increase -- of 10 percentage points -- in the probability of exporting. We do not find evidence of any increase in the value of exports for established exporters. Overall, the effects seem to be particularly pronounced for smaller firms.

We also estimate the fiscal impact of the EGF program. Two years after receiving the subsidized loan, firms on average increase their CIT tax payable by more than 80% and their PAYE tax payable by over 30%. We calculate that given the additional tax revenues generated by the EGF, the program pays for itself in less than 5 years.

These are very promising initial results. Going forward, we propose an initiative that would achieve two goals: (1) expand access to this promising initiative and (2) provide a "gold-standard" impact evaluation of the EGF. To do so, we propose conducting a randomized door-to-door marketing and application assistance campaign. Such a campaign could also be used to identify the optimal targeting strategy and thus maximize the EGF's positive impact on Rwandan firms. In addition, it could be used to expand and assess the impact of the program over potentially underrepresented firms including SMEs, women-owned and youth-owned enterprises.

1. Background

Strong export performance is often seen as key to unleashing firm productivity and spurring economic growth. Exporters tend to be larger, more productive and more skill intensive. Exporting firms experience improved product quality, with significant evidence of learning-by-doing.

Rwanda's Export Growth Fund (EGF) is a multifaceted program developed jointly by the Ministry of Commerce and Industry (MINICOM) and the Development Bank of Rwanda (BRD) to increase exports. It provides loans to exporters and potential exporters at subsidized rates of 10-12% relative to market rates of 17-19%. Since the EGF was launched in 2016 and up to the end of 2022, more than 120 loans have been issued to 80 firms, totalling approximately 25 billion RWF (21 million USD).

While far from negligible, this figure falls below the target of 200-500 beneficiaries and \$50 million USD *per year* in loans targeted by MINICOM in its 2015 National Export Strategy. In order to encourage adoption, in 2023 a media campaign was launched, leading to a very recent spike in firm applications. In this study we analyze the impact of the EGF over the performance of their beneficiaries for firms that received the EGF loans between 2016 and 2022.

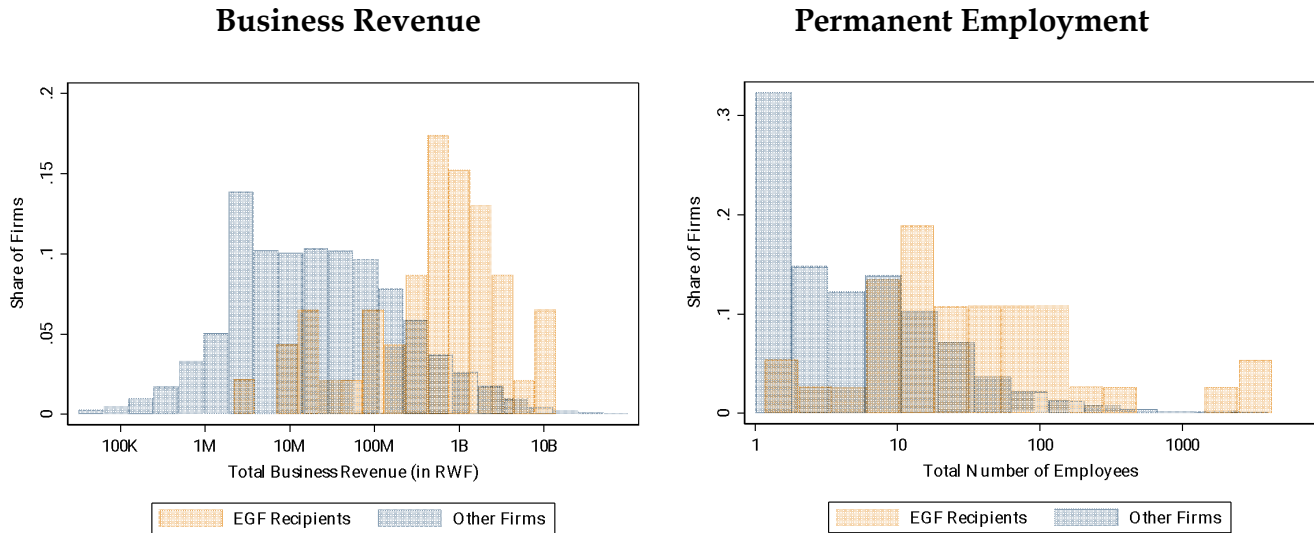
For this analysis, we combine several sources of firm-level administrative data from the Rwanda Revenue Authority (RRA) with data from the BRD on all the firms that were provided with an EGF loan, as well as the timing of each loan. The RRA data includes: (1) Corporate Income Tax (CIT) firm-level information on business revenues and tax payables, (2) Pay-As-You-Earn (PAYE) information on employment, (3) customs data on exports and imports and (4) Value Added Tax (VAT) data information. All data was accessed in a secure data facility within the RRA.

2. Targeting Strategy

In this section, we describe how EGF recipients compare with other firms in the Rwandan economy *before* they receive the loan. This is therefore informative about how the EGF is currently targeted (but does not tell us about impact, which we discuss in the next section). Figure 1 describes the distribution of revenues and employment for EGF recipients (one year before receiving the loan) and non-recipients. Overall, firms that obtain EGF loans are much larger than other formal firms in the Rwandan economy. The median EGF recipient has annual business revenues of 588M RWF and 27 employees, compared with median values of 18M RWF and 4 employees for non-recipients. The median EGF recipient is thus larger than 90% of formal firms in Rwanda.

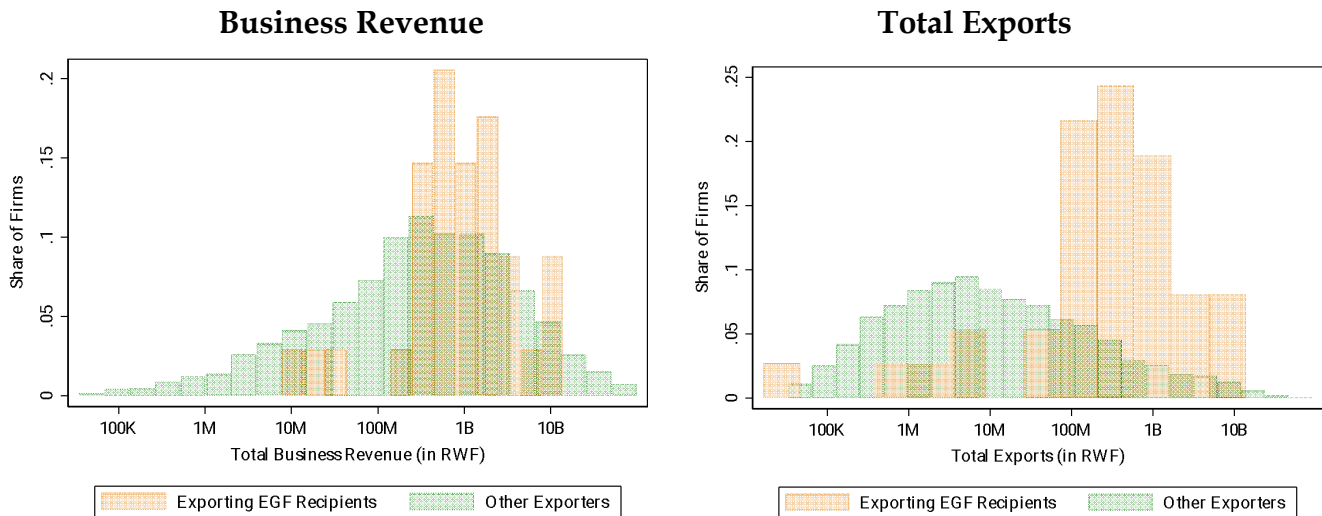
The EGF program is targeted at exporters and potential exporters, which tend to be large. Approximately 65% of EGF recipients were already exporting prior to receiving the program, compared with just 2% of other firms. Therefore, it may be more appropriate to compare their size relative to other exporters. However, Figure 2 shows that, even when compared with other exporters, exporting EGF recipients are very large.

Figure 1
Distribution of Revenues and Employment,
EGF Recipients vs Other Formal Firms in Rwanda



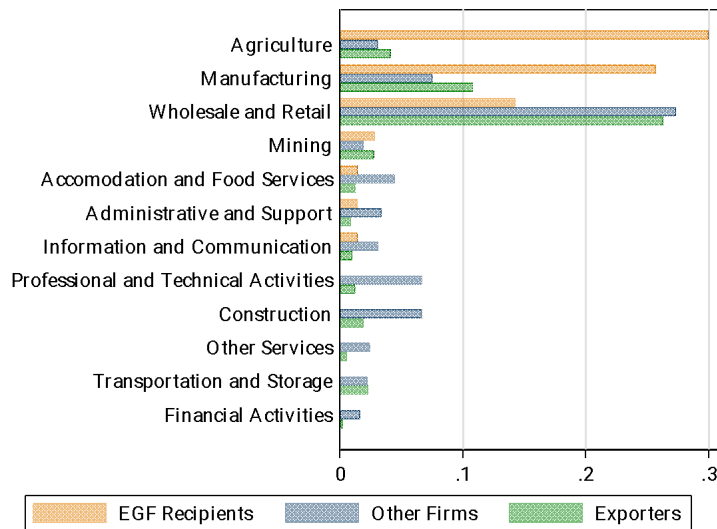
The figure shows a histogram of business revenues (left) and employment (right) for EGF recipients (1 year before participating in the program) and other formal firms in Rwanda reporting CIT and/or PAYE. Source: Authors' elaboration with data from the RRA and BRD.

Figure 2
Distribution of Revenues and Employment,
Exporting EGF Recipients vs Other Exporters



The figure shows a histogram of business revenues (left) and total exports (right) for exporting EGF recipients (1 year before participating in the program) and other exporters in Rwanda reporting CIT and/or exports. Source: Authors' elaboration with data from the RRA and BRD

Figure 3
Distribution by Sector, EGF Recipients vs Other Firms vs. Exporters



The figure shows the distribution of EGF recipients, other formal firms in Rwanda and other exporting firms by aggregate sector. Sector categories come from firm registration records and RRA tax filings. Source: Authors' elaboration with data from the RRA and BRD.

In Figure 3, we show the distribution by aggregate sector of EGF recipients compared with all exporters and with all other firms in the Rwandan economy. Firms that receive the EGF are very concentrated in agricultural sectors (30% of all recipients relative to approximately 5% of all other firms, 4% of exporters) and in manufacturing (25% of EGF recipients compared with approximately 8% of other firms and 10% of exporters). The more represented industry is coffee, comprising approximately 20% of EGF recipients.

3. Impact of the EGF over firm performance and tax revenues

Next, we study how obtaining the EGF has affected the performance of recipients. We identify the impact of the program by comparing the growth rates of EGF recipients (the *treatment group*) with those of non-EGF recipients (a *comparison group*), both before and after obtaining the EGF for the first time. The methodology that we used, which is based on a differences-in-differences approach, is explained in detail in Section A1 of the Technical Appendix. The main challenge of this approach is the choice of comparison group. As we saw above, EGF recipients are very different from other firms in the Rwandan economy: they are larger, more likely to export, and are concentrated in agriculture and manufacturing. We therefore create a comparison group of firms using a matching technique to identify firms that look similar to recipients before they received the EGF loan based on various characteristics, including total revenue, revenue growth, employment and sector of activity. Sections A2, A3 and A4 of the Technical Appendix show results using alternative comparison groups, such as those that additionally match on firm purchases; results are similar to those we present here. Note that we show two

different estimation methodologies to assess the impact of the EGF (Two-Way Fixed Effects and Sun and Abraham, 2021), both of which show similar results.¹

Figure 4 shows our estimates of the impact of the EGF. In these figures, we plot the estimated impact of participating in the EGF up to 2 years after receiving the subsidized loan (“ $t+2$ ”). We find very large increases in business revenues (of approximately 50%) and permanent employment (of ~30%) two years after obtaining the loan. In addition, we find a very significant rise in the probability of exporting (of roughly 10 percentage points). We do not, however, find noticeable increases in export revenue for already established exporters. That said, the sample size of established exporters is small and thus, our estimates are not very precise (the larger the sample size, the more precise the estimates). We therefore can neither confirm nor rule out a positive effect on total exports of established exporters. Appendix A7 analyzes the impact over other firm outcomes.

In addition, in Figure 5 we estimate the impact of the EGF by firm size, dividing EGF beneficiaries into larger and smaller firms (specifically, those above and below the median revenue of recipients in the year before obtaining the loan). We find that after two years the impact of the EGF seems to be higher for smaller firms. For instance, smaller firms have an average increase in business revenues of almost 60%, compared to about 30% for larger firms. In addition, the positive effects over the probability of exporting seem to be concentrated on the sample of smaller firms.

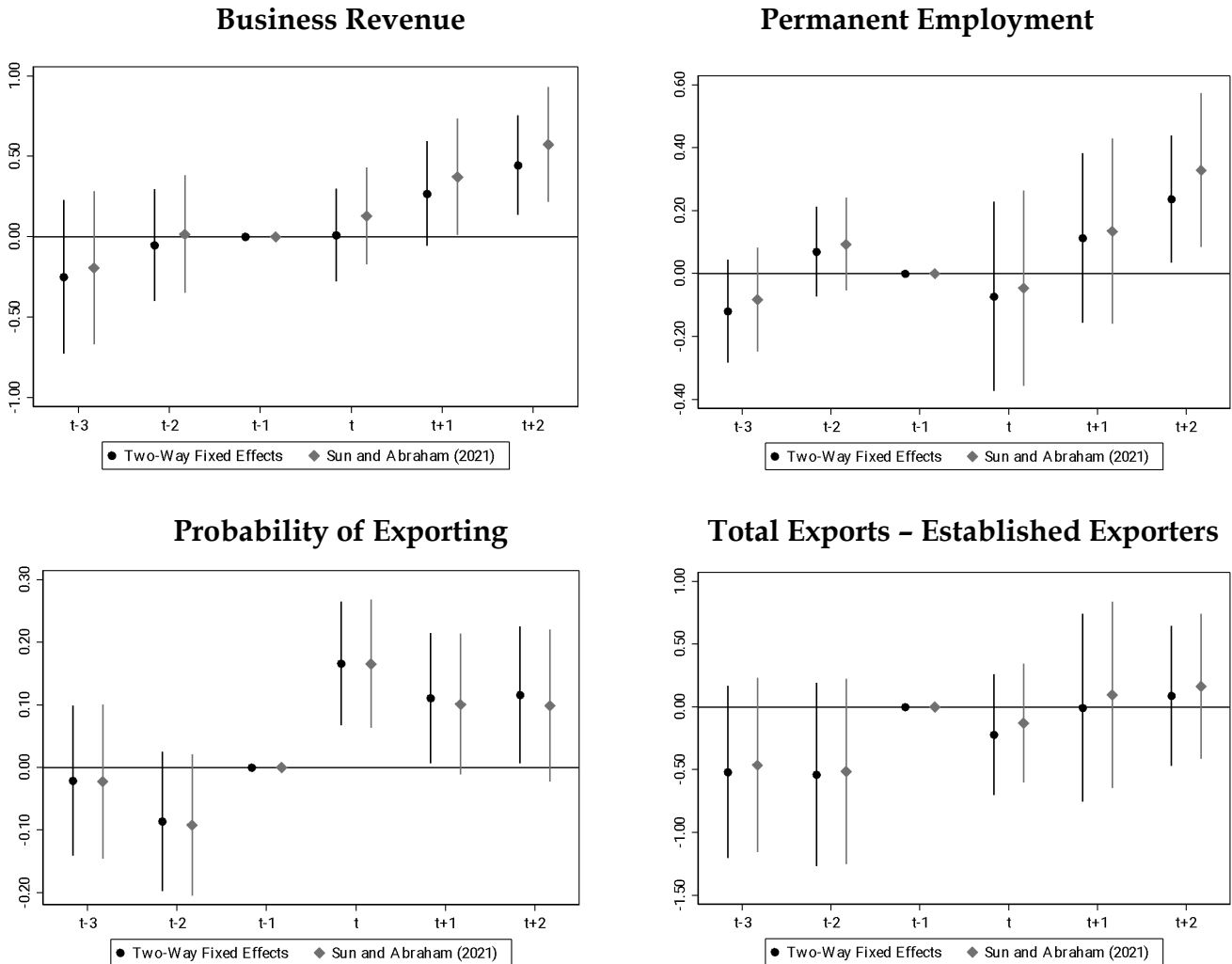
We also separate the effect for recipients in the coffee industry - which account for 20% of all EGF loans - and firms in other industries. We find larger effects for firms in non-coffee industries, especially for business revenue and the probability of exporting.

Finally, we estimate the impact of the EGF on firm-level Corporate Income Tax (CIT) and Pay-As-You-Earn (PAYE) tax payables. With these estimations, we can assess how the EGF affects tax revenue increases and, thus, the fiscal sustainability of the program. We find that two years after obtaining the subsidized loan firms increase on average their CIT tax payable by 80-100% and their PAYE tax payable by 30-40%.

Given the average tax bill of EGF recipients, this translates to approximately 17M RWF additional CIT tax payable and 1.2M RWF additional PAYE tax payable *per year* for each EGF recipient. Between 2016 and 2022, there have been 80 EGF tax recipients, leading to an estimated total increase in tax revenues of approximately 1.4 billion RWF (1.06 million USD), as seen in Figure 7. Importantly, this calculation only considers first-time EGF loans. According to MINICOM, the total cost of loans from 2016 until 2022 has been 6.4 billion RWF (5.16 million USD), suggesting that the increase in tax revenues associated with the EGF surpasses the total costs of the program in less than 5 years. Remarkably, this implies that the tax revenues cover the costs of the program within a timeframe shorter than the program’s current duration (2016-2022).

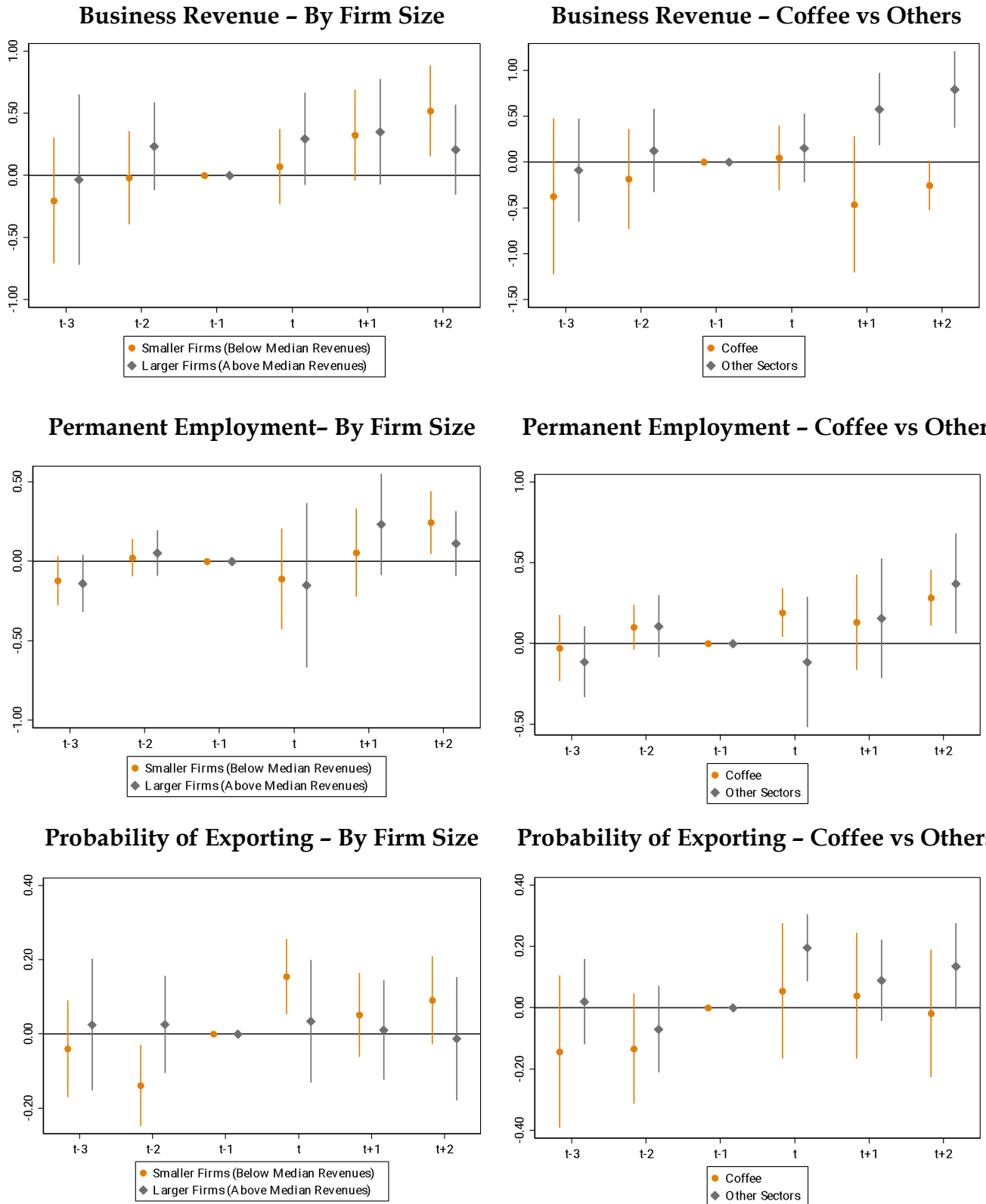
¹ *The two estimation methodologies are uncorrected two-way fixed effects and a correction for treatment heterogeneity following Sun and Abraham (2021). For more information, see Section A1 of the Technical Appendix.*

Figure 4
Estimated Impact of the EGF over Firm Performance
Comparison group: Constructed from Propensity Score Matching



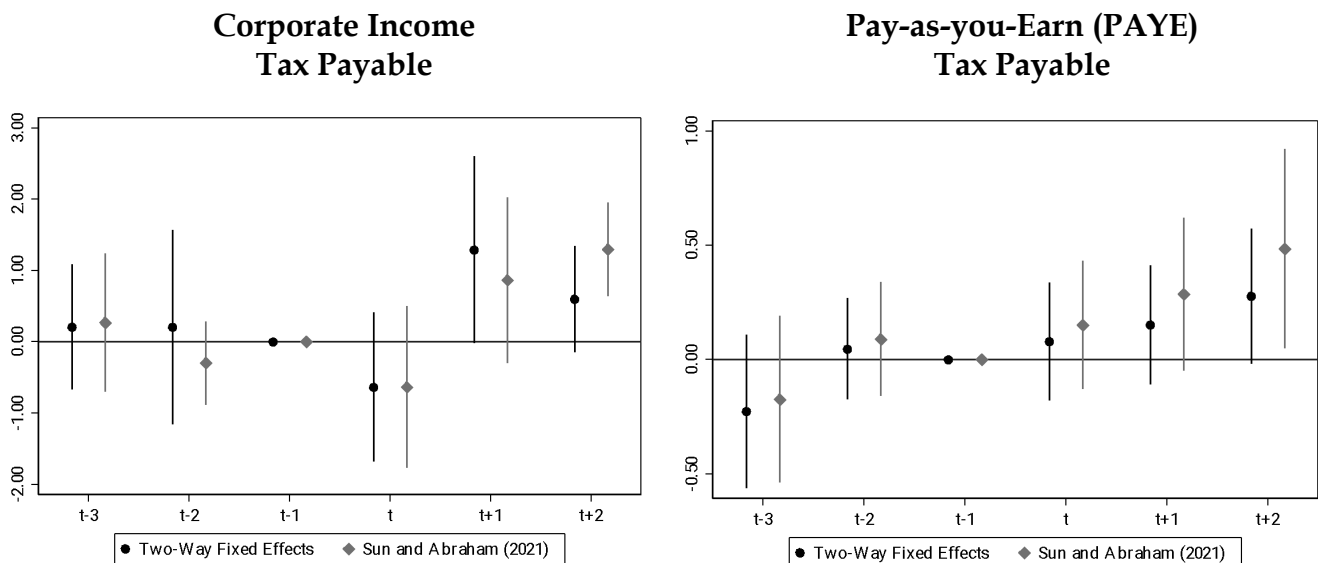
The figures above show the estimated impact of obtaining the EGF in percentages (for business revenue, employment, and total exports) or percentage points (for the probability of exporting). Time “t” refers to the time when an EGF loan was first obtained. Similarly, the coefficient at time “t+2” refers to the effect of the EGF two years after having received the loan. The periods from t-3 to t-1 are “placebo” periods; these are 1-3 years before the loan was disbursed, so there should be zero “treatment effect” in these years (if there were an effect in these years, we would worry that the match to the comparison group was not good enough). The coefficients plotted are at the 95% confidence interval. The comparison group is obtained using propensity score matching, which includes firms above P10 of the treatment distribution. The effects are estimated using two-way fixed effect regression and following the correction for treatment heterogeneity of Sun and Abraham (2021). For more details on the estimation, see Section A1 of the Technical Appendix. Source: Authors’ elaboration with data from the RRA and BRD.

Figure 5
Estimated Impact of the EGF - Heterogeneity by Size and Sector
Comparison group: Constructed from Propensity Score Matching



The figures above show the estimated impact of obtaining the EGF in percentages (for business revenue, employment) or percentage points (for the probability of exporting). The first column separates the impact for firms above median revenues (smaller firms) and firms with above median revenues (larger firms). The second column separates the impact for firms in the coffee sector (approximately 20% of recipients, see Appendix A8 for more information) and firms in other sectors. Time “t” refers to the time when an EGF loan was first obtained. Similarly, the coefficient at time “t+2” refers to the effect of the EGF two years after having received the loan. The periods from t-3 to t-1 are “placebo” periods; these are 1-3 years before the loan was disbursed, so there should be zero “treatment effect” in these years. The coefficients plotted are at the 95% confidence interval. The comparison group is obtained using propensity score matching, which includes firms above P10 of the treatment distribution. The effects are estimated using the correction for treatment heterogeneity of Sun and Abraham (2021). For more details, see Section A1 of the Technical Appendix. Source: Authors’ elaboration with data from the RRA and BRD

Figure 6
Estimated Impact of the EGF over Firm Taxes Paid



The figures above show the estimated impact of obtaining the EGF in percentages (for both corporate income tax payable and Pay-as-you-earn tax payable). Time “t” refers to the time when an EGF loan was first obtained. Similarly, the coefficient at time “t+2” refers to the effect of the EGF two years after having obtained the subsidized loan. The periods from t-3 to t-1 are “placebo” periods; these are 1-3 years before the loan was disbursed, so there should be zero “treatment effect” in these years (if there were an effect in these years, this would make us worry that the match to the comparison group was not good enough). The coefficients plotted are at the 95% confidence interval. The comparison group is obtained using propensity score matching, which includes firms above P10 of the treatment distribution. The effects are estimated using traditional two-way fixed effect regression and following the correction for treatment heterogeneity of Sun and Abraham (2021). For more details on the estimation, see Section A1 of the Technical Appendix. Source: Authors’ elaboration with data from the RRA and BRD.

Figure 7
Aggregate Impact of the EGF over Tax Revenues

	<i>Estimated Impact (in %)</i>	<i>Estimated Impact per beneficiary (RWF)</i>	<i>Total Estimated Impact (All 80 EGF beneficiaries)</i>
Corporate Income Tax	↑ 80%	↑ 17M RWF	↑ 1.3 B RWF
PAYE Tax	↑ 30%	↑ 1.2M RWF	↑ 100 M RWF

The table above shows the estimated impact of the EGF over tax revenues. Column 1 shows the effect over firm-level CIT and PAYE tax payables as a percentage. Column 2 translates these effects into monetary amounts (RWF) using the tax payable of EGF recipients. Column 3 provides the total estimated impact of the EGF beneficiaries over tax revenues.

4. Next Steps: Door-to-door Marketing Campaign

Our set of preliminary results suggests large potential effects of subsidized access to credit through the EGF on business revenues, employment, and the probability of exporting. In addition, we find significant positive effects over tax revenues, which point to the fiscal sustainability of the program. While we view these results as very encouraging and informative about the potential of the EGF, our estimation depends on informative but potentially imperfect comparison groups, which may not be fully comparable with EGF recipients. In addition, the number of recipients has been relatively low, compared to initial targets, with particularly limited take-up among SMEs, the firms that exhibit the greatest gains from the EGF, according to the above analysis.

As a next step, we propose conducting a randomized door-to-door randomized marketing campaign would address both of these issues, potentially increasing take-up and improving targeting of the EGF, while simultaneously providing the tools for a rigorous “gold-standard” impact evaluation of the program. In such a campaign, we would firstly identify a large pool of high-promise potential EGF recipients (especially including but not limited to SMEs) using administrative data and pre-screening surveys. Next, we would conduct a door-to-door outreach campaign offering tailored information and application assistance to randomly selected firms from among this pool of high-promise firms (the exact number will be determined by available budget). Randomizing the outreach among equally deserving firms is the most equitable method to guarantee every firm has an equal chance of obtaining assistance given the budget constraints. It also enables us to assess the impact of the EGF in a highly rigorous manner, as we can now be confident that the control group (those who do not get the outreach campaign) is a perfect match for treated firms (those who do) – meaning the only difference between the two is that the treated firms will be more likely to take up the EGF. Therefore, we can be confident that any difference between the two groups seen after the loan is disbursed is *due to or caused by* the EGF loan. Such rigorous evaluation has become the “gold-

standard" world-wide, with results informing evidence-based decision-making by policymakers and donors alike.

The researchers from Harvard University, Yale University, and the IGC would partner with the BRD to jointly design, implement and evaluate the outreach campaign. The research team will also conduct surveys with firms, from both treatment and control groups, in the year or two following the outreach campaign. The surveys will solicit firms' feedback on the EGF, informing potential ways to improve the future design of the program, and collect additional information to complement the administrative data for the full impact evaluation analysis. The outreach campaign, surveys and evaluation will be funded by the researchers.

This program would also help identify the ideal targeting strategy of the EGF (e.g. established exporters or potential new exporters, smaller or larger firms) and to identify potential barriers to adoption. It can help expand access to firms that are currently underrepresented among beneficiaries, including small and medium enterprises (SMEs), women-owned enterprises and youth-owned businesses. Finally, this randomized door-to-door campaign could also be leveraged to assess the effects of the program to firms in different stages of the value chain, including suppliers of exporting companies.