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Paths to viability

Transnational strategies among Ghana's small-scale ICT entrepreneurs

Linnet Taylor

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- analyse migration as part of broader global change
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Abstract

This paper uses fuzzy-set qualitative comparative analysis (fsQCA) to investigate the relative importance of mobility in the formation and viability of the internet cafes that are responsible for most local internet access in poor countries. It is based on a study of Ghanaian commercial internet cafes, the majority located in the country's remote northern regions, with a second group of cafes studied in the capital city, Accra. The findings presented here demonstrate that while international mobility is typically a strategy available to the better-off, it nevertheless benefits younger and less advantaged entrepreneurs disproportionately in terms of their return on investment. Furthermore, both migrant and non-migrant cafe owners in Ghana are using transfers from abroad of all kinds, especially physical capital and knowledge, to create and sustain their businesses. The study also shows that for those whose presence in the sector is marginal and precarious, i.e. the owners of the smallest businesses and the younger and poorer entrepreneurs, these transfers represent an essential strategy in maintaining a viable enterprise.

Keywords: migration, QCA, entrepreneurship, Africa, ICTs, internet

Author: Linnet Taylor, Institute of Development Studies; email: ltaylor@ids.ac.uk

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Contents

1 Introduction: examining the uses of migration among small and medium ICT enterprises

A huge amount of policy attention has been directed towards what is termed the 'digital divide': the fact that in most poor countries there is little or no connectivity and the flow of information and communications is severely limited. This work is often framed as consisting fundamentally of a poverty agenda, with the underlying assumption that if the 'divide' can be 'bridged', there will be less poverty and inequality (UNCTAD 2008). However, there is little or no evidence so far that bridging the digital divide will reduce poverty, and some that it may in fact increase within-country inequality (Van Dijk and Hacker 2000; Robinson et al. 2003). Furthermore, given that the equipment and skills needed to diffuse information and communication technology in poor countries may have to come from abroad, many of the real processes and benefits of that diffusion may be closely tied to international mobility, something that has not been considered by policy makers.

The demographics of Information and Communication Technology (ICT) use are, however, changing in the developing world. As ICT infrastructure is slowly extended into poorer areas, internet cafes have become important players in the first stages of general internet access. However, empirical studies have so far mainly focused on the extension of connectivity via nonprofit and donor organisations (e.g. McCormick 2002; IICD 2008), so that local, small-scale commercial provision has been neglected.

These small-scale entrepreneurs negotiate various challenges in providing connectivity, chiefly in the areas of infrastructure, skills and resources. This paper deals with the skill and resource gap, and analyses the way internet cafe owners are using migration and transnational social capital as a strategy to access what they need. Using data from a survey of internet cafes in poor and remote areas of Ghana, it traces the mobilities – primarily working abroad and international networking – which enable entrepreneurs to acquire the knowledge, hardware, software and capital needed to start an internet cafe, and analyses the continuing use of these various strategies for the viability of the businesses after formation.

This acquisition of knowledge and skills was demonstrated by Polanyi (1966) to be partly a process of gaining tacit knowledge, a concept later developed by Blackler (2002), who suggested a distinction between 'embodied', 'embrained', 'encultured' and 'embedded' knowledge, positing that the first two types can be gained by being in the presence of the teacher or practicant, but that the latter two are 'grounded in shared understandings... and are socially situated'. This view implies that knowledge and skills cannot be learned without cultural embedding, i.e. a level of integration beyond the purely economic, on the part of the migrant. In contrast, this paper posits that entrepreneurs need not integrate and work for long periods abroad, nor do they even have to spend their time abroad in the IT business, in order to gain skills that enable them to increase their productivity as entrepreneurs in the internet cafe sector after their return. This is more in line with Williams (2007), who incorporates migration in these theories about knowledge, and suggests that wherever migrants are involved in productive activity in the destination country, there is the potential for knowledge transfer.

The paper will argue that physical mobility, international networking and remittances play a central role in the formation of small ICT businesses in poor and remote areas, and

that facilitating these international activities and connections among less-resourced and lower-profile ICT entrepreneurs deserves a place in the international development policy agenda. Furthermore, despite the fact that those with the least resources in poor countries cannot migrate, either because they cannot afford to (Skeldon 2002) or because they are denied visas since receiving countries believe they will not return, this paper will offer evidence that those who cannot migrate are nonetheless benefiting from the migration of others, and that via their transnational networks they are mobilising social capital that results in an inflow of ICT skills and resources to areas where they are otherwise unavailable, sustaining businesses that would not otherwise be viable.

This paper reports the results of an analysis conducted using fuzzy-set Qualitative Comparative Analysis (Ragin 2000), a non-statistical method for systematic analysis in social science. The main characteristics of this method are a non-probabilistic, combinatorial approach, and an ability to focus on diversity rather than most-common explanations. The latter is particularly useful in a small-scale cross-sectional study such as this, where existing theory is minimal or possibly inapplicable but the researcher has detailed case knowledge. In such a situation, where there is an advantage to conducting a systematic and rigorous form of analysis, QCA makes it possible to take into account outliers and deviating cases that might be important for understanding the phenomenon but would necessarily be excluded by a statistical approach.

2 Background

The internet cafes (all small or micro-businesses) that are the chief providers of internet connectivity on a local level in West Africa face a number of challenges. These can be broadly categorised into infrastructure, skills and market gaps. Infrastructural problems consist of an inadequate 'communications backbone' to physically provide broadband; unreliable electricity provision on the national level; and an underdeveloped financial infrastructure which leads to a lack of access to credit in this fledgling industry.

The broadband infrastructure in Ghana, the focus of this study, is still poor. It does not extend nationally, but instead covers the main cities of the south, with a single spur to the North to supply an area of approximately 100,000 km². Where service does exist, it is unreliable: over the six months during which this research was conducted, the internet cafes studied reported losing their broadband connection for an average of three days a week, and sometimes for two weeks or more at a time, without compensation from the provider, the latter constituting a shock big enough to cripple a subsistence business.

An underdeveloped financial infrastructure in Ghana also means that credit cards are virtually unavailable to non-elites, so that purchasing software such as antivirus programmes is impossible. Hardware is also hard to come by, especially in the north: new computers are subject to heavy import taxes, so that 1997-vintage computers with Pentium II processors are standard, bought second or third-hand at the national port 700km away.

Knowledge and skills are equally hard to acquire. The Accra area is seeing an upsurge in private IT colleges, but the regions studied in the north have an average literacy rate of 29 per cent, ranging as low as 9 per cent in some of the areas covered by this study (Ghana census 2005). The three northern regions (the Upper East, Upper West and Northern), comprising about half the country's territory, do not have a single institution teaching commercial cafe operators how to network, programme or repair computers. It is especially

interesting, given this dearth of literacy and computer skills, that all the internet cafes surveyed for this study were full of customers even in the most remote and poor areas: it suggests that the entrepreneurs studied know more about the potential market than the national communications provider.

In fact, internet uptake rates seem to indicate that the idea of connectivity may be driving internet diffusion in Ghana as much as the availability of functioning hardware or connections. The country's user-to-subscriber ratio was 28:1 in 2007 (ITU 2008), compared to the United States' 3:1, suggesting that the desire to be online has spread much faster than either hardware or connectivity, and that most of this market is being captured by small-scale internet cafes. A comparison of Ghana with Malawi, whose user-to-subscriber ratio was just 1.6:1 over the same period (*ibid.*), suggests that Ghanaians may be particularly motivated to get online. All of this suggests that when thinking about ways to study the emergence and diffusion of ICTs in poor areas, it might be important to look beyond the physical and regulatory infrastructure that is so often the focus of IT policy makers and donors (e.g. UNCTAD 2003). The next section will outline the methodology used to collect data on these cafes, and the transfers of knowledge, software and hardware that enable them to exist in this tough business environment.

3 Methodology

This study faced two major challenges in terms of data collection. The first challenge was finding the businesses in question. This was problematic due to the lack of a sampling frame: the last survey to categorise small-to-medium enterprises (SMEs) in Ghana was conducted by the World Bank in 1997, when internet cafes could not yet be distinguished as a group of businesses – and internet cafes in the north, like most enterprises there, operated mainly as informal businesses. The second challenge was gathering accurate data on profit, expenditure and revenue, given the small size of the businesses and the frequent lack of standard business skills and practices among entrepreneurs.

The approach adopted was a cross-sectional survey to gather data on different levels and in a variety of locations. First, a census[1] was conducted of the internet cafes across the entire northern area of Ghana, comprising the Upper East, Upper West and Northern regions. The study gathered data in 68 cafes operating in the region at the time, defining an internet cafe as any for-profit enterprise where customers could pay to browse the internet. Cafes were located by a process of working outward from the regional capitals, using information from local cafe owners to find other cafes and check that all those known had been included. The research was conducted with the help of local assistants in each area who worked in the sector and could help locate each of the cafes and translate where necessary.

To find the rural and remote cafes, the main criteria used were the availability of electricity and the presence of a customer base, which ruled out the smallest and most remote settlements. Each remote cafe was asked which was its nearest competitor, and so

[1] No census is completely accurate. It was later discovered that two cafes had been missed, because the owner had actively avoided identification by this study. Awareness of these missing cases, however, suggests that overall the study can be argued to be a census of the northern cafes.

on. Rural people were also asked where they went to get online, and whether they had a choice of locations.

It is important to stress that this study did not include telecentres (nonprofit ICT centres run by local government, religious organisations or NGOs), since the research question was whether international mobility was a factor in people's ability to run a commercial business. Thus this study does not represent a complete survey of sources of connectivity in the north of Ghana; rather, only of the commercial enterprises involved in providing it. Numerous church and NGO-run internet cafes were not included, although they too represent an important resource for internet users in remote areas.

Another factor that aided in performing as complete a study as possible was that the internet cafe business in Ghana is highly competitive, so that owners tend to know their local competitors. There is also little technical support available in the north of Ghana, so that the most highly skilled owners tend to offer their services locally to fix hardware or connectivity problems, and are most likely to know where other cafes are located. Those in remote areas who can only connect to the internet via satellite or GPRS modem tend to know the others who do so, due partly to these collaborations, but also to the search for an affordable provider.

Finally, a sub-sample of 27 more cafes was surveyed in Accra, the capital city, in order to provide data to explore whether differences in business outcomes were based on location (i.e. proximity to better connectivity, more international culture and sources of imports), or whether internet cafes all over Ghana were subject to the same challenges and opportunities. The cafes surveyed in Accra represent all those operating in two subdivisions of the city, Adabraka and Kokomlemle. The choice of subdivisions was purposive in order to avoid the presence of expatriates or of migrants from the north of the country, who tend to group together in certain areas of the city. This choice was based on the zones' demographic characteristics according to the 2000 Ghana census and according to direct observation.

Interviews were conducted in English, with the help of a local translator where necessary. The survey contained three sections: the migration history of the owner and manager or partners and details of any family, friends and associates who sent resources from overseas; the assets, expenditure and profits of the business; and membership in any associations relating to the business. Owners were also interviewed in greater depth about their business problems and problem-solving strategies, and their perceptions of their relationship to the global IT industry.

The second problem, that of the reliability of the data gathered, was addressed by a mixed methods approach that combined a formal, structured questionnaire for purposes of comparability and unstructured interviews, both to probe entrepreneurs' understanding of the financial aspects of their business, and to go deeper into their migration history and the international aspects of their enterprise. Uncertainty in identifying profit or loss was addressed by breaking down revenue and expenditure into shorter time periods such as a day or a week, asking about the seasonality of the business, and thus arriving at average figures.

It is also important to note that international travel, rather than migration, is the factor analysed here (although a majority of the internationally mobile also fit within the United Nations' official category of migrant, i.e. a stay of longer than three months for short-term migration, or a year for long-term migration (United Nations 1998)). This is due

to the working assumption that the benefits relevant to business formation and sustainability accruing from international travel do not require a six-month stay to pick up, and in fact may be transmitted in much less time.

The data was first subjected to exploratory analysis to determine the key relationships between groups according to age, size of business and uses of migration and networks. Next, these findings were used to inform a fuzzy-set Qualitative Comparative Analysis (Ragin 2008a). As a non-probabilistic analytical method, QCA allows the researcher to treat the cases studied as constellations of strategies and characteristics, each of which may be either necessary or sufficient, alone or in combination, for the outcome in question. It traces the effects of particular combinations of factors, and offers ways to deal with a lack of diversity in the data. It is relatively common in comparative social science research, as is done in this analysis, to use exploratory statistical methods alongside QCA (e.g. Skaaning 2005). The statistical methods (which in this case were limited to frequencies and simple tests of significance) make it possible to form a dialogue between different methods that can display both the strengths of existing theories and identify, test and hopefully explain their weaknesses.

Going beyond simple statistical analysis, the main advantage of QCA as a method is that it makes it possible to investigate the effect of factors both alone and in combination – known as 'conjunctural causation' (Ragin 1987) – and, in contrast to statistical modelling, retains a case-study level of detail throughout the process, constantly referring back to the characteristics of individual cases in the search for combinations of causal factors. A second advantage is that QCA incorporates an assumption of equifinality – that different combinations of factors can lead to the same outcome – and therefore enables the researcher to explore multiple configurations in a non-exclusive way. This is very different from statistical analysis, which aims to single out causal factors (or combinations of factors that are hypothesised to work together to produce an outcome) in a search for those with the greatest likelihood of being causal a majority of the time. This method leads to the exclusion of interesting but smaller-scale explanations, aiming to sacrifice diversity for explanatory power. QCA, in contrast, is designed to help researchers understand the level of diversity in their data,[2] and is appropriate where the researcher has a detailed level of knowledge of his or her cases that will help to calibrate the models used as finely as possible. Because the method relies on finely tuned calibrations that determine set membership, much depends on having not only detailed case knowledge, but a clear hypothesis based on knowledge of the social reality that forms the environment for those cases.

The research design was from the start based on a comparative approach. This was for several reasons: first, because this was the first micro-level study of internet cafes in Ghana to look at them as businesses, rather than at their users. It was also the first to take a mobility perspective, i.e. the assumption that various forms of mobility might be an important contributor to business formation and viability. Both these factors argued for an in-depth, case-study approach that would give as full an account as possible of the processes and factors at work in this sector. Second, and related to this, the comparative

[2] QCA software asks the researcher to set their target level of diversity, offering either to list every configuration leading to the outcome in question (referred to as a 'most complex' solution), or to reduce this using Boolean minimisation to a shorter, more 'parsimonious' set of configurations.

approach was adopted because the obstacles to gathering data for the project (primarily the remoteness of the businesses and the lack of a sampling frame) meant that it would be easy to miss important factors, or to misinterpret local perspectives on business or mobility, if a detailed, multi-faceted inquiry was not conducted. These factors made it possible to do a comparative analysis on a micro level, with in-depth knowledge of each case – something which is important but rare in comparative methodologies.

Thus the interview structure was planned to be as wide-ranging as possible, with the idea of creating fuzzy variables from various dimensions of business practices, background and viability. The data collection phase justified the choice of a comparative approach, since the diversity of the businesses gradually resolved into more or less distinct sets of enterprises: those owned by young and new entrepreneurs versus older and more established ones; those involving actual long-distance mobility by the owner, versus those where mobility was an important factor but by proxy; and several other groupings that proved useful in forming sets for comparative analysis. Finally, it also became clear in the course of the research that the viability of these businesses (perhaps even more so than more established sectors in Ghana) was determined on two levels: by a range of highly contingent strategies such as mobility and overseas connections, but also by the inherent characteristics of the entrepreneur, his competitors, and the available infrastructure. Thus the data lends itself to a form of analysis that can focus in detail on a diversity of starting conditions and the multiple paths taken to the outcome of viability. The census approach to case selection also indicated the potential utility of a comparative approach to analysis, since as Olsen (2010) points out, the use of a whole population rather than a random sample radically reduces the analytical power of significance levels as used in probabilistic analysis.

Building a QCA model involves developing a hypothesis about which conditions are important in explaining the outcome and calibrating the variables accordingly into fuzzy sets denoting membership, or lack of it, in each condition as operationalised. The 'crisp set', binary version of QCA involves dichotomising cases as either fully members or fully non-members of a given set. An example, where cases consist of individuals, would be the set of 'university-educated' people or 'politically active' individuals. In contrast, the fuzzy-set version of QCA (here referred to as fsQCA) allows a more nuanced calibration of these factors, placing cases 'more in' or 'more out' of a set of membership in a particular condition on a scale from 0 to 1. An example would be the set of 'religiously affiliated' individuals where, if detailed data was available on subjects' views, one might wish to denote more complex degrees of affiliation ranging from no religious activity to intense involvement. Both forms of QCA can be conducted using relatively simple software which can be downloaded free.[3] fsQCA software was thus used to calibrate and analyse the variables used below. Further details of the method's assumptions regarding causality and the measures of sufficiency, necessity and consistency can be found in Ragin (1987; 2000), and examples of its use as part of a mixed-methods strategy for the analysis of data to do with migration and mobility include Takenoshita (2009) and Mengeot (2003).

[3] The software is available at www.u.arizona.edu/~cragin/fsQCA/software.shtml

4 Exploratory analysis

The first issue that became apparent in analysing the data was that, despite the relative remoteness of the northern group in particular, one important factor in grouping the cases would be a history of international mobility (see Table 1). A total of 66 per cent of the business owners or partners had travelled outside Ghana, and 43 per cent had been outside Africa.

Table 1: International mobility among the entrepreneurs studied

Mobility	Number	%
No international mobility; limited internal mobility	5	5.2
Internal mobility (stay of longer than 6 months)	28	29.5
Mobility within Africa (any length of stay)	21	22.1
Mobility outside Africa (any length of stay)	41	43.2

Destinations beyond Africa were principally the US and Europe, but many also travelled, or were aspiring to travel, to China and other Asian destinations. This travel was generally for trade or work reasons. All those who had not yet travelled expressed the hope to do so in the future. The respondents who had travelled internationally had almost all done so independently of any organisation or programme. A few had been deported, but most had returned voluntarily. None had been part of a formal return programme.

The main hypothesis of this project, that international mobility would have a positive impact on IT entrepreneurs' businesses, is not initially supported by the data. Those who have travelled, whether outside Ghana or outside Africa, do not show a higher level of expenditure, profit or return on investment (ROI) than those who have not. Given the potential for selectivity bias common to migration studies and explored by Gibson et al. (2006), we might expect to see migrants doing better overall, and attribute this to a higher level of starting capital, both human and financial. However, there appear to be more nuanced dynamics at work here, as becomes apparent when the cases are broken down according to activities outside Africa and age.

The exploratory analysis found that working outside Africa is associated with higher profits. Those who have done so make a higher net profit than those who have not, with a median of 219.5 cedis per month (USD 152.77) to the nonmigrants' 115 (USD 80.04).[4] This difference could be attributed simply to having the money to travel, and therefore to put into the business as well, except that those who had travelled outside Africa were also more likely to keep accounts,[5] which is an important factor in building a business beyond the micro level (Frese 2000) and one that may point to some degree of causality in terms of migration increasing people's skills and increasing efficiency.

One of the more interesting points to emerge from the initial analysis is that entrepreneurs' employment outside Africa does not have to be in IT in order to provide benefits to their internet cafes: most of those who had travelled had been exposed to

[4] This was confirmed with a t-test to check that the difference in means was significant *(two-sample t (df 84) = 1.5677, p = 0.1).*

[5] This finding was confirmed using a chi-square test, which determines whether the difference between two groups is greater than is likely to occur by chance *($\chi 2(1, N = 95) = 7.10, p < .01$)*

different cultures and work practices, but almost none had gained experience specifically in the IT field.

More interesting differences emerge when the group is categorised according to age. The youngest are here grouped with those who lacked a high school qualification and therefore may suffer similar disadvantages in a society that privileges maturity and status. This young/less-educated group receives more of a boost in terms of profit than their older peers[6] from working abroad,[7] and more importantly, registers a more-than-twofold increase in return on investment.[8] This younger group were more likely to be running businesses less than two years old *($\chi 2(1, N = 95) = 4.04, p = 0.04$)*, although both age categories could be assumed to have a roughly similar likelihood of running a longer-established internet cafe. This is partly because the 'younger' group is defined as those up to 30 years old, but mainly because of the relatively recent availability of the commercial internet in the areas studied for this project – only six of the 96 cafes surveyed were established before 2004, meaning that the group had entered the sector in the boom immediately following the introduction of broadband just when competition became fiercest and entrepreneurial skills most important. They were also more likely to be running the smallest businesses in terms of expenditure,[9] and so were at a disadvantage in a region where the internet cafe business privileges access to capital and hardware over technical skill. No matter how skilled the technician, having to make 1997-vintage computers work in tropical conditions is a business disadvantage when a competitor can access flat-screen, heat-tolerant monitors and new hard disks. Among the majority who cannot, however, entrepreneurial skills such as the ability to keep accounts and plan ahead offer a competitive edge. Thus the increase in ROI seen among those travelling to work abroad suggests that they are making up for this material disadvantage by learning skills that improve their efficiency and make the most of the resources they have.

Indirect mobility was also an important factor, particularly for the majority (57 per cent) who could not afford to migrate, or who could not access a visa. These entrepreneurs reported receiving remittances of money, equipment or knowledge from a family member (the most usual source of remittances), a friend or associate, or even a visitor to Ghana whom they had only met briefly such as a foreign volunteer or NGO worker. Most reported gaining technical knowledge, many from people they had only met online.

Entrepreneurs described two main benefits of migration: first, education, and second, sourcing goods that could not be obtained in Ghana. This was to some extent dependent on their migration history. Those who had not yet travelled abroad perceived migration as necessary for skill development and business know-how, while those who did travel perceived it as a way to access resources and equipment and to get around market failures in Ghana. Many also described migration as a way to learn new ways of doing things and,

[6] Again, this finding was confirmed with a chi-square test *($\chi 2(1, N = 95) = 3.14, p = 0.08$).*

[7] 'Young' here denotes under 30, a threshold based on interviews with older businesspeople who were asked at what age a business-owner is considered mature in terms of social status and other related factors such as access to credit.

[8] ROI here is calculated as monthly net profit as a percentage of expenditure. Those under 30 who had worked outside Africa had an ROI of 0.78 per cent, compared to 0.33 per cent among the older entrepreneurs. This was confirmed by a rank-sum test, a version of the t-test for data that is not normally distributed *(two-sample Wilcoxon rank-sum, $z=1.63, p = 0.10$).*

[9] This was confirmed using a chi-square test *($\chi 2(1, N = 95) = 4.68, p = 0.03$).*

more importantly, reconceptualise themselves as actors in the global tech sector. There was also a group who had gone into the internet cafe business as a strategy to help them migrate, usually for education.

Where they were occurring, transfers of technical and business knowledge were as likely to be from friends and associates as family members, indicating the value of weak ties to these enterprises. Predictably, capital transfers from abroad are primarily sourced from 'strong' family ties, while hardware transfers, which involve buying and shipping new computers, show less of an intra-family bias. This behaviour is in line with the 'strength of weak ties' theory developed by the sociologist Granovetter (1973): networking activities involving contacts not connected by kinship or other close bonds of obligation. Weak ties, Granovetter found, are most useful in transmitting new information and opportunities, since they form a more open network than the individual's close (and closed) community of strong ties. The poorer and younger entrepreneurs studied in this project were constantly seeking ways to use weak ties to identify ideas and opportunities and resources, since they lacked these within their local networks.

The next section discusses how fsQCA was used to further explore the comparative importance of international travel and connections.

5 fsQCA analysis: the comparative importance of mobility

The analysis above demonstrates that mobility is associated in important ways with business outcomes. However, the initial exploration detailed above reveals that several factors are notable for their absence: the literature on small businesses in Africa suggests that entrepreneurs' education level, access to credit (formal or informal) and professional networks should all be important in determining the viability of a business (e.g. Frese 2000; Nziramasanga et al. 2009). However, these do not emerge from the exploratory analysis, and do not appear to be associated with higher profits or return on investment. QCA is here used to investigate whether these factors are influential when they operate in conjunction with each other, or with the different degrees of mobility analysed above.

To do this, four ideal types were first created based on hypotheses about the factors making businesses viable. These were then used to generate QCA models. The first two are based on the process of breaking into the internet cafe business, as represented by having a cafe that is less than three years old. These new cafe entrepreneurs constitute 70 per cent of the population surveyed. Within this group of new cafes, there are two types of entrepreneur. First, there are those who have not travelled outside Africa (ideal type 1), and are therefore making the most of local factors to get a business advantage – mainly (according to the interviews conducted) building status in the community that will allow them to gain local allies and access credit to expand their businesses and survive shocks. The second group of cafes (ideal type 2), which constitute 55 per cent of businesses three years old or less, are those whose owners have travelled outside Africa, or who have contacts who do so, and who are thus drawing resources and knowledge from more technologically advanced areas.

The second pair of scenarios involves the likelihood of a business breaking even. Here, similarly, the entrepreneurs are grouped into an ideal type (#3) where they are using local resources to make their businesses viable, and another (#4), where the owner employs international mobility and contacts in order to gain a competitive advantage. These four

ideal types were translated into four models, as demonstrated below. The calculations used will be explained in some detail for the first model, but for a fuller explanation of the procedures involved in the computation of a fuzzy-set QCA analysis, see Ragin (2008b). It should be noted that three types of QCA analysis currently exist: crisp set QCA (which uses binary values); multi-value QCA and fuzzy-set QCA. The models presented here make use of the first and last types, in some cases within the same model. This is possible because the software used, fsQCA,[10] can be used equally for both the binary and fuzzy-set versions of the analysis.[11]

Model 1: Businesses established less than three years ago, without mobility as a factor

This model is designed around an ideal type where new entrants to the field are using existing resources to set up their enterprises. Thus the factors included are having at least one pre-existing business, having another salaried job (i.e. one providing security and possibly savings to invest productively), access to formal credit, and access to informal credit. All the variables used in this first model are dichotomous, i.e. binary, in their construction.

Table 2: Variables used in model 1

Variable	Type	Description	Rationale
Business not older than 3 years	Dichotomous	OUTCOME VARIABLE	Defines a group of new entrants to the sector
Other enterprise	Dichotomous	Is the business part of a group owned by the same person	Those who are already doing business are looking for opportunities in new sectors
Other salaried work	Dichotomous	Does the respondent/owner have an unrelated salaried position	Public sector workers may seek to grow their savings through entrepreneurship
Formal credit	Dichotomous	Has the business ever benefited from a bank loan	Literature suggests formal credit is a key factor in SME formation
Informal credit	Dichotomous	Has the business ever benefited from another type of loan from an organisation	Same rationale as formal credit

The next step is to create a 'truth table' (Table 3) containing every possible logical combination of the variables used in the model, and the outcome with which each is associated. The last three rows here are 'logical remainders', combinations that are possible

[10] fsQCA software can be downloaded free at http://www.u.arizona.edu/~cragin/fsQCA/software.shtml

[11] This is because the process of fsQCA analysis allows for the use of 0-1 as well as fuzzy variables, taking 0 and 1 in this case as expressions of full non-membership and full membership respectively.

but were not observed. The truth table displays all the combinations of conditions that are sufficient, or may be sufficient, for the outcome to occur.[12]

Table 3: Truth table: Model 1

Other enterprise	Other salaried	Formal credit	Informal credit	Number	Cases where outcome (Y = not older than 3 years) occurs	Cases where outcome (Y = not older than 3 years) does not occur	Consistency	Outcome = not older than 3 years
1	0	1	1	1	1	0	1.000000	1
0	1	0	1	1	1	0	1.000000	1
0	0	1	1	1	1	0	1.000000	1
1	1	1	0	2	2	0	1.000000	1
0	1	1	0	3	3	0	1.000000	1
1	1	0	0	6	5	1	0.833333	1
1	0	0	1	5	4	1	0.800000	1
0	1	0	0	14	11	3	0.785714	1
0	0	0	0	26	20	6	0.769231	1
1	0	0	0	24	14	10	0.583333	0
0	0	0	1	4	2	2	0.500000	0
0	0	1	0	4	2	2	0.500000	0
1	0	1	0	2	1	1	0.500000	0
0	1	1	1	0				?
1	1	0	1	0				?
1	1	1	1	0				?

The term 'consistency' in the truth table refers to the extent to which a causal combination is representative of the argument being tested. It can be expressed by the following formula:

Consistency (Xi ≤Yi) = ∑[〖min (X_i,〗 〖Y_i)〗]/∑(X_i)

where 'min' denotes the lower of the two values, X is membership in a particular combination of factors, and Y is degree of membership in the outcome. Thus when all the instances of a combination X also show outcome Y, the consistency score is 1, but when a few 'near misses' (Ragin 2008a: 134) are present, the score will fall slightly below 1.[13] When many inconsistent scores are present, the score will be even lower. The researcher then determines the level of consistency score (the 'consistency cutoff point')[14] at which she will

[12] Due to limited diversity in the dataset, the final rows represent combinations which could lead to the outcome but were not empirically observed. These 'logical remainders', marked '?' in the truth table are in this case excluded by the choice of consistency threshhold.

[13] To take the example of line 6 of the truth table (Table 3), the consistency score is arrived at by dividing the number of instances of the combination in question (X) where the outcome (Y) is present (i.e. 5) by the number of instances of combination X throughout the dataset (6), yielding a score of 0.833333.

[14] The consistency cutoff point is chosen by the researcher, but is guided by the convention of regarding cases with less than 0.75 consistency as representing 'substantial inconsistency' (Ragin 2008b).

use a given combination as potentially 'explanatory' in the analysis, and sets the outcomes to 0 for cases falling below this score, so that they are not included in the Boolean minimisation process used to calculate the solution terms (Table 6).

A QCA analysis also involves testing all the individual conditions for *necessity* (Table 4) to check whether one is a perfect fit with the outcome and should therefore be excluded. For instance, if Ghana had recently passed a law stipulating that only those with other salaried work could own an internet cafe, this condition would show up at this point as 'necessary' to the outcome and would need to be excluded from the analysis. We should note that when testing for necessity, consistency and coverage are calculated differently (see Table 5 for a disaggregation of this difference in calculations). In this case, no condition offers a perfect fit with the outcome.

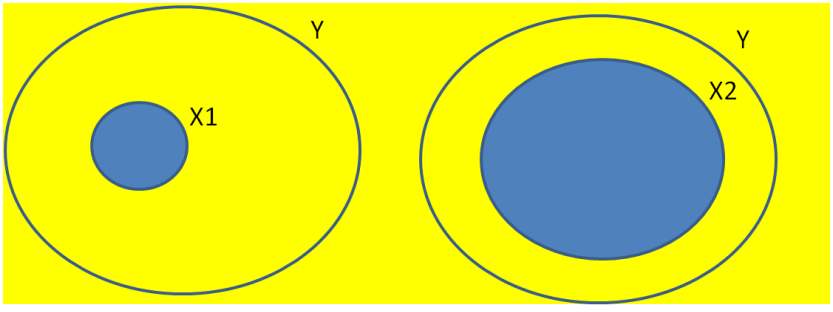
Table 4: Analysis of necessary conditions: Model 1

Outcome variable: Business not older than 3 years		
Conditions tested	Consistency	Coverage
other enterprise	0.402985	0.675000
other salaried	0.328358	0.846154
formal credit	0.149254	0.769231
informal credit	0.134328	0.750000

Given that no single condition is necessary, the analysis therefore moves next to a minimisation of the combinations in the truth table, in a search for the *combinations of conditions that are sufficient for the outcome to occur*. This is performed using an algorithm for Boolean minimisation to reduce all the possible combinations to their simplest expressions, or 'solution factors'. These, taken together, form a 'solution term' which can explain all the instances of the outcome.

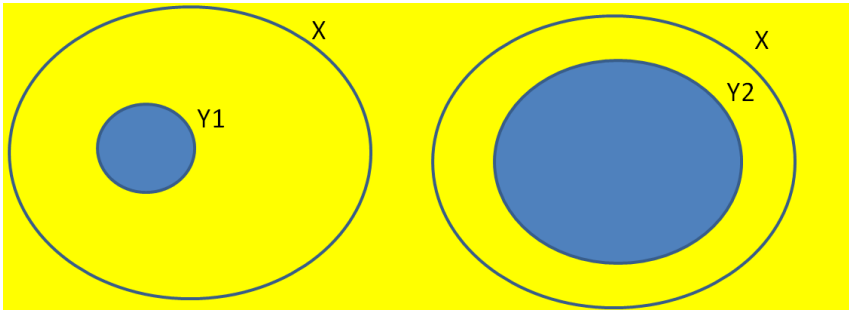
This procedure of testing for *sufficient conditions* also involves measures of coverage and consistency. When we look at sufficient conditions, the consistency level denotes the degree to which each path (X) is a subset of Y, the outcome. Figure 1 shows this: X1 shows a low level of consistency, such that we only rarely see path X and outcome Y together, while X2 shows much higher consistency, being present in most instances of the outcome.

Figure 1: Consistency in the case of sufficient conditions



Coverage, in the case of sufficient conditions, denotes the extent to which the outcome is a subset of a given path. Figure 2 below demonstrates this: the first diagram shows low coverage where cases of the outcome, Y1, are only a small share of cases showing path X. The second shows high coverage, where most of the time when we see the outcome, Y2, we also see instances of path X.

Figure 2: Coverage in the case of sufficient conditions



Thus, a solution term's *consistency* level speaks to its contextual accuracy: where we find the outcome, do we find the condition? In contrast, the term's *coverage* level denotes its empirical relevance: where the condition is present, can we reliably expect to find the outcome?

As noted above, these two measures operate differently in the tests of necessary and sufficient conditions, as can be summarised in Table 5.

Table 5: Necessity and sufficiency

	Necessity	**Sufficiency**
Consistency	Y as a subset of X	X as a subset of Y
Coverage	X as a subset of Y	Y as subset of X

Table 6 shows the solution terms for this model. Boolean syntax is used so that * denotes the logical AND, while ~ denotes the logical NOT. Here the measure of coverage is split into two more exact terms: 'raw', where the solution term may overlap with others in explaining the outcome, and 'unique', which denotes the extent to which cases of the outcome involve that term alone (see footnote for how to calculate these terms).

The first three solution terms, which involve various forms of capital generation, show high consistency but low coverage. This suggests that although these conditions are often characteristics of the new businesses studied, they do not do a good job of explaining the specific characteristic of *recent entry* to the sector. In contrast the last term, which shows businesses with much less access to capital through loans or related enterprises, shows higher coverage and therefore greater relevance to the question. Who are these entrepreneurs, and what are they using instead of locally generated capital? The relatively substantial number of businesses involved, 31, suggests that this fourth path is worth investigating using a different model.

Table 6: Model 1 solution factors

Model 1	Business 3 years old or less =f(other enterprise, other salaried, formal credit, informal credit)				
Consistency cutoff:	0.769231				
Results:		Number of cases	Raw coverage[15]	Unique coverage	Consistency[16]
Solution factors:	1. Other salaried	22	0.328358	0.164179	0.846154
	2. Other enterprise * informal credit	5	0.074627	0.059701	0.833333
	3. Formal credit * informal credit	2	0.029851	0.014925	1.000000
	4. ~Other enterprise * ~formal credit * ~informal credit	31	0.462687	0.298507	0.775000
Solution coverage:	0.716418				
Solution consistency:	0.813559				

Model 2: Businesses younger than three years involving mobility

A second model was run to explore the idea that this fourth group from Model 1 is using other means than credit, stable income or local standing to advance their business interests. The outcome variable is the same: being in the sector three years or less. This time, the factors included were those suggested by the exploratory analysis, according to the ideal type involving entrepreneurs who are young and/or uneducated, lack status, and are therefore trying to use international resources to replace those that are lacking locally. Unlike the first model, this one uses a combination of fuzzy and dichotomised variables (Table 7): the young/uneducated group is captured by a dichotomised variable, while the potential solution factors (having a high number of non-Ghanaian contacts outside Africa, receiving inputs from outside Africa, being young or uneducated, and migrating outside Ghana) are expressed as fuzzy sets. The migration variable is calibrated to give greater importance to migrating to an OECD country outside Africa, based in particular on recent work by de Vreyer et al. (2010) which found significant returns to this type of migration in

[15] The number of cases with the outcome (Y) is 67. Thus the 'raw coverage' score is obtained by dividing the number of cases in each configuration by the total cases showing the outcome, and 'unique coverage' by dividing the number of cases showing the outcome by those which involve that term alone.

[16] The 'consistency' score is determined, as in the truth table, by dividing the number of cases where the configuration and outcome are both present by the overall number showing that configuration.

terms of entrepreneurial productivity. For an explanation of the theory behind, and the process of, calibrating fuzzy variables, see Ragin (2010).

Table 7: Variables used in Model 2

Variable	Type	Description	Fuzzy set calibration	Rationale
Business not older than 3 years	Dichotomous	OUTCOME VARIABLE	N/A	Defines a group of new entrants to the sector
Migration	Fuzzy	Set of cases involving long-distance migration	Fully in = 3 (outside Africa), Neither in nor out = 1.9 (outside Ghana but within Africa), Fully out = 0.1 (internal or no migration)	Migrants who travel are more exposed to the potential commercial benefits of internet use, those going outside Africa most of all (NB the use of the 0.1 threshold weights the variable so that internal migration is taken into consideration)
Non-Ghanaian contacts	Fuzzy	Set of cases with a high number of non-Ghanaian contacts overseas	Fully in = 4.9 (the maximum observed value), Neither in nor out = 1.9 (more than one contact suggests purposeful international networking), Fully out= 0 (no contacts abroad)	Even if contacts are not yet contributing to the business, many businesses are seeking them in the hope of future contributions
Foreign inputs	Fuzzy	Set of cases that receive significant resources from overseas	Fully in = 1.9 (2 benefactors abroad suggests significant mobilisation of social capital), Neither in nor out = 0.9 (one contact may be a coincidence), Fully out = 0 (no contacts abroad contributing to the enterprise)	Interviews suggest entrepreneurs are seeking to gain and use social capital via international networking
Young/uneducated	Dichotomous	Is the business run by someone young and/or without a high school education	N/A	Those with relatively low social status will find it harder to do business in conventional sectors and may be seeking new venues for entrepreneurship

The truth table produced for this model is shown in Table 8 below. The last row of the table, as in the previous model, represents a *logical remainder* (Ragin and Sonnett 2005): a combination that is possible but is not empirically observed. This logical remainder is excluded from the eventual solution term, since case knowledge indicates it seems unlikely to occur. The truth table below shows that being young and/or uneducated is common to most of the cases of new entrants to the sector. Consistency values are less straightforward in this model because it involves causal conditions that are expressed as fuzzy sets, so that each case may have partial membership in every truth table row (Ragin 2005). The other factors that combine with this to produce the 'breaking even' outcome vary considerably, suggesting that strategies of mobility and of using contacts abroad are used both in combination and separately.

Table 8: Truth table: Model 2

Migration	Non-Ghanaian contacts	Foreign inputs	Young/ uneducated	Number	Consistency	Outcome = not older than 3 years
0	1	0	1	5	0.947020	1
0	1	1	1	12	0.882300	1
1	1	1	1	11	0.880928	1
1	1	0	1	1	0.876950	1
0	0	1	1	1	0.829268	1
0	0	0	1	7	0.820365	1
1	0	0	1	6	0.741935	1
1	0	1	1	3	0.729198	0
0	0	0	0	3	0.701183	0
1	0	0	0	3	0.674923	0
1	1	0	0	7	0.642923	0
0	0	1	0	4	0.639261	0
1	0	1	0	3	0.621905	0
1	1	1	0	22	0.557583	0
0	1	1	0	5	0.543507	0
0	1	0	0	0	?	?

Table 9: Analysis of necessary conditions: Model 2

Outcome variable: Business not older than 3 years		
Conditions tested	**Consistency**	**Coverage**
Migration	0.530746	0.677850
Non-Ghanaian contacts	0.564627	0.726522
Foreign inputs to enterprise	0.506567	0.688438
Young/uneducated	0.567164	0.826087

Table 9 shows that there were no single conditions that could be counted as necessary for the outcome. Thus the analysis moves on to a minimisation of the truth table (Table 10), which offers three solution factors. While these have low unique coverage, their raw coverage is noticeably higher than in the previous model, suggesting that mobility is indeed an important factor in entering the internet cafe business. The most common condition

among these new businesses is being young and/or uneducated, and the overlap between these factors (higher raw than unique coverage) shows that while most cannot travel outside Africa (1) and are not yet accessing foreign inputs (2), they are nevertheless building networks of non-Ghanaian contacts in the hope of generating inputs (3).

Table 10: Model 2: solution factors

Model 2	Business less than 3 years old =f(migration, non-Ghanaian contacts, foreign inputs, young/uneducated)				
Consistency cutoff:	0.741935				
Results:		Number of cases	Raw coverage	Unique coverage	Consistency
Solution factors:	1. ~ foreign inputs * young/uneducated	19	0.299254	0. 063731	0.827487
	2. ~ migration* young/uneducated	20	0.327164	0.022388	0.871571
	3. non-Ghanaian contacts * young/uneducated	20	0.328209	0.077761	0.903080
Solution coverage:	0.495224				
Solution consistency:	0.842346				

This model is interesting in comparison with the truth table (Table 8) above, because of the difference between the variety of paths indicated in the truth table and the minimised version of these combinations. The overlapping solution factors can be interpreted, with additional support from the interviews conducted, to indicate the overall unavailability of options rather than the freedom to choose different strategies – migration is impossible, foreign inputs (such as capital or equipment) are scarce, and non-Ghanaian contacts (factor 3) are not yet paying off. This is also reflected in the geographical distribution of the outcomes analysed in this model: the paths highlighted involve mainly actors from the north (30, as opposed to 7 from Accra), who have a lower rate of mobility outside Africa. While international contacts and mobility come up clearly in the exploratory analysis concerning this group, they are not clearly contributing to concrete achievements. This could be interpreted, with the help of the interview data, to suggest that transnational social capital is viewed as essential by those without the status to access credit locally, but is difficult to mobilise and may be of more use as a longer-term strategy.

Model 3: Businesses that break even and involve little international contact

From the process of entering the sector, the analysis now moves on to the outcome of breaking even. The third model includes formal education and sector-specific skills, which are important according to the literature on small business viability (e.g. Nziramasanga et al. 2009; Frese 2000), but which have not so far emerged as strong explanatory factors. Of the entrepreneurs surveyed, 74 per cent had a high school education or more, and 53 per cent of the businesses surveyed kept accounts. Regarding sector-specific skills, 38 per cent were

owned by entrepreneurs who also worked with varying degrees of formality as IT technicians.

Table 11: Variables used in Model 3

Variable	Type	Description	Fuzzy set calibration	Rationale
Breakeven	Dichotomous	OUTCOME VARIABLE	N/A	Does the business make a profit in an average month
Broad networks	Fuzzy	How varied is the owner/respondent's network of contacts	Fully in =3 (local, national, international), Neither in nor out =1.9 (national), Fully out =0 (respondent claims not to be professionally networked).	Those with the broadest range of contacts are most likely to be able to mobilise social capital in the form of resources and problem-solving help.
Formal education	Fuzzy	What is the highest level of education attained by someone responsible for the business	Fully in=3.1 (more than high school), Neither in nor out= 1.9 (attended but did not complete high school), Fully out= 0 (did not attend high school).	Ghanaian high schools teach in English, the language of the IT sector. Those with more than primary-school education can keep accurate accounts, pay back loans, read contracts in English.
Formal accounts	Dichotomous	Does the business keep accounts	N/A	Literature suggests formal accounts are key to SME viability
Technical ability	Dichotomous	Does the owner/ respondent have advanced technical skills	N/A	Do they have a sideline in repairing hardware, building websites or networking?

The variables used in this case, their calibration and its rationale are detailed in Table 11. 'Broad networks' was calibrated to give full set membership to those with the greatest variety in their networks (i.e. local, national and international) and non-membership to those who were least connected. 'Formal education' was calibrated to give those with a high school diploma or above full membership, and no membership to those without any

formal education, on the basis that first, the studies suggest this is important elsewhere in Africa, and second, that a high school education should improve entrepreneurs' level of English, and thus their ability to do business in a sector that privileges English language proficiency. Finally, keeping formal accounts and having technical skills that extend the business' human capital base are included as dichotomous variables.

Table 12: Truth table: Model 3

Formal accounts	Technical ability	Formal education	International networks	Number of cases	Consistency	Outcome= breakeven
0	1	0	0	4	0.944444	1
1	1	1	0	2	0.866035	1
1	1	0	0	6	0.818027	1
1	1	1	1	8	0.804389	1
1	1	0	1	8	0.799397	1
1	0	0	0	2	0.794549	1
0	1	1	0	1	0.78487	1
0	0	0	1	15	0.739131	1
0	1	1	1	5	0.728033	0
0	0	0	0	10	0.695332	0
0	0	1	1	5	0.684878	0
0	0	1	0	2	0.665686	0
1	0	0	1	10	0.621543	0
0	1	0	1	2	0.618474	0
1	0	1	1	9	0.554367	0
1	0	1	0	4	0.552448	0

Table 13: Analysis of necessary conditions: Model 3

Outcome variable: Breaking even		
Conditions tested	Consistency	Coverage
formal accounts	0.515152	0.693878
technical ability	0.439394	0.805556
broad networks	0.525455	0.689326
formal education	0.555455	0.682936

Table 14: Model 3 solution factors

Model 3	breakeven = f(formal accounts, technical ability, formal education, broad networks)				
Consistency cutoff:	0.739130				
Results:		Number of cases	Raw coverage	Unique coverage	Consistency
Solution factors:	1. accounts * technical ability	13	0.303030	0.170606	0.833333
	2. technical ability * ~ networks	20	0.208333	0.075909	0.859375

	3. accounts *~ education * ~ networks	8	0.130303	0.057424	0.807511
	4. ~ accounts * ~ technical ability * ~education * networks	15	0.123636	0.123636	0.739130
Solution coverage:	0.560000				
Solution consistency:	0.808222				

This model (Tables 11–14) shows an interesting and initially counterintuitive result, again describing mainly northern enterprises (33, as opposed to nine from Accra). As seen in the first solution factor, technical skills and accounting ability – which are associated with working abroad, as seen in the exploratory analysis – are involved in 13 of the cases showing the outcome. The second factor shows that in 20 cases, entrepreneurs can break even through technical skill despite a lack of networks.

The last two solution factors show a surprising result: formal education seems to contribute only by its absence. It is negatively implicated in each of the two factors, with networks and accounting indicated as possible substitutes.

In both the exploratory and the QCA analysis, this was the only way in which formal education emerged as a relevant factor for the small businesses studied. This finding differs from that of Nzimarasanga et al. (2009) whose study of self-employment in various sectors in Zimbabwe found that entrepreneurs' level of education was an important condition for business viability. However, the entrepreneurs in Nzimarasanga's study were all able to access loans, whereas only 14 per cent of those surveyed here had done so. This suggests that formal education's relationship to entrepreneurial success differs according to the sophistication of the business environment, and that where the environment is resource-poor, the ability to problem-solve and gather resources from elsewhere is more helpful than formal education.

Model 4: Businesses that break even and involve mobility

This fourth model, where entrepreneurs are able to migrate, is based both on the exploratory analysis and on the Transrede study of Ghanaian entrepreneurs (Black and Ammassari 2001), which showed that migrating for work is a source of new approaches and greater efficiency, and thus a higher likelihood of breaking even. It includes maturity as a variable since returnees tend to be older (de Vreyer et al. 2010), and incorporates the possibility that these cases will also show ongoing foreign inputs resulting from contacts made while abroad.

Table 15: Variables used in Model 4

Variable	Type	Description	Fuzzy set calibration	Rationale
Breakeven	Dichotomous	OUTCOME VARIABLE	N/A	Does the business make a profit in an average month
Migrated for work	Dichotomous	Has the owner/ respondent worked abroad	N/A	Any period spent working outside Africa enables people to learn different skills and approaches to business
Foreign inputs	Fuzzy	How many people are contributing from outside Ghana	Fully in = 1.9, Neither in nor out = 0.9, Fully out = 0	One foreign contributor may be a coincidence, but if a business is communicating with 2 or more people abroad, the owner may have been building a network by design
Maturity	Fuzzy	Are they senior members of their community	Fully in = born after 1929, Neither in nor out = born after 1978, Fully out = born after 1991	Entrepreneurs over 30 are considered mature, senior members of the community in terms of credit eligibility and association-building
Non-Ghanaian contacts	Fuzzy	Set of cases with a high number of non-Ghanaian contacts overseas	Fully in = 4.9 (the maximum observed value), Neither in nor out = 1.9 (more than one contact suggests purposeful international networking), Fully out= 0 (no contacts abroad)	Even if contacts are not yet contributing to the business, many businesses are seeking them in the hope of future contributions

Table 16: Truth table: Model 4

Migrated for work	Foreign inputs	Maturity	Non-Ghanaian contacts	Number of cases	Consistency	Outcome=
breakeven						
1	0	0	1	0	0.834559	1
1	0	0	0	3	0.818672	1
1	1	0	1	7	0.814709	1
1	0	1	1	4	0.801399	1
1	0	1	0	0	0.772080	1
1	1	1	1	16	0.743525	1
0	0	0	0	10	0.708888	1
1	1	1	0	3	0.698530	0
1	1	0	0	3	0.697226	0
0	0	1	0	6	0.689600	0
0	1	1	1	14	0.676450	0
0	1	1	0	4	0.654788	0
0	1	0	1	13	0.616848	0
0	1	0	0	1	0.613184	0
0	0	1	1	3	0.598520	0
0	0	0	1	6	0.554065	0

Table 17: Analysis of necessary conditions: Model 4

Outcome variable: Breaking even		
Conditions tested	Consistency	Coverage
Migrated for work	0.424242	0.777778
Foreign inputs	0.526667	0.705071
Maturity	0.498030	0.714255
Non-Ghanaian contacts	0.551061	0.698483

The logical remainder shown in line 1 of the truth table (having migrated for work and having non-Ghanaian contacts that are not contributing inputs) was not excluded because it was considered possible, given that there were observed cases involving work migration that had neither ongoing contacts nor inputs. Table 18 shows the solution factors for this model. First, there is a group of nine northern and four southern cases, for whom none of these factors are at work. The second term shows that another path involves having worked abroad, and having non-Ghanaian contacts and inputs resulting from those contacts. This solution factor is shared by ten northern and ten southern cases. Finally, the third solution involves being over 30, having worked abroad, and having non-Ghanaian contacts which may or may not be actively contributing resources, and involves 12 northern and 8 southern cases.

Table 18: Model 4, solution factors

Model 4	breakeven = f(migrated for work, foreign inputs, maturity, non-Ghanaian contacts)				
Consistency cutoff:	0.708887				
Results:		Number of cases	Raw coverage:	Unique coverage:	Consistency:
Solution factors:	1. ~foreign inputs * ~non-Ghanaian contacts * ~mature	13	0.222576	0.192576	0.739678
	2. migrated for work * non-Ghanaian contacts * foreign inputs	20	0.177879	0.041970	0.782667
	3. migrated for work * non-Ghanaian contacts * mature	20	0.170909	0.03333	0.749004
Solution coverage:	0.406515				
Solution consistency:	0.762216				

This suggests that those who can migrate build networks overseas that continue to operate after their return, and that, for those who are able to do so, migrating for work is an important path to the outcome of breaking even. Second, it suggests that the youngest entrepreneurs are unlikely to have these contacts or these inputs. Thus networks are built up over time, and do not always result in inputs. Those in the first group, who migrate for work, may not have such an immediate need for these inputs from their contacts abroad, but may instead be bringing back the technical knowledge, capital and hardware they need. Overall, this shows that migrating for work may have a powerful influence on entrepreneurs' skills and effectiveness after return, a finding that supports the conclusions of projects such as the Transrede study.

It is interesting that this model incorporates fewer northern cases (23) and more (16) from the Accra group than the previous models. This can be explained by the fact that it most explicitly involves factors related to travel outside Africa, which was more common among the Accra businesses (63 per cent, in contrast to 36 per cent of northerners). Model 2, in contrast, also looked at migration but covered mainly northern businesses and showed that among these, migration was important by its absence. This concurs with the findings from the exploratory analysis, where the cafes found to be using contacts abroad as a proxy for migration were generally northern.

Conclusion

Each of the models this paper explores shows high consistency levels but relatively low levels of coverage. The high consistency levels denote that the combinations of conditions chosen are common across a large proportion of the cases studied. However the low levels of coverage, and of unique coverage in particular, suggest that the there is no one factor, or combination of factors, that by itself can ensure success in this field. What is interesting, moreover, is that this is even more strongly apparent for those factors generally treated by the literature as central to micro- and small-business viability: credit and formal education.

Instead, this analysis offers a picture of an emerging business sector with a highly diverse population of entrepreneurs. There are many different backgrounds and strategies at play, and various different approaches are seen to pay off. Of these, two important ones seem to be maturity and status and their consequent access to capital and credit, versus youth and technical ability combined with contacts abroad to smooth over resource scarcities. However, the issue of mobility seems to cut across this diverse crowd of entrepreneurs, forming part of each differing strategy in different ways.

Overall this paper demonstrates, using a QCA methodology incorporating both crisp and fuzzy variables, that international mobility and networks are important catalysts for the formation and viability of internet cafes in the poorest regions of Ghana. The different combinations of conditions leading to the outcome of viability are examined, showing that one path involves largely domestic activity, while the other is more complex and international, and reflects the use of multiple mobilities ranging from migrating for work to international networking.

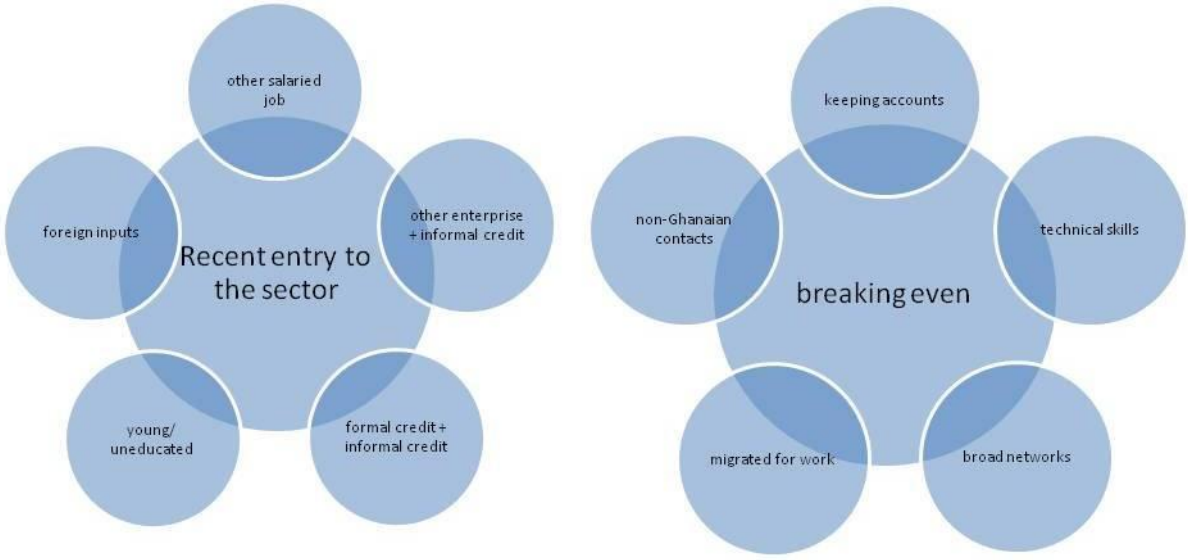
The analysis conducted here offers two new insights into the issue of small business viability in poorer regions of Africa. It is the first to investigate the importance of international mobility in the process of internet diffusion in these regions, and demonstrates that a significant level of provision is reliant on resources deriving from entrepreneurs' own travel or that of their contacts. Second, it brings into question whether some of the central assumptions about entrepreneurship apply to small-scale IT businesses such as internet cafes. It suggests that for entrepreneurs in very poor regions, the skills needed to become and remain viable in the IT sector are highly diverse, largely informal, and are more likely to be learned through international travel or transnational networking than from formal education.

Figure 3 shows the two main outcomes analysed with the paths indicated by the analysis. Formal education, which the literature highlights as an important factor in breaking even, appears less important than the gradual acquisition of technical and business skills through international networking.

Overall, the combinations of conditions explored in this analysis show that small-scale providers of connectivity in the Ghanaian market are adopting various strategies to seek inputs directly from abroad in response to infrastructural and market failures, and that there are multiple and widely varying paths to gaining the capital and skills that allow the provision of internet connectivity to remote and poor areas of West Africa. These transfers are no panacea: most of the businesses belonging to this group remained only minimally profitable despite them. However, while some can afford to stay home, migration and

international connections seem to be an important way of levelling the playing field for those who cannot.

Figure 3: Synthesis of conclusions



Migration is shown here to function in two distinct ways. Better-resourced entrepreneurs can afford to use international resources to build their businesses and acquire necessities that are unavailable or unaffordable within Ghana. Thus those who can migrate – specifically those who have worked overseas – run more productive businesses at home, confirming the findings of de Vreyer et al. (2010). In contrast, poorer and lower-status entrepreneurs can gain resources and opportunity if they can manage to travel internationally. These younger, poorer entrepreneurs are shown to be engaging in a form of international *bricolage*, where they network as widely as possible in as many fora as possible (online, in person with travellers, with institutions and with friends and family who migrate) in order to maximise their exposure to the international. Thus, despite the equal difficulty of travelling internationally and of accessing resources at home, the evidence offered here does suggest that international mobility and contacts constitute an important resource in this spartan business environment. There is a case for future longitudinal research to assess whether mobility is a resource that promotes profitability over the longer term, or whether it is merely a short-term response to market failures.

Although it is impossible to say what this sector would look like without its unseen but extensive and multidimensional international linkages, one can posit that a large proportion of businesses that are currently managing to break even and provide jobs, education and opportunity, often in rural or very poor urban areas, would simply be missing from the picture.

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