# Business and Human Development in the Base of the Pyramid: Exploring Challenges and Opportunities with Market Heat Maps

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| ARTICLE INFO | ABSTRACT |
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| Keywords:<br>human development, market access, Millennium Development Goals (MDGs), base of the pyramid (BOP)<br>JEL: C81, I31, O17 | Roughly a little under half of the world's population is mired in poverty, most in the developing world—about 3 billion people constitute the global base of the economic pyramid. Building on earlier work by Banerjee and Duflo (2007), this paper uses survey data from three countries in order to provideprovide a clear visualization of the spatial dimension of the economic lives of the poor and their access to markets. It develops a framework that could be used to map market inclusiveness, and then applies this to a number of markets that are critical to reducing poverty and increasing human welfare: water, credit and telecommunications. These "market heat maps" help to illustrate the extent of the challenges and in some cases reveal potential opportunities in growing more inclusive markets for the poor. |

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## I. Introduction

Roughly a little under half of the world's population is mired in poverty, most in the developing world—about 3 billion people constitute the global base of the economic pyramid or BOP (Figure 1).[1] Poor and low-income people represent a vast and largely untapped market for goods and services, as well as a potential source of entrepreneurial initiative and productive capacity (Prahalad, 2005; IDB, 2006; Hammond *et al.*, 2007; OECD, 2007a; Rangan *et al.*, 2007). As an alternative to traditional public provision of goods and services for the poor, the current state of the debate seems to consider bridging these needs through innovative, cost-effective entrepreneurship, providing incentives for new actors to enter these underserved markets. If unleashed, this wealth of initiative and capacity could contribute to enhancing the welfare of many by making markets more inclusive and helping the poor to lift themselves out of poverty. For all these reasons, both business and development practitioners will benefit immensely from detailed information on the opportunities and challenges in the BOP.

Clearly, not all of the challenges related with poverty are best addressed through markets.[2] In many parts of the world, notably in countries ravaged by conflict, the destitute poor are unlikely to be able to participate in markets, if markets are able to operate at all.[3] A significant body of literature now shows how lack of access to markets,

[1] While there are a number of ways to estimate the exact size of the BOP, this paper will focus on the poor as defined by a widely used metric in development circles: people living on less than $2 a day (in purchasing power parity levels). There are, however, alternatives to this approach, and the proposed tool in this paper—the market heat map—could be designed to focus on these alternative groupings.

[2] As has been noted in other studies (Porteous 2005; Melzer 2006), for the part of the poor whose income is too low, redistribution and income transfers may be more effective than relying on market solutions in enhancing usage of certain goods and services that are essential for human development.

[3] For a discussion of the "bottom billion" (i.e. those people who live in countries mired in poverty and conflict traps), see Collier (2007).

such as those for credit and insurance, could reinforce low asset levels and poverty traps which many of the poor face. Lower access to credit markets and insurance could limit the poor's capacity to smooth consumption and investments (e.g. education, healthcare, etc.) which might ultimately reinforce their poverty (Hoff *et al*., 1993; Dercon, 2005; Carter and Barrett, 2006). Market access is a critical aspect of the economic lives of many of the poor and near-poor, and successful participation as consumers or producers in markets (or "market inclusiveness") is *sine qua non* in permanently exiting poverty. In certain areas where the public sector has been deficient or even absent, markets are in fact the *de facto* recourse of the poor.

This paper seeks to contribute to the literature by developing an analytical tool—the "market heat map", which could be used to examine how inclusive markets are for the poor as compared to the non-poor. Our goal is to build on earlier work by Banerjee and Duflo (2007) who tapped household survey data in order to characterize more fully the economic lives of the poor. Our focus is on one aspect of their economic lives: market access. One application of this tool is to provide a readily accessible illustration of the extent to which total poor consumers have access to key goods and services that are important in enhancing human development. This illustrates the extent to which the poor are being reached by various supply-side agents, both public and private, as well as in the formal and informal sectors to the extent that data is available. Another application is to map how inclusive markets are for the poor as producers. More economic activity would be analogous to more "heat"— that is, higher "temperature" would be analogous to a greater share of total poor consumers being reached (or the total poor on the supply side participating in the market). Less heat implies a tendency for a larger share of poor consumers that remain with little or no access to key goods and services (or the poor as producers with little or no access to markets to sell their goods and services). The heat map is intended to help policy makers and other stakeholders, notably business and civil society (e.g., non-governmental organizations (NGOs), non-profit organizations, etc.), to keep track of market inclusiveness for the poor as both consumers and producers. Construction of this tool could contribute to better informed and more sophisticated policy analysis, clarifying the scope of the challenge and possible market opportunities for the private sector, as well as advancing advocacy goals.

In what follows, section II elaborates on the rationale as well as the basic methodology in constructing the market heat map. Drawing on UNDP's *Market Heat Map Database*, Section III presents three applications of the market heat map tool. The applications focus on services that are critical to advancing human development and poverty reduction: access to safe drinking water, banking services and credit, and information and communication technology (ICT). The analyses are meant to illustrate the usefulness of this analytical tool and take the point of view of the poor as consumers. A brief conclusion (section IV) outlines several additional aspects of the market heat map and other complementary tools that could be further developed in follow-up research.

## II. Market Heat Maps: A Primer

*Market heat map*s are simple illustrations of the extent to which the poor and the non-poor, respectively, engage with markets: how inclusive of the poor (as compared to the non-poor) the markets are.[4] A market heat map typically consists of two illustrations: a regional map and a bar chart (see, for example, Figure 2). The regional map provides a graphic representation of access to goods and services in a selected sector—education, water, microfinance, etc— by the poor and the non-poor, respectively. “Heat” is illustrated through the use of color in the regional maps. A greater share of consumers being reached is analogous to more “heat” (more color in the regional map). Less heat (lack of color) in the regional map indicates that a larger share of consumers is excluded. The bar chart adds information on how the goods and services in the selected sector are being provided for both the poor and the non-poor in rural and urban areas.[5] [6]

In our analyses we focus on the demand side, hence the market heat maps show the nature and extent of consumer access to key goods and services that are important for human development across spatial dimensions in a particular country as well as the presence (or lack thereof) of various agents on the supply-side. However, when applied to the production side, market heat maps can also illustrate how inclusive markets are for the poor as producers (as entrepreneurs or as providers of labor inputs).

There is already a rich literature and extensive practice in poverty mapping. So far, geographic poverty mapping has mostly been used by actors from the public and not-for-profit sphere who leverage it to highlight the geographic variations in poverty, to design and target their interventions, to pinpoint and coordinate priority areas of their operational programs and activities, to determine where to best allocate their budget, to

[4] The market heat map is a tool that can be used to examine economic activity for market actors in general. However, the main purpose of this paper is to highlight the access to markets by particularly disadvantaged people.
[5] See Tufte (1983) for a variety of examples of how to present complex statistical information by ways of graphs.
[6] For technical information on how to construct heat maps, see Acosta, Kim & Melzer (2008).

monitor and evaluate their operations, and to increase transparency and social accountability.[7] Amongst others, geographic poverty mapping is applied in the areas of poverty reduction operations, infrastructure provision and coordination in humanitarian crises. While poverty mapping is often used by many actors toenhance the coordination of their own activities, it can also help improve the visualization of the spatial dimension of current development issues amongst external actors, including a broader public audience.

The use of poverty mapping might also be of interest for private for-profit actors who could gain useful insights into the economic activities of the poor, especially those living in remote areas. The intention here is to contribute by developing a tool that complements geographic poverty mapping with a mapping of the market engagement by the poor. The same databases, including those from household, labor force, and other types of surveys, are tapped to construct market heat maps.[8] Their value-added is essentially the combination of information in a visually compelling way that would contribute to:

- *Revealing unmet demand and opportunity.* A market heat map shows visually the extent to which potential consumers for certain goods and services have (or have not) been reached. It informs to which degree markets are inclusive for different consumer groups, for example, the poor and non-poor. This information can be translated into opportunities that have yet to be realized for expansion and innovation in product and service delivery. Alternatively, the market heat maps could also illustrate how the poor

[7] Elbers *et al*. (2007), for example, find that poverty maps could improve government targeting schemes aimed at reducing poverty. For further discussion on poverty mapping, please refer to Davis (2003).
[8] Tailored surveys could also be commissioned to produce more detailed and in-depth data on markets. However, the main goal of this paper is to develop the market heat map tool using existing surveys that are available in order to demonstrate the types of insights that could be derived from them. For most countries, household surveys of various types are increasing in their quality and frequency of implementation, making these databases conducive to further usage in characterizing markets.

are marginalized on the supply side of different markets. This could reflect unrealized opportunities, not only for the poor themselves, but also for a society as a whole.

- *Assessing market inclusiveness.* Market heat maps can be structured to provide a clearer visualization of market inclusiveness along various spatial dimensions, such as geographic regions, urban vs. rural dichotomies, etc., depending on the focus of interest.

- *Clarifying the supply structure*. An additional aspect of the market heat map is that it can also illustrate the supply structure. It can give information on the presence (and relative market shares) of different types of suppliers. Suppliers can be differentiated in terms of ownership (public, non-governmental organizations, private), size (multinational corporations, micro, small, medium or large scale enterprises), or any other criterion that may be relevant.

There are three key steps in constructing market heat maps:

- *Step 1: Measuring total potential poor consumers*. The first step is to establish a measure for the total demand to be met in each market. There are a number of ways to approach this, because different possible metrics become relevant depending on the market being examined. As a starting point to reflect demand by the poor, one takes the total number of potential poor consumers in the market being examined.

- *Step 2: Measuring the total poor consumers who have access*. The next step is to identify the extent to which potential poor consumers have access to the good or service in question. Access could be interpreted in a number of ways, delving into issues such as geographic proximity and affordability. As a measure of access, the number of poor individuals or households that presently consume or use the good or service being analyzed is usually considered.[9]

- *Step 3: Measuring the different actors on the supply side*. A last step disaggregates the information in Step 2 by providing additional information on the relative shares of different agents comprising total current supply.

Market heat maps could be further specified along two dimensions: the exact population group and the specific markets to be analyzed. Several measurements of the size of the poor population could depend on the expenditure threshold used to define this population group. Here, the widely used international poverty line ($2 in purchasing power parity a day) is considered to define the poor. Other cut-offs, depending on the intended purpose, can be used as well. However, as stated in Banerjee and Duflo (2007), using the $2 a day threshold remains consistent with the focus on the most vulnerable population group, allows for international comparability, and also takes into consideration present data availability.

Regarding the markets to be analyzed, the focus is on those who are important from a human development perspective. Development can be seen as the process of enlarging and expanding people's choices and freedom (Sen 1999). Several markets for which the poor's participation is expected to have a large and positive impact on human development include:

- Markets for goods and services that could be considered to help satisfy basic human needs and thus to directly improve their welfare and underpin their broader human

[9] Porteous (2005) notes the difference between access and usage—the number of people who choose to use or consume a product might be less than the total number of people with access to it. The idea here is to tap data on usage as a first approximation of access, though more detailed analysis of access and exploration of the different barriers would be ideal. See Beck and De La Torre (2006) for an analysis of access to financial services, and Melzer (2006) for an analysis of access to housing finance.

capabilities (for example, access to healthcare, housing, water etc.). This is in line with the methodology for the construction of the Human Development Index.

- Markets for goods and services that could be crucial to opening up opportunities for the poor to enhance their standard of living, increase their income, and further expand their choices, in large part, through economic empowerment (for example, credit markets, insurance markets, markets for the application of information and communication technologies, labor markets, etc.).

## III. Applications and Analyses

### III.a. Improving Access to Safe Drinking Water: The Role of the "Other" Private Sector in Haiti

Water is a necessity of life, required for basic needs in nutrition, health, and sanitation. Access to safe drinking water plays an important role in reducing a number of health and sanitation concerns emerging from use of contaminated water, including waterborne and water-washed diseases (water-washed diseases occur when water is not available for washing and personal hygiene) such as typhoid, cholera, dysentery, and diarrhea.[10] Its importance is enshrined in Millennium Development Goal (MDG) 7, which seeks to reduce by half the proportion of people without sustainable access to safe drinking water by 2015.

[10] For instance, very rough estimates suggest that access to piped water into a house could diminish the risk of diarrhea by close to 70 percent in Ghana, while access to a safe water source is shown to cut the risk of infant mortality by 23 percent in Uganda (UNDP, 2006).

The most recent estimates suggest that over 1 billion people still do not have access to safe water sources—an estimated 17 percent of total world population (UNDP, 2006; World Bank, 2008a).[11] Progress towards achieving this goal has been uneven across the developing world, despite impressive inroads made by a number of countries.[12] Access to safe drinking water within some countries is also highly uneven, and reflects, in part, the stark inequality in access between the poor and the non-poor. In addition, rural areas also tend to lag behind urban areas in terms of water access.[13]

Reflecting this general trend, a market heat map (Figure 2) illustrates data on access to water among Haiti's poor population in different regions of the country. In this illustration, access to water includes access to private piped water (inside and outside the house and wells) and public piped water. Darker shades represent greater access. By presenting data on the providers of water services, the market heat map also reveals some interesting insights into the provision of drinking water in Haiti.

As one of the world's 50 least developed countries, Haiti ranks 146th out of 177 countries in the world in terms of human development (UNDP, 2007). Latest available figures (for 2001) indicate that between 72 and 78 percent of Haiti's population lives with less than $2 a day (World Bank, 2006; 2008b). In rural areas, about 86 percent of the population is poor according to such criteria. Poverty rates in urban areas vary greatly: in

[11] Figures for access to a safe water source refer to the percentage of the population with reasonable access (availability of at least 20 liters a day per person from a source within 1 kilometer of dwelling) to an adequate amount of water from such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. Unsafe water sources include vendors, tanker trucks and unprotected wells and springs (UNDP, 2006).

[12] Tanzania, Chad and Malawi are among the countries that have made most progress, with increases in drinking water coverage of 92 percent, 70 percent and 63 percent respectively in the 1990-2002 period (UNICEF and WHO, 2004). Whereas Sub-Saharan Africa has the lowest access to a safe water source in the world in terms of share of population (56 percent in 2004), most people without access to a safe water source live in the East Asian and Pacific region (406 million versus 314 million in Sub-Saharan Africa) (UNDP, 2006).

[13] UNICEF (2006) reports that 92 percent of the population in urban areas in developing countries, and 70 percent of the population in rural areas has access to safe drinking water sources.

Port-au-Prince, 51 percent of the population lives with less than $2 a day, while in other urban areas this figure climbs to 85 percent (World Bank, 2006). Recent estimates on the regional pattern of poverty in Haiti reveal that poverty rates are lowest in the West region (60.8 percent), home of the country's capital Port-au-Prince, and highest in the North East region (94.2 percent). Nevertheless, even in the relatively less poor West region, poverty is extremely high by international standards.[14]

Given daunting conditions associated with low economic growth, natural disasters, political instability, and poor governance, basic public services provision has failed to progress, and has even deteriorated in Haiti (World Bank, 1998). The market heat map shows that access to piped water networks is generally very limited, with about a third of the urban poor and less than a third of the rural poor having access to this type of water source.[15] Taking a closer look at regional access data is even more revealing. The market heat map indicates the existence of a possible business opportunity in the water market, even in Haiti's richest region, the West region, home to the capital Port-au-Prince. In this region, where almost one third of the country's total poor population lives and piped water access rates are relatively higher compared to other regions, only 18 percent of the poor population has access to piped water. The market heat map shows, however, that 45 percent of the population in urban areas of the country has access to water from trucks, bottled water, and water by bucket, which indicates that they are willing to pay for safe water. Possible business opportunities might also exist in other regions with even lower access rates, especially in rural areas.

[14] The $2 a day poverty rate for the West region, the richest area in Haiti, is higher than that of any country in Latin America and the Caribbean (CEDLAS and World Bank, 2009).
[15] The figures presented here could be slightly different from those quoted in other studies, mainly because of the different units of analysis and methodology.

The market heat map therefore helps to illustrate an interesting aspect in Haiti: due to the limitations of public water provision, as well as the lack of large private investment, other water providers seem to have stepped in, and a thriving water market has emerged to fill the gap. Some consumers have also resorted to investing in their own water sources, for example, by drawing their water from wells in association with community based organizations (IDB, 2005). Small-scale private service providers (SPSPs) of water, mostly in peri-urban areas, play a major role in extending access to water—delivering water by trucks, in bottled form, or by the bucket.[16] Critically important services are thus provided to poor households, especially in urban areas.

Typically, when one contemplates alternatives to public sector provision of water, one thinks of large (foreign or domestic) private consortiums as the main investors in water markets in the developing world. However, as the recent literature is beginning to show, and figures like the one for Haiti could further reveal, there is a growing and important role played by the "other" private sector in water markets. In many parts of the world, water markets thrive where both the public sector and large private investors have been absent, deficient, or have failed to achieve universal access.[17] There are a number of challenges linked to the operations of the "other" private sector, including in some cases higher prices and heterogeneity in water quality, as well as limited access to formal

[16] "Independent operator" is a term used to describe small private operators who provide complementary or alternative service to the dominant operator, whether this is public or private. The definition has been used to encompass associations or user groups, provided that they deliver services on a commercial basis. Independence refers to their source of water, which does not come from the network of a large organization (Valfrey-Visser *et al.*, 2006).

[17] The annual number of water projects in the developing world involving the private sector shrank by 20 percent in 2006 compared to the year before (at 48 total projects), but still remained at a relatively high level compared to 1995 (that is, around 20 projects). Nevertheless, the number of cancelled and distressed private water contracts grew by 11 projects in 2006 alone (World Bank 2007). For a review of the recent trends in (large-scale) private sector participation in infrastructure investments in water in the developing world, see Harris (2003).

sources of finance. Clearly, the public sector could play a key role to help address these challenges as well as oversee different aspects of the water market, even as it will be involved (directly as a provider or perhaps indirectly as regulator of private concessions) in the challenge of improving the efficiency and outreach of the piped water network.

Where country capacity is extremely weak, and where larger investors may be reluctant to engage for a variety of reasons, such as in Haiti, tapping the "other" private sector could offer a pragmatic way forward to help increase access to safe drinking water. These actors could be very effective in closing the "last mile" which would connect poor consumers to water supplies. It is beyond the scope of this paper to examine the different modalities in closing this "last mile." This might be considered as a niche for small scale providers in a variety of settings, spanning the provision of water, healthcare, microfinance, and other goods and services that are critical to human development, while at the same time comprising untapped business opportunities.[18] Market heat maps like this could thus be especially useful to help reveal where such opportunities might be found.

### III.b. Digging Deeper into Credit Access: Credit Supply in Guatemala

Increased access to finance could have a variety of positive impacts on the poor, by enhancing their ability to manage shocks (through microinsurance products), and by

[18] The term "last mile" is often used to characterize the final leg a service or goods provider needs to traverse in order to reach a customer. Innovations that help to bridge the "last mile" to poor consumers could leverage wireless telecommunications technologies, such as for mobile banking, or business models involving small scale service providers such as for water provision (see Mendoza and Thelen, 2008). In addition, the interested reader may also wish to consult Fafchamps (2004) for a fuller elaboration on the nature and extent of market development in the African context, where the challenge of developing institutions has been partly addressed by some market actors through networks and other approaches.

improving their opportunities to undertake investments (through credit) and build capital (through savings products). Although growing more inclusive financial markets for the poor involves improving access to a broad range of financial products (for example, savings, money transfer services, insurance), the focus here is on credit. Credit could be used to expand or diversify income streams, increase investment, and smooth consumption, especially by mitigating the effects of negative shocks.[19] However, the poor often lack access to credit, which coupled with their vulnerability to shocks could push them into a poverty trap, including through interruptions in human capital investments (which have implications on future income streams), and by diminishing their capacity to adopt new technologies (which limits improvements in productivity and household wealth).[20]

Credit providers that serve the poor include microfinance institutions (MFIs), credit unions, cooperatives, and an increasing number of commercial banks. Even though most low-income households in developing countries have no access to formal financial services, the burgeoning success of Grameen Bank in Bangladesh, BancoSol in Bolivia, and other microfinance innovators has led a growing number of financial providers to begin looking to serve this market. Honohan (2004) shows that in most countries the microfinance industry operates well below the efficient scale penetration rate of 2 percent

[19] Migrant remittances can also be important for the poor to weather unexpected income shocks, but they are excluded in the analysis in this paper. For the role of remittance incomes in enhancing development outcomes, see Fajnzylber and Lopez (2008).

[20] A number of recent studies, notably those using randomized-control trials (RCTs), have helped clarify the links between access to finance and development. One RCT study in South Africa, for example, finds that expanding consumer loans to marginal customers (that is, those who would normally be turned down for loans) led to measurable benefits in the form of increased employment, reduced hunger, and reduced poverty (Karlan and Zinman, 2007). A similar study on small-scale fishermen in India suggests that the easing of credit constraints speeds up the adoption of technology (in this case, fibre-reinforced plastic boats that are cost and fuel efficient), enhancing productivity and contributing to economic growth (Gine and Klonner, 2005).

of total country population. For those fortunate enough to be in regions where this growth is taking place, a number of different institutions are engaging in competition for certain low-income customers.

While state-owned development banks, non-governmental organizations originated MFIs, credit unions, and cooperatives have played a role in this market for some time, many commercial banks and non-bank financial institutions are bringing additional competition. CGAP (2007) reports that in just 2 years, microfinance funding from international financing institutions doubled to reach $2.3 billion in 2006, while private investments more than tripled to a total of $2 billion. Where the provision of microcredit is profitable as a business opportunity (that is, lending to individuals with better credit rating or wanting larger loans), a zone of competition exists in which numerous providers of commercial financial services compete with each other as well as with subsidized and informal financial services.

To provide a better picture of the present state of access, market heat maps could be used to help illustrate the state of access across different regions within a country. Figures 3 and 4, for example, show access to credit in different regions within Guatemala, for both the non-poor (Figure 3) and the poor (Figure 4). Here, access to credit figures includes access to credit from formal sources, such as banks and microfinance institutions, as well as credit from informal sources, such as family and friends. Darker shades in the map represent greater access. These preliminary illustrations suggest that access to credit among the poor and non-poor tends to be higher in the South West regions of the country, nearest the Pacific coast, and in the political and economic center of the country (Guatemala City, in Guatemala Department). Some regions in Guatemala with high poverty rates, like parts of the Northern and South-Eastern Department, also tend to have comparatively less access to credit among both the poor and the non-poor.

Figures 3 and 4 present even more information on market access, and specify whether market access was provided by market actors, the government or even through informal sources in rural and urban areas. Market heat maps focusing on access to credit can thus reveal important additional information on the percentage of the households in a respective country that are still unserved, while at the same time they allow scanning the landscape of actors that are currently serving the different target groups. The market heat map for Guatemala signals that access to credit is generally low and that poor households remain for the most part excluded in its credit market.[21] The role of formal credit sources still seems very limited, and although rural poor households seem to have better access to loans compared to urban poor households, informal credit sources in rural areas seem to account for much of this trend.

A closer look at the actual use of credit in Guatemala provides additional information and might strengthen the case for a possible business opportunity. While only 19 percent of non-poor urban borrowers spend their loans on investment (rather than consumption), 55 percent of rural poor borrowers invest their loan into (agricultural and other) business (Figure 5). It seems that if formal credit is expanded for the rural poor, and the distribution of spending is kept the same, the loans will most likely be invested rather than consumed.

[21] Here, data on actual usage of credit is taken as a proxy indicator for market access; however, individuals may choose to self-exclude themselves from these markets for a variety of reasons. Hence, one way to interpret the figures on those without credit is to refer to them as upper bound indicators of the share of the population with no access to credit markets.

Clearly, more detailed context-specific analyses is required in order to understand the nature of credit demand among the poor, and the market heat maps presented here could serve, in part, as a basis for expanding our understanding of these markets. Perhaps more importantly, they could also help guide a number of important research questions. Will better access to microfinance help the poor to lift themselves out of poverty? Or, depending on the design of credit products offered, will increased access primarily enhance the poor's welfare—but not necessarily make them un-poor? Could formal longer-term bank loans rather than short-term informal loans help the poor invest their resources in a possibly more productive way, such as through land acquisition and business start-up? What role could formal banking institutions and MFIs play in enhancing access and in introducing financial products that are most useful for the poor? A deeper analysis of these and other questions could guide policy makers, business and civil society actors in exploring ways to make financial markets more inclusive for the poor.[22]

[22] Bebczuk (2008) answers some of these questions for the case of Latin American and Caribbean (LAC) countries. It claims that: (a) Limited financial inclusion does not simply follow from unfair discrimination against the poor, but to a great deal from a low demand for financial services and scarce access for the population at large (supply-side constraints have a second-order importance); (b) Despite the impressive progress of microfinance in recent years, stakeholders should avoid over-optimism, suggesting that, while a potentially powerful tool to fight poverty, microcredit must be carefully targeted, and granted by highly specialized intermediaries under commercially-oriented criteria; (c) Although financial inclusion is a social matter, the private sector has provided more and better responses than the public sector; furthermore, these private programs have proven to be quite profitable; and (d) Recent experiences in several LAC countries hint that governments can play a decisive role in coordinating financial inclusion initiatives, leading normative changes, and supporting innovative banking outreach strategies without engaging directly in credit allocation.

### III.c. Leveraging ICTs to Improve Banking Access: The Potential for M-banking in South Africa

Access to information and communication technologies (ICTs) could contribute to economic growth and human development in a variety of ways, notably by facilitating commerce and trade (Grace *et al*., 2004; Von Braun and Torero, 2006). Improving access to ICTs is also part of Goal 8 of the MDGs which also involves making the benefits of new technologies— especially ICTs—more widely available.

Mobile phones could be used to improve access to ICT-related services in the developing world. By 2008 there were an estimated of 4.1bn mobile subscriptions world while, up from 1bn in 2002. The number of mobile phone subscribers in low and middle income countries is already far higher than in high income countries (about two-thirds of the mobile phones in use), and the gap between developing and industrial countries in terms of mobile phone density has been shrinking. Amongst the developing regions, Africa has the highest mobile growth rate (32 per cent in 2006/2007) and mobile penetration has risen from just one in 50 people at the beginning of the twenty-first century to over one fourth of the population today (ITU, 2009).

Access to mobile phones could generate a positive impact on poverty and inequality reduction, by enhancing its users' ability to effectively engage in market exchange. Farmers, fisher folk and other rural entrepreneurs with mobile phones, for example, could enhance their access to market information, helping them obtain the best possible price for their goods as well as save on costs related to acquiring this information had they not had a mobile phone.[23]

New applications of mobile telephony could also be used to enhance the efficiency of the public sector in its provision of certain types of services, notably in remote rural areas which may not be so easily reached by most physical infrastructure networks. It might also be possible to leverage mobile telephony-related technologies in order to re-organize the production and provision of some products in such a way as to lower their costs of provision and make them more accessible for the low-income population. The development of mobile banking (m-banking), which involves the use of a mobile phone or another mobile device to undertake financial transactions linked to a client's account, seems to hold promise in this regard. Studies by Porteous (2006, 2007) and Ivatury and Pickens (2006) suggest that the wide and growing use of mobile phones in developing countries, and the power of the various actors involved in the provision of financial services through this channel—mainly network operators and banks—, could help to bank the "unbanked". In Africa, much of the take-up in mobile phone penetration is thought to have been driven by money transfer services that allow people without bank accounts to send money speedily and safely by text messages, which the recipient - typically a family member - can cash in at the other end (ITU, 2009).

Figures 6 and 7 contain market heat maps that illustrate the access to mobile phones among the non-poor (Figure 6) and among the poor (Figure 7) in rural and urban areas as

[23] For example, Jensen (2007) examined the effects of access to mobile phones by fisher folk in Northern Kerala in India during the period from 1996 to 2001 and found that fishermen with mobile phones were able to call ahead to markets to find out where their catch would fetch the best prices. The proportion of fishermen who ventured beyond their home markets jumped from zero (situation of near autarky) to 30-40 percent as soon as mobile phone coverage became available. Their profits also rose by 8 percent on average. Because of the more appropriate matching of demand and supply for fish, waste was completely eliminated (that is, previously excess fish supply were often thrown away in some markets).

well as in different provinces in South Africa.[24] Darker shades in the maps indicate higher access rates amongst the respective income group. The market heat map suggests that mobile phone access rates are higher for both the poor and the non-poor in the regions in the West (Northern Cape, Western Cape) and East of the country (Northern Province Limpopo, Mpumalanga, and Kwazulu Natal), varying between 41 and 80 percent in almost all of the provinces in these geographical areas. Mobile phone access rates in the Eastern Cape, a province with a relatively high poverty rate (Schwabe, 2004), are low (ranging from 0 to 20 percent) for both the non-poor and the poor. However, the relatively high density of population centers and built-up areas in those provinces with lower mobile phone access rates for both the poor and the non-poor (for example, Eastern Cape, Free State, and North-West) suggests that these provinces are highly populated and, hence, that there might be a potential business opportunity for providers of mobile phone services to serve many of those who still lack access to mobile phones. Due to lack of data availability, the market heat map does not contain information on suppliers of mobile phone services.[25]

Once again, the market heat maps are not only useful to help illustrate general market access patterns—one might also be able to glean some important links between these and some of the possible underlying factors behind poverty itself. Estimates suggest that the poor are concentrated in former homelands in the provinces North-West, Eastern Cape, Kwazulu, and Limpopo, in the peri-urban areas and the townships (Schwabe, 2004). In

[24] Here, data on personal usage of a mobile phone are used as a proxy indicator for access. Again, estimates for people without access to mobile phones could be interpreted as an upper bound indicator for the share of people without access to mobile phones.

[25] South Africa has 4 main mobile services providers, including industry leader VODACOM (with almost 60 percent share) and the remaining distributed among Cell C, MTN, and Virgin Mobile SA. More detailed information on their subscribers (as well as whether or not they are poor or non-poor, or in rural or urban areas) is not presently available. For further information, see Business Monitor International (2008).

many of these areas, the inclusiveness of markets for the poor in general—including mobile phone markets in particular—could tend to be relatively low.

The challenge is to address these historical inequalities, translated in part in the lack of access to key markets that could potentially empower the poor. To this end, market heat maps could provide valuable additional information on some key market opportunities for financial services providers. More specifically, these could help to reveal the potential overlaps between those with mobile phone access, but remain unbanked, which comprise opportunities for leveraging mobile phones to provide m-banking (mobile banking) services. In South Africa, more urban and rural poor people have mobile phones than are banked, which suggests that if banking services were to somehow be cost-effectively provided through mobile phones, then perhaps some traction could be achieved in terms of banking the unbanked.

An important additional point to make here is that these opportunities exist in the poorer sub-section of the market. In urban areas in South Africa, 43 percent of the poor adult population has access to a mobile phone while only 32 percent of the adult population in this income category is banked. In rural South Africa, 31 percent of the poor have a mobile phone, while only 19 percent of them are currently banked (FinScope, 2006). An estimate of the precise intersection of the poor who have mobile phones, and among them those who do not have bank accounts, reveals an opportunity to leverage mobile phone access in order to bank the unbanked in South Africa: about 24 percent of the urban poor, and 21 percent of the rural poor. Estimates of the precise intersection in three other countries reveal that this potential market could be large in those countries as well (see Figure 8):

- Botswana: about 30 percent of the urban poor, and 10 percent of the rural poor;
- Namibia: about 12 percent of the urban poor, and 6 percent of the rural poor;
- Zambia: about 42 percent of the urban poor, and 7 percent of the rural poor.

A departure from more traditional “brick and mortar” provision technologies for financial services could help make these services much more affordable for the poor. Private sector innovations to leverage “soft ICT networks” are already being applied in a number of countries and also in South Africa.[26] Furthermore, with the expected increase in mobile phone penetration rates, as prices of handsets and services further decline and as secondary markets for handsets develop, opportunities to bank the poor by leveraging mobile phones could emerge in a growing number of countries.

## IV. Conclusion

This paper proposes a new analytical tool to be used in examining and monitoring the inclusiveness of certain markets for the poor. As envisioned, this market heat map is intended to help policy makers and other stakeholders, notably business and civil society, to keep track of the demand- and supply-side dimensions of certain markets that could be crucial for human development. Construction of this tool could contribute to better informed policymaking, as well as clarify possible market opportunities for the private sector. By conveying information on how the poor fare in markets, these heat maps could

[26] For instance, Celpay allows individuals and companies in the DRC and Zambia to manage their bank account via mobile phone or the internet (Catheu, 2007). In addition, M-Pesa is a mobile payment solution launched in Kenya in 2007 that allows customers in Kenya to use the mobile phone for simple financial transactions and has now 5 million users (ITU, 2009).In South Africa the startup mobile banking provider Wizzit is targeting the unbanked offering a transaction banking account accessible via mobile phone and debit card. The company, which operates as a division of the South African Bank of Athens, was launched in December 2004 (Ivatury and Pickens, 2006).

also be useful for advocacy, to the extent that lack of access to markets could also be an important factor linked to inequality.

In developing this tool, there are several aspects that could be interesting to explore further. Future research could evaluate the possible use of other metrics to describe the poor. Since the characteristics of the population are central to the analysis, it would be useful to explore the sensitivity of the findings to the exact threshold used. More specificity on the exact good or service being examined might also shed further light on the potential development impact of the product being examined. For instance, the applications of the market heat map on credit examined access to credit in general, yet different loans could have a variety of different features (e.g. loan payment terms, insurance attachments, etc.), and thus different potential impacts on the poor.

Another aspect worth exploring further would be the development of possible metrics for market inclusiveness to reflect not just *quantity*, i.e. the number of people (or households) currently consuming or using certain goods or services which was the focus of this paper, but also *quality*. Measures for "goodness of fit" to the circumstances and tastes of poor consumers, and measures for the possible "poverty penalty" charged to poor consumers, are two areas that could be further developed. Reducing poverty penalty premiums could be considered as an additional aspect of meeting presently unmet demand and increasing market inclusiveness for the poor, and progress towards reducing these premiums could thus be readily measured and monitored.[27]

[27] It is beyond the scope of this paper to elaborate more fully on the design of indicators for the poverty penalty. Nevertheless, the main point here is that goods and services may not necessarily be homogenous, and poor consumers may get less quality for the same price paid by all consumers, or they may actually demand lesser quality products but at more affordable prices. Mendoza (forthcoming), for example, elaborates further on the poverty penalty concept as well as possible measures, such as the construction of a poverty penalty index.

It might also be interesting to expand the use of the market heat map in development planning and business strategy, once a standardized way of compiling and reporting data on the poor has been established over time. This would allow for an analysis of progress or regress along certain dimensions such as consumption or usage of specific goods and services that are especially important from a human development lens, as well as of the relative dynamism of different supply-side agents. It is also appealing to see trends over time and monitor gradual changes, as this could reveal how businesses operate on the margin, and how their activities contribute to market access.

Finally, and perhaps most importantly, further development and application of the market heat map require extensive data collection that would allowfully constructing cross-country—and within each country, cross-sectoral—heat maps. Investments in data collection will enable the development of more detailed market heat maps, adding further to the usefulness of this tool for decision makers. The intention of this paper is to provide an outline of how market heat maps could be constructed using a basic methodology that draws on already existing databases. As this paper has tried to illustrate, the cost for developing this tool further could be relatively small (since it could tap existing household surveys). And the returns from investing in the construction and application of this tool (including further detailed data collection) could be large, due to the rich information it could provide on the participation of the poor in the market economy.

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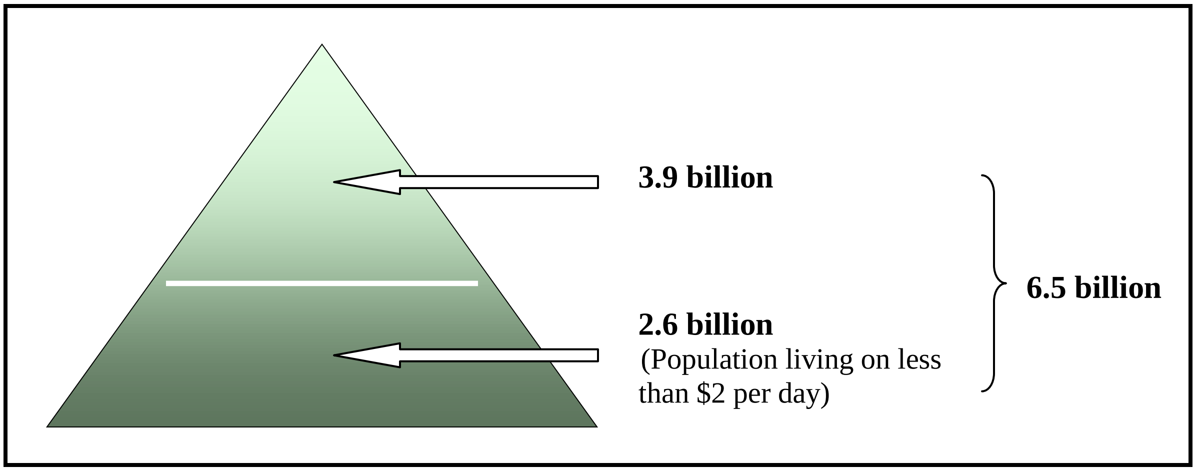
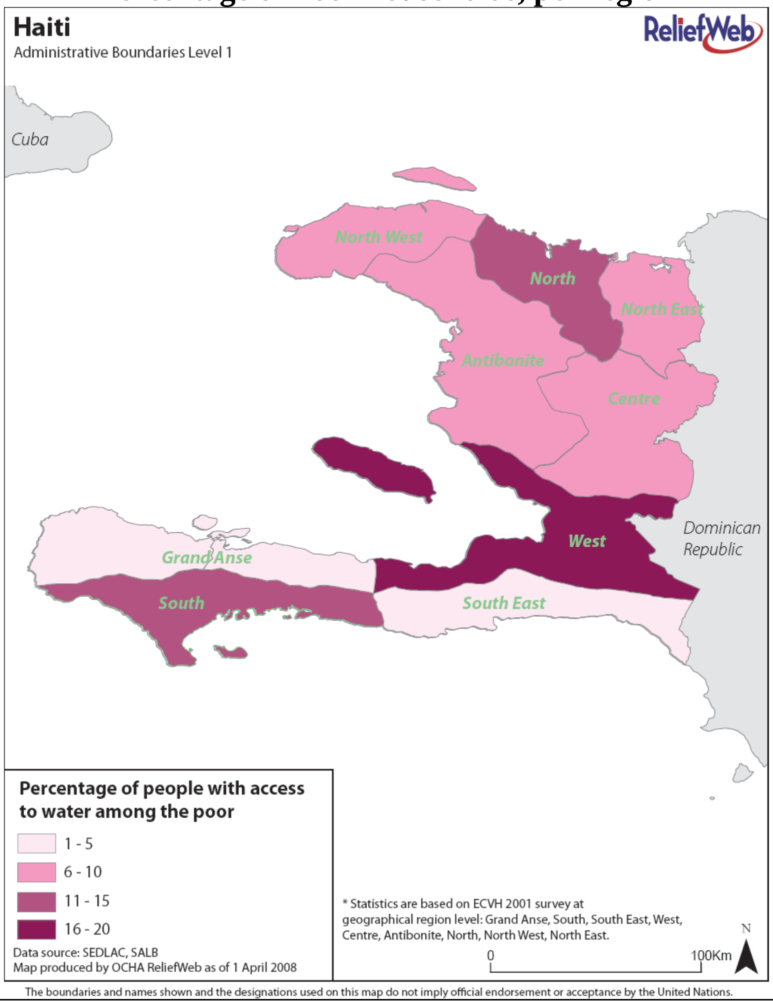
Figure 1. The Poor and Total World Population (2005)



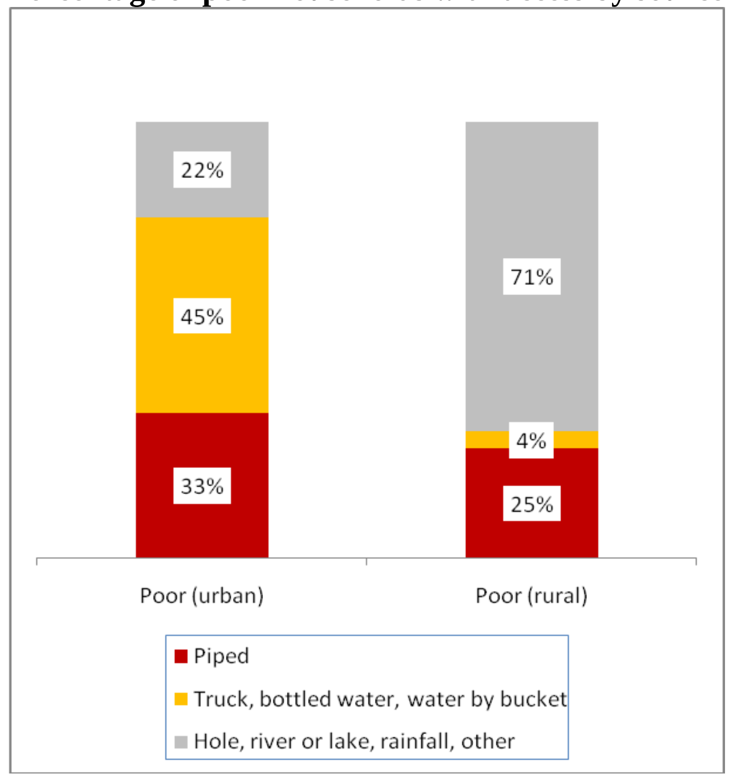

*Note:* The poor are defined as the total number of people living on less than $2 per day (in 2005 PPP).
*Source:* Estimates for the number of people living on less than $2 per day are taken from World Bank (2008b, p.11, table 3). Estimates for total world population for 2005 are taken from World Bank (2009).

**Figure 2**
**Market Heat Map for Access to Water in Haiti (2001)**
**(Poor households)**

**Percentage of Poor households, per region**



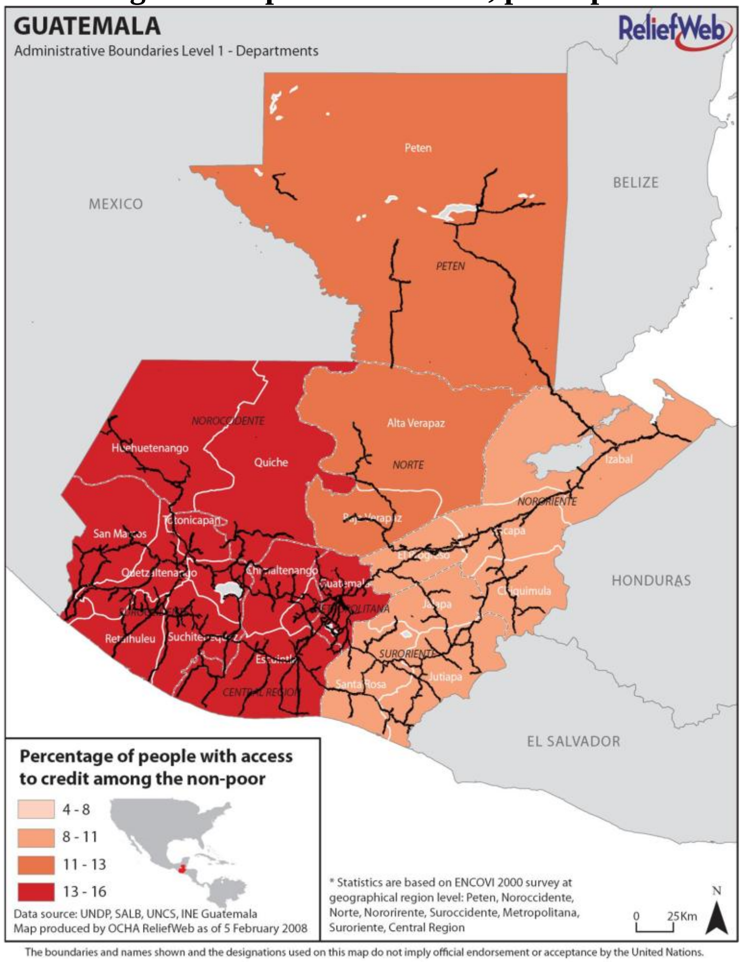

**Percentage of poor households with access by source**



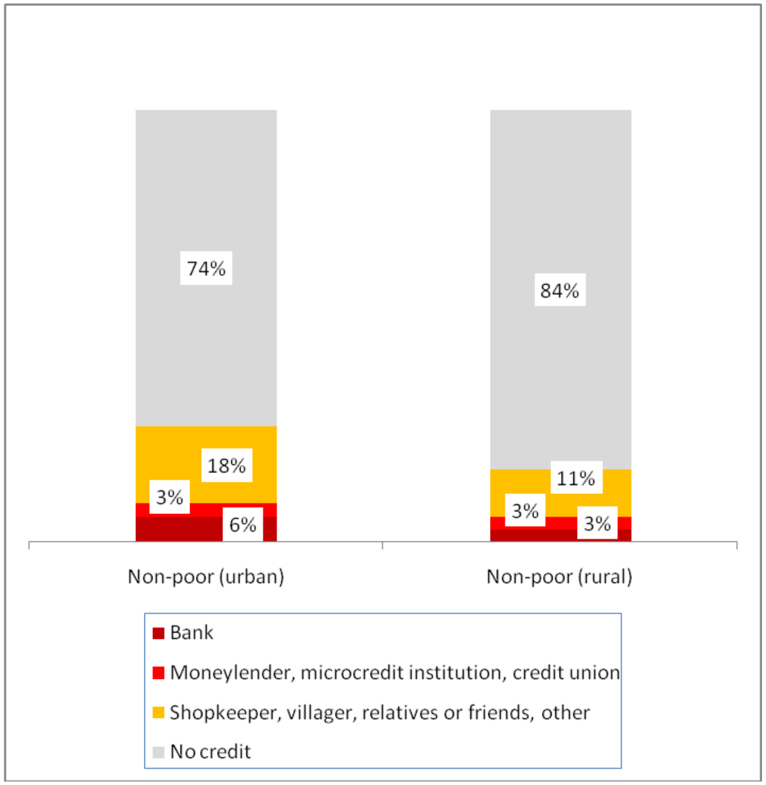

*Note* : The regional map shows data on access to piped water. Estimates for piped water in the figure refer to private piped water (inside and outside the house as well as wells in the house) and public piped water.
*Source*: Based on Institut Haïtien de Statistique et d'Informatique (2001).

# Figure 3
# Market Heat Map for Access to Credit in Guatemala (2000)
# (Non-poor households)

**Percentage of non-poor households, per department**



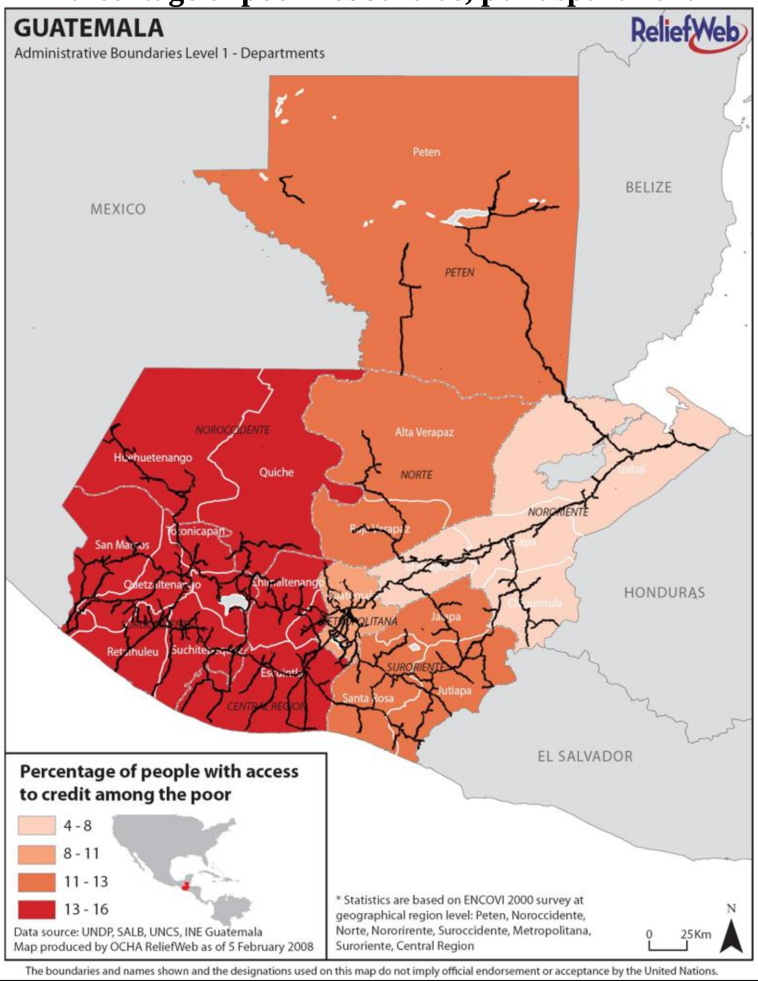

**Percentage of non-poor households with access by source**



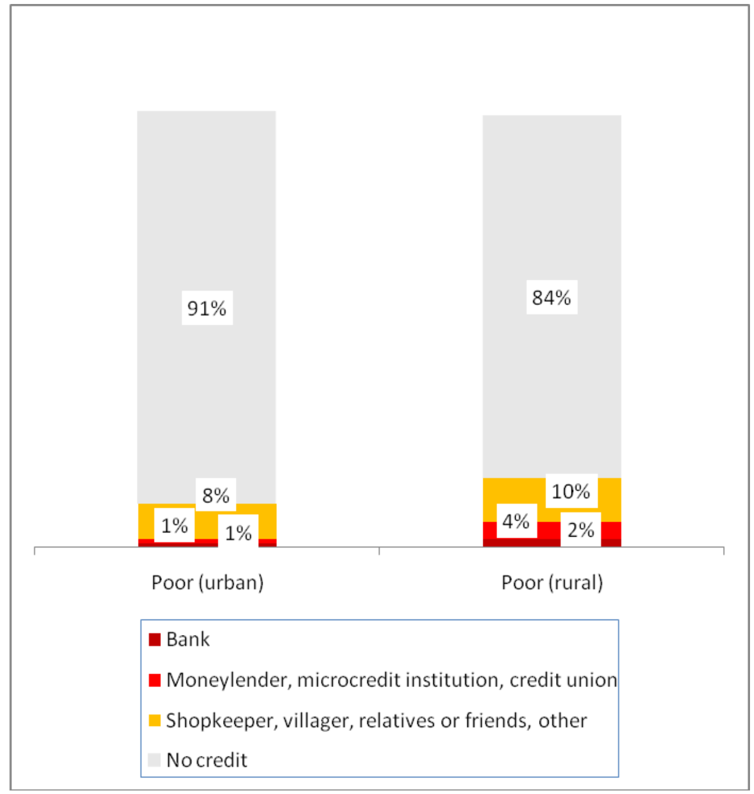

*Note:* Black lines in the map represent asphalt roads (see Henninger and Snel 2002, p.20).
*Source:* Based on Instituto Nacional de Estadistica de Guatemala (2000).

**Figure 4**
**Market Heat Map for Access to Credit in Guatemala (2000)**
**(Poor households)**

**Percentage of poor households, per department**

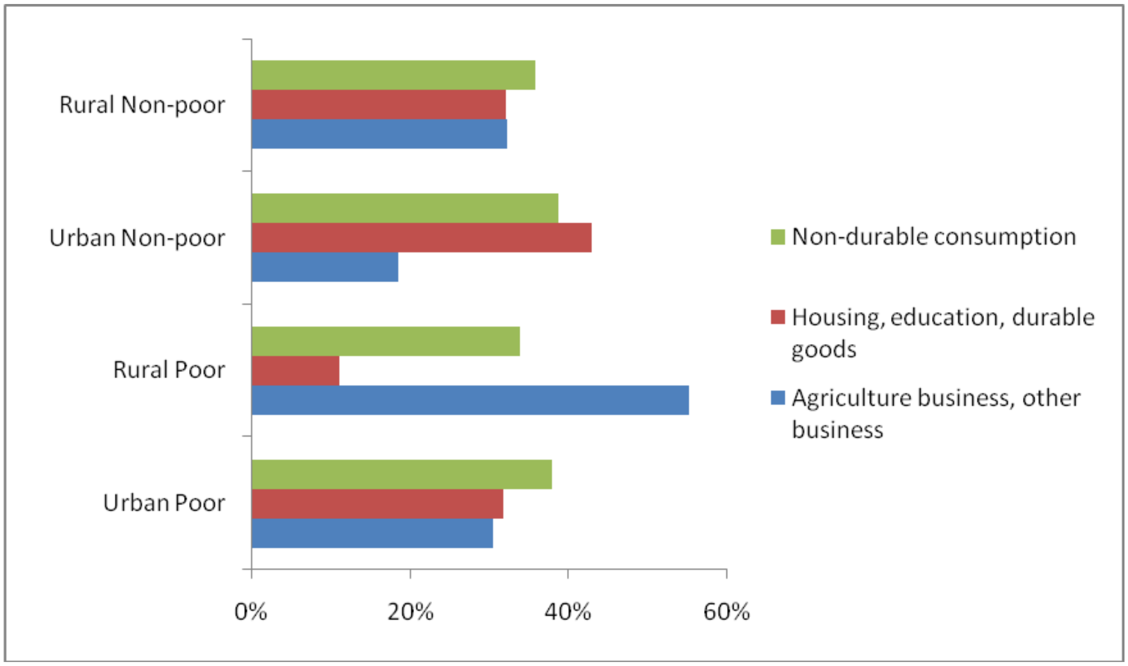



**Percentage of poor households with access by source**



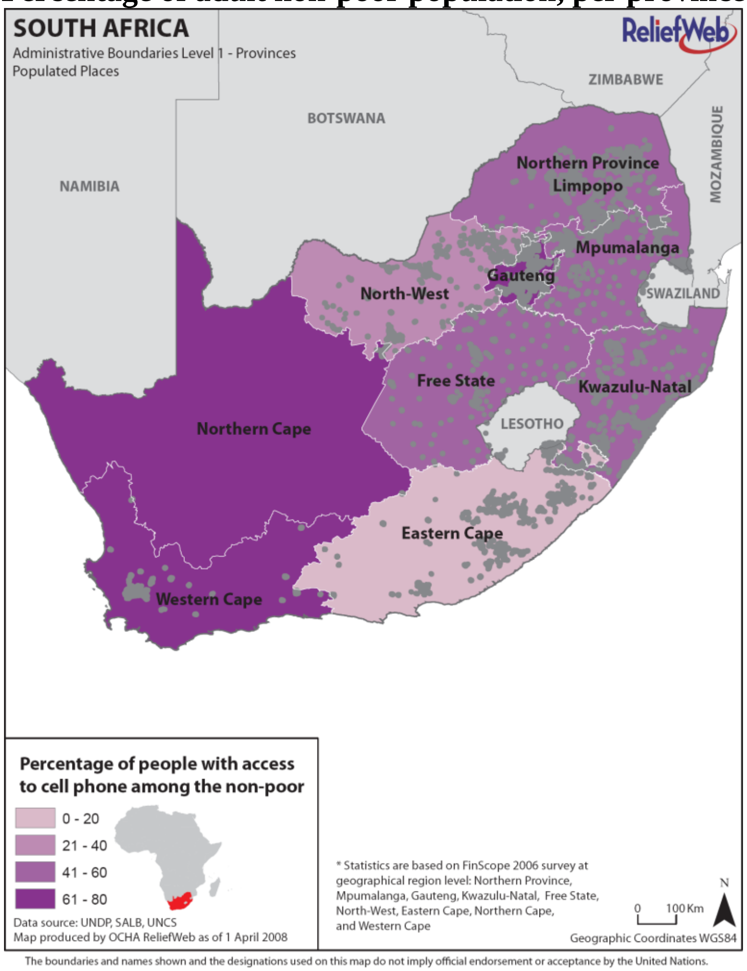
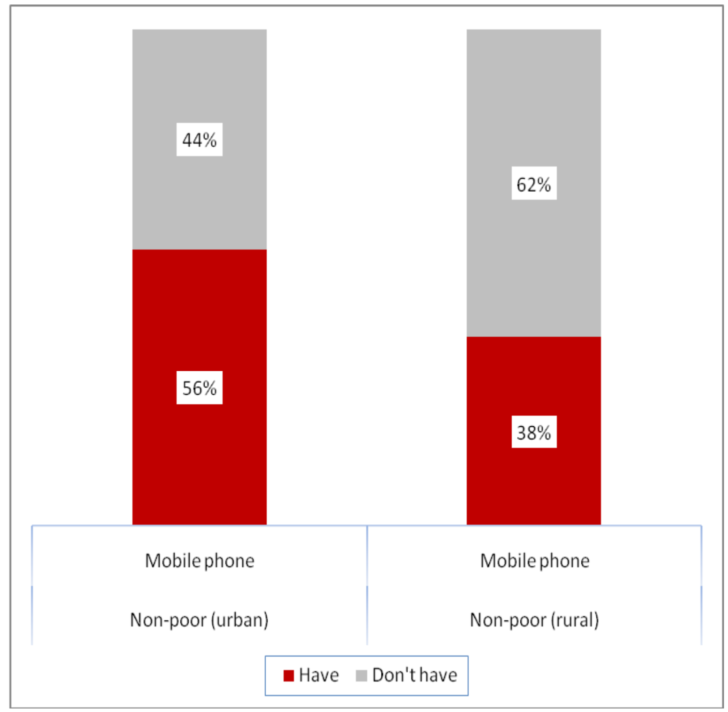

*Note:* Black lines in the map represent asphalt roads (see Henninger and Snel 2002, p.20).
*Source:* Based on Instituto Nacional de Estadistica de Guatemala (2000).

**Figure 5**
**A Possible Opportunity: Estimates of the Use of Credit in Guatemala amongst the Poor and the Non-poor (2000)**




*Source:* Based on Instituto Nacional de Estadistica de Guatemala (2000).

**Figure 6**
**Market Heat Map for Access to Mobile Phones in South Africa (2006)**
**(Non-poor population)**

| **Percentage of adult non-poor population, per province** | **Percentage of non-poor adult population** |
|---|---|
|  |  |

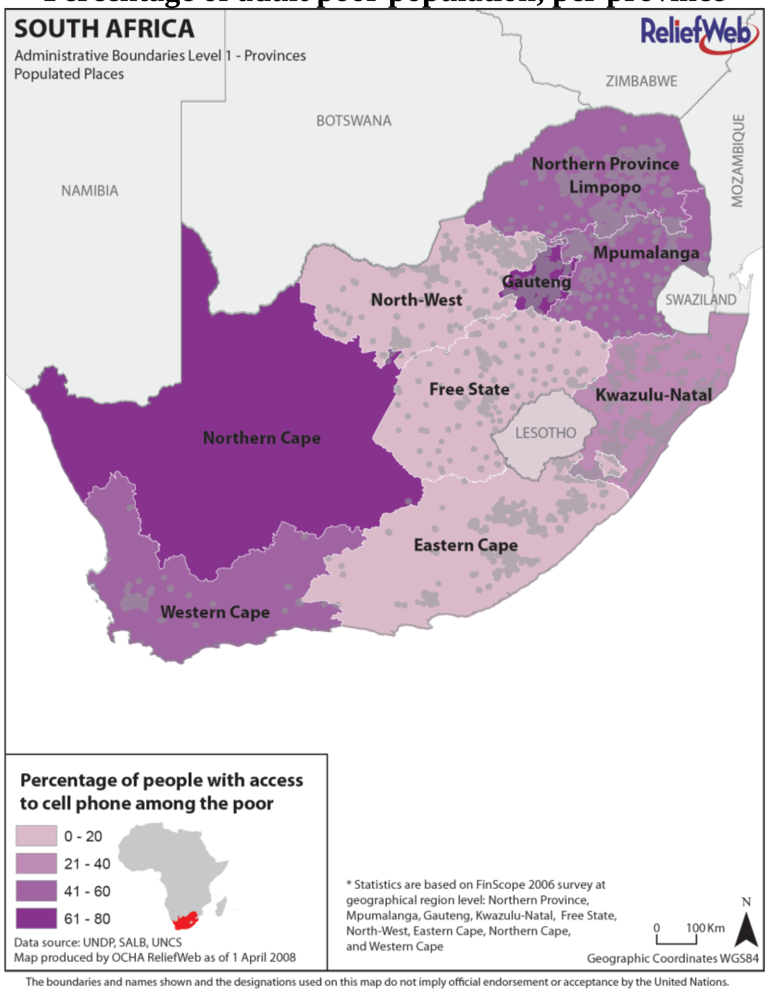




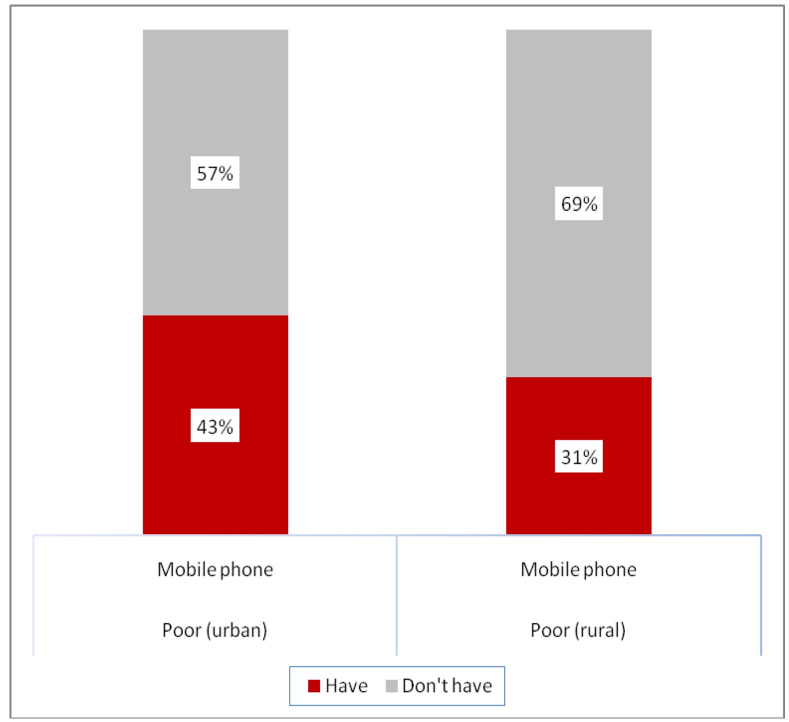
*Note*: Grey spots in the regional map represent population centers, built-up areas.
Estimates for mobile phone access are taken from the survey category "personally make use of…", answer "pre-paid cell phone".
*Source:* Based on FinScope (2006).

**Figure 7**
**Market Heat Map for Access to Mobile Phones in South Africa (2006)**
**(Poor population)**

**Percentage of adult poor population, per province**

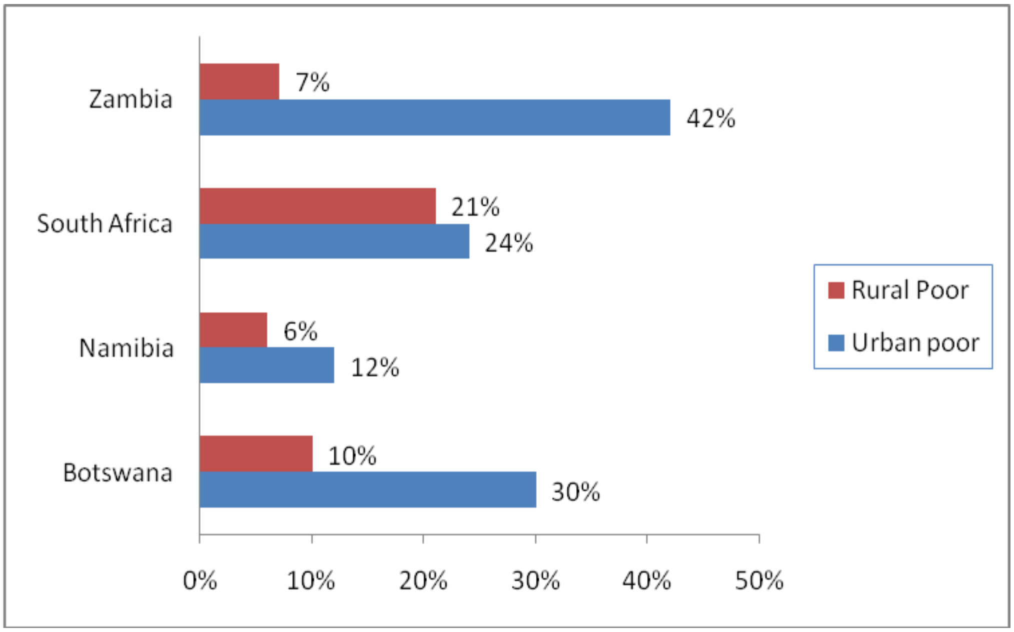



**Percentage of poor adult population**




*Note*: Grey spots in the regional map represent population centers, built-up areas.
Estimates for mobile phone access are taken from the survey category “personally make use of…”, answer “pre-paid cell phone”.
*Source:* Based on FinScope (2006).

**Figure 8**
**A Possible Opportunity: Estimates of the Precise Intersection of the Poor who have Mobile Phones and among Them Those Who Do Not Have Bank Accounts in Botswana, Namibia, South Africa, and Zambia (in percentage)**




*Source*: Based on FinScope (2004a; 2004b; 2005; 2006).

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