



IMAGE: THE TREASURY AT PETRA, JORDAN

START-UP LENDING IN JORDAN: SUCSESSES, LESSONS, AND OPPORTUNITIES

USAID Jordan Local Enterprise Support Project (LENS)

VERSION 2.4
2019-08-29

PREPARED BY RAFAEL PILLIARD HELLWIG AND ALESSANDRO BARONI

The USAID Local Enterprise Support (LENS) Project is funded by the United States Agency for International Development (USAID) and implemented by FHI 360. This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of FHI 360 and do not necessarily reflect the views of USAID or the United States Government.

ABSTRACT: The USAID Local Enterprise Support Project (LENS) is a five-year activity that helped create new loan products for micro- and small enterprises (MSEs) in Jordan, mainly through micro-finance institutions (MFIs). A telephone survey with 1,567 loan recipients from one such product shows that the intervention generally achieved its desired development outcomes. The start-up loan product created clear financing opportunities for some 1,806 businesses prior to FY19. However, the program did unwittingly extend credit to individuals who used the funds for debt repayment and consumption rather than business purposes. Furthermore, of the 62% of loan recipients that started a business, only a third survived two years. Still, the opinions of entrepreneurs were, on balance, considerably more positive than negative, and the program made important contributions on social metrics. For example, a decent portion of credit reached MSE target groups, including 87% to first-time loan recipients, 89% to women, and 12% to vulnerable communities in poverty pockets. The program helped 94% of businesses form business linkages (primarily through new customers) and allowed 94% of businesses to increase their revenues. And finally, net employment ostensibly increased by 552 stable job opportunities for entrepreneurs who were previously unemployed.

TABLE OF CONTENTS

Executive Summary.....	1
Background.....	3
About USAID LENS	3
Intervention Overview.....	4
Research Context, Objectives, and Limitations.....	4
Theory of Action	5
Population of Study.....	5
Findings.....	6
General Profile.....	6
Reasons for Seeking Credit	7
Business Creation and Closure.....	8
Loan Amount.....	10
Revenue.....	11
Business Linkages	12
Job Creation.....	13
Formalization	13
Most Significant Change	14
Sectors	15
Conclusions and Recommendations.....	16
General Recommendations	17
Appendix A: Survey Administration.....	21
Outcome Rates	21
Appendix B: Estimation Methodology.....	24
Choosing an Optimal Estimator.....	24
Adusting for Non-Response Bias	25
Adusting for Non-Response Variance.....	25
Adjusting for Coverage Error	26
Assessing Efficiency	27
Appendix C: Regression Models	30
Appendix D: Survey Instrument.....	33
References.....	42

EXECUTIVE SUMMARY

This report presents findings from a start-up loan product supported by the USAID Local Enterprise Support Project (LENS). The activity was designed in 2017 with a Jordanian Micro-Finance Institution (MFI) specifically to help young entrepreneurs form new businesses. As of the 2018 fiscal year-end, a total of 2,942 loans were disbursed through the program.

POSITIVE IMPACT

At a high level, the positive outcomes were that the start-up loan program:

- Created new businesses: The loan program helped 1,806 individuals establish new businesses, 1,025 who were still active at the time of the assessment.
- Stimulated job creation: Some 552 individuals who were unemployed in months prior to the loan found that the creation of the business gave them a stable job through entrepreneurship.
- Supported financial inclusion: A high incidence of lesser-privileged target groups were reached by the loan product: 89% of the loans went to women, 80% went to home-based businesses, and 12% to populations in poverty pockets.

Because the loan program will continue into FY19 and beyond, these numbers will continue to grow.

AREAS FOR IMPROVEMENT

Three issues stood out as needing stronger monitoring and mitigation strategies:

- Use of credit for non-business purposes: While the loan product was designed specifically for start-ups, only 62% of loan recipients used the funds to start a business. Alternate reasons for taking the loan included consumption purposes and debt repayment.
- Business failure: Only a third of businesses make it to their second anniversary. Though entrepreneurship can never be a risk-free proposition, this figure still leaves much room for MFIs and donors to innovate on strategies to support longer-term success.
- Over-indebtedness: 14% of loan recipients took the loan in order to pay off existing debts, and for respondents who found the most significant change to be negative, the principal reason given was ‘increased financial burden.’ Recent media and news reports suggest that over-indebtedness is a growing problem in Jordan, and although this is a problem that plagues micro-finance globally, more can be done to mitigate this issue.

SUMMARY RECOMMENDATIONS

If not already in place, some key recommendations for MFIs would be to:

- A1. Establish strong information systems to capture business-level data on loan recipients;
- A2. Implement procedures that support learning and help validate programmatic assumptions;
- A3. Integrate vulnerability into institutional risk assessment frameworks;
- A4. Implement strategies to mitigate over-indebtedness resulting from business failure;
- A5. Work on improving data-sharing platforms and the quality of information in reports from credit bureaus;
- A6. Introduce measures of success that relate more directly to MSME growth and success.

For the donor community, practices to implement (or continue supporting) would be to:

- B1. Complement results frameworks with evaluations and learning activities;
- B2. Communicate the value of data to institutional partners and help them extract insight from information;

- B3. Integrate monitoring, evaluation, and learning requirements into partnership/grant agreements with MFIs;
- B4. Defer indicator reporting until a post-assessment has been conducted, or otherwise make an *a priori* provision for losses resulting from loans being used for non-business purposes;
- B5. Plan with data privacy considerations in mind, as this can hamper M&E efforts;
- B6. Integrate vulnerability mitigation plans into the design of technical activities in order to assess likelihood of over-indebtedness and consumption lending;
- B7. Set targets selectively and judiciously to avoid propagating existing structures of privilege;
- B8. Encourage demand-driven program design and build institutional capacity within MFIs for such an approach;
- B9. Participate in regular coordination meetings with donors and stakeholders;
- B10. Engage with the informal financial sector;
- B11. Promote the national campaign on Financial Literacy/Financial Awareness;
- B12. Consider advocating accessible deposits mechanisms for un-bankable and/or vulnerable Jordanians.

BACKGROUND

ABOUT USAID LENS

The USAID Jordan Local Enterprise Support Project (LENS) is a six-year project encouraging the long-term economic growth and development potential of underserved communities by combining local economic development efforts with private sector initiatives, particularly focusing on Micro and Small Enterprises (MSEs). LENS seeks to improve the overall environment for local economic development through:

1. Strengthening local economic networks: LENS facilitates links between MSEs, customers, business service providers, chambers of commerce, financial institutions, community-based organizations, municipal/governorate authorities, and government ministries. By building these linkages, LENS supports development of local economic ecosystems to advance economic growth initiatives.
2. Building stakeholder capacity: LENS pursues the sustainable growth of MSEs and entrepreneurs by raising awareness of available resources, improving access to financing, and giving microfinance institutions and business service providers the tools and techniques to better serve MSEs. LENS also builds the capacity of local government to design and implement economic development initiatives that result in economic growth and increased investment.
3. Improving the enabling environment: The project works to reduce barriers to local economic development, especially policies that inhibit the expansion of local economic networks or impede market entry, sustainability and growth for MSEs. To achieve this, the project helps local authorities streamline mechanisms, clarify roles and responsibilities, and introduce best practices for local economic development.

The project operates in the governorates of Irbid, Zarqa, and Amman, Aqaba, Tafilah and Karak. The project's technical assistance and grants for MSEs largely focus on the following three sectors: Food Processing, Tourism and Transportation.

The project includes a significant Access to Finance (A2F) component. It contributes to Jordan's financial inclusion strategy by working with leading Microfinance Institutions (MFIs) in Jordan to introduce new products, risk methodologies, and technology tools to increase the number of MSEs that access loans to start and build a business. Specific activities with MFIs include establishment of a new department for small- and medium enterprise (SME) lending, a new department for Risk Management, development of a mobile application and integration with *eFawateercom* networks, as well as a mobile banking branch and kiosks to reach remote areas. In 2017, USAID LENS supported MFIs in launching three new products targeted towards women and youth clients to grow and develop their businesses. One of these products is the start-up loan product assessed in the present report.

INTERVENTION OVERVIEW

In 2017, USAID LENS began supporting one of the micro-finance institutions in Jordan to develop a new start-up loan product for businesses.¹ The support began with a demand study on youth start-ups, a previously un-tapped market deemed too risky by MFIs and banks in Jordan. The research by USAID LENS assessed the current youth products in Jordan, evaluated them against *the MFI's* current youth product offering, and determined *the MFI's* capacity to support such a product. As the findings pointed to significant potential, a product was developed, pilot tested and launched. While the marketing strategy was geared to youth, the product was opened to individuals of all ages willing to start a business.

USAID LENS and *the MFI* enhanced the activity by providing support services to youth MSEs such as training, mentoring and access to new market actors. For example, a subset of female start-ups was trained in e-marketing and branding. A mentorship program was also piloted with loan recipients through the Queen Rania Entrepreneurship Center. And finally, the loan program was improved with mentorship and hands-on technical support for staff members. This final element had a critical role to play in the successful rollout, as most loan officers had never worked with this type of client and were far more comfortable with existing businesses that had credit histories.

Cumulative disbursement by the end of FY18 reached 2,942 loan recipients for a total value of 2.5 million Jordanian dinars. Building on their success, *the MFI* has since made the loan product available to Syrian refugees interested in starting their own business.

RESEARCH CONTEXT, OBJECTIVES, AND LIMITATIONS

This purpose of this paper is to provide an internal analysis of a follow-up study with businesses who received credit through one particular start-up loan program created with USG support. The genesis of this research traces itself to USAID LENS' results framework, which requires detailed data collection on indicators of interest such as the *number of MSEs with increased revenue*. As such, the primary objective of the data collection for USAID LENS is program monitoring.

However, because the project has a commitment to ongoing evidence-based learning, an ancillary objective is to assess the overall effectiveness of the start-up loan product. To this end, the follow-up exercise presented an opportunity to gather new information that could inform how the product has measured up against USAID LENS' theorized development hypotheses. For this reason, the present paper does not have pre-determined evaluation questions, but rather, takes the theory of action as a departure point for an exploratory analysis that can be used to inform similar programs in the future.

The research was designed as a computer-assisted telephone interviewing (CATI) survey. Because highly disaggregated contingency tables were required for donor-reporting, a census was taken rather than a sample. Most of the data collection was undertaken by *Leading Point*, with the balance coming from a pilot run jointly between USAID LENS and *the MFI*. As is the case with most telephone surveys, the breadth of the questionnaire had to be kept short to reduce respondent burden and reduce non-response. As such, the length of the survey instrument was limited to target a duration of 10 minutes.

¹ At the request of the micro-finance institution, USAID LENS anonymized the name of the institution and the name of the start-up loan product. In this report, the lending organization will be referred to as *the MFI* (with italics) and the product as "start-up loan product."

A second telephone survey was conducted by the MFI's marketing team several months after the initial survey. A number of new questions were added to the questionnaire that addressed open questions from the first survey. In this report, the findings from this second survey are distinguished from the first survey with an asterisk (*).

An important limitation to the research is measurement error. Key concepts such as revenues have an objective basis in reality but are often not recorded by micro-businesses. Consequently, the data received is often subjective and approximate. Furthermore, respondents may have motives to provide answers that bend the truth, giving answers they believe the donor or MFI prefers to hear. To a certain extent, these challenges are inevitable. However, where possible, the research has attempted to reduce the problem by outsourcing the data collection to an independent firm, asking balanced questions, informing the respondents of their right to refuse to answer, and triangulating responses with probative follow-on questions.

THEORY OF ACTION

USAID LENS' theory of action for the start-up loan product can be stated succinctly as:

IF a new start-up loan product is created,
THEN new financing opportunities will be created for

- underbanked and unbanked Jordanians,
- women, and
- individuals in poverty pockets;

THEN new MSE start-ups will be created;
THEN new jobs will be created, including for entrepreneurs;
THEN start-ups will grow, demonstrated by

- increased revenues, and
- formation new business linkages;

THEN a higher number of businesses will formalize.

POPULATION OF STUDY

For the present analysis, the universe of interest consists of firm-level loans disbursed prior to fiscal year 2019. This includes all start-up loans, and excludes loan products not designed for organizations, such as education loans through other loan products supported with USAID LENS assistance. Some of these educational loan recipients were accidentally included in the call sheet, but those results are not included in the present analysis.

The frame has 2,942 start-up product loans prior to fiscal year 2019, capturing 2,939 distinct loan recipients.

FINDINGS

GENERAL PROFILE

Out of 2,939 distinct loan recipients, 1,806 (± 64)² formed a business. At the time of the assessment, $\hat{N}_q = 1,025$ (± 45) were still active.

Table 1: General Demographics	Population Total (\hat{t}_y)	Population Proportion (\hat{y}_r)
By sex		
Woman-owned	912 ± 45	88.9% ± 1.0
Man-owned	113 ± 10	11.1% ± 1.0
Home-based^{3*}	1,918 ± 130	79.6% ± 4.1
Vulnerable communities⁴	125 ± 18	12.2% ± 1.6
By governorate		
Amman	313 ± 24	30.6% ± 2.1
Irbid	289 ± 26	28.2% ± 2.1
Zarqa	110 ± 16	10.7% ± 1.5
Ma'raq	63 ± 14	6.1% ± 1.3
Balqa	51 ± 11	4.9% ± 1.0
Jerash	49 ± 13	4.8% ± 1.2
Ajloun	47 ± 12	4.6% ± 1.2
Tafilah	37 ± 11	3.6% ± 1.1
Madaba	34 ± 11	3.3% ± 1.0
Aqaba	16 ± 7	1.5% ± 0.7
Karak	14 ± 7	1.3% ± 0.7
Ma'an	3 ± 3	0.3% ± 0.3
All businesses	1,025 ± 45	

² Throughout this report, margins of error and confidence intervals are reported at the 95% level. The scope of all findings is limited to loan recipients signed-on prior to FY 2019 (the period ending September 30th, 2018).

³ The question inquiring about home-based status was added in a separate follow-up survey conducted by the MFI's internal research team. Using frame data from the MFI's database, an earlier version of this report contended that 64% of loan recipients were home-based. The discrepancy between the two surveys implies that a greater number of loan recipients are home-based than what the MFI has in its database.

* In this report, an asterisk will be used to denote findings that originate from this second survey conducted by the MFI.

⁴ USAID LENS defines vulnerable communities according to 42 municipalities that align with a list of poverty pockets published by the government of Jordan. These include the municipalities of Al eonah, Al Jezah, Qariqara and Finan, Wadi Araba, Hood Al Daisa, Ain Al Basha, Dear Alla Al Jadedah, Ma'ade Al Jadedah, Al Shoneh Al Westa, Swaymeh, Al Ramtha, Sahel Horan, Burma, Al Agwar Al Janobiah, Al Qatraneh, Al Husaineiyah, Ail Al Jadedah, Al Jafer, Greater Ma'an, Dheban, Al Khaldeiah, Al Sarhan, Al Salheieh w Nayfeh, Deir Al Kahaf, Sabha w Dafyaneh, Um Al Jemal, Um Al Kotean w Al Mukeiftah, Al Rowaished, Besara, Al Hassa, Al Rusifa, Al Duleil, Beraeen, Qutar w Rahma, Al Qawiera Al Jadedah, Al Ashari, Al Sharah, Al Ameer Husein Bin Abdullah, Al za'attari w Al Mansheiah, Bane Hashem, Al Safawe, and Al Hallabat.

More than half of the loans disbursed through the loan product went to recipients in the governorates of Amman and Irbid. Most of these were home-based businesses and women.⁵ The average age of loan recipients is 34.6 (± 0.6), with 62% (± 3.0) of all loan recipients being 35 or younger (*the MFI's definition of youth*).

For 88% (± 1.9) of business loan recipients, the loan received through the loan product was their first loan received. Though the loan product is designed for newly created businesses, only 85% (± 2.3) of respondents self-identified as start-ups. The term “start-up” was not defined specifically over the interview, so respondents were free to interpret it liberally. For this reason, *the MFI's own definition*— which allows for businesses up to three years in age— may differ from the tabulations in this report.

Although not specifically targeted, 12% (± 1.6) of loans went to vulnerable communities. Over half of these were in Irbid and Mafrqa, followed by loans in Balqa, Tafilah, and Zarqa. Women were no more or less likely to be recipients of loans in vulnerable communities than elsewhere. The loan product was not specifically designed to reach these areas, so it is encouraging to see that a non-trivial percentage of credit is reaching poorer areas.

REASONS FOR SEEKING CREDIT

Propitiously, the principal reasons cited by individuals who had an establishment was that they wanted to start or enhance their business. However, the research team was surprised to discover a substantial fraction of loan takers who ultimately used the money for non-business purposes. The main reasons given for this were debt repayment, support with home maintenance, purchase of appliances, educational expenses, and support of basic living costs.

Table 2: Reasons Cited for Seeking Credit*	Population Total (\hat{t}_y)		Population Proportion (\hat{y}_r)	
Loan recipients who formed a business				
To establish a new business	1,043	±68	37%	±8.3
To enhance an existing business	742	±619	25%	±16.2
To help a family member start a business	75	±22	2.6%	±1.0
Loan recipients who did not form a business				
To pay-off debts	432	±50	15%	±3.7
To support with home maintenance	264	±39	24%	±3.3
To buy home appliances	126	±30	4%	±1.4
To help cover educational expenses	114	±27	4%	±1.3
To help cover basic living costs (e.g. food)	69	±22	2%	±0.9
To support the maintenance/ licensing of a car	41	±26	1%	±0.7
To cover medical expenses	40	±15	1%	±0.6
To support with birth expenses	33	±15	1%	±0.5

NB: This question followed a multiple-selection format. Response choices are not mutually exclusive and do not sum to 100%. Low frequency reasons have been excluded from the table above.

⁵ Most demographics variables are taken from the sampling frame rather than included in the questionnaire. This includes whether a business is home-based, which is gauged by the loan officer at the application stage and may change over time.

Although all cases of non-business loans merit further investigation, those who used the money to pay-off existing debt are a particular cause of concern. These individuals are likely vulnerable to over-indebtedness and cyclical lending. Data mining suggests that there are no strongly predictive variables in MFIs' databases that associate with whether individuals cited "to pay-off debts." This suggests it is difficult to know whether a loan applicant will intend to use the credit for debt repayment based on existing data collected at the application stage.

Predicting whether individual applicants will actually form a business therefore remains a challenge. MSE loan recipients are often informal and only have a business idea at the time they apply for loans. This makes it difficult for MFIs to have objective and actionable data on whether incipient entrepreneurs will be successful in establishing a business. However, at least with respect to using new loans for debt repayment, there is cause for optimism. The Central Bank of Jordan⁶ has implemented several initiatives to increase oversight over the sector and mitigate this issue in the future: (1) the regulator gave credit bureaus (CRIF) domain over micro-loans; (2) allocated more resources to the Jordan Loan Guarantee Corporation⁷; (3) launched a Financial Literacy campaign; and (4) put in place guidelines and recommendations to better protect clients.

While CBJ did not yet put limits on the allowable Debt-to-Burden Ratio (DBR), MFIs set-up internal guidelines to keep it approximately 50% for the client and 70% for the guarantor. Nevertheless, it should be noted that credit default risk (to the institutions) are not necessarily congruent with personal risk to the individuals. Furthermore, credit reports are priced per inquiry, and the cost-benefit ratio not always align with the personal risk of over-indebtedness to the applicant. For example, small-value loan applicants who are highly indebted may not present a large enough risk to a given MFI for them to warrant an external credit check.

BUSINESS CREATION AND CLOSURE

62% (± 2.2)* of individuals established a business upon receiving a start-up loan. Of these, 65% (± 8.5)* believe they could not have started the business without the loan from *the MFI*. Though this suggests that the credit is indeed helping establish additional MSEs, a less encouraging fact is that only a third are expected survive longer than two years. The survival curves on the subsequent page visualize this decay in businesses over time and confirm that successful entrepreneurship is difficult to achieve. While much of the market exit is risk that is inherent to start-ups, some is also attributable to economic forces that impact the entire economy. Indeed, 14.3% (± 2.7) of MSEs in Jordan in 2018 did not think they would continue for the next three years (source: USAID LENS MSE survey).

Loan recipients did not all experience the same chances of success. A survival model⁸* suggests that women who took a start-up loan had a 59% (± 4.0) higher hazard than men of going out of business (or indeed, were less likely to establish one). Not surprisingly, home-based businesses had a higher hazard, being 24% (± 17) less likely to survive at any given time compared businesses that operate in

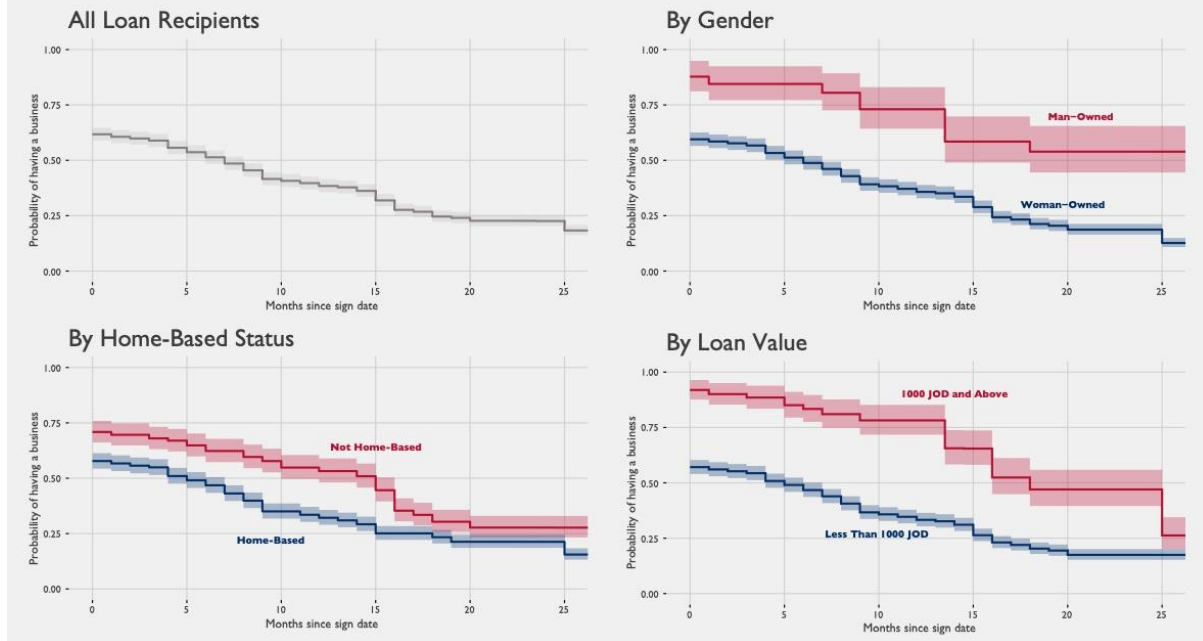
⁶ In recent years the government of Jordan has made a strong commitment to increasing financial inclusion, with the Central Bank of Jordan (CBJ) taking a leading role in implementing this commitment. 2015 Microfinance By-law No. (5) placed CBJ as the authority in charge of licensing, supervising and regulating MFIs.

⁷ The Jordan Loan Guarantee Corporation (JLGC) aims to provide the necessary guarantees to facilitate financing of SMEs and national export, to contribute to the process of economic growth, job creation and national export encouragement. It signed several partnerships with MFIs to guarantee loans.

⁸ See Model 2.1 in Appendix C for details on the Cox proportional hazards model. The fit adjusts for the sex of the loan recipient, whether it is home-based or not (as per the data collected at the application stage), and the loan value.

Probability of Having a Business

Weighted Kaplan-Meier survival curves fit on interval-censored data



a commercial location. And for every additional 1,000 JOD given in credit to a business, the model suggests that exit hazard was halved.⁹ Although there is evidence that businesses of illiterate individuals are less likely to survive, the risks curves for all other education levels are remarkably similar to one another.

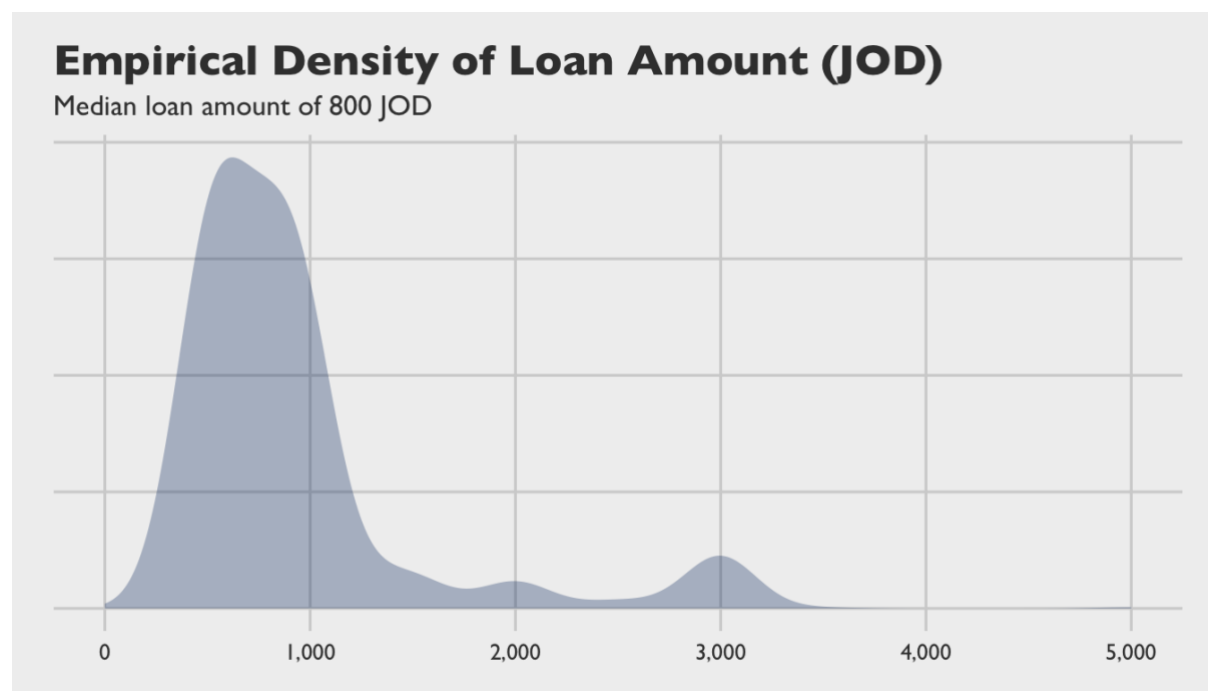
The principal finding from this risk analysis is that although six in ten loan recipients establish a business, only a fifth of them are expected to have a business that makes it to its second anniversary. While this statistic may appear discouraging, it is important to consider that *the MFI* targets many 'difficult' strata by design. Women, home-based businesses, and vulnerable populations who need micro-level loans—these profiles are precisely those that are often overlooked by larger financial institutions. If *the MFI* focused on clients deemed profitable, less risky, and easy to score for credit-worthiness, it would no doubt achieve a higher rate of business survival—but at the cost of reaching the underbanked segments of society who lack access to credit. It is for this reason that business survival alone should not be taken as a wholesale measure of success.

Reasons for closures varied but most commonly had to do with the business model being unsuccessful (see Table 3 on page 10). Factors unrelated to the business, such as medical and family matters, accounted for one in five cases. And 1% of closures were attributed to disagreements with partner—a surprisingly small rate for start-ups. 41% (±6)* of respondents who closed their business said that the failure of their enterprise adversely impacted their ability repay the loan.

⁹ This association is not necessarily causal. Indeed, it is both possible and plausible that such a relation exists in the inverse direction: that businesses deemed on more solid footing are granted higher amounts of credit by loan officers.

Table 3: Reasons Cited for Business Closure*		Population Total (\hat{t}_y)		Population Proportion (\hat{y}_r)	
1.	Idea was not successful	257	±40	32%	±4.3
2.	Poor financial circumstances	145	±31	18%	±3.6
3.	Selling with on debit to customers	83	±23	10%	±2.8
4.	Medical conditions	81	±23	10%	±2.8
5.	Personal family matters	76	±22	10%	±2.6
6.	Marketing for the project was not successful	30	±15	4%	±1.9
7.	Changed place of residence	26	±13	3%	±1.6
8.	Disagreement with partner(s)	10	±7	1%	±0.9
9.	Other	85	±23	11%	±2.8
	Refused to answer	6	±7	1%	±0.9

LOAN AMOUNT



A total of 1.42 million JOD (±45k) was disbursed to businesses through the loan product (2.47mn JOD if you also include non-businesses) prior to fiscal year 2019. The median loan amount for businesses was 800 JOD. These loans were much smaller in value than the median of 3,000 JOD for MSEs in Jordan (source: USAID LENS MSE survey). On average, a loan to a business was signed for a duration of 17 months.

REVENUE

Businesses were asked if their average monthly revenues had increased, decreased, or stayed the same after taking the loan. 94% (± 1.3) of respondents reported that their revenues increased. On average, loan recipients that successfully established a business reported that they started making revenue 1.3 months after receiving the loan. Of the business that increased sales, 97% (± 1.0) stated that they believed this was as a result of the loan. In contrast, the USAID LENS MSE survey reveals that only 12.9% (± 2.5) of MSEs in Jordan had revenues increase in 2017, with 75.0% (± 3.3) reporting that revenues decreased.

Table 4: Mean Monthly Revenue (\tilde{y}_r)	Pre		Post		Difference¹⁰	
Sex of the owner						
Woman-owned	29	± 10	145	± 16	115	± 11
Man-owned	151	± 53	356	± 66	203	± 35
Vulnerable communities						
Vulnerable	16	± 8	127	± 14	110	± 12
Not vulnerable	44	± 12	170	± 19	126	± 12
All businesses	40	± 10	165	± 16	124	± 11

NB: This variable carries considerable item non-response and measurement error.

On the whole, men reported considerably higher sales than women. Whereas the average monthly revenues increased by 124 JOD after taking the loan, the net increase was only 115 JOD for women compared to 203 JOD for men. Indeed, at the time of the interview, the average revenue for man-owned businesses was 365 JOD per month; more than double the 145 JOD average for woman-owned businesses. While not encouraging, it is not unexpected: the USAID LENS MSE survey found that woman-owned businesses in Jordan earned 210 JOD less than men in average monthly profits. The gender disparities observed in the wider economy are mirrored by the experience of the start-up loan recipients.

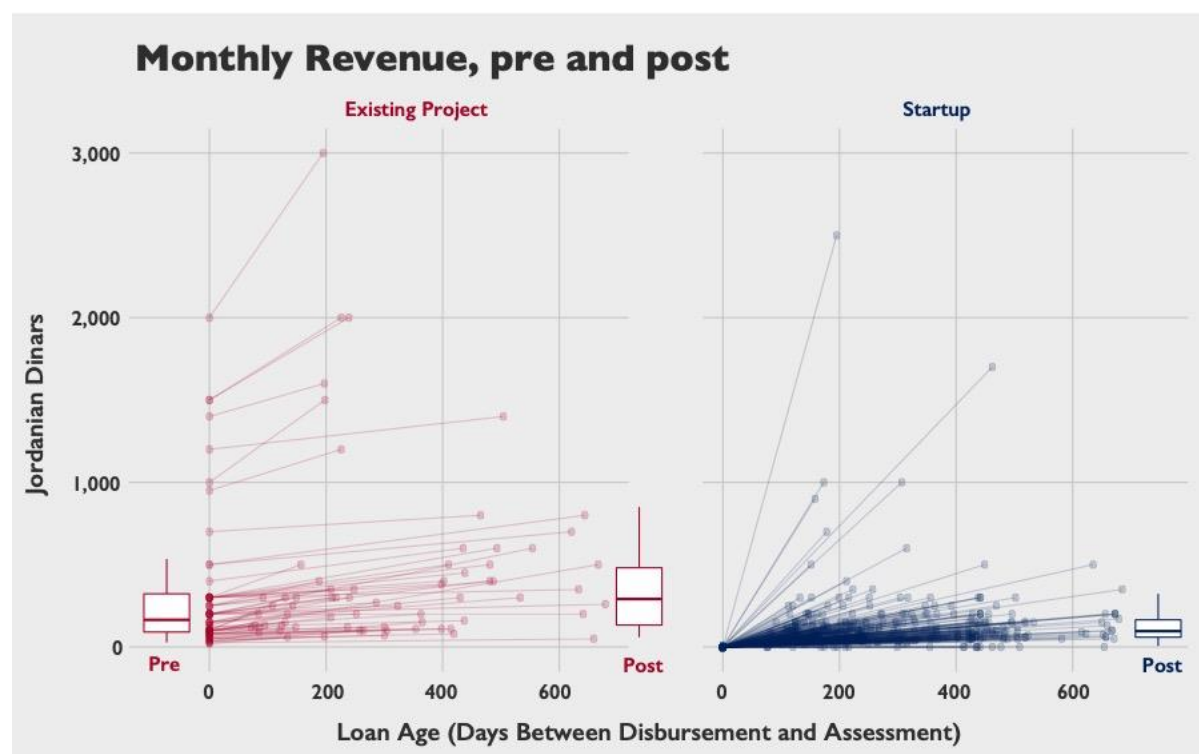
At a portfolio level, the ratio of revenues pre and post loan¹¹ is estimated at 4.0 (± 0.4). This suggests that as of the assessment date, there had been a fourfold increase in total revenues for businesses combined. Women tended to have much higher rates of *relative growth*: 4.9x (± 1.3) compared to 2.3 (± 0.5) for man-owned businesses. The reasons for this may have to do with the fact that women typically start with lower amounts of revenue, realizing substantial relative gains with nominally small amounts. Another explanation may be that because the odds of women being inactive is 2.6 times as high as men, that many of the less-successful women are not captured due to market exit.

The above growth ratios do not account for differences across loan recipients who received loans earlier on in the life-cycle of the program. We might expect relative increases to be less pronounced

¹⁰ The mean difference $\tilde{y}_r = (\sum_r (y_k^{post} - y_k^{pre}) w_k) / \sum_r w_k$ is identical to the contrast of means $(\sum_r y_k^{post} w_k) / (\sum_r y_k^{pre} w_k) - (\sum_r y_k^{pre} w_k) / (\sum_r y_k^{pre} w_k)$.

¹¹ This quantity is given by the ratio of totals $(\sum_r y_k^{post} w_k) / (\sum_r y_k^{pre} w_k)$.

in the first few months after receiving the loan. We can normalize the difference by adjusting for the age of the loan, in days:

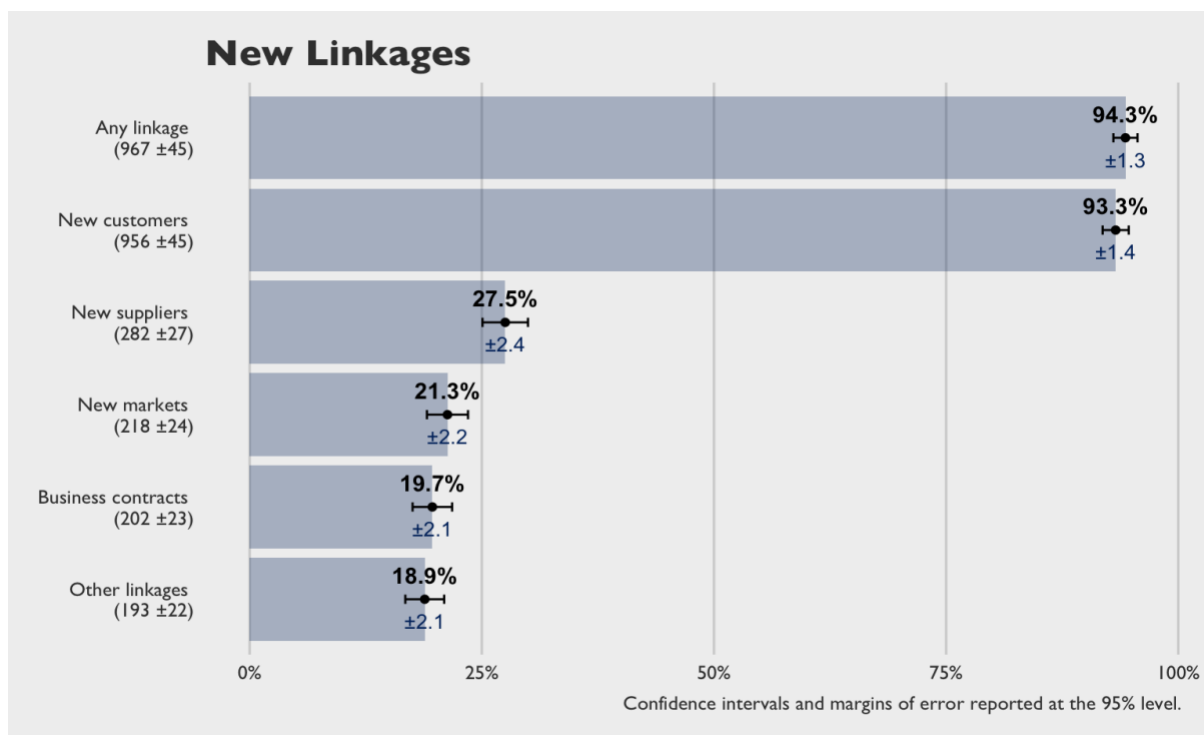


A few patterns emerge from the visualization. The cases with the steepest slopes (highest relative increases in revenue) are predominantly for cases where the post-assessment was taken relatively soon after disbursement. This suggests these cases may be regression anomalies, that revenue is more stable in later months, and that they do not produce unusually high changes in later months.

There is a statistically significant relationship between the absolute difference in revenue and the loan amount, but it has weak predictive power and is of little practical interest ($R^2 = 0.058$).

BUSINESS LINKAGES

Almost all businesses reported an increased number of customers as a result of the loan. Roughly half reported that a new business product was developed as a result of the loan. Other new linkages, such as new suppliers, new markets, business contracts were less frequent but not uncommon (between 19% and 28%). Nearly half of businesses— 49.5% (± 2.8)—developed a new product.



JOB CREATION

The principal job-creation impact from the loan product comes from owners creating employment for themselves. A central piece of the counterfactual argument is that 73% (± 5.8)* of the entrepreneurs who received loans were unemployed in the three months prior to taking the loan. Discounting owners who did not find that the business created a stable employment opportunity, and those who already had employment prior to the loan, the net increase in durable employment is equivalent to 552 (± 82)* jobs. In all, 47% (± 4.5)* of loan recipients (including those who closed) reported that they found the financing provided them with a stable job opportunity. Considering that entrepreneurship carries considerable risk of failure and that employment opportunities are thought to be difficult to find by many Jordanians, this rate is an encouraging indication of impact.¹²

Job creation for non-owner positions was negligible. Only 2% (± 0.8) of the businesses created staff positions after starting up, for an estimated total of 17 (± 7) non-owner positions in the entire portfolio businesses. Given many of these start-ups are home-based and informal, it is not a surprise that most do not employ other individuals. However, it stands in contrast to the average MSE in Jordan, 48% of which have fulltime staff (source: USAID LENS MSE survey).

FORMALIZATION

786 (± 44) business loan recipients are not formal, with 77% (± 2.2) being unregistered and unlicensed with the government. This rate stands in contrast MSEs in the wider economy, 77.4% of whom are registered. This hints that the level of sophistication of the MFI's loan recipients is lower average micro-enterprise in Jordan, and that they may therefore need more support to overcome barriers.

92% (± 3.1) of these businesses report that they registered their businesses in order to secure the loan. This is an interesting finding, because only those businesses who applied for a start-up loan in

¹² In contrast, benchmark comparisons by Marmer et al. find that 90% of American start-ups fail.

excess of 3,000 JOD were required to be registered for approval. Overall, businesses that registered for the purpose of securing the loan were 1.3 times more likely to be woman-owned than man-owned ($\widehat{OR} = 2.5$, $F = 4.9$, $p = .03$).

92% (± 3.0) of the businesses that registered did so as individual establishments directly with the Ministry of Industry, Trade, and Supply. 7% (± 2.9) registered as limited liability companies and 0.7% (± 1.0) as general partnership companies with the Companies Control Directorate.

MOST SIGNIFICANT CHANGE

Loan recipients were asked about the most significant positive or negative change resulting from the loan. 49% (± 5) gave a primary reason that was positive, 15% (± 5) gave a reason that was negative, and the remaining 36% (± 5) said there was no significant change. The principal positive impacts cited were increased income, self-reliance and improved economic conditions. The most common negative changes were increased debt and financial burdens.

Table 5: Most Significant Change	Population Total ($\hat{\ell}_y$)		Population Proportion (\hat{y}_r)	
Positive Change				
Increased income / sales	426	± 74	23.4%	± 4.0
Improved stability / living condition	412	± 71	22.6%	± 3.8
Increased self-reliance	246	± 64	13.5%	± 3.5
Project development	140	± 52	7.7%	± 2.8
Other	92	± 42	5.1%	± 2.3
Improved self-confidence	47	± 32	2.6%	± 1.8
Negative Change				
Increased debt / financial burden	394	± 68	21.6%	± 3.6
Unsuccessful project	66	± 39	3.6%	± 2.1

SECTORS

Micro- and small-enterprises were classified into sectors based on an open-ended question about the nature of the business. Sectors were assigned using the taxonomy from the fourth revision of the *International Standard Industrial Classification of All Economic Activities* (ISIC). This produces the following principal sector groupings:

		Population Total (\hat{t}_y)		Population Proportion (\hat{y}_r)	
47	Retail trade, except of motor vehicles and motorcycles	410	± 34	50%	± 3.2
10	Manufacture of food products	141	± 21	17%	± 2.4
14	Manufacture of wearing apparel	104	± 18	13%	± 2.1
96	Other personal service activities	63	± 14	8%	± 1.6
01	Crop and animal production	34	± 11	4%	± 1.3
85	Education	22	± 8	3%	± 0.9
56	Food and beverage service activities	12	± 6	1%	± 0.7
++	Divisions n.e.c.	41	± 11	5%	± 1.3
++	Unknown	200	± 23		

The sectors are visualized in the treemap diagram below. Half of all businesses are in retail trade, with a sizeable portion in manufacturing. However, given that many MSEs may be both in the business of manufacturing and selling products, this distinction is not without problems.



CONCLUSIONS AND RECOMMENDATIONS

The start-up product created by USAID LENS and the MFI was successful in achieving the desired development outcomes. While the loan program did result in a significant portion of loans going to individuals who used the funds for consumption and debt-repayment, it has clearly created new financing opportunities for some 1,025 active businesses. When summarized against the theory of action, the results demonstrate that on balance, the loan product has had a positive impact:

Table 7: Summary Conclusion		
Theory of Action	Summary Results	Contextual Benchmarks*
IF a new start-up loan product is created,	◆ Loan product launched in February 2017.	
THEN new financing opportunities will be created for		
<ul style="list-style-type: none"> underbanked and unbanked Jordanians, 	◆ 898 first-time business loan recipients (87% of all business loans).	Only 9.8% of MSEs in Jordan have ever applied for a loan.
<ul style="list-style-type: none"> women, and 	◆ 912 business loans to women (792 of whom are first-time loan recipients). Women represent 90% of the start-up portfolio.	Woman-owned businesses in Jordan are as likely as men to have applied for a loan.
<ul style="list-style-type: none"> individuals in poverty pockets; 	◆ 125 business loans in vulnerable communities	Firms in vulnerable communities are 1.4x less likely to apply for credit.
THEN new MSE start-ups will be created;	◆ 1,806 start-up businesses created, with 69% owners saying they could not have done so without the loan. However, only 62% of loan recipients start a business, and of these, only a third survive two years.	Research by USAID LENS suggests this rate of actual firms is similar in other MFIs.
THEN new jobs will be created, including for entrepreneurs;	◆ An estimated 552 net increase in stable jobs created for entrepreneurs and 17 jobs for other staff. Half of all loan recipients who managed to start a business believe the loan gave them a path to a stable job.	The official unemployment rate has been increasing in the past five years and is now close to 19%. 48% of MSEs in Jordan have fulltime staff.
THEN start-ups will grow, demonstrated by		
<ul style="list-style-type: none"> increasing revenues, and 	◆ 962 (94%) businesses reported increases in revenue, of which 949 believe the growth was due to the loan. Total revenue for the combined portfolio of businesses grew 4x.	Only 12.9% of MSEs reported that their revenues increased in 2017 compared to 2016.
<ul style="list-style-type: none"> forming new business linkages; 	◆ 967 businesses formed new linkages (94%). 956 found new customers, 282 linked up with new suppliers, 218 found new markets, and 202 entered into new business contracts.	
THEN a higher number of businesses will formalize.	◆ 223 businesses formalized (22%), though most were not required to do so.	75% of MSEs in Jordan are formal.

* Unless otherwise indicated, benchmarks are taken from the USAID LENS survey of micro- and small enterprises.

Some caveats are in order. First, one should not rush to ascribe full attribution of the above results to the MFI or USAID LENS. Although it is a new product, and likely would not have existed in the absence of USAID LENS assistance, the counter-factual is unlikely to be a scenario where all the above measures would have been fixed at zero. Indeed, loan recipients might well have found funds to start a business elsewhere, and in creating employment opportunities, new start-ups may have displaced existing businesses. Private and human capital used to develop this loan product may well have been directed to other novel programs. And start-ups may well have achieved some of these impacts better or differently without external financing. In the absence of a control, the results should only be taken as a causally suggestive rather than a definitive pronouncement of the loan product's exact impact. Like all good science, the results should be understood within their proper context, using expert knowledge and judgement.

Second, the full complexity of the impact— both positive and negative— goes beyond the data collected in a telephone survey. Due to challenges with measurement, important concepts like growth, economic opportunity, and social transformation are difficult to pin down. Furthermore, factors that impact loan recipients are typically not independent from one another: they interact and intersect. Lesser-educated women in poor communities face much more adversity than educated men in urban areas, and yet a loan to either carries just as much weight in a total. The risk to the analysis is that consequential small-scale achievements may be under-appreciated, and that reported totals may comprise of results that may be more attributable to pre-existing conditions.

GENERAL RECOMMENDATIONS

Several lessons were learned by USAID LENS after five years of work with MFIs. Based on multiple interventions with several institutions, some general recommendations for the future include:

Recommendations for MFIs:

- A1. Where not yet in place, establish strong information systems that capture business-level data on loan recipients, including information on sectors, home-based status, and registered status. Data should be collected at this level even if a business is informal and unregistered. Even if loan programs are not designed for consumption, MFIs should validate and track the actual purposes to which funds have been applied. Data should also be collected on markers of vulnerability, such as variables on literacy/education, geographic location, etc. USAID LENS contributed to this objective by (1) developing a knowledge management system (KMS) for Microfund for Women, (2) supporting a new mobile app and banking system for National Microfinance Bank, (3) providing MFW and Tamweelcom with devices (tablets) to improve quantity and quality of data collection, and (4) funding a Tanmeyah information-sharing system for the sector. Nevertheless, given the growth of the market and its complexity and challenges, these approaches need to be strengthened and further validated through evidence.
- A2. Put in place data-collection procedures that support a learning agenda and help validate programmatic assumptions. USAID LENS contributed with monitoring & evaluation (M&E) technical assistance to all MFIs. With the exception of Microfund for Women, other MFIs have not yet invested enough to set-up the sophisticated M&E systems to validate assumptions; further support is therefore needed beyond 2019.
- A3. Discussions with MFI partners reveals that the reputational risks related to perceptions of predatory lending are growing. If not already in place, MFIs should integrate vulnerability into the institution's approach to risk assessment. Low-value loans that present low economic risk to the institution may be risky to the loan recipient if they are not in a position to repay it. This in turn is a risk to the reputation to the MFI. MFIs may benefit

from reviewing their due diligence criteria on small-value loans to assess vulnerability. USAID LENS supported such approaches in product design for new lending products with MfW, NMB, and Ethmar as well as applying this to analysis of existing products with FINCA, AMC, and MfW. USAID LENS also supported the development of Risk Department at MfW to better assess and manage risk. However, with the introduction of new instructions from CBJ and more competitive and challenging market, further improvements are undoubtedly needed.

- A4. MFIs should expect that a proportion of start-ups will inevitably fail. While this is natural in any economy, extra consideration should be given to the fact that loan applicants typically bank on a successful business idea to generate money to repay the debt. Loan officers could be trained on making the risks of business failure clear to loan applicants.
- A5. MFIs should lobby to improve the utility of cross-institutional data sharing platforms and credit bureaus. Even with the credit bureau (CRIF) in place for all MFIs, the quality of the services, consistency of data, and frequency of the uploads were reported by MFIs as far from optimal to be of real use.
- A6. For MSME loan products, measures of success used by MFIs should extend beyond economic metrics (profitability, default rates, etc.) and include social metrics that relate to MSME growth and success. Most MFIs are now including client protection principles in their lending strategies. These will guarantee a major attention to social indicators; The CBJ could help monitor to guarantee the quality of such data. A number of MFIs have already decided to be audited for Social Ratings; this practice should be encouraged and supported for others in the industry.

Recommendations for the donor community at large:

- B1. Complement monitoring with evaluations and learning activities. These may include data-gathering mechanisms such as in-personal surveys, telephone surveys, SMS polls, focus groups, and key informant interviews. Qualitative data gathering should aim to validate assumptions not only by engaging with HQ staff, but also by speaking with loan recipients and loan officers in branches.
- B2. Communicate the value of data to institutional partners and help them extract insight from information. Most MFIs in Jordan do not have systematic procedures for collecting data from loan recipients after the application stage. If actionable knowledge is extricated from post-assessments by project staff, this should be shared to increase buy-in for the data gathering processes. USAID LENS' most successful post-activity data gathering exercises were participative and included learning questions of interest to the MFI.
- B3. Include explicit monitoring and learning requirements into partnership/grant agreements with MFIs. In USAID LENS' experience, one MFI refused to allow the project to conduct telephone surveys with its loan recipients (even when costs were borne for by the project and all privacy concerns had been addressed).
- B4. Defer indicator/KPI reporting until a post-assessment has been conducted, or otherwise make an a priori provision for losses. If start-ups are a key demographic, survival rates should be built into tracking definitions/protocols. This will allow stakeholders to have a clear definition of when a business ought to be captured (e.g. if it makes it past 12 months).
- B5. Plan with data privacy considerations in mind. Due to strict controls on privacy of information, monitoring data received from financial institutions will not include personally identifiable information. As a result, donors should expect that they will not be able to conduct follow-up activities independently, but only in partnership with the MFIs. In USAID LENS' case, the project hired a third-party firm to conduct telephone interviews on behalf

of the MFIs, always within the MFI's premises. The research team was vetted by the MFIs to ensure no conflict of interests existed, for example by having relatives who were clients. Non-disclosure agreements were signed and all personally-identifiable information remained within the branches. Survey microdata received by USAID LENS always remained anonymized.

- B6. Integrate vulnerability mitigation plans into the design of technical activities in order to assess likelihood of over-indebtedness and consumption lending. MSME loans may be profitable even when they are issued to non-businesses, and loan officers at some institutions may be under pressure to hit certain quotas or targets. SME loan product may have higher limits on the maximum loan amounts compared to consumption loan products, creating a moral hazard for applicants to use MSME loan products because other loan products do not serve their needs. As a result, the private incentive structures are not entirely aligned with donors' social objectives, further validating the need for risk mitigation plans.
- B7. Be judicious in the setting of targets, as these can lead to skewed outcomes that propagate existing structures of privilege. Women, the poor, the illiterate, home-based businesses, and micro-establishments are but a few sub-populations have a higher hazard of going out of business. They are also more difficult to reach and typically take smaller loans. The consequence is that high targets can unwittingly cause implementers to pursue activities that emphasize volume at the cost of initiatives that target harder-to-reach populations in need. Measures of success should aim to capture both the quantity and quality of results.
- B8. Push for demand-driven program design and build institutional capacity: Technical assistance to partners (specifically MFIs) must be driven by evidence. Before grants and T.A. activities are approved, careful examination of the organizations' current capacity to support the intervention must be undertaken. Prior to USAID LENS product development interventions, MFIs' approach to product development was not always systematic or demand-responsive, resulting in poorly performing products. Product development should not be a stand-alone activity, and continual operational and staff development must be undertaken to achieve success. For activities to be successful, a capacity-building component is often necessary in order to achieve knowledge transfer required for ownership and sustainability.
- B9. Participate in regular coordination meetings with donors and stakeholders: Jordan put in place technical donors' coordination meetings, initially at MOPIC and later at CBJ, including several Access to Finance technical round tables on MFIs and payment service providers (PSPs), securing an appropriate sharing of information and the appropriate coordination. These events have been an excellent opportunity for designing complementary interventions and aligning them to CBJ's National Financial Inclusion Strategy; it is recommended that all Financial Inclusion players continue participating and report challenges and lessons learned.
- B10. The reduction of over-indebtedness and the promotion of improved credit practices require a stronger engagement with—and awareness of—the Jordanian informal financial sector. This is especially true in regard to unlicensed financing companies, cooperatives, and retailers that sell on credit with interest. These institutions are not currently regulated nor supervised by Central Bank. Donors should engage with such un-regulated entities in order to improve the quality of their services and possibly facilitating their (1) transformation into a regulated entity under the supervision of CBJ or (2) raising their credit practices to the same standard of regulated institutions.
- B11. Support and promote the national campaign on Financial Literacy/Financial Awareness. The campaign is hoped to put in place effective and sustainable mitigation measures against over-indebtedness and poor financial management.

- B12. Provide and promote accessible deposits mechanism for un-bankable and/or vulnerable Jordanians. The mobilization of deposits is a fundamental component of financial inclusion programs and should help avoid the risk of over-indebtedness. In February 2019 CBJ released instructions for all banks to open a “basic bank account” for eligible citizens. This presents an opportunity for the donor community to consider supporting new regulations allowing MFIs to mobilize deposits.

APPENDIX A: SURVEY ADMINISTRATION

Due to reporting requirements necessitating highly-granular contingency tables, a census of cases was taken rather than a sample. USAID LENS attempted to interview each loan recipient in the frame. Training for the field team was conducted on November 14th, 2018. The survey firm *Leading Point* undertook its phone campaign between December 12, 2018 and January 21, 2019. Successful calls with businesses took a median of 12 minutes to complete.

OUTCOME RATES

A total of 2,720 cases were attempted for interview. However, due to non-response and coverage error, the size of the response set r is substantially smaller than the frame. The attempts at phone calls can broadly be categorized into four, mutually exclusive groups.

Table 8: Interview Categories	Total
1. Interview	567
2. Eligible, non-interview	0
3. Unknown eligibility, non-interview	1,153
4. Not eligible	1,000
<i>Total Attempts</i>	2,720

Because many respondents claimed not to have a business, non-calls and refusals are categorized as cases with unknown eligibility. There are therefore no eligible non-interviews (category 2).

The four categories can be disaggregated further in to the following cases:

Table 9: Dispositions	Code	Disposition	n
1. Interview	I	Complete Interview	565
	P	Partial Interview	2
2. Eligible, non-interview	R	Refusal	0
	NC	Non-contact	0
3. Unknown eligibility, non-interview	UH	Non-working number	271
	R/UH	Refusal	197
	UH	Call blocking	175
	UH	No answer	171
	UH	Disconnected number	110
	UH	Number Changed	109
	UH	Turned Off	75
	UH	Call Forwarding	22
	UH	Technical phone problems	20
	UH	Always busy	3
4. Not eligible	NE	No eligible respondent	1,000

Partial interviews are those interviews where the respondent agreed to participate but was unwilling to disclose information on critical questions pertaining to revenue.

Depending on the what is being estimated, certain cases can be coded differently. Above, individuals who refused to participate are categorized as “UH” under heading 3 (unknown eligibility), but for purposes of calculating the refusal rate, it makes more sense to code them as “R”. Respondents who indicated their loan was for individual purposes (who did not have a true business) are also ambiguous. Above, they are classified to as category 4: ineligible cases.¹³

Out of the 2,939 firm-level loans, 36% (± 2.4) reported that they truly had a business. This is the unweighted *eligibility rate* (ELR). If respondents are to be taken at their word, this implies considerable over-coverage in the frame. Including the pilot, the survey achieved a response rate (RR2) of 33.0%.¹⁴ The contact rate (CONI) was 44.4%, which is the percentage of cases that were reachable (whether they agreed to participate or not). 74.0% of reached individuals agreed to partake in the survey (COOPI). 11.5% of cases out of the total sample refused to participate (REFI).

The general outcome rates can also be calculated by domain:

Table 10: Outcome Rates by Domain						
Group	Levels	N	RR2	CONI	COOPI	REFI
Age Group	50 and above	119	36.5%	52.7%	69.2%	16.2%
	30-49	1,683	34.9%	45.6%	76.5%	10.7%
	18-29	818	31.5%	43.0%	73.0%	11.4%
	(undefined)	100	8.3%	26.7%	25.0%	18.3%
Gender	Male	220	46.7%	57.0%	80.9%	10.3%
	Female	2,500	31.5%	43.1%	73.0%	11.6%
Sector	Education	28	68.0%	68.0%	100.0%	0.0%
	Retail & Trade	641	36.7%	48.7%	74.9%	12.0%
	Food Processing	267	34.8%	48.3%	72.1%	13.5%
	Other	1,425	32.1%	42.6%	75.2%	10.4%
	Agriculture, Livestock & Fishing	74	25.6%	46.2%	55.6%	20.5%
	Other Manufacturing Industries	285	23.1%	36.1%	63.9%	13.0%

From the table above, a few patterns emerge (highlighted in blue). Individuals whose age is unknown in the frame were much harder to reach. Individuals above the age of 50 were easier to reach on the phone, but more likely to refuse participation. Men had a higher response rate, being more easily reached on the phone and more willing to participate. And on a sector level, certain industries were hard to reach, such as agricultural businesses and manufacturing.

¹³ For the purpose of statistical estimation, it will be necessary to re-code all category 4 cases as eligible cases, in order to then treat the business as a domain to be estimated. See Appendix A for details.

¹⁴ According to AAPOR guidance, the response rate excludes known ineligible cases from the denominator. The response rate expresses the fraction of successful interviews out of the *intended* sample frame. Here the intended sample frame is a random quantity, estimated as the number of actual businesses out of the database of firm-level loans.

As a result of these systematic differences, some non-response adjustments would be appropriate in the estimation of results, as we cannot justify treating the non-response to be “missing completely at random” (MCAR). Instead, the analysis proceeds on the assumption that the data is “missing at random”—that is to say, that the existing variables are sufficiently informative to make the missingness ignorable with analyses that appropriately adjust for the gaps.

APPENDIX B: ESTIMATION METHODOLOGY

CHOOSING AN OPTIMAL ESTIMATOR

Our choice of estimator should:

1. Reduce naturally-occurring variation (sampling error, non-response variance);
2. Adjust for non-response bias; and
3. Account for frame deficiencies (coverage error).

Selecting an estimator that tackles these three areas will help to reduce parameter uncertainty and produce decent estimates of the margin of error.

Because a census was taken, the sampling error is zero. Non-response variance is a concern, but less challenging to adjust for compared to non-response bias, which requires assumptions about the data-generating mechanism. The third problem of coverage error is sometimes overlooked but is significant enough that it cannot be ignored in this study. The reason for this is that 64.2% of the frame participants reported that they were, in fact, not businesses. Despite being “firm-level” loans, these respondents report that they used the loan for consumption purposes such as health-related expenses, weddings, or other personal reasons. As a result, the true number of businesses under study is **not** the size of the frame; it is a random quantity that itself needs to be estimated and injects error into all other estimates.

In consideration of this, the estimator chosen for the analysis is the calibrated domain estimator, which is part of a wider family of estimators known as the generalized regression estimator (GREG). The GREG estimator typically improves accuracy and is approximately unbiased if frame has full coverage of the target population. This condition will be met if we consider the businesses and non-businesses as the starting point for estimation, then using a domain-estimation approach to account for the over-coverage (details on page 26).

There are a multitude of ways to express GREG estimator, but a common way is by stating the population total as $\hat{t}_{yr} = \sum_r y_k / \pi_k + \sum_{j=1}^J \hat{B}_j (\sum_U x_{jk} - \sum_r x_{jk} / \pi_k)$. This formulation adds an adjustment on the straightforward expansion estimator $\hat{t}_{y\pi} = \sum_s y_k d_k$ by modifying weights to:

$$w_k = d_k g_k \quad \text{for all } k \in r$$

Here, d_k is the vector of design weights; they are constructed by taking the inverse of the selection probabilities π_k . s is the set of items in the sample (identical to the universe U in this study), and r is the response set that excludes individuals that could not be interviewed. Because a census was taken, the base weights d_k are 1 for all k . The vector g_i is the calibration factor that adjusts the base weights to match control totals.

To obtain the most accurate estimates, the g_i adjustment should be constructed using auxiliary variables that best:

- predict non-response
- covary with the y -variables
- identify the domain of interest

The subsequent pages of this appendix detail the process of choosing a set of variables that will lead to an efficient g_k .

ADJUSTING FOR NON-RESPONSE BIAS

The starting point for calibration adjustment is to find a model that reasonably explains the non-response. If this mechanism is understood, it is hoped that remedial actions can then be taken to correct for this error.

To explain the non-response, a logistic regression is fit using step-wise forward search. The feature space includes the owner's age, owner's sex, geographic location, loan amount, loan duration, registration status, primary sector, type of business (home-based or not), and a separately-created blocking variable. These variables are, for the most part, free of missing data. The dependent variable is a dichotomous variable that specifies if a loan recipient responded or not.

As the analysis of deviance table shows, the selected fit retains only age, sector, and sex. The model notation below is simplified to ease interpretation, as the full model matrix encoding would have $J = 11$ parameters.

$y_i \sim \text{Binomial}(n_i, p_i)$ $\text{logit}(p_i) = \alpha + \beta_1 \text{age_of_owner} + \beta_2 \text{primary_sector} + \beta_3 \text{gender}$				
Analysis of Deviance				
	<u>d.f.</u>	<u>Deviance</u>	<u>Residual d.f.</u>	<u>Residual Deviance</u>
null model			2,938	4,071
+ age of owner	3	20.4	2,935	4,051
+ primary sector	6	20.3	2,929	4,030
+ gender	1	6.3	2,928	4,024

The model covariates are strongly associated with the response, but the model has weak predictive power. The Cox & Snell R^2 is effectively 0.016. This is so small that there may not be an appreciable difference between estimates calibrated for non-response bias and straightforward π -estimation. Two explanations may explain this small effect size: that the non-response bias is low (i.e. data is close to being *missing completely at random*), or that we have “lurking” unmeasured auxiliary variables that explain the non-response. Unfortunately, in the absence of more covariates, we can only speculate on which explanation to believe.

ADJUSTING FOR NON-RESPONSE VARIANCE

From the step-wise model, we know to adjust for the owner's age, sector, and gender. Doing so reduces non-response bias. Non-response variance, on the other hand, can be mitigated through post-stratification or calibration approaches. To do so, we should find auxiliary variables that covary with the outcome variables and are known for all elements in the frame. This is not always straightforward, because such associations will differ from one y -variable to another. Although one could construct separate calibration weights for each survey item, in practice it is convenient to have one set of weights for the entire survey, and hence one set of adjustment variables.

An omnibus blocking variable is used for this purpose. It was produced by reducing the feature space of a large range of variables on the full population of loan recipients, and then running a clustering

algorithm to produce 20 clusters for the MFI.¹⁵ This blocking variable is not of direct interest, but its use should improve the efficacy of estimates on most survey items. The regression summaries in Appendix C: Regression Models confirm that this is indeed the case, as the blocking is statistically significant in all models. Its inclusion in the calibration is therefore well justified.¹⁶

ADJUSTING FOR COVERAGE ERROR

The scope of study concerns all business loans from the start-up loan product. Not all respondents called over the phone fit this criterion: only 35% state that they have a business. Some of the reasons quoted included consumption loan purposes, such as medical procedures, weddings, and education. If we knew exactly how many businesses exist in our frame, we could filter our data and use the π -estimator $\hat{t}_{y\pi} = \sum_s y_i w_i$. However, this quantity N_q is not known; we only have an estimate \hat{N}_q . This adds uncertainty to the estimation, known as coverage error.

There is no single way to account for coverage error, but one approach is through domain estimation. This method is appropriate if there is over-coverage, but not under-coverage. Because we can safely say that no eligible cases are missing from our frame, such an approach is appropriate. Most survey software packages can readily extend calibration estimators to domain problems.

However, domain estimation can inflate variance considerably. To minimize this problem, chosen calibration variables should carry as much predictive information about the domain of interest as possible. A second stepwise logistic regression with the domain as the outcome variable gives the following predictors (in order of algorithmic selection): the loan value, age of the owner (already calibrated for), gender (already calibrated), sector (already calibrated), and whether a business is home-based.¹⁷ These five variables will be included in the auxiliary vector.

$$y_i \sim \text{Binomial}(n_i, p_i)$$

$$\text{logit}(p_i) = \alpha + \beta_1 \text{loan_value} + \beta_2 \text{age_of_owner} + \beta_3 \text{gender} + \beta_2 \text{primary_sector} + \beta_3 \text{home_based}$$

Analysis of Deviance				
	<u>d.f.</u>	<u>Deviance</u>	<u>Residual d.f.</u>	<u>Residual Deviance</u>
null model			1,566	2,051
+ loan value	1	63.3	1,565	1,988
+ age of owner	3	31.6	1,562	1,956
+ gender	1	33.8	1,561	1,923
+ primary sector	6	27.9	1,555	1,895
+ home-based	1	4.3	1,554	1,890

¹⁵ The algorithm used is the t-SNE procedure that reduces the dimensionality of the auxiliary variables to three dimensions, followed by a DBSCAN clustering algorithm. Non-clustered cases were assigned to their nearest neighbor to ensure all cases were assigned to a block. This resulted in 119 distinct clusters across the full portfolio of LENS loan recipients, of which 20 apply to The MFI. Care was taken to ensure that none of the cluster population counts would be too small, in order to allow for stable post-stratification.

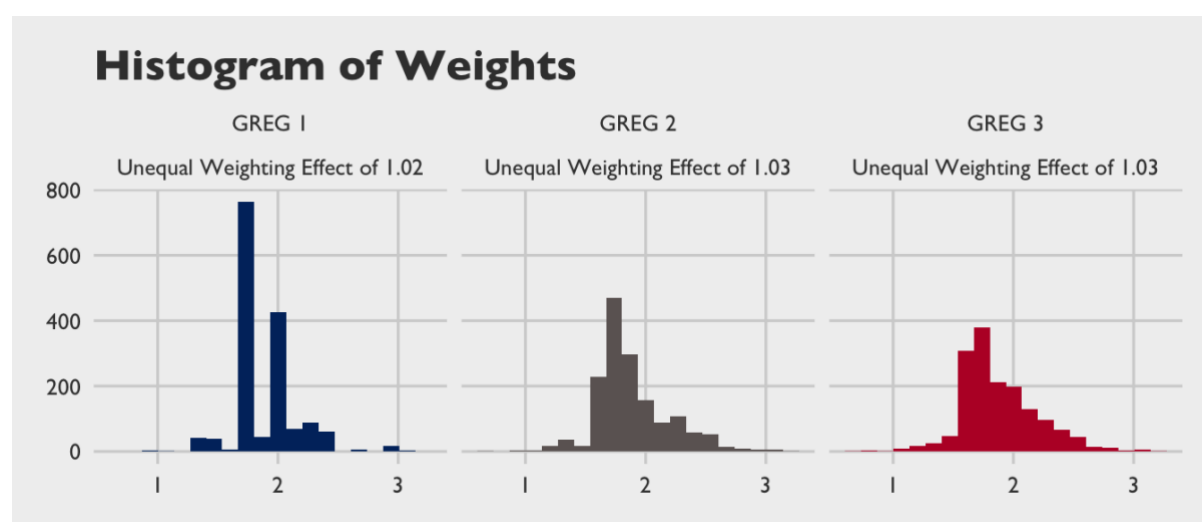
¹⁶ If the working model that underpins the GREG estimation is incorrect, the estimator is still nearly unbiased, albeit less efficient. For a discussion, see Lumley (2010).

¹⁷ The stepwise procedure can be extended to search for interactions. Doing so returns a model with interactions `loan_value:primary_sector` and the `gender:home_based`. However, their inclusion in calibration create unwieldy weight distributions that do not yield gains in efficiency. Consequently, they are not discussed further here.

ASSESSING EFFICIENCY

As stated earlier, an efficient auxiliary g -vector will predict non-response, covary with the y -variables, and carry information about the domain of interest (businesses). Let us define three designs, $GREG_1$, $GREG_2$, and $GREG_3$. Each successively expands the auxiliary vector used by the previous design. The $GREG_1$ weights adjust only for the three non-response model variables sex, age, and sector. $GREG_2$ additionally calibrates against the blocking variable that associates with many y -variables. Finally, the $GREG_3$ adds whether a respondent is home-based and a variable for the loan value.

A visual examination of the weight distributions of the designs reveals that all three have reasonable weights. The histograms show that neither have any egregious outliers or values below zero, so weight trimming is not necessary.



The unequal weighting effect¹⁸ (UWE) of the designs are similar and close to that of a simple random sample. The low UWE of $GREG_1$ might suggest that it is the design to be preferred, but this would be a mistake; the UWE does not give proper ‘credit’ for efficiency gains obtained from y_k -related and domain-related gains in calibration. We saw earlier that these are strong. For this reason, $GREG_3$ is still preferred.

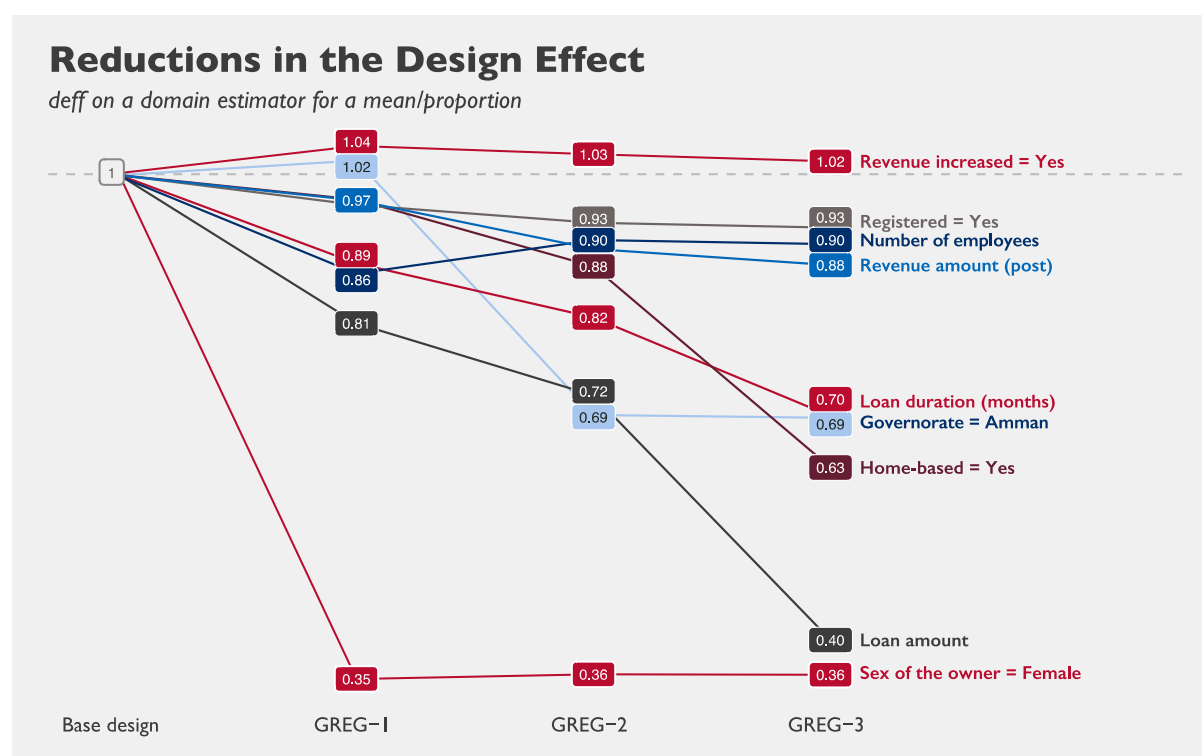
The justification behind this choice is validated by comparing the $deff$ ’s on select study variables. The lower the design effect, the lower the error, and the better the estimate. By comparing the $GREG_1$ and $GREG_2$ designs on variables applicable to business and non-business loans, we see that the $GREG_2$ offers considerable improvements:

¹⁸ The unequal weighting effect (UWE) is also known as the “Kish design effect.” It is defined as $(n \sum_{i=1}^n w_i^2) / (\sum_{i=1}^n w_i)^2$. The term “design effect” is reserved in the present analysis for a quantity that represents the ratio of the variance of an estimator to that of a simple random sample of the same size. Here, the design effect ($deff$) is a quantity that depends on the variability y -values, unlike the UWE, which depends only on the weights.

Table II: Comparison of Design Efficiency	GREG 1			GREG 2		
	Estimate	\widehat{SE}	\widehat{deff}	Estimate	\widehat{SE}	\widehat{deff}
Population total, \hat{t}_y						
Revenue increased (= Yes)	968	23.2	0.94	962	22.9	0.92
Number of employees	61	10.3	0.88	65	10.8	0.92
Loan amount, millions of dinars	2.46	0.027	0.78	2.45	0.025	0.71
Number of businesses	1,033	23.5	0.94	1,026	23.2	0.92
Population proportion/mean, \hat{y}_r						
Type of loan (= Business)	35.1%	0.80	0.94	34.9%	0.79	0.92
Revenue increased (= Yes)	32.9%	0.79	0.94	32.7%	0.78	0.92
Loan duration, months	16.9	0.04	0.88	16.9	0.04	0.76

As the parameters in the table show, the estimated design effect is generally lower for $GREG_2$ than $GREG_1$ (but not always— e.g. the number of employees). This demonstrates that our estimation procedure is efficient. For example, with a design effect of 0.71 for the total loan amount, we obtain the same accuracy using $GREG_2$ that we would expect from a simple random sample of size $\hat{n}_{eff} = \frac{n_r}{\widehat{deff}} = \frac{1567}{0.71} = 2,207$.

If we compare the \widehat{deff} under a calibrated domain estimator, the reductions should be even greater with $GREG_3$, because the auxiliary vector includes information that identifies the domain (business loans). In the chart below, we can see this is the case.



The study variables do not benefit equally from each adjustment step. For example, the estimate of the proportion of business loans in Amman is greatly improved by using the blocking variable (step two)

but receives no gains from adjustment in steps one and three. Other variables like the *loan amount* benefits from each type adjustment, while the *proportion of businesses that increased revenue* is barely improved by calibration at all. This differential impact demonstrates how identifying a single set of calibration weights for a multipurpose survey is not straightforward.

Nevertheless, because the above analysis shows that $GREG_3$ is almost universally the best at reducing error under the desired estimator, it is used as the calibrated design in this report.

APPENDIX C: REGRESSION MODELS

The regression models below demonstrate that the blocking variable is strongly associated with key response variables of interest. As a result, its inclusion as an auxiliary input for calibration is well justified. Even though it does not predict non-response, the blocking variable is likely to reduce non-response variance due to the reductions in the size of the response set.

MODEL I.1

The first model fits a design-adjusted logistic regression where the response is whether the business increased its revenues after receiving the loan. As the p -values indicate, the blocking variable is strongly correlated with the response variable.

```
Call:
svyglm(formula = increased_yn ~ block, design = dsg, family = "quasibinomial")

Survey design:
svydesign(~1, data = responders, fpc = ~N)

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.057e+01  4.830e-01  42.58   <2e-16 ***
clusterB046 -1.665e+01  6.262e-01 -26.60   <2e-16 ***
clusterB047 -1.752e+01  6.296e-01 -27.83   <2e-16 ***
clusterB048 -1.675e+01  6.264e-01 -26.74   <2e-16 ***
clusterB049 -1.725e+01  6.894e-01 -25.02   <2e-16 ***
clusterB050 -1.593e+01  8.396e-01 -18.98   <2e-16 ***
clusterB051 -1.624e+01  6.253e-01 -25.98   <2e-16 ***
clusterB052  7.450e-06  4.935e-01  0.00      1
clusterB053  7.450e-06  4.872e-01  0.00      1
clusterB054 -1.682e+01  6.873e-01 -24.47   <2e-16 ***
clusterB055  7.468e-06  4.932e-01  0.00      1
clusterB056 -1.608e+01  6.852e-01 -23.46   <2e-16 ***
clusterB057 -1.710e+01  8.456e-01 -20.22   <2e-16 ***
clusterB058 -1.798e+01  6.330e-01 -28.40   <2e-16 ***
clusterB059  7.450e-06  4.889e-01  0.00      1
clusterB060  7.450e-06  5.002e-01  0.00      1
clusterB061  7.453e-06  4.939e-01  0.00      1
clusterB062 -1.690e+01  8.440e-01 -20.03   <2e-16 ***
clusterB063  7.453e-06  4.973e-01  0.00      1
clusterB064  7.450e-06  5.039e-01  0.00      1
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for quasibinomial family taken to be 0.7222222)

Number of Fisher Scoring iterations: 19
```

MODEL I.2

The second model fits a design-adjusted Poisson regression where the response is the number of employees in the business. As the p -values indicate, the blocking variable is strongly correlated with the response variable.

```
Call:
svyglm(formula = number_of_employee ~ block, design = dsg,
       family = "quasipoisson")

Survey design:
svydesign(~1, data = responders, fpc = ~N)

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  -2.33537    0.49441  -4.724 3.67e-06 ***
```

```

clusterB047 -16.96721    0.54410 -31.184 < 2e-16 ***
clusterB048  -0.88350    0.83240  -1.061 0.289425
clusterB049   2.08406    0.65641   3.175 0.001666 **
clusterB050 -16.96721    0.51132 -33.183 < 2e-16 ***
clusterB051  -0.06252    0.72511  -0.086 0.931351
clusterB052 -16.96721    0.56745 -29.901 < 2e-16 ***
clusterB053   1.11160    0.67814   1.639 0.102296
clusterB054  -0.66036    0.82959  -0.796 0.426701
clusterB055 -16.96721    0.56745 -29.901 < 2e-16 ***
clusterB056   0.16062    0.69046   0.233 0.816217
clusterB057 -16.96721    0.56745 -29.901 < 2e-16 ***
clusterB058 -16.96721    0.55756 -30.431 < 2e-16 ***
clusterB059 -16.96721    0.52468 -32.338 < 2e-16 ***
clusterB060 -16.96721    0.60077 -28.242 < 2e-16 ***
clusterB061   1.35455    0.66751   2.029 0.043378 *
clusterB062 -16.96721    0.58101 -29.203 < 2e-16 ***
clusterB063   2.16832    0.57288   3.785 0.000188 ***
clusterB064 -16.96721    0.63234 -26.832 < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for quasipoisson family taken to be 1.367044)

Number of Fisher Scoring iterations: 17

```

MODEL 1.3

The third model fits a design-adjusted Gaussian regression where the response is the value of the loan. As the p -values indicate, the blocking variable is strongly correlated with the response variable.

```

Call:
svyglm(formula = loan_amount ~ block, design = dsg)

Survey design:
svydesign(~1, data = responders, fpc = ~N)

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)    7500.0      241.6   31.04 <2e-16 ***
clusterB046   -6733.0      245.7  -27.40 <2e-16 ***
clusterB047   -6719.7      242.2  -27.75 <2e-16 ***
clusterB048   -6461.7      249.4  -25.91 <2e-16 ***
clusterB049   -6606.1      250.2  -26.40 <2e-16 ***
clusterB050   -6698.9      243.7  -27.49 <2e-16 ***
clusterB051   -6695.0      242.1  -27.65 <2e-16 ***
clusterB052   -6785.6      242.6  -27.98 <2e-16 ***
clusterB053   -6683.1      243.7  -27.42 <2e-16 ***
clusterB054   -6627.6      244.8  -27.07 <2e-16 ***
clusterB055   -6700.0      246.1  -27.23 <2e-16 ***
clusterB056   -6562.2      243.7  -26.93 <2e-16 ***
clusterB057   -6695.3      243.1  -27.54 <2e-16 ***
clusterB058   -6770.4      243.8  -27.78 <2e-16 ***
clusterB059   -6775.3      242.3  -27.96 <2e-16 ***
clusterB060   -6814.3      246.9  -27.60 <2e-16 ***
clusterB061   -6583.0      247.3  -26.62 <2e-16 ***
clusterB062   -6861.2      242.6  -28.28 <2e-16 ***
clusterB063   -6053.0      260.7  -23.22 <2e-16 ***
clusterB064   -6724.0      246.2  -27.31 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 342580.4)

Number of Fisher Scoring iterations: 2

```

MODEL 2.1

The below output is from a censored Cox proportional hazards model on the time-to-exit, understood as the number of months between the loan sign date and the date when a business closes. Loan recipients who never ended up establishing a business are coded as 0.

```
Model: Cox PH
Dependency structure assumed: Independence
Baseline: semi-parametric
Call: ic_sp(formula = Surv(lower, upper, type = "interval2") ~ frm_sex +
  frm_hbb + I(frm_jod/1000), data = df, weights = df$rwt, bs_samples = 500)

              Estimate Exp(Est) Std.Error z-value      p
frm_sexWoman-Owned    0.4604    1.5850    0.20240    2.274 0.02294000
frm_hbbHome Based     0.2194    1.2450    0.08566    2.561 0.01044000
I(frm_jod/1000)       -0.6808    0.5062    0.13610   -5.001 0.00000057

final llk = -1436.448
Iterations = 187
Bootstrap Samples = 500
```

APPENDIX D: SURVEY INSTRUMENT

Generated by leadingpoint Apr 03 2019 17:28
Questionnaire created by leadingpoint Jan 06 2019 15:00
Last modified by leadingpoint Jan 06 2019 20:10

Not shared with anyone

Sections: 2 Sub-sections: 1 Questions: 60
Questions with enabling conditions: 59
Questions with validation conditions: 5
Rosters: 1
Variables: 0



Loan Questionnaire Final

SURVEY IDENTIFICATION INFORMATION QUESTIONNAIRE DESCRIPTION

PERSONAL INFORMATION

No sub sections, No rosters, Questions: 16, Static texts: 2.

INFORMATION RELATED TO THE LOAN

Sub sections: 1, Rosters: 1, Questions: 44, Static texts: 4.

APPENDIX A ENABLING CONDITIONS

APPENDIX B CATEGORIES

LEGEND

PERSONAL INFORMATION

current time and date	DATE CURRENT TIME	date
-----------------------	-------------------	------

Researcher Name: E // enable a question if: IsAnswered(date)	SINGLE-SELECT COMBO BOX qa 01 <input type="radio"/> [REDACTED] 02 <input type="radio"/> [REDACTED] 03 <input type="radio"/> [REDACTED] 04 <input type="radio"/> [REDACTED] 05 <input type="radio"/> [REDACTED] 06 <input type="radio"/> [REDACTED] 07 <input type="radio"/> [REDACTED] 08 <input type="radio"/> [REDACTED] 09 <input type="radio"/> [REDACTED] 10 <input type="radio"/> [REDACTED] 11 <input type="radio"/> [REDACTED] 12 <input type="radio"/> [REDACTED] 13 <input type="radio"/> [REDACTED] 14 <input type="radio"/> [REDACTED] 15 <input type="radio"/> [REDACTED] 16 <input type="radio"/> [REDACTED] And 14 other symbols [1]
---	---

MFI Name E // enable a question if: IsAnswered(qa)	SINGLE-SELECT qb 01 <input type="radio"/> MicroFund For Women "MFW" 02 <input type="radio"/> [REDACTED] 03 <input type="radio"/> [REDACTED] 04 <input type="radio"/> [REDACTED]
---	--

STAT C TEXT

E // enable a question if: qb.InList(1,2,3)

Dear,.....

My name is %qa% from **LeadingPoint** and I am conducting this interview to evaluate the impact of the loan received from MFI Name %qb% on (date). The questionnaire to be filled seeks to evaluate the loan's impact on the economic growth of your business. The interview will take approximately ten minutes and your participation is voluntary.

There are no specific risks or benefits to you and if you agree to participate you can choose to stop or skip any questions you do not want to answer, without penalty.

All information you provide that directly identifies your name and contact will be kept confidential. Other non-identifiable information you provide will be shared it with partners involved in the loan program design, including related partners. If I do, I may not ask your consent again.

STAT C TEXT

E // enable a question if: qb.InList(4)

Dear,.....

My name is %qa% from **LeadingPoint** and I am conducting this interview to evaluate the impact of the loans received. The questionnaire to be filled seeks to evaluate the loan's impact on the economic growth of your business. The interview will take approximately ten minutes and your participation is voluntary.

There are no specific risks or benefits to you and if you agree to participate you can choose to stop or skip any questions you do not want to answer, without penalty.

All information you provide that directly identifies your name and contact will be kept confidential. Other non-identifiable information you provide will be shared it with partners involved in the loan program design, including related partners. If I do, I may not ask your consent again.

Are you willing to participate in this survey? E // enable a question if: IsAnswered(qb)	SINGLE-SELECT 01 <input type="radio"/> Yes 02 <input type="radio"/> No	qc
Unique Individual ID E // enable a question if: qc== 1 qc== 2	TEXT	q1
Loan Amount (JD): E // enable a question if: qc== 1 && IsAnswered(q1)	SINGLE-SELECT 01 <input type="radio"/> Amount, _____ JD 02 <input type="radio"/> Refused to answer	q2
Amount, _____ JD E // enable a question if: q2== 1	NUMERIC INTEGER -----	q2a
Loan sign Date: E // enable a question if: q2== 2 IsAnswered(q2a) WI q4>= 1999 && q4<= 2018 MI Please check the number	NUMERIC INTEGER -----	q4
Sector (Nature of Business) E // enable a question if: IsAnswered(q4)	TEXT	q5
Current Status of the Project E // enable a question if: IsAnswered(q5)	SINGLE-SELECT 01 <input type="radio"/> Active 02 <input type="radio"/> Stopped 03 <input type="radio"/> Closed	q6
At the time of getting the loan, the project was E // enable a question if: IsAnswered(q6)	SINGLE-SELECT 01 <input type="radio"/> Startup 02 <input type="radio"/> Existing Project	q7
Number of current employees E // enable a question if: IsAnswered(q7)	NUMERIC INTEGER -----	q8
Governorate: E // enable a question if: IsAnswered(q8)	SINGLE-SELECT COMBO BOX 01 <input type="radio"/> Irbid 02 <input type="radio"/> A-Baqa 03 <input type="radio"/> A-Zarqa 04 <input type="radio"/> A-Tafeeh 05 <input type="radio"/> Amman 06 <input type="radio"/> A-Aqaba 07 <input type="radio"/> A-Karak 08 <input type="radio"/> A-Mafraq 09 <input type="radio"/> Jarash 10 <input type="radio"/> Ajloun 11 <input type="radio"/> Madaba 12 <input type="radio"/> Ma'an	q9

Municipality: E // enable a question if: IsAnswered(q9)	TEXT q9a
Owner's age: E // enable a question if: IsAnswered(q9a) WI q10>= 18 && q10<= 100 MI Please check the number	NUMERIC INTEGER q10 -----
Sex of the Owner E // enable a question if: IsAnswered(q10)	SINGLE-SELECT q11 01 <input type="radio"/> Male 02 <input type="radio"/> Female

INFORMATION RELATED TO THE LOAN

E // enable a question if: qc== 2 (qc== 1 && IsAnswered(q11))

STATCTEXT

E // enable a question if: qc== 1 && IsAnswered(q11)

Please provide the following information as a result of the loan provided by MFI:

Is this the first loan you received for your business from MFI or any other financial institution? E // enable a question if: (qc== 1 && IsAnswered(q11))	SINGLE-SELECT q12 01 <input type="radio"/> Yes 02 <input type="radio"/> No
1. After receiving the loan, did your revenue increased, decreased, Stayed the same? (an increase in one JD will be considered increase) E // enable a question if: IsAnswered(q12)	SINGLE-SELECT q13 01 <input type="radio"/> Increased 02 <input type="radio"/> Decreased 03 <input type="radio"/> Stayed the same 04 <input type="radio"/> Refused to answer 05 <input type="radio"/> I don't know 06 <input type="radio"/> Not Applicable
2. What was the average monthly revenue you made for the 12th months before receiving the loan? E // enable a question if: IsAnswered(q13)	SINGLE-SELECT q14 01 <input type="radio"/> Amount, _____ JD 02 <input type="radio"/> Refused to answer 03 <input type="radio"/> I don't know 04 <input type="radio"/> Not Applicable
Amount, _____ JD E // enable a question if: q14== 1	NUMERIC INTEGER q14a -----
3. The average monthly revenue you made After receiving the loan E // enable a question if: q14.InList(2,3,4) IsAnswered (q14a)	SINGLE-SELECT q15 01 <input type="radio"/> Amount, _____ JD 02 <input type="radio"/> Refused to answer 03 <input type="radio"/> I don't know 04 <input type="radio"/> Not Applicable
Amount, _____ JD E // enable a question if: q15== 1	NUMERIC INTEGER q15a -----
4. If the answer of Q 1 (increased) After How many months did you start observing increased revenue? E // enable a question if: (q15.InList(2,3,4) IsAnswered (q15a)) && q13== 1	SINGLE-SELECT q16 01 <input type="radio"/> Period 02 <input type="radio"/> I don't know 03 <input type="radio"/> Refused to answer 04 <input type="radio"/> Not Applicable

Period: E // enable a question if: q16== 1	NUMERIC INTEGER q16a -----
5. If there was an increase in your revenue (an increase in one JD will be considered increase), do you believe that the increase was because of the loan? E // enable a question if: (q13== 1 && (q14.InList(2,3,4) IsAnswered(q14a)) && q15.InList(2,3,4)) (q13== 1 && q14.InList(2,3,4) && (q15.InList(2,3,4) IsAnswered(q15a))) (q13== 1 && IsAnswered(And 28 other symbols [1])	SINGLE-SELECT q17 01 <input type="radio"/> Yes, why _____ 02 <input type="radio"/> No 03 <input type="radio"/> I don't know 04 <input type="radio"/> Refused to answer 05 <input type="radio"/> Not Applicable
Yes, why _____ E // enable a question if: q17== 1	TEXT q17a -----
6. If you answered Q 1 (increased) what is your estimate of the increase in your revenue as a result of the loan? E // enable a question if: ((q17.InList(2,3,4,5) IsAnswered(q17a)) && q13== 1 && (q14== 2 q15== 2)) ((q17.InList(2,3,4,5) IsAnswered(q17a)) && q13== 1 && (q14== 2 q15== 3)) ((q17.InList(And 559 other symbols [2])	SINGLE-SELECT q18 01 <input type="radio"/> less than 10% 02 <input type="radio"/> 10%- 15% 03 <input type="radio"/> 16%- 25% 04 <input type="radio"/> 26%- 35% 05 <input type="radio"/> more than 35%, Specify _____ 06 <input type="radio"/> I don't know 07 <input type="radio"/> Refused to answer 08 <input type="radio"/> Not Applicable
more than 35%, Specify _____ E // enable a question if: q18== 5 WI q18a>= 36 && q18a<= 100 MI Please check the number	NUMERIC INTEGER q18a -----
7. If you answered Q 1 (decreased) what is the reason/s behind the decrease in revenue? E // enable a question if: ((q15.InList(2,3,4) IsAnswered(q15a)) && q13== 2)	TEXT q19 -----

INFORMATION RELATED TO THE LOAN

MAKE NEW BUSINESS LINKAGES, AS A RESULT OF RECEIVING THE LOAN:

E // enable a question if: q13.InList(3,4,5,6) (q13== 2 && IsAnswered(q19)) (q13== 1 && IsAnswered(q14a) && IsAnswered(q15a) && (IsAnswered(q17a) q17.InList(2,3,4,5))) (q13== 1 && (IsAnswered(And 230 other symbols [4])

STAT C TEXT

E // enable a question if: q13.InList(3,4,5,6) (q13== 2 && IsAnswered(q19)) (q13== 1 && IsAnswered(q14a) && IsAnswered(q15a) && (IsAnswered(q17a) q17.InList(2,3,4,5))) (q13== 1 && (IsAnswered(And 230 other symbols [5])

Make new business linkages, as a result of receiving the loan:

a) Have new customers E // enable a question if: q13.InList(3,4,5,6) (q13== 2 && IsAnswered(q19)) (q13== 1 && IsAnswered(q14a) && IsAnswered(q15a) && (IsAnswered(q17a) q17.InList(2,3,4,5))) (q13== 1 && (IsAnswered(And 230 other symbols [3])	SINGLE-SELECT q20a 01 <input type="radio"/> Yes 02 <input type="radio"/> No 03 <input type="radio"/> I don't know 04 <input type="radio"/> Refused to answer 05 <input type="radio"/> Not Applicable
Please give precise examples E // enable a question if: q20a== 1	TEXT q20a1 -----

<p>b) Have new suppliers</p> <p>E // enable a question if: q20a.InList(2,3,4,5) IsAnswered(q20a1)</p>	<p>SINGLE-SELECT q20b</p> <p>01 <input type="radio"/> Yes</p> <p>02 <input type="radio"/> No</p> <p>03 <input type="radio"/> I don't know</p> <p>04 <input type="radio"/> Refused to answer</p> <p>05 <input type="radio"/> Not Applicable</p>
<p>Please give precise examples</p> <p>E // enable a question if: q20b== 1</p>	<p>TEXT q20b1</p> <p>.....</p>
<p>c) Making new Business contracts</p> <p>E // enable a question if: q20b.InList(2,3,4,5) IsAnswered(q20b1)</p>	<p>SINGLE-SELECT q20c</p> <p>01 <input type="radio"/> Yes</p> <p>02 <input type="radio"/> No</p> <p>03 <input type="radio"/> I don't know</p> <p>04 <input type="radio"/> Refused to answer</p> <p>05 <input type="radio"/> Not Applicable</p>
<p>Please give precise examples</p> <p>E // enable a question if: q20c== 1</p>	<p>TEXT q20c1</p> <p>.....</p>
<p>d) Opening new markets</p> <p>E // enable a question if: q20c.InList(2,3,4,5) IsAnswered(q20c1)</p>	<p>SINGLE-SELECT q20d</p> <p>01 <input type="radio"/> Yes</p> <p>02 <input type="radio"/> No</p> <p>03 <input type="radio"/> I don't know</p> <p>04 <input type="radio"/> Refused to answer</p> <p>05 <input type="radio"/> Not Applicable</p>
<p>Please give precise examples</p> <p>E // enable a question if: q20d== 1</p>	<p>TEXT q20d1</p> <p>.....</p>
<p>e) Other:</p> <p>E // enable a question if: q20d.InList(2,3,4,5) IsAnswered(q20d1)</p>	<p>SINGLE-SELECT q20e</p> <p>01 <input type="radio"/> Yes</p> <p>02 <input type="radio"/> No</p> <p>03 <input type="radio"/> I don't know</p> <p>04 <input type="radio"/> Refused to answer</p>
<p>e) Other:_____</p> <p>E // enable a question if: q20e== 1</p>	<p>TEXT q20e1</p> <p>.....</p>
<p>Please give precise examples</p> <p>E // enable a question if: IsAnswered(q20e1)</p>	<p>TEXT q20e2</p> <p>.....</p>
<p>8. Did you develop new product/ service after you received the loan?</p> <p>E // enable a question if: q20e.InList(2,3,4) IsAnswered(q20e2)</p>	<p>SINGLE-SELECT q21</p> <p>01 <input type="radio"/> Yes</p> <p>02 <input type="radio"/> No</p> <p>03 <input type="radio"/> I don't know</p> <p>04 <input type="radio"/> Refused to answer</p> <p>05 <input type="radio"/> Not Applicable</p>
<p>Please give precise examples</p> <p>E // enable a question if: q21== 1</p>	<p>TEXT q21a</p> <p>.....</p>

<p>9. Did you hire staff after you received the loan?(For 6 months and more)</p> <p>E // enable a question if: q21.InList(2,3,4,5) IsAnswered(q21a)</p>	<p>SINGLE-SELECT q22</p> <p>01 <input type="radio"/> Yes, how many_____</p> <p>02 <input type="radio"/> No</p> <p>03 <input type="radio"/> I don't know</p> <p>04 <input type="radio"/> Refused to answer</p> <p>05 <input type="radio"/> Not Applicable</p>
<p>Yes, how many_____</p> <p>E // enable a question if: q22== 1</p>	<p>NUMERIC INTEGER q22a</p> <p>-----</p>
<p>STATCTEXT</p> <p>E // enable a question if: IsAnswered(q22a)</p> <p><i>If you answered Yes above, please answer the following:</i></p>	
<p>Code</p> <p>E // enable a question if: IsAnswered(q22a)</p>	<p>LIST q23</p> <p>-----</p>
<p>INFORMATION RELATED TO THE LOAN</p> <p>Roster: CODE</p> <p>generated by statement on q23</p> <p>E // enable a question if: q23.Count()>0</p>	
<p>gender %rosterite%</p> <p>E // enable a question if: q23.Count()>0</p>	<p>SINGLE-SELECT q23a</p> <p>01 <input type="radio"/> Male</p> <p>02 <input type="radio"/> Female</p>
<p>Date of Hire %rosterite%</p> <p>E // enable a question if: IsAnswered(q23a)</p> <p>WI q23b>= 1999 && q23b<= 2018</p> <p>MI Please check the number</p>	<p>NUMERIC INTEGER q23b</p> <p>-----</p>
<p>Number Of hrs/ week %rosterite%</p> <p>E // enable a question if: IsAnswered(q23b)</p> <p>WI q23c>= 1 && q23c<= 80</p> <p>MI Please check the number</p>	<p>NUMERIC INTEGER q23c</p> <p>-----</p>
<p>Nationality %rosterite%</p> <p>E // enable a question if: IsAnswered(q23c)</p>	<p>SINGLE-SELECT q23d</p> <p>01 <input type="radio"/> Jordanian</p> <p>02 <input type="radio"/> Egyptian</p> <p>03 <input type="radio"/> Syrian</p> <p>04 <input type="radio"/> Other, specify_____</p>
<p>Other, specify_____</p> <p>E // enable a question if: q23d== 4</p>	<p>TEXT q23d1</p> <p>-----</p>

<p>Governorate %rosterite%</p> <p>E // enable a question if: q23d== 1 q23d== 2 q23d== 3 IsAnswered(q23d1)</p>	<p>SINGLE-SELECT COMBO BOX q23e</p> <p>01 <input type="radio"/> Irbid 02 <input type="radio"/> A-Ba qqa 03 <input type="radio"/> A-Zarqa 04 <input type="radio"/> A-Tafe eh 05 <input type="radio"/> Amman 06 <input type="radio"/> A-Aqaba 07 <input type="radio"/> A-Karak 08 <input type="radio"/> A-Mafraq 09 <input type="radio"/> Jarash 10 <input type="radio"/> Ajoun 11 <input type="radio"/> Madaba 12 <input type="radio"/> Ma'an</p>
<p>Municipality %rosterite%</p> <p>E // enable a question if: IsAnswered(q23e)</p>	<p>TEXT q23f</p> <p>.....</p>
<p>Age of the employee %rosterite%</p> <p>E // enable a question if: IsAnswered(q23f)</p>	<p>SINGLE-SELECT q23g</p> <p>01 <input type="radio"/> 18-29 02 <input type="radio"/> 30-49 03 <input type="radio"/> 50 and above</p>
<p>STAT CTEXT</p> <p>E // enable a question if: q22.InList(2,3,4,5) q23.Count()>0</p> <p><i>Before asking you the following question, I would like to remind you that all information will be kept confidential and it is not linked to your name:</i></p>	
<p>11. A. is your business registered with Company Contro Department (CCD) or the MOIT?</p> <p>E // enable a question if: q22.InList(2,3,4,5) q23.Count()>0</p>	<p>SINGLE-SELECT q24</p> <p>01 <input type="radio"/> Yes, after receiving the oan 02 <input type="radio"/> No, not yet 03 <input type="radio"/> I was registered before receiving the oan 04 <input type="radio"/> I prefer not to answer 05 <input type="radio"/> Not App icab e</p>
<p>9.B if you answered yes above, when did you register your business?</p> <p>E // enable a question if: q24== 1 q24== 3</p>	<p>NUMERIC INTEGER q25</p> <p>-----</p>
<p>9.C did you register your business in order to receive the oan?</p> <p>E // enable a question if: IsAnswered(q25) && q24== 1</p>	<p>SINGLE-SELECT q26</p> <p>01 <input type="radio"/> Yes 02 <input type="radio"/> No 03 <input type="radio"/> Not App icab e</p>
<p>12. If you registered the business or the business was a ready registered, what is the ega status of the company?</p> <p>E // enable a question if: IsAnswered(q25) IsAnswered(q26)</p>	<p>SINGLE-SELECT q27</p> <p>01 <input type="radio"/> Individua company 02 <input type="radio"/> Partnership 03 <input type="radio"/> Private Shareho ding 04 <input type="radio"/> imited iabi ity company 05 <input type="radio"/> Other, specify_____</p>
<p>Other, specify_____</p> <p>E // enable a question if: q27== 5</p>	<p>TEXT q27a</p> <p>.....</p>
<p>Individua ID (this is fi ed by LENS)</p> <p>E // enable a question if: qc== 2 q27.InList(1,2,3,4) IsAnswered(q27a) q24.InList(2,4,5)</p>	<p>TEXT q29</p> <p>.....</p>

End time of interview. E // enable a question if: IsAnswered(q29)	DATE CURRENT TIME date_end
--	--

REFERENCES

PUBLISHED WORKS

- The American Association for Public Opinion Research. 2016. *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 9th edition. AAPOR.
- Gelman, Andrew, and Hill, Jennifer. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. 1st Edition. Cambridge: Cambridge UP, 2006.
- Lumley, Thomas. *Complex Surveys: A Guide to Analysis Using R*. Hoboken, NJ: John Wiley & Sons, 2010.
- Särndal, Carl-Erik, and Lundström, Sixten. *Estimation in Surveys with Nonresponse*. Chichester: Wiley, 2005.
- Särndal, Carl-Erik, Swensson, Bengt, and Wretman, Jan. *Model Assisted Survey Sampling*. New York: Springer-Verlag, 2003.
- sin nomine, *Survey of Micro- and Small Enterprises*. USAID Local Enterprise Support Project (LENS), 2015.
- Valliant, Richard, Jill A. Dever, and Frauke Kreuter. *Practical Tools for Designing and Weighting Survey Samples*. New York: Springer, 2013.
- Valliant, Richard, and Dever, Jill A. *Survey Weights : A Step-by-Step Guide to Calculation*. College Station: Stata Press, 2018.

SOFTWARE PACKAGES

- Anderson-Bergman, C. (2017). “icenReg: Regression Models for Interval Censored Data in R.” *Journal of Statistical Software*, *81*(12), 1-23. doi: 10.18637/jss.v081.i12 <https://doi.org/10.18637/jss.v081.i12>
- Ellis, Greg Freedman (2019). *srvyr: 'dplyr'-Like Syntax for Summary Statistics of Survey Data*. R package version 0.3.4. <https://CRAN.R-project.org/package=srvyr>
- Lumley, Thomas. (2019). *survey: analysis of complex survey samples*. R package version 3.35-1.
- Lumley, Thomas. (2019). *mitools: Tools for Multiple Imputation of Missing Data*. R package. version 2.4. <https://CRAN.R-project.org/package=mitools>
- Pilliard Hellwig, Rafael. (2018). *outcomerate: AAPOR Survey Outcome Rates*. R package version 1.0.1.
- R Core Team (2013). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. <http://www.R-project.org/>
- Therneau, T. (2015). *survival: A Package for Survival Analysis in S*. version 2.38, <https://CRAN.R-project.org/package=survival>
- Wickham, Hadley. *ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York, 2016.
- Wickham, Hadley, et al. (2019). *dplyr: A Grammar of Data Manipulation*. R package version 0.8.0.1.