

Theses of doctoral (PhD) dissertation

**LIFE SATISFACTION
AND THE CYCLICAL COMPONENT OF GDP**

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1 Preliminaries and Motivation of the Dissertation

The greatest happiness for the greatest number of citizens seems to be a sound goal for public policy. In the personal sphere too, the pursuit of happiness has been the aim of many of us. Before 1950 it was exclusively philosophers and theologians who focused on the question of how to live a good life. However, for more than 60 years the mainstream social sciences have been researching the topic. To obtain quantifiable results, data about people's well-being was gathered in countless surveys which asked about individuals' life satisfaction, feelings and other states of mind. These social, cognitive and emotional factors are very important for the new branch of economics called behavioral economics. This is necessary because "economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world" (Keynes 1938).

In economic analysis life satisfaction data is used to avoid interference of short lived emotional factors as it focuses on the evaluation of life as a whole. Therefore, my empirical studies only use life satisfaction data and I use the term exclusively in connection with my research. However, in the discussions or general summaries life satisfaction, subjective or reported well-being and happiness are used interchangeably. In behavioral economics life satisfaction data is seen as a certain utility notion and consequently the effects of economic situations can be analyzed in this new framework. It is important to note that the rationality of human beings, expressed in the concept of the "homo oeconomicus", is challenged.

It has been stated that higher income levels have not resulted in increased happiness measures. For example, the United States of America has witnessed a massive increase in Gross Domestic Product (GDP), particularly since 1960. This has meant that the average household can enjoy the benefits of a fridge, a telephone and a personal car. However, happiness levels have remained the same throughout the period. This paradox challenges the main assumptions of the discipline of economics.

Consequently, many researchers have investigated the impact of GDP on happiness but they still dispute the impact and the importance of GDP on the well-being of citizens. For the last few decades continuous and intense debates in the field have been conducted on this topic: on the one side, Easterlin and others believe in the 'Easterlin-paradox' (Easterlin

1974, 2013) which states that GDP growth does not influence reported well-being once basic needs are met. On the other side, the ‘opponent group’ rejects the existence of the paradox (Wolfers – Stevenson 2008, 2013).

In the vast literature available, however, what has not been attempted is an empirical examination of the effect of a deviation from the trend growth of GDP (cyclical component of GDP) on happiness. In other words, the research supposes that people react on the difference between real and average level of GDP growth. If real GDP growth is lower citizens become disappointed because they had higher expectations. The implication would be that reported levels of life satisfaction could fall even if the economy is growing. If, nonetheless, the growth of GDP exceeds the expected level people will be positively surprised and the happiness index will rise. Member countries of the Eurozone (EZ) have been selected and analyzed to test the hypothesis. Interesting results have emerged in connection with Mediterranean countries, notably Portugal, Italy, Greece and Spain.

Following this, further research questions opened up and the theoretical and practical examination of European welfare systems as well as the current situation in the EZ was necessary; especially what kind of consequences an exit from the EZ would have.

2 Structure and Methodology of the Dissertation

The dissertation starts with an introductory chapter in which the background and the resulting research questions and hypotheses are presented. Thereafter, to give an overview of the field and to confront criticism from standard economic thinking the second chapter sets the stage for a general analysis of the field happiness and economics. It is noteworthy that the thesis follows the argumentation of the main scholars in the field, especially Frey and Stutzer (2002). Consequently the second chapter follows their analysis and findings plus the work of Veenhoven (1991), Diener et al. (1999), Van Praag et al. (1999) and Easterlin (2000) as all of them give an excellent introduction to the field particularly about the measure of happiness and its integration into economic science.¹ For shorter introductions Wiese (2014a) is advised. Next, important findings of the past and recent literature are presented in chapter 3. From this literature review the need to investigate the relationship between income and life satisfaction becomes obvious because remaining puzzles are still the subject of ongoing debates. In chapter 4 the dissertation focuses on my own novel empirical analysis which tries to address a missing part of the literature: the cyclical component of GDP and its association with life satisfaction. Several different models and approaches are undertaken – from a microeconomic perspective with individual data (chapter 5) as well as from a macroeconomic perspective with aggregated data (chapter 4). Chapter 6 goes into detail on the political and individual implications of happiness research in general as well as from the point of view of my results; the idea of maximizing a National Happiness Index like for instance Gross National Happiness is reviewed and critically examined. In chapter 7 the focus is on the explanation of the econometrically found association and thus, explores different welfare state models and the implications of the results for the EZ member countries. The dissertation ends with a discussion (chapter 8) of the topics examined and concludes thereafter (chapter 9). The appendix contains statistical data related to the empirical research, further statistics about several affected topics and different results from various happiness studies.

¹ I also used these publications for my courses “Happiness and Economics” which I conducted at the University of Debrecen and at the Corvinus University of Budapest.

The dissertation uses literature analysis to highlight missing and important areas of research as well as to argue for the right method of research. Hence, the thesis builds upon major works of well cited economists which have laid the foundations of my analysis. Several statistical methods which are standard approaches in the literature are used in a new way. For example, life satisfaction data from the European Commission's Eurobarometer report is correlated with de-trended economic data from Eurostat databases.

3 Research Questions and Hypotheses of the Dissertation

As was mentioned before, happiness researchers still dispute the impact and the importance of GDP on the well-being of citizens. For the last few decades continuous and intense debates in the field have been conducted: on the one side, Easterlin (1974, 2013) and his followers (e.g. Diener, E., Lane, R., Oswald, Seligman, A., Zolatas, X.) believe in the 'Easterlin-paradox' which states that GDP growth does not influence reported well-being once basic needs are met. On the other side, the 'opponent group' (e.g. Hagerty, M., Veenhoven, R., Stevenson, B., Wolfers, J.) deny the existence of the paradox and believe that higher GDP levels can always raise well-being further (Wolfers – Stevenson 2008, 2013).

Research Question 1: Does an association between Eurozone member countries citizens' life satisfaction and the cyclical component of GDP exist? How does aggregated life satisfaction of Eurozone member countries citizen's react on a deviation from the trend growth of GDP?

Hypothesis: My research tested whether adaptation effects exist and hence, additional explanations as to why economic growth has not lead to higher satisfaction scores were examined.

An important difference among certain countries in connection with life satisfaction and the cyclical component of GDP was found: Spain, Italy, Portugal and Greece react to a deviation from the trend growth of GDP but other European countries do not. Therefore, certain welfare state characteristics, such as the ability to create sufficient equity and the flexibility of labor markets lead to the second research question:

Research Question 2: What is the role of youth unemployment, equity and poverty in the context of individual life satisfaction and the cyclical component of GDP? Do differences in the social welfare systems explain the variations of the extent how aggregated life satisfaction of Eurozone member countries citizen's react on a deviation from the trend growth of GDP?

Hypothesis: The population is more dependent on economic variables such as rising income in countries where the social safety net is rather weak and where stratification of entitlements is rather strong.

The contemporary discussions and the future economic prospects of the EZ demand broader analysis: for example, should Mediterranean countries like Greece undergo several years of tough austerity, high unemployment and negative growth until they regain competitiveness or should they reintroduce their own currency, default on national debt and be able to make a new start? This important consideration caused the third research question of the dissertation:

Research Question 3: What are the implications for the design and future of the Eurozone member countries from the previous results? What are the practical propositions of the found correlations in the current political and socio-economic discussion?

Hypothesis: In a case where the necessary realignment of prices through internal devaluation is too high it is better to make a painful break than draw out the agony.

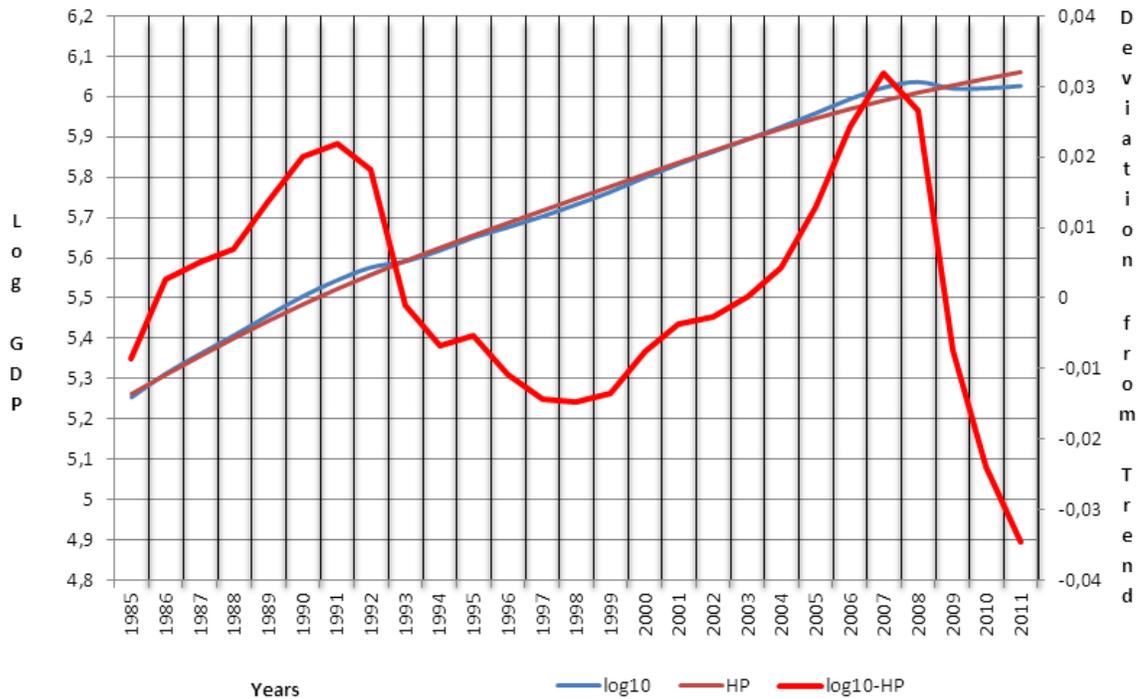
4 Empirical Analyses of Main Findings

I tested the hypothesis that the general public reacts to a deviation from trend growth of GDP. A growing or declining economy might have just a rather small effect on the aggregated life satisfaction level as long as this is in line with the expectation of the citizens.

For my model life satisfaction and growth data were needed. The GDP data were taken from the OECD database (OECD 2013). I used the version which is seasonally adjusted to the current prices of the national currencies. In addition, yearly life satisfaction data from the Eurobarometer report of the European Commission were used. These were downloaded from the world database of happiness (Erasmus University Rotterdam 2013). The survey focuses on the overall perception of life satisfaction. The question asked was “How satisfied are you with the life you lead?” Answers given ranged from “very satisfied” to “not at all satisfied” and were adjusted according to a 10 to 1 scale. In many European countries the survey captured the answers to this question and average figures have been calculated since 1975. Hence, a data depth of more than three decades coverage was available for most of the countries and for each country the last data point was 2011.

For my purpose a simple linear regression was the most suitable tool, and this is also widely used in the literature (Frey – Stutzer 2002, Easterlin 2013). All econometric results were computed with SPSS version 20. Instead of using the original GDP data it was transformed into logarithmic versions. The Hodrick-Prescott (HP) filter was used to calculate the trend growth of GDP and this is a widely applied tool in macroeconomics (compare Metz 1995). The HP filter is a smoothing method to estimate the long term trend component of a series. Technically it is a two-sided linear filter that computes the trend by minimizing the variance of the original series. The cyclical component of GDP was obtained by subtracting the estimated trend component from the original GDP series. I use the terms cyclical component of GDP and deviation from trend GDP growth interchangeably. Other smoothing methods were considered, but in my analysis the HP-filter models the expectations of individuals more consistently than others (Hodrick – Prescott 1997). Figure 1 depicts the results of the HP-filtering for Spain.

Figure 1: Logarithmic GDP growth, GDP trend and Cycle component for Spain



Notes: The seasonally adjusted GDP data from Spain from 1985 until 2011 was taken from OECD datasets and smoothed with the Hodrick – Prescott filter.

Figure 1 shows the logarithm of the time series of GDP in Spain (\log_{10}). Furthermore, the HP filter generated two new series, a smoothed series (HP) and a cyclical one ($\log_{10}-HP$), which distinguishes the parts where the original series differentiates from the trend. The vertical axis on the right shows the logarithmic value of the GDP series and on the left the value of the deviation from the trend. Further, the horizontal axis depicts the time frame.

The aim was to analyze the relationship between life satisfaction and the cycle series. The cyclical component of GDP ($Cycle$), a constant factor and the error term μ were correlated with life satisfaction indices, called LS , at a certain time t . Additionally, I modelled for time lags of one year. Accordingly, the equation to be tested is specified in the following form:

$$LS_t = \beta_1 + \beta_2 * Cycle_t + \mu \quad (1)$$

For valid implications a minimum probability of 5% for the factors β_1 and β_2 is considered as significant and of less than 1% highly significant. R^2 gives information about how well the model fits and it can explain the variance in life satisfaction. Each equation was tested for autocorrelation. This was done with the correlogram of squared residuals.

After the outcome had been evaluated two country groups materialized. The first group consists of Portugal, Italy, Greece and Spain (GIPS)² and the regression results are summarized in table 1.

Table1: Estimation of equation (1) for GIPS

Country	β_1	Significance of β_1	β_2	Significance of β_2	R^2
Spain	6.38	0.000***	8.46	0.002**	36.4%
Portugal	5.33	0.000***	16.45	0.000***	40.9%
Italy	5.96	0.000***	0.60	0.002**	32.7%
Greece	0.02	0.80	25.96	0.000***	62.2%

*** = significant at the 1% level; ** = significant at the 5% level

Notes: Gross Domestic Product data from the OECD, seasonally adjusted to current prices of the national currencies. Aggregated happiness data from the Eurobarometer Report of the European Commission dating back to 1975. Estimates of the coefficients of the linear model, the p-value of the corresponding t-test and adjusted R^2 are presented.

As we can see in table 1, Spain, Italy, Portugal, and Greece show significant and meaningful results: overall, between 30% and 60% of the adjusted variance can be explained by the equation. Further, the cyclical component of GDP correlates with life satisfaction positively and with a very high significance as the p-values are small. Therefore, I suppose that a deviation from trend GDP growth has an effect on life satisfaction for the GIPS countries. This phenomenon is strongest for Greece, Portugal and Spain. The relationship holds to a lesser extent for Italy. Greece was the only country in the sample which did not show a significant constant term. This only implies that for Greece the regression starts in the origin.

² The term GIPS is used by Sinn (Project Syndicate 2011) and other economists as an abbreviation for Greece, Italy, Portugal and Spain. The original German Gips and Hungarian Gipsz means cement which can be seen on the one hand as emphasizing the role of these countries in the process of further integration of the EZ. On the other hand it can also be understood sarcastically in the way that they are not cement but more like the opposite.

It is essential to mention that only Spain reacted more strongly if a time lag of one year was applied to the GDP series.³ The reason might be that it takes some time for the effects of higher income to materialize. Higher wages, for example, can only be negotiated once a year and even though the country on the whole is growing distribution issues delay the effects. Other lags have been excluded because of the lack of a rationale for longer than one year effects: Easterlin (2000) could show that two-thirds of the income effects on well-being were off within a year.

Table 2: Estimation of equation (1) for various EZ countries

Country	β_1	Significance of β_1	β_2	Significance of β_2	R ²
Finland	7.09	0.000***	-5.52	0.243	3.0%
France	5.94	0.000***	-10.30	0.584	1.9%
Ireland	6.86	0.000***	8.68	0.196	2%
Luxembourg	7.16	0.000***	17.81	0.151	3.0%
Netherlands	7.33	0.000***	22.00	0.175	2.4%
Austria	6.73	0.000***	-1.38	0.825	0.3%
Slovakia	5.66	0.000***	-1.17	0.848	0.4%
Slovenia	6.76	0.000***	3.62	0.038**	33.0%
Belgium	6.71	0.000***	18.76	0.381	2.1%

*** = significant at the 1% level; ** = significant at the 5% level

Notes: Gross Domestic Product data from the OECD, seasonally adjusted to current prices of the national currencies. Aggregated happiness data from the Eurobarometer Report of the European Commission dating back to 1975. Estimates of the coefficients of the linear model, the p-value of the corresponding t-test and adjusted R² are presented.

In table 2 outcomes from the linear model for other EZ member countries, Finland, France, Ireland, Luxembourg, Netherlands, Austria, Slovakia, Slovenia, Belgium are offered. All of the countries showed a significant stable component, but the deviation from trend GDP growth and life satisfaction did not correlate meaningfully: either the R² was too low (less than 10%) and/or the significance level of β_2 did not meet the standard (for instance it was

³
$$LS_t = \underset{(0.000)***}{6.38} + \underset{(0.001)***}{17.06 * Cycle_{t-1}}$$

above 5%) and/or the number of available observations was too low to make strong conclusions (less than 20 data points). This suggests that the influence of trend GDP growth is either low or non-existent. For countries such as Finland, the Netherlands, Belgium, Luxembourg, Austria and France this can be explained by the fact that these countries already have high GDP levels and therefore are less dependent on a deviation in income levels. Other countries, like Slovenia, did not provide the data depth for a meaningful discussion and Germany has been left out of the analysis because reunification biased the data.

To counter criticism I comment on the approach and the empirical analyses. The “beauty” of simple models is that the implications are easy to analyze and the model fits my analysis to a sufficient degree. Furthermore, if only the deviation from trend growth of GDP is used as a variable, the results of significance, variance and the statistical fit of the study can be directly attributed to this. Moreover, adding more information and/or further factors could have biased the model. For example, including data about inflation, unemployment or levels of the Human Development Index could have hindered the analysis of trend GDP growth and information could have been biased because of multicollinearity. Inflation and unemployment are interrelated with GDP and could replace it to a certain point. The model used showed strong results (residuals, autocorrelation, significance levels). Even though the whole situation is not explained it can be pointed out that the method serves well to explain the basic relationship. My results give ample room for further investigations in the field.

The empirical evidence points to the fact that the citizens of Spain, Italy, Portugal and Greece react strongly on a deviation from trend growth. Hence, a positive stimulus to national life satisfaction is more likely to manifest itself if trend growth rates are overachieved. On average 40% of the variation of life satisfaction can be explained by a constant term and the deviation from trend growth. The other EZ countries do not show the same relationship. The reasons could be that the citizens of the other group perceive the world differently. High GDP levels might make citizens more independent from volatility in growth rates. Also development status, cultural differences and a special set of political constraints could be the reasons why behavior differs. Reason for the presence or absence of this effect might be explained solely with cultural, instead of economic factors. Spain,

Italy, Portugal and Greece show certain similarities as they are all southern countries with to a certain extent similar cultural backgrounds like a strong influence of the church and intense family ties. In addition, the configuration of the welfare model might have a similar impact on the adaptation to growth. Noteworthy is that the findings do not conclude that all citizens feel this way but simply that the country as a whole, or the majority of its citizens, responds accordingly.

Notably, the analysis has focused only on the cyclical component. Whether life satisfaction is also strongly impacted by the trend component of GDP growth is interesting but still opaque. So, the trend of GDP growth (*Trend*) which is given after the Hodrick-Prescott filter was applied, a constant factor γ_1 and the error term μ are correlated with life satisfaction indices (*LS*) at a certain time t . The equation to be tested is specified in the following form

$$LS_t = \gamma_1 + \gamma_2 * Trend_t + \mu \quad (6)$$

We can see in table 5 that the trend component of GDP growth seems to have a rather limited effect on the life satisfaction for G IPS countries. Only for Italy the significance of the coefficient is sufficient. For all other countries it is not significant and that's why it seems that the trend component of GDP has only limited importance (explanatory power) in (the variance of) happiness in these countries.

Table 3: Estimation of Equation (6) for GIPS

Country	γ_1	Significance of γ_1	γ_2	Significance of γ_2	R ²	Observations
Spain	5.06	0.000***	1.029	0.313	4.1%	36
Portugal	7.78	0.000***	0.617	0.09	14.1%	36
Italy	2.34	0.001***	0.616	0.042**	24.5%	36
Greece	6.88	0.000***	2.999	0.12	13.3%	30

*** = significant at the 1% level; ** = significant at the 5% level

Notes: Gross Domestic Product data from the OECD, seasonally adjusted to current prices of the national currencies. Aggregated life satisfaction data from the Eurobarometer Report of the European Commission dating back to 1975. Estimates of the coefficients of the linear model, the p-value of the corresponding t-test and R² are presented.

If we only focus on the relationship between growth and life satisfaction levels, the political consequences for the GIPS countries might be that economic prosperity and development should center on increasing returns instead of rapid growth. Consequently, GDP growth should be progressive instead of proportional or regressive. The ever increasing rates of growth surprise the population and continuously lift their level of life satisfaction during the process. In the proportional case the reality meets the expected growth rates and no positive or negative stimulus is given to satisfaction with life. The regressive approach would lead to a reduction in satisfaction levels because growth rates continuously dissatisfy expectations: the population would get used to the high growth rate of the first period and consequently expect it to continue. However, they will be negatively surprised in each following period because the growth rate will always be lower than they expect. This is true even though expectations will be lowered for each growth period.

If everything else remains constant, one monetary policy for the two country groups might lower life satisfaction levels. Adjustment processes are hindered and business cycles are more intense. Further, as GDP growth is valued differently a common currency creates problems in finding a compromise in this regard.

The second research question has been examined by my paper which got accepted by the journal *Society and Economy*. In general, it has become customary to divide European welfare systems into four models according to Ferrera (1998), Bertola et al. (2001) and Sapir (2005).

Sapir (2005) compared the four social models according to the benchmarks of efficiency (high employment) and equity (low risk of poverty) as we can see in table 3. On the one hand, Mediterranean countries score low on efficiency as well as on equity because their systems are unable to adequately reduce poverty and the system is living beyond its means as it has problems to motivate enough people to work and finance social expenses. On the other hand, Nordic countries score high on efficiency as well as on equity because in their system young and old are well integrated in the work force and the risk of falling into poverty is low. Continental countries can reduce poverty and hence create equity but are less well equipped to create sufficient high employment rates. Lastly, Anglo-Saxons

countries have strong activation measures and thus employment rates are high but lack an equitable system because the risk of falling into poverty is high.

Table 4: Four European Models according to Efficiency and Equity

		EFFICIENCY	
		<i>Low</i>	<i>High</i>
EQUITY	<i>High</i>	Continental	Nordics
	<i>Low</i>	Mediterranean	Anglo-Saxons

Source: Sapir 2005: 9.

As we can see the Mediterranean social welfare model is unable to create equity: the burden of unemployment and poverty is mainly on the young, the old and the uneducated. As unemployment is one of the key macroeconomic factors determining gross national happiness levels, it is important to note that Employment Protection Legislation (EPL) has a significant negative effect on employment. Sapir (2005:8) finds that UB has no impact on the level of unemployment; however, he states that “EPL is the key explanation of employment rates”. As most Mediterranean countries protect their workers with EPL instead of with Unemployment Benefits (UB) it is not surprising that they suffer from high unemployment rates, as well as extremely high youth unemployment rates. Structural reforms liberalising labour markets would put pressure on wages. This would result in higher employment and regained competitiveness.

As we have seen from the answer to the first research question, a group of countries (GIPS) showed a significant and strong correlation between trend GDP growth and life satisfaction. This suggests that the citizens of these countries get used to a certain growth rate. Certain groups of citizens can only find employment in boom times; this is especially true for the young, the old and the uneducated. These segments of society are also the ones which face the highest risks of falling into poverty. During economic expansion which is above trend growth these are lifted out of the poverty trap and life satisfaction levels rise. Other

countries in the EZ are more resilient to fluctuations in growth as their social welfare models are able to create equity. I conclude that this seems to be another strong finding for the inclusion of the Mediterranean as a fourth type of welfare state.

To analyze these findings deeper, the dissertation presents further regression analyses to test whether youth unemployment and in the end equity considerations play a dominate role in explaining why Mediterranean countries differ.

I used a multivariate regression analysis with more than 30 different variables. All socio-economic data were taken from the World Development Indicators database of the World Bank (2013). The BACKWARD as well as FORWARD function was used in order to select the variables which show the highest relationship with the dependent variable.⁴ In the forward method the algorithm starts with only one variable, the one with the strongest relationship with the dependent variable; then in each step the next best covariate (or candidate) – according to a partial correlation – is included in the model, but only if it has a significant role according to the corresponding t-test. The forward process loops as long as the next best candidate is not good enough to be taken into the model. In the case of the backward process, this starts by including all possible independent variables and then excluding one by one those which do not explain a significant part according to the t-test. Additionally, yearly life satisfaction data from the Eurobarometer report of the European Commission was used. As in the previous study the survey focuses on the question “How satisfied are you with the life you lead.” Answers given ranged from “very satisfied” to “not at all satisfied”.

An interesting pattern was found for the Mediterranean countries: for all of them youth unemployment was a strong correlate of life satisfaction; if the regression is run using the FORWARD function youth unemployment stays as only variable for Spain and Portugal. For illustration compare the simple regression outlined in equation 2: youth unemployment (*Youth_Unempl*), a constant factor and the error term μ were correlated with life satisfaction indices (*LS*) at a certain time t .

$$LS_t = \delta_1 + \delta_2 * Youth_Unempl_t + \mu \quad (2)$$

⁴ SPSS manual (IBM 2010), or any major statistics book e.g. Anderson et al. (2010) chapter 16.

Regression results can be found in table 4. It can be seen that Spain, Italy, Portugal, and Greece show significant and meaningful results: youth unemployment correlates with life satisfaction negatively and with a very high significance as the p-values are small. The results for Spain and Portugal are stronger as more than 60% of the variance can be explained by the equation.

Table 5: Regression Results for Equation (2)

Country	δ_1	Significance of δ_1	δ_2	Significance of δ_2	R ²	Observations
Spain	7.195	0.000***	-0.027	0.001***	73.6%	35
Portugal	6.143	0.000***	-0.025	0.000***	61.0%	27
Italy	5.368	0.000***	-0.063	0.027**	15.4%	38
Greece	6.169	0.000***	-0.028	0.034**	14.6%	31

*** = significant at the 1% level; ** = significant at the 5% level

Notes: Youth unemployment data taken from the World Bank database. Aggregated life satisfaction data taken from the Eurobarometer report of the European Commission dating back to 1973. Estimates of the coefficients of the linear model, the p-value of the corresponding t-test and R² are presented.

However, for Italy the FORWARD function indicates that Vulnerable employment (*Vul_Empl*), total unemployment (*Unempl_Total*) and household final consumption (*HH_Consum*) together correlate more strongly. The main argument for this is that the R² is 84.4% and consequently more variance can be explained. The regression results can be seen in equation 3. For Greece it seems that Vulnerable employment (*Vul_Empl*), Long-term unemployment (*Unempl_Long*) and Youth unemployment (*Youth_Unempl*) together correlate stronger. The main argument for this is that the R² is 86.3% and consequently more variance can be explained. The regression results can be seen in equation 4. In parentheses significance levels are given.

$$LS_t = 7.24 + 0.05 * Vul_Empl_t - 0.079 * Unempl_Total_t + 1.50E-12 * HH_Consum_t + \mu \quad (3)$$

(0.000) *** (0.000) *** (0.013) ** (0.043) ***

$$LS_t = 6.653 + 0.22 * Vul_Empl_t - 0.117 * Unempl_Long_t - 0.047 * Youth_Unempl_t + \mu \quad (4)$$

(0.020) ** (0.000) *** (0.014) ** (0.000) ***

We can see from the regression results that unemployment – especially youth unemployment - is one of the strongest correlates for life satisfaction in GIPS countries. In boom phases the economy can create jobs even for the young, the uneducated and the old. Hence, people are lifted out of poverty and life satisfaction levels rise. Since the Mediterranean welfare model is unable to create social equity the cyclical component of GDP has an influence on life satisfaction. Other European countries differ as they are better able to protect their citizens against adverse labor market outcomes. From these results my initial hypothesis is strengthened.

After the situation has been analyzed on a macroeconomic level the paper turns to investigate the cyclical component of GDP as well as the role of equity and poverty on an individual level. My approach is in line with the current research conduct of individual analysis, for instance compare Odermatt and Stutzer (2013). The effect of the cyclical component of GDP on individual welfare is analyzed by using reported life satisfaction data together with several macroeconomic and country specific variables. The hypothesis whether equity is the determinant which makes GIPS countries stand out from the rest of the EZ is studied. The analysis uses the GINI coefficient which measures inequality in the distribution of wealth inside a country. It ranges from 0 to 1, with low values indicating more equally distributed incomes. Further, the population living in poverty after redistribution is an important indicator for whether the hardships endured due to the unequal distribution of wealth are the cause of the previously found effect. The above mentioned data were obtained from the dataset of the World Bank (2013).

Additionally, I used repeated cross-sectional life satisfaction data from the Eurobarometer surveys. All surveys cover more than 2 million individuals from most of the European countries between 1970 and 2013. To narrow down the analysis on the impact of the current crisis in the EZ I selected the timeframe 2001 to 2011. Moreover, macroeconomic data taken from Eurostat (2013) statistics are exploited. Unemployment rates and inflation statistics going back several years into the past for most European countries can be found there. I used the “Harmonised Index of Consumer Prices” as well as the “Seasonally Adjusted Unemployment Rates” measures. Overall, my analysis was able to use a rich data pool with around 28 000 individual observations. This allows me to take into account the effects of macro-economic conditions on so far unobserved country specific effects.

With reported satisfaction with life as the dependent variable, I directly assess the consequences of macroeconomic changes for the proxy for individuals' welfare. I estimate country by country whether life satisfaction adapts to individual welfare and the effect of the GINI index and poverty rates while controlling for other macroeconomic variables. As higher levels of the GINI coefficient indicate higher inequality I include it with a negative sign in the regression. Hence, equation 5 gives us the regression:

$$LS_{ijt} = \varepsilon_1 + \varepsilon_2 * Cycle_{jt} - \varepsilon_3 * GINI_{jt} + \varepsilon_4 * Poverty_{jt} + \varepsilon_5 * Z_{jt} + \mu_{ijt} \quad (5)$$

The life satisfaction LS_{ijt} of individual i in country j at time t is regressed on a constant factor ε_1 , the deviation from the trend growth of GDP (*Cycle*), yearly *GINI* and *Poverty* data. As control variables country-level variables Z (unemployment, inflation) and an error term μ are included.

As we can see in table 5 all countries show a significant and positive relationship with the deviation from the trend growth of GDP. This is in line with my previous results and highlights the fact that citizens of Spain, Italy, Greece and Portugal react to a deviation from the trend growth of their country. If growth expectations are missed life satisfaction reacts. We see that the coefficient varies in size; however, I am not yet able to address this issue because the variability of GDP plays a role. Further tests would be important to see how the rate of variations impact life satisfaction. Next, the expected results in connection with the GINI index for Spain and Italy was observed as the coefficients show the expected signs and they are significant. However, for Portugal and Greece the significance level does not reach the required minimum plus the sign is the opposite from what would have been anticipated. The coefficients of the poverty measure show the assumed signs and are significant for Spain, Italy and Portugal. Nevertheless, the result for Greece was insignificant. Overall, we see R^2 levels between 12% and 50% which is between acceptable and excellent for the analysis of these rather big datasets.

Table 6: Regression results for equation (5) in the time series of 2001 until 2011 for GIPS

	Spain	Italy	Greece	Portugal
Cycle	8.787*** (6.744)	151.994*** (43.363)	85.013*** (11.423)	16.592*** (3.843)
GINI	0.140*** (5.669)	5.901*** (33.342)	-0.864 (-1.508)	-0.15 (-0.775)
Poverty	-0.630*** (-3.464)	-3.669*** (-4.511)	1.029 (1.023)	-0.113*** (-4.828)
Country FE	Yes	Yes	Yes	Yes
No. of observations	7048	6689	7000	7074
R ²	0.210	0.511	0.304	0.121

Notes: OLS estimations. T-values in parentheses. Gross Domestic Product data from the OECD, seasonally adjusted to current prices of the national currencies; Unemployment and Inflation statistics from Eurostat. Individual life satisfaction data from the Eurobarometer Report of the European Commission.

Significance levels: * 0.05 < p < 0.1; ** 0.01 < p < 0.05; *** < 0.01.

We can see in table 6 regression results of equation 5 for France and Finland, two countries for which the adaptation theory to the trend growth of GDP did not hold on an aggregated level. The results indicate that this is also true on an individual level as the *Cycle* component is not significant. For France the sign is positive but for Finland it is negative. The coefficient for the GINI index is positive for both countries but it is only significant for Finland, which suggests that higher inequality has a negative effect on Finnish people. Also poverty is very negatively correlated with life satisfaction in both countries, but only the Finnish data can show some significance. The regression controlled for economic factors like unemployment and inflation. The number of observations are above 7000 and therefore the R² levels are low (around 3%). The results are in line with the previously found ones but they cannot help to solve the puzzle of why GIPS countries differ.

Table 7: Regression results for equation (5) in the time series of 2001 until 2011 for France and Finland

	France	Finland
Cycle	11.0661 (1.521)	-27.440 (-1.664)
GINI	0.041 (1.442)	0.104* (2.289)
Poverty	-0.069 (-1.084)	-0.339*** (-4.511)
Country FE	Yes	Yes
No. of observations	7205	7062
R ²	0.033	0.041

Notes: OLS estimations. T-value in parentheses. Gross Domestic Product data from the OECD, seasonally adjusted to current prices of the national currencies; Unemployment and Inflation statistics from Eurostat. Individual life satisfaction data from the Eurobarometer Report of the European Commission. Significance levels: * $0.05 < p < 0.1$; ** $0.01 < p < 0.05$; *** < 0.01 .

These results emphasize and validate the previously found association in GIPS countries. However, for the purpose of explaining the effect found the analysis is still not perfect: on the one hand, the results of Spain and Italy point to the conclusion that inequality due to the special design of the welfare state plays a major role. On the other hand, Greece and Portugal show still some insignificant results in this area. To address these open issues the inclusion of further control variables such as individual socio-demographic characteristics could facilitate the analysis. For instance, the effect of age, sex, level of education, marital status, number of children in the same household, and the occupation of the respondent are important determinants of happiness and hence could improve the results. Further, the time frame of the analysis could be expanded: the years 2012 and 2013 could be included as well as years before 2001. The additional data would improve the analysis and improve the outcome. It would be also interesting to analyze further non-GIPS EZ member countries like Austria, Netherlands, etc. to make a distinction between the two groups and maybe even find further groups.

Despite this, other possible explanations of the association found between life satisfaction and a deviation from trend growth of GDP which are not yet ruled out could be included in

the regression: firstly, maybe it is not the welfare system as whole which is the crucial factor but just one specific part of it. Most convincingly, labor market institutions like the previously mentioned EPL could be the missing puzzle piece. Secondly, just because all countries with the association found belong to one welfare model does not mean that the welfare system or the inequality it brings is the driving force behind it. For example, certain cultural factors could be possible further explanations. For example, the regression should include either the Hofstede data or the Schwartz-data. Thirdly, the relatively low income of Greece, Portugal and Spain could be one explanation because Layard (2005) claims that higher income can boost life satisfaction just until a threshold level. As long as a country is below that threshold, focusing on higher growth rates can raise overall well-being. Higher income could make countries independent from economic growth and hence they behave differently. However, even if a country is developed beyond the threshold where income seems to lose meaning, sections of the population can be still endangered by poverty as distribution effects have to be considered.

To answer the third research question the dissertation follows the analysis of the current crisis in the EZ of Professor Hans-Werner Sinn (2013) from the Ifo institute in Munich. The economic calamity in Europe made headline news in 2010 when Greek government bonds reached high levels of interest payments. As the markets were not willing to fund Greece's large deficit and the huge amount of debt which had to be rolled over, governments and the IMF jumped in with bilateral help (Spiegel 2010). However, the market became extremely worried and reassessed the risks of other sovereigns in the EZ new. This led to the point at which Ireland and Portugal had to follow the same path as Greece and so they implemented official rescue programs. Soon after this, the Spanish banking system also found itself in trouble and was rescued as well. At that time this was simply referred to as a crisis of confidence which has its roots in a brief liquidity issue.

As the market reacted rather turbulently to the situation, the only institution which was able to react quick and effectively was the European Central Bank (ECB): firstly, after 2010 most of its monetary base was created by GIPS national banks and hence, the liquidity of Southern banks was sustained. Secondly, TARGET2 credit lines were used - indirectly and without parliamentary consensus - to provide credit for Southern Central Banks (Spiegel

2012). At the moment the amount of TARGET2 imbalances stands at around 657 billion euros (Ifo Institute 2014). Thirdly, the ECB purchased 116 billion euros worth of crisis countries' government bonds (ibid.).

The second pillar among the rescue institutions was the IMF and the European partner nations. They have already given credit and guarantees totaling 392 billion euros, a sum which could reach a potential 1.068 trillion euros if the European Stability Mechanism is fully used (ibid.).

It is worth mentioning that the current discussions about a fiscal union, a banking union or Eurobonds cannot solve the core issue of the lost competitiveness of certain countries. These remedies would only prolong the suffering and hinder the realignment. What we see is the creation of creditor and debtor nations in the EMU and the partnership of equals is broken. This destroys the common spirit of the bloc, as it is not the country's own elected parliament which decides on the budget and welfare provision of a country but the parliaments of creditor nations or a European bureaucratic institution such as the European Commission. Frey (2002) has pointed out the positive effects on life satisfaction of self-determination and direct democracy – the current development undermines these sources of happiness. A further danger is that such a development leads to nationalism and a hostile atmosphere between countries which in itself creates dissatisfaction.

But even if all debt of the GIPS countries were written off they would still import more than they export and their governments would spend more than they earned because all nations in trouble are subjected to a realignment problem of real wages due to a lack of competitiveness: after the Madrid Summit of 1995 interest rates in Europe converged due to the fact that the introduction of the Euro would abolish the exchange rate risk. Hence, easy credit created an inflationary boom and prices and wages were raised in Southern Europe.⁵ From 1995 until the start of the financial crisis in 2008 Greek prices went up by 18%, Spanish by 22%, Portuguese by 14% and Italian ones by 27% in comparison with the rest of the EZ (Sinn 2013:3,5). To reverse this trend and, eventually, to achieve competitiveness for the Southern countries the price increases must be reverted. Goldman

⁵ The creation of the Euro with its mandate for stable prices (close to but under 2% inflation per annum) and the low interest payments on perceived "riskless" government bonds managed to drive up imports and debt loads and governments postponed the necessary reforms modern globalization demanded. The result was the already mentioned loss of competitiveness as well as high government and household debt.

Sachs Economic Research (2013) published a study indicating that in order to achieve external debt sustainability Italy would have to lower its relative price level by around 10% but “Spain, Greece and Portugal will have to come down by 25 – 35%” (Sinn 2013:5).

This process can be carried out either by internal devaluation with austerity and reforms or by achieving the necessary realignment through an open devaluation.

The first option - internal devaluation - forces governments to stay on a restructuring path to lift the country out of its misery but the adjustment is hard and takes a long time: due to downward price stickiness it is extremely hard to implement the necessary price cuts with austerity measures to achieve competitiveness without forcing the country and its population into political protests and governability problems. Keynes (1960:267) and Friedman (1976:214) both agreed on the difficulty, and perhaps even the impossibility of internal devaluation. The unavoidable recession with cuts in welfare programs and dismissal of government employees creates uncertainty, high unemployment and negative growth. Consequently, lower life satisfaction levels will prevail until the turnaround is achieved, which is unlikely to happen before 2020 in Greece according to OECD predictions (Greekreporter 2013). As pointed out before, the realignment needed in Greece and Portugal would amount to around 30% or more, which can only be achieved if wages and government subsidies are cut drastically, which would create high unemployment and social tensions. “In Greece, the labor market situation today is already hardly sustainable, with youth unemployment exceeding 50% and an official rate of unemployment moving towards 30%. This catastrophe results from the attempt to try the impossible (Sinn 2013:12).” Other countries face similar, although less bleak, prospects.

The second possibility - of a realignment of real wages - can be achieved by external devaluation of a lower exchange rate with import and export partners. However, the current high level of the euro to the dollar of 1.3652 (Finanzen 2014) is undermining the competitiveness of GIPS countries with their non-EZ partners. By entering the EMU each nation gave up their direct influence on monetary policy and they are thus unable to influence the exchange rate. Hence, only a withdrawal from the EMU could provide the needed realignment of prices in a quick and nationwide fashion, but with catastrophic prospects for the real economy, as a new local currency would quickly lose purchasing power compared to the Euro currency and most of the Euro liabilities of the country would

have to be restructured and a partial default would occur. This would have extremely negative effects on foreign direct investment and financial institutions' market access and lead to turmoil in the household and government debt markets. The output of the country would decline rapidly to a much lower level. To avoid a humanitarian catastrophe the European Union and other organizations could provide aid for medical imports and other assistance of the last resort. In this context it is important to mention my findings that once citizens became accustomed to the lower level of GDP and the negative economic prospects, adaptation and copying effects would stabilize life satisfaction levels. Furthermore, this situation would not last for long as competitiveness would be restored. As the prices of imported products would rise new employment opportunities would open up as domestic production became profitable. The tourism sector would be boosted as real prices for services and accommodation would decline. Government finances could be brought in check as promises such as high retirement liabilities or government pay checks could be lowered in real terms with higher inflation. Furthermore, capital from outside would flow into the country as land prices and company stocks would be cheap. After some time the economy would grow again from a lower starting point – slowly but with accelerating returns. Life satisfaction levels would be raised as low growth expectations would be over-satisfied each year.

Hence, we can discuss two possible growth paths at the example of Greece. As mentioned before, according to an OECD study (Greekreporter 2013) the turnaround in the case of internal devaluation is not likely to occur before 2020. Thus, in this scenario the economy is expected to witness high unemployment rates and could stay depressed with low or negative growth for at least another 6 years until the bottom is reached after 2020. However, the economic forecast remains rather uncertain as the country has to increase taxes and reduce spending. Aggregated demand is likely to stay low until competitiveness is regained after 2020. In the second scenario Greece will exit the EZ in 2014. It is projected by the chief economist of Citigroup (Businessinsider 2012) that GDP would contract by 10% in the first year of Greece leaving the EZ. However after the initial hit to the economy growth would stabilize around that level and soon after would begin to grow again as pointed out in the analysis above. At first growth would be low but it is likely that it would shape itself in a progressive fashion. Moreover, unemployment rates would

dramatically go down as own production would be efficient again. After few years, the level of the first scenario would be overachieved. One positive key feature of the second scenario would be that the economic outlook would be rather certain after the first hit from the disintegration would be absorbed. Sinn (2013:14) concludes that “the dangers of an exit are minuscule compared to the horror resulting from a non-exit.”

5 Theses and Results of the Dissertation

The motivation of my research was that despite several decades with significant GDP growth life satisfaction levels have not increased, for example for Japan, the US and European countries like Belgium. Several scholars have debated this puzzle and no convincing line of thought has been able to dominate the field. The initial idea of this thesis was that citizens would get accustomed to the level of GDP growth and only a deviation from that expected level would have an impact on well-being. Hence, the important controversy about the impact of GDP on happiness was aided by my research and I could supplement the existing literature with a novel approach. The results of this study were that two country groups emerged. GIPS countries differ from the rest of the EZ. In this context the theory of welfare models was reviewed. As possible explanations equity, culture, labor market institutions and the initial level of income were considered. This is reflected in the analysis of several sophisticated econometric models as well as in logical analysis. The current sovereign debt crisis in Europe focuses on Mediterranean countries which lost competitiveness. This issue is discussed with special regard to my findings.

In the following the initial hypotheses are revisited and I elaborate whether the results can confirm them. Additionally, other findings are mentioned based on the further analysis.

Impact of the Cyclical Component of GDP

An association between Eurozone member countries citizens' life satisfaction and the cyclical component of GDP exists for Spain, Portugal, Italy and Greece but not for others EZ countries. Hence, we can see two country groups in the Eurozone of which one adapts to a deviation of trend growth and another one which does not.

My econometric results (see Wiese 2014b) indicate that EZ members differ in the extent to which they experience a deviation from trend growth: Spain, Italy, Portugal, and Greece are significantly impacted, but other countries, such as Ireland, the Netherlands, France, Austria, Luxembourg, Belgium and Finland are not. Consequently, in GIPS countries a positive stimulus for national satisfaction will manifest itself if growth rates over-achieve

the expected trend. On average 40% of the variance in life satisfaction can be explained by the cyclical component of GDP. Higher GDP levels, more equal distribution of wealth and different social norms might make citizens of other EZ countries more independent from volatility in growth rates. Furthermore, the trend component seems not to play an important role in GIPS countries

I can add to the existing literature that GIPS countries, *ceteris paribus*, are expected to profit from increasing returns instead of rapid growth in terms of life satisfaction scores. Thus, progressive instead of proportional or regressive GDP growth is advisable: increasing rates of growth surprises the population and constantly lifts their level of well-being during the process. However, the regressive approach would lead to a reduction in life satisfaction levels as growth rates always dissatisfy expectations. My analysis is also able to show that other EZ member countries are independent from this effect and the cyclical component of GDP has no significant effect on their citizen's life satisfaction.

Inequality in the Mediterranean Welfare Model and Life Satisfaction

The causes of the different associations in the Eurozone can be partly explained by social welfare models and the resulting variations in inequality levels in the systems. Further econometric analyses showed that youth unemployment is an important factor for life satisfaction in Southern European countries. Moreover, a study on an individual level provided evidence that poverty and inequality correlate negatively with life satisfaction.

We have seen that the citizens of Spain, Portugal, Italy and Greece react on the cyclical component of GDP. Due to a high level of social stratification in the welfare model of the Mediterranean countries it is rather difficult for the young, old and uneducated to find employment when the economy is declining. Consequently, these segments of society face higher risks of falling into poverty. They are lifted out of the poverty trap mainly during economic boom times as, for instance, the need for additional employment intensifies and so satisfaction scores are lifted. It seems that in other EZ countries social welfare models are able to create equity and consequently their citizens are more resilient to fluctuations in

growth as they are better protected against poverty. Based on my results I can add further evidence to the concept of a “Mediterranean” or “Latin Rim” welfare model as a fourth type of social welfare models.

From my regression results in connection with aggregated life satisfaction and youth unemployment (see in Wiese 2014c) I can see the importance for high employment rates for the GIPS countries. Additionally, with reported satisfaction with life data from repeated cross-sectional surveys of the European Commission as the dependent variable, I have directly assessed the consequences of the cyclical component of GDP on individual data. While controlling for other aggregated economic variables I estimated for the GIPS countries as well as for France and Finland whether individual life satisfaction reacts to a deviation of the trend growth of GDP as well as the effect of the GINI index and poverty rates. I could show that GIPS countries react to the cyclical component even on an individual level. Furthermore, I could proof that inequality and poverty can somewhat explain the variations in the association and hence, the role of welfare models is strengthened.

However, more specific characteristics of welfare models like special labor market institutions could also be causing the variations. Further, the lower initial level of income in GIPS countries especially in the 1980s and 1990s in comparison with other European countries has been considered as a possible explanation: they might not have reached the threshold where income becomes rather unimportant. Furthermore, cultural differences as the reason why adaptation behaviour differs have been analyzed. However, future research could focus on a deeper analysis of the GIPS countries in connection with their common culture and their similar labor market institutions. To test the effect of culture the use of Hofstede or the Schwartz-data is advisable and to test the impact of labor market institutions employment protection legislation should be considered.

Implications from my Results for the Current Crisis

Implications from my results for the design and future of the Eurozone for some Mediterranean member countries are that if the road to regain competitiveness

through internal devaluation is too long disintegration might be advisable. *Ceteris paribus*, high unemployment, depressed economic output and cuts in government spending as well as tax increases would keep life satisfaction levels down. However, leaving the Eurozone would lower GDP levels and life satisfaction in the short run but could enable positive and progressive growth opportunities thereafter. As a result continuous increases in life satisfaction levels would be expected in the medium run due to positive cyclical components.

The current economic crisis in the EZ is centred on the question of how certain Mediterranean countries like Greece can regain competitiveness: on the one hand, we see that internal devaluation would depress the country for a long period. Thus, the slow but accelerating economic downturn would reduce satisfaction levels for a long time, especially if false promises of growth and prosperity are communicated and consequently expected. On the other hand, a quick exit, the reintroduction of an own weak currency and possible defaults would devastate living standards and growth expectations immediately. This negative shock would have a huge impact on happiness levels in the short run, but adaptation and coping processes would stabilize the situation. Additionally, the countries would regain competitiveness and consequently recover and grow - slowly but with increasing rates in a positive upward spiral. Each year growth expectations would be over-satisfied and life satisfaction levels would be boosted. In a nutshell it seems that it would be better to make a painful break than draw out the agony.

However, these results have to be seen as a *ceteris paribus* analysis as certain political and socio-economic factors will be influenced by such a dramatic move as leaving the EZ. The difficulty in forecasting these is not within the scope of an economic PhD thesis. Further, the recent analysis should only be seen as an input for the contemporary discussion – the GIPS countries and the GIPS citizens have to decide themselves what is best for them and have to balance the short term and the long term costs and benefits.

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- Wiese, T. (2014b): Analysis of the Trend Growth of GDP and Life Satisfaction in the EMU. Accepted (in 2013) and forthcoming in *Acta Oeconomica*.
- Wiese, T. (2014c): Explanation of the Trend Growth of GDP and Life Satisfaction in the EMU: The Impact of Welfare Regimes. Accepted (in 2014) and forthcoming in *Society and Economy*.

List of Publications and Lectures Related to the Dissertation

Articles:

- Wiese T. (2013): Notes on Biodiversity Conservation and Declining Discount Rates. *Acta Beregsasiensis* 12(2013)/1: 211-220.
- Wiese, T. (2014): Analysis of the Trend Growth of GDP and Life Satisfaction in the EMU. Accepted (in 2013) and forthcoming in *Acta Oeconomica*.
- Wiese, T. (2014): A literature review of Happiness and Economics and guide to needed research. Accepted (in 2013) and forthcoming in *Competitio*.
- Wiese, T. (2014): Explanation of the Trend Growth of GDP and Life Satisfaction in the EMU: The Impact of Welfare Regimes. Accepted (in 2014) and forthcoming in *Society and Economy*.

Conference lectures:

- Wiese, T. (2013): Analysis of the Trend Growth of GDP and Life Satisfaction in the EMU. EHERO Conference: “Advances in Happiness Economics”, Erasmus University Rotterdam, Holland, 28 & 29 October 2013.
- Wiese, T. (2013): Analysis of the Trend Growth of GDP and Life Satisfaction in the EMU. EINCO Conference: “European Integration – New Challenges”, Faculty of Economic Sciences, University of Oradea, Romania, 24 & 25 May 2013.

Lectures and Seminars conducted:

- Wiese, T. 2011/12. Europe in Crisis. Held at the Debreceni Egyetem Közgazdaság- és Gazdaságtudományi Kar.
- Wiese, T. 2011/12. Studies in Europe. Held at the Debreceni Egyetem Közgazdaság- és Gazdaságtudományi Kar.
- Wiese, T. 2012/13. Current Problems of European Economic Policy. Held at the Debreceni Egyetem Közgazdaság- és Gazdaságtudományi Kar.
- Wiese, T. 2013. Happiness and Economics. Held at the Debreceni Egyetem Közgazdaság- és Gazdaságtudományi Kar.
- Wiese, T. 2013/14. Happiness and Economics. Held at the Debreceni Egyetem Közgazdaság- és Gazdaságtudományi Kar.
- Wiese, T. 2014. Happiness and Economics. Forthcoming at the Corvinus University Budapest.

Notes: