Bringing Africa Online:
Leveraging Technology to Enable Entrepreneurs

By Scott E. Hartley

Investment, or capital injection in portfolio companies created by entrepreneurs to solve market problems and seed innovation, is of fundamental importance to new business creation in Africa and sustained economic growth across the vast continent. Capital injections can come in all shapes and sizes. Since the 1970s, Grameen Bank in Bangladesh has popularized the advent of "microfinance," or small loans –debt capital– offered to help impoverished women gain economic autonomy. Microfinance, however popular and imperative for poverty alleviation, is but one piece of a comprehensive investment palliative in Africa, an impoverished continent with extremely high potential. Microfinance provides small injections of capital to small entrepreneurs. For those with greater capital needs, such as Small and Medium Enterprises (SMEs), however, the means of obtaining finance become substantially more difficult.

SME Investment Overview

While global definitions of SMEs vary, according to the World Bank employment-based definition, Small Enterprises are those with between 5-20 employees, and Medium Enterprises are those between 20-50. Thus the World Bank broadly defines SMEs as organizations with between 5-50 employees.[1] In Africa, the SME economic sector accounts for significant percentages of employment, GDP, and total exports.

According to a study by the Small Enterprise Assistance Fund (SEAF), for each dollar invested in an SME, an additional US$10 was generated in the local economy. Additionally, such investment created jobs, introduced new business methods, and plugged otherwise isolated regions into the global supply chain.[2]

Scott E. Hartley, a Columbia University graduate student, former Googler, Google.org consultant and White House Intern, holds a B.A. from Stanford University.

SME production can promote growth and industry agglomeration, and can transfer technology, provide windfalls for local industry, educational opportunities, and empower inspirational heroes fit for future leadership. Capital injections that address SME financing needs come in two forms: debt and equity.

Debt Financing

Debt financing is traditionally made in the form of a loan with a given maturity. Loans often require collateral, or proof of entrepreneurial competency so that the lending institution – typically a bank – can lend with confidence that the borrower will not default. Accordingly, banks must assess the risk associated with lending to a particular entrepreneur. This process takes time and energy, and lending institutions incur a "Transaction Cost" in determining risk. In Africa, the transaction costs associated with risk assessment are high because un-standardized and disparate information make the process difficult and protracted, and therefore more expensive. Consequently, high transaction costs make up-market, or higher-value loans the standard rather than the exception; if banks are to spend wisely on assessing risk, they will pragmatically assess risk for higher-value proposition loans first, leaving out smaller business owners, or the entrepreneurs of SMEs. The opportunity cost associated with SME risk assessment is too high to warrant reallocation of lending resources, and this is due to technology and transaction cost constraints.

Equity Financing

Equity financing is traditionally made in the form of "Venture Capital." Venture capital (VC) is capital provided to entrepreneurs – typically slightly larger than debt finance in scope and capital demand – in return for partial ownership or intellectual property rights to what is developed. Also known as "risk capital," VC is capital with returns that are not contractually guaranteed, and is contingent on counterparty post-investment success.[3] Unlike "risky" debt capital, neither principal nor upside returns are binding matters of contract. Ownership comes in many forms, though traditionally in preferred shares convertible to common stock issued on an exchange when a company is "taken public" or makes its "exit" from private ownership. VC deal composition can also provide incentive for engagement over the longer term by providing "coupons" stipulating interest returns, and "equity kickers" that provide additional ownership beyond specified time horizons.

In Africa, as in other emerging markets, the opportunities to have an Initial Public Offering (IPO), or public issuing of stock, are limited due to shallower capital markets and greater financial disclosure requirements that preclude companies with less established means of corporate governance to prove their mettle before issuing common stock. In other words, there are few opportunities to successfully debut SMEs on markets, as limited demand from open-market buyers to capitalize the company through an IPO limits the extent to which equity inves-

tors can realize upside returns on their early-stage capital injections. Smaller capital markets, fewer exchanges available for public listing, weak accounting systems, and lack of transparency all perpetuate the problem.

Addressing "The Missing Middle"

Such systemic challenges – high transaction costs associated with risk assessment, larger transaction sizes, higher risks associated for earlier-stage ventures, and lack of exit options for trading smaller firms on secondary markets – have created a funding gap known as "The Missing Middle." This missing middle is a gap between those small businesses with access to debt finance, and those established firms with access to both debt and equity finance. For entrepreneurs with capital demands greater than microfinance though less than the threshold profitability for a bank to perform sufficient counterparty risk assessment, finance availability will necessarily be limited, and the inability to obtain seed and expansion capital limits business creation, and reduces innovation. The opportunity cost of SME policy oversight is tremendous in burgeoning economies such as those in East Africa.

THIS MISSING MIDDLE IS A GAP BETWEEN THOSE SMALL BUSINESSES WITH ACCESS TO DEBT FINANCE, AND THOSE ESTABLISHED FIRMS WITH ACCESS TO BOTH DEBT AND EQUITY FINANCE.

What follows is an illustrative, though not exhaustive, attempt to outline those salient deficiencies in current risk assessment processes, and those transaction costs that could be mitigated by better leveraging private sector technological resources for gains on the African continent. This paper will seek to highlight some of the more innovative tactics used by private philanthropists to address the missing middle, and provide prescriptive recommendations for technologists to address systemic challenges that deter more widespread use of debt and equity finance in Africa. The hope is that such normative guidance might impel improved private and public partnerships that will leverage technology to mitigate transaction costs associated with counterparty risk assessment, and facilitate capital allocation. By addressing the "missing middle," SME development can be a means to poverty alleviation, job creation, and sustained economic growth in Africa.

Addressing Systemic Limitations

Although the above paragraphs detail some of the systemic limitations associated with debt and equity financing in emerging markets, and specifically in Africa, there are means of addressing and mitigating such challenges through creative innovation. Solutions to the world's biggest problems will require the

collaboration of public and private means. They will require the technology and efficiency of the private sector, the local knowledge of non-governmental organizations, and the buy-in of governments. The private sector can drive innovation and civil society can understand local needs, but government is necessary to scale and deliver ideas to global audiences.

Firms like Google.org, the philanthropic arm of Google, Inc., endowed with one percent of profits and equity and operating off the Google, Inc. balance sheet, are spearheading the types of initiatives that could be made across the African continent, and targeting the types of problems that must be addressed to attain progress. Unlike the Bill and Melinda Gates Foundation and other non-profits under the 501(c)(3) U.S. tax code (exempt from filing federal income tax), Google.org can make equity and venture-based investments for profit in developing markets, or support firms that do.[4] In fact, in April 2009 Google, Inc. announced Google Ventures, an in-house VC team with the expanded mandate to invest in clean technology, and innovative ideas to accelerate global economic development. Unlike their non-profit philanthropic peers, these organizations can leverage Google employees and resources, make for-profit investments to promote technology advancement, and can lobby on behalf of initiatives it supports.[5]

What Solutions May Exist

Firms like Google.org could seek to address systemic problems in developing markets by improving information to lower transaction costs associated with counterparty risk assessment in debt capital finance, improving transparency for investors who provide equity finance, and deepening capital markets by potentially creating mezzanine funds. Such funds would provide SMEs with mid-level liquidity options by leveraging debt-equity swaps to transfer SME debt into a fund's equity stake in a growing venture. The latter could provide exit options for equity investors looking to recoup capital, and could provide liquidity for SME entrepreneurs without the option to list their company via an IPO. Solutions need not remake financial markets, but changes must leverage technology to expand risk models, aggregating and taking into account new ways to understand borrowers, and assess counterparty risk cheaply and efficiently to broaden credit access.

SOLUTIONS TO THE WORLD'S BIGGEST PROBLEMS WILL REQUIRE THE COLLABORATION OF PUBLIC AND PRIVATE MEANS.

The following two sections outline two ideas that leverage technology: (1) Facilitating credit history aggregation to minimize transaction costs associated with debt capital counterparty risk assessment; and (2) Leveraging the Internet to expand local markets, improve online transaction capability, and create an

Online Development Bank enabling entrepreneurs in emerging markets to generate and store capital online, with partnerships for extraction.

Improving Credit Histories

POOR INFORMATION ABOUT BUSINESS PERFORMANCE AND OTHER CREDIT-RELATED FACTORS INCREASES THE TRANSACTION COSTS OF INVESTING IN SMALL AND LOCAL ENTERPRISES.

One problem in the developing world is the lack of robust credit histories for entrepreneurs, a problem that limits the extent to which financing organizations –providers of both debt and equity capital – can efficiently assess risk. Technology firms could help promote economic growth in low-income countries by creating a global platform that allows users to create and manage their credit profiles, thereby addressing the vital importance of facilitated financial and credit markets in emerging economies. By aggregating diverse sources of credit history data, technology firms could create a platform for developing-market entrepreneurs to demonstrate their credit-worthiness to lenders. This would enable increased access to credit, investment, enterprise growth, and job creation in Africa.

Currently, credit bureaus either do not exist or do not have reliable data in low-income countries because of a lack of infrastructure and consolidated information. This dearth of credit history prevents businesses and individuals from accessing credit, or in turn makes collateral requirements difficult, and interest rates high. Poor information about business performance and other credit-related factors increases the transaction costs of investing in small and local enterprises. However, discrepancies between credit worthy and unworthy institutions and individuals is more pronounced in the developing world, and small innovations in risk assessment would enable financial institutions to make informed capital allocation decisions.

Technology firms could help low-income individuals gain control of their own credit, giving them the tools to access financing when they need it, to grow their businesses and improve their livelihoods. The primary constraints that prevent individuals and enterprises from accessing finance are the issues of information asymmetry, lack of reliable institutional data, and the resulting costs and complexities involved in mitigating counterparty risk. Individuals who are currently excluded from the formal financial systems in their local markets still engage in meaningful economic activities, many of which depend upon their ability to access credit. Evidence suggests that there are data sources other than the formal financial systems and credit bureaus that can help demonstrate credit-worthiness. Technology firms with significant access to information are

uniquely positioned to aggregate these data sources and help borrowers develop a type of credit history which will facilitate and unlock opportunity by expanding access to vital financial markets and lenders, a significant need in low-income African countries.

IN HELPING ESTABLISH MORE ROBUST CREDIT HISTORIES IN AFRICAN NATIONS, TECHNOLOGY FIRMS COULD PROVIDE THE CENTRALIZED PLATFORM FOR AGGREGATION OF VARIEGATED CREDIT REPORTING SOURCES.

By leveraging existing transaction and credit patterns to help low-income individuals build an independent credit history as a supplement or alternative to traditional credit bureau reports in low-income African countries, technology firms can help facilitate entrepreneurial access to capital that will allow for business growth. This approach will expand individual borrower power, in that they can control who will access their data, and they can supplement it by adding new forms of credit by broadening institutional or financial engagements. Furthermore, this improvement would give the entrepreneur knowledge into the types of information that financial institutions find helpful, and would highlight areas where their history is weak or could be strengthened.

In helping establish more robust credit histories in African nations, technology firms could provide the centralized platform for aggregation of variegated credit reporting sources. For example, credit need not stem from formal financial relations alone, but could include utility bills and other municipal services, store or supplier credits, trade credits and rent registries. Home mortgages and other housing-related services could be evaluated, including those areas in which diminished property rights often leave the individual subject to collateral deficiency, namely when one can't prove ownership over a favela, slum, or informal township lease. Phone bills and mobile payments could be consolidated, including post-paid mobile services as well as pre-pay stored value systems. Money transfers, remittances both received and sent lend insight into the consumer's access to private capital. Furthermore, online services such as banking, investing, payments or online advertising expenditure could be monitored temporally, monitoring trends in spend that could be indicative of stability, growth, and credit-worthiness, rather than the absolute value of savings and expenditure. Bank and non-bank credit history such as microfinance repayment patterns, graduating loan sizes, group loans, capital from angel investors, credit unions, rotating credit schemes could all contribute to comprehensive evaluation of the individual as a potential borrower. Additionally, entrepreneurial financial statements and performance data on cash flow could prove borrowing mettle. Income statements, accounts receivables, inventory, land ownership, commercial leases and stock-based collateral of all types could be reviewed and included as

variables into a multivariate regression model. The purpose of such a model would be to identify predictive indicators useful in efficiently identifying entrepreneurial credit-worthiness.

In aggregate, such information would be sufficient for lending institutions across Africa to more efficiently assess counterparty risk prior to allocating capital. This information would be readily available online, and the transaction costs associated with risk assessment would be minimized to the extent that capital allocation to SMEs would become not only possible, but pragmatic, due to growth potential.

Leveraging the Internet

Even in the developing world, savvy entrepreneurs recognize the Internet as a platform for both local and global market expansion. In order for business-to-consumer entrepreneurs to have the greatest ability to provide their good or service to the largest number of individuals, they must leverage the Internet, and growing numbers of Africans are coming online.

Informational websites are necessary, though not sufficient for entrepreneurial success in developing markets. Currently, there is limited access for developing-world entrepreneurs to leverage online transaction functionality, such as through examples like Google Checkout and Paypal. The expansion of functionality and availability for emerging market entrepreneurs would not only facilitate online transactions but would also expand markets and create positive externalities for SME sales to go global.

EVEN IN THE DEVELOPING WORLD, SAVVY ENTREPRENEURS RECOGNIZE THE INTERNET AS A PLATFORM FOR BOTH LOCAL AND GLOBAL MARKET EXPANSION.

For entrepreneurs in the developing world looking to provide goods and services via an Internet platform, current online payment options are not widely available. Legal and systemic limitations require banks to be based in the United States or United Kingdom, limiting the facility with which an emerging market entrepreneur can create a viable online business with transaction facility. Consequently, websites for entrepreneurs in the developing world do not usually allow online transactions, despite the fact that increased access to the on-line market would markedly benefit emerging market entrepreneurs. There are an increasing number of Internet-able consumers, local to the entrepreneur, and an increasingly globalized economy in which the demand for and premium paid on unique "ethnic" goods is raising market potential for African SMEs.

In sum, African governments must –in partnership with the private sector – improve Internet penetration and speed by expanding access to Internet Service Providers (ISP). However, with infrastructure improvements, technology firms such as Google have the technology and ability to develop an "Online Development Bank." Organizations such as Google.org could help establish an online system by which the entrepreneur located in a developing market without access to an American or British bank account, could use Google Checkout to sell their goods and services to a global marketplace. The entrepreneur would, when signing up for his or her Online Development Bank account, specify that they are not located in an available banking market, and would then have access to a set of services specific to increasing transaction capability access in Africa.

AFRICAN GOVERNMENTS MUST –IN PARTNERSHIP WITH THE PRIVATE SECTOR – IMPROVE INTERNET PENETRATION AND SPEED BY EXPANDING ACCESS TO INTERNET SERVICE PROVIDERS (ISP).

By creating an account with the Online Development Bank (ODB), he or she could be given a unique account number, and immediately allowed to open a transaction account through a platform like Google Checkout or Paypal. Their unique account number could allow for a repository for receipt of online transaction funds, and would permit them to immediately be in business and instantly gain access to global customers. Through the establishment of local partnerships, withdrawing funds from the online ODB account would happen in one of two ways: (1) Online debit capability only; and (2) Local banking and mobile partnerships for tangible capital withdrawal.

Online Debit Capability Only

In the first scenario, the entrepreneur would only be able to utilize funds acquired through Google Checkout or Paypal online sales by using those funds online. For example, similar to how eBay payments received through PayPal can be used to purchase books on Amazon.com or other online vendors, the entrepreneur would only have access to his online bank funds. In essence, parallel to the conception of "Cloud Computing," this would be the advent of "Cloud Banking" in the emerging African market.

The online funds received into each unique account number would be accessible only online, and only from the standpoint that the entrepreneur could leverage those funds to make other online purchases available to them via shipping. The benefits of this model are that the technology proprietor would be responsible for storing and monitoring funds, but not responsible for establishing local banking partnerships by which the entrepreneur would be able to withdraw those funds, acquired online, in cash. The drawbacks of this model would include the

fact that the entrepreneur would have far less financial flexibility in recouping their profits in cash form.

Local Banking Partnerships for Fund Withdrawal
The second proposed solution would be for the technology firm to partner with local banking institutions and mobile providers in developing markets. For example, partnerships with the National Bank of Commerce (NBC) in Tanzania or Vodacom mobile in Kenya would allow capital withdrawal in the form of cash or M-Pesa credits. M-Pesa credits –a mobile-based, transferable, remunerative unit of account, and store of value pioneered by Vodacom– have facilitated formal bank penetration in rural Kenya.

The purpose of a partnership, or agreement, would be to establish a means by which the entrepreneur could solicit or withdraw those funds acquired via the online transaction. Whereas the first withdrawal model would allow only online transfer access of funds to a secondary online merchant, without the possibility of accessing tangible capital and credits, this second option would require that a local institution recognize an Online Development Bank voucher, provide an advance on the funds requested, and subsequently gain payment from the technology firm. Analogous to how a local vendor provides a product discount when presented a coupon only to return the coupons to the product producer subsequently for reimbursement, the ODB would allow coupons to be printed and presented to partner banking institutions in the developing world for the redemption of tangible funds to the entrepreneur account owner.

The benefits of this model are enhanced financial flexibility for the entrepreneur in the developing market. Not only could they transact online quickly and easily, but they would also gain tangible access to their funds in either an online or offline capacity. Vodacom, an East African mobile provider, has proven that its local mobile credit plan, M-Pesa, can penetrate rural East Africa, where diffuse population, poor infrastructure, and bank scarcity has impelled its success as a cash alternative unit of account, store of value, and off-line platform for remuneration. The drawbacks of this model are the fact that local partnerships would be specific, and as such the development timeline of the ODB would be protracted and initially unavailable in a greater number of developing markets across Africa.

Witness to Hope

As a former Google.org Business Development Consultant working with TechnoServe in Tanzania's 2007 "Believe, Begin, Become" national business plan competition, I understand the promise of SME business development in Africa, and the imperative of financial markets as the providers of credit and capital to expand business hope. But only in a dusty back-alleyway of Dar es Salaam,

interacting with a talented yet impoverished artist, did I come to understand true market limitation, the power of the Internet, and the need for its democratization across Africa.

In Tanzania I met a local Maasai artist named Gregory Mchopa. Paintbrush in one hand, dusty Nokia in another, negotiating in mile-a-minute Swahili, Greg was a passionate entrepreneur whom I was able to help – working with Joshua To, a Google.org colleague – by utilizing technology and the Internet to bring his artwork to a global market.

Working on a dial-up connection in our hotel lobby, we purchased an eponymous domain name and used Google applications to establish an email address and means of data and inventory sharing and tracking across the globe. We built a functional website that featured descriptions of his art, autobiographical YouTube videos of Greg telling his story, and photographs of paintings that Greg could now sell to an international audience—and we accomplished all of this in just two days. Within weeks Greg received inquiries from buyers in Canada at price points eclipsing his previous annual earnings.

Only upon returning to California with the established website did my Google colleague and I begin to encounter difficulties associated with business creation in Africa. In order to solicit online payments, and in order to repatriate funds to Tanzania, we had limited options. We attempted to employ Google Checkout and Paypal, free and accessible accounts that would enable an entrepreneur to establish and accept online payment transactions, but, in order to enable online transactions on the site, we were required to create a domestic U.S. bank account. To create a tax-distinct bank account, we were required to file for a separate Tax ID, and this required registration, a seller's permit, a fictitious business name, and filing for a "General Partnership" at the county level. Though we were eventually able to open a bank account with which we could create an independent online transaction account to facilitate online site payments for Greg, the challenges for a developing market entrepreneur were laborious at best, and realistically insurmountable at worst.

Bringing Africa Online

As outlined above, technology firms hold the keys to inject efficiency into financial markets, expand access to credit and capital, and treat some of the development maladies across Africa. Firms could pursue the aforementioned ideas as business opportunities, developing African online communities and becoming a market by conjoining a large user base with relevant advertisers of services targeting local demographics of entrepreneurs. Contrarily, firms could approach such problems as a means to create public goods by building platforms that consolidate institutional data and create robust credit histories,

or that enable African SME entrepreneurs to gain access to global markets via the Internet.

Solutions that offer credit reporting and management service that will help borrowers understand their levels of indebtedness and manage their credit, while adding new sources of credit profile reporting to facilitate lending institution counterparty risk assessment. The result will expand access capital in emerging markets. By aggregating novel evaluative variables of credit-worthiness, housing data online, and expanding predictive models beyond financial-only indicators, technology firms could help alter systemic financial market inefficiencies and deficiencies. Such a platform would, in conjunction with improved Internet transaction services for low-income entrepreneurs, support SME growth globally by allowing financial institutions to leverage consolidated data sources. Centralized access to borrower data will lower transaction costs associated with risk assessment, diminish the profitability threshold for lending, and expand access to credit. In high-growth emerging African markets, this will change lives.

THE CHALLENGES FOR A DEVELOPING MARKET ENTREPRENEUR WERE LABORIOUS AT BEST, AND REALISTICALLY INSURMOUNTABLE AT WORST.

But such foray into credit aggregation in Africa and Online Development Bank creation does not come without risk to the technology firm engaged. Technology firms pioneering this space will necessarily encounter moral hazard, namely that those who seek to access credit may not be worthy of such credit, and may choose to only disclose certain positive information in an attempt to circumvent the system, or that online transaction platforms could engender increased fraud. Additionally, determining predictive indicators of credit worthiness and sourcing emerging markets data sources in it will prove difficult. There would be political challenges associated with accessing and sharing financial data, and privacy considerations would be salient in obtaining, aggregating, and disclosing individual credit data. Depending on the technology firm's previous role in the market, there could also be conflicts of interest and scope-creep in their business.

As such, while opportunities are far reaching, they will likely require the collaboration of both public and private firms conjoining, balancing constraints and incentives, to provide greater capital availability for SME entrepreneurs in Africa. Foundations and independent public organizations should help co-fund research in the area related to indicators of credit-worthiness. Such organizations should provide the initial evaluation of markets across the African continent with the highest levels of technology penetration or high-connectiv-

ity that would facilitate quick aggregation of credit data, or should evaluate statistical correlation between predictive indicators and real credit worthiness. Independent multivariate regression analysis could help define a fungible risk model that takes into account extant predictive indicators in Africa that are more widely available than banking and institutional financial data alone. Such a model, with empirically tested correlation between non-financial indicators and real credit-worthiness, could be applied – with circumspection, and aware of cultural differences – across the African continent. This would provide a new basis for financial market counterparty risk assessment, decreased transaction costs for lending institutions, decreased profitability thresholds for lending, and expanded credit for borrowers, allowing the spirit of entrepreneurship to freely expand innovation and change.

If such collaboration can be made possible, windfalls of value creation will extend beyond the financial sector, beyond the technology firm, beyond the entrepreneur, and beyond the present; such collaboration will accelerate business development that will empower entrepreneurs to become the African heroes of tomorrow. ■

- Carol Gallo served as lead editor for this article.

NOTES

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[2] Small Enterprise Assistance Funds, "The Development Impact of Small and Medium Enterprises: Lessons Learned from SEAF Investments, Report, Small Enterprise Assistance Funds." (2004)
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