

Determinants of a Country's Happiness

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Abstract:

This paper examines the relationship between several macroeconomic factors and the relative happiness of a country's citizens. Inflation, GDP growth, real interest rate, and unemployment rate were selected as independent variables. Data on the dependent variable, the degree of happiness, was not available from other studies. Therefore, life satisfaction was used as the dependent variable which was obtained from the Happy Planet Index. This study was conducted using cross sectional data and the least squared method to determine if any of the independent variables are statistically significant to the happiness of a country.

JEL Classification: E24, O47, E4, E31

Keywords: GDP Growth, Real Interest Rate, Unemployment Rate, Inflation

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The author gratefully acknowledges the help/guidance from Professor Ramesh Mohan

1.0 Introduction

Happiness is a trait that yields many benefits. First, it is one of humans' greatest needs and is essential to live a full life. Wealth and success mean little without happiness. However, happiness also benefits society as a whole. Many studies have concluded that happy people are more compassionate, caring and creative than those who are dissatisfied with their lives. Thus, happiness can affect many areas of a society. People who are happy are more willing to assist and come to the aid of others. Happy and content individuals may be less inclined to commit crimes. Unhappy people dissatisfied with their country may even be more inclined to make terrorist threats or acts against other countries or groups. Studies have also found that happier people tend to be healthier which places less strain on society in terms of health care. The benefits of a happy society are evident in Denmark that has been classified as "The Happiest Place on Earth", as reported by ABC news. The citizens rank themselves as happy and content. The Danes are less materialistic, choosing bicycles over cars, placing less stress on the environment from pollution while maintaining better fitness. They are also a more trustful society less concerned about crime as it is common to leave babies in strollers unattended and bicycles unlocked.

Happiness has been low in many countries since the financial crisis of 2008. Many citizens in the United States and other countries have experienced the loss of a job which can be devastating causing depression, sadness and disappointment. In some instances, the unemployed can no longer provide for their family. The government has the ability to step in to provide aid for their citizens by creating new jobs. In some instances, jobs are created for public projects such as improving the infrastructure of cities and towns such as building roads and bridges. The government can provide for the unemployed by issuing monetary benefits. As a result, it seems reasonable to rationalize that macroeconomic actions may be able to improve the overall level of happiness of a country.

The study presented in this paper aims to enhance the understanding of macroeconomic factors effect on a country's level of happiness through the expansion of previous studies. From an economic perspective, this analysis is also important because it will help with the understanding of how macroeconomic factors can influence a country's attitude toward

consumption and investment. This is based on the assumption that a lower level of happiness will result in lower consumption and investment, while a higher level of happiness will result in higher consumption and investment.

In previous studies, a country's level of happiness was determined from data collected from surveys given to citizens that rank life satisfaction, such as the Euro-Barometer Survey Series. This study utilizes the Happy Planet Index (life satisfaction). It is acknowledged that using Happy Planet Index as a proxy may produce different results such as a lower p-value or a higher coefficient value.

This study expands on previous research papers by including three additional objectives. Prior studies focused on limited geographic regions such as Europe or South America. This study includes countries throughout the world, providing more data-points, potentially yielding a more significant coefficient than other papers. This study also segregates countries by income level to determine the extent that income level influences the life satisfaction/happiness of a country. By using two different regressions, one for higher income countries, and one for lower income countries, this study provides insight on whether income level biases were present in previous studies. This study will also provide analysis of different continents, including Europe, Asia, Africa, South America, and North America through the use of a dummy variable. This will help reveal any regional biases in results. In addition, this will enable further testing by providing the ability to remove regions from a regression analysis and observe changes in the results.

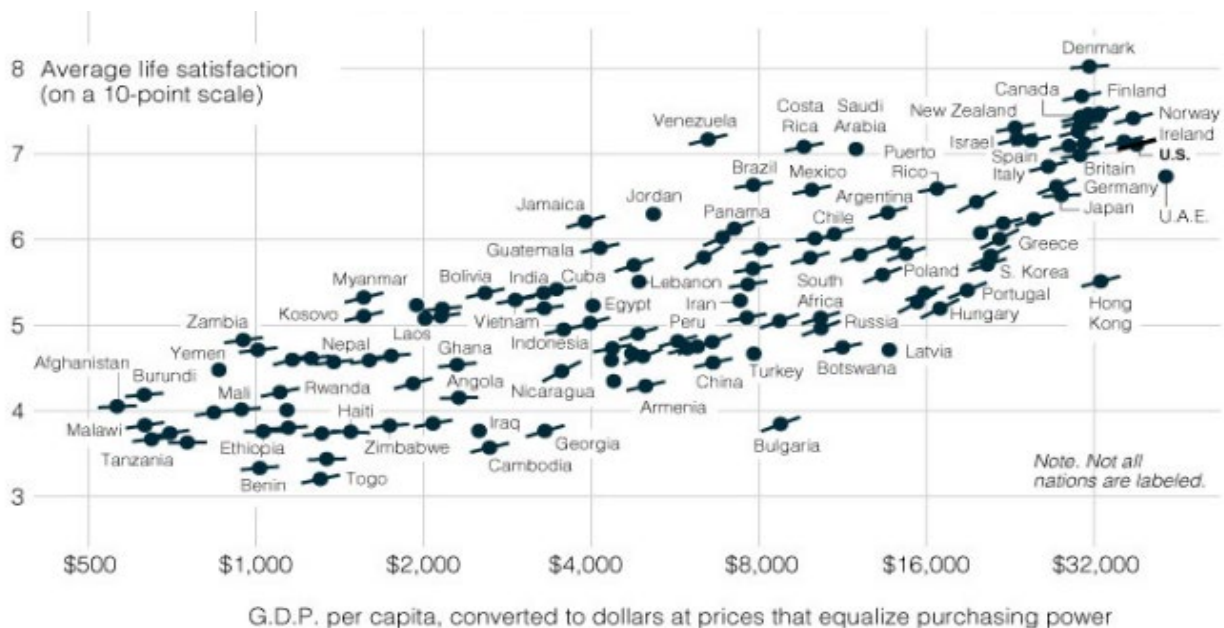
The rest of the paper is organized as follows: Section 2 analyzes on trends of macroeconomic factors. Section 3 provides a literature review. Section 4 outlines the data, empirical model, and estimation methodology. Section 5 discusses the empirical results. Finally, section 6 is the conclusion.

2.0 Trends

As displayed in the Figure 1 below, average life satisfaction appears to be higher in wealthier countries. The graph displays the relationship between the average life satisfaction and GDP per Capita. Each country is represented by a black dot with a line bisecting it. This line indicates the correlation between GDP per capita and life satisfaction. A steeper line indicates a greater correlation between average life satisfaction and GDP per capita.

Past studies have utilized data on a time series basis, analyzing changes in GDP per capita and the impact on life satisfaction/well-being while ignoring the relative overall wealth of a country. However, given the wide variance in wealth by country, it is reasonable to believe that countries at different wealth levels may be dissimilarly impacted by macroeconomic factors. For example, it may be more difficult to raise the overall happiness in Denmark (a wealthier country) through macroeconomic changes than for Afghanistan (a poorer country). As a result, the study presented in this paper segregates countries by wealth level to observe any biases in past studies.

Figure 1: Average Life Satisfaction vs. GDP per Capita

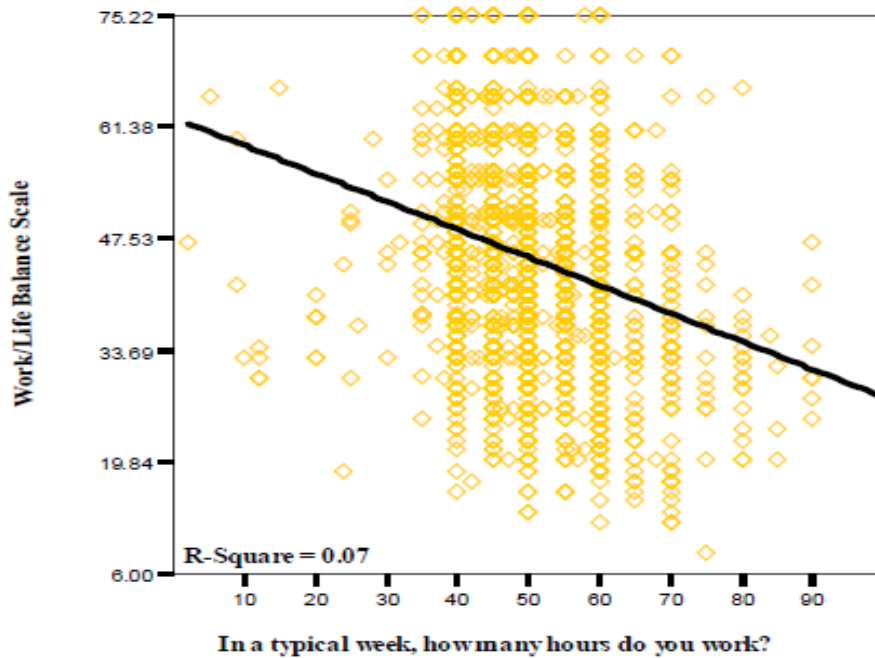


Source: New York Times

A number of other factors could also influence the impact of macroeconomic changes on a country's well-being. For example, as depicted below, work-life balance (related to happiness) was impacted by the number of hours worked in a week. Figure 2 observes recent graduates with their Masters in Business Administration. The dependent variable Work-Life Balance Scale is determined by surveys given to the graduates. These graduates answered questions on how well they balance their work life with their personal life. The regression indicates a negative slope or negative correlation; the more hours that someone works in a week, the lower the number is on the work/life scale. Also, the graph reflects an R-Square value of .07 indicating a very weak negative relationship between these two variables.

Citizens in the United States work longer hours than other countries such as France. Working longer hours can cause a decrease in a citizen's happiness, by providing less available time for leisure activities and family.

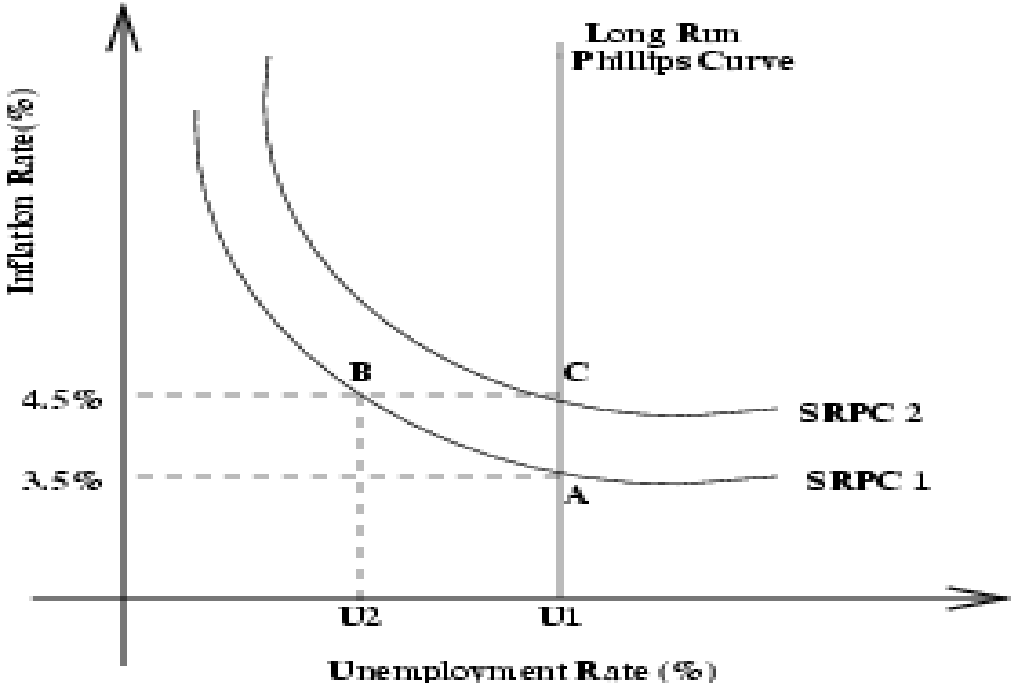
Figure 2: Work-Life Balance Scale vs. In a typical week, how many hours do you work?



Source: Graduate Management Admission Council

Two of the independent variables utilized in the study presented are inflation and unemployment. The inflation rate and unemployment rate are explained by the Phillips Curve exhibited below. On the Phillips Curve, when inflation is high, the unemployment rate will be low, and vice versa.

Figure 3: The Phillips Curve



Source: The General Section

In the above graph, the inflation rate and unemployment rate have a negative relationship or correlation. Life satisfaction/happiness would be expected to be higher when inflation and unemployment are low. When there is low inflation and low unemployment, a higher percentage of the population are employed and the prices for goods and services are lower resulting in a higher life satisfaction/happiness.

3.0 Literature Review

Many studies have been conducted on the relationship between macroeconomic factors and the well being of a country's population. One of the earliest studies by Richard Easterlin (1974) examined the relationship between increases in reported happiness, based on a United States poll, and increases in national income over time. Easterlin concluded that there was no clear trend to support the contention that economic growth yields well-being. He attributed this to the fact that people view happiness relative to others. As income rises people move up together and their relative position does not necessarily change. Easterlin's conclusion that there was no clear trend in the relationship between increase in income and higher levels of happiness was questioned by Oswald who pointed out that well-being did rise for over a portion of the study period Easterlin referenced, "According to these data, well-being did rise through time in the USA" Oswald (1997). However, Oswald also conceded that the methods of measuring well-being are difficult and cannot be accepted critically Oswald (1997). Oswald also concluded that the primary source of unhappiness appears to be unemployment with regression analysis supporting this across different periods and different countries Oswald (1997).

Previous studies also determined that two of the main factors that belong in a well-being function are inflation and unemployment. Di Tella et al. (2000) and DiTella and MacCulloch (2006) concluded that people tend to be happier when unemployment and inflation are low with unemployment depressing well-being more than inflation. The data underlying the study was derived from the Euro-Barometer Survey Series, based on 12 European countries. Higher inflation makes costs of products increase, which makes it harder for people to attain these products. Regression analysis provides evidence that unemployment is the major economic source of human distress. Di Tella, et al. (2001) Also, Di Tella et al. (2001) reported that the large cost of losing a job makes workers in a nation very frightened.

Di Tella, et al. (2001) also utilizing the Euro-Barometer Survey Series as the main data source concluded that macroeconomic movements have strong effects on the well-being of nations. The study observed that losses from recessions are large. In another specific paper using the Euro-Barometer Survey Series by Heinz Welsch in 2006, it was found that in addition to unemployment and inflation, economic growth should be in the life satisfaction regression

Welsch (2007). This paper found economic growth being significant in the life satisfaction regression for the countries in the European Union. Kenny (1999) explained that it is impossible to say that people would be happier before or after growth, finding that while U.S. GDP per capita approximately doubled from 1952 to 1989, happiness actually dropped over that period.

Research thus far was based on a narrow scope of geographic regions, with most studies focusing on Europe. All of the papers referenced used limited geographic regions. Welsch (2007) utilized data only from the European Union, as did Di Tella and Oswald. The study presented in this paper will utilize data from countries on a broad geographic basis representing 67 nations throughout the world. This will yield more credible results and the ability to detect differences by region.

Various papers have used data from the United States General Survey, the Health Questionnaire or the Euro-Barometer Survey Series on reported well-being data. By using a different survey to represent life satisfaction/ happiness, there is a possibility to uncover independent variables that are more significant.

This paper will also introduce the real interest rate as an independent variable, which has not been used in any of the referenced papers. While the Welsch (2007) study used the variable long-term interest rate, he concluded in his paper that using long-term interest rates yields a lower significance for inflation in the regression. Utilizing real interest rates avoids the complication of the inflation lowering phenomena.

Finally, this paper will segregate high income and low income nations as part of the analysis. By using two different regressions, it will be determined if there are any variations between these groups or if there are any biases in previous studies from not normalizing for income level.

In his 2004 paper, "Feeding the Illusion of Growth and Happiness", Easterlin defended his position in prior papers to his critics, "If national income is really generating a growth in happiness, why is it that countries with quite similar rates of economic growth have quite different trends in happiness...". Easterlin (2004) and Oswald (1997) believed that unemployment should be the main concern of countries and not economic growth. The higher level or lower level of the income in the nation will not change for happiness.

4.0 Data and Empirical Methodology

4.1 Data

This paper uses data from 2009. The dependent variable data was obtained from the Happy Planet Index Life Satisfaction data that was developed by the Gallup World Poll. The data was collected from 67 different countries across the world. The countries are distributed from different continents. Independent variables data was obtained by the World Bank. The Independent Variables include Unemployment Rate, Inflation Rate, GDP Growth, and Real Interest Rate. All these variables were obtained in the indicator section on the World Bank website. No logs were considered in this study, since the independent variables are percentages. The complete list of variable definitions and data sources are presented in Appendix A.

4.2 Methodology

In this empirical study, the regressions are estimated by using the ordinary least squared (OLS) method. While to some extent this paper is modeled after Welsch's 2006 study, there are a number of differences. The first three regression methods include the overall model, high income countries model and the low income countries model. These models will be used to understand if the high income or low income countries are a better indicator to the independent variables and dependent variable. Also, this study will distinguish different regions for each regression. These regressions will be used to determine if there is any bias or large errors in these different regions. This study presented in this paper also differs from Welsch's by substituting real interest rate for long-term interest rate, while also using a different source for the dependent variable.

All regressions use the following first functional form except for Table 3 which uses the second formula.

$$HPI = \beta_0 + \beta_1 unemp + \beta_2 inf + \beta_3 gdpgro + \beta_4 intr$$

$$HPI = \beta_0 + B_1 unemp + \beta_2 inf + \beta_3 gdpgro + \beta_4 intr + \beta_5 continent$$

HPI is the Happy Planet Index which is representing life satisfaction/happiness and used as a dependent variable in this equation. The independent variables were researched and developed to ensure that the dependent variable is explained by the independent variables. The equations above are the empirical models which are used for the regression analysis contained in this study.

The independent variables are macroeconomic factors that are used to explain life satisfaction/happiness. **Unemp** is the unemployment rate representing the people that are unemployed and are looking for jobs. **Inf** is the inflation rate and captures the percentage that goods and services are rising. **Gdpgro** is the percentage of GDP that grew or fell in 2009. This variable is being use to represent the economic growth. **Intr** is the real interest rate in 2009. **Continent** is the dummy variable that identifies each country's continent. The complete variable definitions and corresponding expected signs are presented in Appendix B. Summary statistics are provided in Table 1.

4.2 Data

Table 1: Summary Statistics of Dependent and Independent Variables

Variables	HPI	UNEMP	INF	GDPGR O	INTR	EUROP E	ASIA	AFRICA	NORTH AMERIC A	SOUTH AMERIC A
Mean	6.08970 6	0.10667 6	0.05252 9	- 0.00276 5	0.10939 7	0.26470 6	0.30882 4	0.13235 3	0.14805 9	0.11764 7
Median	5.9	.066	.036	0.0	0.09	0.00	0.00	0.00	0.00	0.00
Maximum	8.0	0.79	0.286	0.56	0.442	1.00	1.00	1.00	1.00	1.00
Minimum	3.7	0.008	-0.014	-.18	-0.036	0.00	0.00	0.00	0.00	0.00
Standard Deviation	1.09737 0	0.13196 4	0.05367 0	0.09055 4	0.09088 0	0.44445 7	0.46544 3	0.34139 4	0.35679 8	0.32458 5

5.0 Empirical Results

The purpose of this study is to determine if macroeconomic factors have any significant effect on the life satisfaction/happiness of a country. The study includes unemployment rate, inflation, real interest rate, and GDP growth as independent variables. The study also includes analysis to ensure that there are no biases between high income countries and low income countries. The first table (Table 2) displays a regression with all the countries which is the overall model, a regression with only low income countries, and a regression with only high income countries. The next table (Table 3) includes a dummy variable that identifies each country's region. There are five regressions in the table which include Europe, Asia, Africa, North America, and South America. The last table (Table 4) refers to a regression without South American and North American countries. Both of these continents displayed a low number of observations, therefore they were removed to create a larger coefficient or a stronger T-statistic. These regressions will establish if the Happy Planet Index is a good indicator to determine life satisfaction/happiness in a country.

Table 2: Regression Results

Average Life Satisfaction/ Happiness			
	I (Overall Model)	II (Low-Income)	III (High-Income)
CONSTANT	6.619184*** (24.71942)	6.271513*** (15.88220)	6.976232*** (21.03006)
UNEMP	-1.901580* (-1.902891)	-3.024100** (-2.452302)	.136155 (.097159)
INF	-1.863823 (-.761313)	-1.013687 (-.766674)	-2.094976 (-.639933)
GDPGRO	-1.630399 (-1.116475)	-1.205981 (-.799115)	4.096572 (1.180105)
INTR	-2.131922 (-1.480684)	-1.399179 (-.766674)	-.777101 (-.367100)
R-Squared	.119415	.181060	.084140
F-Statistic	2.135829*	1.824002	.574189
Number of obs	67	37	30

Note: ***, **, * denotes significance at 1%, 5%, and 10% respectively.

T-statistics in parentheses.

As displayed above, in the Overall Model Regression (I) reflecting all of the data, not only was the unemployment rate statistically significant, but unemployment had a negative coefficient. This indicates that when all other variables and factors are held constant; the unemployment rate would have an effect on the life satisfaction/ happiness of a country. When the unemployment rate increases by 1, then the life satisfaction/happiness of a country decreases by 1.901580. Put into more simply terms, the higher unemployment in a country, the lower the life satisfaction/happiness level. This can also be rationalized by the fact that when people do not have jobs, they have difficulty providing for the welfare of their families and undergo more stress. In addition, in the original model, the F-statistic is significant at the 10% level. This means that at least one of the means of the variable is statistically different from 0. By

examination of other variables, it can be determined that unemployment is significant towards life satisfaction/happiness.

In the Low-Income Countries' Regression (II), the unemployment rate actually has a lower p-value than the original regression. This independent variable holds two stars in the low-income countries' model meaning that the null hypothesis would be rejected on a 95% confidence interval. When the unemployment rate increases by 1, then the life satisfaction/happiness of a country decreases by 3.02.

In the High-Income Countries' Regression (III), the unemployment rate is not significant. This could indicate that there are some problems with the data. One possible explanation is that higher income countries are better equipped to provide for their unemployed citizens through government benefits allowing their citizens to continue their life style while finding a job.

Table 3: Regional Regression Results

Average Life Satisfaction/ Happiness by Continent					
	IV (European Countries)	V (Asian Countries)	VI (African Countries)	VII (North American Countries)	VIII (South American Countries)
CONSTANT	6.724997*** (23.06681)	6.880647*** (24.29548)	6.702954*** (27.97504)	6.347729*** (26.04232)	6.712356*** (27.00090)
UNEMP	-1.972223* (-1.965540)	-2.013737** (-2.079263)	-1.319800 (-1.463253)	-1.424112 (-1.606304)	-2.513605*** (-2.676673)
INF	-1.988685 (-0.810134)	-2.731004 (-1.138072)	-0.196420 (-0.088498)	-2.109520 (-0.978305)	-3.029975 (-1.326323)
GDPGRO	-2.233080 (-1.394754)	-1.046295 (-0.728478)	0.380548 (0.273935)	-1.301194 (-1.010272)	-1.468746 (-1.089120)

INTR	-2.256650 (-1.558654)	-2.191062 (-1.571934)	-2.315894* (-1.802879)	-1.899354 (-1.496913)	-3.271662** (-2.389652)
EUROPE	-.301239 (-0.923506)				
ASIA		-0.634219** (-2.29042)			
AFRICA			-1.569547*** (-4.152691)		
NORTH AMERICA				1.420484*** (4.389062)	
SOUTH AMERICA					1.347380*** (3.458629)
R-Squared	0.131363	0.188111	0.311043	0.328160	0.261834
F-Statistic	1.87526	2.873031**	5.598220***	6.056782***	4.398397***
Number of obs	67	67	67	67	67

Note: ***, **, * denotes significance at 1%, 5%, and 10% respectively.

T-statistics in parentheses.

In these regressions, each one has a dummy variable from each region. The Europe variable in Regression (IV) exhibited no significance to life satisfaction/ happiness. As in the overall results in Table 2, unemployment continued to display significance. Unemployment rate holds one star in Regression IV meaning that this variable will be rejected on the 90% confidence interval. If the unemployment rate increases by 1, then life satisfaction/happiness decreases by 1.972223.

The Asia Regression (V) has two significant independent variables. These variables are the unemployment rate and the dummy variable. The unemployment rate holds two stars, meaning that this variable will be rejected on the 95% confidence interval. If the unemployment rate increases by 1, then life satisfaction/ happiness will decrease by 2.013737. The dummy variable holds two stars, meaning that this variable will be rejected on the 95% confidence interval. If the country is from Asia, then the life satisfaction/happiness of that country will decrease by .634219. The F-Statistic was also significant. This means that at least one of the variables is significantly different from zero.

The Africa Regression (VI) shows two significant independent variables. These variables are real interest rate and the dummy variable. The real interest rate holds one star, meaning that this variable will be rejected on a 90% confidence interval. If the real interest rate increases by 1, then the life satisfaction/happiness will decrease by 2.315894. The dummy variable holds three stars, meaning that this variable will be rejected on a 99% confidence interval. If the country is African then the life satisfaction/happiness of that country will decrease by 1.569547. The F-Statistic was also significant.

In the North America Regression (VII), only one variable was significant. This variable was the dummy variable. This variable holds three stars, meaning that this variable will be rejected on a 99% confidence interval. If the country is located in North America, then the life satisfaction/happiness of that country will increase by 1.420484. The F-Statistic is also significant.

In the South America Regression (VIII), there are three significant variables. These variables were unemployment rate, real interest rate, and the dummy variable. The unemployment rate holds three stars, meaning that this variable will be rejected on a 99% confidence level. If unemployment rate increases by 1, then life satisfaction\happiness will decrease by 2.513605. The real interest rate holds two stars meaning that this variable will be rejected on a 95% confidence interval. If the real interest rate increases by 1, then the life satisfaction\happiness will decrease by 3.271662. The dummy variable holds three stars meaning that this variable will be rejected on a 99% confidence interval. If the country is from South American, then the life satisfaction/happiness of that country will increase by 1.347380. The F-Statistic is also significant in this regression.

Table 4: Regression Results

	IX- (No South American Countries)	X (No North American and South American Countries)
CONSTANT	6.835166*** (25.75154)	6.641273 (26.71398)
UNEMP	-3.908311*** (-3.284043)	-3.306575*** (-3.155737)
INF	-3.110283 (-1.153755)	-4.558575* (-1.716681)
GDPGRO	-1.241187 (-0.918912)	-0.812639 (-0.689778)
INTR	-3.311425*** (-2.268965)	-3.603381** (-2.653073)
R-Squared	0.276438	0.340591
F-Statistic	5.157698***	5.810720***
Number of Obs	59	50

Note ***, **, * denotes significance at 1%, 5%, and 10% respectively

T-Statistics in parentheses

In the ninth regression in which South American countries were excluded from the data, the unemployment rate, and the real interest rate are significant. Both of these independent variables hold three stars meaning that the null hypothesis would be rejected on a 99% confidence interval. When unemployment rate increases by 1, then the life satisfaction/ happiness of a country will decrease by 3.91. When the real interest rate increases by 1, the life satisfaction/ happiness of a country will decrease by 3.31.

In the tenth regression that excluded both South American and North American countries from the data, the unemployment rate, the inflation rate, and the real interest rate are all significant. The unemployment rate holds three stars meaning that the null hypothesis would be rejected on a 99% confidence interval. When the unemployment rate increases by 1 then the life satisfaction/happiness of a country decreases by -3.306575. The inflation rate holds one star meaning that the null hypothesis would be rejected on a 90% confidence interval. When the inflation rate increases by 1 then the life satisfaction/ happiness will decrease by 4.558575. The real interest rate holds two stars meaning that the null hypothesis would be rejected on a 95% confidence interval. When the real interest rate increases by 1 then the life satisfaction/ happiness will decrease by 3.603381. In this regression, the F-Statistic holds three stars meaning that the null hypothesis would be rejected on a 99% confidence interval. This also means that at least one of the means is different from zero.

There were some differences from the ninth and tenth model compared to the original model. Both showed a higher coefficient in the unemployment rate. Since North America and South America countries have lower unemployment rates compared to other countries in the world, the coefficient significantly increased. Also the ninth and tenth regressions showed significance in real interest rates. The overall model did not show this significance. One possible reason is that most of the countries in North America and South American had to decrease their interest rates dramatically due to the financial crisis. These outliers could possibly explain the fact that the real interest rate in the overall model was not significant.

Also in the Table 3 regressions, there were some region differences. North American and South American countries showed significance of a higher life satisfaction/ happiness than Asian and African countries. North American and South American countries have a higher GDP per capita and also have better living statuses than Asian and especially African countries. African

countries have very poor living conditions and also very low GDP per capita. These countries are filled with diseases, no opportunities for education, and a high infant mortality rate. As compared to North and South America, they should have a lower life satisfaction/happiness.

Several studies presented in the literature review section found the unemployment rate to be significant in their regressions. The results of the study presented in this paper also indicated this. However, it should be noted that this study used a dependent variable which was not used in prior research papers. There are also problems with looking at the different data sets from past papers because most data sets are not made public or can be found on the internet. Therefore, it was not possible to verify how the authors used their data to determine their regression. In addition, this study included data from 67 countries, while the other papers only analyzed a small group of countries. Heinz Welsh's paper (2007) only used 11 countries from a specific region. All of these countries were part of Western Europe, including the countries Denmark and France. The study presented in this paper utilized developed as well as developing countries. It should be noted that developing countries could have experienced massive economic growth, or increasing unemployment rate and inflation rate.

6.0 Conclusion

The primary purpose of this study is to uncover macroeconomic factors that have any correlation between the life satisfaction/happiness of a country, which includes developed and developing countries. Previous studies have examined the relationship between a number of macroeconomic factors and life satisfaction/ happiness of a country. These factors have included unemployment, inflation, GDP growth, and the long term interest rate. As did many of the prior studies, this paper found that a macroeconomic life satisfaction/ happiness equation should include the unemployment rate. This supports the contention that individuals care about employment. However, segregating the data between high and low income countries reveals that unemployment is not significant for high income countries. The significance for the overall group results is driven by the lower income countries. This could be explained by the fact that higher income countries have a better support mechanism (i.e. unemployment benefits) in place for those out of work.

Other independent variables (inflation, GDP growth, and real interest rates) were not supported as factors in a macroeconomic life satisfaction/ happiness equation for either high or low income countries. However, the data suggests that regional differences may exist. Previous studies were predominantly based on data from European countries. When North American and South American were excluded from the data set of this study, significance was observed for inflation, real interest rates as well as unemployment. These results agree with Di Tella et al. (2000), Oswald (1997) and Welsch (2007) indicating that the unemployment rate is the strongest macroeconomic factor determining the life satisfaction/ happiness in a country when North and South American are removed. Significance for inflation indicates that people care about stability as well employment. There is no evidence that GDP growth affects life satisfaction/happiness of a country contrary to Welsch (2007) findings.

The study concludes that low income countries behave differently than high income countries whose life satisfaction/ happiness are not influenced by unemployment. Furthermore, regional differences may exist. A blanket statement on the impact of macroeconomic factors on life satisfaction/happiness cannot be made for all countries. Therefore, macroeconomic actions would not be effective in increasing the life satisfaction/ happiness may not be effective for all

countries. A careful examination of each country needs to be made before implementing macroeconomic actions to affect the life satisfaction/happiness of a country.

Appendix A: Variable Description and Data Source

Acronym	Description	Data Source
HPI	Life Satisfaction of a country by a survey	Happy Planet Index Site
UNEMP	The unemployment rate for a country in 2009	World Bank
INF	The inflation rate for a country in 2009	World Bank
GDPGRO	The GDP growth of a country in 2009	World Bank
INTR	The real interest rate of a country in 2009	World Bank

Appendix B: Variables and Expected Signs

Acronym	Variable Description	What it captures	Expected Sign
UNEMP	Unemployment Rate	Lower unemployment causes more happiness	-
INF	Inflation Rate	Lower inflation causes more happiness	-
GDPGRO	GDP Growth	Higher GDP growth causes more happiness	+
INTR	Real Interest Rate	Lower real interest rate causes more happiness	-

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