Paper presented in the IV Globelics Conference at Mexico City, September 22-24 2008

Globelics

The Distributional Consequences of Mobile Phones in Jamaica

Dhanaraj Thakur[*]
Susan Cozzens[**]

Introduction

The paper seeks to understand the nature of distributional consequences associated with mobile phones in Jamaica. By distributional consequences we are referring to the changes in the distribution of key aspects of social and personal development. Mobile phones are a pervasive technology in almost all societies. They are even more important in societies such as Jamaica which have had traditionally low levels of fixed-line telephone penetration. While the potential benefits from such a communication technology are enormous, from a policy level, it is also important to understand how these benefits (and costs) are absorbed by different groups in society given a particular set of national conditions.

To understand this dynamic, we first explain the framework and methodology which we will use in this paper. Next, we look at national socio-economic conditions of Jamaica. This is followed by an examination of the development and diffusion of mobile phones in Jamaica and the current industry environment. We then review the various public interventions in the sector including major telecommunications policies. Finally we analyze the various distributional consequences of mobile phones based on the national conditions, industry structure and public interventions that have been outlined.

Framework and Methodology

The paper is an application of a nascent analytical framework that seeks to understand the distributional consequences of emerging technologies given a set of national conditions and policy interventions (Cozzens, Gatchair, Harari, & Thakur, 2006). The framework posits a relationship between personal and social components of value and a technological project, in this case mobile phones. This relationship is mediated by two other variables: national conditions (the economy, poverty, education, etc.) and public interventions (policies, etc.). Personal and social components of value include employment, income, health, political power, social capital, cultural expression, etc.

[*] PhD student, School of Public Policy, Georgia Institute of Technology, Atlanta, USA.
dthakur@gatech.edu
[**] Professor, School of Public Policy, Georgia Institute of Technology, Atlanta, USA.
scozzens@gatech.edu

The importance of this paper then is to first test the usefulness of this framework. The results can then augment existing interventions and future telecommunications policy formulation with the aim of improving distributional outcomes. Furthermore, it is hoped that the results can shed some light on the distributional consequences of technologies in other comparable developing countries particularly those with existing inequalities such as Jamaica.

The approach used in this paper is essentially qualitative. That is, semi-structured interviews were conducted with knowledgeable persons in Jamaica among academic, industry, governmental and non-governmental entities related to mobile phones. In addition, the research was supplemented by data from various reports, surveys and other secondary sources. Based on the framework mentioned above the keys concepts for discussion and research were the evolution of the technology, policy environment, intellectual capital, employment and associated benefits and costs. Interviewees were identified through a combination of snow-balling techniques and desk-research. All interviews were conducted in person and via telephone during the summer of 2007.

Jamaica – Background and key national conditions

Jamaica, a small island state in the Caribbean, has a population of approximately 2.7 million with about half living in rural areas. It has been classified by the World Bank as a lower middle income country based on a GNI per capita of US$3,480 in 2006 (IBRD, 2007). Education at the primary and secondary level has improved in recent decades. However, the gross enrollment ratio at the tertiary level in 2004 was 19.1% (in 2004) (IBRD, 2007).

Although poverty has been reduced in recent years, it is still a major target for government action. In a recent estimate, the national poverty rate stood at 16.9% in 2004 (PIOJ, 2006). Poverty is also a function of the relatively high level of income inequality in the Jamaican economy. The Gini coefficient was 0.45 in 2004 (UNDP, 2007). One significant feature of the economy is the size of the informal sector. This has been estimated at around 40% of the formal economy (IADB, 2006). In addition, the country remains burdened by a high level of debt (both internal and external), one of the highest in the world at 137.9% of GDP (Blavy, 2007). At the same time the unemployment rate stood at 11.3% in 2005 (PIOJ, 2006).

A recent assessment of overall efforts towards achieving the Millennium Development Goals (MDGs) suggest that the goal of halving poverty in the country will be achieved but there are serious concerns about achieving goals related to HIV/AIDS, child mortality, maternal health. In addition, challenges also remain in terms of improving female participation in decision-making and improving male performance at the upper-secondary and tertiary levels (PIOJ, 2005). Another major concern is the high level of crime affecting the country. This has increased the costs of security, mobility and health and has been detrimental to the economy as a whole.

The historical development and diffusion of Mobile Phones

The penetration rate (number of subscribers per 100 persons) for fixed-line phones was below 10%[1] in the early 1990's when mobile phones were commercially introduced in Jamaica by the incumbent Telecommunications of Jamaica (TOJ). However, the availability of an alternative to fixed-line phones was not met with great enthusiasm by most people. This was mostly due to the high costs and cumbersome nature of the technology at the time which put it out the reach of ordinary people. Thus in 1991 there were 10,055 mobile lines and by 1999 that number had increased to 117,861 although this only represented 4.6% of the population[2]. During this period, TOJ was acquired by the UK based Cable and Wireless Group and renamed Cable and Wireless Jamaica (CWJ). Significantly, CWJ was able to gain an exclusive monopoly on telecommunications in the country as part of the privatization deal. Elements of this agreement were outside of public debate and proved to be highly controversial such as a guarantee on monopoly status for the next 25 years (Dunn & Gooden, 1995).

During the monopoly period there was marginal growth in mobile phone adoption in Jamaica. The government later shifted its policy and embarked on a liberalization process with the aim of introducing more competition in the sector. This was legislated in the Telecommunications Act of 2000. The Act paved the way for phased liberalization of the sector. Full liberalization was achieved in 2003 after three successive phases (GOJ, 2007):

1. Mobile phones and Internet and International voice (March 2000-August 2001)
2. Domestic voice and Internet access via cable operators (September 2001 – February 2003)
3. Complete liberalization in all sectors (from March 2003)

As part of this process, two new mobile phone licenses were awarded in 2000. Along with increased competition, the liberalization of the sector also led to a significant increase in the level of investment in telecoms infrastructure. Furthermore, following the award of these licenses penetration rates have increased rapidly. In fact between 2000 and 2005 the CAGR[3] of subscribers was 53.6% (Stern, 2006). During this period, the two new mobile phone companies Digicel (2001) and MiPhone (2004) began operations. Recent estimates put the number of mobile phone subscribers at around 2.45 million in 2006[4]. In other words the mobile penetration rate was 93.32%. This is higher than the Latin American and Caribbean and US rates for the same period. In fact in 2007, Jamaica had the fifth highest mobile phone penetration rate in the Americas (ITU, 2007). More recent estimates put the country's penetration rate at almost 100% (Clarke, 2008).

One result of the boom in the mobile phone sector is the lack of development of land-line infrastructure. Fixed telephone lines per 100 persons actually decreased between 2002 and 2007 from 16.56 to 12.85 (ITU, 2007). This is below the average for the Latin American and Caribbean region. This was due in part to the traditional argument of the incumbent operator that investments in rural and underserved areas could not provide a

[1] Source – Office of Utility Regulation (OUR) Jamaica.
[2] Ibid.
[3] Compound Annual Growth Rate - CAGR
[4] Source – Office of Utility Regulation (OUR) Jamaica.

reasonable return. However given that mobile phones are now the dominant technology for voice communications with almost 9 times greater penetration than fixed line phones, it is unlikely that any significant future investments will be made in traditional fixed-line telephony. Instead, major investments have been made to transform existing cable networks for broadband communications including voice telephony.

Current Industry Structure

There are currently three major operators in the mobile phone industry all of which are foreign owned: CWJ (majority owned by Cable and Wireless – British), Digicel (wholly owned by an Irish entrepreneur) and MiPhone (wholly owned by América Móvil – Mexican). After its launch in 2001, Digicel soon overtook CWJ as the largest operator in terms of subscribers. Currently Digicel has around 70% of the market followed by CWJ with 26% and MiPhone with 4% (Gordon, 2008). A smaller player, MegaPhone operated as a mobile virtual network operator on MiPhone's network and specialized in international calls. However its operations have now ceased and it is estimated that its market share was at most around 1% (The Jamaica Observer, 2007).

Based on current data, it is difficult to discern revenue in the mobile sector from revenues from the telecommunications sector in general. However, given that the mobile phone sector is the largest part of telecoms industry, it would also account for a significant part of the 4.1% contribution of the industry to GDP in 2005 (IBRD, 2006). More importantly, the major operators have made significant investments in infrastructure development over the years. For example, Digicel has invested some US$750 million up to 2007 and plans to invest another US$100 million to build 117 additional cell sites for its GSM network. This would increase its network coverage to 98.4% of the island (Clarke, 2008). Similarly CWJ plans to invest J$2.8 billion (approx. US$39.3 million) to expand its network by 120 cell sites (Clarke, 2008). CWJ which originally started out with a TDMA network but was forced to move to a more advanced GSM network following competition from Digicel. With its acquisition by América Móvil (which has some 153 million mobile phone customers throughout the Americas)[5], MiPhone plans to add 800 new sites to its network. Also recent media reports suggest that it intends to spend over US$400 million to make its island wide network more competitive with that of its larger rivals and to convert it from CDMA to GSM technology (Morrison, 2008).

While increasing the size of the industry from one incumbent operator to three major operators today, liberalization has had mixed implications for employment in the industry. For example, the incumbent Cable and Wireless Jamaica (CWJ) has seen a reduction in its total workforce (including mobile) from 5000 to around 1700. While new entrant Digicel and now the dominant mobile operator employs around 900 persons (Clarke, 2008). Thus while increasing penetration; the policy of liberalization has not necessarily improved employment in the sector. However, there is much anecdotal evidence that a new source of income for many small businesses and low-income individuals is the sale of pre-paid phone cards.

[5] http://www.americamovil.com/

Telecommunications Policy environment

With regard to telecommunications policy, the relevant government ministry is the Ministry of Energy, Mining and Telecommunications. The ministry is responsible for setting overall policy in this area. Other related areas in its portfolio are Intellectual Property and Information Technology. Each of these is managed by subsidiary agencies under the auspices of the Ministry. The telecommunications sector in Jamaica is regulated by the Office of Utilities Regulation (OUR). The OUR is responsible for monitoring the performance and tariffs structures of operators, the issuance of telecoms licenses and the protection of consumer rights. The Ministry is also supported by the Telecommunications Advisory Council in making recommendations on pertinent issues affecting the sector.

In addition, the Spectrum Management Authority is responsible for the management of the radio spectrum in Jamaica. It was created by the Telecommunications Act and started operations in 2001. Another related agency is the Central Information Technology Office (CITO) which was established as the main government agency with responsibility for the coordination of all activities under the governments The National ICT Strategy for Jamaica (2007-2012).

The existing policies and legislations which provide the basis for these organizations to operate include the Telecommunications Act (2000), the Access to Information Act (2002), the Copyright Act (1993), Strategic Information Technology Plan for Jamaica (2002), and the Telecommunications Policy (2002 and draft 2007). Proposals have also been made for amendments to the Copyright Act in accordance with Jamaica's accession to the WIPO copyright treaty. In addition, work is being proposed on a cyber-crime bill.

The existing Telecoms Act (2000) was primarily designed to facilitate the liberalization of the sector. It was developed in part with assistance from the ITU and WTO. However, given the achievement of its original objective, several observers both within and outside of the government have noted the need for revision of the Act. The main issues that will have to be addressed in the new Act include a reorganization of the institutional and regulatory environment such as the creation on a single telecoms regulator, convergence of technologies and media such as broadband via cable, and Internet TV (GOJ, 2007). An overall ICT strategy also exists for the country which is meant to complement telecoms policy. However, as is typical with such ICT policies, there is overlap with the existing telecoms policy in terms of objectives and scope.

Distributional Consequences

The mobile phone is now seen as an ubiquitous device in the Jamaican society. In fact, this is a recent phenomenon that is also evident in many developing countries. In this regard, some suggest that the mobile phone and not the Internet has the greater potential to alleviate poverty (Corbett, 2008; The Economist, 2005). In Jamaica, the introduction of mobile phones has had several consequences that are the result of a combination of policy, technological and structural conditions. For example, at an individual level, the policy of liberalization has resulted in increased adoption of mobile phones by all groups in

Jamaica regardless of gender and class although its impacts appear to be differential across income groups.

A recent survey of mobile phone use among low-income Jamaicans revealed that approximately 51% were male and 49% female (Dunn, 2007). In terms of usage, the most frequently called group was family (for 55.3% of users) followed by family (29.8%). Furthermore, there was a perception among this group that in general their quality of life and safety had improved after acquiring a mobile phone. The feeling of safety is important in a society with high levels of crime and violence and where public perceptions point to this issue as the most pertinent facing the country.

For low-income groups who are typically more vulnerable to socio-economic shocks and are therefore often engaged in coping strategies, mobile phones have become an effective tool in implementing these strategies. In an ethnographic study of the impacts of mobile phones on two low-income communities in Jamaica, Horst and Miller (2006) found that mobile phones have put people into a network of communication especially since other ICTs (ie land-lines) did not previously exist. Thus the technology has become a central part of communication networks in Jamaica. This critical role in communication networks does not automatically translate to new economic or entrepreneurial activities as might be expected. Rather, as Horst and Miller (2006) suggest, it functions as a minimum requirement for financial survival, a tool for maintaining social networks and contributes to the user's sense of well-being. The converse of this point is that the opportunity costs of not having a phone (ie. mobile) in this environment are very high.

Another important benefit of mobile phones particularly for low-income persons is its function in facilitating remittances from abroad. Remittances are in fact an important source of income for many persons and accounts for more than 15% of GDP (Blavy, 2007). Given the large Jamaican diaspora (almost as large as the local population), mobile phones are also important in facilitating trans-national communications. One advantage of the industry cost structure is that it uses the typical "calling party pays" system. Some remittance companies have taken advantage of this by offering "free" calls so that the sender can call the receiver regarding the money transfer. In fact this cost structure is also maximized by many persons even when they have no phone credit. For example, they can call another party and after several rings hang up and wait for their party to return the call, all at no expense to the original caller. This feature is particularly important for some low-income persons to stay connected.

Mobile phones have been a significant form of communication for almost all economic activity given its role as the de facto communication technology. This is especially true for those participating in the large informal economy. Self-employed persons in the services sector (from IT consultants to gardeners) and SMEs are able operate and communicate with clients because of mobile phones.

At a social level, many families (particular low-income) in Jamaica are headed by a single mother. One of the important uses of the mobile phone in this case has been to assist the mother in the managing her family and promoting safety and security.

Additionally, Batson-Savage (2007) notes the importance of mobile phones in social activities such as dating and sexuality and how this evinced in local pop culture songs.

Alternatively, several benefits are still limited by the lack of exploitation of more advanced data services such as mobile government, mobile banking, etc. Among higher income Jamaicans, access to the existing and more expensive advanced data and media mobile services can imply increased productivity and use of alternative and new forms of communication. In addition, as is the case with national comparisons, early adopters of technologies are usually at an advantage. This was the case with high income Jamaicans when the technology was introduced in the mid 1990's and could be the case as the technology evolves towards providing more converged services. The existing illiteracy rate in Jamaica – which is around 20% (UNDP, 2007) – could also limit the uptake of more advanced mobile services particular among the poor (The Jamaica Observer, 2008).

In addition, telecommunications policy in Jamaica is such that it has not sufficiently encouraged the integration of services between the major operators in a way that would benefit consumers. For example, because there is no local loop unbundling there remains high interconnection costs between the newer mobile networks and the fixed line network. Interconnection costs are also high between mobile networks. This has led to a "two phone phenomenon" where many low-income persons buy handsets on different networks to make calls to persons on those networks (Stern, 2006). In addition, there are high switching costs for consumers that move from one network to another. This is because there is no number portability and most handsets in the market are locked with a particular provider (OUR, 2007).

Another result which is typical of most mobile phone markets is a higher cost for pre-paid services. In a survey of low-income mobile phone users, approximately 97% reported using pre-paid services (Dunn, 2007). This is so even though pre-paid services costs more than post-paid services in terms of rates per minute. For example, among CWJ and Digicel, the difference in pre-paid and post-paid rates can vary between 40-100% (CWJ is slightly cheaper). Nevertheless, some 36% of low-income users felt that pre-paid was the cheaper option (Dunn, 2007). While it can be more cost-effective in the short run for users who lack sufficient money to get a post-paid contract, it will be more expensive in the long-run. Thus low-income users are at a disadvantage to high-income users in terms of the cost of using a mobile phone even though they are more vulnerable to such a cost difference. Of course the benefit of pre-paid services is that is it responsible for the rapid adoption of mobile phones in most countries (Castells, Fernández Ardèvol, Qiu, & Sey, 2007) including Jamaica.

Other economic concerns[6] that have accompanied the widespread diffusion of mobile phones include the emphasis that is often placed on the handset as a status symbol. This can lead to expenditure on the most expensive phones and is keeping with Jamaican culture which places a high premium on status. Related to this point, several policy makers expressed concern that a disproportionate amount of income (among low-income groups) was being spent on phone credit and multiple handsets. Higher income Jamaicans

[6] Based on similar comments made by several interviewees in the Jamaican telecoms sector – August 2007.

are less likely to use pre-paid services and are more likely to use one handset to call all networks, implying a lower proportion of income spent on mobile phone services.

One other potential cost of the widespread diffusion on mobile phones is how to adequately deal with the disposal of handsets. While this is not yet an immediate threat, there is awareness among some policy-makers that as the market matures and as older handsets become obsolete, the environmental consequences become important. Currently retailers are not required to inform customers about the proper procedures for the disposal of handsets and related devices. This is an issue which the draft Telecoms Policy (2007) seeks to address. Finally, given the high (real and perceived) levels of crime and violence in the country, several policy-makers are also concerned about the use of mobile phones by criminals. As with other social networks in Jamaica, mobile phones are also important to the functioning of criminal networks especially gangs which are the source of much violent activity in urban areas.

Summary and Conclusion

One interesting feature of the Jamaican case is that even where a country has achieved near universal service, the benefits and costs of the technology in question are not evenly distributed. However, while some benefits and costs accrue to one group over another, it is difficult to say that one group necessarily obtains more benefits than costs when compared to the other group.

First of all, some benefits and costs accrue to all users regardless of grouping. These include the basic benefits of mobile phones (communication, mobility, etc.). Others are more specific to Jamaica but still beneficial to all groups such as safety and security. In the same way, there are a common set of costs that apply to all groups in the country. These include a lack of development of fixed line infrastructure, the environmental impact of handset disposal and the use of mobile phones by criminal networks.

When we introduce the national conditions variable, the main group variation to occur is by income. For example low-income Jamaicans are more likely to resort to mobile phones as their only means of communication. This is turn has enabled benefits such as interfacing with the economic sector (both formal and informal), facilitating remittances from abroad, and managing single parent families. Alternatively, this same income differential implies that higher-income Jamaicans are more likely to access more expensive and advanced mobile services. Also low-income Jamaicans who are more likely to be illiterate are therefore less likely to use text based services.

After adding the public intervention variable we identify other further differentiation in benefits and costs. For example, high interconnection costs (that result from an inadequate regulatory regime) lead to a two-phone phenomenon. When this is coupled with the use of pre-paid services we see an additional burden on the low-income user. What we find then is complex interaction between the three variables of the framework. Also, this interaction appears to affect different groups in different ways. Further research (comparisons with other countries) will allow greater understanding of how this

interaction works and possible policy options to use for the greatest benefits for all groups in society.

Our discussion has shown that while the impacts of mobile phones on the general population of a country have been documented extensively, the distributional consequences appear to be less ostensible particularly when they are mediated by policies and national conditions. In the case of Jamaica where structurally vertical inequalities (income based) are perhaps more pronounced than other group distinctions and where telecommunications policy was initially aimed at liberalization, we note the various and different positive and negative impacts on lower and higher income Jamaicans. We can no doubt continue to observe differential effects as the policy environment changes (the 2007 draft telecoms policy is aimed at improving the governance, growth and consumer benefits within the sector); as structural conditions such as income inequality, the informal sector and social structures change; and of course as mobile technology and applications evolve.

References:

Batson-Savage, T. (2007). 'Hol' Awn Mek a Answer mi Cellular': Sex, Sexuality and the Cellular Phone in Urban Jamaica. *Continuum, 21*(2), 239 - 251.

Blavy, R. (2007). Public Debt and Productivity: The Difficult Quest for Growth in Jamaica. *IMF Working Paper, WP/06/235*.

Castells, M., Fernández Ardèvol, M., Qiu, J., & Sey, A. (2007). *Mobile Communication and Society - A Global Perspective*. Cambridge: The MIT Press.

Clarke, L. (2008, May 9, 2008). Digicel's $7 billion defence. *The Jamaica Gleaner*,

Corbett, S. (2008, April 13, 2008). Can the Cellphone Help End Global Poverty? *The New York Times*,

Cozzens, S., Gatchair, S., Harari, E., & Thakur, D. (2006, October 5-7). *Distributional Assessment of Emerging Technologies: A framework for analysis.* Paper presented at the Globelics 2006, Kerala, India.

Dunn, H. (2007). *Mobile Opportunities: poverty and telephony access in Latin America and the Caribbean - The case of Jamaica*: DIRSI - Regional Dialogue on the Information Society.

Dunn, H., & Gooden, W. (1995). Telecommunications in Jamaica. *Columbia Institute for Tele-Information Working Paper Series, 803*.

GOJ (2007). *The Jamaica Telecommunications Policy 2007 - Draft*. Kingston, Jamaica: Government of Jamaica.

Gordon, S. (2008, February 1, 2008). MiPhone makes a stand - Hires Chinese company to build hundreds of cell sites. *The Jamaica Gleaner*,

Horst, H., & Miller, D. (2006). *The Cell Phone - An Anthropology of Communication*. Oxford, UK: Berg Press.

IADB (2006). *The Informal Sector in Jamaica*. Washington DC: Inter-American Development Bank.

IBRD (2006). *Information and Communications for Development - Global Trends and Policies*. Washington DC: The World Bank.

IBRD (2007). *World Development Indicators 2007*. Washington D.C.: The World Bank.

ITU (2007). *World Telecommunication/ICT Indicators Database*. Geneva: International Telecommunications Union.

Morrison, D. (2008, February 27, 2008). Will consumers see benefits from new telecoms providers? *The Jamaica Observer*,

OUR (2007). *Quality of Service Standards for the Telecommunications Sector - A Consultative Document*. Kingston, Jamaica: Office of Utilities Regulation.

PIOJ (2005). *Millennium Development Goals - Jamaica*. Kingston, Jamaica: Planning Institute of Jamaica.

PIOJ (2006). *Economic and Social Survey of Jamaica 2005*. Kingston, Jamaica: Planning Institute of Jamaica.

Stern, P. (2006). *Promoting Investment in Information and Communications Technologies (ICT) in the Caribbean*. Washington DC: Inter-American Development Bank.

The Economist (2005). The real digital divide. (Cover story). *Economist, 374*(8417), 11-11.

The Jamaica Observer (2007, August 25, 2007). MiPhone changes hands again. *The Jamaica Observer*,

The Jamaica Observer (2008). Could illiteracy threaten JA tech revolution? Retrieved July 27 2008, from http://www.jamaicaobserver.com/blog/template_permalink.asp?id=196

UNDP (2007). *Human Development Report 2007/2008: Fighting climate change: Human solidarity in a divided world*. New York: Palgrave Macmillian.