

## Chapter 5

# Conclusion

**Abstract** While these current and potential entrepreneurs face numerous hurdles, the evidence clearly shows that the difficulties of financial intermediation for small and medium-sized enterprises are both significant and costly. Overcoming this barrier represents both a major profit opportunity for lenders and a major development opportunity for society at large, including of course entrepreneurs themselves. New tools that allow for screening and risk evaluation for small and medium-sized enterprises with low transaction costs and without depending on pre-existing information like borrowing history or business plans could represent a breakthrough in solving this problem. We have proposed one such tool, the use of psychometric tests, and evaluated its potential both conceptually, based on past studies, and based on a newly collected international dataset. The results show that there are some psychometric dimensions that have statistically and economically significant relationships with business profitability, which is of significant interest to investors, entrepreneurs, and capacity builders, and also that have significant relationships with default risk, which is of significant interest to lenders. Some of them are found to hold with surprising stability across a wide variety of countries, cultures, and business types. These questions could provide the boost to predictive power needed to bring millions of striving small business owners into the formal financial system and give them the capital they need to grow their businesses, if they can be successfully leveraged for credit screening. The Entrepreneurial Finance Lab (or EFL for short) is a company set up to work with banks to deploy this technology and realize this potential. Since 2010, the company has been implementing a credit-screening tool including psychometric content similar to that reviewed above, and modeled using the Bayesian hierarchical methodology.

Promoting economic growth and poverty reduction in emerging markets is one of the key challenges facing society today. Unleashing the latent entrepreneurial potential in these markets is one of the best ways to ensure this challenge is met in a significant and sustainable way. While these current and potential entrepreneurs face numerous hurdles, the evidence clearly shows that the difficulties of financial intermediation for small- and medium-sized enterprises are both significant and costly. Overcoming this barrier represents both a major profit opportunity for lenders and a major development opportunity for society at large, including of course entrepreneurs themselves.

New tools that allow for screening and risk evaluation for small- and medium-sized enterprises with low transaction costs and without depending on pre-existing information like borrowing history or business plans could represent a breakthrough in solving this problem. We have proposed one such tool, the use of psychometric tests, and evaluated its potential both conceptually, based on past studies and based on a newly collected international dataset. The results show that there are some psychometric dimensions that have statistically and economically significant relationships with business profitability, which is of significant interest to investors, entrepreneurs, and capacity builders, and also that have significant relationships with default risk, which is of significant interest to lenders. Some of them are found to hold with surprising stability across a wide variety of countries, cultures, and business types. These questions could provide the boost to predictive power needed to bring millions of striving small business owners into the formal financial system and give them the capital they need to grow their businesses, if they can be successfully leveraged for credit screening.

## **Implications for Practice: The Entrepreneurial Finance Lab**

The Entrepreneurial Finance Lab (or EFL for short) is a company setup to work with banks to deploy this technology and realize this potential. Since 2010, the company has been implementing a credit-screening tool including psychometric content similar to that reviewed above and modeled using the Bayesian hierarchical methodology.

As of the end of 2012, this tool is being used in countries across Latin America, Asia, and Africa, with over 48,000 applications completed. Using this application, EFL's partner banks have originated over \$170 million US dollars to small businesses, over two thirds of which would have been rejected by traditional underwriting criteria. Though still in pilot phases, these implementations have been highly profitable for the financial institutions, leading to rapid scale-up across the globe. And the success stories of the entrepreneurs that have benefitted from this tool show the power of productive finance in improving lives.

## Leah Mugure Mwaura Story



Photo is courtesy of Greg Larson

Leah Mugure Mwaura sells mutumba, or second-hand clothing, in Gikomba market in Nairobi, Kenya. She first opened her shop in 1991 with 15,000 shillings (approximately \$170 USD). Her husband, an accountant during the 1990s, told Leah that banks were only giving loans to “big big people” or big companies, so for 19 years she ran her business without a bank loan. She said: “for twenty years I was running it by myself!! With my own money... No help, there was no help.”

She took small assistance from group loans, and once she approached a bank because she needed 500,000 shillings (\$5,500) in capital, but after an initial consultation where they looked at her turnover, the maximum they offered her was 100,000(\$1,100)—provided that she could provide collateral and a guarantor. “I was despairing. I did away with banks” she recalls. She walked away and never went back to the bank.

In 2010, Leah took the EFL application and was approved for an unsecured 600,000 shilling loan. She recalls: “I expected it to take a month or two and so I was surprised to get it in 2 weeks’ time. There was no struggle. I was not told ‘go see so and so.’ I was just referred to one person. I’m happy with that bank ... you feel wanted. I’ve even introduced some friends to be customers there.”

When she received the loan she put it towards her business “you will get bigger profits ... like with the loan I got: if I had used it to buy a car or a house, surely I would not be where I am now. But I put that loan, 100 % of it, in here. And I’ve seen the profits.” She paid back her first loan, and her second loan from the bank was more than tripled: A 2M shilling loan last November. And she now has a new shop to accommodate the extra bales. Even though business has been slow this month, she’s happy and comfortable saying, “I can pay! That’s why I don’t even look stressed. I have stock... I’m not stressed because I know I’ll manage to pay the loan. The value of my stock is more than the loan that I’m having.” She’s looking forward to more loans, and more expansion adding, “I even want to expand more — and take the position of my supplier! I’ll be his competitor. You know, you have to think big.”

“I have really made it in Gikomba, and I’m really proud of the place. If I imagine for the 19 years I started with a capital of 15,000 shillings... I never even dreamt of dealing with millions of shillings... So I can say that I’m proud – it has moved me from point A to C ... The loan has helped me. To be sincere it has tripled my business. And I expect to do better after finishing this current loan.”

## Implications for Future Research

The results reviewed in this study overcome many weaknesses of previous research, often based on conveniently available samples of entrepreneurs in rich countries without clear and comparable performance data. The dataset is large compared to some studies and more importantly is from emerging rather than developed countries, actually from a variety of emerging countries, providing both a more relevant sample and richer cross-cultural heterogeneity. Equally important, the results are based on a relatively clear and consistent set of tests and outcome variables, including actual loan repayment performance, which is a first in the literature. Finally, an alternative modeling methodology based on Bayesian techniques was introduced that is more robust to what will be an ever-present challenge to the application of psychometrics to credit scoring, namely, small samples sizes with cross-country data.

However, there are some weaknesses that should be overcome in new work. Most critical is the issue of external validity. As the goal is to evaluate the power of these tools when implemented in a high-stakes setting with real bank loans on the line, the evaluation of their power should be under as similar circumstances as possible. This means that the stakes should be high, with test-takers putting in full effort and attention, and even attempting to game or “beat” the test. That is the truest validation of how well such a tool would function in practice. It also means that testing should be performed prior to the success or failure of the business or success or failure at repaying the loan, to eliminate possibilities of reverse causality.

That setup would also allow for an extension of the psychometric factors considered herein to include other dimensions that could have an even stronger relationship with entrepreneurial outcomes but are potentially more malleable and less stable over time. Such factors had to be ignored in this retrospective study but could have strong relationships with default risk. Even more interestingly, they would allow for direct studies of the causal impact of educational and public policies to “improve” those malleable characteristics on business success, which is of primary interest to capacity builders and policy-makers seeking to encourage more and better entrepreneurial activity in their countries.

Future work will therefore prioritize *ex ante* high-stakes data collection, from even larger samples across a wider variety of emerging markets. If those results continue to validate the added value of psychometric content to credit applications for small business borrowers, the impact on employment, GDP growth, and entrepreneurship in emerging markets would be enormous. It would help the hundreds of millions of entrepreneurs currently locked out of the formal credit system achieve greater business success, become profitable clients for banks, and further contribute to economic growth and job creation in their communities.

## Florence Atieno Ahenda Story



Photo is courtesy of Greg Larson

Florence Atieno Ahenda is a wholesale used shoe-seller with a stall located on a busy corner in Gikomba Market in Nairobi, Kenya. Ten years ago, Florence started the business with nothing. As the years passed, it grew “slowly by slowly,” but at some point, sales plateaued. She normally purchased a stock supply of about five bales of shoes—or about \$750 in inventory. She would work on selling those shoes until she raised another \$750 and then buy more stock. But

she could never seem to expand beyond the sell-and-restock cycle. Florence never had a bank loan; she never even opened an account. The business operated on cash savings, and Florence never imagined that she could get approved for a loan. “Not in my wildest dreams,” she says.

Meanwhile, Florence was raising a family almost completely on her own. Her husband was laid off in 2001 and in order to sustain her family she began selling shoes in Gikomba that same year. Her husband never found another job, forcing Florence to be the family’s sole breadwinner.

In 2010, Florence saw ads around Gikomba for a new bank branch. She decided to open up an account—her first ever—and the teller mentioned their new small business loans, with the EFL Application process that involved no guarantors or collateral and featured a set of new nontraditional questions on a touch screen computer. Despite having zero banking history, Florence took the application and was approved for a first-time unsecured loan of \$6,000. She was ecstatic and determined to stay in good standing with the bank.

Florence paid off that first loan six months early. The bank pre-approved her for a second loan of \$12,000; when she paid that loan back on time, the bank approved her for a third loan, of \$24,000, which she is currently servicing and is on track to pay off on time. All told: Over two and a half years, Florence accessed \$42,000 in unsecured loans to expand her wholesale shoe business. The impact, both on Florence’s shoe shop and her family, has been remarkable.

Nowadays, Florence’s stock supply is fifty bales of shoes—or about \$7,500 in inventory, a tenfold improvement in just a few years. Her sales cycle has improved dramatically, as well; whereas it used to take more than a week to sell her small inventory, she now moves fifty bales of product in less than five days, on average. With her third loan, Florence has moved up the supply chain in Gikomba.

(continued)

(continued)

The new capital was enough to make a down payment on a large consignment in Germany. She's now an intermediary supplier, but her dream is "to become the supplier of the suppliers."

Today, Florence is proud. Her business is thriving, and her children are excelling in school—she never dreamed she'd be able to pay for her kids to attend university. She credits her family's good fortune to the success of her business in Gikomba she says: "Good life! We are truly having the good life. I feel good because now I have money—I can boost my business right, and I can educate my children."

It is no coincidence that each of these case studies is about a female entrepreneur. The previously mentioned microfinance "ghetto" for women entrepreneurs is just one symptom of lending selection criteria that often are even more difficult for women. For example, in some countries, it is more difficult if not impossible for women to pledge household assets as collateral, which makes a collateral requirement systematically discouraging to female entrepreneurs for their applying to get and ever obtaining larger amounts of credit. Women entrepreneurs are more likely to face higher interest rates, are required to collateralize a greater percentage of their loan, and have shorter loan terms than men (IFC 2011).

In the regions EFL has a larger geographical footprint, such as Latin America and sub-Saharan Africa, women encounter particularly strong biases. For very small businesses in Latin America (those that employ 5–9 people), 57–70 % of women-owned firms either need loans and were rejected by a bank or need larger loans, compared to 50–61 % of men-owned business (IFC 2011). Across Latin America, women are approximately 14 % less likely than men to have a bank loan or line of credit and are required to have approximately 8.1 % more collateral than men for bank loans (World Bank 2012). In sub-Saharan Africa for those that received loans, the average loan size indexed to revenue was 13 % to 16 % for women versus 17 % to 21 % for men (IFC 2011).

EFL's tool enables bank lending to female entrepreneurs by eliminating gender biases and helping banks lend to the informal small- and medium-sized enterprise sector. By using the responses to the application in place of traditional requirements, EFL's partner banks have closed this gender gap, as the data shows equal approval rates for male and female applicants, with nearly identical terms applied to the resulting loans. In fact, one EFL partner bank stated, "in the past 18 months, we have been able to offer access to finance to unbanked and underserved SMEs across Africa by applying the EFL Tool. Half of the beneficiaries are women and many have successfully repaid their first loan and qualified for additional facilities." In general, EFL's partner banks have increased the percentage of women-owned SMEs they lend to by over 70 %, translating into over \$45 million dollars of additional lending.

### **EFL Story**

---

For banks, the EFL credit-scoring tool has allowed them to both help fuel the growth of their local economy and grow their loan portfolios with quality. As one partner bank said: “the key driver of growth in most emerging markets around the world is Small & Medium Enterprises...[yet] many small business owners continually tell us that the one aspect that constraints their growth is access to finance. We have found a solution to meet our customer’s needs, by using it we can give many of them the opportunity of growing their businesses. Through a capability introduced to us by the Entrepreneurial Financial Laboratory (EFL) we now have a tool to assist us in making speedy lending decisions.”

As another partner described how using EFL’s “nontraditional toolset” to evaluate entrepreneurs has allowed them to accept more loan applicants by “cut[ing] through the red tape we traditionally required for lending to this segment, and allowed a shorter, more convenient customer experience” without increasing the risk of their portfolios. As our partner continued to say, “the end result has been a completely revolutionary approach of determining the willingness of the client to pay back debt and also their ability to manage their business which can enable banks to enhance traditional scorecard building techniques to become even more predictive.”

For more information about the Entrepreneurial Finance Lab, please visit [www.eflglobal.com](http://www.eflglobal.com). Though this organization is the leader in applying psychometrics to credit risk modeling, it is our hope that with additional results and impact, other organizations will experiment with nontraditional data, including psychometrics, to further enable SME lending and unleash the entrepreneurial potential that is currently held back in emerging markets due to barriers to productive lending.

The final chapter discusses implications of these results for future research, both academic and applied.