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TELECOMMUNICATION POLICY IN THE CARIBBEAN: A COMPARISON OF TELECOMMUNICATIONS IN THE DOMINICAN REPUBLIC AND HAITI

by

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September 2011

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Several factors affect the development of telecommunications policy in a country. These include government intervention, geography, alliances, and economic stability. By studying different countries, and comparing these factors and the rates of growth of each state, one can further understand the different levels of telecommunications development. This thesis will explore telecommunications policy, its success and failures, in the Dominican Republic and Haiti, where telecommunications has become a major source of jobs and economy due to foreign investments. Analysis of telecommunications policies, regulatory bodies, and agreements will be studied and compared to each country's rate of growth in the past 10 years.

This thesis will provide recommendations for the successful implementation of regulatory policies in the named developing Caribbean nations. By examining the policies in these nations, this thesis will determine the effectiveness of the country's telecommunications policy. Additionally, the thesis will explore the influence of specific actors, such as corruption, nonenforcement of regulatory laws, lack of developed accounting and auditing systems, and the limitation of the government in developing policy.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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LIST OF ACRONYMS AND ABBREVIATIONS

ACN	Alpha Communications Network
AT&T	American Telephone and Telegraph
CAFTADR	Central America Free Trade Agreement Dominican Republic
CIA	Central Intelligence Agency
CODETEL	Compañia Dominicana de Teléfonos
CONATEL	Conseil National des Telecommunications
FCC	Federal Communications Commission
GDP	Gross Domestic Product
GNP	Gross National Product
ICT	Information and Communication Technology
INDOTEL	Instituto Dominicano de Telecomunicaciones
INTELSAT	International Telecommunication Satellite Organization
IP	Internet Protocol
ISP	Internet Service Provider
ITU	International Telecommunications Union
LAC	Latin American Countries
PRD	Partido Revolucionario Dominicano
RF	Radio Frequency
TELECO	Telecommunications d’Haiti
VOIP	Voice Over Internet Protocol

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I. INTRODUCTION

A. DESCRIPTION AND BACKGROUND

The last ten years have seen tremendous growth in telecommunication investment in some developing countries. As a result of these investments, and the expansion of the telecommunications industry, these nations have experience economic growth. In addition to growth, telecommunications investments in these nations have expanded market boundaries, have reduced the cost of communications, and have empowered citizens by providing greater access to information (Waverman, Meschi, & Fuss, 2005). Some experts argue that, because of the great impact of telecommunications and its vital role in every aspect of society, regulation, and policy should oversee this industry.

The main argument for regulation of telecommunications has been that fair competition amongst providers would be unlikely by merely relying on market forces. As an example, advocates for regulation would point to AT&T's monopoly of long-distance services and its refusal to interconnect with independent telephone companies, resulting in the failure of these companies. Large companies, such as AT&T, had an established network and allowing competitors to interconnect to their network provided no real incentive to them. To prevent monopolistic tactics from allowing fair competition between companies, regulation of these companies was established at the federal and state levels (Economides, 2004).

Intven, Oliver, and Sepulveda (2000) provide five main reasons for regulating telecommunications:

- Allow for basic telecommunications services
- Better competition
- Licensing of new operators
- To regulate the process of pricing
- To better allocate scarce resources required in the operation of services.

Economides (2004) states, “In general, regulation should be used only when it is clear that deregulated markets are likely to fail even in the presence of reasonably strict antitrust enforcement.” In unregulated markets, success and failure depend on the operation and pricing policies of the current technology. As new telecommunication technologies are introduced, pricing policies change substantially. As a result, Economides argues, it can change the telecommunications market into a market that will not require regulation.

Other experts argue that liberalization of the telecommunications industry in developing nations has positively affected the telecommunications market and has caught the attention of foreign investment. Liberalization of the markets has revolutionized the telecommunications industry producing a rapid transformation in technology, resulting in savings to service providers and consumers alike. For example, the telecommunication cost reductions have provided cheaper Internet access and wireless telephony to the general public, while increasing the market share for service providers.

The United States has long been the world leader in telecommunications and, as such, its policies and regulations affect the development of telecommunication policy in other nations (Simancas, 2009). The dismantling of telecommunication monopolies, as was the case in the United States with AT&T, has produced the same three problems in every market: how to ensure users of the system benefit from the competition; how to ensure users get the best service; and how to ensure new operators are given a fair chance to compete in the market. In addition to these problems, Simancas (2009) has pointed to other factors that have influenced the development and adoption of telecommunications policy in foreign nations. These include, but are not limited to: government intervention, geography, regional and global alliances or estrangement, and economic, social, and political stability (Simancas, 2009).

Telecommunication plays a vital role in all sectors, groups, and persons of all nations, and is a factor that heavily influences the economy of these nations. The impacts of telecommunications in the economic development of these nations are a direct result of the investment the telecom industries have made. Roeller and Waverman (2001) suggest a causal link between investment in communication infrastructure and economic growth. The outcome of investment in telecommunications infrastructure, such as cable, switches, routers, etc., increases the production of these products and the services they provide (Roeller & Waverman, 2001).

Aschauer (1989) suggests that investment in infrastructure positively affects productivity growth and hence economic growth. Additional studies performed by Greenstein and Spiller (1996) found that investment in telecommunication infrastructure resulted in growth in consumer surplus and business profits in local telecommunications services.

The advances in telecommunication systems have given rise to service economies throughout many developing nations (Langdale, 1989). The integration of new technologies, such as satellite and fiber optics, has expanded international trade (Hepworth, 1990). While the dependence on these new technologies, has motivated developing nations to pursue superiority in information services (Gillispie & Williams, 1987). The integration and dependence on these technologies has created job growth and attracted foreign investment, two important components of any developing nation.

Heeks (1989) suggests that there is a direct link between economic growth, the adoption of new technology and poverty reduction. Given Heeks' suggestion, and looking at various regions throughout the world, one asks why have countries in the same region developed so differently, or at a different rate? How has telecommunication, its policies, and regulations affected this development? What changes in telecommunication policy and regulation need to be implemented in order to benefit these nations?

This thesis will examine telecommunications development, policy and regulations and telecommunications' linkage to economic growth in the countries of Dominican Republic, and Haiti. Dominican Republic has seen dramatic

growth in information services. Its government has actively encouraged the growth of the telecommunication sector in an attempt to lessen its dependency on the agricultural and tourism sector. Haiti and its government understand that telecommunications development acts as an engine for economic growth. From 2005 on, Haiti saw increased mobile phone penetration rates. However, due to a lack of resources, infrastructure, and the recent earthquake of January 2010, a large part of the population remains excluded from basic telecommunication services.

B. WHY THIS THESIS?

This thesis will explore the telecommunications history, policy, and its effects in the countries of Dominican Republic and Haiti. The thesis will also explore the impact of these policies in the economic and regional development of these countries. More specifically, an analysis of the country's policies, regulatory bodies, and international agreements, in comparison to the rates of economic growth and telecommunications capabilities will be performed. Furthermore, the thesis will examine what application of regulatory factors leads to the best performance in the regulation of telecommunication markets.

This thesis will provide recommendations for the successful implementation of regulatory policies in the named developing Caribbean nations. By examining the policies in these nations this thesis will determine the effectiveness of the country's telecommunications policy. Additionally, the thesis will explore the influence of specific actors, such as corruption, nonenforcement of

regulatory laws, lack of developed accounting and auditing systems, and the limitation of the government in developing policy.

C. SCOPE OF THESIS

This thesis will cover the exploration of telecommunications policy and regulation. A comparison of development and adoption of telecommunications technology of the Caribbean region and the United States will be performed. The extent of the thesis will be additionally bounded by concentrating in the countries of Dominican Republic and Haiti. The principal research timeframe will be of telecommunications policy and regulations in the last decade.

D. ORGANIZATION AND METHODOLOGY

This research is focused on the policies, trends, and regulations of telecommunications in developing Caribbean nations. The thesis will be organized in five chapters. Chapters II and III will explore the Dominican Republic and Haiti, their history, and each country's telecommunications sector, respectively. Chapter IV will contrast the policies of each of the countries and their effect in economic development. Finally, Chapter V will provide recommendations for the successful implementation of regulatory policies in the countries studied. The chapter will provide additional areas for future research to be explored.

II. DOMINICAN REPUBLIC

Figure 1. Map of the Dominican Republic (From DOMREP, 2010).

This chapter will focus on the Dominican Republic. Initially the chapter will look at Dominican history. The chapter will follow with the country's geography and geopolitical climate. In part three, the chapter will discuss telecommunications in the Dominican Republic: its history, primary players, policy and regulations, and finally telecommunications data and conclusions.

A. EARLY HISTORY

Dominican Republic forms the eastern two-thirds of the island of Hispaniola (see Figure 1). Originally occupied by

Arawak-speaking Tainos, it was colonized by the Spanish in 1492 on Christopher Columbus' first voyage. Named Hispaniola by Columbus, the island became one of the most important colonies in the Spanish colonization of the Caribbean and the Americas. Santo Domingo, the capital, was started as a settlement established by Bartholomew Columbus, Christopher Columbus' son, in 1496. Throughout this period, the Spanish leadership changed several times, each mismanaging the resources of the island and harshly treating the local Taino population. The Taino's population dwindled from over 1,000,000 in 1492 to less than 500 in less than 50 years of Spanish rule, as Spanish colonists abused, tortured, and killed the Taino population to replenish their labor force (Library of Congress, 1989).

With the conquest of Mexico in 1521, followed by the conquest of Peru, Spain's interest in Santo Domingo began to decline. Higher quantities of gold and silver in Mexico and Peru attracted the Spanish settlers from Hispaniola (Library of Congress, 1989). This event happened simultaneously as the exhaustion of gold deposits in Santo Domingo and the dying of Indian labor. As Spanish interest drew to Central and South America, so did their strength in Santo Domingo. The departure of the colonial government from northern Hispaniola weakened the island's colonial defenses and left it vulnerable to other colonial powers. French buccaneers began settling in the northwestern part of Hispaniola; by 1664, France created the French West India Company, indicating their objective to colonize western Hispaniola (Library of Congress, 1989). For other key events in Dominican history refer to Table 1.

Table 1. Key Events in Dominican Republic History (From BBC News, 2011).

Year	Event
1492	Christopher Columbus visits the island, which he names Hispaniola, or "Little Spain"
1496	Spaniards set up first Spanish colony in Western hemisphere at Santo Domingo, which subsequently serves as capital of all Spanish colonies in America
1664	France creates French West India Company.
1697	Treaty of Ryswick gives western part of Hispaniola island (Haiti) to France and eastern part (Santo Domingo - the present Dominican Republic) to Spain
1795	Spain cedes its portion of Hispaniola island to France
1808	Spain retakes Santo Domingo following revolt by Spanish Creoles.
1821	Uprising against Spanish rules is followed by brief period of independence.
1822	Haitian President Jean-Pierre Boyer marches his troops into Santo Domingo and annexes it.
1844	Boyer overthrown; Santo Domingo declares its independence and becomes the Dominican Republic.
1861	President Pedro Santana returns the Dominican Republic to Spanish rule.
1863	Spain withdraws from, and annuls its annexation of, the Dominican Republic following a popular revolt.
1865	The second Dominican Republic proclaimed.
1906	Dominican Republic and U.S. sign 50-year treaty according to which the U.S. takes over the republic's customs department in return for buying its debts.
1916-24	U.S. forces occupy the Dominican Republic following internal disorder.
1924	Constitutional government assumes control; US forces withdraw.
1930	General Rafael Leonidas Trujillo Molina establishes personal dictatorship following the overthrow of President Horacio Vazquez.
1937	Army massacres 19,000-20,000 Haitians living in areas of the Dominican Republic adjacent to Haiti.
1960	Organization of American States adopts resolution calling for severance of diplomatic ties with the Dominican Republic.
1961	Trujillo assassinated.
1962	Juan Bosch, founder of the leftist Dominican Revolutionary Party (PRD) elected president in the first democratic elections for nearly four decades.
1963	Bosch deposed in military coup and replaced by a three-man civilian junta.
1965	Some 30,000 U.S. troops invade the Dominican Republic following a pro-Bosch uprising.

Year	Event
1966	Joaquin Balaguer, a Trujillo protégé and former leader of the Reformist Party (later to become the center-right Christian Social Reform Party (PRSC)), is elected president.
1978	Silvestre Antonio Guzman (PRD) is elected president and proceeds to release some 200 political prisoners, ease media censorship and purge the armed forces of Balaguer supporters.
1979	Two hurricanes leave more than 200,0000 people homeless and cause damage worth 1 billion dollars as the economy continues to deteriorate due to high fuel prices and low sugar prices.
1982	Jorge Blanco, elected president.
2010	Dominican Republic tightens border restrictions to prevent cholera spreading from Haiti.

Despite destroying French settlements in Hispaniola, the Spanish were unsuccessful in preventing resettlement by the French colonists. War in Europe prevented Spain from maintaining a garrison in Santo Domingo to deter the French from settling. This opened the doors to France, which took as one of its colonies the western part of Hispaniola. In 1697, under the Treaty of Ryswick, the Spanish officially recognized French dominion of the western part of the island, which was now called by the French, Saint Domingue (Library of Congress, 1989).

In 1791, the revolution against the French monarchy spread to Saint Domingue, where rebellious black slaves slaughtered Frenchmen and their armies. After defeating the French in 1804, rebel ex-slave Jean-Jacques Dessalines established the independent nation of Haiti in what used to be called Saint Domingue (Library of Congress, 1989).

Throughout the early nineteenth century, Santo Domingo, as the eastern part of the island was called, sought to gain its independence but was halted by Napoleon’s army, which gained control of the whole island under the Treaty of Basel. After Haiti’s independence, Dessalines declared

himself emperor and invaded Santo Domingo in 1805, followed by a quick retreat due to French naval forces in the area. In their retreat, the Haitians slaughtered the residents and sacked the towns of Moca and Santiago, laying the foundation for the continued animosity between the two nations, which continues to exist to date (Wikipedia, 2011).

The Spanish regained control of the island from the French in 1808 with the help of the British Royal Navy (Wikipedia, 2011). The re-conquering Spanish showed little interest in their restored colony and, in 1822, Haitian forces invaded Santo Domingo. Dominicans consider Haiti's twenty-two year rule of the island as a period of brutal military rule, which added to the already existing animosity between the two nations. Throughout this period, Haitians took over Dominican property, restricted the use of the official language (Spanish), and forbid Dominican citizens from practicing their local customs. The Haitian constitution forbade whites from owning land, leading to the exodus of many white landowning families to Cuba and Puerto Rico (Wikipedia, 2011). In 1844, Dominican Republic gained and declared its independence from Haiti modeling its constitution after the United States' constitution Wikipedia, 2011). From 1861 to 1865, Dominicans voluntarily returned to the Spanish empire, but independence was once again restored.

Internal struggles, economic hardships and the threat of European intervention in 19th century Dominican Republic finally led to U.S. occupation and the establishment of a military government in 1916. U.S. occupation lasted until 1924 after the election of a democratically elected government (U.S. Department of State, 2010).

In 1930, Rafael Leonidas Trujillo, a former army commander, assumed the presidency and ruled the country with an iron fist until 1961. Although he promoted some economic development, most of which to benefit his personal fortune, he severely repressed domestic human rights (U.S. Department of State, 2010). In 1961, Trujillo was assassinated by opposition elements.

The following years saw many domestic political leaders trying to assume power in the island. In 1963, a military coup led to violence in the island, which negated the 1962 election of Juan Bosch. The coup formed an unsuccessful civilian junta, known as the Triumvirate. The junta was not able to institute its authority and was seen as illegitimate to most of the Dominican population (Library of Congress, 1989). Distrust of the junta combined with the revolutionary ideals of Juan Bosch, sparked a revolution in 1965 where U.S. forces again had to intervene in the country to protect citizens, evacuate U.S. citizens, and restore order (U.S. Department of State, 2010).

Following U.S. intervention the country's two leading political leaders, Juan Bosch and Joaquin Balaguer, campaigned for the presidency. However, the events of 1965 were still fresh in the minds of many Dominicans who feared that Bosch's re-election would again end in violence. This fear by Dominican voters helped Balaguer win the election in 1966 with 57% of the vote (Library of Congress, 1989). Balaguer served as president for 12 years but was accused by political opposition leaders of winning his elections through intimidation and bribery (Library of Congress, 1989).

Under Balaguer's tenure, the Dominican economy had above-average growth. Sugar, which was the main country export, had favorable international prices, resulting in additional foreign investment, borrowing, aid, and the growth of tourism (Library of Congress, 1989). Expansion of the economy was rapidly halted in the 1970s due to falling sugar prices and the rise of oil prices. Inflation and high unemployment resulted from the slowing economy, which was particularly felt by the middle class.

Sensing disappointment in the Dominican government by the population, the PRD (Partido Revolucionario Dominicano – Dominican Revolutionary Party) nominated Antonio Guzman to run against Balaguer in the elections of 1978. Although early voting returns showed a sizable lead by Guzman, on the morning of May 17 the Central Electoral Board was occupied by military units who impounded the voting ballots. President Balaguer unsuccessfully tried to nullify the elections and keep his presidency by force (Library of Congress, 1989). But strong opposition from the United States made Balaguer reconsider. Balaguer allowed the vote count to resume and two weeks later Antonio Guzman became the new president.

After new economic reforms in the early 1990s, the Dominican Republic has experienced economic growth with moderate inflation and a steadily increasing GDP. In addition to economic growth in part due to the free trade agreement (CAFTA-DR) the Dominican Republic has also experienced explosive growth in telecommunications development.

B. COUNTRY FACTS

1. Geography

The Dominican Republic is located in the West Indies and occupies the eastern two-thirds of the island of Hispaniola. It is bordered on the west by Haiti, which occupies the western one-third of the island with a border of 224 miles (360 km). The country has an area of 18,704 square miles (48,442 km□), about twice the size of New Hampshire, with 800 miles (1,288 km) of coastline (U.S. Department of State, 2010). Maximum length from east to west is 242 miles (390 km) and 165 miles (265 km) north to south (Wikipedia, 2011). The capital, Santo Domingo, is located in the southern part of the country, north of the Caribbean Sea. The northern shore is south of the Atlantic Ocean and the eastern part of the island is separated from Puerto Rico by the Mona Passage (see Figure 2).

Figure 2. Map of Hispaniola and Puerto Rico (From SITEATLAS, 2010).

The highest peaks of the West Indies are found in the Dominican Republic. Its highest elevation is Pico Duarte at 3,175 meters in the Cordillera Central mountain range. The lowest elevation is Lago Enriquillo at –46 meters (Library of Congress, 1989).

The island is a tropical maritime nation. Trade winds from the northeast blow all year long. Annual mean temperature is 77° F with regional temperatures ranging between 64° F in Constanza to 81° F in drier regions. Temperatures infrequently rise above 90° F while freezing temperatures only occur during the winter in the highest peaks. Annual average rainfall is about 53 inches with rainy season taking place between May and November. The island is the path of hurricane alley, occasionally receiving hurricanes and tropical storms between June and November.

Although the Dominican Republic has been mainly seen as an agricultural nation, exporting products such as coffee, tobacco, and sugar, the last fifteen years has seen the service sector become the largest employer in the country. This change is due primarily to the explosive growth in telecommunications, tourism, and free trade zones. Despite the growth, the country's economy is heavily dependent on the United States, destination of nearly 60% of the island's exports. About 10% of GDP is attributed to remittances from the United States, which is equivalent to nearly half of its exports and 75% of the tourist trade (U.S. Department of State, 2010). Income inequality is rampant as the poorest in the country receive less than a fifth of the country's GDP, while the top 10% receives about 40%. In March 2007,

the Central America-Dominican Republic Free Trade Agreement (CAFTA-DR) became law, improving investment and exports. Although the Dominican Republic was greatly affected by the global recession of recent years, its economy recovered in 2010, and remains one of the quickest developing economies of the Caribbean (U.S. Department of State, 2010).

2. Political Conditions and Social Climate

The history of Dominican Republic includes many periods of political turmoil where revolutions, coups, and revolts were frequent. According to the Library of Congress Country Studies these periods can be used as a measure of the political atmosphere in the country. The high frequency of these tumultuous periods indicates that they are common in the political process (Library of Congress, 1989).

Dominican politics are described by some experts as a family affair. Many of the main political figures are related and these ties play an important role in the Dominican political process. It is these ties that explain the political scene and who is who in the political hierarchy (Library of Congress, 1989).

a. Elite Class

The economic elite in the Dominican Republic has steadily been growing. In the 1980s, the mainly agrarian economy of the country was replaced by trade, tourism, commerce, and industry (Library of Congress, 1989). Decreasing influence by political interest groups allowed other nonpolitical interest groups and professional associations to flourish. Members of this class entered

public service and made up a good portion of the cabinet and high-level government positions, providing them access to the decision-making process in Dominican government policies (Library of Congress, 1989).

b. Middle Class

As a result of political and economic reform in the 1970s by the 1980s, a more affluent middle class emerged. This new middle class was made up of shopkeepers, government officials, military personnel, and white-collar workers, settling mostly in the capital Santo Domingo, and the big cities of Santiago and La Romana (Library of Congress, 1989). This middle class is the majority in the country's political institutions, though they are often divided on social and political issues (Library of Congress, 1989).

c. Lower Class/Peasants

Although the lower class in Dominican Republic made up the largest population, early in the country's history they were mostly illiterate and politically unconnected. Many changes in the 1980s occurred that changed the political influence and education of the lower class. The country was developing and as 1990 approached, the country had become 30% rural and 70% urban with many peasants migrating to the big cities in search of better jobs and education (Library of Congress, 1989). Furthermore, the requirement that all voters be literate was abolished in 1962, increasing the lower-class voting numbers and giving them a voice in government (Library of Congress, 1989). The development of modern communications (radio and

television) empowered the class, bringing them out of isolation and organizing them into a powerful voice.

C. TELECOMMUNICATIONS HISTORY IN DOMINICAN REPUBLIC

1. Telegraph

The first telegraph in Dominican Republic was installed on May 17, 1884 under the presidency of Ulises Heureaux (Morrison, 2009). In 1885, telegraphy schools were established in the city of Santo Domingo and Puerto Plata. That same year the first telegraphic line was established with a distance that extended for 30 km, allowing for communication between the city of Santo Domingo and San Cristobal (Morrison, 2009). The second line was established that same year with a range of 40 km and extended between Sanchez and Samaná. Other telegraph lines followed with increasing range and, by the 1900s, the country was covered under the telegraph circuit.

The French company Societe des Telegraphes Sous administered the telegraph. The company had established cables between the Dominican Republic and the United States and Venezuela. This allowed the communication to the most important communications circuit in the Americas and Europe (Morrison, 2009). But the French company fell into conflict with the Dominican minister of Mail and Telegraph due to the high tariffs charged by the company and the slow progress in extending additional lines to the rest of the island (Morrison, 2009). Additionally, the Dominican government discovered that the company was listening in on official Dominican correspondence, while also providing communication services to known enemies of the state. These events caused

the Dominican government to establish an independent National Telegraphic Station with training by and for Dominican citizens (Morrison, 2009).

These communication lines were of high importance in the political arena as they allowed for communication over vast distances. The lines were also of importance to the government for the confidential information that could be transmitted via these networks (Morrison, 2009). Enemies of the state also knew of the importance of these networks and at certain nodes of the network, they would intercept messages and become aware of many government actions.

By the early twentieth century, the telegraph was well established as the country had one of the most complete and modern networks of the continent (Morrison, 2009). Not only did the country have the ability for national and international communication but it also possessed a great quantity of local skilled telegraph technicians, one of which was Rafael L. Trujillo, who in 1930 would assume the Dominican presidency and begin one of the most brutal dictatorships (Morrison, 2009). By 1902, the telegraph was beginning to be replaced by the telephone and by 1927 the telegraph had been mostly replaced in Dominican Republic.

2. Telephone

The first telephone concession in the Dominican Republic was registered in 1884 when congress came to an exclusive agreement with Preston Nason for a period of 50 years (Morrison, 2009). In 1886, the first telephone call was made in the Dominican Republic. By 1904, the telephone system had developed dramatically and was declared a public

utility by president Carlos Morales (Morrison, 2009). Telephone costs were dropped dramatically, allowing for the installation of telephone lines across the nation.

In 1907, the first telephone book was published (see Figure 3) and, by 1909, the country possessed a network of 13 primary telephone and telegraph station, 39 secondary stations, and its lines covered 2050 km of the nation (Morrison, 2009).

Figure 3. First Dominican Telephone Directory (From INDOTEL, 2011).

Following government mismanagement of resources, the telephone network rapidly deteriorated between 1913 and 1916

(Morrison, 2009). It was not until 1916, following U.S. intervention, that repairs and modernization of the network occurred under U.S. control. The government put in place by the United States nationalized all the phone companies under executive order number 275 and indemnified all existing private owners (Morrison, 2009). In 1927, the first automatic telephone was installed rapidly increasing the number of companies and private citizens with a telephone.

The economic crisis of the 1930s prevented the maintenance and upkeep of the telephone system by the Dominican government. This forced the government to sell all telephone installations to the American Telephone and Telegraph to which the Dominican government contracted for service for a period of 20 years. This led to the creation by the foreign investors of American Telephone and Telegraph of Compañia Dominicana de Teléfonos (CODETEL – Dominican Telephone Company) in 1930. By 1934, CODETEL had organized and optimized the telephone system and that same year inaugurated international telephone service via short wave radio (Morrison, 2009).

3. CODETEL

Beginning in the 1960s, a communications revolution took place in the Dominican Republic. Radio, television, and newspapers had spread throughout the nation, which encouraged rapid urbanization, and led to the political mobilization of millions of Dominicans. Additionally, after the assassination of longtime dictator, Rafael Trujillo, the Dominican media had become one of the freest in Latin America.

Throughout the 1950s and 1960s, CODETEL continued to grow to the point of having a de-facto monopoly over the telephone network in the Dominican Republic. In 1969, CODETEL signed a contract with the Dominican state to represent the nation in the International Telecommunications Satellite Organization (INTELSAT). This aggressive growth and continued modernization continued into the 1970s, and gave the Dominican Republic one of the most modern telecommunications networks in the world (Morrison, 2009). The first satellite station was built in the country in 1975, which allowed the Dominican Republic to join the global communications network via the INTERSAT IV satellite.

In the 1980s and 1990s, CODETEL continued its aggressive growth as it grew 100% throughout this period. In the 1980s, the company launched cellular service, making the Dominican Republic one of the first countries in Latin America and the world to have such service (Morrison, 2009). The 1990s saw CODETEL's de-facto monopoly come to an end after the Dominican government passed a law improving pro-competition regulation.

In 2004, CODETEL's name was changed to Verizon Dominicana in order to welcome the Verizon brand to the country (Wikipedia, 2011). In 2006, Verizon agreed to sell its stakes in Verizon Dominicana to Carlos Slim's group America Movil for $3.7 billion (Wikipedia, 2011). America Movil renamed the telecom company "CODETEL" and their mobile service "Claro," in 2007. America Movil owns 100% of the company, which is the leading local, long distance, and wireless telephone service provider in the Dominican Republic (Wikipedia, 2011). The America Movil-Verizon

Dominicana deal came under great scrutiny after it was reported that Carlos Slim tried to evade country taxes, but after agreement between the Dominican government and Verizon the deal was approved after a tax payment of $170 million.

D. POLICY AND REGULATIONS

1. Telecommunications Policy Overview

The telecommunications revolution has created alliances between telecommunications companies that want to expand and diversify their services, combine their technological facilities, and have access to new international markets. In order to regulate this industry, the general law of telecommunications was adopted in Dominican Republic in 1998. The law liberalized and modernized prior telecommunications regulations, updating them to newly established guidelines set by the World Trade Organization and the International Telecommunications Union (Pellerano, 2001). The law established the Instituto Dominicano de Telecomunicaciones (INDOTEL–Dominican Institute of Telecommunications), which regulates and promotes the organized and efficient development of telecommunications in the country.

This law, also known as “Law 153-98,” promotes the liberalization of telecommunications services, establishing that the regulating institution (INDOTEL) cannot set limits on the participation of telecommunications companies in the Dominican market, if these companies abide by Dominican law to provide such services (Pellerano, 2001). The law also states that all decisions by INDOTEL should be based on

minimum regulation and maximum functioning of the market, allowing for effective and sustained competition (Pellerano, 2001).

Another principal objective of law 153-98 is to promote the principle of universal service, guaranteeing telecommunications services to all consumers with equality and without discrimination (Pellerano, 2001). Universal service offers access to clear and efficient telephone services, and accessible prices to all consumers (Pellerano, 2001). The law also guarantees to fulfill the demand for telecommunications service by obliging service providers to expand their services as demand from consumers grows.

Law 153-98 has the following as specific objectives (Pellerano, 2001):

- Establish the principle of freedom in the provision of telecommunications services, to include freedom of construction and operations of systems and facilities.
- Deregulate the telecommunications sector and promote competition, in order to improve quality of service, innovation, and pricing in the telecommunications sector.
- Reaffirm the principle of universal service and guarantee that telecommunications services are accessible to all the population, conforming with the principle of continuity, generality, equality, and neutrality in such services.
- Adapt the national telecommunications industry to the levels and technical policies adapted by international organizations of which Dominican Republic is a member, especially to the recommendations of the World Trade Organization and the International Telecommunications Union.

- Ensure the effective and impartial role of the state in the functioning of the industry by the creation of an independent and transparent regulatory body.
- Guarantee the administration and efficient use of the public domain in the radio-electric spectrum.

Authorizations required for companies interested in providing communications services in the Dominican Republic are shown in Table 2.

Table 2. Authorizations Required by Service Providers in the Dominican Republic (From Frias, 2007).

TYPE OF AUTHORIZATION	MANDATORY FOR	IMPORTANT PROVISIONS
CONCESSIONS	-All telephony services (fixed and wireless) -Cable TV services -Television broadcasting -Radio broadcasting	Granted after INDOTEL has determined that the applicant complies with the technical, economic, and qualification requirements. Granted for renewable terms of five to twenty years.
LICENSES	Services that require the use of the RF spectrum: 1) Wireless services (cellular, paging, trunking), 2) Radio and TV broadcasting.	Granted through a public biding because the frequencies are not available in an unlimited number and are granted for renewable terms of five to twenty years. Radio and television broadcasting licenses are only issued to Dominican citizens.
REGISTRATIONS	-Ham radio service -Mobile aeronautical service -Mobile maritime service -Resale of services -Private telecommunication services -Value added services (electronic mail, Internet/Intranet, and digital transmission of data).	A simple formality of registration.

2. INDOTEL

INDOTEL is a state institution created by the general law of communications 153-98 with the purpose of regulating

and developing the telecommunications market. Its mission is “to promote and regulate telecommunications services to benefit society, within a liberal frame, with effective and legal competition.” INDOTEL is composed of a board and an executive director. The board has final authority in the regulation body having the right to establish directives of general policy and telecommunication laws to regulate the industry. The board is composed of five members from diverse fields assigned by the executive branch. Telecommunication companies in the country select two members, while a third represents consumer’s interests. Two members, one of whom is the technical advisor to the president, who also is part of the regulatory body, represent the government. The government representative also represents the Dominican state before international telecommunications organizations (Pellerano, 2001).

All decisions made by INDOTEL are made by resolution. Members of the board make these resolutions by majority vote. Decisions by the boards can be brought up by administrative ways or by judicial means. Appeals or reconsideration are open to decisions made by the executive director and the board within ten days of notification or publication (Pellerano, 2001).

Law 153-98 establishes guarantees necessary to ensure the independence, efficiency and impartiality of INDOTEL in performing its function as a regulatory body. The law gives INDOTEL the right to intervene between service providers in interconnection or cooperation agreements. The law also gives INDOTEL national jurisdiction to regulate the telecommunications sector, allowing intervention exclusively

by the executive branch in cases of emergency or when national interests require it (Pellerano, 2001).

To ensure the appropriate behavior and impartiality of members of the institution, there are standard requirements of qualifications and prior experience in the sector (Pellerano, 2001). In addition, any conflicts of interest by members of INDOTEL with telecommunication companies providing service in the nation are addressed in the by-laws. Laws specifically address the application of disciplinary action in cases of bribery, divulging confidential information, and addressing pending resolutions with members outside of the INDOTEL organization (Pellerano, 2001).

INDOTEL by law has the right to solicit information and data from service providers when, in their view, the service provider has violated law 153-98 and such information is necessary for adjusting the telecommunications policy. INDOTEL employees have the right to inspect all service provider’s installations, dependencies, and equipment with the goal that providers adhere to the law. In such cases, INDOTEL employees are representing the public authority and should provide evidence for such acts until evidence pointing to the contrary is given. If service providers refuse to cooperate or deny access to their installations or dependencies, INDOTEL can request aid from law enforcement institutions.

3. Services

According to the Dominican general law of telecommunications, telecommunications constitute the

transmission of voice, sound, image, or text via an electromagnetic medium. This provides for the distinction between telephone / fax services, which can be offered via wired technology, or mobile and broadcasting services, which are offered via waves (Pellerano, 2001). Applicable policies and regulation for each of the services depends on the medium of transmission for these services. Standards for telecommunications services and protocols in the country follow those of the International Telecommunications Union (ITU), of which the Dominican Republic is a member.

After the passing of law 153-98, most telecommunications license holders were allowed to provide local, long distance, cellular, Internet, and data transmission services. Soon after liberalization of the telecommunications market, Tricom (CODETEL's main competitor) began offering long-distance services, followed by cellular, beeper, Internet, and pre-paid card services (Lapuerta, Benavides, & Jorge, 2003). Local service by Tricom was not immediately available as CODETEL hindered its arrival by not allowing interconnection with its existing infrastructure. In 1998, CODETEL was ordered to provide interconnection after law 153-98 was passed (Lapuerta et al., 2003).

New systems and technologies, such as fixed wireless telephony, were introduced by Tricom. Following the liberalization of the telecom market, two additional service providers were started in the country, Centennial Dominicana and Turitel. New companies in the sector invested in wireless solutions for urban areas and extended services to rural and remote areas, bringing to light CODETEL's lack of

service to these areas (Lapuerta et al., 2003). Although progress has been made in bringing communication technology to these remote areas, only limited services are available.

A license is required for service providers to operate in the country, though this requisite has become a simple formality to guarantee that these companies are registered in the country, have met minimum requirements to be a provider, and contribute to the country's telecommunications development fund (Lapuerta et al., 2003). These policies have allowed unrestricted entry into the market and have promoted competition between providers (Lapuerta et al., 2003).

a. Fixed-Line Telephone Service

Telephone service is defined as local, long distance, and international long distance service. Monopoly of this industry was held by CODETEL, which continues to be the dominant service provider in the nation for domestic and international long-distance calls, controlling about 88% of the local market (Frias, 2007).

Law 153-98 reduced taxes on international long distance calls by 8%, permitting growth in the long-distance sector in the country. The law also opened the market to other competitors, giving users the right to choose their local, long distance, and international long distance service providers. Under law 153-98, access to telephone services are guaranteed by the creation of the fund, "Contribución al Desarrollo de las Telecomunicaciones," (contribution to the development of telecommunications). This fund finances various projects to develop telephone

service throughout the country by requiring service providers to pay 2% of revenues as a contribution to this fund (Pellerano, 2001).

Dominican households can have two types of telephone equipment: conventional telephone sets, and sets that are terminals of a proprietary phone system. CODETEL provides two types of phone systems to their business clients and their upper-class residential customers: a proprietary Nortel phone system, in which only Nortel phones can be used as terminals, and the Avaya phone system, which is more flexible, provides interoperability, and allows the migration to VoIP (Frias, 2007). Telephone sets imported to the country do not need to go through a registration process, but must meet guidelines of World Zone Number 1, to which the country belongs (Frias, 2007).

At the end of 2010, statistics by INDOTEL indicate there was considerable growth in fixed line telephones from 1996 to 2001. Following 2001, growth has slowed; this is likely as a result of the mobile phone market becoming the predominant calling technology, as depicted in Figure 4.

Statistics also show that teledensity of fixed lines also increased from 1996 to 2001, when it peaked at 11%. From 2002 to 2010, fixed-line teledensity remained relatively steady, as depicted in Figure 5.

b. Mobile Telephone Service

Mobile telephone service was introduced in the Dominican Republic by CODETEL in 1992. Their monopoly of the sector was short lived, as three additional competitors entered the cellular market soon thereafter. These were

Tricom, in 1995; Centennial, in 1998; and France Telecom (Orange) in 2000 (Lapuerta et al, 2003). CODETEL leads the pack with 64% of the market, followed by Orange (25%), Tricom (6%), and Centennial (5%) (Frias, 2007).

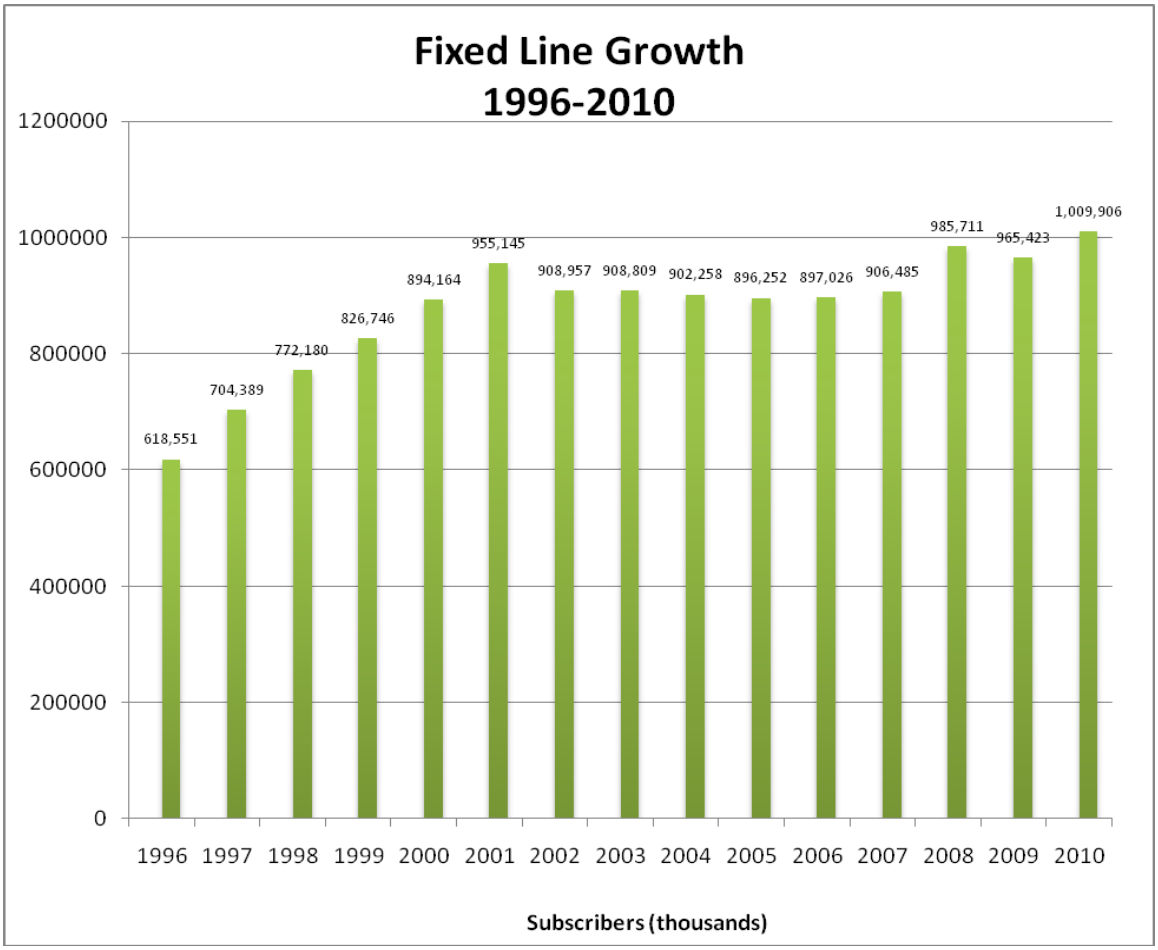

Figure 4. Fixed Line Growth 1996-2010 (After INDOTEL, 2010).

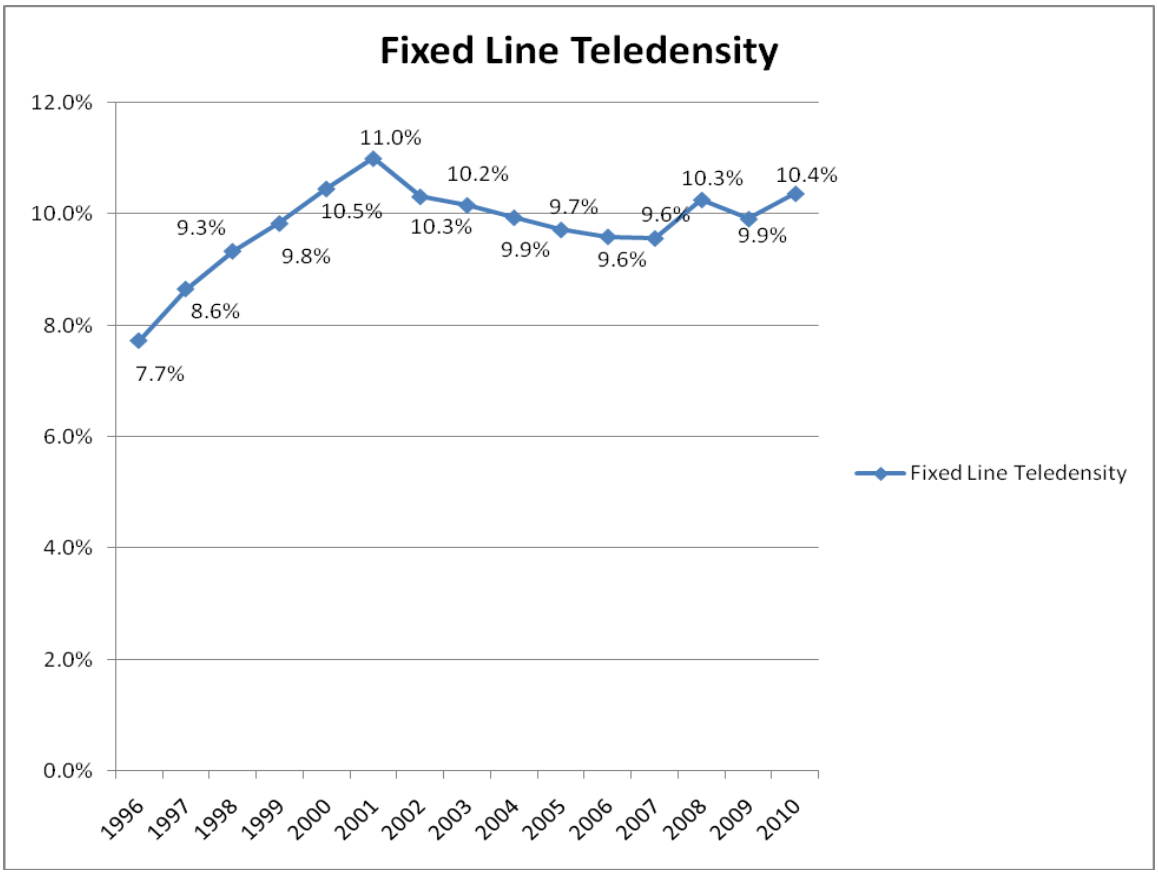

Figure 5. Fixed Line Teledensity 1996-2010 (After INDOTEL, 2010)

Competitors to CODETEL have been able attract clients by lowering their prices and by marketing their services aggressively. Companies gain market share by targeting Dominican families with family members abroad, lessening their long-distance communication costs. Competition in this sector has contributed to lower prices and fast growth in mobile phone users (Lapuerta et al., 2003).

Cellular network coverage is approximately 90% of the country. Cellular frequencies used the same standard as in the United States, operating between 800 and 1900 MHZ using 3g CDMA (code division multiple access) and GSM

(global system for mobile communications) technologies. The mobile phone subsector has much growing potential (Frias, 2007). The last seven years have seen the sector grow quickly, as shown by Figure 6. Teledensity of mobile lines has also seen impressive growth, as shown in Figure 7.

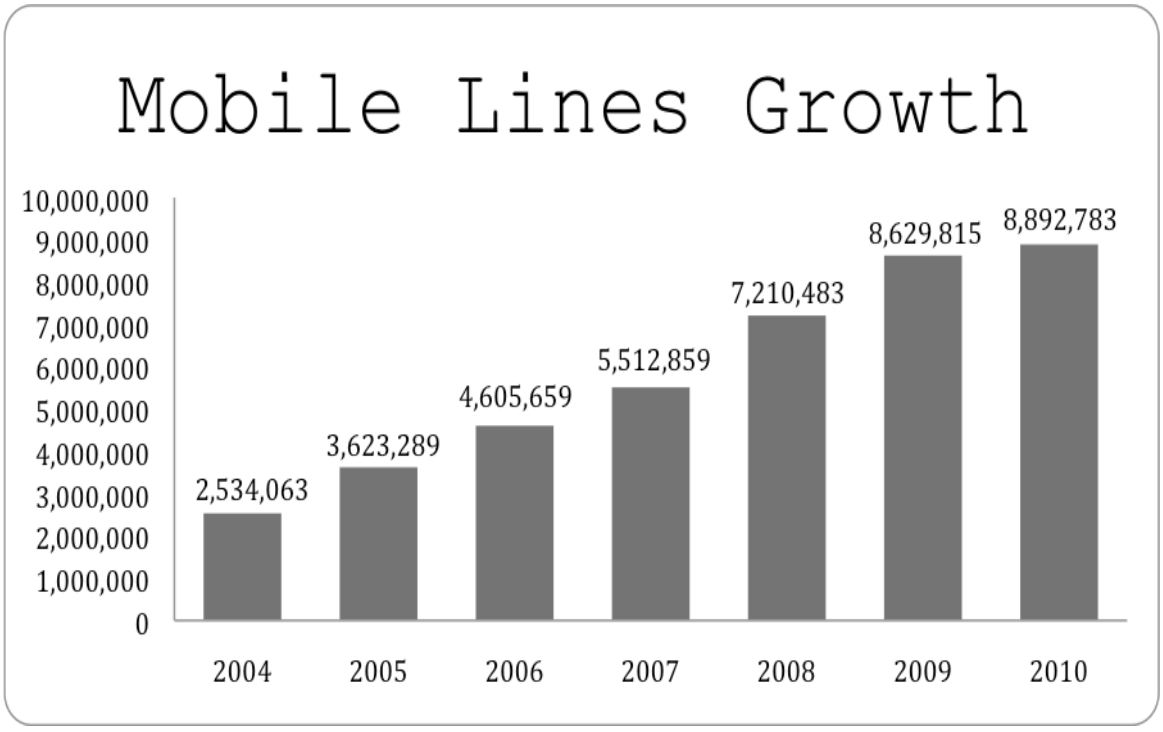

Figure 6. Mobile Lines Growth 2004-2010 (After INDOTEL, 2010)

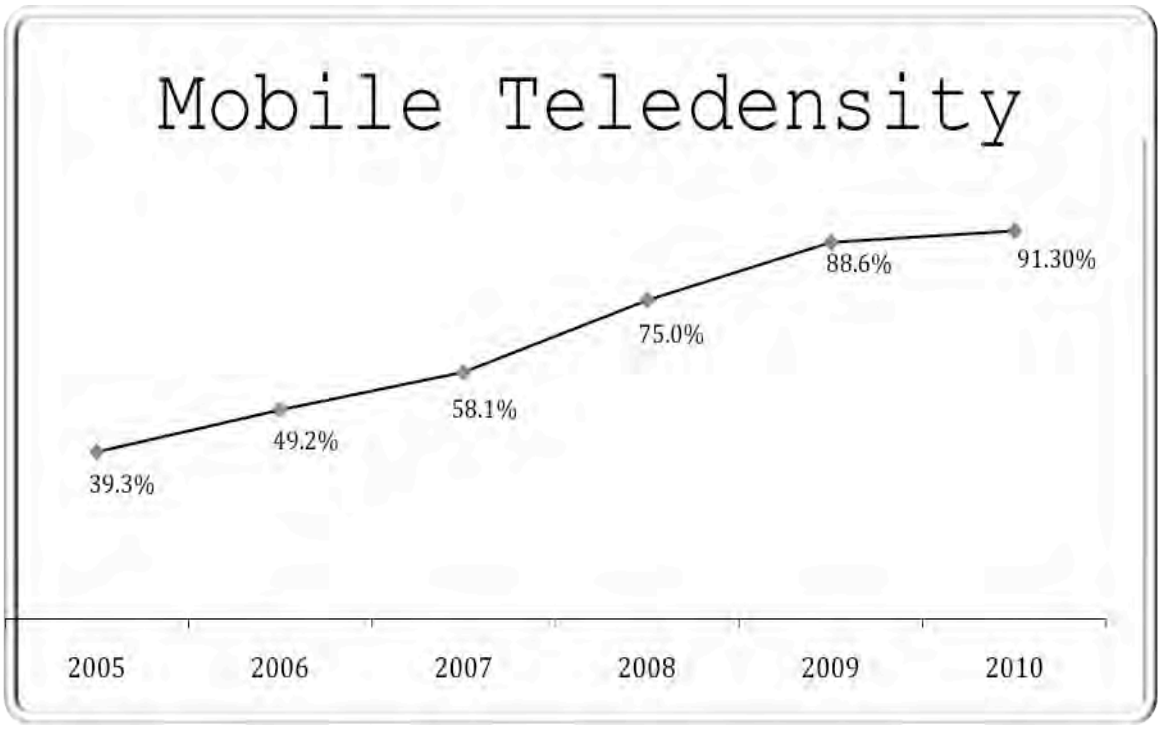

Figure 7. Mobile Teledensity 2004-2010 (After INDOTEL, 2010)

c. Internet

According to INDOTEL, nearly 28% of all Dominicans have Internet access, nearly 15 years after the service was first introduced into the country by CODETEL. As of 2008, Dominican Republic ranked eighth amongst Latin American countries with three million users (see Figure 8; Internet World Stats, 2011). Internet growth has been quite substantial, with a growth rate of 45% in 2010. Internet statistics for Latin American countries are shown in Table 3.

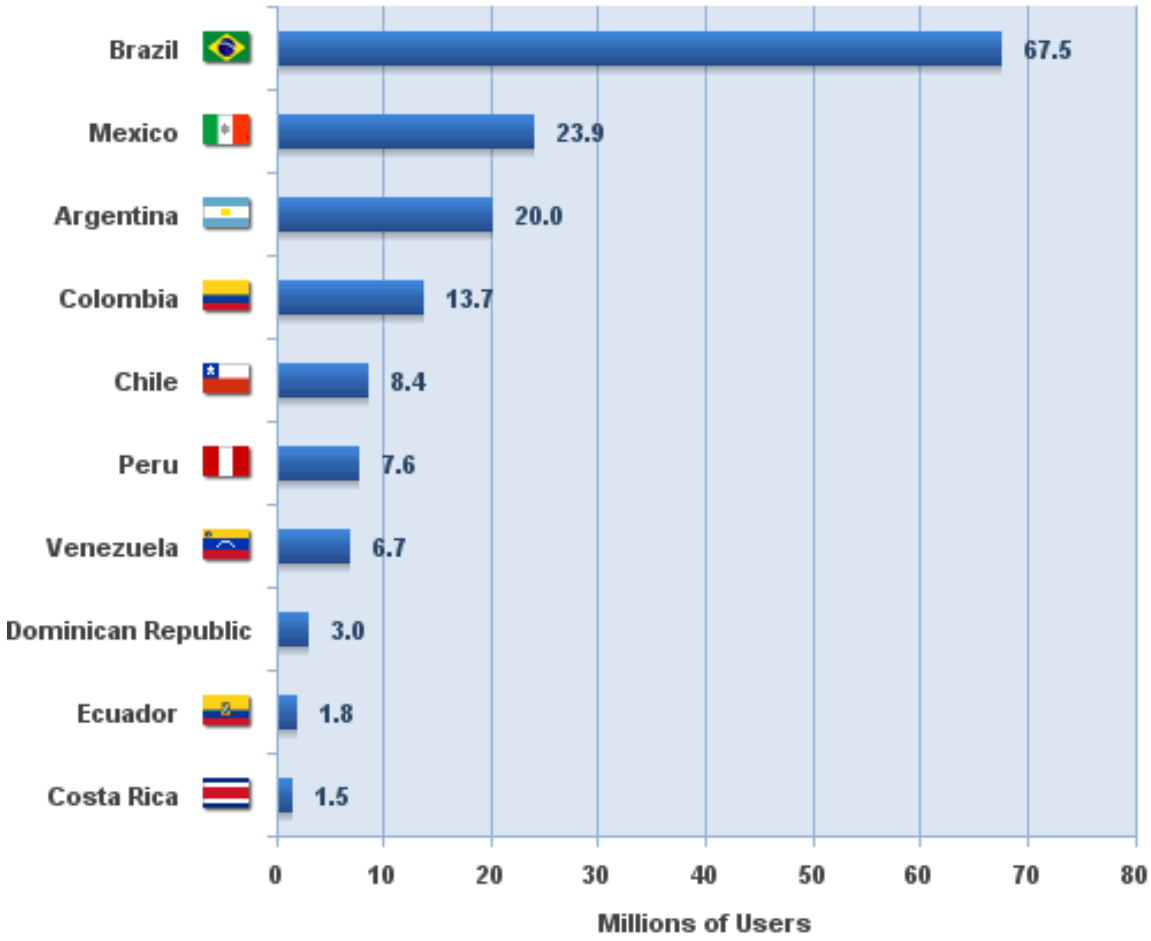

Figure 8. Top 10 Internet Countries in Latin American (From Internet World Stats, 2011)

Table 3. Latin American Internet Usage as of 2009 (From Internet World Stats, 2011)

Latin American Internet Usage					
LATIN AMERICA COUNTRIES / REGIONS	Population (Est. 2009)	Internet Users, Latest Data	% Population (Penetration)	User Growth (2000-2009)	% Users in Table
Argentina	40,913,584	20,000,000	48.9 %	700.0 %	10.9 %
Bolivia	9,775,246	1,050,000	10.7 %	775.0 %	0.6 %
Brazil	198,739,269	72,027,700	36.2 %	1,340.6 %	39.4 %
Chile	16,601,707	8,369,036	50.4 %	376.2 %	4.6 %
Colombia	43,677,372	20,788,818	47.6 %	2,267.7 %	11.4 %
Costa Rica	4,253,877	1,500,000	35.3 %	500.0 %	0.8 %
Cuba	11,451,652	1,450,000	12.7 %	2,316.7 %	0.8 %
Dominican Republic	9,650,054	3,000,000	31.1 %	5,354.5 %	1.6 %
Ecuador	14,573,101	1,840,678	12.6 %	922.6 %	1.0 %
El Salvador	7,185,218	975,000	13.6 %	2,337.5 %	0.5 %
Guatemala	13,276,517	1,960,000	14.8 %	2,915.4 %	1.1 %
Honduras	7,833,696	958,500	12.2 %	2,296.3 %	0.5 %
Mexico	111,211,789	27,600,000	24.8 %	917.5 %	15.1 %
Nicaragua	5,891,199	600,000	10.2 %	1,100.0 %	0.3 %
Panama	3,360,474	934,500	27.8 %	1,976.7 %	0.5 %
Paraguay	6,995,655	894,200	12.8 %	4,371.0 %	0.5 %
Peru	29,546,963	7,636,400	25.8 %	205.5 %	4.2 %
Puerto Rico	3,966,213	1,000,000	25.2 %	400.0 %	0.5 %
Uruguay	3,494,382	1,340,000	38.3 %	262.2 %	0.7 %
Venezuela	26,814,843	8,846,535	33.0 %	831.2 %	4.8 %
TOTAL	569,212,811	182,771,367	32.1 %	927.2 %	100.0 %

The expansion of the Internet in the Dominican Republic has generated controversies on whether the Internet industry should be regulated. Law 153-98 does not regulate the information or the transmission of Internet service. It further states that these services have become very important to society and the modern economy (Pellerano, 2001). Under the law, service providers can access public telecommunications networks without concessions or licenses; the only requirement is registration with the regulating agency, INDOTEL.

Internet accounts' growth throughout the last six years is shown in Figure 9, while Internet users are shown in Figure 10. Technology centers throughout the country, which allow for multiple users with one service account, account for the difference between accounts and users.

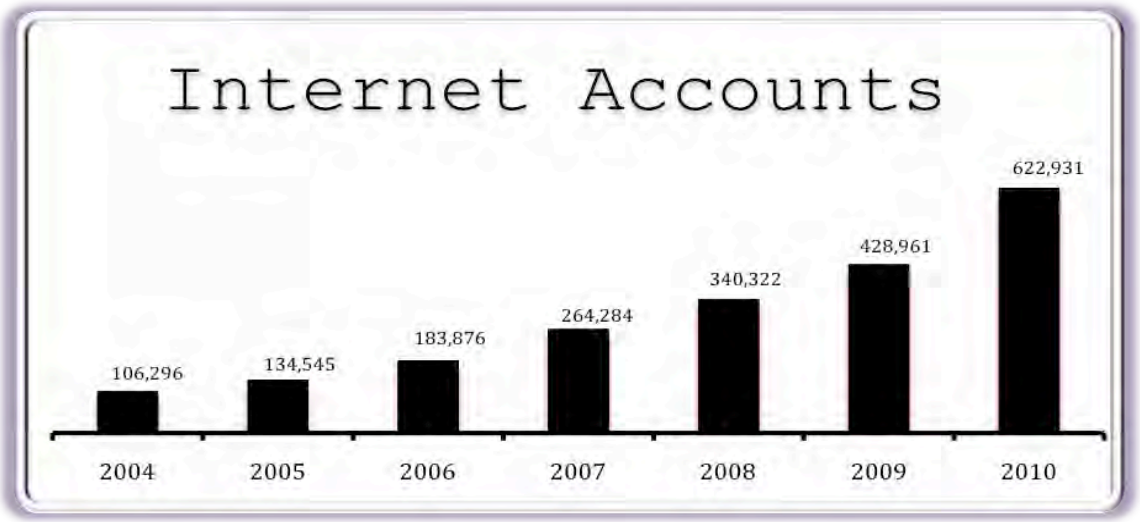

Figure 9. Internet Accounts 2004-2010 (After INDOTEL, 2010)

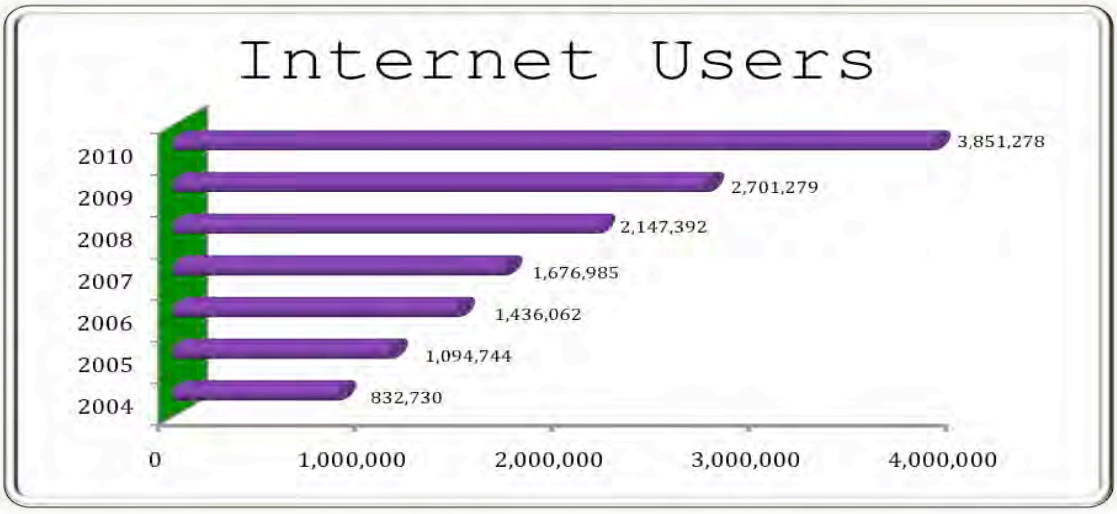

Figure 10. Internet Users 2004-2010 (From INDOTEL, 2010).

E. CHAPTER SUMMARY

The early Dominican economy was very dependent on agriculture, mainly tobacco, sugar, and the exportation of mahogany. After the arrival of the telegraph, the agricultural industry benefited greatly. Specifically, the telegraph allowed the industry to expand allowing for the exportation of these products to new markets in Europe and the Americas. By the end of the 19th century, the country had over 30 sugar refineries, becoming the most important export of the country. Following the success of the sugar industry, various foreign banks entered the country, allowing for more foreign investment to enter the Dominican economy. The telegraph and future telecommunications technologies in the country widened buyer and supplier networks and lowered transaction costs for various industries. In addition, telecommunications also reduced transportation costs significantly, permitting for the expansion of these industries.

The telecommunications investments in the Dominican Republic have greatly contributed to its economic development, which is reflected in the last ten years in the gross domestic product (GDP). From 1990 to 2005, the telecommunications sector grew 15% yearly and was the fastest growing sector of the Dominican economy, while the economy grew at a rate of 8% yearly from 1996 to 2000 (Travel Document Systems, 2011).

Law 153-98 modernized the telecommunications market in the Dominican Republic. The law deregulated the sector and promoted the offering of telecom services in a free market, which has benefited various other industries throughout the

country (Pellerano, 2001). The law has provided users: (1) more offers from service providers, (2) a reduction in prices, (3) guarantee of universal service, (4) efficient service, and (5) quality of service. Service providers can compete in a free market and can establish a transparent relationship with the regulating agency. The national economy has also greatly benefited, not only with the growth of economic activity, but also with the competition of the local market and flow of capital.

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III. HAITI

Figure 11. Map of Haiti (From Remnant Project Ministries, 2010).

This chapter will focus on the country of Haiti (shown in Figure 11). Initially, the chapter will look at Haitian history. The chapter will follow with the country's geography and geopolitical climate. In part three, the chapter will discuss telecommunications in the Haiti: its history, primary players, policy and regulations, and finally telecommunications data and conclusions.

A. EARLY HISTORY

As mentioned in Chapter II, Spanish interest in Hispaniola began to decline in the 1520s, as bigger quantities of gold and silver were discovered in Mexico and South America. By 1625, French buccaneers had established a settlement on the island of Tortuga and survived by pirating English and Spanish ships. As the population of Hispaniola decreased, and fearful of French pirate attacks, Spain ordered all colonists in Hispaniola to move closer to the more guarded capital city, Santo Domingo. This decision did not go as planned, as the French buccaneers then began to settle on Hispaniola's northern and western coasts (Wikipedia, 2011).

In 1664, the French West India Company was established and highlighted France's commitment to the new permanent settlement. The first major colony in Hispaniola by the French was Cap Francois (now Cap Haitien), established in 1670 (Library of Congress, 1989). Following the Treaty of Ryswick, in which the Spanish ceded the western part of the island to France, the French took possession of the western part of Hispaniola and called it Saint Domingue.

Soon after French rule was established in Saint Domingue, the territory became one of the wealthiest in the Americas (Library of Congress, 1989). By the late 18th century, the colony produced close to 60% of the world's coffee and 40% of the sugar consumed by France and Spain, making the island very prosperous but at the expense of the abuse and mistreatment of slaves. During French rule, the slave population peaked at 700,000, in 1791, but with the increase in slaves there was rampant mistreatment and abuses

against the slaves, causing much racial tension in the colony (Library of Congress, 1989). For other key events in Haitian history refer to Table 4.

Table 4. Key Events in Haitian History
(From BBC News, 2011)

Year	Event
1492	Christopher Columbus lands and names the island Hispaniola, or Little Spain.
1697	Spain cedes western part of Hispaniola to France, and this becomes Haiti, or Land of Mountains.
1801	A former black slave who became a guerrilla leader, Toussaint Louverture, conquers Haiti, abolishing slavery and proclaiming himself governor-general of an autonomous government over all Hispaniola.
1802	French force led by Napoleon's brother-in-law, Charles Leclerc, fails to conquer Haitian interior.
1804	Haiti becomes independent; former slave Jean-Jacques Dessalines declares himself emperor.
1806	Dessalines assassinated and Haiti divided into a black-controlled north and a mulatto-ruled south.
1822	Haitian forces invade Santo Domingo.
1844	Nationalist group revolts against Haitian occupation in Santo Domingo and form country of Dominican Republic.
1915	U.S. invades Haiti following black-mulatto friction, which it thought endangered its property and investments in the country.
1934	U.S. withdraws troops from Haiti, but maintains fiscal control until 1947.
1956	Voodoo physician Francois "Papa Doc" Duvalier seizes power in military coup and is elected president a year later.
1964	Duvalier declares himself president-for-life and establishes a dictatorship with the help of the Tontons Macoutes militia

Year	Event
1971	Duvalier dies and is succeeded by his 19-year-old son, Jean-Claude, or "Baby Doc", who also declares himself president-for-life.
1986	Baby Doc flees Haiti in the wake of mounting popular discontent. Replaced by Lieutenant-General Namphy as head of a governing council.
1988	Leslie Manigat becomes president, but is ousted in a coup led by Brigadier-General Prosper Avril, who installs a civilian government under military control.
1990	Jean-Bertrand Aristide elected president in Haiti's first free and peaceful polls.
1991	Aristide ousted in a coup led by Brigadier-General Raoul Cedras, triggering sanctions by the U.S. and the Organization of American States.
1994	Military regime relinquishes power in the face of an imminent U.S. invasion; U.S. forces oversee a transition to a civilian government; Aristide returns.
2000	Aristide elected president for a second nonconsecutive term, amid allegations of irregularities.
2004	Celebrations marking 200 years of independence turn into uprising against President Aristide, who is forced into exile. An interim government takes over.
2006	General elections, the first since former President Aristide was overthrown in 2004. Rene Preval is declared the winner of the presidential vote after a deal is reached over spoiled ballot papers.
2010	Up to 300,000 people are killed when a magnitude 7.0 earthquake hits the capital Port-au-Prince and its wider region - the worst in Haiti in 200 years.
2011	Michel Martelly wins presidential elections, according to provisional results.

Restrictions on slaves prevented them from having certain jobs, interracial marriages, dressing in European

clothes, carrying weapons, or assisting at events where whites were in attendance (Library of Congress, 1989). One of the few rights given to the slaves was land ownership. Through land acquisition, some slaves became relatively wealthy and actually were lending money to white men. Debt by white men to slave landowners led to resentment and further discrimination by the white men. Due to the injustices faced and a search for freedom, in 1791, a slave rebellion, which eventually evolved to the Haitian Revolution, overthrew French power in Saint Domingue. In this revolt, the slaves killed every white person they came across, along with setting fire to white properties (Library of Congress, 1989).

One of the leaders of this revolt was Toussaint Louverture, pictured in Figure 12. Louverture had served his childhood and early years as a man under humane masters who taught him how to read and write, making him one of the few literate black revolutionary leaders (Library of Congress, 1989). Before joining the slave uprising, Louverture informed his masters and ensured their safe return to France. Under Louverture's leadership, the rebels emerged as an effective fighting force and, by 1798, Louverture was the de-facto ruler of the colony. In 1801, Louverture invaded Spanish Santo Domingo and proclaimed the abolition of slavery, but did not proclaim full independence from France (Library of Congress, 1989).

Figure 12. Touissaint Louverture (From Wikipedia, 2011).

After a massive invasion by France, in 1802, the colony again fell to French control. Napoleon Bonaparte placed the colony under control of Donatie-Marie-Joseph de Vimeur, vicomte de Rochambeau. Rochambeau's ruling was brutal; he hanged, drowned, tortured, boiled, and buried alive black prisoners (Library of Congress, 1989). This brutal treatment helped unite the black soldiers, turning the tide of the war against the French. Jean-Jacques Dessalines (see Figure 13), who in 1803 overwhelmed the French army at the Battle of Vertieres, led this new army. Following the defeat, many of the white settlers fled the colony. In 1804, Dessalines named himself emperor, declared independence, and named the new nation Haiti, which means, "Land of the Mountains." He was assassinated in 1806, following a power struggle for government.

Figure 13. Jean Jacques Dessalines (From Wikipedia, 2011).

France refused to recognize the new nation until a retribution payment of 150 million gold francs from Haiti to France was received for lost property, slaves, land, and equipment (Wikipedia, 2011). This payment was later reduced to 90 million francs, which Haiti agreed to pay to lift an embargo imposed by France. To pay the debt, Haiti took high-interest loans, which were not repaid until 1947 (Tunzelmann, 2009). Haiti was recognized by Britain in 1833 and by the United States in 1862.

In 1822, Haitian forces invaded Santo Domingo. Haiti ruled the eastern part of the island for twenty-two years, until 1844, when an eastern nationalist group called “La Trinitaria,” led a revolt to form the country of Dominican Republic.

Political instability ruled Haiti throughout the 19th century. From 1843 to 1911, the country saw 16 rulers, 11 of whom were overthrown by revolution. This instability grew worse in the 20th century following revolutions, debt, and mob violence. In 1915, after the execution of 167 political prisoners under the rule of then-president General Guillame Sam, Haitian citizens became enraged. They sought Sam for execution; he was caught by the Haitian mob, torn to pieces, and paraded through the streets. Shocked by the brutality of these events, the United States took immediate action and invaded Haiti. Soon representatives from the United States controlled customhouses and administrative institutions in the country; this continued until 1934 (Library of Congress, 1989).

A military coup removed then-president Lescot in 1946, replacing him with Dumarsais Estime, who was overthrown by the military in 1950. Paul Malgoire, who resigned in 1956, replaced Estime. Provisional presidents held power until 1957, when elections were held and Francois Duvalier was elected president.

Duvalier, a former health minister, was known as Papadoc. He ruled with absolute power; his was regarded as one of the most repressive and corrupt governments in the 20th century. Under Duvalier's leadership, political murders, beatings, and intimidation became common. In 1964, Duvalier declared himself president for life, continuing corrupt policies until his death in 1971.

Following Papadoc's death, Duvalier's son, then 19-year-old Jean-Claude Duvalier, assumed control of the government. Although not as cruel as his father, Jean-Claude did not improve Haiti's deteriorating political and

economic situation. After condemnation of the regime by Pope John Paul II, a rebellion took place that forced Duvalier to resign and go into exile in 1986 (Library of Congress, 1989).

General Namphy assumed power under a provisional government until a new constitution was ratified in 1987. The new constitution called for a new bicameral parliament, an elected president, a prime minister, a cabinet, and a supreme court appointed by the president with parliament's approval (Wikipedia, 2011). Due to violence provoked by Haitian troops in an effort to maintain power, the 1987 elections were cancelled. The 1988 elections saw Leslie Manigat come to power; but, just three months after assuming the presidency, he was forced to resign by the military.

In 1990, Jean Bertrand Aristide, a former Catholic priest, won the presidential elections. Aristide's presidency was also short lived, as he was ousted by a military coup in 1991. This brought General Raoul Cedras to power (Library of Congress, 2006). The military government ruled the country for three years, and an estimated 3000-5000 Haitians were killed at the hands of the military government (Wikipedia, 2011). The government agreed to step down in 1994, following negotiations with the United States that threatened the country with a U.S. military invasion. Elections were again held in 1995, and saw the election of Rene Preval.

In November 2000, Aristide was elected president with more than 90% of the vote, although the elections were highly criticized for irregularities. Aristide was ousted by a coup in 2004, when he accused the United States of deposing him of his presidency. Throughout Aristide's

tenure, investigators claimed to have discovered extensive embezzlement, corruption, and money laundering, but these charges have yet to be proven (Wikipedia, 2011).

Supreme Court Justice Boniface Alexandre took over the presidency and petitioned the United Nations Security Council for the intervention of an international peacekeeping force. In June of 2004, the peacekeeping mission was passed to MINUSTAH (United Nations Stabilization Mission in Haiti), led by forces from Brazil, Argentina, Chile, Jordan, Morocco, Nepal, Peru, Philippines, Spain, Sri Lanka, and Uruguay (Wikipedia, 2011).

New elections were held in 2006, and Rene Preval was elected president. Although able to stay in power for his entire presidency, Preval faced many challenges, including a devastating earthquake in 2010. Death tolls were estimated at over 300,000 by the Haitian government. The earthquake destroyed most buildings, including the presidential palace, and severely affected the already weak health infrastructure. Disease became widespread and many survivors died due to infection, gangrene, and malnutrition. The country has not recovered from the earthquake and continues to face hardship. Due to the earthquake, the 2010 elections were delayed. In April 2011, after elections were held, Michel Martelly won the presidency with 67% of the vote.

B. COUNTRY FACTS

1. Overview

Haiti is a nation located in the western one-third of the island of Hispaniola, between the Caribbean Sea and the

North Atlantic Ocean. It is bordered on the east by the Dominican Republic with a border of 224 miles. Haiti is separated from Cuba by The Windward Passage, which lies northwest of the northern Haitian peninsula (see Figure 14). The country has an area of about 10,000 square miles, about the size of Maryland, with 1100 miles of coastline (1,771 km) (Library of Congress, 2006).

Haiti has many rivers and streams that rise from the mountains. Throughout the dry season, some of these rivers can get as shallow as one meter, while others dry out completely. The saltwater lake Etang Saumatre is the biggest body of water in the southern region. Haiti also has four smaller islands in its territory; these are: Ile de la Gonave, Ile de la Tortue (Tortuga Island), Grande Cayemite, and Ile de la Vache.

The island is a tropical semiarid nation where mountains in the east block off the trade winds. The dry season is interrupted by the northern winds, which bring fog and drizzle from November to January, followed by the northeast trade winds, which bring with them heavy rains from February to May (Library of Congress, 1989).

Figure 14. Northwest Peninsula of Haiti and the Gulf of Gonave (From Central Intelligence Agency, 2011).

Annual rainfall averages about 140 to 200 centimeters, although not all areas receive the same amount of rain (Library of Congress, 1989). Most of the rainfall received occurs in the northern plains and the southern peninsula, while the western coast, including Port-au-Prince, is very dry. Temperature throughout the year is hot, ranging from 60°F to 80°F in the winter to 80°F to 100°F in the summer.

Haiti has been extensively deforested and the remaining land continues to be cleared for agriculture and charcoal used for fuel. The consequence of deforestation has been soil erosion, which has lowered the productivity of the land, has worsened droughts, and has led to desertification (Library of Congress, 1989). With less than 3% of the country having tree cover, Haiti has a big challenge in reforesting the country as some parts of land have lost so much of its topsoil that the land is no longer arable.

According to the CIA Factbook, Haiti's poverty, corruption, and lack of access in education over the years has placed the country in a difficult position. Over 80% of the population lives under poverty, with 54% living in abject poverty. Adding to the troubles of the country was the recent 7.0 magnitude earthquake, which destroyed most of the capital city, Port-au-Prince. Over two-thirds of the population, estimated at 9,719,932 as of July 2011, depends on the agricultural sector, putting the livelihoods of many Haitians at risk due to deforestation. The Haitian government relies heavily on international assistance for sustainability, receiving over half of its fiscal budget from international organizations. GDP per capita in U.S. dollars is estimated at $1200.00, placing the country in the 207th position in world rankings (Central Intelligence Agency, 2011).

2. Political Conditions

Although it was the first black republic to declare independence, political violence and corruption have made Haiti one of the poorest countries in the western hemisphere. Periods of military rule, dictatorships, and

irresponsible government have weakened the nation's institutions and left the country economically vulnerable. Throughout its modern history, the country has ranked amongst the most corrupt and, in 2006, was ranked the most corrupt nation according to the Corruptions Perception Index (Transparency International, 2006).

Officially, Haiti is a semi-presidential republic, although some would argue that the political system is authoritarian. The new constitution, approved in 1987, models those of the United States and France. The government consists of three branches: the executive, legislative, and judicial. The president is the head of state and is elected by popular vote every 5 years. The prime minister is the head of government and is appointed by the president.

Politics in Haiti place much emphasis on the presidency. The president is seen as having absolute power, with many citizens viewing him as godlike (Library of Congress, 1989). Many presidents have obtained the presidency by means of seizing power, usually with the help of the military. As a result the other branches of government have been weakened, leaving the check and balances system well unbalanced.

3. Social Climate

Social classes in Haiti were drastically altered following the Haitian Revolution. The white populations along with the elites fled the colony or were killed. The plantation system, which provided the economic basis for the colony, was largely destroyed. In the revolution the

Haitian upper class lost their influence over the agricultural sector and control of their lands, which were distributed amongst former slaves (Library of Congress, 1989). Many in the upper class switched their interest to other areas, in particular government.

Two groups composed the Haitian ruling class during the 19th century; these were the urban elite and the military leadership (Library of Congress, 1989). Social position amongst the urban elite was determined by birth, while the military became a way to climb the social ladder for lower class Haitians. Farmers wishing to improve their economic status took to the city in search of better living conditions and wages. Prior to the 20th century, the middle class was nonexistent; but, once established, it became very influential over the Haitian political process (Library of Congress, 1989).

a. Elite Class

Although only making up 2% of the Haitian population, Haiti's upper class controlled over 44% of the nation's wealth. Many of these elites had become wealthy through government connections, more specifically during the Duvalier years. Some of the elites achieved their wealth through industry and business as access to the educational system in Haiti improved.

Members of the traditional elite were members of known families and achieved their wealth through inheritances. They held white-collar jobs in trade and industry. Customs and appearance were also a key characteristic of this group, as members had to be familiar

of French customs, in addition to having light skin and straight hair (Library of Congress, 1989).

b. Middle Class

Emergence of the Haitian middle class in Haiti came about in the late 19th century, but did not become politically affluent until the U.S. occupation in 1915. The U.S. occupation was partly responsible, as it created a professional military and expanded government services, slowly developing a middle class. Restructuring of the educational system was followed by economic prosperity in the 1920s, increasing the affluence of the middle class. By the 1980s, although only making up 5% of the population, the middle class was established and had a powerful voice in Haitian politics (Library of Congress, 1989).

Association to the middle class was defined by nonmanual labor, literacy, a moderate income, and mastery of French (Library of Congress, 1989). Middle-class citizens saw education and living in the city as the two key factors to improve their economic position. Despite the attempts to match the customs of the elites, elitist racism resulted in hatred in the middle class, leading to conflicts between the classes (Library of Congress, 1989).

c. Peasants

Peasants make up about 75% of the Haitian population. Due to the Haitian Revolution, from early in the 19th century Haitian peasants owned land, in contrast to peasants in other Latin American nations. Although many peasants were landowners, many lacked clear titles to their

lands due mainly to the fact that Haiti has never conducted a cadastral survey (Library of Congress, 1989). Most lands are held with a notarized paper instead of a formal deed.

Although initially isolated from the Haitian capital and the political process, the introduction of the radio helped peasants become more involved in the political process. The building of roads and bridges throughout Haiti made travel easier to the bigger cities. Infrastructure development also brought much needed aid from the government and international organizations.

d. Urban Lower Class

Mainly established in Port-au-Prince and coastal towns, the urban lower class made up 15% of the Haitian population in 1980. This class was mainly made up of farmers who had migrated to the cities in search of better jobs. Due to limited job growth in the cities, many of these farmers reached the city and found themselves jobless. Although at the bottom of the social ladder, many in the urban lower class recognize the importance of education and make tremendous efforts to keep their children in school, allowing members of this class to climb the social ladder (Library of Congress, 1989).

C. TELECOMMUNICATIONS HISTORY IN HAITI

Between 1957 and 1989, Haiti’s mass media grew rapidly. Radio usage throughout rural Haiti brought out of isolation much of the less affluent citizens, giving them a voice in the Haitian political process. By the 1980s, about two-dozen radio stations, a similar number of newspapers and two

television stations were operating in Haiti, most of them in Port-au-Prince. Free expression of the media was not tolerated throughout the Duvalier years and any outspoken critic would end up kidnapped or killed (Library of Congress, 1989). Tight control of the press was not loosened until the departure of Jean-Claude Duvalier in 1986.

In 1993, Haiti's first commercial ISP, Alpha Communications Network (ACN) was established. Its original goal was to provide support for a large Haitian company, but soon they recognized that they could use the same equipment to provide telecommunications services to other businesses and commercialized their services (Peha, 1999). Other ISPs include: Hintelfocus, which originally came to Haiti as MCI to provide telecommunications services for the U.S. armed forces and the U.S. embassy; and Companet who resells communication services from CAN (Peha, 1999).

D. POLICY AND REGULATIONS

1. Telecommunications Overview

From the 1960s to the 1980s, Francois and Jean Claude Duvalier ruled Haiti. Both father and son accumulated large fortunes in their time in government, despite the over-rampant poverty in the country (Peha, 1999). After this regime, years of crisis and instability followed that left Haiti as one of the least developed countries, resulting in a real challenge to telecommunications infrastructure development. Priorities such as health care, food, and other basic services were most pressing, placing information technology development and infrastructure in a back seat.

Haiti's geography is also not conducive to telecommunications development (Peha, 1999). The mountainous terrain increases the cost of infrastructure development. This rough terrain, combined with a per capita gross domestic product (GDP) of $250.00, deters investments by telecom companies. In addition, 65% of the population is rural, further increasing development costs (Peha, 1999).

Haiti has the lowest telephone density in the Caribbean with an average of 3.25 subscribers per 100 inhabitants as of 2006 (Library of Congress, 2006). The average for the Caribbean region is 34 subscribers per 100 inhabitants. In 1998, the government allowed two additional service providers to enter the market, increasing the number of subscribers throughout the nation. Although service remained expensive for most Haitians, new companies have been allowed to enter the market and they continue to erase the communications gap in Haiti.

Three major cell phone providers operate in Haiti. These are Digicel, Comcel, and Haitel. As of 2006, Comcel and Haitel had about 500,000 subcribers. In 2006, Digicel entered the market, undercutting the competition and gaining 1.4 million subscribers within the first year. Haitel and Comcel responded with low pricing and by offering new services, resulting in a combined increase of 500,000 additional subscribers.

2. CONATEL

Although the Library of Congress Country Study of Haiti states that the Haitian government no longer completely controls the telecommunications industry, the Haitian

Council on National Telecommunications (CONATEL) still publishes a decree by former dictator Jean-Claude Duvalier, granting the state a full monopoly of the telecommunications sector. CONATEL is a department under the ministry of public works, transportation, and communications, and is responsible for regulating telecommunications policy in Haiti. The department was created in 1969 and its missions were defined under the Haitian Law-Decree of June 10, 1987, passed under the presidency of Lieutenant General Henry Namphy. No further updates to this decree were found but, according to CONATEL, new legislative proposals and framework for reforming the telecommunications sector have been developed and are still waiting to be sanctioned by authorities. Development of competition has moved the monopoly of TELECO, Haiti's national phone company, to five telephone companies, increasing teledensity from 0.8% to 8% in ten years (CONATEL, 2011).

The missions of CONATEL are (CONATEL, 2011):

- Provide the government various options for national policy on telecommunications.
- Evaluate the development of telecommunications services by operators for possible adoption by the government.
- Analyze proposed regulations for the operation of services and technical standards for possible adoption.
- Provide the government recommendations for pricing, taxation, fees, and other charges for telecommunications services.
- Evaluate applications for grant recommendations to the government.
- Mediate between different service providers.

- Ensure compliance with the International Telecommunications Convention on behalf of the state.
- Protect the rights of third parties vis-à-vis contracts between the state and other parties.
- Manage the radio spectrum.

CONATEL is composed of a board of directors and an executive body. The board of directors is composed of the work, transport, and communications minister, who sits as chairman, and four other members in an advisory capacity in the following fields: radio, television, telephony, and telecommunications legislation, planning and public finance. The other members of the board are appointed by order of the president. Decisions by the board are taken by majority vote and in case of a tie the President's vote shall be decisive.

3. TELECO / Viettel

TELECO (Telecommunications D'Haiti) was a government-owned monopoly that provided telephone services in Haiti. Although the company has been profitable for most years, many government officials used it as their own personal wallet. The company was created in 1968, and is controlled by the Haitian state through the bank of the Republic of Haiti (TELECO, 2011).

In 2010, partial privatization of TELECO resulted in NATCOM, who as of 2010 holds a monopoly on the provision of landline services in the country. Viettel, a Vietnamese telecommunications company, bought 60% of TELECO for $59 million, while the government held the remaining 40% of the company (Gary, 2010). Viettel has promised to build 3100 km

of fiber-optic lines across the country providing a link between Haiti's 10 major cities (Gary, 2010). In addition, a new submarine cable linking Florida to Haiti will be installed by Viettel, replacing the previous cable, damaged by the January 12, 2010 earthquake (Gary, 2010).

4. Corruption

Haiti's TELECO long-distance revenues were one of the few profit-making sectors for the Haitian country. In 2004, following President Aristide departure from power, TELECO's coffers were found to be empty (O'Grady, 2008). According to a Haitian official commission, over $19 million was transferred through accounts linked to Aristide, (Komisar, 2005).

Komisar (2005) states, "a lawsuit by the Haitian government says that payments to TELECO were kicked back to Aristide's group through banks in the Turks and Caicos Islands and the British Virgin Islands." The lawsuit involves the U.S. telecommunications company IDT, headquartered out of Newark, NJ, which the lawsuit claims paid the Aristide group in return for favorable contracts with Haiti's TELECO, the government-owned telephone service company.

According to U.S. law, American companies conducting business in Haiti must pay 23 cents a minute to TELECO for services completing calls from the United States. To allow fairness between companies, the law requires that any company that deals with the local government for a better rate must notify the FCC (Federal Communications Commission)

so the new rate is applied to all other companies providing service in that country (Komisar, 2005).

IDT entered into an exclusive agreement with TELECO, where they would only pay TELECO a total of 9 cents a minute. IDT violated the law by not reporting the newly negotiated price with the FCC. In addition, the Haitian government says that out of the 9 cents, only 6 cents went to TELECO, while 3 cents was paid to an intermediary company, Mont Salem, set up by Aristide to receive the bribe payments by IDT (Komisar, 2005). IDT also violated the U.S. Foreign Corrupt Practices Act, which forbids payment of bribes or kickback in order to obtain foreign contracts.

In Haiti, TELECO's records were falsified to show that IDT was not the carrier, but rather the intermediary Mont Salem. Komisar (2005) explains, "these intermediary companies serve no purpose other than to carry out illegal transactions to justify the movement of money." According to the Haitian government, in a six-month period over $300,000 in kickbacks was paid to the Aristide group. The deal with Aristide and his company, Mont Salem, allowed IDT to dominate the U.S.-Haiti route, making many company insiders very wealthy (O'Grady, 2008).

As of 2008, the U.S. Department of Justice, the U.S. Attorney in Newark, NJ, and the Securities and Exchange Commission have all initiated investigations into the charges against IDT. Investigations into IDT's practices are ongoing by the Department of Justice. The IDT whistleblower who denounced the corrupt actions of IDT was fired immediately. He sued the company and, as of January 2011, the lawsuit was dropped. No comments were provided by

attorneys from either side, most likely because a confidential settlement was reached (Komisar, 2011).

5. Services

a. Fixed Line Telephone Service

As of 2009, there were 108,300 fixed telephone lines in use in Haiti, which has a population of just less than 10 million. Compared to other countries in the world, Haiti ranks about 143 out of 233 in number of fixed mainlines per country per capita (Nationmaster, 2011). Fixed telephone lines are shown in Figure 15. Fixed line teledensity, shown in Figure 16, shows a decrease in the number of Haitians with fixed telephone lines, most likely due to the free competition of cell phone service in the country.

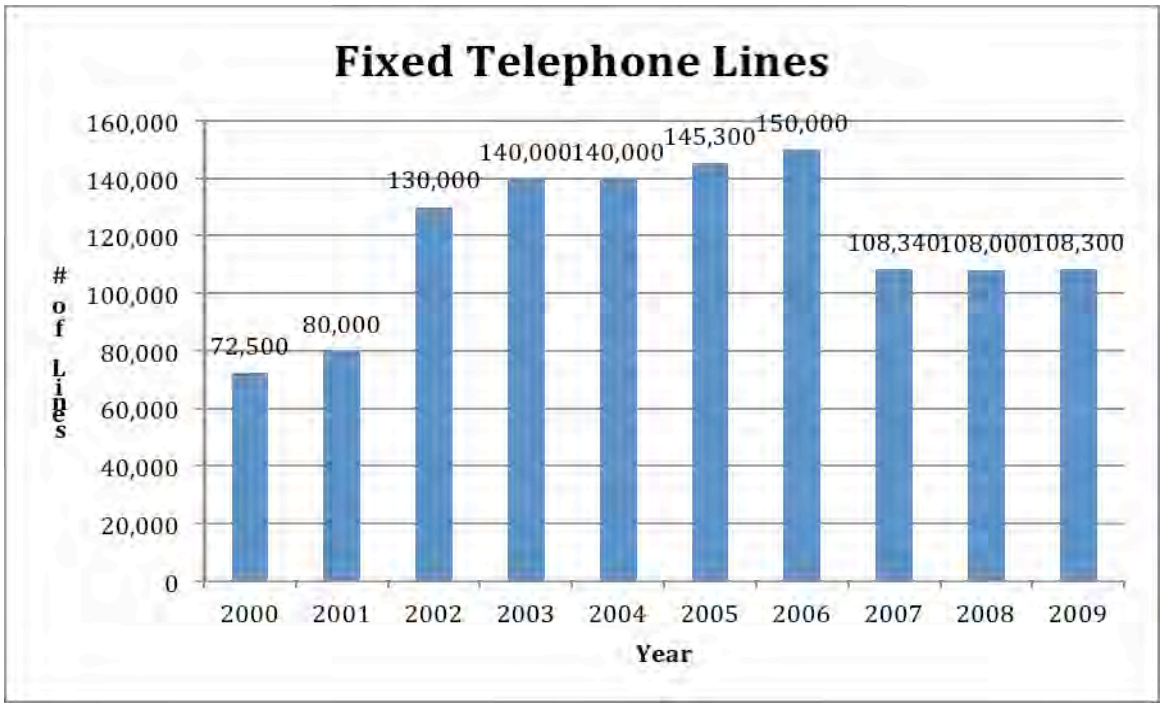

Figure 15. Number of Fixed Lines in Haiti (After ITU, 2010).

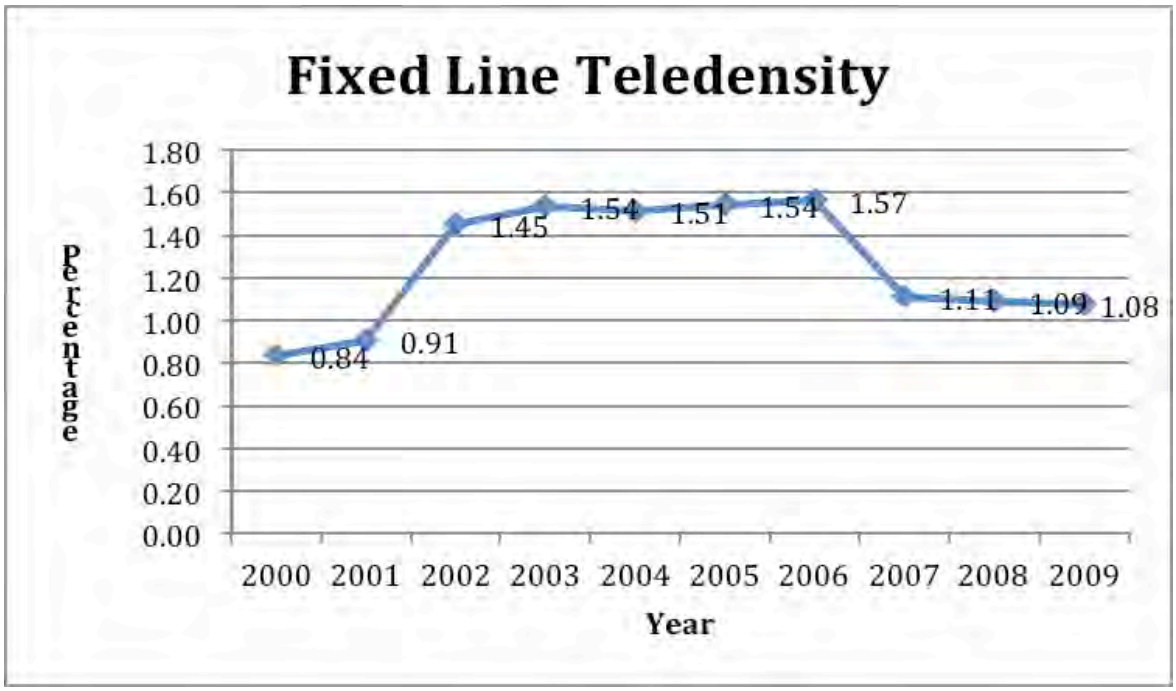

Figure 16. Haiti Fixed Line Teledensity (After ITU, 2010).

b. Mobile Telephone Service

Through 2005, mobile telephone penetration remained below 5% in Haiti. This changed with the introduction of Digicel-Haiti, launched with the support of the World Bank, Proparco, and the Dutch Canadian International Development agencies (Barberousse, Bernard & Pescatori, 2009). By 2007, mobile phone penetration had reached 30% of the Haitian population, with Digicel accounting for 60% of the market. Coverage was not only limited to urban areas but also rural ones, with network coverage to 95% of the population by 2008 (Barberousse et al., 2009). Growth in mobile subscriptions is shown in Figure 17, while mobile teledensity is shown in Figure 18.

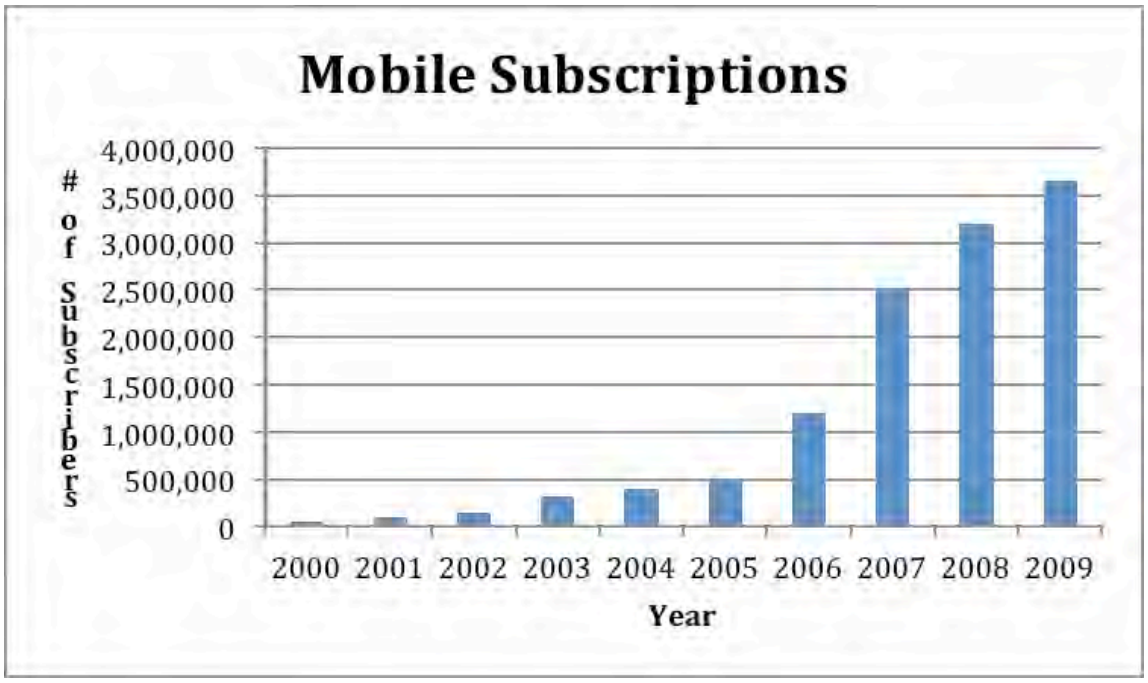

Figure 17. Mobile Subscriptions in Haiti (After ITU, 2010).

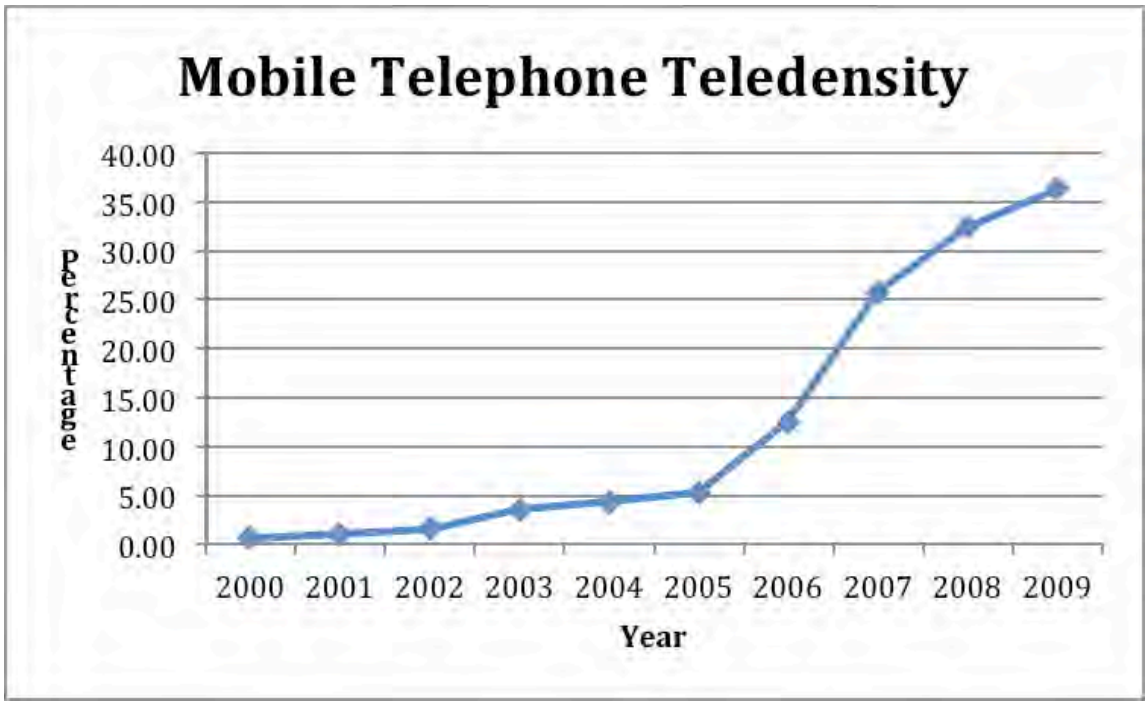

Figure 18. Haiti's Mobile Telephone Teledensity (After ITU, 2010).

Haiti's rapid growth in mobile telephone sector has allowed the country's mobile telephone penetration rate to catch up to other developing countries as depicted in Figure 19.

Development of the mobile telephone sector in Haiti has had a considerable effect on employment. Over 1,000 employees have been hired by Digicel as of 2008, in addition to providing income to 60,000 street vendors (Barberousse et al., 2009). Furthermore, the company has become the largest taxpayer, paying $24 million in 2007, making up about 15% of Haiti's tax revenues. This equates to 1.12% of Haiti's 5.56% total GDP growth between 2005 and 2007 (Barberousse et al., 2009).

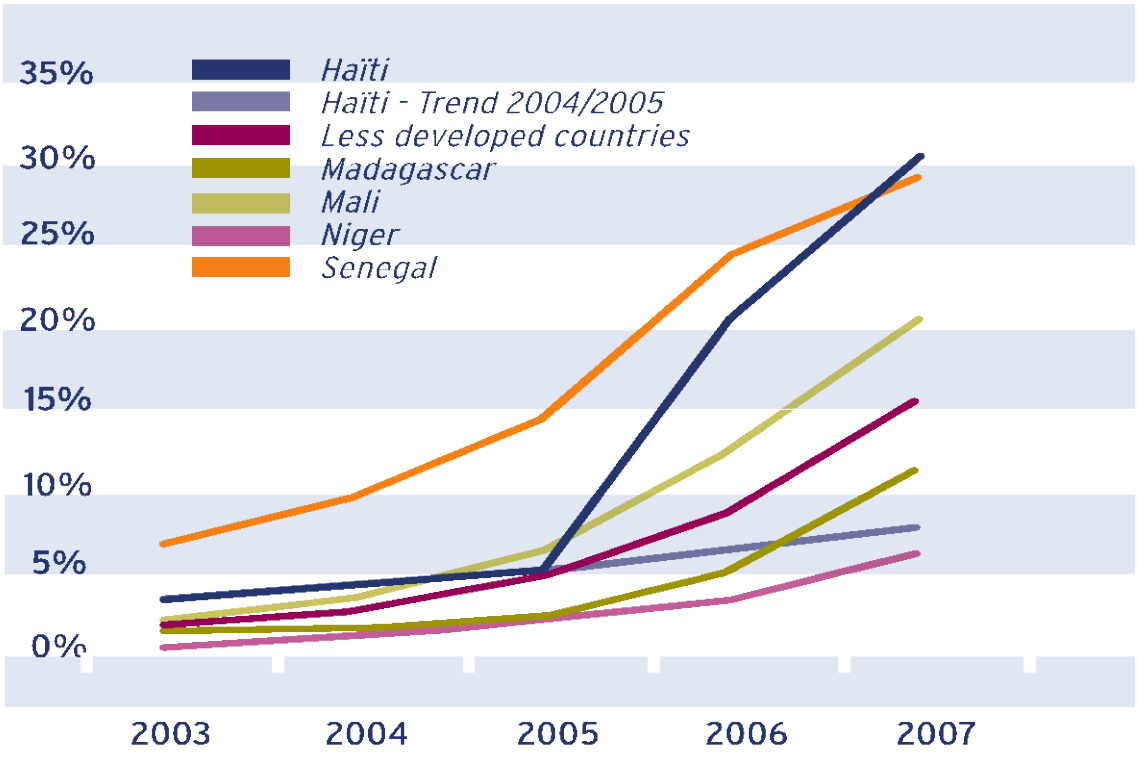

Figure 19. Mobile Penetration Rate in Haiti and Other Low-Income Countries (From Bearing Point, 2009).

c. Internet

Currently, there are three major established Internet service providers in Haiti: Hainet (Haiti Networking Group), Multi-Link, and Access Haiti. These companies provide the majority of their services in Port-au-Prince and major towns, but do not have proper service to rural areas. Market share of these companies are illustrated in Figure 20.

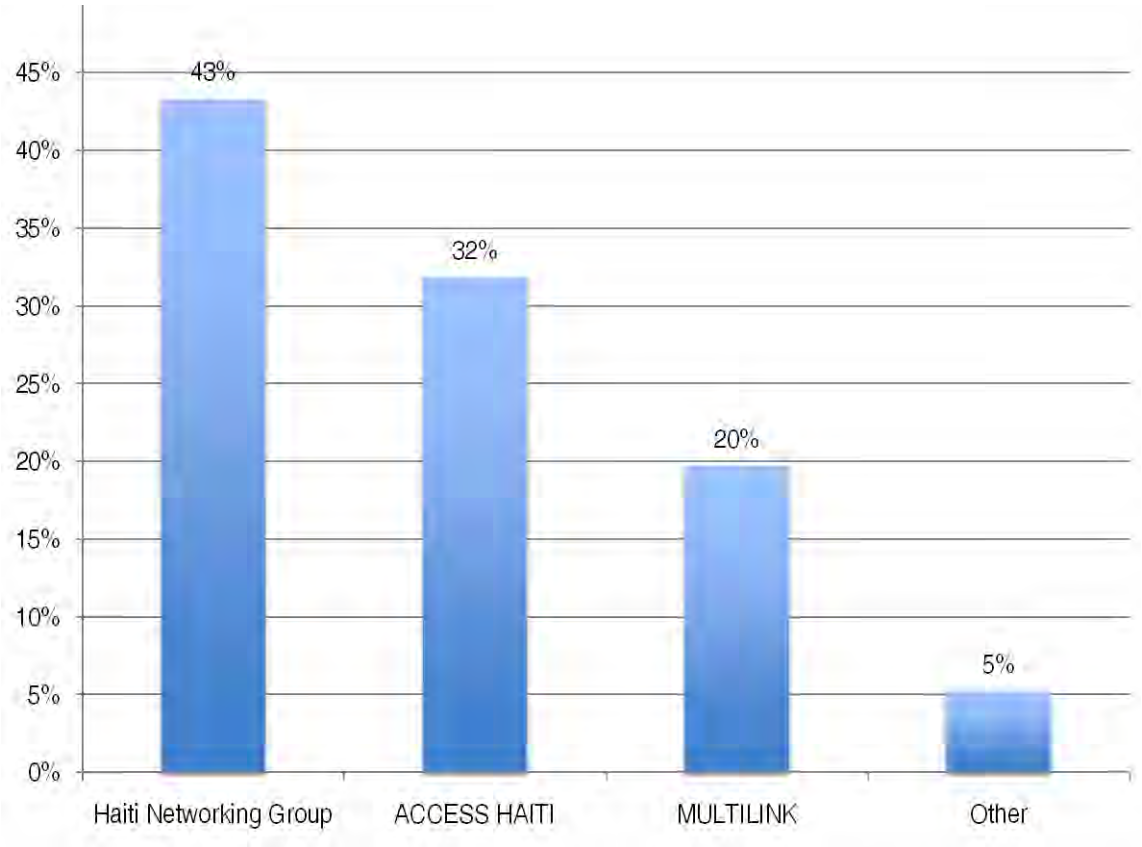

Figure 20. Market Share of Top Internet Service Providers in Haiti (From Google, 2010).

Internet infrastructure in Haiti lags behind many other developing countries similar in size and population. Efforts to improve Haiti's Internet infrastructure are

ongoing, as is the case with Viettel's announcement to provide high-speed Internet throughout the country by laying 3100 km of optical fiber. Haiti's Internet subscription growth is shown in Figure 21, while Internet teledensity is shown in Figure 22. No data was found for years 2005, 2006, 2008, and 2009.

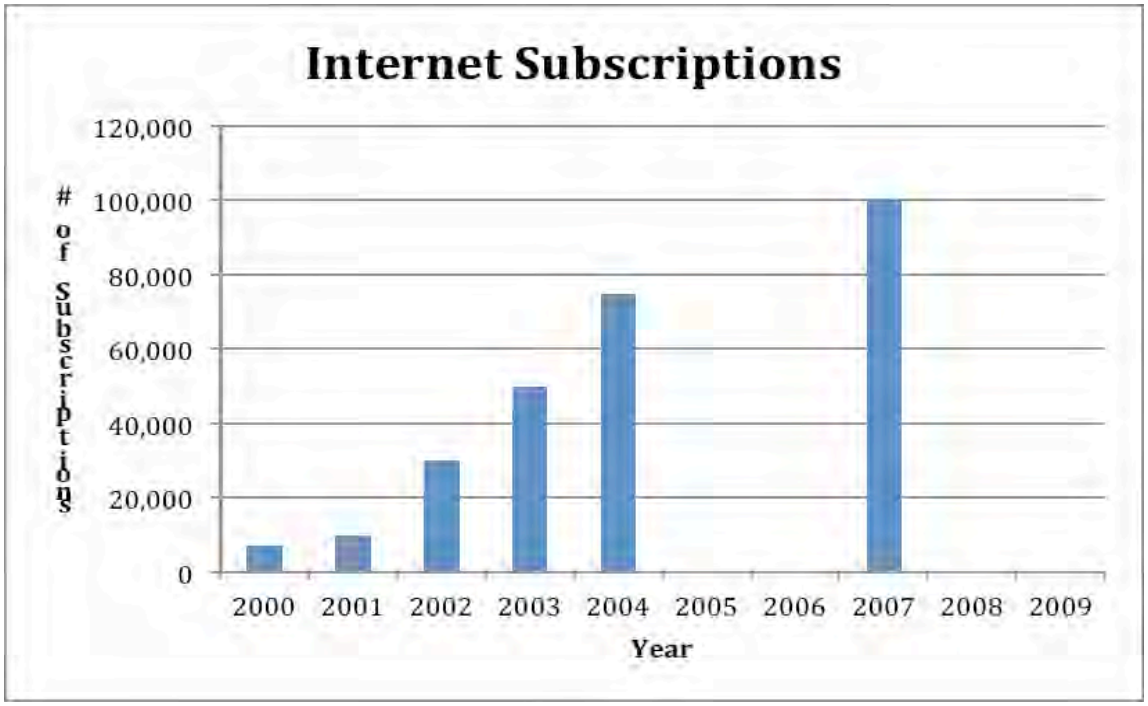

Figure 21. Internet Subscriptions in Haiti (After ITU, 2010).

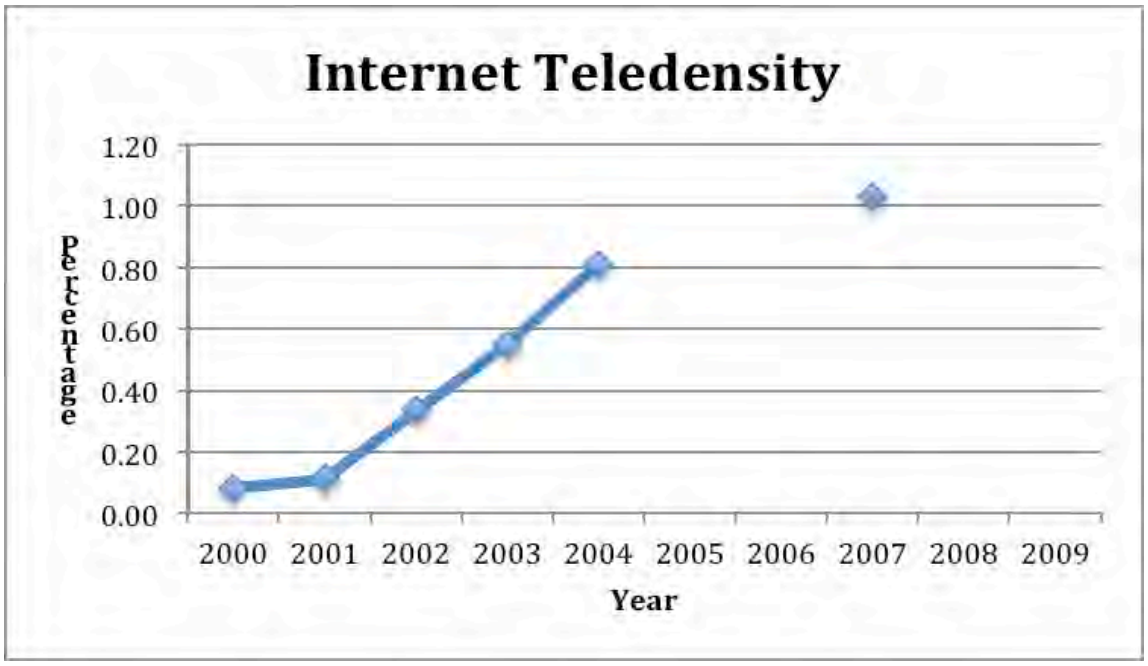

Figure 22. Haiti's Internet Teledensity (After ITU, 2010).

Internet usage in Haiti peaked in the days leading to the devastating earthquake of 2010, and dropped to nearly zero on January 12 (Google, 2010). Internet usage has slowly started to recover and has steadily been increasing since the earthquake as shown in Figure 23.

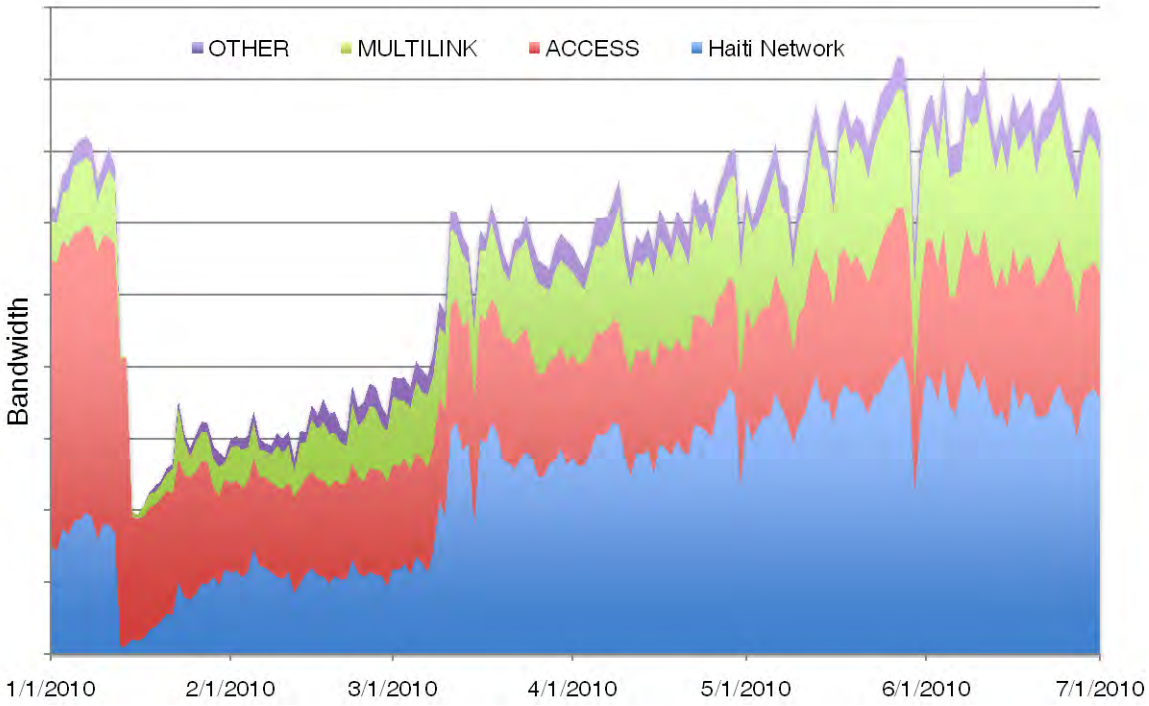

Figure 23. Internet Traffic in Haiti Across Internet Service Providers (From Google, 2010).

E. CHAPTER SUMMARY

Prior to the devastating earthquake of 2010, Haiti's telecommunications infrastructure was inadequate. Lack of investment, monopolies, geography and other social prevalent issues have prevented the nation from developing its telecommunications infrastructure. In addition, corruption, tied to the highest channels of the Haitian government, has dried up the limited resources for the nation to develop the sector.

Partial liberalization of the mobile telephone market, in 2000, has brought in new companies willing to compete and provide much needed services to the population. Investments by these companies will increase access to fixed and mobile

telephone services, in addition to developing the country's first fiber optic network. The liberalization has brought new developments including (International Finance Corporation, 2010):

- Intensified competition in the telecom market.
- Increased penetration rates and higher quality mobile telephony services, especially for low-income customers and rural subscribers.
- Increased Internet penetration.
- Significant investments in critical telecom infrastructure.

Despite the progress provided by the liberalization of certain sectors of the telecom industry, the industry lags far behind that of the surrounding Caribbean region. The expansion and development of the industry as a whole is crucial for long-term economic development.

IV. TELECOMMUNICATIONS POLICY EFFECTS ON DOMINICAN REPUBLIC AND HAITI, A COMPARISON

The Dominican Republic and Haiti share the same island, but each country has pursued different telecommunications policies. These policies were the result of government or dictatorial decrees, corruption and history, and can partly explain why the Dominican Republic has experienced better economic performance as compared to Haiti. This chapter will explore how these factors have affected economic performance in these countries.

A. LIBERALIZATION AND EFFECT ON ECONOMY

Calderon, Loayza, and Schmidt (2004) suggest market liberalization and investment in infrastructure are linked to economic growth. The differences in economic growth amongst countries can be partly explained by income levels, institutional and policy factors, and regulatory factors (The World Bank, 2005). When speaking of liberalization this thesis specifically focuses on **economic liberalization** and is defined as:

> Less government interference in regulations and restrictions in the economy (in this case the telecommunications sector) with the purpose of encouraging and rewarding more participation by the private sector. (Wikipedia, 2011)

Although the Dominican Republic and Haiti had the same per capita GDP in 1960, economic growth since then has differed dramatically between the two countries. In 1960, GDP for both nations was equal at about U.S. $800, but by 2005, GDP in the Dominican Republic had increased to about

U.S. $2500, while Haiti's had decreased to about U.S. $430 (Jaramillo & Sancak, 2007). Figure 24 illustrates per capita GDP growth rates for Latin American countries (LAC), with Dominican Republic having a 5% GDP growth rate and Haiti with a GDP growth rate of 1% for the last 45 years. Average for Latin American countries came in at just below 4% GDP growth (Jaramillo & Sancak, 2007).

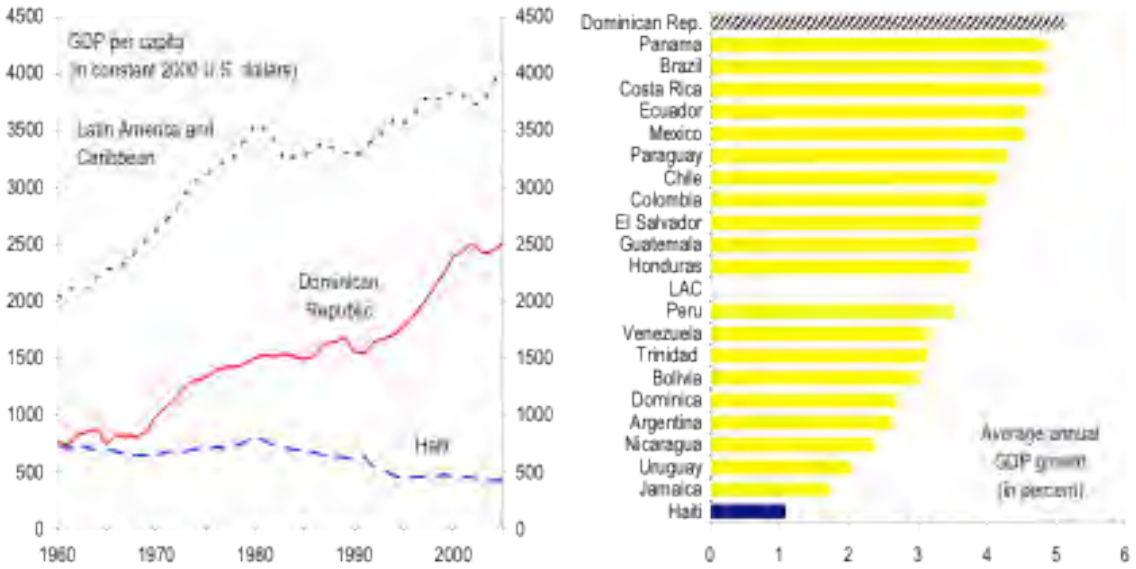

Figure 24. GDP Per Capita and Growth Rate 1960-2005 (From Jaramillo & Sancak, 2007).

1. Teledensity and GDP

In the 1990s, most telecommunication services in the Caribbean was limited to fixed landlines for the middle and upper classes, while payphones provided communication for the lower-income earners. This is no longer the case in most Caribbean countries as the liberalizations of markets

have allowed the entrance of new competitive companies in the fixed-line and mobile telephone markets (The World Bank, 2005).

As of the mid-20th century, teledensity (defined as total fixed and mobile lines per 100 people) has been used as a valid statistical measure of a country's economic growth; the greater the teledensity, the more opportunity for economic growth (Slekys, 2004). Three factors account for teledensity's influence on economic growth. These are (1) efficiency: greater teledensity reduces costs of doing business and enables economies to move information quickly; (2) equality: greater teledensity aids in spreading information equally among all classes in a nation, thereby widely spreading information at low cost; and (3) networking: the value of the network increases as more people use it (Slekys, 2004).

In the mid-1990s, Dominican Republic was one of the first Latin American countries to liberalize the telecom industry and welcome new companies to compete against the de-facto monopoly held by CODETEL. Competition decreased user cost and increased teledensity, providing plans and alternative solutions, such as pre-pay phones, for the majority of the population. In comparison, Haiti's government has held tight to their government controlled monopoly and it was not until 2005 that partial liberalization of the market begun, accounting for less growth in teledensity. Figure 25 shows total teledensity for Dominican Republic, Haiti, and the United States from 2000-2009.

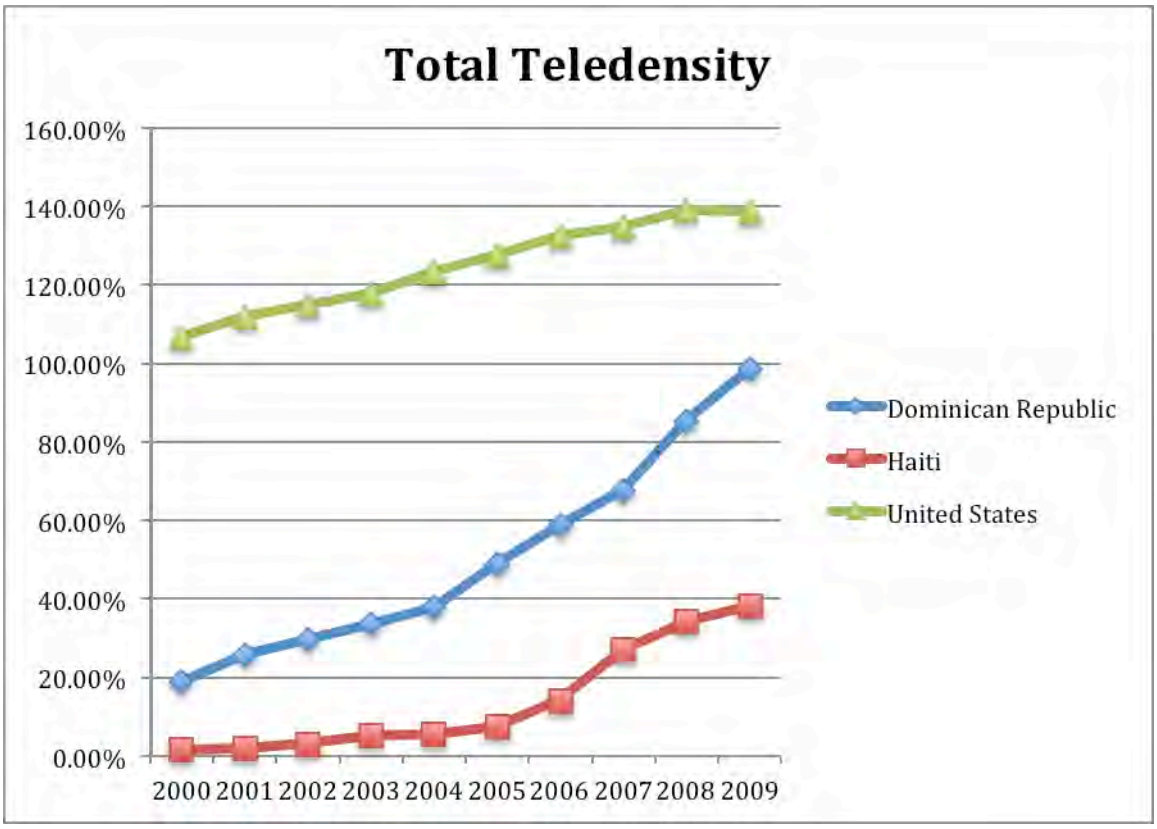

Figure 25. Dominican Republic/Haiti/US total teledensity 2000-2009.

As illustrated in Figure 26, Haiti's teledensity in 2004 was relatively low compared to other developing nations in the Caribbean. This can be explained by the Haitian's government tight control of the country's telecommunications sector.

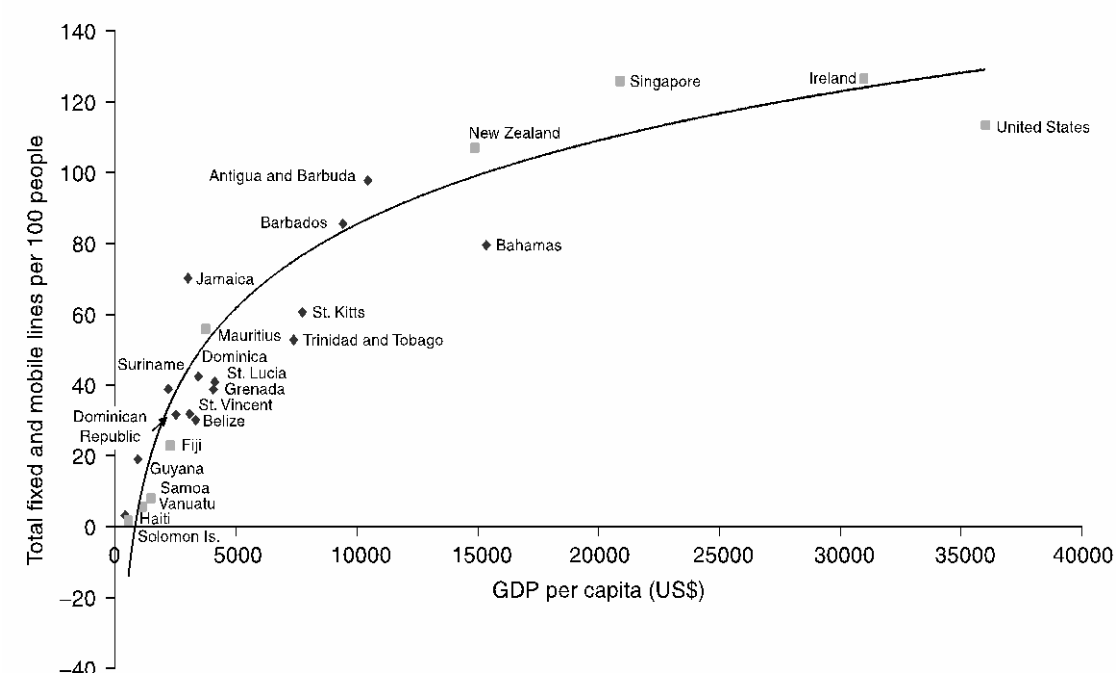

Figure 26. Teledensity Versus GDP in 2004 (From The World Bank, 2005).

Haiti's government past refusal to fully liberalize the telecommunications market slowed and even stopped new investments from entering the country. New investments bring with it new jobs, money, and infrastructure, all needed to stimulate GDP growth. As Waverman explains, investment in telecom generates growth, because the spread of telecommunications reduces cost of interaction, expands market boundaries, and expands information flow. Further liberalization of Haiti's telecommunications market did not occur until 2005 by allowing foreign mobile companies to compete in the Haitian market. The change in teledensity and GDP is evident following Haiti's partial liberalization of the market in 2005 as depicted in Figure 27. Total teledensity information was not available for the years 1996-1999.

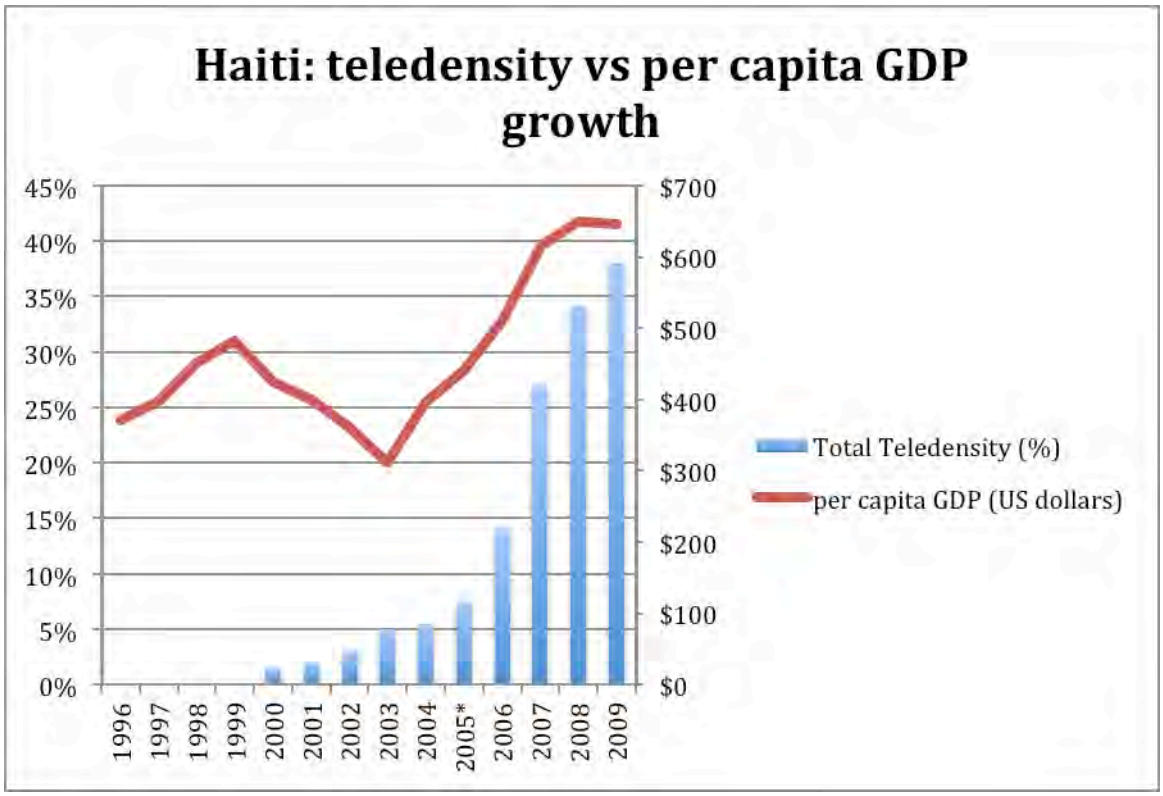

Figure 27. Teledensity Versus Per Capita GDP Growth in Haiti.

Liberalization of the telecommunications sector also changed the teledensity and per capita GDP growth in the Dominican Republic. The liberalization of the telecommunications market began in the mid-1990s in the Dominican Republic and was in full effect after the passage of Telecommunications Law 153-98 in 1998. Although changes in teledensity and per capita GDP were less evident in the Dominican Republic, growth did occur in per capita GDP and teledensity as shown in Figure 28.

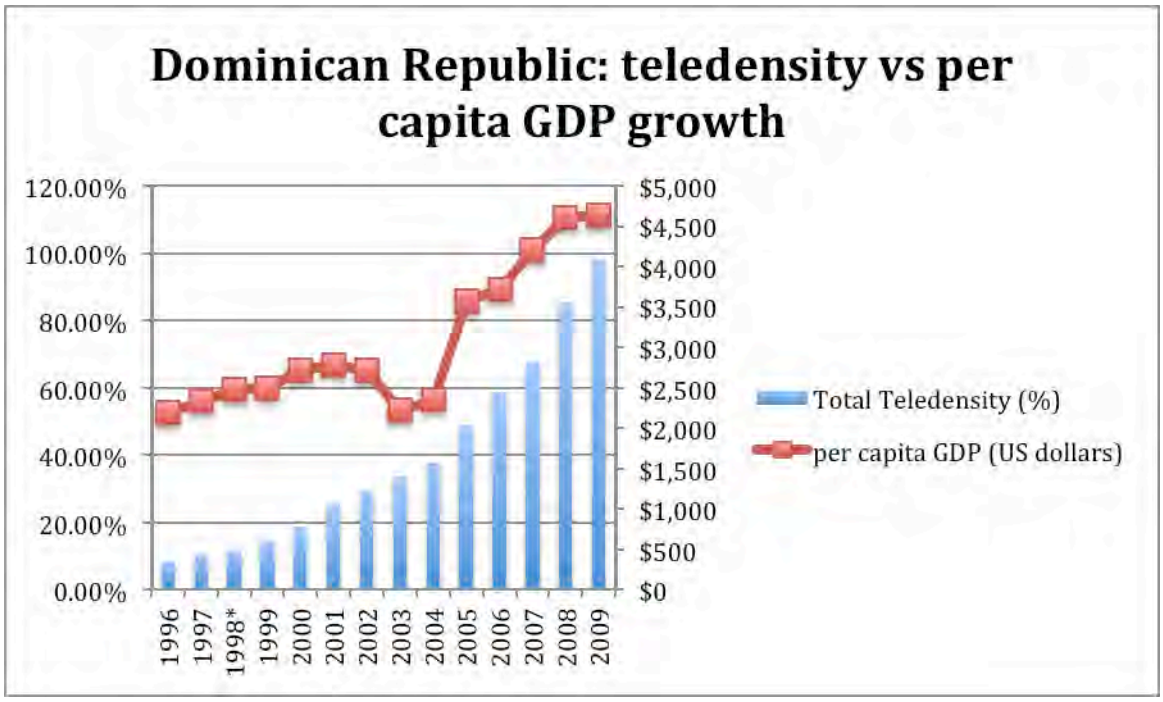

Figure 28. Teledensity Versus Per Capita GDP Growth in Dominican Republic.

As of 2009, teledensity and GDP have increased in the Dominican Republic and Haiti. Teledensity and per capita GDP have not increased as much in Haiti following liberalization. This can be partly attributed to the massive earthquake of January 2010, which destroyed the fragile telecommunications infrastructure in the country. Part of the fault can also be attributed to Haiti's partial liberalization of the telecommunications market. Although since 2005 the telecommunications market has become more competitive, with more companies and more services, full liberalization has not been realized in Haiti. The Haitian government still holds partial control of the sector with no clear intent of fully liberalizing the market. In comparison with the United States, both countries are well below U.S. teledensity and per capita GDP as shown in

Figures 29 and 30. Higher teledensity in the United States is partly explained by earlier liberalization of the telecommunication markets.

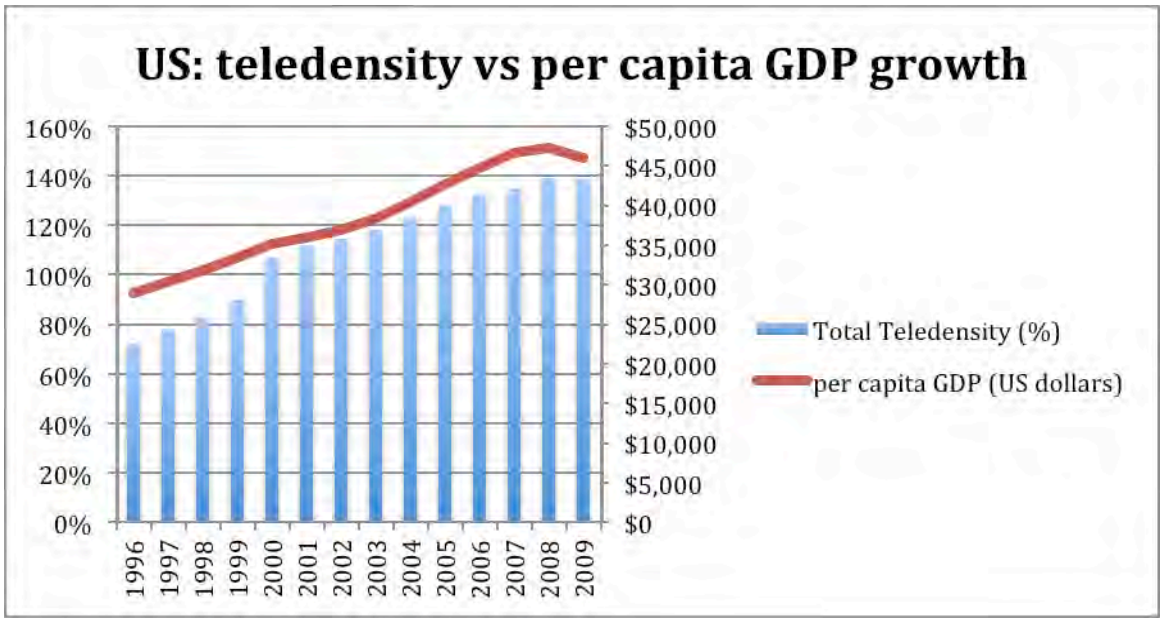

Figure 29. Teledensity Versus Per Capita GDP Growth in the United States.

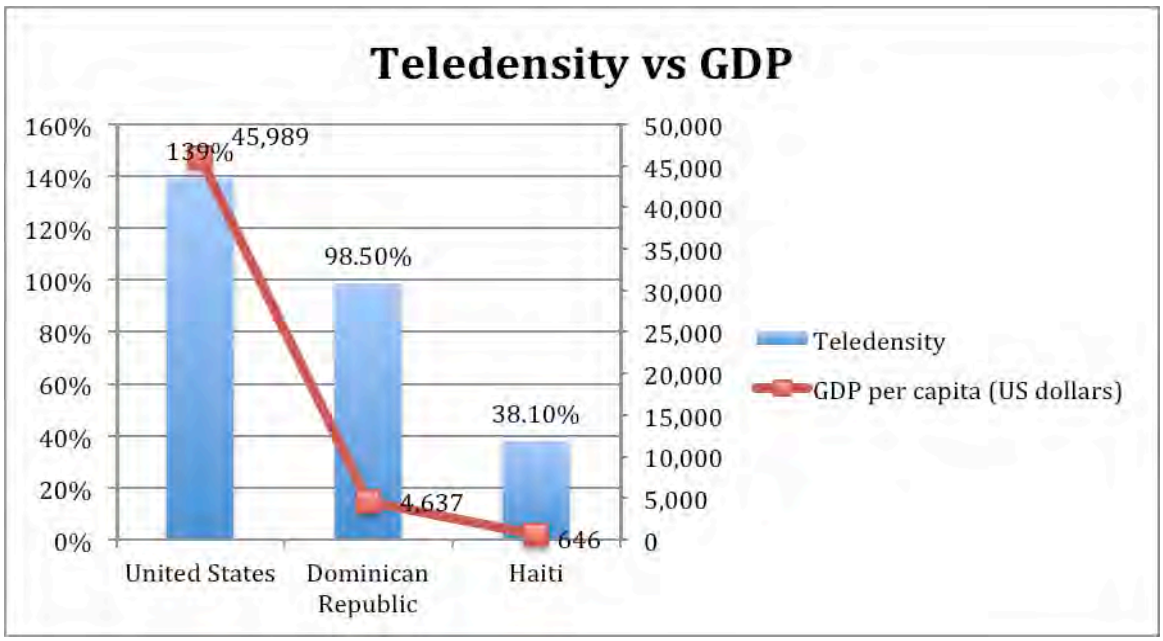

Figure 30. Teledensity Versus GDP in 2009.

2. Communication Costs

In addition to stagnating GDP per capita growth, lack of competition in the telecommunications sector increases communication costs. Consumers in countries that have newly liberalized or have yet to liberalize their telecommunications sector paid well above international calling rates as illustrated in Figure 31. This problem can also be resolved by liberalization of the telecommunications sector as it requires rate rebalancing, whereby local charges and monthly connection fees increase, but international calling rates fall (The World Bank, 2005). Rate rebalancing improves the local telecom sector by (ICT, 2011):

- Increasing demand for services such as long distance calling.
- Encouraging service providers to invest in new technologies by providing a better connection service.
- Incentives given to service providers for improving service to consumers promotes competition.

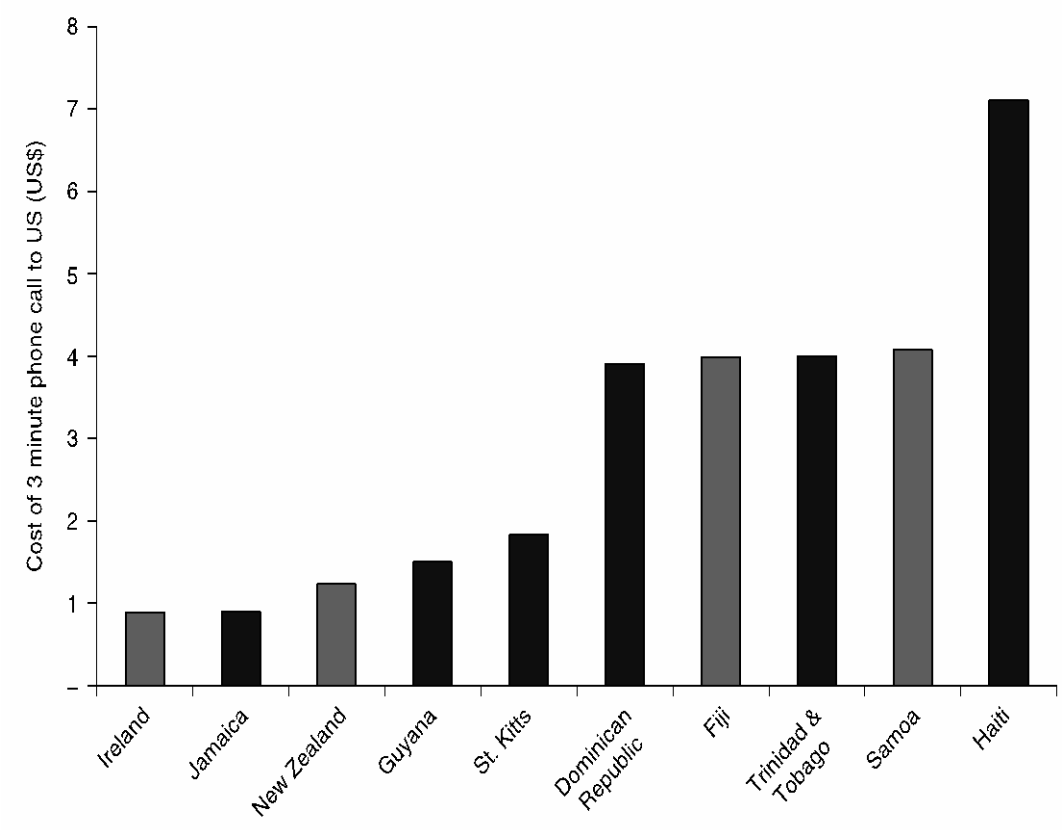

Figure 31. Cost of a 3-Minute Phone Call to the United States in 2004 (From The World Bank, 2005).

Current rates for a three-minute call to the USA from Dominican Republic and Haiti via a fixed line have decreased from the 2004 figures as shown in Table 5. Figures were estimated by the author from phone company websites in each respective country.

Table 5. Current Cost of a 3-Minute Call to the United States.

Country	**Cost**
Dominican Republic	$2.00
Haiti	$3.00

Another effect of not liberalizing the markets in Haiti was high monthly Internet costs. Despite having a population similar in size to that of the Dominican Republic, 2004 monthly Internet costs in Haiti were over three times as much as those in the Dominican Republic. Figure 32 shows comparisons amongst different nations in the Caribbean.

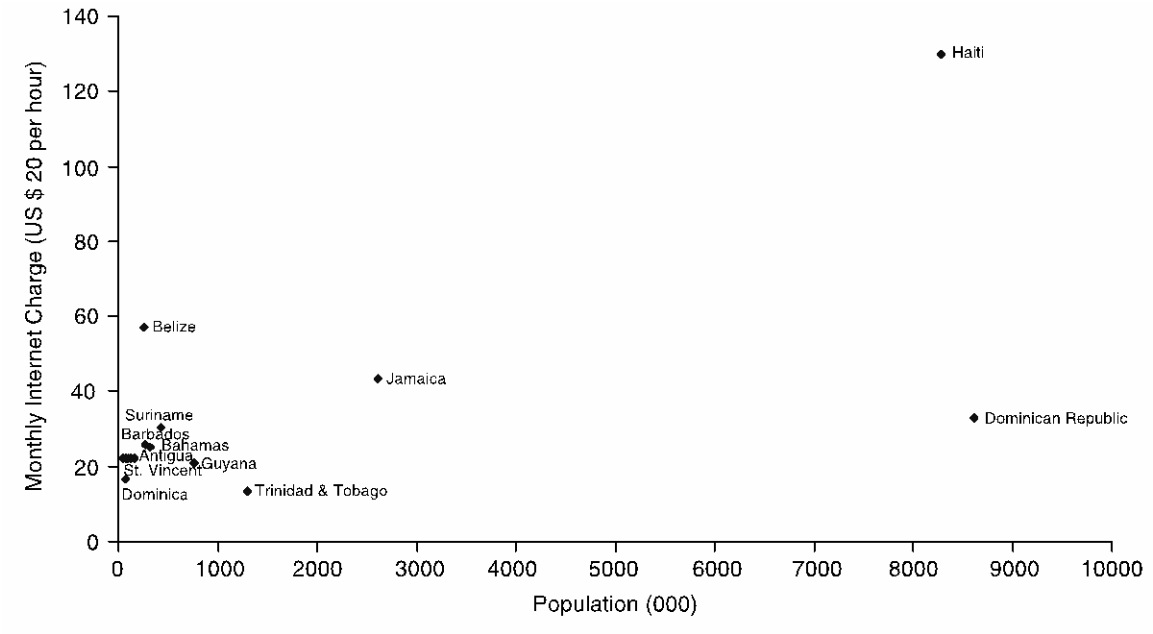

Figure 32. Internet Costs in 2004 (From The World Bank 2005.

The lack of competition combined with mismanagement in the government-run telecommunications company has had a lasting effect on Haiti's Internet users as a portion of the total population, and Haiti's bandwidth per capita. As of 2010, Haiti lags behind other Caribbean nations in Internet users as a percentage of the population as shown in Figure 33. U.S. Internet users as a percentage of the total population are shown in Table 6, in order to keep Figure 33 within a readable scale.

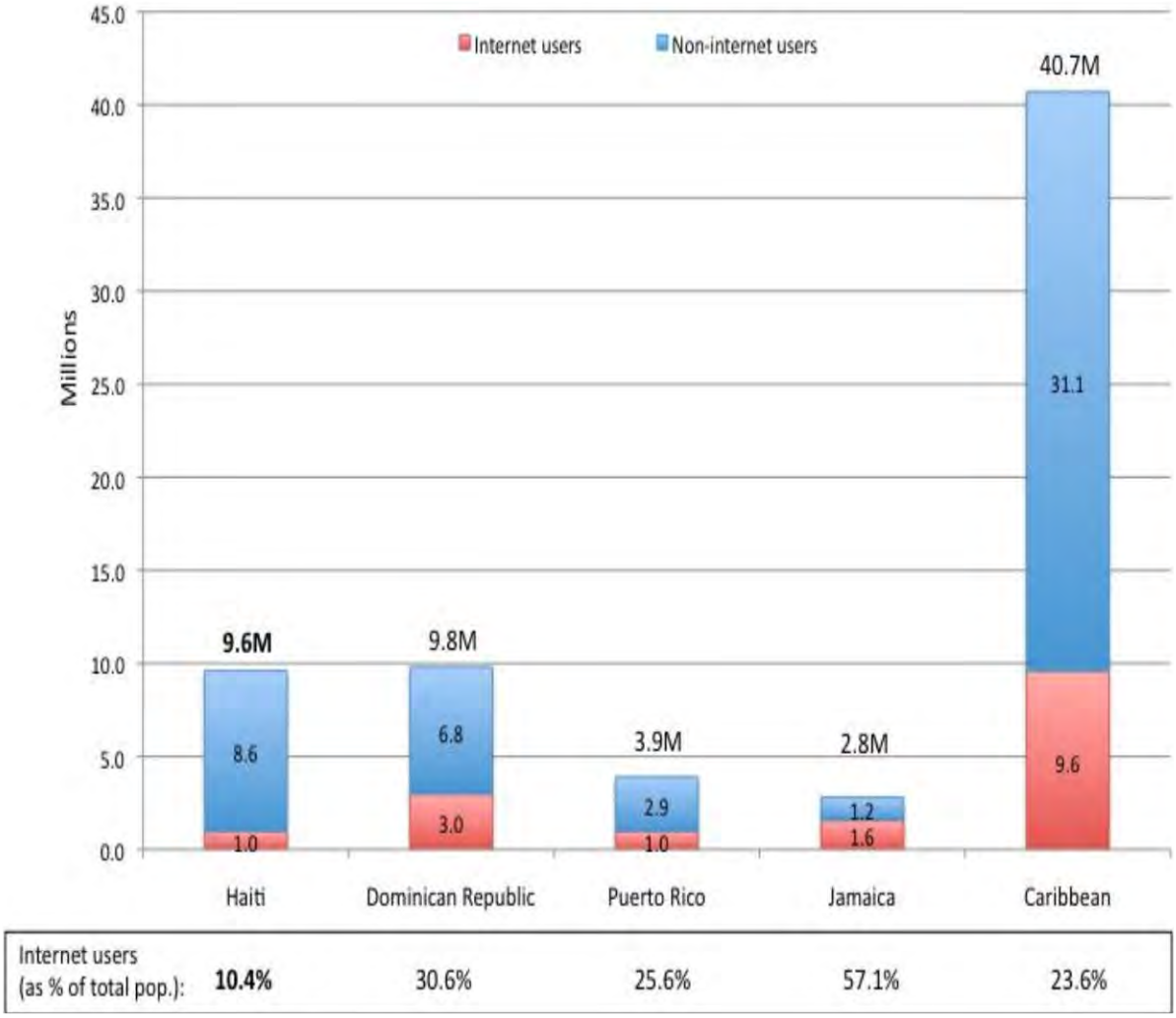

Figure 33. Caribbean Internet Users as Portion of the Total Population (From Google, 2010).

Table 6. U.S. Internet Users as a Percentage of the Total Population in 2010 (After Internet World Stats, 2011).

Year	**Population**	**User**	**Percent of population**
2010	310,232,863	239,893,600	77.3%

Per capita bandwidth amongst Latin American nations is shown in Figure 34.

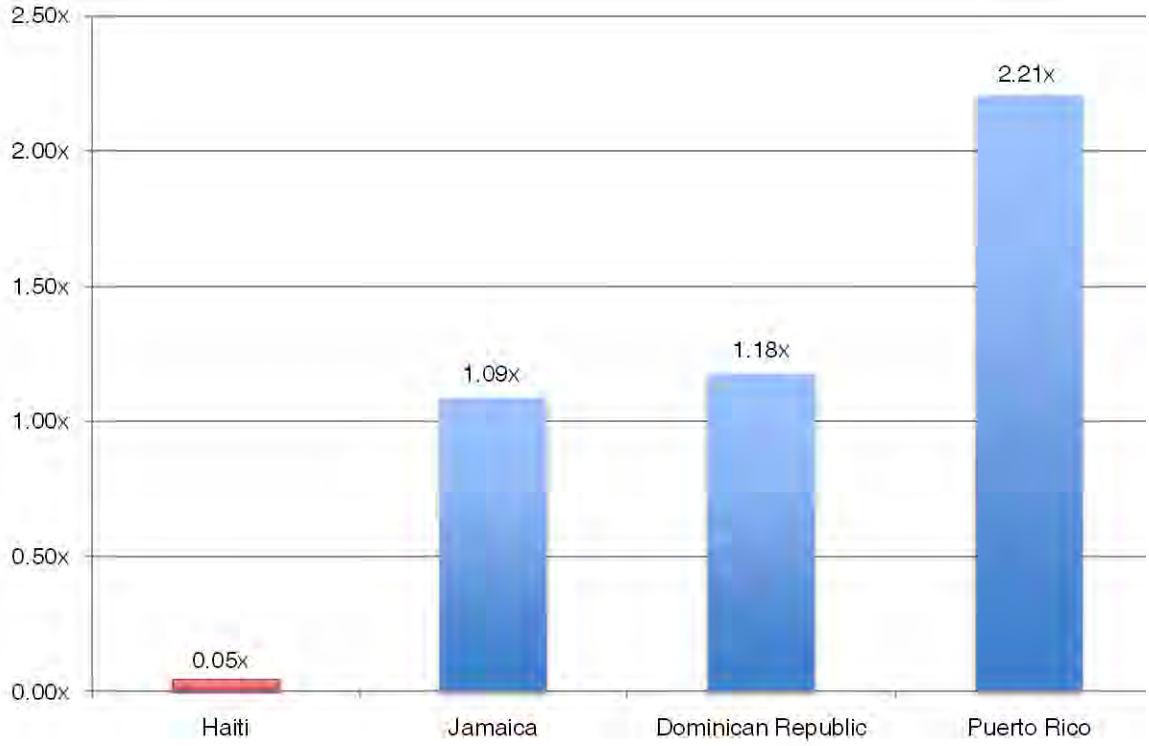

Figure 34. Bandwidth Per Capita (From Google, 2010).

B. ACCESS TO THE INTERNET

Internet access in the Dominican Republic has rapidly grown following liberalization. As of 2010, nearly 30% of Dominicans have Internet access (INDOTEL, 2010). Internet growth rate has been between 67% and 85% from year to year according to INDOTEL director, Jose Rafael Vargas (INDOTEL, 2010). This rapid expansion in Internet access is partly due to Dominican Republic's early and full liberalization of the telecommunications market.

In comparison, Haiti has not experienced this rapid growth, and has one of the lowest percentages of people with access to the Internet. Three main problems affect the expansion of Haiti's Internet infrastructure (Google, 2010):

- Costs: companies wishing to build an infrastructure require high capital expenditure requirements.
- Revenue: due to Haiti's low per capita GDP, any return on investment will be minimal initially; low-average revenue per user.
- Regulatory: Haiti has not fully liberalized the telecommunications sector. Companies feel that government policies can stifle competition with such policies as Internet taxes.

One additional problem in Haiti is the country's geography, which has many steep hills and mountains. Google has suggested that companies install and use submarine cables to link coastal cities with minimal costs. Google's model has companies using short fiber-optic cables (less than 100 km) with Gigabit Ethernet switches, instead of more expensive traditional telecommunications equipment. Equipment installed will be energy efficient and require minimal power, which can be supplied via solar cells or wind turbines (Google, 2010).

According to Google, in the model, each cable provides incremental benefit, hence it does not need to be built all at once, but rather as a sequence of city to city links over time. The costs for this network are unclear, but it is agreed by experts that this type of network plan would be a lot more cost efficient than old traditional methods of digging trenches along Haiti's mountainous and rocky areas to cross the interior of the country (Google, 2010). Figure 35 illustrates Google's model.

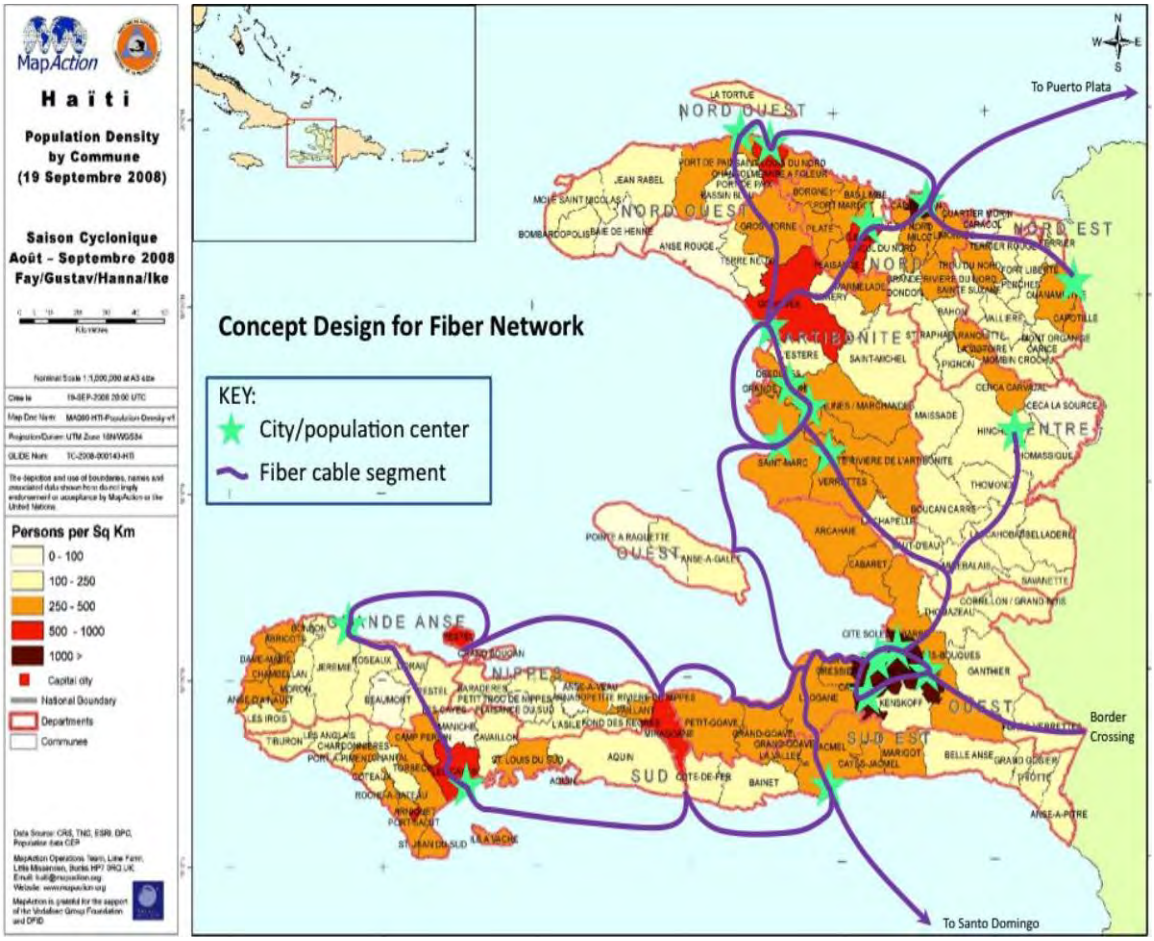

Figure 35. Google Concept for Haiti's Fiber Network (From Google, 2010).

C. GOVERNMENT INFLUENCE IN TELECOMM

1. Dominican Republic

Similar to United States' protection of AT&Ts monopoly over telecommunications, the Dominican government also protected CODETEL throughout their de-facto monopoly from 1930 to 1998. Lack of intervention from the Dominican government allowed CODETEL to maintain their dominant position and prevent competition from flourishing. It was

not until 1998, following the passing of law 153-98, that the market playing field was leveled, improving competition and ending CODETEL's monopoly.

Fault in the Dominican government stems not so much from preventing CODETEL's competitors from entering the market, but from not regulating the aggressive monopolistic like tactics CODETEL used to squash their competition. CODETEL prevented competitors from interconnecting to their network or demanded fees for such services with no regulation or interference by the government to stop their tactics.

Although regulation passed by the Dominican government liberalized the telecommunications market, currently the country's telecommunications companies feel that regulation has not been standard across the country. Companies have complained that city halls constantly levy taxes that vary from one place to another, and usually these city halls request voluntary economic contributions, solicit payments without invoices (blackmail), and delay the approval of permits if they don't receive a bribe (Dominican Today, 2011). Companies argue that additional rules could solve these obstacles and prevent blackmail, which is currently holding back over U.S. $80 million in telecommunication investments.

2. Haiti

In contrast, Haiti's TELECO was 100% owned and regulated by the Haitian government, who outright disallowed competition from entering the country until 2005. Although TELECO was somewhat profitable, corruption within the

Haitian government retarded any growth the company could have accomplished, thereby lessening access to telecommunications to its citizens. Little accountability existed by the government of TELECOs funds, and government officials used company revenues as personal funds or for political purpose (Lucas, 2007). Government control of TELECO prevented its growth, deteriorated its infrastructure, and made customer service nonexistent.

3. Privatization

Dominican telecommunication companies are currently private companies and were only nationalized during U.S. intervention in 1919. Influence to nationalize the companies came under the U.S. installed government in the Dominican Republic and lasted from 1919 to 1930 (Morrison, 2009). It is important to note that prior to U.S. occupation, the telephone network in the Dominican Republic was in deplorable conditions. During the intervention service improved considerably and much needed repairs were done to infrastructure.

Haiti’s government took sole control of TELECO in 1969 following a decree by then dictator, Papadoc Duvalier. As noted before, service by TELECO was only limited to Haiti’s biggest cities, leaving much of the rural areas without service. Bureaucracy and corruption within government ranks prevented the growth of the service. It was not until 2005 that partial privatization was begun and, as of today, full privatization has not been implemented.

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V. CONCLUSION

A. LIBERALIZATION AND REGULATION

Telecommunications development and investment promotes economic growth. Some countries have been able to understand this fact ahead of others, improving their economies and empowering their citizens. Other countries whether by corruption or lack of foresight have failed to liberalize their telecommunication markets, slowing their economic growth and in turn the development of their country.

1. Liberalization

Countries that have liberalized their telecommunications market have achieved increased total teledensity, higher cellular penetration and Internet access, and below average pricing in their mobile, local, international calls, and fees for other telecommunication services. In the early 1990s, the government of the Dominican Republic started to liberalize the telecommunications market, promoting competition, rapid growth in communications services, but most importantly in the development and modernization of the country. In order to protect consumers and new telecommunication companies, Law 153-98 was passed in 1998, which regulates the telecommunications market by a government agency, INDOTEL.

Liberalization of the sector has allowed the Dominican Republic to diversify their economy by not solely relying in its primary industries: agriculture, mining, and fishing.

The growth in the sector has increased by more than 15% each year from 1997-2005 and has represented almost 10% of GNP (gross national product).

In contrast, Haiti did not begin this process until 2005, and did so only partially. In addition to Haiti's late start in the liberalization process, the devastating earthquake of 2010 destroyed its fragile telecommunications infrastructure, rendering useless prior infrastructure development. Haiti continues the liberalization process and the results have been evident. Competition in the telecommunications sector has grown, lowering costs to consumers. Competition has also increased teledensity throughout the nation, empowering citizens with knowledge, and providing them a more efficient way to conduct business. Haiti should fully privatize its telecommunications sector. In addition, assistance should be provided to the country in developing its liberalization policies and negotiation agreements with the private companies.

2. Regulation

Regulation in the telecommunications sector is necessary but there should be limits as to its powers over the sector. It is the view of this author that fair market competition will not be achieved in developing nations without regulation. Without regulation, de-facto monopolies previously protected by the government would delay or prevent third-party companies from interconnecting to the existing network in order to maintain their dominance over the market. In doing so, consumers will not benefit from the lower costs provided by competition. Regulation also brought universal service as a way to decrease costs to

people in rural or hard to reach areas. Without universal service, many people would have been left voiceless, furthering the communications divide.

B. PRIVATIZATION

Research and history has shown that privately owned companies are more efficient and more profitable than government owned companies. As stated in Lundy (2008), “few if any advances come from countries where the government controls telecommunications. Government control and regulation often has a chilling effect on investment and innovation in telecommunications.”

Although the nationalization of the Dominican telephone service in 1919 did improve service and infrastructure, improvement in the network came at the behest of U.S. oversight over the Dominican economy, infrastructure, and government. It is the opinion of this author that nationalization of the Dominican telephone companies without U.S. oversight would have further deteriorated the already deplorable conditions of the Dominican telephone network.

Haiti’s privatization of the telecommunications sector has not been fully completed as of 2011. The author believes the sector must be privatized in order to provide better and more affordable services to Haitian citizens. In order to fully privatize, clear objectives and a leveled playing field amongst all competing companies must be created. This will lessen political lobbying by companies and selfish political meddling in the process. Transparency must be ensured and a regulatory government agency with limited powers established. Government oversight should not

have input on corporate governance over management and the government should limit its power to enforcing the compliance of companies with regulatory policies and international trade rules. Privatization can be hindered or complemented by government regulation. It is essential that government's role in regulation be clearly defined as privatization without regulatory support is less effective (Ure, 2003).

C. CORRUPTION

Political corruption hinders the economy of developing nations as it steals the needed resources to develop infrastructure, jeopardizes investments from international companies, and decreases overall economic output:

> The most significant effects of corruption on Caribbean development are in total economic output (GDP per capita), capital formation, and in the rule of law. The inefficiencies that Caribbean governing elite are inserting into the Caribbean economies are a major cause of the region's degraded economic outputs and low levels of capital formation. (Collier, 2002)

Political corruption has plagued both the Dominican Republic and Haiti, but corruption has been significantly higher, with dire consequences in the Haitian nation. Corruption has plagued all sectors of Haiti's government, specially the telecommunications sector. Despite the fact that TELECO was able to generate profits it was not able to self-sustain due to the political corruption. In addition to deteriorating and not modernizing its telecommunications infrastructure, corruption also prevented much needed economic investment in the telecommunications sector.

Political corruption also scared investors, particularly foreign investors in telecommunications. Corruption is partly to blame for Haiti's slow progress in telecommunications sector.

D. FUTURE RESEARCH

1. Partial Privatization

In the topic of telecommunications, policy, and economic development, there are many areas for continued research. We have seen how full implemented liberalization shapes a country's development and growth; it would be of interest to study Haiti's specific case of partial liberalization. Will partial liberalization further hinder growth or can it become a new model to follow for other developing nations with nationalized companies?

2. Effects of Regional Monopolies

The effects of monopolies on individual nations have been studied, and indicate that monopolies slow progress in the sector, hinder competition and in doing so maintain high prices for services. Regional monopolies, such as Movil America, are slowly taking control of state owned companies and smaller telecom companies. What will be the effects of regional monopolies in individual countries? Will the effects of a regional monopoly be the same as national monopolies?

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