ECONOMIC STUDY FOR FINANCING TELECOMMUINCATION DEVELOPMENT

A STUDY FOR THE INTERNATIONAL TELECOMMUNICATION UNION TELECOMMUNICATION DEVELOPMENT BUREAU

By

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Note: *The views expressed in this paper are those of the author and do not necessarily represent the opinions of ITU or its membership. The terms and definitions used are the author's own and can on no account be regarded as replacing the official ITU definitions.*

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1 Introduction

Telecommunications investors[1] have been stunned in the last few years, but value remains in telecommunications development despite our current market uncertainties. The International Telecommunications Union (ITU) is committed to helping investors realize that value; to assisting its Member States, especially Lesser Developed Countries (LDC), in creating an atmosphere for investment; and to facilitating the marriage between potential investors and recipients. In particular, the ITU BDT is tasked with analyzing and fostering these relationships, and this paper is intended to serve both Member States and investors in creating the means for telecommunication development.

Relating the current economic status and various indicators to the requirements and needs of potential investors for financing telecommunications development is the method used herein. By clarifying this mystical set of needs, we will attempt to diminish the gap between the two sides of the investment equation: those with available funds and those needing funds. In fulfilling this task, it is necessary to understand the economic world that investors are in and the outside influences that can affect investment. Furthermore, it is essential to provide some level of confidence to investors in light of the risk to be taken.

As it is in mathematics, both sides of the equation must be equal. In our case, the investors have to realize the needs of the entities in which they invest as much as the reverse responsibility placed on recipients. Market forces generally determine if decisions made by investors are in line with the needs of the entities, but investment organizations have to take an asserted look at the program in which they are investing and the overall goal of that program with reference to organizational preferences. This document will only be concentrating on the relationship from the perspective of the investor. For more information on country perspective, please refer to country case studies produced by the ITU and to the ITU website at www.itu.int.

This paper will not blindly support investment but it will attempt to foster understanding on both sides of the equation. By way of a Hierarchy of Needs for the Telecommunications Investor, we show that we are working to understand the overriding principles that affect investment. For empirical analysis, we analyze some of the indicators used by the ITU (and people across the world) to show the status of its Member States with relation to telecommunications development. Our goal is to take those indicators a bit further—to the realm of financial terms and usability. The last section of the paper provides an analysis of some indicators, their usefulness in assessing telecommunications investment, and several examples of financial indicators that can be loosely calculated given existing data.

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[1] The term *investors* refers to any entity with the ability to provide financing for development. Examples include companies, venture capitalists, banks, funds, and multilateral and bilateral organizations.

We are aware of the necessity of investment, and by working together with our Member States and with potential investors, we hope to facilitate development across the world. We appreciate any comments you may wish to make concerning this paper and look forward to continuing our partnership/implementation role in order to foster communication development.

2 Economic Environment

Dr. Jipp showed in 1963 that there is a strong relationship between the wealth of a nation and its corresponding telephone density.[2] Since then, we have studied this relationship in all sorts of ways and by all means, but we have yet to show causality between telecommunication development and economic growth. Many economists believe that information transport via telecommunications is essential to growth, but the information on its own does not cause an increase in economic growth. Instead, the use of information is part of an overall environment that is capable of creating sustainable growth.[3]

Regardless of causality questions, it is critical for investment stakeholders to understand the close relationship between economic status and telecommunications development. In the following sections, we will examine the world economic market status, the geopolitical factors that are impacting those markets today, and the recent financial history of the telecommunications sector. These sections will set a broad base from which to continue our assessment of the potential for financing telecommunications development.

2.1 World Economy

In the last 10 years we have witnessed both amazing growth and disastrous loss in economies as evidenced in world markets. Asian markets went through a serious downturn during the Asian Crisis of 1997, but then rebounded on hopes of increased trade and more solid banking principles. In Europe and North America, markets provided sustained growth that was thought to be a part of a "New Economy" until the US markets peaked in early 2000 and began to fall.

From those market peaks, investors have seen values plunge—in some cases over 60%—and they have been shocked to see markets topple from their all-time highs rather than continue with unprecedented growth.[4] Increased risk aversion and less consumer spending are affecting economies all over the world. Companies' profits are being squeezed, and unemployment is rising

[2] Jipp, A.,"Richesse des nations et densité téléphonique," *Journal des Télécommunications*, 1963.
[3] World Economic Forum 2002, The Global Information Technology Report 2001-2002:Readiness for the Networked World, Chapter 7.
[4] Economist 2003. Special Report, The World Economy. "Horror Stories". Ppg 71-72.

steadily. The last few years have put an end to irrational exuberance[5], and investors that once believed they were infallible are now more cautious.

Optimistic economists have been anxious to shoot the starting gun that leads to the next economic growth cycle. Governments from the largest economies in the world reacted quickly to the fall with interest rate decreases, tax incentives, and spending cuts. By late 2001, economists were already hinting of a recovery led by strong global trade and industrial production.[6] The swift changes in monetary policy indeed did remove some of the inherent risk with borrowing capital and thus led to more cash on hand for investors.[7] However, this newfound cash has not flowed freely back into the market.

The European Commission in their April economic report said that the Euro zone economy may have retracted in the first quarter of 2003, and they decreased earlier estimates for the second quarter of 2003. Even without the conflict in Iraq, investors are wary of indicators showing economic weakness, such as increased unemployment, high trade imbalances in the larger economies, lower manufacturing production, and decreased consumer spending.[8] Also, markets have been broadsided by uncertainty due to corporate scandals in the United States and unsustainable economic conditions elsewhere in the world (e.g., grossly unbalanced trade and high foreign debt levels).[9] Investors have developed an appetite for more rigorous investigations and apprehension that is difficult to overcome.

2.2 Geopolitical Situation

2.2.1 Opening Trade Barriers

Trade can do more for ailing economies than direct aid itself. The last few years have seen some great developments in world trade, and in turn, more countries have created more open market opportunities (e.g., China, Russia, and Taiwan). Such actions drive more investment and soon the cycle begins: policy changes lead to investments that lead to more policy changes and then more investment. The IMF World Economic Outlook from September of 2002 concentrated on trade and reiterated its staunch support for more trade among countries as opposed to policies created to protect home markets.[10]

A landmark development in trade negotiations occurred with the declaration of the Fourth Ministerial Conference of the World Trade Organization in November 2001. The Doha Declaration,

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[5] "Irrational exuberance" was made popular after Alan Greenspan, US Federal Reserve Bank Chairman, mentioned it during a speech at the Institute for Public Policy Research in Washington, D.C. on December 5, 1996.
[6] IMF 2002. "World Economic Outlook September 2002". Washington, DC. IMF. Pg. 1. ITU Library.
[7] IMF 2003. "Global Financial Stability Report". Market Developments and Issues. March 2003.
[8] Economist 2003. Special Report, The World Economy. "Horror Stories". Ppg 71-72.
[9] DiPiazza, S. and Eccles, R., *Building Public Trust*, John Wiley & Sons, New York, 2002.
[10] IMF 2002, The World Economic Outlook September 2002, IMF.

as it is called, creates the mandate for a series of negotiations on a wide range of subjects affecting trade, and it stipulates that virtually all of the linked negotiations are to be completed January 1, 2005. Moreover, it mandates a work program that is designed to establish a fair and market-oriented trading system through a program of fundamental reform. More specifically, member governments commit themselves to comprehensive negotiations aimed at:

- Market access
- Reductions and possibly phasing out of export subsidies
- Reductions in trade-distorting domestic support[11]

The negotiations have been difficult thus far and some believe that the deadlines set in the declaration will not be met.[12] However, any progress in these talks will affect investment in a positive way and ultimately lead to a change in investor attitude. The European Union has recently submitted commitments to the negotiations in preparation for a June 2003 meeting in Mexico that could change the relations between developed and developing countries for some time to come.[13]

The European Union expansion from 15 to 25 countries agreed to in early 2003 also creates opportunities for open trade, and with the possibility of even wider expansion, perhaps the EU will become an example for how increased trade can benefit all countries involved.

2.3 Telecommunications Sector

The telecommunication sector enjoyed some of the highest growth rates during the bubble of the late 1990s, but since 2000 the sector has lost more in terms of dollars invested than what has been lost on Internet investments during the same time frame. MCI Worldcom, Deutsch Telekom, France Telecom, Telecom Italia, and many other stalwart telecommunications companies across the world are in financial trouble. Furthermore, the only sort of recovery that has been mentioned in the telecommunications industry has been a "jobless" one.[14] Finally, recent financial adjustments by a large telecommunications company in the US to write down the value of long-term assets, such as plant, property and equipment, have put yet another damper on investment in the sector.[15]

Uncertainty has become even more prevalent in telecommunications than in the market as a whole. Investors were burned by inflated asset prices and are still waiting to see if there will be any further repercussions of earlier investments. Bleak forecasts are more the norm than a rarity. Some companies have predicted major telecommunications sector problems, such as the failure of

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[11] For more information on the Doha Declaration refer to www.wto.org.
[12] Business Day 2003, "Developed Countries Miss Key Deadlines in Doha Trade Talks," March 6, 2003.
[13] http://europa.eu.int.
[14] The New York Times. "3 Years Later, Investors Crave Safety". 10 March 2003.
[15] The New York Times. "From WorldCom, an Amazing View of a Bloated Industry". 16 March 2003.

a regional Bell operating company (RBOC) in the US with reverberations felt all over the world.[16] The paradox, and a cause for more uncertainty, is that the raw numbers of people adapting telecommunications technologies are increasing at normal, if not rapid, rates. Wireless LAN, Wi-Fi, main line teledensity, and mobile subscriber numbers have had unprecedented growth and are expected to continue on such growth paths into the near future.[17] Other encouraging data are:

- Total spending in the US telecommunications industry is expected to grow at 9% from 2003 to 2006.[18]
- International telecommunications spending is expected to grow even faster than the US market.[19]
- Wireless deployments in Africa have proven to be successful and have raised the teledensity (including wireless) of some countries by more than 200% over the past 2 years.
- Recent earnings reports and other financial data are pointing to a telecommunications rebound.[20]

As mentioned before, companies and investors have built substantial cash reserves due to the recent changes in monetary policy. Also, there has been considerable pressure to have cash reserves to cover existing debts and to provide security during these questionable times. These two facts coupled with a new attitude toward telecommunications development offer new possibilities for financing development. Some investors are even saying it is time to get back into the foray of telecommunications, since the entry prices are so low and the companies do have intrinsic value. Investors are always looking to reap a return on their money, and their new attitude toward uncertainty can provide opportunities for development funds that earlier would have gone toward some hot IPO.

Our aim here is not to list the types of financing but to provide information that will facilitate the marriage between the potential investors and the entities in need.[21] Regardless of what type of financing was used, all stakeholders were happy with the project plan and its potential at the moment of investment. To keep participants happy and interested in further development, it is necessary to understand the needs of an investor and to convey what the potential recipients can do in order to meet those needs.

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[16] The New York Times. "At Telecom Research Firm, the Forecast Is Never Sunny" 17 March 2003.
[17] World Telecommunications Development Report 2002, Chapter 5 Reinventing Telecoms.
[18] TIA 2003. Press Release, "TIA Releases 2003 Market Review and Forecast". February 25, 2003.
[19] TIA 2003, Press Release, "TIA Releases 2003 Market Review and Forecast," February 25, 2003.
[20] Reuters, "Investors See Light in Telecoms Quarterly Reports," April 23, 2003.
[21] For a good listing of financing methods currently used in practice, see World Bank Discussion Paper Number 432, "Telecommunications and Information Services for the Poor (Toward a Strategy for Universal Access)."

3 Telecommunications Investors

Just three years ago, venture capital firms were jumping at opportunities to invest in new telecommunication ideas and in risky propositions that had made so many people in the industry rich. Seeking to reap the benefits of untapped markets, companies ventured into new geographical, cultural, and development-limited realms. Some of these ventures turned out to be excellent financial investments, while others have more long-term goals such as universal access. Current investors have been and will continue to be more cautious with their capital investments, but even still they will be looking for investments with potential.

The next sections will discuss the mindset of telecommunications investors and thus begin the process of creating a valuable relationship for both investor and recipient.

3.1 Relating Telecommunications to the Overall Economy

Virtually all of the governments in developing countries have been both owners and/or operators of their respective telecommunications networks. This premise was based on a perception of government's social, political, cultural, and economic responsibilities and the role of telecommunications in fulfilling those responsibilities. Government involvement in and dominance of the telecommunications sector in developing countries have been based on the following factors:

- National security interests;
- Need to generate fiscal revenue;
- Desire to ensure equity or universal service;
- Huge initial investment requirement.

Over the last 5-10 years, the ownership structure of telecommunications entities around the world has changed drastically in favor of privatized operators. As governments realized the benefits of allowing the private sector into telecommunications, they went through the necessary regulatory changes to allow private ownership of telecommunications entities and in many cases incorporated favorable foreign ownership provisions as well. New ventures sprung up all over the world, but many least developed countries were left behind in favor of lower risk investments in countries on the cusp of development, such as Egypt and Romania. As a result, some of the world's weakest economies have been unable so far to reap the benefits of telecommunication contribution to economic growth.

Increased access to and use of Internet and Communication Technologies (ICT) leads to productivity gains that affect the economy as a whole in a favorable way. The 2002 Annual Report from infoDev dubs ICTs as the "oxygen of modern economy and society." Some productivity gains using ICTs are listed below:

- Marketing via ICT rather than conventional postal methods or by word of mouth;

- Sales functions, including support, carried out via ICT rather than by Sales Representatives or other conventional methods;
- Constant availability of information saves time associated with knowing when you might need the information and collecting extraneous information in case of a change over time;
- Other services (e.g., medical, educational, and governmental) can be paired with ICTs to become more effective.

Often countries are not convinced of the benefits of telecommunications, and they place development of such services in a lower priority despite apparent economic rewards.[22] Stymied by more grave concerns, least developed countries rarely have the opportunity to look beyond their immediate issues into the futuristic world of ICT. The ITU strives to convey the benefits of ICT in furthering economic development and also to find ways to assist governments in creating an environment that is favorable for investment even if the governments themselves are unable to provide undivided attention to it. Figure 1 shows the strategic importance of African investments among the companies investing there.

Investors of all sorts realize the opportunities in telecommunications development and have seen the potential of returns from well-planned deployments or partnerships. The marriage of willing investors with those needing funds is a delicate relationship that is based on pleasing all stakeholders. In facilitating this process, the ITU must understand the needs of both investor and of governments in relation to ICT proliferation.

[22] Saunders, Warford, and Wellenius. Telecommunications and Economic Development". 2nd Edition, 1994. ITU library.

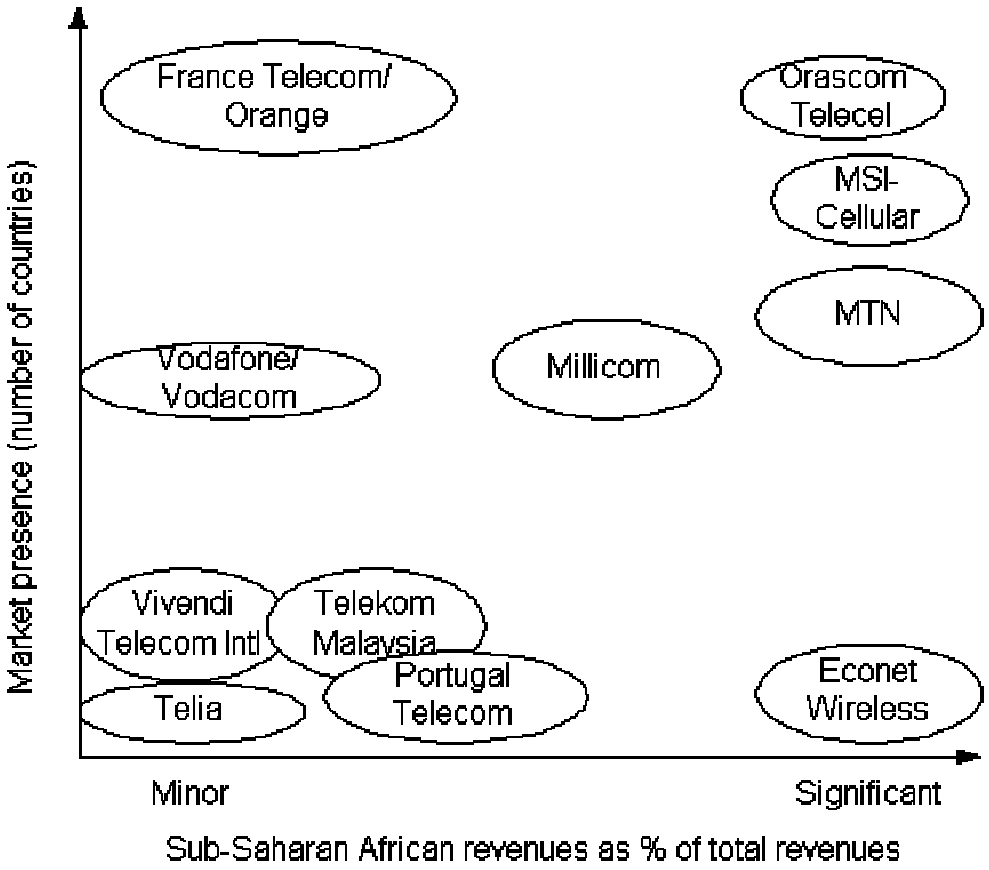


Figure 1: Strategic Importance of African Investments

3.2 Needs

The ITU addresses the concerns of all stakeholders through a three-pronged approach. The ITU Radiocommunications Sector considers the development of such technologies that will lead to further development for all countries and the potential to expand the reach of telecommunications to more and more people. Furthermore, the Telecommunication Standards Sector assists Member States in the process of establishing standards that will lead to smoother technological implementation and more access to ICT for everyone. Finally, the Telecommunications Development Bureau (BDT) exists to directly assist Member States with implementation of ICT solutions. Furthermore, the BDT works to merge the needs for telecommunication development with the means for making development happen: funding.

3.2.1 Capital

Investors must have free capital in order to invest it. After describing the current economic state, it is obvious why investors have either retreated with the little cash they had or not invested at all. Companies have been unable to invest capital in new ventures because of pressure to pay down debt and increase cash flow. Large operators have curbed capital spending over the last couple of years and have reevaluated projects that would have gotten approval under better conditions. Banks have seen overall portfolio values decline so much that they have had to write down their

company value. Finally, multilateral and bilateral organizations are feeling the pinch of reduced state budgets and are therefore reluctant to “expand” operations.

However, with recent changes in monetary policy and after giving regulatory issues further time to develop, opportunities abound in the field of telecommunications development. Increased cash amounts on the balance sheets of former problem companies will lead to further investment in promising projects. The task is to understand the attitude of investors as they come back into the fray of telecommunications development funding.

3.2.2 Hierarchy of Telecommunications Investor Needs

Abraham Maslow (1908-1970), a prominent psychologist, spent much of his time studying the needs of the individual. Maslow said that human beings do everything in their power to meet certain needs before moving on to a higher level of self-actualization. For example, the lowest level in his hierarchy contains physiological needs such as water, food, and air. If these needs go unfulfilled, an individual will be irritated to the point of thinking of nothing else other than satisfying these needs. Indeed, one can go to a higher level of the hierarchy before completely satisfying the needs of the previous level, but one will not be able to reach self-actualization without removing her need deficiencies.

Maslow's hierarchy of needs has been applied in business for motivational theories, but the next few sections will take this application a bit further--to investors. Investors look to satisfy a laundry

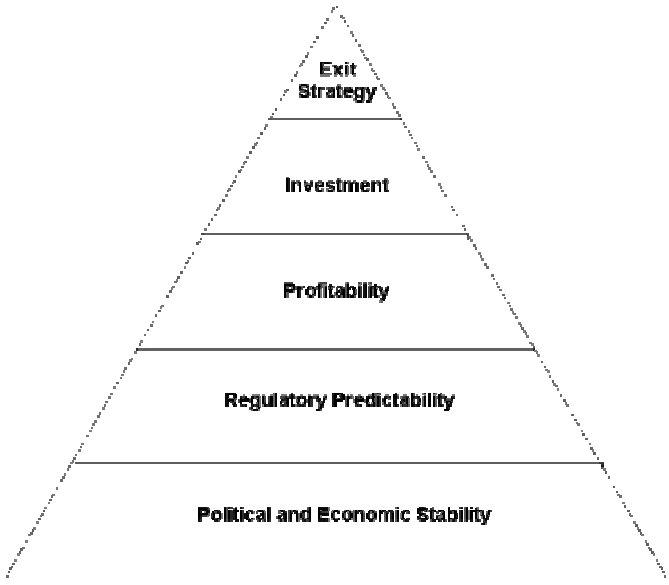


Figure 2: Hierarchy of Investor Needs

list of points before moving to full investment, and their needs are organized in Figure 2 just as Maslow did with his hierarchy of needs.[23] As with individuals, investors can move from one level to the next without fully satisfying certain needs. However, they too will be constantly thinking about ways to fulfill unmeet needs, and in turn, they will ask for more return for their risks.

The next sections will describe the relationship of the hierarchy of investment needs for telecommunications to Maslow's theories on individual motivation and give some insight on how these needs are fulfilled in today's telecommunications investment environment.

3.2.2.1 Political and Economic Stability

For telecommunications development, political and economic stability are as essential to the investor as food, water, and air are for an individual human being. Both of these needs have somewhat equal importance to an investor, since without either of them, the investor cannot move forward to full investment realization. On the political side, peace, legitimate governmental dealings (i.e., no corruption), rule of law, and democratic accountability dictate the feasibility of a project. Without political assurances, investors cannot determine a reward that meets the corresponding risks and thus do not invest. Regardless of the demand or need for telecommunications services, investors will opt for other investments before taking a risk on one with limited political stability.

In addition to these requirements, a stable economic environment is equally as essential. Investors favor currency stability, controllable inflation, and reasonable local interest rates in the country of investment. Companies do not limit themselves to one investment in one telecommunication project, as this would be against the proven solidity of diversification. Instead, investors consider entire portfolios and only add investments that have the best opportunity to contribute to the fund as a whole. In this light, investors evaluate the opportunity costs of making one investment as opposed to another.

> *"In emerging markets, the deterioration in the outlook has partly reflected lower risk appetite and contagion, but country-specific factors—including political uncertainties and concerns about debt dynamics—have played a more important role." IMF 2002 Economic Outlook*

Investment at this level in the hierarchy is practically limited to government organizations and other cause-related entities who invest without the need for a huge return on investment but prefer a different result, such as universal access, gender equality, poverty reduction, or general economic stimulation. The World Bank, ITU Development Bureau, NEPAD, Infodev, et al., along with

[23] See http://web.utk.edu/~gwynne/maslow.HTM for a description of Maslow's Hierarchy of Needs. Saved copies available from the author in the case the website does not exist.

governments make contributions in this area to assist countries in reaping the benefits of telecommunications. Notice in Figure 3 how the capital structure mix varies as sector reforms.[24]

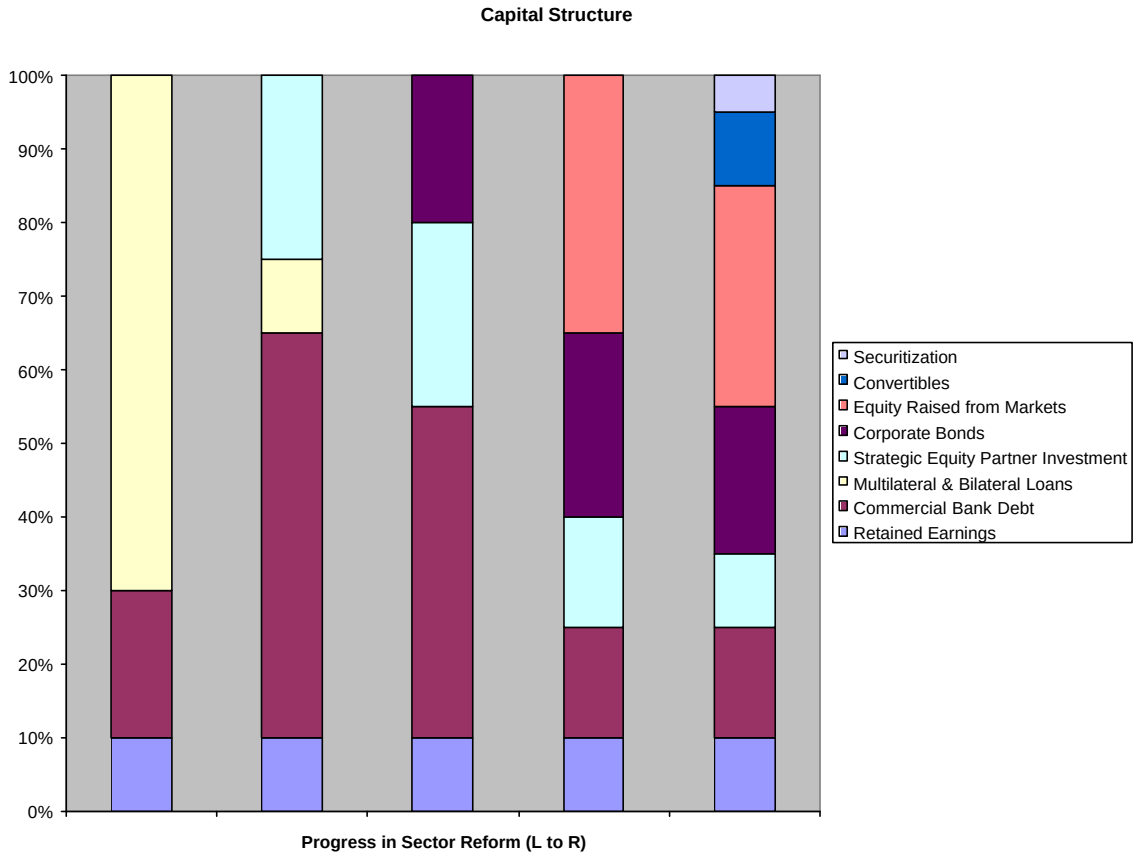
3.2.2.2 Regulatory Predictability

Safety and security comprise the second level of needs for the individual. For telecommunications investors, a predictable regulatory environment that enables them to address levels of competition and market access provides safety and security. Also, the long-term feasibility of a project can be questionable if the system for technological advancement is not clear and defined. In general, investors can account for good news and for bad news, but unpredictability leads to a risk-reward

Figure 3: Capital Structure and Sector Reform

relationship that is not conducive to investment.

The ITU Telecommunication Development Bureau realizes the importance of this need and has special departments who work with countries across the world to create regulatory environments that foster investment. In December 2002 during a Global Symposium for Regulators, the BDT



[24] Marcelle, G., "What Can the Caribbean Learn From African Telecommunication Sector Reform?"

Regulation Group released a report entitled “Feedback to regulators from investors—Telecommunications in crisis: Perspectives of the Financial sector on regulatory Impediments to Sustainable Investment.” This and other publications along with extensive direct assistance to countries provide the BDT with a unique perspective on regulation.

3.2.2.3 Profitability

This level in Maslow's hierarchy is characterized by the need for belongingness and love. It is the first level at which individuals begin to consider emotions outside of their immediate selves and become proactive rather than reactive. They also battle with doubts about their usefulness and seek to be accepted.

On the investment front, profitability includes the majority of financial consideration, and it is the point at which investors decide if indeed their funds do belong in a certain project. Investors normally do not seek to be accepted like an individual does; they discount as many doubts as possible with formulas and calculations. Demand curves, discounted cash flows, asset valuation, revenue projections, sales forecasts, cost assumptions, and return on investment are just a few of the methods used to allay investment fears.

Even though there have been substantial moves in the regulation environment to create competition and open markets, the poor financial condition of the telecommunications industry has led to little or no capital that is available for investment. Companies and investors have had to use their limited available capital for necessary internal operations or have resorted to investments that are less risky. However, even with this level of financial scrutiny, there are many investments in telecommunications that offer returns that are too lucrative to avoid.

After these questions concerning profitability are answered, the level of self-confidence is high. Individuals fulfilling the need for belongingness and love begin to believe that they really have something to offer to society. Likewise, investors are convinced that they can contribute to the project and create economic growth.

3.2.2.4 Investment

Individuals at this stage are proud and have a desire to show you what they can do. Investors show you what they can do by entering a market, making contributions and reaching financial profitability. However, as with all levels of the hierarchy, there are risks at this point. Business relationships are difficult to set up, so although the regulatory environment might allow such partnerships, success can be limited by management styles, project implementation schedules, and local interest in the project. For telecommunication development, investors can pair with many types of organizations in order to minimize the impact of entrance.

Presentation to Caribbean Development Bank, June 20, 2002.

Sustainability is also at issue at this stage. Relationships must be forged for the life of the investment, and the level of cooperation is a direct contributor to project success. Also, local workforce, technical adaptation and growth, and the possibility of renegotiation based on changing needs are significant contributors to sustainability.

3.2.2.5 Exit Strategy

Maslow said that we are all working toward self-actualization. Individuals at this level are concerned with becoming everything that one is capable of becoming. Having accomplished substantial success, humans long to find a new level of needs--one that is solely created for them and only they can accomplish. This self-fulfillment comes for investors as they prepare to exit a successful project. It is evident that Orascom was pleased with its exit of its Jordanian telecommunications venture called Fastlink. They sold their stake in the company after 3 years and earned an internal rate of return (IRR) of 64%.[25] With a high return on investment (ROI) behind them, investor thoughts sometimes turn to areas that they believe can also be fruitful. If these projects are based on the same principles as mentioned above, the investors can have the same level of success. However, overconfidence sometimes leads to investments that are riskier and lead to poor returns for both the investor and the end user.

This is also the level where some local economy creation begins. As the investment ages, more locals will be employed and more locals gain access to the given technological advancements. While a direct cause-effect relationship between economic growth and telecommunications can be debated, a long-term investment can indeed offer some sort of stability in a wobbling economy, thus providing the basis for some other investor's hierarchy of needs.

4 Measuring the Risk and Reward

We have provided a glimpse of the investment environment with a concentration on the telecommunications investor. The previous sections clarified the “feeling” of investors, but now we will consider a more empirical approach to development. Investors use a plethora of data to examine market possibilities; however, our approach to these numbers will be slightly different. Remembering the intention of this paper to bridge the gap between the fund haves and have-nots, we will examine the usefulness of a number of indicators in telling the story of a given country. During this discussion, special attention is given to both sides of the investment equation and how each might use such indicators to assist in a development decision.

[25] Orascom Telecom 2003. “Progress Report: Balance Sheet Restructuring and Focus on Core Assets,” January 19, 2003.

4.1 Usefulness

From the perspective of potential recipients, indicators should be seen as a way to show where investment is warranted and the extent to which that investment could be successful. An objective approach using data is often an excellent argument for investment, and if this is coupled with an understanding of stakeholder needs, then one has the best chance of securing funds. Of course, potential investors are not looking for a risk-free investment. Instead, they are looking for a reasonable return given the risks involved. Every situation that needs funding is not a good investment for those with capital. Knowing this, those needing the investments need ways to calculate which ideas would be more valuable to investors. Indeed, all projects have worthy goals, but the means by which to get there have to be considered from both sides of the investment equation.

Investors crave numbers: numbers showing how an investment today will earn X% for the next 5 years, numbers showing an unrealized market, numbers calculated using up-to-date financial techniques, numbers, and more numbers. As mentioned before, they also yearn for a place to invest their capital. Often, their attention to financial data is considered aloof concerning the needs of the country proposing a project. However, their dependence on numbers is well grounded in the fields of finance and economics. Furthermore, the numbers provide objective data by which to compare projects and potential.

4.2 Methods

Too much data can be overwhelming even for someone educated to use it. Methods to simplify the data make it more usable and in many cases, more convincing. In light of this, statisticians, financial analysts, and economic analysts have created many ways to group, filter, combine, and regress data. Two popular methods are categorization and indices.

4.2.1 Categorization

A *categorization* is a group of things arranged by class or category.[26] Using the method of categorization allows analysts to understand one single data point among its peers by creating some sort of ranking system. For example, the World Bank categorizes countries according to their gross national income (GNI) per capita into 4 different fields: poor, low-income, middle-income and high-income. Many valuable determinations can be made between groups and the influences or needs of the groups. While such categories allow for some general thoughts to be produced concerning the group and concerning individual points within the group, one must be careful not to put too much weight into the data without first considering some of the categorization method weaknesses:

[26] WorldNet 1.6, Princeton University, 1997 from the website www.dictionary.com.

- Data points on the cusp of a range will have characteristics of the range in which it sits and the range closest to it.
- Categories may be defined in a way as to portray certain results.
- There can be drastic change within a group that may not be seen given the predetermined ranges.

There are debates around almost every sort of categorization, and those used in telecommunications are no different. In the empirical sections below, we will utilize this method often in assessing general trends in the given indicator. Questions may arise as to our chosen ranges, but remember that these exercises are there only to offer support for an argument. A categorization can never be the final determinant for investment, but it does offer some sort of quantification of the unknowns.

4.2.2 Indices

Indices combine data in such a way as to incorporate many different indicators that together equate to some level of development. Developing an index should be done through a statistical process by considering factors (i.e., indicators) that lead to an entity's given level in the hierarchy. The details of developing an index are beyond the scope of this document, but we would like to bring attention to the fact that there are many subjective elements in an index and these should be considered before accepting a given "ranking." Some examples of indices in the telecommunications industry are listed below:

- ITU Mobile/Internet Index
- UNDP Technology Achievement Index
- World Economic Forum Network Readiness Index
- The World Paper Information Society Index

4.3 Political Stability

During the last 40 years in Africa, there have been approximately 180 regime changes. Out of those, over 100 have come as a result of a coup or other non-democratic method. All investors may not be aware of this statistic, but you can be sure that they have an idea how unstable one country is in comparison with another. How can the inhabitants of a country be concerned with getting a new phone line when they have to watch out over their shoulder for a rebel invasion or prepare to flee with thousands of others in order to avoid turmoil? Indeed, there are uses for ICT in that sort of environment, but investors will leave that development to agencies with agendas outside of the realm of profit.

Since political stability is so difficult to measure with raw data, indices are the best method to understand where countries lie in comparison with their peers. Credit rating agencies, such as Standard and Poor's or Moody have developed credit rating systems that include not only political

stability but also economic indicators.[27] The table below shows a ranking system developed by a company called Coface that indicates investment risk based on political factors, currency issues, and a state's ability to meet its commitments.[28] (Economic indicators will be discussed later.) These companies create these ranking systems or indices to assist investors as they make their investment choices. While it is not essential to know every index, recipients must realize where they rank among their peers in one or another respected indexing system, and they must be prepared to dispute unfavorable rankings in their project proposal to investors.

Table 1: Coface Investment Risk Ranking System

Grade	Rating	Comment
Investment	A1	The steady political and economic environment has positive effects on an already good payment record of companies. Very weak default probability.
	A2	Default probability is still weak even in the case when one country's political and economic environment or the payment record of companies is not as good as in A1-rated countries.
	A3	Adverse political or economic circumstances may lead to a worsening payment record that is already lower than the previous categories, although the probability of a payment default is still low.
	A4	An already patchy payment record could be further worsened by a deteriorating political and economic environment. Nevertheless, the probability of a default is still acceptable.
Speculative	B	An unsteady political and economic environment is likely to affect further an already poor payment record.
	C	An very unsteady political and economic environment could deteriorate an already bad payment record.
	D	The high risk profile of a country's economic and political environment will further worsen a generally very bad payment record.

[27] See Appendix A for definitions of long-term credit ratings from these agencies.
[28] Taken from the Coface website at www.cofacerating.com.

4.4 Economic Stability

4.4.1 Gross Domestic Product

Gross Domestic Product (GDP) is an economic indicator that is the total market value of all goods and services produced within the political boundary of an entity.[29]

Investors analyze this indicator over time and across countries in order to understand how well the country is functioning economically. Consistent growth in GDP removes some of the uncertainty associated with investing, and as long as the investor believes that the current state for the country will continue, economic stability is no longer in question.

Due to the vastly different sizes of the countries across the world, this indicator is almost always (in-country analysis on GDP growth is one exception) used in combination with a population factor. The GDP per capita, as it is called, loosely shows how much income each individual within that given country has to "live" on. This combined indicator is used in the Millennium Development Goals, to determine Lesser Developed Country (LDC) status, and is seen throughout organizational strategies of multilateral and bilateral organizations.

The World Bank uses a slightly different economic indicator called Gross National Income (GNI) to develop yearly ranges to indicate a country's income category. GNI is different from GDP in that it includes income from the residents of a given entity rather than GDP, which includes products within the political boundary of that entity. Usually, the difference between GDP and GNI on a global scale is negligible. The ranges shown below were used in 2001 to classify all World Bank member economies along with economies with populations of more than 30,000.

Table 2: World Bank Income Ranges, 2001

Rank	GNI/capita (G)[30]
Low Income	G = $745
Lower Middle Income	$745< G = $2975
Upper Middle Income	$2975< G = $9205
High Income	G > $9205

4.4.2 Inflation/Deflation

Inflation is an average increase in the price of goods within an economy.

[29] www.amosweb.com, GLOSS*arama. Search for GDP.
[30] GNI/capita calculated using the Atlas Method developed at the World Bank.

Economists and investors keep an eye on inflation as an indicator of either high or low economic stability. Slight inflation is considered almost crucial alongside a slight growth in GDP. If inflation is minimal or , even worse, deflation (an average decrease in prices) occurs, individuals will refrain from spending in the hopes that the same money they have today will buy more goods later. On the other hand, high inflation puts a high burden on lenders and can adversely affect the currency dynamic outside of a country.

4.4.3 Debt

High levels of external debt have been increasingly recognized as a serious constraint on the ability of poor countries to pursue sustainable development and reduce poverty. Once countries have a problem with debt, their investment rankings decline. Then, a vicious downward spiral can develop causing FDI (Foreign Direct Investment) and FPI (Foreign Private Investment) to rapidly

Indebtedness Classification	Detail
Severely Indebted	Present value of debt service/GNP >80% or present value of debt service/exports >220%.
Moderately Indebted	Either of the ratios above exceeds 60% of, but does not reach the critical levels.
Less Indebted	All other classified low-and middle-income economies

Table 3: IMF/World Bank Indebtedness Ranking System

decline. To combat this issue, the World Bank and the IMF launched the Initiative for Heavily Indebted Poor Countries (HIPC) in 1996. It was endorsed by some 180 governments around the world as an effective and welcome approach to help poor, severely indebted countries reduce debt as part of an overall poverty reduction strategy and thus increase their attractiveness in the international investment realm.[31]

4.5 Regulatory Stability

Regulatory stability has become more of a question over the last 10 years in telecommunications due to the move from state- to private-owned enterprises. Uncertainty concerning technological advancement, spectrum management, tariffs, etc. will steer investors to other, more predictable regulatory environments.

As these changes have occurred, there was an identifiable need for a single authoritative source of information and advice. In 1997 the ITU established the Regulatory Reform Unit (RRU)[32] to

[31] http://www.worldbank.org/hipc/faq/faq.html.
[32] Established as the Sector Reform Unit and then changed to the Regulatory Reform Unit in 2003.

identify and analyze world trends in telecommunication reform and assist ITU members in reforming their telecommunication policies and regulations. This unit provides expert assistance and information to ITU Members via direct assistance, publications, workshops and seminars. The RRU also publishes a country-by-country matrix listing the status of its Members. The following points of information can be found on the RRU website:

- Regulator information
- Policy maker information
- Independent regulator determination
- Organizational structure of the regulator
- Pertinent legislation concerning telecommunications
- List of online documentation
- Table showing level of competition across multiple telecommunications fields

4.6 Profitability

The third level of the investor hierarchy of needs includes the majority of the calculations and assumptions concerning profitability. This section will start inside the world of telecommunications indicators and then move into the realm of financial indicators used across multiple disciplines.

4.6.1 Teledensity (Main Line)

Teledensity is the number of telephone main lines per 100 habitants in a particular country or territory.

In the field of telecommunications, there are few indicators as well known as teledensity. This indicator is mainly used to give an indication of a country with respect to its peers, but it can also be used to trend development within a country and to determine how much more growth is possible. Since 1950, the ITU has been using this indicator to show the level of telecommunications development for a particular country or Member State. This reliance stems from the indicator's obvious advantages:

- Up-to-date data is readily available for a variety of countries. ITU stresses the importance of the indicator by having it on the top of its "Top 50 Indicators" list.
- It is specific to telecommunications and is not influenced by outside factors such as exchange rate fluctuations, changes in commodity prices, or inequities in the distribution of national wealth.

While this indicator tells a good story about the telecommunications status of a nation, it still lacks ubiquitous appeal. The following disadvantages highlight some of the major concerns among the industry in reference to teledensity:

- It may not provide the most accurate reflector of residential access to telecommunications (i.e., penetration of telephones in households), particularly in

economies with a high degree of tourism. In the case of much tourism, most of the lines could be to hotels rather than households.

- It can change relatively rapidly, either in an upward direction due to rapid growth or in a downward direction due to such factors as civil war or neglect. The categories defined may not therefore be stable over an extended period.
- Technological advancements can diminish the applicability of this indicator. For instance, wireless teledensity overtook main line teledensity on a worldwide scale in 2002 (verify year).

4.6.1.1 Data example

An ITU study of 206 countries based on teledensity yields the following categorical distribution[33]:

Table 4: Teledensity Classification, 2000

Teledensity (T)	Designation of class	Number of countries
T<1	Category 1	34
1=T<5	Category 2	36
5=T<10	Category 3	22
10=T<20	Category 4	28
20=T<35	Category 5	30
35=T<50	Category 6	29
T>50	Category 7	30

These categories yield an equal distribution of the countries in the study; but keep in mind how the categories are defined. So, in our first empirical example of categorization, one can see that data can be manipulated to tell different stories. In most cases, the categories become much more helpful as other data are considered, as can be seen below.

Table 5: Teledensity Categories with Other Data

Teledensity class designation	% of world main lines	% of world population	% of world GDP	% of telephone revenue	Revenue per line/GDP per capita	Revenue/ GDP	Revenue/ line
Category 1	0.3%	12%	1%	0.2%	268%	1.0%	606
Category 2	5%	30%	3%	2%	62%	1.9%	306
Category 3	2%	5%	1%	1%	28%	2.1%	433
Category 4	24%	31%	11%	11%	24%	3.0%	419
Category 5	10%	7%	4%	4%	13%	3.1%	374

[33] These categories were defined during a meeting to determine tariff charges between nations and which nations should receive relief from expensive telecommunications connections to the rest of the world. Reference ITU-T Recommendation 140. The data was derived from the ITU World Telecommunication Indicators Database.

Category 6	10%	4%	10%	12%	8%	3.4%	1024
Category 7	48%	12%	71%	71%	5%	2.9%	1367
Total / Average*	**100%**	**100%**	**100%**	**100%**	**58%**	**2.5%**	**647**

* Total percentages may not sum to 100% due to rounding. Year 2000 data.

In Table 5, Categories 1 and 2 approximately correspond to low-income countries and Categories 6 and 7 correspond to high-income countries as designated by the OECD GDP classification system.[34] This relationship shows how closely economic growth and stability are correlated with increases in ICT. Moreover, using this association between economic and financial factors, it is interesting to note the fundamental differences between Categories 1 and 2.

- Revenue per line divided by GDP per capita (TR_{line}/GDP_{cap}) is 268% for Category 1 while it is a mere 62% for Category 2.
- The revenue per main line is USD 606 for Category 1 countries, but about half of that for those in Category 2.

One explanation of this phenomenon can be described as a "chaos-to-developing" phase of telecommunications. The ratio between the teledensities for Categories 1 and 2 is approximately 7.7. This shows that the telephone main line density in the 36 countries in Category 2 is 7.7 times higher than in the 34 countries in Category 1. In this essence, the Category 2 countries have emerged from a state of chaos and confusion and are developing an infrastructure for telecommunications development.

The chaos for Category 1 countries can be attributed to an environment that inadequately satisfies the basic needs for investment—either from the government OR outside sources. Also, the high dependence on business customers, as evidenced in the exceptionally high revenue per main line, to support telecommunications revenue is a further cause for the lack of development and universal access.

One astonishing point that can be seen by the percent of total main lines in combination with percent of world population is the unbelievable imbalance. While category 7 countries have just over 12% of the world population, they possess almost half of total main lines. Furthermore, this data shows that 38% of people around the world are in a situation where less than 1 in 20 of them have access to a main telephone line.

The other categories and their corresponding data are astonishing, but not outside of reasonable logic. The low revenue per line in the other categories, excluding 6 and 7, could be explained by the lack of a full range of services or by a more even distribution of business customers. In categories 6 and 7, one can see that increased teledensity and therefore communications infrastructure lead to a higher level of revenue from telecommunications sources.

[34] OECD GDP classification study info for 1999.

4.6.1.2 Sample of Developing Countries

Using these same classifications, data for 34 selected countries are listed below. These countries are at the lowest levels of telecommunications development according to teledensity, and therefore, the BDT is concerned with quantifying the level of disparity these countries are in and how to assist them in development.

Table 6: Teledensity Rankings of 34 Selected Countries

Country	Main Telephone Lines 1999 (10^3)	Population 1999 (10^6)	Teledensity	Designation of class
Chad	9.7	7.46	0.13	Category 1
Niger	18.1	10.4	0.18	Category 1
Liberia	6.6	2.93	0.23	Category 1
Cambodia	27.7	11.76	0.25	Category 1
Central African Rep.	9.9	3.55	0.28	Category 1
Ethiopia	194.5	61.09	0.32	Category 1
Sierra Leone	17.4	4.72	0.38	Category 1
Malawi	41.4	10.64	0.39	Category 1
Mozambique	78.1	19.29	0.4	Category 1
Tanzania	149.6	32.79	0.46	Category 1
Guinea	677	7.8	0.59	Category 1
Cameroon	94.6	14.69	0.64	Category 1
Benin	38.4	5.94	0.66	Category 1
Togo	38.2	4.51	0.85	Category 1
Kenya	304.6	29.5	1.03	Category 2
Djibouti	8.8	0.63	1.4	Category 2
Zimbabwe	239	11.53	2.07	Category 2
Pakistan	2,986.1	134.51	2.22	Category 2
Viet Nam	2,105.9	78.71	2.68	Category 2
Gabon	38	1.2	3.17	Category 2
Albania	140.4	3.85	3.65	Category 2
Philippines	2892.4	74.45	3.88	Category 2
Mongolia	103.4	2.62	3.95	Category 2
Algeria	1600	30.77	5.2	Category 3
Guatemala	610.7	11.09	5.51	Category 3
Bolivia	502.5	8.14	6.17	Category 3
Namibia	108.2	1.69	6.38	Category 3
Peru	1,688.6	25.23	6.69	Category 3
Guyana	64	0.86	7.49	Category 3
Egypt	4684.4	62.43	7.51	Category 3
Tunisia	850.4	9.46	8.99	Category 3
Ecuador	1129.5	12.41	9.1	Category 3
Syria	1,600	16.11	9.93	Category 3
Romania	3,740	22.4	16.7	Category 4

In further support for classification by teledensity, the above classification of the selected developing economies is consistent with the rankings produced by Francisco Rodriguez and

Ernest J. Wilson III in their report for InfoDev. The InfoDev study classification is based on Index of Technological Progress (ITP), which uses the total figures for televisions, fax machines, personal computers, Internet hosts, and mobile phones as its components.[35]

Certain countries, though, show vast contradictions to classification by main line teledensity and point to some of the weaknesses mentioned at the outset of this report. Cameroon has a very low MAIN line teledensity, but when mobile phones are added to the density indicator, the country moves from a Category 1 to a Category 3. Also, current data for Egypt reveals a steep climb in their telecommunications development largely due to a government focus on increasing overall access to communications. Finally, Djibouti has a teledensity above 1, but this is inflated due to the countries overwhelming dependence on business customers (the average revenue per line is over $1000) and a highly urbanized population.

4.6.2 Teledensity (Mobile)

The boom of mobile telecommunications has made a monstrous effect on the level of communications in the world, especially in those countries where installing traditional main lines is financially prohibitive. On top of providing a method of communications for those who otherwise would not have it, mobile communications has changed the way people communicate. We measure this wireless phenomenon in basically the same way as teledensity for main lines, except mobile teledensity is measured using the number of subscribers rather than the number of actual lines installed. Therefore, mobile teledensity has many of the same disadvantages as main line teledensity.

Yet, the data supports the importance of mobile teledensity. In the US, the average mobile minutes of use (MOU) have just surpassed the main line average monthly MOU. This indicates a strong shift to wireless in newly developing wireless countries as well as in developed wireless countries. The table below contains mobile teledensity data for the same 34 countries as listed above with the same categorization scheme as used for main line teledensity. The table is ordered according to Mobile Teledensity for 2001.

[35] Infodev document on index of telecommunications prowess. World Bank.

Table 7: Mobile Teledensity 34 Countries, 1997-2001

	Country	Mobile Teledensity 1997	Mobile Teledensity 1998	Mobile Teledensity 1999	Mobile Teledensity 2000	Mobile Teledensity 2001	Average Growth 1997-2001
Category 1	Niger	0.00	0.01	0.02	0.02	0.02	306%
	Ethiopia	0.00	0.00	0.01	0.03	0.04	104%
	Liberia	0.00	0.00	0.00	0.05	0.06	33%
	Chad	0.00	0.00	0.00	0.07	0.27	275%
	Central African Rep.	0.04	0.05	0.12	0.14	0.29	74%
	Algeria	0.06	0.06	0.24	0.28	0.32	81%
	Djibouti	0.03	0.04	0.05	0.04	0.47	303%
	Malawi	0.07	0.11	0.22	0.47	0.48	68%
	Pakistan	0.10	0.16	0.21	0.25	0.55	56%
	Sierra Leone	0.00	0.00	0.00	0.25	0.55	124%
	Guinea	0.04	0.28	0.32	0.53	0.69	187%
	Mozambique	0.01	0.04	0.06	0.26	0.84	192%
Category 2	Tanzania	0.06	0.12	0.16	0.51	1.19	120%
	Syria	0.00	0.00	0.03	0.19	1.20	595%
	Viet Nam	0.21	0.29	0.42	0.99	1.54	69%
	Kenya	0.02	0.04	0.08	0.42	1.60	220%
	Cambodia	0.32	0.54	0.73	1.00	1.66	52%
	Benin	0.08	0.11	0.12	0.91	1.94	204%
	Cameroon	0.03	0.04	0.04	0.98	2.04	609%
	Togo	0.07	0.17	0.38	1.08	2.04	136%
	Zimbabwe	0.05	0.17	1.51	2.29	2.41	272%
	Tunisia	0.08	0.42	0.58	1.24	4.01	195%
	Egypt	0.11	0.15	0.77	2.14	4.33	184%
	Guyana	0.17	0.17	0.33	0.58	4.54	213%
Category 3	Namibia	0.78	1.18	1.77	4.67	5.59	71%
	Peru	1.73	3.00	4.02	4.96	5.92	37%
	Ecuador	1.06	1.99	3.09	3.81	6.67	60%
	Mongolia	0.09	0.39	1.47	6.51	7.62	245%
	Bolivia	1.52	3.01	5.16	7.28	8.74	58%
	Albania	0.09	0.15	0.29	0.76	8.82	346%
	Guatemala	0.61	1.03	3.05	7.41	9.70	110%
Category 4	Philippines	1.86	2.38	3.83	8.44	13.70	68%
	Romania	0.89	2.86	6.05	11.14	17.24	118%
	Gabon	0.84	0.83	0.74	9.79		369%

Immediately, one notices the growth rates of mobile teledensity. No country listed here had less than 37% growth in mobile teledensity from 1997-2001, while no country had above 21% average growth in main line teledensity over the same period. Furthermore, the movement to higher categories has happened much faster for countries such as Romania, which went from Category 1 to Category 4 in a mere 5 years.

This data makes the case to incorporate mobile teledensity in any consideration of country telecommunications capabilities, but how should we incorporate it? First, there is the possibility to add main line and mobile teledensities together. Although this would yield the maximum capacity of telecommunications, this method is not accurate since many mobile subscribers also have main lines at home. Second, one could average the two numbers thus creating a new indicator. Still, this method has severe disadvantages. Finally, one could create a weighted index including the two indicators that would take into consideration the shortcomings of each indicator. The ITU is currently working toward a sort of weighted index in this area, but the raw indicators still proliferate.

There are still other Internet and Communication Technologies (ICT) that warrant or will warrant their own "teledensity." Data for ICT using broadband, cable TV, satellite, wireless LAN, wireless local loop, etc. are already being monitored by the ITU and are beginning not only to make a contribution but are becoming a significant part of a country's telecommunications density. Indicators such as number of computers, Internet service providers, broadband minutes of use, cable TV subscribers, and fiber optic capacity are fast becoming crucial factors as economies become dependent on the services allowed by such technology.

4.6.3 Average Revenue per Line

Average Revenue per Line (ARPL) is useful in many financial calculations associated with installing new main lines. Alone, ARPL is useful in developing revenue forecasts, cash flow, and demand forecasts. In combination with other indicators, ARPL can show the feasibility of an investment and what type of customers may be underserved. For example, a high ARPL per GDP per capita shows more higher-income (mostly business) customers are on the system. Table 5 shows that the ARPL/GDP per capita for Teledensity Category 1 countries is 152%. A number above 100% provides instant proof that the majority of the lines are paid by customers who make more than the average citizen, usually businesses. This information helps investors understand what types of customers are already using the ICT and formulate plans to bring other customers onto the service.

Investors are also interested in ARPL because it offers some indication of growth potential in a market. After assessing the other categories from Table 5 one notices that with an increase in the number of lines comes a decrease in the ARPL/GDP per capita. This indicates that the consumers in the lower categories are willing to put out more of their income toward telecommunications.

There are many other correlations that investors can discern using ARPL, and recipients must be aware how they can portray themselves in order to make a convincing argument.

4.6.4 Average Revenue per Unit

Average Revenue per Unit (ARPU) is very similar to ARPL, but is used primarily in the wireless business. Executives and investors monitor ARPU among companies and across time frames to see many of the same trends that ARPL offers. Investors look at a company's ARPU as an indicator of future cash flows and management effectiveness.[36] Increased attention on this indicator has led companies such as Vodafone UK, T-Mobile, Verizon Wireless, and Sprint PCS to concentrate their efforts on increasing ARPU and thus their share prices.[37]

On a company level, ARPU is generally calculated as follows, $\frac{\text{Total Revenues / Month}}{\text{\# of Active Users}}$. In calculating this indicator on a country level it is usually easier to use the yearly numbers that countries supply to the ITU and other international organizations. Thus, the equation for a country's ARPU might look like this, $\frac{\text{Mobile Communication Revenue/Year}}{\text{\# Cellular Subscribers}}$. Using the data from the ITU World Telecommunication Indicators from 2001 to calculate ARPU, one notices that almost every country has had a marked decrease in the amount of ARPU over the years.[38]

The ARPU calculation does have weaknesses, but investors are looking for a multitude of information that leads to the same conclusion. Some problems are:

- Determining the number of "active" subscribers
- Understanding the exact source of the "mobile communication revenue"
- Attributing an increase or decrease in ARPU to more or less opportunity in the market

One noticeable difference between ARPL and ARPU is that ARPU tends to decline steadily over the phases of development while ARPL dips in the middle categories and then rebounds in the higher categories. This difference can be explained by a new resurgence in uses of main lines that are just beginning for wireless connections. Main line companies in developed nations have seen revenues increase due to more high-speed orders and the necessity of higher throughput for data. Early in its life cycle, wireless did not have the opportunity to offer such high-speed connections, but that is changing quickly. The vast majority of wireless companies in developed nations already offer data connections, and they are planning for even higher throughput options that will put them in direct competition with main line companies.

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[36] CNN/Money, "US Wireless Firms Add Subscribers, But ARPU Declines," April 24, 2003.
[37] Dow Jones Newswires, "UK Mobile Phone Firms Shift Focus to ARPU," May 6, 2003.
[38] Refer to Appendix B for a chart showing the marked decreases in ARPU over the years.

4.6.5 Capital Expenditures

Capital expenditures (CapEx) include the monies spent to acquire or upgrade physical assets. Traditionally, these costs have been extremely high for setting up a main line telephone business, which is one of the primary reasons that governments usually developed main line systems in the beginning. However, decreased costs associated with new technologies have enabled private firms to secure the funding necessary to set up business. Many new technologies, such as data over power lines, Wi-Fi, and cable data, offer technological substitutions to the high costs of installing traditional main lines.

Investors are more reluctant now to give free reign to companies that need substantial amounts of capital to begin offering services. Since investors are shy to get back into telecommunication investments, recipients must consider the capital outlay that is necessary for the project to begin and what capital is needed to continue necessary business functions. Predicting capital expenditure must be done on the project level, but some useful data can be taken from the ITU indicators Annual Telecommunication Investment and Telecommunication Equipment (Import).

Using existing data from the ITU World Indicators Database, one can develop some interesting numbers concerning telecommunications investment on a worldwide scale over the past 6 years (5 measurements):

- Telecommunication investment has increased 4%.
- Telephone service revenue has increased only 2%.
- Total telecommunication revenue has increased 9%.
- Mobile revenue has increased 31%.

These statistics could be even more useful on a country-by-country basis, but many of the Member States did not provide data. If this information were available, one could determine growth in capital expenditures and other valuable data concerning telecommunication development.

4.6.6 Operating Expenditures

Operating expenditures (OpEx) are the monies that are spent to keep the business running. Examples include salaries, rent, marketing, sales, and general administrative costs. OpEx continue throughout the life of a project and must be considered in addition to any CapEx incurred. Investors take special note of these expenditures in relation to the cash flow that a business will produce over time. Not having enough cash on hand will handcuff a project or business and is a sign of an uncertain future.

Unlike the other financial indicators, OpEx is only useful on a project level. Within a country, management preferences differ, and thus no “average” OpEx would be indicative of what is required for a given project or business. OpEx is the point at which businesses make choices, and often no two businesses are alike. Some businesses prefer to rent rather than buy property.

Others pay modest salaries, but have a large marketing budget. This business mix is what works with market forces to make or break a venture.

4.6.7 Taxes

Taxes are mentioned separately because of the impact that a State can have over them. Incentives for development come in many forms, but taxes are often a very practical way of showing support from the State. Tax reductions are also ways of reaching societal goals through investment and development. For example, tax incentives for developing ICT for rural areas or for underprivileged urban areas have proven to be effective.

4.6.8 Forecasting

4.6.8.1 Demand

The waiting list is the number of registered people waiting for a telephone line (in this case, a main telephone line).

The ITU has been collecting data on main line waiting list for over 40 years and the data can be quite shocking. While the waiting list has been declining over the years, the raw number of people waiting for a telephone line in 1999 was 34 million. Also during 1999, the average amount of time required to satisfy waiting customers in the Americas and Asia was 0.4 years (approximately 5 months) as opposed to 2.2 years for Africans. Clearly the low teledensity and unsatisfied demand in Africa presents both a challenge and an opportunity for investors. The key for a recipient is presenting a case for relieving this expressed demand and benefiting from other possible customers who have yet to "register" their interests in ICT.

It is difficult to know, even with tabulations of expressed demand, how many people desire a product or service but have not put their names on a list asking for it. People in certain areas may not put their names on a main line demand list because they feel that there is NO CHANCE that they will receive service any time soon. Also, many people are not aware of a new service until it becomes fully available to them. For example, wireless demand has not only stemmed from those who are frustrated with extended wait periods for main line service, but also for people who were beforehand not interested in ICT at all. Sometimes, availability creates demand.

Latent demand is difficult to measure, but by using existing information on other product launches, market surveys, or population capacity to use a product of service, one can estimate it. The developed countries have little opportunity to capitalize on latent demand with regard to proven services such as mobile or Wi-Fi. The developing countries, on the other hand, are ripe with latent demand, and the recent deployments of wireless services in Nigeria, Kenya, and Romania are examples of just how large that demand can be.

4.6.8.2 Exchange Rate

Economic stability as discussed in Section 4.4 does include concerns about the exchange rate. However, forecasting the exchange rate and using those forecasts to hedge properly can minimize risks associated with rate fluctuations. This paper will not delve into the intricacies of exchange rate hedging, but below are some reasons why investors are worried about it.

Telecommunications companies might make substantial money in local currency, but if they have debts to be paid to other countries, local currency takes a back seat to exchange rate. Much of the equipment used in ICT comes from developed countries, and thus the debts to the sellers are usually in the developed country's currency. From mid-2000 to mid-2003 for example, the Brazilian Real has gone from around 1.8 per dollar to around 2.9. The maximum during the same period was 4 while the minimum was 1.77. With these drastic changes, a 1 million USD debt that equaled only 1.8 million BRL in 2000 now equals close to 3 million BRL.

Of course, there is not very much most recipients can do to affect the exchange rate of a given country. However, a recipient must understand how investors look at exchange rates and how those rates affect the value of a proposal. Having this knowledge and developing ways to mitigate exchange rate risks are essential parts of any proposal.

4.6.8.3 Sales

By forecasting demand, one can understand more about the field of people who might be interested in purchasing a given service. Just knowing how many total people might be interested in having a service is not enough: The next step is determining how many of those people will be interested in the given service, price, and coverage. One method of calculating sales figures is by assuming a percentage of the available customers who will buy the service. This percentage is usually based on market research that has been thoroughly reviewed; however, no one can know the exact number of people who will be willing to pay for a service. New technologies have tempted us to scale sales numbers logarithmically rather than linearly, but the telecommunication downturn has made us aware (once again) that there are only so many customers available and we don't know for sure that they will buy.

There are two sources of methods used for forecasting sales (or anything else for that matter): judgment and statistics. Judgment-based methods depend on the intentions or preferences of individuals to indicate the forecast. Statistical methods, however, build upon existing data using mathematical extrapolations or econometrical methods.[39] These methods have been shown to be very accurate when based on sound data, which makes the argument for investment even stronger.

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[39] Armstrong, J. and Brodie, R. "Forecasting for Marketing," Published in Hooley, G. and Hussey, M., **Quantitative Methods for Marketing, Second Edition.** London: International Thompson Business Press, 1999, pp. 92-119.

4.7 Investment Indicators

Investors use calculations to prove success. While these numbers may seem like another language to some recipients, they are essential to know and to include in proposals. Knowing the language of the investor allows for discussions on equal terms. Additionally, investors have been educated to use well-founded indicators to develop dependable research to minimize uncertainty.

4.7.1 Time Value of Money

Depending on economic conditions, money today has a different value than money in the future. For example, $100 dollars today is worth $106 dollars in one year given 9% annual interest and 3% inflation. Investors have an option whether to invest today or to hold their capital until a more favorable opportunity comes along. In order to account for the time value of money, investors use calculations such as Discounted Cash Flows (DCF), Net Present Value (NPV), and Internal Rate of Return (IRR).

DCF is used to analyze an investment over time with attention given to the cash flows of the organization. Cash flows for each time period are calculated using forecasts or actual numbers, and then the resulting cash balances are discounted back to the present time. To discount the cash flows, an investor uses interest rates, inflation, and other investment opportunities to determine a combined rate to discount the cash flows over time. At the end of the process, one can determine if the cash flows from the project in question are worthy of the investment needed.

NPV does not depend solely on the cash flows of the business but on the overall value of the project in today's dollars. NPV is used frequently to determine the financial feasibility of spending capital dollars. For example, before buying a new digital switch, an operator should consider the cash outlay, cost savings, depreciation, and incremental company value attributed to that piece of equipment.

"IRR is the rate of return that would make the present value of future cash flows plus market value of an investment or business opportunity equal to the current market price of the investment." This definition from www.investorwords.com is somewhat complicated, but it basically points to one use of DCF and NPV along with market value to determine just how much an investor has made on an investment.

Forward-looking calculations for NPV or IRR for countries listed in the ITU World Indicators Database are impossible without some sort of forecasts, but historical calculations could provide some insight into how much has been made off of telecommunications investments in the past. Of course with data on a company basis, this calculation would be much more dependable.

As mentioned in Section 4.6.5, we can use the valuable data from the ITU database to give some indication as to the past growth rates. Using this information we could use forecasting methods mentioned above to calculate data into the future. In addition, any country-level or company-level

information from the country in question would be of utmost assistance in relieving some of the uncertainty with calculating future revenues, costs, and ultimately returns.

4.7.2 ROE/ROI

Return on Equity (ROE) and Return on Investment (ROI) are essentially the same. They both determine the return that an investor will get (or has gotten) for what he has given into a project. Both of these investment indicators are similar to IRR except that they normally operate on a year-over-year time frame rather than incorporating the time value of money mentioned above.

4.8 Exit Strategy

Generally, the goal of an investor is to make money on a project and then to make a seamless transition to another investment or expand upon the existing one. An exit strategy must give the investor a feasible way out while allowing the business to prosper without his support. While it is not essential for a recipient to know how the investor plans to get out of the investment, it could be useful to make sure that the investor and recipient are working toward the same or comparable goals.

The three major strategies for exiting a business are listed in the table below.

Strategy	Substrategy	Comment
Divestment	Spinoff	Selling to independent investors during a bear market is the most favored option for a profitable unit.
	Firm sell	An attractive option given the buying firm is in the same or similar business.
	MBO	A risky option allowing the current management to buy out a financially troubled firm.
Harvest		Suspending investment while reaping the short- to medium-term cash flows from the firm. Unfavorable option as employees, customer, and employees will most likely see the change in strategy of the company.
Liquidation		Extremely costly. Illiquidity is a major concern.

The recipient also has to find a way to incorporate a possible exit strategy with a long-term plan for the state. Investors' intentions are primarily financially based and do not necessarily coincide with facilitating the overall communication betterment of a state. Also, the state has to consider economic growth and other large scale issues such as health care, political stability and world perception of its practices.

4.9 Intangibles

In dealing with all of the numbers required by investors during the profitability and investment phases, one must not forget the larger cause of the project. Telecommunications is not just about making money. Some investors share our opinion that telecommunications offers new opportunities for all people and everyone is entitled to a basic level of service. Admittedly, investors are not as concerned as the recipients themselves about universal access or overall economic growth, but these aspects of a project can influence people and organizations in a positive way for telecommunications investment.

We believe that telecommunications makes a difference in people's lives and in the countries they live in. Investors are people too, and creating an understanding of the intangibles of a project may bring in the necessary funding to make a difference.

5 Conclusion

Investors have indeed been stung by the downtown in telecommunications over the last few years. This paper has analyzed the economic environment, world economy and geopolitical situation in order to describe why investors have taken on a new sense of uncertainty. The ITU BDT strives to understand both of the environments that are essential to development funding for telecommunications: the investor and the recipient.

To understand telecommunications investors this paper proposes a hierarchy of needs for the investor that includes a discussion political and economical stability, regulatory predictability, profitability, investment, and exit strategy. We believe that by understanding what the needs of the investors are the recipients will put forth better proposals and have more success in funding. Also, the ITU must understand both sides of the investment equation in order to use its resources more efficiently in fulfilling its supportive role.

One absolute need that is taken from the hierarchy and highlighted is the measurement of the risk and reward associated with telecommunications profitability and investment. This paper uses some easily available information to calculate some convincing numbers for funding on a global scale and describes how with different data these numbers could be used to support an individual proposal in an individual country.

Our intention, as always, is to support our Member States and Sector Members. This document is a base from which proposals can be built and theoretical discussion can be undertaken. Through this interaction between investor and recipient, we hope to make the investment equation equal on both sides.

Appendix A

Standard and Poor's Long-Term Debt Credit Ratings (taken from the Standard and Poor's website at www.standardandpoors.com.

Apply to obligations with an original maturity of one year and over.

raAAA
An obligation rated 'raAAA' has the highest rating assigned on Standard & Poor's Argentine national scale. The obligor's capacity to meet its financial commitments on the obligation, relative to other Argentine obligors, is EXTREMELY STRONG.

raAA
An obligation rated 'raAA' differs from the highest rated debt only to a small degree. The obligor's capacity to meet its financial commitments on the obligation, relative to other Argentine obligors, is VERY STRONG.

raA
An obligation rated 'raA' is somewhat more susceptible to adverse effects of changes in circumstances and economic conditions than higher-rated debt. Still, the obligor's capacity to meet its financial commitments on the obligation, relative to other Argentine obligors, is STRONG.

raBBB
An obligation rated 'raBBB' denotes ADEQUATE protection parameters relative to other Argentine obligations. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity on the part of the obligor to meet its financial commitments on the obligation.

raBB
An obligation rated 'raBB' denotes SOMEWHAT WEAK protection parameters relative to other Argentine obligations. The obligor's capacity to meet its financial commitments on the obligation is somewhat weak because of major ongoing uncertainties or exposure to adverse business, financial, or economic conditions.

raB
An obligation rated 'raB' denotes WEAK protection parameters relative to other Argentine obligations. The obligor currently has the capacity to meet its financial commitments on the obligation. But adverse business, financial, or economic conditions would likely impair capacity or willingness of the obligor to meet its financial commitments on the obligation.

raCCC
An obligation rated 'raCCC' is CURRENTLY VULNERABLE to non-payment, and is dependent upon favorable business and financial conditions for the obligor to meet its financial commitments on the obligation.

raCC
An obligation rated 'raCC' is CURRENTLY HIGHLY VULNERABLE to non-payment.

raC

The 'raC' rating may be used to cover a situation where a bankruptcy petition has been filed or similar action has been taken, but payments on the obligation are being continued.

raD

An obligation is rated 'raD' when it is in payment default, or the obligor has filed for bankruptcy. The 'raD' rating is used when interest or principal payments are not made on the date due, even if the applicable grace period has not expired, unless Standard & Poor's believes that such payments will be made during such grace period.

The ratings from 'raAA' to 'raB' may be modified by the addition of a plus (+) or minus (-) sign to show relative strength within the rating category.

Appendix B