Exploring Economic and Social factors that increase Economic and Well-being measurements of developing and developed countries

Kofi D. Boadu
Minnesota State University - Moorhead, kdboadu@hotmail.com

Follow this and additional works at: https://digitalcommons.iwu.edu/uer

Part of the Behavioral Economics Commons, Economic Theory Commons, Education Economics Commons, Growth and Development Commons, International Economics Commons, Macroeconomics Commons, and the Technology and Innovation Commons

Recommended Citation

Exploring Economic and Social factors that increase Economic and Well-being measurements of developing and developed countries

Abstract

The historical growth paths of developed and developing countries reveal the challenges that developing countries face in traveling the road from poverty to prosperity. Based on economic development literature, economic theory, and ordinary least squares (OLS) regression method, this research considers whether or not, and to what extent globalization characteristics, foreign direct investment levels (FDI), secondary school enrollment rates, information communication technology (ICT) as a percentage of trade imports, and happiness levels of 103 developing and developed countries, impact their GDP per capita levels. This paper will also take a look at alternative ways of viewing and measuring economic success.

Keywords

Cover Page Footnote

Exploring economic and social factors that increase economic and well-being measurements of developing and developed countries

Kofi Boadu

Abstract

Gross domestic product (GDP) per capita is a recognized measure for comparing the standard of living between different nations, or monitoring conditions in an individual nation over time. Comparisons between 2013 GDP per capita of the United States ($53,042) and developing nations such as Guatemala ($3,478), Nepal ($694), Ghana ($1,858), Philippines ($2,765), and Malawi ($227) reveal that widespread differences remain. The historical growth paths of developed and developing countries reveal the challenges that developing countries face in traveling the road from poverty to prosperity. The main purpose of this paper is take a look at alternative ways of viewing and measuring economic success.

To do that, an overview of current traditional economic measures will be reviewed and tested with the aid of economic development literature, economic theory, and ordinary least squares (OLS) regression method. Specifically, globalization characteristics, foreign direct investment levels (FDI), secondary school enrollment rates, information communication technology (ICT) as a percentage of trade imports, and happiness levels, will be tested to ascertain its impact on GDP per capita levels of 103 developing and developed countries. Results of this country-level and cross-sectional study can give domestic firms, foreign firms, and international policymakers (especially in developing countries) an idea of the accuracy of traditional economic indicators, and how nontraditional ones can aid in providing a better picture of their economies. This will help them increase economic growth indicators, but at the same time increase the overall well-being of their citizens.

Introduction

All governments have finite resources and budget constraints. Due to this, they seek to find out how much spending and time should go into things like education; or if interest rates should be increased to attract foreign investment. In essence, countries want to know what it takes to attain higher levels of wealth indicators (such as real GDP). Developing countries sometimes ask, what will it take to attain similar levels of wealth indicators as developed nations? This is the idea of convergence theory. Convergence theory states that countries with lower income per capita can converge to countries with higher income per capita due to ready access to technology. According to this theory, developing countries have to just absorb technological transfers from developed countries to successfully increase income per capita to similar levels. Convergence theory essentially brings up the idea that maybe developing countries need not reinvent the wheel.

Although convergence theory is influential in growth economics, this paper will focus mainly on testing economic growth indicators. However, due to parallelism between the two ideas growth concepts will be explored and explained using convergence theory. The convoluted nature of this topic questions whether there could be other unknown variables that could potentially close the GDP per capita gap between developing and developed countries. Better yet, how do we know for certain if this is the gap we should be closing? Do traditional economic measurements like GDP per capita accurately report the overall well-being of people? Should developing and developed countries be spending their efforts in closing different measurement gaps? These questions, and more, are precisely why this paper seeks to asses alternative ways of viewing and measuring economic success.

GDP has been in existence for so long that majority of people, countries, and the international community views it as the yardstick for economic success. However like many things, it was born out of the circumstances and beliefs of a specific era. In 1665 Thomas Petty made the first estimates of national accounts in England. It was an attempt to "ascertain the taxable capacity of the nation." (Cobb, Halstead, Rowe 1995) A more focused method also came out of France around that time. Adam Smith's approach revealed a general view of national wealth that encompassed manufacturing. However he excluded the entertainment and service industries which are primarily what the American economy is known for today. GDP was made to measure the total value production of activities that are counted on the national accounts system. It makes no judgments on the costs or benefits of the goods and services that are produced.

In 1931 during Hoover's administration, government and private experts were asked to answer questions concerning the economy. This turned out to be a futile endeavor due to the lack of real data to assist in providing conclusive answers. During the last year of the Hoover Administration the Senate asked the Commerce Department to prepare estimates of the national income. The Department tasked a young Economist, called Simon Kuznets, with developing a consistent set of national accounts. It was this that set the framework for the GDP measurement. It is interesting to note that Simon Kuznets was skeptical of the system he created. In his first report to Congress in 1934, he attempted to clue in the nation of the glaring limitations of the very system he created. In his report he concluded that, "the welfare of a nation can scarcely be inferred from a measurement of national income as defined above." In 1962 he reechoed the same message of the reconstruction of the National Accounting System he created. He said,

"Distinctions must be kept in mind between quantity and quality of growth, between its costs and return, and between the short and the long run. Goals for 'more' growth should specify of what and for what." (Cobb, Halstead, Rowe 1995)

Although useful, GDP does not take into account many things like negative externalities (i.e pollution) that come as a result of the continual increase in production. Pollution like many other negative externalities is counted twice in calculating GDP. It is first counted when a factory produces it as a by-product during the manufacturing process, and is counted again when the same company spends millions of dollars trying to clean it up. The repercussions of such disasters are not only monetary, but can also affect many things like the health of the people. Which may affect their well-being.

Generally it is accepted that the higher the GDP per capita of a country is, the better the citizens of the country are doing. This is based on the assumption that human beings generate well-being entirely from their monetary status. If fact, it appears the amount of political power and respect a country holds is fueled by its GDP per capita level. Therefore, many governments do whatever they can to increase per capita measurements. Unfortunately, due to the fact that the field of economics does not accurately measure the entire well-being of a person, countries may increase per capita measurements (like GDP per capita), and end up not actually increasing the well-being of its people. This creates a need for a new system of measurements that is able to fuse the well-being of citizens and the monetary position of the country and people. This will provide a better idea of how well a country is actually doing. This research will be different from

previous research in that it will measure traditional and non-traditional economic indicators' impact on GDP per capita.

Literature Review

Past literature will be reviewed in this section to better understand what convergence and growth theory is and what economists have said about what economic factors are important to increase growth. Research on non-traditional measurements of economic success will also be reviewed. William Baumol (1996) was one of the first economists to use extensive data to attempt an economically sound answer to convergence theory. He concludes that there is strong evidence of convergence in the growth of industrial nations since 1870. Baumol bases this conclusion on the regression of growth of productivity since 1870 for sixteen countries selected and analyzed by Angus Maddison (1982). All sixteen countries acquire modern technology and converge. Robert De Long (1988) did an extensive review of Baumol's work and conclusions. De Long believes that "when properly interpreted Baumol's finding is less informative than one might think."(De Long 1988) He argues strongly of a sample selection problem.

De Long (1988) criticizes Maddison's choice to only include countries that are now considered developed. He says that countries that were considered only relatively developed at the time were complete omitted. Namely, if the sample contained only countries likely to converge, then could any real conclusions be made about the convergence since 1870? He concludes that due to sample selection bias and errors in the measuring of the independent variable, technological differences between developing and developed countries close the gap

between them eventually. He cites the work of Paul Romer (1994) who expects the gap between the developing and relatively affluent countries to widen further.

Many economists view globalization as an important ingredient for sustainable growth. Although it is difficult to quantify globalization, foreign direct investment and how active the country is in the global economy could be good indicators of a country's degree of globalization. Khaled Elmawazini and Sonny Nwankwo (2013) conduct tests to ascertain if increases in globalization could alleviate the gap mentioned. Sample size in the study is restricted to Sub-Saharan Africa. An intriguing and major component in their work is their use of globalization indexes from Konjunkturforschungsstelle (KOF) and the Center for the Study of Globalization and Regionalization (CSGR). The KOF index attempts to determine how integrated the country is in the world. It does this by measuring three aspects of globalization: economic, social, and political. The question is, how well does the KOF index accurately capture the definition of globalization? Data is a major element of testing economic theories; however, if the validity of the means of capturing the data is questionable, then the discovery methods may prove less informative.

Economic globalization is the first aspect of globalization measured in the KOF index. According to the KOF index, economic globalization includes "distance flows of goods, capital and services as well as information and perceptions that accompany market exchanges." (KOF ETH Zurich) Economic flows and restrictions to trade and capital are tested. The country's trade stocks of foreign direct investment data are from the World Bank. Trade data are composed of imports, exports, and portfolio investment. Income payments to foreign nationals are also

included. Issues with hidden trade barriers, mean tariff rates, and taxes on international trade are encountered. Tariffs could be a country's method of discouraging trade.

The second aspect, social globalization, is one that is harder to measure and thus probably less contributive to the index. The KOF index measures it by "personal contacts, data on information flows and cultural proximity." (KOF ETH Zurich) International telecom traffic, tourism, number of foreign nationals (as a sign of interaction with other countries), and number of international letters sent are some factors measured to construct this index. Number of internet users per 100 people is also included. Data for telecommunication is provided by the International Telecommunication Union, number of letters is reported by the Universal Postal Union's Postal Statistics Database, and the remaining information originated from the World Bank. Cultural proximity seems less conducive to the accuracy of the index. Number of English songs in national hit list, movies from Hollywood in national cinemas, number of McDonalds and Ikea businesses are a few of the criteria considered.

An important observation is that globalization in this context almost refers to spread of the American culture exclusively. A country's attraction of McDonald franchises is largely due to the dynamics of its food culture. If the country refuses spread of franchises for several reasons (like health reasons or differences in diet), they might score very low in this aspect. Another thing to point out is the substitution of movie theatres by the expanding world of peer-to-peer torrent downloads in developing countries. US copyright laws will not let this happen; however, the absence of this in some developing countries contributes to the illegal downloading of movies on a regular basis. The sheer cost of watching these movies deters people from watching

them legally. Therefore, Hollywood movies being in the theaters and the number attending is an underestimation of globalization. Due to it being an illegal activity, it is safe to say that a plethora of data and statistics are not readily available. This goes to say that the measurement is not only difficult, but the methods used in the KOF index could possibly be biased.

The third aspect, political globalization, measures the number of embassies and high commissions, number of international organizations, and the number of United Nations peace missions in which the country participates. Political stability is an essential part of economic growth. Many developing countries, especially in Africa, are just recovering from years of war or overcoming unsuccessful political systems. This affects globalization because the more isolated a country is, the less likely it is to trade. Therefore, with Adam Smith's introduction of specialization, a closed country will not benefit from cheaper goods due to comparative advantage of other countries. North Korea, for example, might discourage embassies and high commissions and will probably score lower in this aspect. Data for this aspect is from the Europa World Yearbook, CIA World Factbook, the UN Department of Peacekeeping Operations, and the UN Treaties Collection.

There are different stories when it comes to the impact of globalization on the development of developing countries. First, the assumption is that less-developed countries have not adequately incorporated themselves in the global production of goods and services. If continuous picking from this pool of goods and services is done, a country is expected to increase growth rates and thus GDP per capita. Elmawazini's and Nwankwo's research reveals that globalization has "widened the income gap between SSA and developed countries over the period." Dollar (2005) says that a new wave of globalization beginning around 1980 impacts the

economic growth rates of developing countries in a positive manner. However Stiglitz (2002) supports the conclusions of Elmawazini and Nwankwo. He believes that globalization has contributed to the gap between developing and developed countries. Rodrik (2000) also mentions that trade has not had a significant impact on the growth of China and India. The mixed conclusions for globalization's impact on growth may be tied to the difficulty of measuring it; as shown in the review of the KOF index.

Foreign direct investment (FDI) is a factor that is closely tied to globalization. Due to Neo-classical theory stating the importance of integration in the world economy to economic growth, FDIs are seen as a possible means of decreasing the gap between affluent and developing countries. In Africa, FDI inflows of $36 billion in 2006 (UNCTAD 2008) represent a 20% increase from 2005 ($30 billion), and 200% increase from 2004. In 2007, FDI rose to $53 billion, a record breaking number. These statistics show the increase in FDI to Africa.

There is a noticeable increase during this time period, particularly from 1997 to 2012. Between 1970 and 1996, FDI inflows remain fairly constant and less than $10 billion. FDI surpasses the $10 billion mark in 1997, with approximately $5 billion of this increase occurring between 1996 and 1997. Growth in FDI is even more significant between 2004 and 2008. This four-year interval shows a difference of $41.5 billion. The question is whether or not Africa exhibits huge growths of capita between that period. There appears to be relatively constant FDI inflows from 1970 to 1992. From 1999 to 2003, there is a sharp decrease of 54.1% in FDI inflows. However, over the same period, there is an increase of 2.62% in FDI inflows. The time period that stands out is the apparent growth realized from 2002 to 2008 when there was a 312%

increase in FDIs into Asia. This is by far the highest increase from any of the regions at any time. This is consistent with a 25% increase in GDP per capita between 2002 and 2008. An interesting observation is that Asia has the highest inflow of FDIs and also the highest literacy rates.

In this research, secondary school enrollment rates, instead of literacy rates, is chosen as a proxy for educational attainment of a nation's citizens. Inclusion of secondary school enrollment does not assume all a country needs to do to converge is to have all its citizens reading and writing. It is simply a measure of the depth of knowledge in the country. Everything measured in accordance to convergence is considered physical capital. Review of existing literature shows the exclusion of anything related to human capital. Mankiw, Weil, and Romer (1992) include human capital as part of the Solow growth model. They comment on the exclusion: "Economists have long stressed the importance of human capital to the process of growth. One might expect that ignoring human capital would lead to incorrect conclusions." Kendrick (1976) "[estimated] that over a half of the total U.S capital stock in 1969 was human capital." One can only imagine what that is like today.

Like many economists who have conducted similar research, Mankiw, Weil, and Romer use the percentage of the working-age population that is in secondary school as a proxy for the rate of human-capital accumulation. Their results show that the inclusion of human capital to the model "improves its performance." (Mankiw, Weil, Romer 1992) Although the proxy does not accurately capture the quality of human capital, it helps "dispose of a fairly large part of the model's residual variance." Mankiw, Weil, and Romer set the stage for many economists to

include additional factors when testing convergence in order to offer thorough assessment of convergence theory.

There is not a plethora of economic research that attempts to bridge the gap between the traditional and nontraditional wealth indicators. However there has been an increase in the search for a more suitable method of measuring a country's wealth. On September 8th 2006, the State Environmental Protection Administration (SEPA) and the National Bureau of Statistics (NBS) of China released China's first green national accounting study report. The project was started in March 2004 by SEPA and NBS to perform accounting analysis on the "physical quantification of environmental pollution, imputed treatment cost and environmental degradation cost for 42 industries and 3 regions of the East, the Central and the West China." (*Green GDP Accounting Study Report 2004 Issued*) It showed GDP accounting that had been environmentally-adjusted.

The 'Green GDP' is an accounting system that deducts natural resources costs and environmental degradation costs in order to truly assess China's economic development. Initial results showed that environmental pollutions caused an economic loss of about 511.8 billion yuan (about 83 billion dollars). This accounted for about 3.05% of the national GDP in 2004. They also estimated a treatment cost of 287.4 billion yuan (47 billion dollars) which also accounted for 1.8% of 2004 national GDP. The results show that the environmental issues that China faces seriously hold back its potential economic development. The report commented on these results by saying that for many years China has been the "bottleneck period of resources and energy today and it cannot bear any risks of resources exhaustion."

According to the Vice Minister Pan Yue of SEPA and Commissioner Qiu Xiaohua of NBS, although "the integrated green GDP accounting still needs more arduous efforts and has a long way to go", it is still a positive start to build a "resource-conserving and environmentally-friendly China." The World Bank and many countries encouraged and commended China's efforts in attempting to truly increase the overall well-being of its citizens. This happened simply due to a change in the way they measure and view wealth. China's government believes that this effort provides developing countries with a great example in the field of Green GDP accounting. It is therefore not shocking to see the small nation of Bhutan's attempt to redefine how it measure economic success.

In 2012 the Center of Bhutan Studies published a long report titled, *A Short Guide to Gross National Happiness Index,* which introduced an alternative way to measure their country's development. The idea of Gross National Happiness (GNH) stems from Bhutan's fourth Dragon King, Jigme Singye Wangchuck. He coined the phrase to help build an economy that would help Bhutan's culture which is based on Buddhist values, instead of what he felt was Western material development embodied in Gross National Product (GNP). The GNH philosophy is meant to promote four pillars: 1) Sustainable development 2) Preservation and promotion of cultural values 3) Conservation of the natural environment 4) Establishment of good governance. The Center for Bhutan Studies expanded the four pillars into nine: 1) Happiness-physical 2) Mental and Spiritual health 3) Time-balance 4) Social and community vitality 5) cultural vitality 6) Education 7) Living Standards 8) Good governance 9) Ecological vitality. The report states that the index is "meant to orient the people and the nation towards happiness, primarily by improving the conditions of not-yet-happy people." The GNH index value for 2010 reveals that

10.4% Bhutanese people were unhappy, 47.8% were 'narrowly happy', 32.6% were 'extensively happy', and 8.3% were 'deeply happy'. According to the report, the GNH "is very much a living experiment, seeking to convey more fully the color and texture of people's lives than does the standard welfare measure of GDP per capita." (Ura, Alkire, Zangmo, Wangdi 2012)

Like China, Bhutan's decision to use GNH inspired a lot of countries to follow suit. In 2012 alone South Korean, India, Seattle (US), Singapore, Dubai, United Kingdom, launched measures and ideologies similar to the GNH. The United Nations passed a resolution in July 2011 that put 'happiness' on the global development agenda. Titled, "Happiness: Towards a Holistic Approach to Development", it was co-sponsored by 68 countries. In April 2012 a meeting at the UN attended by over 800 participants including the Costa Rica's president, the UN general secretary, the president of the UN General Assembly, the Economic and Social Council, government ministers, ambassadors, leading economists and scholars, and business and spiritual leaders. As a result, a secretariat was put in place in Bhutan which was intended to draft a new global development model. However it is interesting to note that Bhutan found it difficult to put in place its GNH policy due to a changing political structure and the use of subjective things like happiness over economic development. This suggests that a lot more work is needed in the implementation of measures like GNH.

Alternative Measures of Well-Being, a working paper published in Organization for Economic Co-operation and Development (OECD), evaluates whether GDP per capita is an appropriate measure of well-being or if other substitutes or compliments need to be found. The authors notes that "the well-being of individuals and households does not only depend on GDP

per capita, but also on other factors such as leisure time, environmental quality, increases in competences and longevity, and distributive issues." (Boarini, Johansson, D'Ercole 2006) Therefore, this paper reviews several measures of well-being and their correlation to levels, rates of change, and international rankings of GDP per capita. Findings show that there are other traditional measures of economic resources (such as net national product, net incomes) that are better than GDP per capita. However data availability and reliability does not allow for a wide breadth of cross-country and inter-temporal studies. These traditional economic measures are correlated with each other and confirm the ranking of countries and developments through time.

Results also show that there are ways to measure social indicators that are linked to well-being. Review of OECD countries show that levels of the social indicators are significantly correlated to GDP per capita, but changes over time are not. An index that is based on these social indicators show a "significant difference in performance relative to GDP per capita in around half of countries." Also, little correlation was observed between a survey based data on happiness and life-satisfaction across OECD countries and GDP per capita. Their research showed that things like joblessness, family and community ties contribute to life-satisfaction and that they are not reduced by any dimension of economic resources. The authors believe that although traditional measures of economic growth are important for the evaluation of well-being, they "need to be complemented with measures of other dimensions of well-being."

Conceptual Framework

The Solow-Swan model of long-run productivity growth is used in this conceptual framework to attempt a solution to convergence theory and provide possible growth indicators. The model was developed by Robert Solow and Trevor Swan in 1956. It contributes to work that is considered neo-classical economics. In this work, Robert Solow finds that the available US growth data fit his model. Many economists use the Solow model to explain long run economic growth.

The Solow-Swan model shows the effects of technological change, capital, and labor. It typically shows three lines: the production curve, the investment line, and the depreciation line. The production equation is where is the saving rate, represents productivity, and is capital. The depreciation line is where is the population growth rate, represents the rate of depreciation, and is the capital stock. Mathematically, if either the saving rate or productivity increases, the production function increases and output increases. If all the equations are divided by L, we get the per-worker production function. Capital divided by L is called the capital-labor ratio.

Another important aspect of the model is the concept of steady state. The country is considered to be in steady state when output, consumption, and capital stock per worker are constant. In a steady state, investment is equal to the depreciation line, and because number of workers (L) is divided through the entire equation, consumption changes from to . The difference between the production function and the investment line is
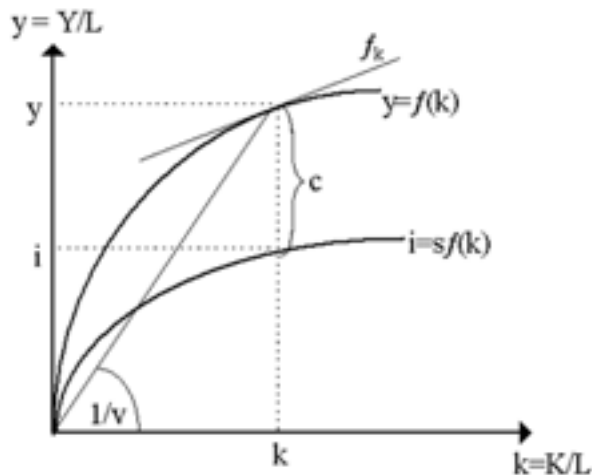

Figure 1: General Model
http://cruel.org/econthought/essays/growth/neoclass/solowgr.html

consumption. Figure 4 illustrates that there are many ways of increasing consumption. Increasing capital and labor means increasing the capital-labor ratio, and when this happens we reach higher levels of production. However, there is a maximum combination of capital and labor. It is at this point that area is largest. Beyond this point, consumption decreases and diminishing returns occur. Further, as investment increases, the less there is to consume and vice versa.

Productivity is dependent on the quality and quantity of capital and labor. Increases in depreciation rates increase the slope of the investment line, decreasing consumption. In other words the quality of capital produced is important. Quality of capital could likewise encompass human capital. Human capital is known to increase with education. Another intricate part of the
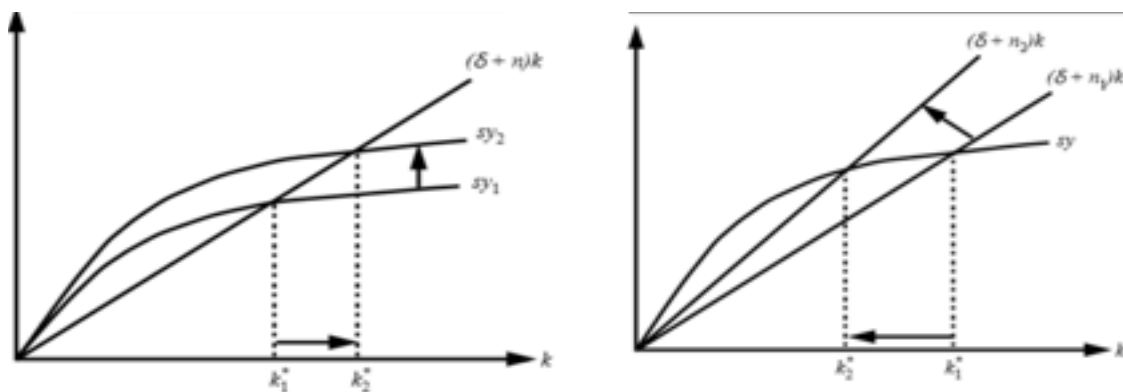
Figure 2: Increase in Saving, Figure 3: Increase in depreciation or population growth
http://cruel.org/econthought/essays/growth/neoclass/solowgr.html

Solow model is the effect of saving and population growth rates have on the capital stock. Figure 5 (above) shows that as the saving rates increases, the country's capital stock increasing. On the other hand, Figure 6 (above) shows a negative effect on capital stock as depreciation (d) increases and the population growth rate (n) increases. Thus, to positively affect its capital stock a country must increase saving rates and decrease depreciation and population growth rates.

Due to the bowed out shape of   in Figure 4, we see that the rate of change in capital increases at a decreasing rate. At steady state, the economy essentially stops growing because no additional capital is being injected into the economy. Chou (2002) states that, the only way to shift the production function outward are with technological advances. This creates a new steady state that comes with multiple increases, including an increase in real GDP per capita. This model predicts that conditional convergence occurs when there are similarities in depreciation, population, and saving rates. This leaves limited opportunities for countries in sub-Saharan Africa which have high birth rates (about double the western world), low saving rates, and most importantly little to no access to modern technology. Therefore, according to conditional convergence, it is not a matter or whether developing countries will converge to the more developed ones, but rather that slightly developed will slowly converge to developed countries, and developing countries will converge towards other developing countries. From this theoretical perspective, the huge gap remains.

Japan reveals some opportunity for developing countries. After World War II, Japan was a disaster economically. However, it has since converged to the level of many developed countries. Increases in saving rates are attributed to Japan's high growth rates. Slower growth occurred as its saving rate stabilized in 1970. This follows the logic of Chou's model and the idea of conditional convergence. Once a country attains saving rates similar to developed countries, it will converge to a closer level of real GDP per capita, in essence closing the gap. Technological advances are the only way to transition from one steady state to another. Japan invested a lot in modern technology and is now one of biggest producers of technology in the world. However the question is how true convergence theory is, and are there other economic factors apart from the

ones underlined in this theory that can increase a countries wealth and the well-being of its citizens?

Data and Results

OLS is used in this research to determine whether or not, and to what extent globalization characteristics, foreign direct investment levels (FDI), literacy rates, and information communication technology as percentage of trade (ICT), and happiness levels impact GDP per capita of 103 developing and developed countries. These independent variables were chosen through review of existing literature and through examination of the Solow-Swan growth model. Acquisition of consistent cross-dimensional data especially for less developed countries, proved nearly unattainable. Some of these countries do not have the resources and systems in place to gather this breadth of data. Therefore in this research, data was set from a time frame of 2000 to 2012. This approach allowed for more a complete data set.

The variable called KOF is a globalization index from Konjunkturforschungsstelle and the Center for the Study of Globalization and Regionalization (CSGR), as mentioned in the literature review. The KOF index attempts to determine how integrated the country is in the world (see Literature review for an in-depth explanation). The variable called *FDI* measures the net inflows of investment into a country. It is a sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital. The variable called *ICT* is the percentage of a country's imports that includes telecommunications, audio and video, computer and related equipment, electronic components, and other information and communication technology goods.

Software is not included in this data. *ICT* is used as a proxy for the 'technology' mentioned in convergence theory.

With review of literature such as *A Contribution to the Empirics of Economic Growth* (Mankiw, Romer, Weil 1992), it appears human capital or education, is essential to a country's growth. Secondary school enrollment (*SSE*) was therefore used as a proxy for human capital. This is consistent with other convergence and growth literature because it appears secondary school enrollment, instead of literacy rates, gives a more accurate picture of the state of education in a country. Happiness is subjective, so ways of measuring happiness are also subjective. Two different happiness indices were used in order to provide a better picture.

The first index was collected by the Gallup poll and is called the Gallup-Healthways Global well-being index (*GHap*). It is based on peoples perceptions of five factors that contribute to well-being. These factors are having purpose, being physically healthy, being financially secure, having supportive social relationships, and being satisfied with the community. The values are created by looking at the percentage of people who felt they were in 3 or more elements of well-being. The second happiness index is called the Happy Planet Index (HPI). This index quantifies happiness by using data on life expectancy, experienced well-being, and ecological footprint. The calculation is as follows: [(Experienced well-being*Life expectancy)/ Ecological footprint]. 'Experience well-being' was evaluated using the 'Ladder of Life' from the Gallup poll. People were asked to rate their life from 0 to 10, 10 being the best possible life. 'Life expectancy' data was from the 2011 UNDP Human Development Report. 'Ecological Footprint' is a per capita measure of the amount of land that is needed to sustain a country's

consumption practices, measured in global hectares which represents a hectare of land with average productive bio capacity. The total index is rated from 0 to 100, with 89 as the target set.

Table 1.1 shows the expected signs of the independent variables. It is expected that all the independent variables apart from the happiness indices will contribute positively to GDP per capita.

Table 1.1 (expected signs)

Independent Variable	Definition	Expected Sign
KOF	Globalization Index	(+)
FDI	Foreign Direct Investment	(+)
ICT	Information Technology as a % of imports	(+)
SSE	Secondary School Enrollment	(+)
GHap	Gallup-Healthways Global Well-Being Index	(-)
HPI	Happy Planet Index	(-)

Table 1.2 shows the regression statistics:

Table 1.2 (regression results)

Independent Variable	Definition	Coefficient	t-score	P>|t|
KOF	Globalization Index	773.4	5.34	0.000
FDI	Foreign Direct Investment	$7.25*10^{-8}$	2.25	0.027
ICT	Information Technology as a % of imports	-673.1	-2.16	0.033
SSE	Secondary School Enrollment	34.9	0.41	0.682
GHap	Gallup-Healthways Global Well-Being Index	577.9	3.80	0.000
HPI	Happy Planet Index	-546.6	-3.16	0.002

The regression has an acceptable R-squared value of 61.96%. Coupled with a high F value of 26.06 we can say the regression has a good overall fit. All independent variables except *SSE* are significant. This means no real initial interpretation can be made about secondary school enrollment's impact on GDP per capita. Globalization, foreign direct investment, and the Gallup-Healthways Global Well-Being Index appear to increase GDP per capita. However ICT as a percentage of imports and the Happy Planet index decrease GDP per capita.

The regression results gave reason to check for any statistical problems. Due to some unexpected t-scores and signs the regression was tested for multicollinearity. It was also tested due to the possibility of the two happiness variables being related. The Variance inflation factor (VIF) test was employed. With the highest VIF value of 3.18 out of 5 and a mean VIF of 1.98, we can assume there is no severe multicollinearity. Lastly the regression was tested for serial correlation and heteroskedasticity. Although serial correlation is tested mostly in times series, it is tested to ensure correct hypothesis testing. The Durbin-Watson test was used and with a value of 2.01 it is safe to say the regression does not have serial correlation.

Heteroskedasticity was also tested due to large variations in various countries' GDP per capita. The Breusch-Pagan test was used, and it returned a chi-squared of 39.09 and a probability of 0.0000. Therefore the null hypothesis of homoscedasticity can be rejected, and therefore as suspected, there is strong heteroskedasticity in this regression. To solve for heteroskedasticity the robust standard errors was used. The results are shown in Table 1.3. Use of robust standard errors does not reveal significant changes in the significance of SSE. Further work will be done to find a better proxy for human capital. In conclusion, globalization, foreign direct investment, and the

gallup-healthways global well-being index contribute positively to GDP per capita. However ICT as a percentage of imports and the happy planet index contribute negatively to GDP per capita.

Table 1.3 (with robust standard errors)				
Independent Variable	**Definition**	**Coefficient**	**t-score**	**P>|t|**
KOF	Globalization Index	773.4	5.24	0.000
FDI	Foreign Direct Investment	$7.25*10^{-8}$	2.52	0.013
ICT	Information Technology as a percentage of imports	-673.1	-2.46	0.016
SSE	Secondary School Enrollment	34.9	0.53	0.598
GHap	Gallup-Healthways Global Well-Being Index	577.9	3.26	0.002
HPI	Happy Planet Index	-546.6	-2.98	0.007

Analysis and Conclusion

The purpose of this research paper was to investigate alternative ways of viewing and measuring economic success. Globalization, foreign direct investment, ICT as a percentage of trade imports, secondary school enrollment, and happiness levels of 103 countries from different parts of the worlds were explored and analyzed with the use of a literature review, a conceptual framework, economic theory, and OLS, to determine whether or not, and to what extent they impacted their respected GDP per capita levels. This gave a true look at how traditional economic measurements reported the status of a country, and how more non-traditional ones fared when compared such measurements. The reason for including happiness in this research is to challenge the way economic measures assume people's monetary status is all their well-being

is composed of. This paper does not suggest alternative measurements of countries' economic status, but rather brings to attention an issue that if solved, could change the way economies are viewed, and most importantly the lives of their citizens.

Review of literature reveals that there are mixed opinions about whether developing countries will converge. Economists like Paul Romer (1994) believe the gap will widen, and others like Sala-i-Martin (2006) believe innovation and technological imitation (as convergence theory states) will increase growth rates and close the income gap. Elmawazini and Nwankwo (2013) and Stiglitz (2002) reveal in their research that globalization has actually widened the income gap between SSA and developed countries. These do not support the majority of studies conducted. For example, the international monetary fund, the World Bank, and Dollar (2005) believe globalization has had a positive impact on growth rates. This research joins the majority of studies in saying that since globalization has a significant impact on GDP per capita, it may encourage serious growth. Looking at how the KOF index is measured, it is hard to pinpoint exactly what countries need to do to increase globalization. However one certain thing is that countries should actively engage in the world economy to some degree.

The amount of foreign direct investment that a country attracts can be a good measure of how globalized the country is. This means foreign investors will be drawn to the country. Foreign direct investment in Asia, Africa, and America have increased noticeably between 1970 to 2012. With increases in GDP capita during that period in Africa being minimal and an astonishing 25% increase from 2002 and 2008 for Asia, it is apparent that increases in FDI does not guarantee similar increases in GDP per capita. Studies have shown that if a country has weak human and

technological capabilities, FDI will have no positive impact on their economy. Results of this study show that a \$1 increase in FDI will result in a minute \$7.25*10^{-8} increase in GDP per capita. This shows that although FDI does not negatively impact GDP per capita, it does not increase it significantly either. However countries are encouraged to allow FDI as it leads to many like things like globalization which this study has shown to increase GDP per capita significantly.

In this research secondary school enrollment rates was used as a proxy for human capital. Although economic theory and empirical studies have shown the increases in this proxy encourage growth, this study is unable to give a conclusion on the matter due to the insignificance of the variable *SSE*. A possible solution that will be considered in future research is the use of a different functional form. As mentioned, ICT as a percentage of trade imports was used as a proxy for the 'technology' in convergence theory. Results show that a 1% increase in ICT as a percentage of imports decreases GDP per capita by \$673.1. This contradicts the theory presented by the Solow-Swan model as seen in the conceptual framework. However this could be attributed to the fact it may not be a perfect proxy of the technology absorption proposed in convergency theory.

The inclusion of happiness in this study is ironically meant to point the flaws in measurements such as GDP capita and encourage the fusion of well-being into such measurements. In the literature review it was seen that countries like Bhutan and China have taken the first leap in finding such a measurement. This research finds that the Gallup-Healthways Global Well-Being Index seems to be positively correlated with GDP per capita
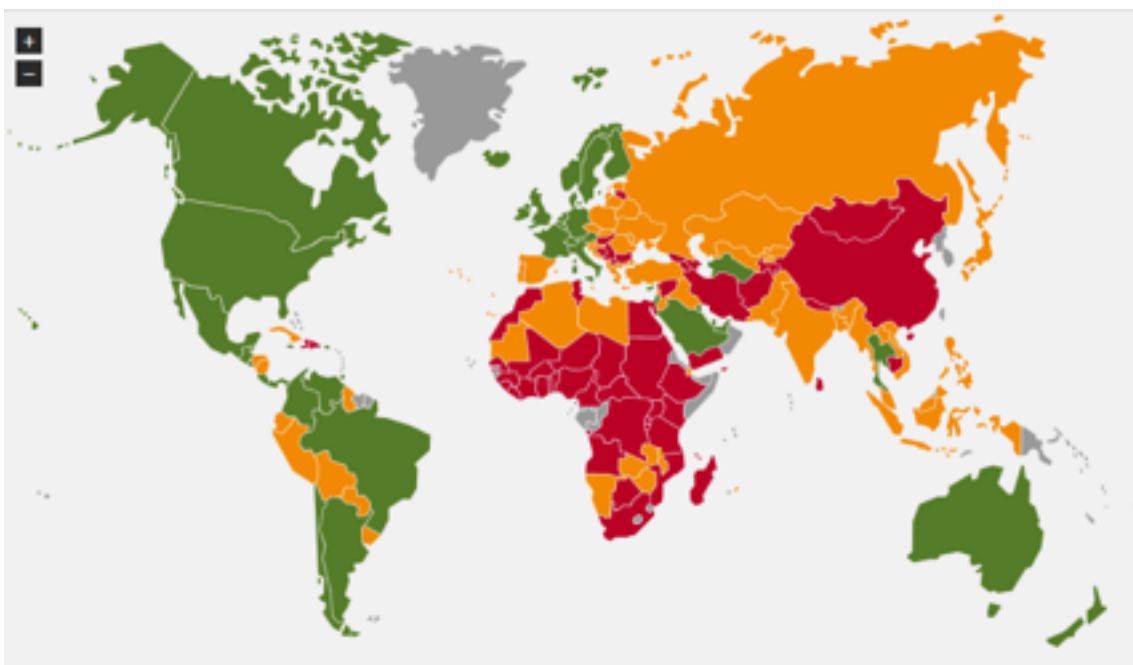
Figure 4: 'Well-being' aspect of the HPI

whereas the Happy planet index is not. This shows that well-being and happiness levels may have nothing to do with GDP per capita levels. In other words, rich people may not necessarily always be the happiest people. This what the initial hypothesis of happiness being inversely related to GDP per capita is based on. Personal experience has revealed that the most visibly happy people are third world citizens. Being poor and witnessing extreme poverty forces people focus on the things that truly matter in life.

Figure 4 shows exclusively the "well-being" portion of the HPI graphically. This is when people were asked to rate their life from 0 to 10, 10 being the best possible life. Dark red represents the least happy, amber represents the middle, bright green shows the most happy, and gray represents countries that no data was gathered from. We see a country like the USA with a similar well-being value to a country like Thailand which has 11% of US GDP per capita. This shows that there are other factors that constitute happiness aside from wealth. This reiterates the

problem of finding a good economic measurement that includes well-being. However I think taking the first step is what's important, and with time we will focus on increasing a country's wealth without decreasing the well-being of its citizens. Leaders need to dedicate themselves to maximizing the well-being of their people, no matter the cost.

According to the Solow-Swan model, technological transfers should bring about economic growth. However, there are equally important things like the implementation of social and political structures. Developing countries suffer from political systems that do not seem to work. Due to wars over natural resources in Africa (like diamonds in the case of Sierra Leone), there is no strong political structure. Why is a political structure important? Economic principles are only put in place if political leaders decide they are important. This assumes that political leaders are transparent and seek the greater good of the country. Unfortunately, this is not consistent with many developing countries. Corruption is a problem in these countries and there are many criminal cases of government officials siphoning resources into their own pockets. Hall and Jones (1996) emphasize that technology transfers and foreign investment are also greater when economic institutions are stable.

The Solow-Swan model suggests that decreasing population growth could increase capital stock. Developing countries tend to have higher birth rates than developed countries. Experience suggests that parents in poorer countries attempt to have as many children to ensure a higher percentage of success among them. This is because without good social programs parents rely heavily on their children for their retirement plans. History also suggests that male children are chosen to attend school because they are assumed to yield a higher return. Therefore,

countries could devote resources to healthcare education about birth control to reduce the population growth rate.

The outflow of human capital from developing countries is another area worth investigating. Many individuals make the decision to leave their countries in search of 'greener pastures.' These individuals end up contributing (taxes, know-how, etc) immensely to the destination country and some even forsake their home country. As discussed in this paper and other literature, human capital is essential to economic growth. Therefore, if developing countries could find a way of retaining this human capital, growth will be even more likely. I believe if a country shows potential of economic growth the retention rate of such individuals will increase. In future research, migration of essential human capital will be tested to ascertain its effect on GDP per capita. I have immense positivity and hope that developing countries like Ghana, of which I'm a citizen, can not only experience consistent economic growth, but potentially attain the same level of wealth indicators as developed countries without negatively impacting the well-being of its people.

Bibliography

Adams, Samuel. "Globalization and Economic Growth in Sub Sahara Africa."*Intech*.Intech, n.d. Web. 08 Apr. 2014. <http://www.intechopen.com/books/globalization--today--tomorrow/ globalization-and-economic-growth-in-africa>.

Baumol, J. W. "Productivity Growth, Convergence, and Welfare: What the Long-run Data Show." *American Economic Review* 76 (1986): 1072-085. Web.

Boarini, Romina, Asa Johansson, and Marco M. D'Ercole."Alternative Measures of Well-Being."*OECD Economics Department Working Papers* 476 (2006): n. pag. *OECD ILibrary*. OECD, 30 Jan. 2006. Web. 21 Apr. 2015. <http://www.oecd-ilibrary.org/economics/ alternative-measures-of-well-being_832614168015>.

Chou, Yuan K. "Convergence: Do Poor Countries Tend to Catch Up with the Rich?" *The Australian Economic Review* 35.2 (2002): 221-26. *Business Source Premier*. Web.<http:// onlinelibrary.wiley.com.trmproxy.mnpals.net/journal/10.1111/%28ISSN%291467-8462/ issues>.

De Long, J. Bradford. "Productivity Growth, Convergence, and Welfare]."*The American Economic Review* 78.5 (1988): 1138-154. *JSTOR*.Web. 08 Apr. 2014. <http://www.jstor.org/ stable/10.2307/1807174?ref=search-gateway:9483ab089b950197324fad86dab5a6fa>.

Dollar, D. "Globalization, Poverty, and Inequality since 1980."*The World Bank Research Observer* 20.2 (2005): 145-75. Print.

Elmawazini, Khaled, and Sonny Nwankwo."Globalisation and Income Gap between Rich and Poor Nations."*Economic Issues* 18.2 (2013): 19-40. *EBSCO MegaFILE*.Web.

Gholipour, Bahar. "This Is How 135 Nations Fare on Happiness." *LiveScience*.TechMedia Network, 16 Sept. 2014. Web. 19 Apr. 2015. <http://www.livescience.com/47863-countries-happiness-rank.html>.

Gholipour, Bahar. "World's Happiest Country Is ... (Hint: It Has a Canal)." *LiveScience*.TechMedia Network, 16 Sept. 2014. Web. 19 Apr. 2015. <http://www.livescience.com/47865-happiest-countries-revealed.html>.

"Green GDP Accounting Study Report 2004 Issued." *China.org.cn*. China.org.cn, 12 Sept. 2012. Web. 19 Apr. 2015. <http://www.china.org.cn/english/environment/180850.htm>.

Hall, R. E., and C. I. Jones."The Productivity of Nations."*National Bureau of Economic Research* (1996): Web.

Kendrick, John W. "The Formation and Stocks of Total Capital." *The Journal of Economic History* 38.02 (1978): 572-73. Print.

"KOF Index of Globalization."*KOF Index of Globalization*.ETH Zurich, n.d. Web. 08 Apr. 2014. <http://globalization.kof.ethz.ch/>.

"Maddison Historical GDP Data."*WorldEconomics*.Economic& Financial Publishing, 2014.Web. 08 Apr. 2014. <http://www.worldeconomics.com/Data/MadisonHistoricalGDP/Madison%2520Historical%2520GDP%2520Data.efp>.

Maddison, Angus. *Phases of Capitalist Development*. Oxford: Oxford UP, 1982. Print.

Mankiw, N. G., D. Romer, and D. N. Weil."A Contribution to the Empirics of Economic Growth."*The Quarterly Journal of Economics* 107.2 (1992): 407-37. Print.

"Happy Planet Index."*Happy Planet Index*.NEF, n.d. Web. 19 Apr. 2015.

Rodrik, D. "Comments on "Trade, Growth, and Poverty" by D. Dollar and A. Kraay."*Wheatherhead Center for International Affairs* (n.d.): Web. <http://www.wcfia.harvard.edu/node/478>.

Romer, P. M. "The Origins of Endogenous Growth."*The Journal of Economic Perspectives* (1994): Web.

Sala-I-Martin, X. "The World Distribution of Income: Falling Poverty and ... Convergence, Period." *The Quarterly Journal of Economics* 121.2 (2006): 351-97. Print.

"Statistics."*UNdata*.United Nations Statistics Division, 2014.Web. 08 Apr. 2014. <http://data.un.org/Default.aspx>.

Stiglitz, Joseph E. "Globalization and Its Discontents." *Public Choice* 120.1/2 (2004): 236-41. Print.

"Unctad Statistics." *United Nations Conference on Trade and Development*.UNCSTAD, n.d. Web. 08 Apr. 2014. <http://unctad.org/en/pages/Statistics.aspx>.

Ura, Karma, Sabina Alkire, TshokiZangmo, and Karma Wangdi. *A Short Guide to Gross National Happiness Index*.Thimphu: Centre for Bhutan Studies, 2012. *Http://www.grossnationalhappiness.com/*. The Centre for Bhutan Studies.Web. 21 Apr. 2015.