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Subjective Well-Being in Times of Crisis

Evidence on the wider impact of economic crises and turmoil on subjective well-being

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Subjectief welzijn in tijden van crisis
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onrust op subjectief welzijn.

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Glossary

Objective well-being (OWB): Objectively measured external conditions that are necessary for individuals to thrive (examples are income, life expectancy, and education level).

Subjective well-being (SWB): *'The degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably'* (Veenhoven, 1984).

Euro-crisis: The economic crisis that has continued in many EU countries since 2010.

Arab Spring: A series of violent and non-violent demonstrations and anti-government uprisings in the MENA region in 2010.

MENA: Middle East and North Africa region. According to the World Bank, the region includes the following countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, Palestine, Tunisia, the United Arab Emirates and Yemen.

Developing MENA: A term referring to the following countries: Algeria, Djibouti, Egypt, Iraq, Iran, Jordan, Lebanon, Libya, Morocco, Palestine, Tunisia, and Yemen.

Shared prosperity: Formally defined as '*fostering income growth of the bottom 40 per cent of the welfare distribution in every country*'. It is *'measured by annualized growth in average real per capita consumption or income of the bottom 40 per cent*' (World Bank, April 2013; Basu, 2013). The concept of shared prosperity is also closely linked to the notion of income inequality.

Shared well-being: Making progress with **shared prosperity** based on subjective well-being measures.

Multidimensional poverty: As defined by the World Bank and IMF, "*The Multidimensional Poverty Index (MPI) is an adjusted headcount indicator that measures the incidence and breadth of those who are deprived in multiple dimensions*" (World Bank and IMF, 2015, p.41). The Multidimensional Poverty Index involves 3 dimensions: health, education, and standard of living.

Chapter 1| Introduction

"Happiness is the meaning and the purpose of life, the whole aim and end of human existence."

— Aristotle

1.1 Background

The first decade of the 21st century witnessed two major events in Europe and in the MENA (Middle East and North Africa) region. The unforeseen nature of the two occurrences and their immeasurable consequences became relevant for wider debates and issues related to economic and social progress.

The first large-scale event, known as the Euro-crisis, followed the failure of the banking system in the USA and Europe in 2007-2008. Historical data show that this was the most severe crisis Europe has experienced since the economic hardship at the end of the Second World War, and it has been listed among the most intense systemic crises (IMF, 2009). Only three years later, in 2010, the real economy had shrunk by 8% and the European unemployment average had increased from 7.2% in 2008 to 9.6% (Eurostat, 2016). The financial crisis and the sovereign debt crisis that followed had detrimental consequences for EU citizens. The economies of Mediterranean countries such as Greece, Spain and Portugal were left in ruins. Greece lost more than 40% of its GDP and unemployment reached 26.3% in 2014 (Eurostat, 2016). Spain, the third largest economy in Europe, struggled with an unprecedented level of unemployment. Portugal received a rescue deal of 1.3 billion to halt the collapse of its banking sector. The shrinking of the economy caused a clear deterioration in living conditions among the European population. In 2014, 121.9 million people were in poverty or at risk of social exclusion risk in the EU, and material deprivation, as measured by the inability to face unexpected expenses, increased by 4.4 points between 2008 and 2014 (see also "*Europe 2020 indicators - poverty and social exclusion*", Eurostat, 2016).

The second event, known as the "*Arab Spring*", refers to the social turbulence observed in a neighbouring region, MENA. In 2010, a series of protests started in many countries in North Africa, including Tunisia, Egypt, Libya, Yemen and Syria. The Arab

Spring began with both violent and nonviolent demonstrations by citizens who were dissatisfied with the regime and the living conditions at the time. These social uprisings caused major destabilization in the region[1]. This unexpected phenomenon occurred despite the economic progress in the region. This progress was recorded based on several indicators of economic performance and social progress, including inequality, hunger and literacy rates (Iqbal and Kiendrebeogo, 2015).

During the same decade, reforms in the standard methods and tools used to capture economic performance and social progress were introduced. Extensive discussions among policymakers, researchers and the general public focused on the way in which development is assessed and the wider causes and consequences of socioeconomic phenomena are evaluated (Stiglitz, Sen, and Fitoussi, 2010, OECD, 2013). Until recently, economists preferred measuring economic performance and social progress exclusively by tracking GDP. Currently, this approach is being criticised for ignoring other non-monetary aspects of welfare. There is also criticism of the statistical indicators being more focused on monitoring the markets and less focused on monitoring social welfare (Stiglitz, et al., 2010). For instance, national income has been found to be valuable in the assessment of economic progress, but it has been less useful in capturing human progress (Stiglitz et al., 2010). Accordingly, there are large discrepancies between growth in income (measured by GDP growth) and how individuals perceive changes in their income. These differences are said to exhibit features described by human psychology or comparison theories (Stiglitz et al., 2010).

Two major initiatives, *The Better Life Initiative* and the *Beyond GDP movement*, undertaken by the OECD (OECD, 2011) and the European Commission (EU Commission, 2009), respectively, have brought the topic into the public discourse. Both reports include an extensive discussion on the usefulness of objective measures of progress, such as GDP, and their weaknesses in reflecting other socio-economic phenomena. The product of the criticism is the acknowledgement of the importance and necessity of complementing the

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[1] In Egypt and Lebanon, the Arab Spring events ended with a violent regime change, where military regimes took over the governments. In Tunisia, the regime change was relatively peaceful, while in Syria, the turbulence was followed by a civil war. The Arab Spring was a phenomenon that took many by surprise and led to unprecedented instability in the area.

existing metrics of development that are more inclusive of the social aspects of progress, with a special focus on subjective well-being (SWB).

Long before the aforementioned actions, SWB had already received substantial attention by researchers (Easterlin, 1974; Frey and Stutzer, 2002a; Di Tella, MacCulloch and Oswald, 2003; Blanchflower and Oswald, 2004; Stevenson and Wolfers, 2008). SWB is defined as *'the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably'* (Veenhoven, 1984). It is measured in several international surveys where individuals rate how satisfied they are with their life or how happy they are as a whole. Unlike objective measures of progress, which purely reflect preconditions for a good life, SWB measures are inclusive of the outcomes of a good life (Veenhoven, 2000).

Many economists now concur that along with income-based metrics, SWB or subjective judgements of how well we do in life are valuable sources for monitoring and evaluating how countries perform (Oswald, 1997; Di Tella, 2003; Blanchflower and Oswald, 2004). To that end, over the last three decades, economic research has focused on measuring the effect of macroeconomic conditions on life satisfaction (Di Tella et al. 2003), examining several measures of wealth and subjective well-being, and exploring the relationship between economic development and happiness (Easterlin, 1974; Oswald, 1997; Stevenson and Wolfers, 2008).

The literature on whether economic development is accompanied by respective progress in society is rich (Easterlin, 1974; Oswald, 1997; Stevenson and Wolfers, 2008). However, there is limited evidence on how SWB measures relate to macroeconomic outcomes before or during a crisis. This dissertation focuses on empirical research of SWB measures during crises. Focusing on the crisis context, the European recession and the Arab Spring are two remarkable examples where the use of SWB measures can be highly significant for two reasons.

First, in the case of the Arab Spring, the economic progress enjoyed by most countries of the MENA region was expected to be accompanied by increased levels of SWB, as improvements in material progress provide individuals with the resources to thrive. Therefore, increased income and/or higher consumption implies higher standards of living and constitutes the foundation for a good life. However, that was not the case for the MENA countries, where economic progress was unable to establish life satisfaction (Figure 1).

Despite the observed progress in objective terms, life satisfaction deteriorated in MENA countries, indicating a discrepancy between objective economic progress and social progress.

Figure 1: Economic Progress and SWB outcomes.

Arab Spring protests
(2010)

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┌─────────────────────┐        ┌─────────────────────┐
│  Positive Economic  │───────▶│  Unexpected SWB      │
│  Growth             │        │  losses              │
└─────────────────────┘        └─────────────────────┘

┌─────────────────────┐        ┌─────────────────────┐
│  Negative Economic  │───────▶│  Heterogeneity in SWB│
│  Growth             │        │  losses              │
└─────────────────────┘        └─────────────────────┘
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Euro Crisis
(2008)
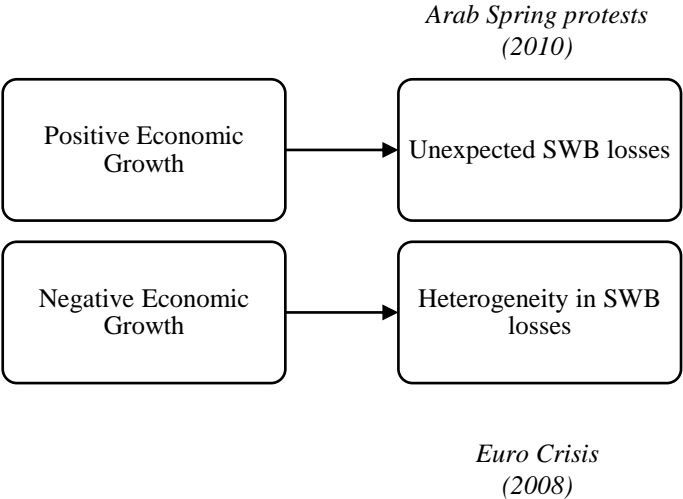
Second, considering recessions and the general consequences of economic downturns on the deterioration of living standards, it would be presumed that these are accompanied by decreases in life evaluation. Recessions and their negative consequences for life satisfaction, including loss of income and unemployment, are also related to psychological costs (Veenhoven and Hagenaars, 1989; Gallie and Russell, 1998). Generally, when the preconditions of being satisfied with life deteriorate, SWB is predicted to decrease. The emergence of a large body of literature in economics shows, for instance, that unemployment, loss of income and increased inflation, which are all economic outcomes that usually characterise a recession, are negatively related to SWB (Di Tella, MacCulloch., and Oswald, 2001; Winkelmann and Winkelmann,1995; Frey, and Stutzer, 2002, 2010).

However, other theories exist in support of alternative views with regards to SWB outcomes during crises. Among the most dominant theories offered in the field to support the notion that SWB measures might not be greatly influenced by a crisis are adaptation

theory (Helson, 1964) and social comparison theory (Festinger, 1954). Adaptation theory suggests that individuals tend to adapt to new circumstances by changing their aspirations. This adaptation process can be captured by SWB measures that "return" to their set-point shortly after an unfavourable event. The adaptation process that might be in play during an economic downfall, for instance, suggests that individuals will change the way they evaluate their lives overall; therefore, small losses or gains in SWB can be observed only in the short-term. Social comparison theory highlights the importance of "relative" instead of "absolute" comparisons. It suggests that individuals evaluate their own situation based on a reference group. This reference group might be framed based on geographical proximity, income levels or social circle. Therefore, according to the social comparison theory, a negative event that influences individuals and their respective comparison groups equally will not have a large impact on SWB due to the relative comparisons people tend to make.

On the other hand, the empirical examination of life evaluation during the EU crisis of 2008 reveals large discrepancies in how countries responded in terms of happiness (WHR, 2013). In some regions, the crisis was not very painful, while in other regions, the crisis had damaging effects in terms of happiness. In some regions, the effects were found to be very persistent (Greece, Spain and Portugal), and life evaluation measures had a consistent downward slope. In other regions, the negative trends in life evaluation were only observed for shorter periods of time and were less intense.

The unexpected SWB losses prior to the Arab Spring and the heterogeneity in SWB responses during the Euro-crisis (see Figure 1) are not necessarily in line with the expectations of the alternative explanations of adaptation and comparison theories. Without questioning the explanatory power of the adaptation or social comparison phenomena, I argue that the aforementioned processes may have been at play when other contingencies were present. For instance, individuals might quickly adapt to their happiness levels after a negative event or change their reference groups under the presence of other circumstances e.g., high levels of social capital (Helliwell, Huang and Wang, 2014).

This disparity signifies the likelihood that some other economic, political or social conditions are relevant in explaining how SWB measures the sense that these factors can amplify or mitigate the negative effects of a recession. It also signifies the urgency to empirically examine how SWB is impacted during crises.

Therefore, this dissertation attempts to empirically examine under which circumstances economic development is a prerequisite for well-being and whether there are particular conditions that satisfy well-being during hardships. To this end, this dissertation uses SWB indicators to answer a series of questions related to two types of crisis: 1) social uprisings and 2) economic crises and negative shocks (see Chapter 6 for a discussion on the definition of crises).

1.2 How do we measure progress? - The value of SWB.

Progress in a society is traditionally measured in economic terms by their respective indicators, e.g., GDP growth, changes in income and unemployment rate. Indeed, the level of economic development in a country reflects the living conditions of its population, as it suggests, e.g., improvements in terms of material possessions. However, GDP, which is the dominant indicator of economic development, was designed to track market production, and while it has proven to be a powerful tool in that respect, it is less suitable for measuring social progress (Stiglitz et al., 2010).

However, aggregate income growth is insufficient to make inferences about human well-being. According to Amartya Sen's capability approach, economic prosperity is only one of the means for pursuing a good life, and most importantly, improvements in average growth do not cause respective improvements in human life. In the capability approach, Sen (1992) argued that progress can be achieved if we aim to improve people's capabilities or the freedom to choose a life. Some of the capabilities might be very basic, such as covering basic needs of food and shelter, while others might involve literacy and education.

Additional indicators were introduced to complement the existing income-based performance measures. Inequality, access to health and infrastructure, education and literacy rates, mortality, low crime rates, the Human Development Index and quality of governance are some of the numerous alternative indicators that account for non-material progress, which is generally not reflected by income-based proxies (World Bank and IMF, 2015).

However, the most recent concerns about our inability to capture our state of being are related to some of the shortcomings of the objective indicators of material and non-material progress (an extensive discussion is provided in Chapter 1.1 of this dissertation).

The dominant feature of the objective indicators of progress is that they embody the preconditions (opportunities in the external environment or the *liveability of the environment*) for a good life (Veenhoven, 2012). These indicators incorporate all of an individual's material and non-material resources and signal the opportunities that exist in order to thrive, such as low inequality, economic prosperity, low crime rates and access to healthcare.

On the other hand, objective indicators have less power in showing how these conditions are experienced by individuals. SWB measures refer to the outcomes as evaluated by individuals and is defined by Veenhoven (1984) as *'the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably'* (Veenhoven 1984, Chapter 2). A high SWB indicates not only that external social and economic conditions are favourable (conditions) but also how individuals experience them (outcomes). A common distinction is made between the affective and cognitive components of SWB. The affective component refers to the frequency of experiencing positive and negative feelings, also known as "affect", whereas the cognitive component refers to the cognitive evaluation of the life as a whole or aspects of it (Diener et al. 1999; Veenhoven 2012). The cognitive aspect, which captures the overall judgements about one's state, is the focus of research in economics, where the terms happiness and life satisfaction are often used interchangeably.

SWB may provide information not easily observed otherwise, and it can be used as a complement for income-based metrics of well-being. However, SWB indicators have their own limitations, and their quality has often been criticized. A first concern is questionnaire design and different response formats, where SWB measures are found to be sensitive to. The sensitivity of SWB measures in phrasing and ordering of the questions can be easily handled with consistent survey design. Other concerns relate to the validity and reliability of SWB measures. Regarding reliability, for instance, cultural biases or socially desirable responses might distort SWB data. However, there is evidence that individual-level responses do not yield biased results in the analysis of SWB determinants (Krueger and Schkade, 2007; Helliwell, 2008). Regarding reliability (consistency of results), many test-retest scores of SWB measures show that they are well above the acceptable reliability thresholds (for a detailed discussion, see OECD, 2013).

Furthermore, the aforementioned concerns become relevant only when they significantly influence the quality of a measure systematically, a problem that is usually eliminated in large samples. Although SWB measures are far from perfect, given that, like other measures, they might suffer from measurement errors, they should not be excluded from analysis, since they carry valuable information and produce meaningful patterns (Diener, Inglehart and Tay, 2012).

The empirical investigation of the performance of income-based metrics and SWB indicators would further bridge the gap in our understanding of what matters for progress. Specifically, a critical aspect remains the identification of the factors that explain the gaps between economic progress and human progress, an aspect that is discussed in Chapter 2.

1.3 SWB on the eve of the Arab Spring.

A comparison between income-based metrics of progress and subjective-based metrics in assessing progress with shared prosperity, as discussed in the previous section results in four cases where (1) positive economic performance goes hand in hand with improvements in SWB and (2) negative growth in income is related to a negative growth in SWB measures. In that respect, we can conclude that the two measures perform consistently in the assessment of development. There are cases, however, in which (3) deterioration in monetary performance is associated with improvements in SWB and cases where (4) improvements in monetary performance are unrelated to decreases in SWB outcomes. The last two cases, where anomalies between monetary and non-monetary dimensions of progress occur, suggest the presence of other relevant conditions that foster or discourage simultaneous improvements.

The latter case seems to identify some of the developing MENA countries (see Chapter 3), where, despite progress in economic and social development in the 2000s, there was an increasing dissatisfaction with life among the population. At the end of the decade, these countries ranked among the least happy economies in the world—a situation that fits the so-called "unhappy development" paradox, which is defined as declining levels of happiness at a time of moderate-to-rapid economic development.

Many development economists were taken by surprise when observing the Arab Spring uprisings. They struggled to identify additional insights into other factors that might have triggered social turbulence. While much of the discontent was explained by the broken social contract—which previously established development by providing jobs in the public sector and subsidies for food and oil in exchange for political support—the exact sources of dissatisfaction remain unknown. This is partly due to the limited capacity of objective conditions in identifying the sources of social discontent related to this change.

To this end, I empirically investigate the relevant aspects for explaining dissatisfaction despite economic progress and shed light on the investigation of circumstances under economic development as a prerequisite for well-being.

1.4 SWB in times of economic crisis.

Substantial research in the field of happiness economics is devoted to the effect of macroeconomic conditions on happiness. Losses in GDP per capita, increased unemployment and inflation have a detrimental impact on SWB (Di Tella et al., 2003; Frey and Stutzer, 2010). Substantially less research is dedicated to SWB in times of crisis or external economic shocks, and findings on how SWB measures behave during economic downturns are diverse.

On the one hand, research shows that economic shocks and their subsequent changes in macroeconomic determinants are hardly reflected by SWB measures (Deaton, 2011). Sharp declines in happiness following a recession are found to be restored after a short period of time, implying that individuals adjust to new circumstances (Graham, C., Chattopadhyay, S., and Picon, M., 2010). These findings are supported by evidence from the US population, and the financial crisis of 2008 and is partly confirmed from evidence after the collapse of the Icelandic banking system in 2009, which led to decreased income and increased unemployment (Gudmundsdottir, 2013). During the crisis in Iceland, small declines in SWB were reported; however, these factors were not found to drive losses in happiness.

On the other hand, another part of the research suggests a sizeable impact of an economic downturn on life evaluation. The World Happiness report of 2013 (WHR, 2013) provides an overview of SWB trends during the global economic crisis. In Western Europe,

six countries experienced increases in SWB, while seven countries suffered the greatest losses in SWB between 2005 and 2007 and between 2010 and 2012. The Southern European countries (Spain Italy, Greece and Portugal) suffered greater losses than could be explained by the high unemployment and losses in income. The negative impact of the Euro-crisis on life evaluation was not only sizable but also persistent in some EU regions. In other areas of Europe, the discontent was generally limited and observed only in the short-term.

There are several factors that could contribute to a widening of the happiness gap among countries. First, the absolute losses in unemployment and income were unequal among EU countries. Therefore, the expected influence on SWB is dissimilar. Some countries lost almost 40% of their GDP, while in other cases, the losses were less dramatic. Second, the adaptation phenomenon might have been in play within countries. Some individuals might have adapted quicker to the changing environment compared to others. Third, future expectations are found to shape current happiness functions. Hence, dissimilar expectations might further explain the happiness gap. Fourth, according to social comparison theory, SWB might not have been greatly influenced during the crisis because individuals might have evaluated their lives relative to their peers.

Still, the differences between actual macroeconomic conditions such as income, unemployment and inflation and how these are experienced (perceptions) are so great that they exceed human psychology and therefore cannot be solely attributed to adaptation and social comparisons. In some cases, the gaps have even weakened the confidence in official statistics (Stiglitz et al., 2010).

In line with these arguments, the WHR (2013) suggests that income loss and unemployment had limited power in fully explaining the differences in SWB changes found between countries (WHR, 2013). This supports the view that other circumstances laid the ground for the how economic crises are experienced. It was concluded that "*Countries which exceeded the expected happiness loss from the economic crises were undergoing some other combination of economic, political and social stresses*" (WHR, 2013).

Figure 2: SWB moderators during economic crises.
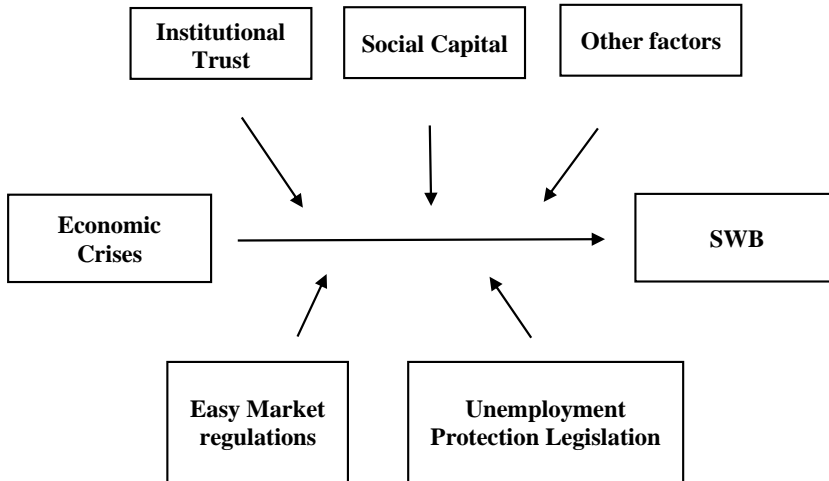
Figure 2 summarizes the state of the literature on the moderators of SWB during economic downturns. The literature on SWB *moderators* during crises identifies the differences in the underlying quality of the social fabric, including social support and trust, with institutional quality having an alleviating impact (WHR, 2013). Further literature exploring crisis moderators focuses on other factors or social circumstances that emphasize the negative effects of economic recessions or hide them. However, few factors have been identified as compensating forces during crises. These include social capital and institutional trust (Helliwell, 2013), easy market regulations (Bjørnskov, 2014) and the presence of unemployment protection legislation programmes (Carr and Chung 2014; Wulfgramm, 2014).

The aforementioned indicators have proven beneficial for SWB due to their inherent power to protect human well-being, allowing individuals to cope better with adversities but unfortunately, there is no systematic framework that can help identify crisis moderators. To this end, this dissertation adopts the contingency approach (Fiedler, 1964), whose origins can be found in management studies, in order to further identify SWB moderators and

provide answers related to the second component of my initial question of whether there are particular conditions that satisfy well-being during hardships.

1.5 Research Objectives and Implications

Research on SWB related to the causes and consequences of socioeconomic phenomena such as social uprisings and economic crises is limited, and the mixed findings can be attributed to the complexity of the underlying forces driving the human experience in times of crisis. The theories developed in the field of happiness economics stress the importance of accounting for human psychology in explaining happiness trends, such as adaptation mechanisms, shifts in expectations and social comparisons mechanisms, however, these theories alone explain only part of how humans experience positive or negative progress, and they account even less for the circumstances or pre-conditions under which these mechanisms are at play.

Generally, the aim of this dissertation is to go beyond the examination of objective factors for measuring progress by complementing them with subjective factors to evaluate under which circumstances economic development is a prerequisite for well-being and whether there are other conditions that can satisfy well-being during hardships.

More specifically, the thesis has three **objectives:**

The first objective is to explore the relative performance of an income-based indicator of prosperity compared to a SWB indicator of prosperity and to identify what possibly drives their differences. The aim of this exercise is to improve our knowledge on the objective and subjective dimensions that can be relevant in explaining progress.

The second is to explore why positive economic growth might not be accompanied by respective improvements in SWB. A recent case, the social uprising in Arab Spring countries, occurred in a region where, according to many indicators, economic and human development was improving; however, dissatisfaction among citizens was prevalent. I explore several objective conditions and subjective dimensions of dissatisfaction as drivers of general unhappiness. I aim to highlight the value of subjective evaluations of life domains and life in general as tools that can help us evaluate progress in societies.

The third objective is to identify factors that mitigate the effect of crises on SWB. To address the lack of a framework to identify crisis moderators, this dissertation adopts a useful approach originating from the management discipline that is known as the contingency approach or the situational approach (Fiedler, 1964). The contingency approach can be used to determine the contingencies that moderate the impact of economic shocks. An essential element that characterizes this approach is the situational element, which is based on the idea that there is no single way to eliminate the impact of an event and that solutions must be tailored to specific circumstances. The contingency approach places emphasis on if-then relationships, e.g., *if* this contingency exists, *then* this is the outcome. In line with the contingency framework, I use an if-then approach to identify expected scenarios (Table 1).

Table 1: A contingency approach to SWB moderators.

Contingencies	*IF*	Impact of Crises Indicators	*THEN*
Financial Distress	High	Unemployment, GDP, Inflation	Lower Life Satisfaction
Financial Distress	Low	Unemployment, GDP, Inflation	No Decline in Life Satisfaction
Economic Expectations	High	Announcement of referendum	No Decline in Happiness
Economic Expectations	Low	Announcement of referendum	Lower Happiness
Regional Quality of Governance	High	Unemployment, GDP, Inflation	No Decline in Life Satisfaction
Regional Quality of Governance	Low	Unemployment, GDP, Inflation	Lower Life Satisfaction

First, I expect that that the impact of unemployment, GDP and inflation as a result of the Euro-crisis that started in 2008 had on life satisfaction is contingent on financial distress, where higher levels of financial distress will increase life satisfaction losses. There is relatively little empirical evidence on the life satisfaction of the employed population, in contrast to the intense interest in the unemployed population, and to what extend the financial distress of households moderates the relationship between macroeconomic conditions and life satisfaction (for an exception, see Gudmundsdottir, 2013).   Second, I explore unique panel data collected at Greek universities in 2015, a process that coincided with an exogenous shock the announcement of the bailout referendum. I expect that the announcement of the bailout referendum (for a specific discussion of the context, see Chapter 5) had a smaller impact on the happiness of individuals when they had high expectations regarding the future. Third, explore another related factor, regional quality of governance and I expect that it moderates the (localised) relationship between macroeconomic developments and life evaluation. I use individual-level data on life satisfaction and personal information taken from Eurobarometer for 28 European countries for the period of 2005-2014, combined with macroeconomic variables and regional quality of governance data.

Therefore, the last question posed in this dissertation is explored in three different contexts, where I explore these three conditions as moderators to explain the heterogeneity of the findings related to the impact of an economic shock on SWB.

Another issue this dissertation addresses is of methodological nature. The inclusion of subjective factors, e.g., exploring how perceptions or subjective opinions (subjective domains) might influence SWB, introduces the problem of endogeneity. SWB measures and satisfaction with other domains in life, trust or perceptions might be simultaneously determined, which makes the isolation of their impact an arduous task. The endogeneity due to reverse causality can be dealt with by using IVs. However, there is a gap in the use of this method, due to the challenge of finding an instrument that satisfies the conditions of validity. This dissertation addresses the endogeneity issues by a method suggested by Lewbel (2012). A detailed discussion of all methodological issues and the contribution of this dissertation is discussed in each chapter separately and is extensively described in Chapter 7.

1.6 Outline of the research

Chapter 2 discusses the shortcomings of objective indicators of measuring growth and empirically tests how SWB measures can contribute in measuring shared prosperity, where progress with shared prosperity is said to be achieved when it involves the least well-off in societies. In line with the existing work in measuring progress with shared prosperity, I perform the same empirical exercise by comparing progress in income with progress in life evaluation (shared well-being). The comparison of the two measures results in four distinct groups. The first group corresponds to occasions on which increased income goes hand in hand with increased life evaluation or occasions on which decreased income corresponds in improvements in life evaluation. In some countries, life evaluation decreases despite observed improvements in income, while in other cases, negative growth is accompanied by increased life evaluation. Next, I empirically examine several indicators that are possibly responsible for the discrepancy between shared prosperity and shared well-being. These indicators are grouped into three categories: (1) Alternative Indicators for Levels and Changes in Monetary Well-being (2) Multidimensional Poverty Indicators (3) Institutional Quality and Public Services. I find that differences between the shared prosperity and shared well-being indicators are for a large part by perceived worsening standards of living, unemployment rates and perceptions about local job market and perceptions about corruption in government.

Chapter 3 examines the Unhappy Development paradox observed in many MENA countries, where improvements in happiness did not go hand in hand with improvements in human development. I empirically test the strength of association of a range of objective and subjective factors in relation to life evaluation in the Middle East and North Africa region in the years immediately preceding the Arab Spring uprisings (2009–10). The findings suggest a significant negative association between life satisfaction levels in the region during this period and dissatisfaction with the standard of living, poor labour market conditions, and cronyism.

Chapter 4 explores to what extent employed individuals were influenced by the crisis. Using data for 28 European countries for the period 2008 to 2012, I examine whether employed individuals were affected by the economic crisis. I associate unfavourable macroeconomic conditions with the life satisfaction of employees, and I further disentangle

this relationship by exploring the financial distress of their households. I support the idea that the level of financial distress of the respondents' households is an SWB moderator. I provide robust evidence that unfavourable macroeconomic conditions are negatively associated with the life satisfaction of employees. I find that higher levels of regional unemployment and inflation are predominantly associated with lower levels of life satisfaction for employees who are in a bad financial situation or who expect that their future financial situation will be worse. By contrast, employed people who do well financially and who have good prospects are not affected by the crisis.

Figure 4: Outline of the Research
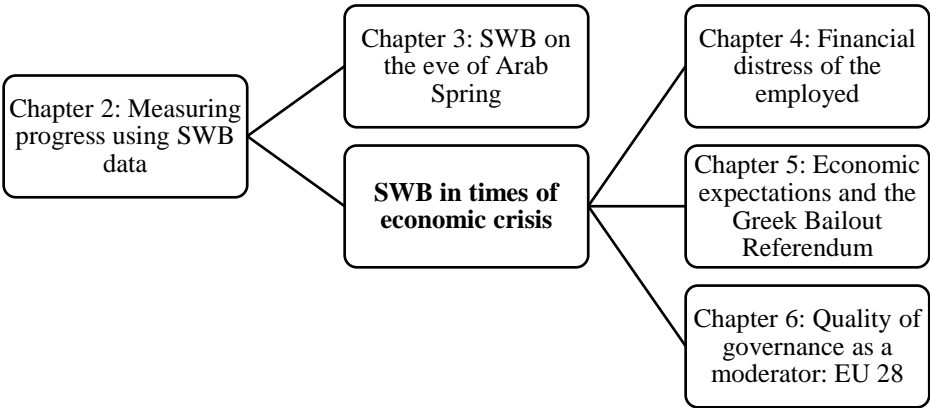
Chapter 5 focuses on a major event that occurred during the crisis in Europe: the announcement of the Greek bailout referendum. In this chapter, I use high-frequency panel data to explore the impact of this event on SWB in a sample collected in Greek universities. My analysis shows that the announcement of the Greek bailout referendum affected well-being levels considerably but not homogenously. The drop in SWB drop was closely associated with the expectations of the respondents regarding their future. Those with higher

expectations before the announcement of the referendum experienced smaller decreases in SWB and adapted more quickly to this adverse event compared to individuals who held negative expectations regarding the future. This supports the view that positive expectations can be a source of resilience, allowing individuals to cope with and adapt more quickly to adverse events.

In Chapter 6, I explore the regional quality of governance as a moderator during the euro-crisis after stressing that macroeconomic changes alone did not seem to explain the happiness gaps in Europe (see also WHR, 2013). The focus goes further than examining the impact of quality of governance on SWB in times of crisis by examining how it can mitigate the consequences of negative economic outcomes. To this aim, I use individual-level data on life satisfaction and personal information taken from Eurobarometer for 28 European countries for the period of 2005-2014, combined with macroeconomic variables and regional quality of governance data to test for the hypothesized moderating effect of quality of governance. I expect that good quality of governance alleviates the impact of an economic downturn in terms of subjective well-being. The most remarkable findings support that differences in quality of governance have a mitigating effect in times of crisis and that additional gaps that are not explained by macroeconomic indicators are significantly predicted by the presence of localized formal institutions.

In Chapter 7, I summarise the main findings, discuss policy implications, highlight the contributions of this dissertation and provide with an overview of the limitations of this research.

In the Appendix, I present additional empirical research that I conducted during my PhD: One article on SWB and its relation to social network sites activity (Appendix A), as parallel evidence for the role of moderators in happiness research and one article on SWB in relation to entrepreneurship (Appendix B). These articles have been published in Journal of Happiness Studies and Applied Economics Letters respectively.

Table 2: Overview of dissertation chapters

	Title	Central Question	Data	Method	Conclusions	Authors	Status
Chapter 1	Introduction						
Chapter 2	Beyond Shared Prosperity: Measuring Progress with Shared Well-being Using Subjective Data	Income vs SWB Shared Prosperity. Which factors explain their differences?	World Bank, Gallup, 63 Developing Countries (2007-2012)	OLS	Unemployment rate, Perceived worsening standards of living, perceptions about local job market, corruption in government	M.J. Burger, E. Ianchovichina E. Arampatzi C.T. Witte	Working Paper
Chapter 3	Unhappy Development: Dissatisfaction with Life on the Eve of the Arab Spring	What were the drivers of dissatisfaction on the eve of the Arab Spring?	World Bank, Gallup, Middle East and North Africa (excl. GCC) (2008-2010)	OLS, Lewbel estimator	Income, Unemployment, Working for the government, Cronyism, Dissatisfaction with standards of living, Labour market conditions	E. Arampatzi, E. Ianchovichina M. J. Burger T. Röhricht R.Veenhoven	Accepted to the Review of Income and Wealth

	Title	Central Question	Data	Method	Conclusions	Authors	Status
Chapter 4	Financial distress of employees in times of economic crisis	Does financial distress differentiate the impact of macroeconomic conditions od SWB?	Eurobarometer, Eurostat, EU28 (2008-2012)	Ordered Probit Model	The relationship between macroeconomic conditions and life satisfaction is contingent on the financial distress levels of employees.	E. Arampatzi, M.J. Burger, R.Veenhoven	Published in Applied Economic Letters
Chapter 5	Subjective Well-Being before and after the Greek Bailout Referendum: Expectations and Resilience to Adverse Events	Do expectations moderate the impact of an unanticipated nation-wide shock on SWB?	Surveys (data collected in Greece), 2015	OLS, Lewbel estimator, Interaction terms	Expectations have a moderating effect on SWB during the Greek Bailout Referendum	E. Arampatzi, M. J. Burger, S. Stavropoulos, L. Tay	Submitted in Journal of Happiness Studies
Chapter 6	Subjective Well-Being and the 2008 Recession; Regional Quality of Governance as a Moderator	Does regional quality of governance moderate the relationship between macroeconomic variables and SWB?	Eurobarometer, Eurostat, World Bank EU28 (2005-2014)	Ordered Logit, Marginal Effects, Interaction terms	Regional quality of governance moderates the relationship between macroeconomic variables and SWB	E. Arampatzi, M.J. Burger, S. Stavropoulos, F. Van Oort	Accepted to the Review of Income and Wealth

	Title	Central Question	Data	Method	Conclusions	Authors	Status
Chapter 7	Conclusions						
Appendix A	Social Network Sites, Individual Social Capital and Happiness	Can online social contacts replace the importance of real-life social connections in our pursuit of happiness?	Longitudinal Internet Studies for the Social Sciences (LISS), Netherlands (2012–2013)	Random effects	SNSs had a negative but insignificant effect on happiness. SNSs can negatively affect the happiness of people who experience a low quality of social contacts.	E. Arampatzi, M. J. Burger, N. Novik	Published in Journal of Happiness Studies
Appendix B	Life satisfaction and self-employment in different types of occupations	Are the self-employed more satisfied with their lives than paid employees?	Eurobarometer, EU28 (2008-2012)	Ordered Probit, Marginal Effects	Self-employed are generally more satisfied with their lives than paid employees are. Self-employment can even help to overcome the low life satisfaction	Hessels, J., E. Arampatzi, P. van der Zwan, M.J. Burger	Published in Applied Economic Letters

1.7 Individual Contributions

The content of this dissertation is not only my work, but also of the work of my co-authors and supervisors. In this section, I declare my contribution to the different chapters of this dissertation and acknowledge the contribution of others. The author of this dissertation is responsible for the content of all chapters in this dissertation. The chapters incorporate valuable feedback from promoters Harry Commandeur and Frank van Oort and co-authors of each study.

Chapter 1: The author of this dissertation is responsible for the content of Chapter 1. The chapter incorporates valuable feedback from promoters Harry Commandeur, Frank van Oort and co-supervisor Martijn Burger.

Chapter 2: The author of this dissertation is responsible for the methodology, analysis and interpretation of results of Chapter 2. The author has also reviewed all sections of Chapter 2. Elena Ianchovichina, Senior Economist in the World Bank provided data related to income for developing countries. She also reviewed Chapter 2 in cooperation with Shanta Devarajan. Martijn Burger wrote the first version of the conceptual framework and reviewed all the parts of the paper with the assistance of Caroline Witte. Ruut Veenhoven commented on the conceptualization of SWB.

Chapter 3: The chapter resulted from a research collaboration between the World Bank and EHERO. The members who collaborated on the projects are the co-authors of this chapter. The author of this dissertation is the first author and is responsible for the introduction, methodology, analysis and discussion of results. Tina Röhricht, contributed in doing the data management. Elena Ianchovichina has put her valuable knowledge on MENA region and has contributed in many ways in this chapter parts including a description of the roots of social discontent and thorough revisions of the complete manuscript. Martijn Burger contributed throughout the chapter including a literature review, helping with methodological issues and analysis and implication of our findings.

Chapter 4: The author of this dissertation and first author is responsible for the content of Chapter 4 with the continuous support and supervision of Martijn Burger. Ruut Veenhoven provided valuable input with respect to the conceptualization of SWB.

Chapter 5: The chapter resulted from a collaboration between the author of this dissertation, Martijn Burger, Spyridon Stavropoulos and Louis Tay. Spyridon Stavropoulos

has contributed greatly in the data collection process and supervision of the procedure. He also contributed to the analysis of results. Martijn Burger also contributed to the data collection, methodology and analysis. Martijn Burger in cooperation with Louis Tay contributed to the introduction and theoretical part of this chapter. Louis Tay used his valuable knowledge to expand the literature review.

Chapter 6: Chapter 6 was the idea of the author of this dissertation who is responsible the literature review, the data management and analysis. All parts were developed with the valuable assistance and contributions of Martijn Burger who further developed the introduction and concept of the chapter, Spyridon Stavropoulos who specifically assisted in the model development, analysis and results and the valuable input of Frank van Oort who is also promoter of the author of this dissertation.

Chapter 7: The author of this dissertation is responsible for the content of Chapter 7 The chapter incorporates valuable feedback from promoters Harry Commandeur, Frank van Oort and co-supervisor Martijn Burger.

Appendices: The author of this dissertation is responsible for the content of Appendices A and B included as additional material in this dissertation. Appendix A has been produced by the author of his dissertation in collaboration with Martijn Burger and Natalia Novik. Appendix B has been produced by the author of his dissertation in collaboration with Jolanda Hessels, Peter van der Zwan and Martijn Burger.

Chapter 2| Beyond Shared Prosperity: Measuring Progress with Shared Well-being Using Subjective Data

Abstract

In this study, we compare progress with shared prosperity based on the monetary measures, reported in the Global Monitoring Report (World Bank and International Monetary Fund, 2015), and progress with shared prosperity ('shared well-being') based on subjective well-being measures. We look at the evolution of the subjective well-being scores of the poorest people (B40), where subjective well-being refers to the appreciation of one's own life-as-a-whole and can be measured using survey questions. We find qualitatively different results and argue that both measures should be used to judge progress with 'true' shared prosperity. The analysis of the factors associated with the discrepancy between the shared prosperity and shared well-being indicators observed in parts of the developing world, suggests that four key factors – perceptions about standards of living, unemployment rates, perceptions about local job market and perceptions about corruption in government– explain the discrepancy between the two types of measures.

2.1 Introduction

In 2013, the World Bank adopted the goal of promoting shared prosperity, formally defined as '*fostering income growth of the bottom 40 per cent of the welfare distribution in every country*', and '*measured by annualized growth in average real per capita consumption or income of the bottom 40 per cent*'. The notion of shared prosperity, described in Basu (2013) is closely linked to the concept of inclusive growth, which is discussed in detail in the work of Ianchovichina and Lundstrom Gable (2012). In order to achieve progress with shared prosperity, economic growth needs to be inclusive of the least well off in a society. Therefore, an empirical analysis of the effect of economic growth on the incomes of the poor and vulnerable in a country is facilitated by tracking the income growth of the bottom 40 per cent (B40).

The concept of shared prosperity is also closely linked to the notion of income inequality. Recording the income growth of the poor sheds light on whether inequality is falling or rising. In line with this reasoning, the Global Monitoring Report (World Bank and International Monetary Fund, 2015) introduced the concept of 'shared prosperity premium', defined as a faster income growth of B40 relative to total population. The report argues that progress with shared prosperity is more sustainable if there is a *premium*; otherwise increasing income inequality along with growth may limit development progress.

In this paper we discuss the need to combine different measures when measuring progress with shared prosperity. Nobel Laureate Amartya Sen (1992) argued that development cannot be simply measured by economic growth and that there are other necessary conditions for improving individuals' capabilities, such as increased access to health and education. This has also been acknowledged in one of the most recent Global Monitoring Report (World Bank and International Monetary Fund, 2015), which recognizes the importance of progress in education, health, nutrition, access to infrastructure, and raising voice and participation of the poorest in society for measuring progress with shared prosperity: '*the goal itself is much broader in that it aspires to sustainably elevate the well-being of the poorer segments of society*' (1.35, p.40), where it is believed that '*monetary and non-monetary aspects of shared prosperity feed into each other and together can produce greater well-being for the poorer segments of society*' (1.37, p. 40-41).

Accordingly, the authors of the Global Monitoring Report (World Bank and International Monetary Fund, 2015) are aware of the severe limitations of measuring progress with shared prosperity through income or consumption data. They opt to track progress of non-monetary dimensions of shared prosperity using the adjusted multidimensional headcount ratio, which measures poverty by focusing on the breadth or multiplicity of deprivations including education, health, housing and food consumption. They note significant differences in the patterns of monetary and multidimensional poverty at the country level.

As defined and measured by the World Bank, the concept of shared prosperity ignores these non-monetary aspects of welfare because they are not adequately captured by measures of income or expenditures growth. In this paper, we make the case for using alternative welfare measures to track progress with 'real' shared prosperity using subjective well-being data, which reflect both monetary and non-monetary human needs for a good life (Veenhoven, 2000). In the spirit of the Stiglitz-Sen-Fitoussi Commission's report on the measurement of economic performance and social progress (Stiglitz, Sen and Fitoussi, 2010), and the United Nations' World Happiness Report (Helliwell, Layard, and Sachs, 2015), we argue that measuring shared prosperity using subjective well-being data can tell us more about shared prosperity than just income data or even objective multidimensional poverty data can do. Subjective well-being – also known as happiness or life satisfaction – has generally been defined as *'the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably'* (Veenhoven 1984, Chapter 2).[2] High average levels of subjective well-being in a country are a signal that many people are thriving and indicate the presence of good life chances in society, such as income, education, access to infrastructure, and high quality institutions. When our basic human needs are satisfied and there is a good fit between opportunities in a society and our capacities, this translates subsequently into higher levels of life satisfaction (Veenhoven, 2000). In addition, subjective well-being has been found to predict future health, mortality, productivity, and income (Oswald and Wu, 2010; De Neve et al., 2013). In other words, being satisfied with life embodies *both* subjective and objective welfare.

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[2] See also Ravallion (2012) for an overview of the use of subjective data in measuring poverty.

In this study, we compare progress with shared prosperity based on the monetary measures, reported in the Global Monitoring Report (World Bank and International Monetary Fund, 2015), and progress with shared prosperity ('shared well-being') based on subjective well-being measures. We look at the evolution of the subjective well-being scores of the poorest people (B40), where subjective well-being refers to the appreciation of one's own life-as-a-whole and can be measured using survey questions. Evaluations of subjective well-being include both emotional reactions and cognitive judgments.[3] In building the shared prosperity indicator, however, we focus on the cognitive component of subjective well-being by measuring subjective well-being using the Cantril ladder (Cantril, 1965) from the Gallup World Poll 2006-2015: '*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time*?'[4] We do so, because in contrast to measures of feelings or affect, the Cantril Scale life evaluation has been found to be closely correlated with income (Deaton 2008).

In our analysis, we focus on the developing countries that are included in the assessment of the Global Monitoring Report (World Bank and International Monetary Fund, 2015). The report, monitors progress with the development goals, including the World Bank's twin goals of reducing extreme poverty and boosting shared prosperity. For 63 out of the 71 developing countries included in the report, we could obtain subjective well-being data for the relevant years with data on the monetary measures of shared prosperity. In this way, we compare the progress with shared prosperity measured using the objective monetary indicators in the report, and the progress with shared well-being, using the subjective well-being measures proposed in this paper.

We find qualitatively different results and argue that both measures should be used to judge progress with 'true' shared prosperity. The conclusions reached using subjective well-being data and objective monetary measures are similar in only 46% of the reported country

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[3] Subjective well-being in terms of hedonic affect refers to feelings, emotions, and moods that occur, while subjective well-being as a cognitive construct focuses on contentment, in which current life is compared to the worse and best possible life one can imagine (Diener et al., 1999; Veenhoven, 2000).
[4] We assume cardinality of scale responses here. See Ferrer-i-Carbonnell and Frijters (2004) for a discussion of this.

cases. In the rest of the cases, the two measures do not align. Many countries that have made progress with shared prosperity have not make progress with shared well-being. The analysis of the factors associated with the discrepancy between the shared prosperity and shared well-being indicators observed in parts of the developing world, suggests that four key factors – perceptions about standards of living, unemployment rates, perceptions about local job market and perceptions about corruption in government– explain the discrepancy between the two types of measures. This finding underlines the importance of moving beyond income and expenditures to track progress with shared prosperity and of using subjective data as input for the indices that track shared prosperity.

The remainder of this paper is organized as follows. The conceptual framework is elaborated in Section 2. The empirical analysis of the drivers of the differences between shared prosperity and shared well-being is presented Section 3. We present concluding remarks in Section 4.

2.2 Shared Prosperity and Shared Well-Being in Developing Countries

2.2.1 Shared Prosperity vs Shared Well-being

Following the original definition of shared prosperity (Basu, 2013), we define shared well-being as an improvement in the average Cantril ladder score of the B40. An overview is presented in Table 1, where g_INC refers to average per capita income growth and g_LS refers to an average improvement in subjective well-being in a country, calculated as the growth rate in life satisfaction.[5] For the purpose of assessing progress with shared prosperity or shared well-being, we examine progress for the poorest 40% of the population (B40). Countries that make progress towards shared well-being are those where the subjective well-being improves on average for the B40 ($0 < g\_LS_{B40}$), however, improvements in shared well-being can go hand-in-hand with rising inequality (Basu et al., 2013), which may limit

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[5] We use subjective well-being and life satisfaction interchangeably as commonly done in the literature.

development progress. Hence, we make a further distinction based on whether countries have a shared well-being premium.

Table 1: Progress with Shared Prosperity and Shared Well-being Explained

Groups	Progress with Shared Prosperity	Progress with Shared Well-Being
Progress	$0 < g\_INC_{B40}$	$0 < g\_LS_{B40}$
Strong Progress	$0 < g\_INC \leq g\_INC_{B40}$	$0 < g\_LS \leq g\_LS_{B40}$
Weak Progress	$0 < g\_INC_{B40} < g\_INC$	$0 < g\_LS_{B40} < g\_LS$
No progress	$g\_INC_{B40} < 0$	$g\_LS_{B40} < 0$

Note: INC denotes per capital income, LS – life satisfaction or subjective well-being, and g stands for the growth rate of the respective variable.

Countries making strong progress towards shared well-being are those where subjective well-being improves on average for the B40 and where the subjective well-being level of the poorest B40 improves more than the subjective well-being level on average ($0 < g\_LS \leq g\_LS_{B40}$). In contrast, countries making weak progress with shared well-being are those where the subjective well-being of the B40 improves less than the improvement in average subjective well-being ($0 < g\_LS_{B40} < g\_LS$). In addition, there are countries that do not make progress with shared well-being in that the B40 are worse off ($g\_LS_{B40} < 0$). Finally, neutral countries are those with a relatively small annualized life satisfaction growth rate of less than 1% in absolute terms both for the B40 ($-0.01 \leq g_{LS_{B40}} < 0.01$).

We applied this classification to the subjective well-being data and we found that during the last decade many countries, many of them Latin American economies, had made progress with shared well-being (Figure 1). Strong progress was observed in some Latin American, Eastern European and Central Asian countries and a couple of African economies. In the majority of cases, progress with shared well-being was weak, i.e. the shared well-being of the B40 improved less than the shared well-being of the whole population. There were also many countries which had not made progress with shared well-being. These countries can be found in different parts of the world. Examples include Belarus and Slovakia in Eastern Europe, Honduras and Costa Rica in Latin America, India and Nepal in South Asia, Laos in East Asia and South Africa, Senegal and Togo in Africa. There are

relatively few countries where the well-being of the B40 has improved but average well-being deteriorated (e.g. Mali, Hungary, Iraq, Ukraine and Uganda) or where the well-being of the B40 has deteriorated but average well-being improved (e.g. China, Bulgaria).

A different picture emerges with the household income and expenditures data (Figure 2) used in the Global Monitoring Report 2015/2016 (World Bank and IMF, 2015).

Figure 1: Progress with Shared Prosperity using Subjective Well-Being Data
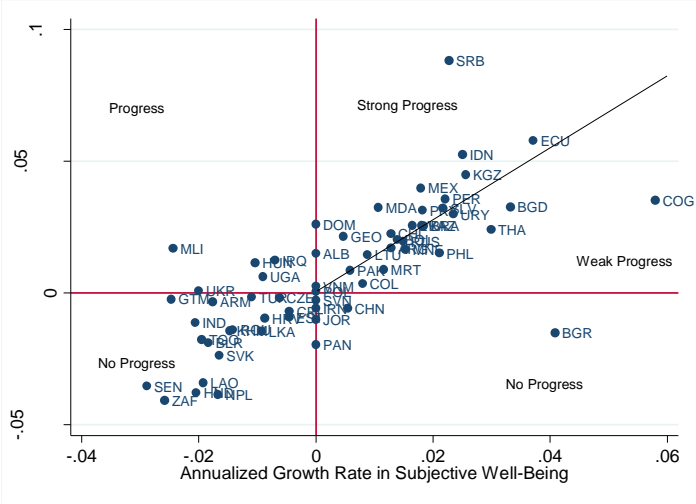
Note: For illustration purposes Tanzania (TZA) and Rwanda (RWA) have been excluded from this graph. The scores are available in Appendix A.

Figure 2: Progress with Shared Prosperity using Household Income and Expenditures Data
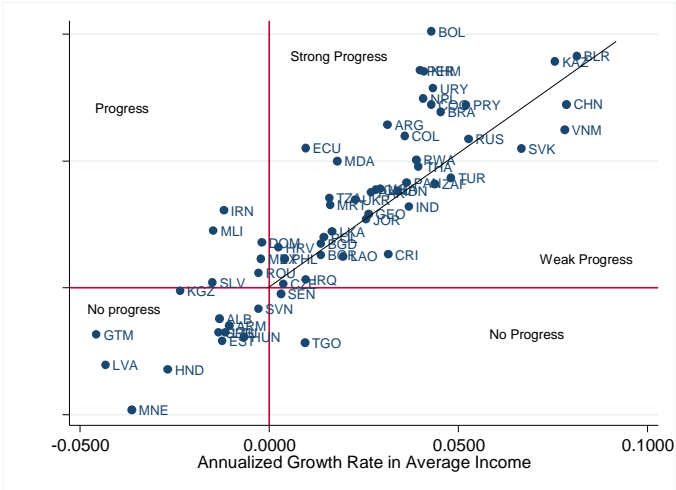
When we apply the classification of Table 1 to income and expenditures data, we see that countries that made strong progress with shared well-being, measured with subjective data, are not necessarily the countries that made strong progress with shared prosperity, measured with income or expenditures data. In some countries, strong growth in household income or expenditures of the B40 occurs at a time of declining progress in the incomes of the B40 (e.g. Senegal and Togo). In other cases, a decline in household income or expenditures of the B40 occurs at a time of rising well-being for the B40 (e.g., Romania, Mexico and Dominican Republic).

To compare progress with shared prosperity and shared well-being, we combined subjective and objective data to show the change in income or well-being status of the B40 (see Figure 3). Progress along both monetary and subjective well-being dimensions for the B40 can be referred to as 'thriving' or 'happy development', while declines in both the household incomes[6] and subjective well-being of the B40 can be regarded as 'deprivation' or 'unhappy decline'. When income is increasing, but the annualized growth rate in

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[6] In this paper we use incomes and expenditures interchangeably.

subjective well-being of the B40 is negative, the term 'dissonance' or 'unhappy development' is applied,[7] and the combination of declining income and increasing subjective well-being is labeled 'compensation' or 'happy decline'. Please note that given the very limited number of countries in the strong progress groups (i.e, countries with a shared prosperity premium or shared well-being premium), we have not made a further distinction within the four distinguished groups.

Figure 3: Progress of the B40: Household Income vs. Subjective Well-Being
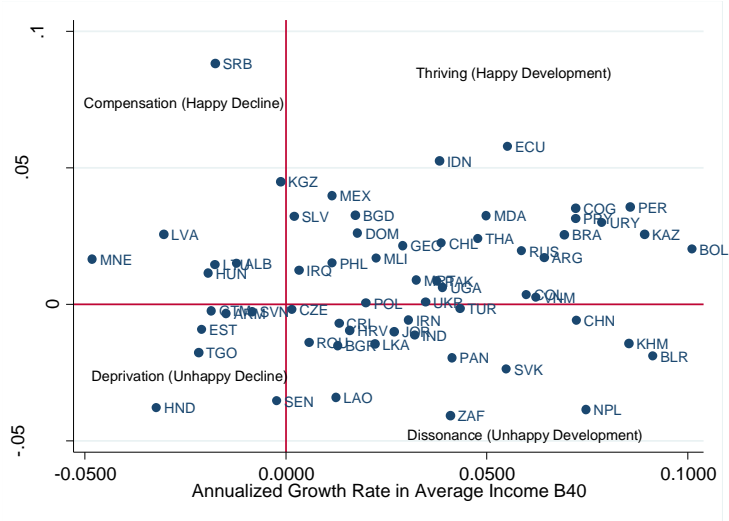
Note: For illustration purposes Tanzania (TZA) and Rwanda (RWA) have been excluded from this graph. The scores are available in Appendix A.

We find that progress or decline with shared well-being and shared prosperity coincides mostly in the cases of Latin American economies and many Eastern European, Central Asian countries and Sub-Saharan countries (Figure 3, top right and bottom left quadrants). There is dissonance marked by progress with shared prosperity but not shared well-being, mostly in Eastern European and Central Asian countries, Middle East countries, and a few economies in other parts of the world (Figure 2, bottom right quadrant). Arampatzi et al. (2015) call this dissonance unhappy development and associate it with deterioration in

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[7] This term is first introduced in the work of Arampatzi et al. (2015).

the quality of life, particularly the standards of living, quality of public services, unemployment, and poor governance.[8] In these cases, the shared prosperity measure overstates the progress made with improving the well-being of the B40. Finally, in several Eastern European countries, the incomes of the B40 have deteriorated but their well-being has improved. People in these countries have had to adapt to sluggish economic growth in the aftermath of the global financial and economic crisis, but other aspects of life have improved leading to increases in happiness levels.

2.2.2 The value of Shared well-being

The literature cautions about the use of subjective well-being measures on the grounds that happiness scores are malleable. Kahneman, Wakker, and Sarin (1997) also warn about a divergence between subjective well-being and decision utility, due to people's systematic errors in predicting their happiness. We argue that while these caveats should be kept in mind, subjective well-being measures should be used to provide additional information crucial to tracking progress with shared prosperity or shared well-being.

Although subjective data have often been criticized as being a noisy approximation of the facts and therefore discarded from economic analyses,[9] we argue that solely relying on an objective income proxy is problematic. There are four different reasons for using subjective well-being data, which can provide useful information that cannot be obtained from objective data (e.g., Veenhoven, 2002; Diener et al., 2009; Ravallion, 2012).

First, objective conditions in a country merely indicate the conditions for a good life, but not necessarily the outcomes of a good life (Veenhoven, 2000; 2002). In other words, the domains encapsulated in the shared prosperity measure, and the multidimensional poverty index may contribute to subjective well-being, but they do not necessarily do so. In the case of the multidimensional poverty index, the importance of individual domains included in the index to overall well-being is questionable because the choice to include

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[8] This observation is related to the literature on economic growth and happiness, which has found that people living in fast-growing economies are on average less happy than those living in slow-growing economies (Deaton, 2008; Stevenson and Wolfers, 2008; Graham and Lora, 2009).

[9] The measurement of subjective data comes with its own problems related to the validity and reliability of the measures (discussed at the end of the paper, but see e.g., Bertrand and Mullainathan, 2001).

them and the weights assigned to them reflects the index makers' subjective opinions of what constitutes a good life (Dolan and White, 2007; Diener et al., 2008). Subjective well-being data can provide additional information about the progress of the B40 as these data provide us with an overall picture of quality of life (Veenhoven, 2002) and allow us to uncover what conditions matter for individual well-being.

Second and related to the previous point, there might be some systematic differences in how the different aspects of objective well-being are valued across countries as well as across different groups within countries (Deaton et al., 2008). In addition, values and preferences within a given society may change over time as people calibrate their subjective well-being based on the 'ideal' they have for their personal life ('reference point'). In low-income countries, for example, people tend to care less about corruption (Tay et al., 2014; Abdur Rahman et al., 2017) as the poor are preoccupied with their survival and the fulfillment of their basic needs. Economic development leads to awareness and demand for greater integrity, as reflected by higher levels of disapproval towards corruption (Abdur Rahman et al., 2017). Likewise, not all cultures value safety or climate to the same degree as not all population groups within countries equally value religion. Therefore, the use of objective social indicators might not properly capture well-being within and across countries.

Third, subjective data include information that is often absent in objective measures, which makes them useful as standalone indicators (Veenhoven, 2002; Diener et al., 2009; Okulicz-Kozaryn, 2013; Jahedi and Méndez, 2014). While objective measures can capture the objectively measurable part of a concept, they often fail to capture all its relevant components. Certainly, objective indicators are preferred, when clearly defined concepts are being measured, however, with regards to broader concepts and/or difficult-to-quantify concepts, such as prosperity, subjective measures are considered useful tools given their ability to capture unobserved components of that concept by gauging people's evaluations and experiences (Diener et al., 2009; Jahedi and Méndez, 2014). If we would like to quantify human right violations, for example, the objective indicator would likely capture the number of human right violation incidents that took place, however, the same measure would fail in capturing incidents that could have happened but were avoided because of random events (other occasions, avoiding certain environments, etc.). On a similar note, unemployment

statistics may improve as more people drop out of the work force and household expenditures may rise as a result of an increase in food prices. Although the latter events would be considered to be an objective improvement of quality of life in a country, in themselves they do not signify progress as the decline in living standards remains obscured. In the case of household expenditures, people can be asked about whether they are 'satisfied with their standards of living' or whether they 'experience stress to make ends meet'. In this regard, literature on the relative performance of objective and subjective indicators has suggested that in absence of perfectly measured objective information, subjective measures generally perform better and complement objective data (Jahedi and Méndez, 2014).

Fourth, subjective data can also be used to capture useful aspects of shared well-being when relevant objective information is absent. Although the proposed multidimensional poverty measures for the B40 already complement existing monetary measures that are used in the Global Monitoring Report, objective data on many of the aspects measured is thin on the ground. In many countries, information on the health, education and living conditions of the B40 is lacking or only collected once every four or five years. Even for middle-income countries the Health Nutrition and Population Statistics by Wealth Quintile Database has many missing values on items used to measure multidimensional poverty for the B40.

Notwithstanding the strengths and weaknesses of objective and subjective data in measuring progress, we highlight that both objective monetary and subjective well-being data provide an indication of quality of life, however, while shared prosperity calculated using monetary income or expenditure data mainly indicate the presence of livability conditions[10] or *opportunities* for a good quality of life, shared well-being calculated using subjective well-being data predominately reflects *experienced* quality of life. In other words, where shared prosperity is mainly geared at an identification of *life chances* in a given society, shared well-being is centered on *life outcomes* or how people appreciate the quality of their own lives. Following Veenhoven (2000), this distinction between life chances and life outcomes is of pivotal importance: opportunities and outcomes are related, but not necessarily the same. Chances can fail to be realized, while at the same time people sometimes make much of their life despite poor opportunities. Hence, increased income or

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[10] With livability we mean here the sum of the objective factors that add up to a country's quality of life—including income, education, and healthcare.

expenditures do not necessarily indicate rising subjective well-being levels. At the same time, it should also be taken into account that monetary welfare only constitutes one element of the livability of the environment and other aspects such as the quality of education and housing matter as well, strengthening the case for using both shared prosperity and shared well-being indicators to draw policy conclusions.

Similar distinctions between opportunities and outcomes can be found in public-health research (Veenhoven, 2000). Health indicators reflecting conditions for a good health such as access to healthcare and adequate nutrition are considered to be very different from indicators reflecting outcomes of a healthy life such as disease and mortality figures. Along these lines, a substantial amount of health research aims at assessing the relationship between conditions and outcomes. For example, do public expenditures on mental healthcare really improve mental health? In the literature on quality of life, means and ends are often less well distinguished than in the health-related research: in our daily language and policy discussions we often confuse life satisfaction with livability of the environment.

2.3 Exploring Discrepancies between Shared Prosperity and Shared Well-Being

There are several explanations for the discrepancy between shared prosperity and shared well-being measures. We used the contingency approach (Fiedler, 1964), the origins of which can be found in management studies, to identify the different factors that might explain the discrepancy between shared prosperity and shared well-being. This approach highlights the significance of situational elements in designing effective solutions for organizational management, and was been adopted by a number of other disciplines. The contingency approach is based on the idea that solutions or explanations to problems must be tailored to specific situations given that they are always contingent upon contextual factors. Accordingly, we can identify different explanations for the discrepancy between shared prosperity and shared well-being by formulating if-*then* relationships. In this study, we categorize the contingencies into three groups based on the literature discussed in Section II: (1) Alternative Indicators for Levels and Changes in Monetary Well-being, (2) Multidimensional Poverty Indicators and (3) Institutional Quality and Public Services. These contingencies are summarized as if –then relationships in Figure 4.

Figure 4: Explanatory factors for the discrepancy between shared prosperity and shared well-being
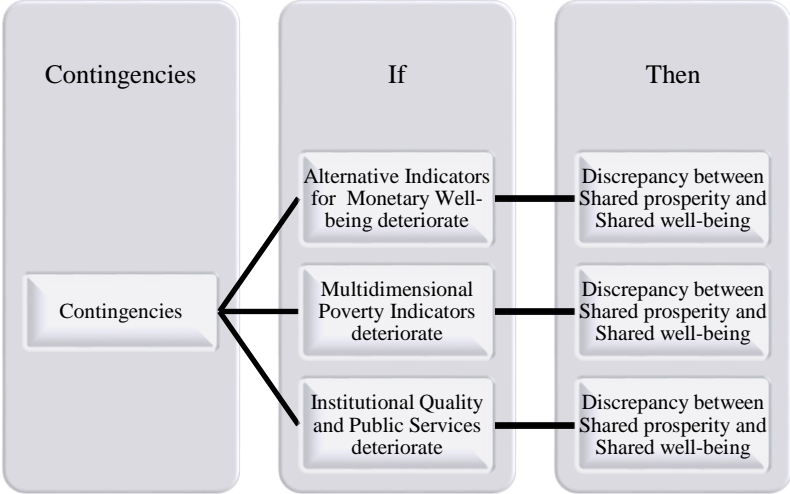
The alternative explanations for the discrepancy between shared prosperity and shared well-being reflect the limitations of the use of income data to measure progress using the broader concept of prosperity.

First, there can be a difference between objective and subjective economic development indicators. The incomes or expenditures of the B40 may have been rising but at the same time this group has experienced deterioration in their ability to meet basic needs. This deterioration might be the result of either rising energy or food prices, or changes in reference points of what a good standard of living constitutes. Therefore, we use alternative indicators for levels and changes in monetary well-being to explain the discrepancy between shared prosperity and shared well-being.

Second, there can be other basic needs that co-determine quality of life that have not improved or have deteriorated, offsetting the positive effect that economic growth has on subjective well-being. For example, if increasing income coincides with decreasing access or quality of education or healthcare, the overall well-being effects can be negative while income may be rising. Therefore, following the literature, we account for these other aspects

by using alternative multidimensional poverty indicators to explain the discrepancy between shared prosperity and shared well-being.

Third, and related to the previous point, other factors that co-determine subjective well-being, such as quality of governance and democracy, might have declined, stagnated or not improved sufficiently in the period under research, especially when these factors are more important in the national well-being function than income, income growth does not translate into increasing well-being levels.

To examine these different explanations, we utilized data from the Gallup World Poll for the same years as the reported subjective well-being data, except for some of the data reflecting quality of institutions, which were obtained from the Worldwide Governance Indicators (Kaufmann et al., 2006). All indicators obtained from the Gallup World Poll reflect the changes and average scores of the B40. A full overview and description of the variables included in the analysis can be found in Appendix B. For each dimension, we explored whether the average level and changes in the level over the period of study were associated with the differences between income growth of the B40 and growth in life satisfaction of the B40.

Alternative Indicators for Levels and Changes in Monetary Well-being (B40 Specific)

1. Level and changes in satisfaction with standards of living
2. Level and changes in capability that people have to meet their basic need for food
3. Level and changes in expectations regarding standards of living
4. Level and changes in income inequality (Gini) (non-B40 specific)
5. Level and changes in inflation (non-B40 specific)

Multidimensional Poverty Indicators

1. Level and changes in percentage of people with health problems
2. Level and changes in satisfaction with healthcare
3. Level and changes in feelings of safety
4. Level and changes in unemployment (non-B40 specific)
5. Level and changes in job market expectations
6. Level and changes in education system satisfaction levels

Other Aspects Contributing to Subjective Well-being: Institutional Quality and Public Services (B40 Specific)

1. Level and changes in perceived corruption

2. Level and changes in quality of public services

3. Level and changes in approval of leadership and confidence government

4. Level and changes in self-reported freedom

5. Level and changes in institutional quality (Kaufmann Index, non-B40 specific)

2.4 Econometric Model

To explore discrepancies between shared Prosperity and Shared Well-being, we used the difference between annualized growth rate of well-being of B40 and the annualized growth rate of income of B40 as dependent variable[11]. We estimated the following equation:

$$\overline{(LS_{B40}} - \overline{INC_{B40}}) = \beta_0 + f(O,S) + \varepsilon$$

Where

$\overline{LS_{B40}} - \overline{INC_{B40}}$ is the difference between annualized growth rate of well-being of B40 and the annualized growth rate of income of B40.

$f\,(O,S)$ is a function of alternative indicators for monetary well-being, multidimensional poverty and other aspects

ε is the (robust) standard error.

Due to the limited number of countries and a strong correlation between some of the variables in the empirical analysis, we tested the designated indicators first one-by-one and later estimate a model incorporating multiple factors. We recognize this problem and caution that our results should be interpreted as (unconditional) associations, rather than reflecting causal relationships.

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[11] Additionally to the linear specification and to formally test why some countries experience happy growth, while other countries experience unhappy growth, we estimated several discrete choice models to examine the drivers of group membership (Wrigley, 1985; Long, 1997). The results were similar to our OLS and are available on request.

2.5 Results

The linear estimates for the different indicators are shown in Tables 1 and 2. For brevity, we only report the statistically significant findings and due to multicollinearity issues we analyzed the associations using the dependent variable per block of variables.

First, other monetary variables explain part of the differences between the shared prosperity and shared well-being indicators. As shown in Table 1, perceptions about worsening living standards explain differences between income-based shared prosperity and shared well-being indicators (Column 1). In addition, we found that although the Gini coefficient and inflation were not significantly associated with the dependent variable, changes in Gini (Column 2) and changes in Inflation rates (Column 3) were negatively, however weakly, related to the discrepancy between objective and subjective growth. In the last column (Column 4) where all factors are simultaneously regressed on the dependent variable, we can see that worsening living standards drove the differences between shared prosperity and shared well-being. The changes in the Gini coefficient remained weakly associated with the dependent variable and the relationship between inflations rates turned insignificant.

Apart from the monetary factors, there are several other variables that explain the difference between the shared prosperity and shared well-being indicators. Alternative multidimensional poverty measures such as unemployment and perceptions related to the job market are associated with the differences in shared prosperity and shared well-being. The findings with respect to alternative multidimensional poverty indicators are summarized in Table 2.

Table 1: OLS Estimates: Dependent variable: Differences shared prosperity and shared well-being (d(LSB40-IncB40)

VARIABLES	(1)	(2)	(3)	(4)
Standard of living: Getting worse	0.119***			0.107***
	(0.033)			(0.035)
Changes in Standard of living: Getting worse	0.110			0.082
	(0.119)			(0.093)
GINI Index		-0.000		-0.000
		(0.000)		(0.000)
Change GINI Index		-0.001*		-0.000*
		(0.000)		(0.000)
Inflation Rates			-0.001	-0.001
			(0.002)	(0.001)
Changes Inflation Rates			-0.004*	-0.004
			(0.002)	(0.003)
Constant	-0.060***	-0.009	-0.012	-0.045**
	(0.012)	(0.011)	(0.010)	(0.020)
Observations	63	63	63	63
R-squared	0.148	0.074	0.051	0.238

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Changes in unemployment rates were positively associated with differences between income-based shared prosperity and shared well-being indicators (Column 1), indicating that changes in unemployment rates increased the gap between shared prosperity and shared well-being. Positive perceptions about the job market with respect to whether individuals thought it was a good time to find a job, were negatively associated with the dependent variable, therefore, were associated with decreases in the gap between shared prosperity and shared well-being (Column 3). Similarly, satisfaction with the educational system was negatively related to the differences between shared prosperity and shared well-being, implying that education is one of the alternative multidimensional poverty indicators that explains part of the differences of the dependent variable. When all factors were simultaneously regressed on the dependent variable, the differences between shared prosperity and shared well-being, we found that the effect of changing unemployment rates on the dependent variable persisted as positive.

Table 2: OLS Estimates: Dependent variable: Differences shared prosperity and shared well-being d(LSB40-IncB40)

VARIABLES	(1)	(2)	(3)	(4)
Unemployment Rate	0.002			0.002
	(0.001)			(0.002)
Changes in Unemployment rate	0.038***			0.045***
	(0.008)			(0.012)
Local Job market: Good Time		-0.103**		-0.025
		(0.051)		(0.065)
Changes in Local Job market: Good Time		0.202		0.504**
		(0.230)		(0.245)
Educational System: Satisfied			-0.061*	0.026
			(0.035)	(0.051)
change Educational System: Satisfied			0.407	0.263
			(0.453)	(0.328)
Constant	-0.038***	0.005	0.019	-0.052
	(0.013)	(0.013)	(0.022)	(0.034)
Observations	63	63	63	63
R-squared	0.183	0.064	0.039	0.222

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The relationship between changes in positive perceptions about the job market as observed in whether individuals thought it was a good time to find a job increased the gaps between shared prosperity and shared well-being[12].

Finally, we found that other factors from the institutional quality group explained the observed differences between monetary and non-monetary dimensions of well-being. Changes in perceptions about the presence corruption in government was found to be important for decreasing the gap between shared prosperity and shared well-being. The negative relationship also held in the full model (column 7).

Although cronyism, measured by perceptions of whether people can get ahead by working hard (column 2), perceived freedom (column 3), and satisfaction with roads (column 4), were found to explain some of the differences between shared prosperity and

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[12] No indication of multicollinearity was particularly detected in the full model of column 4. The Variance Inflation Factor score is found to be 1.52.

shared well-being, however their significance seems to be minimized in the full model (column 7).

Looking at the Kaufmann indicators (Worldwide Governance Indicators (Kaufmann et al., 2006), voice and accountability and regulatory quality were significantly related to the differences between income growth and growth in SWB (column 5 and column 6), However, similar to cronyism and perceived freedom, they did not seem to account for any of the gaps in the full model (column 7). A further examination of the different components of the institutional quality variable uncovered that changes in control of corruption, changes in political stability and government effectiveness did not seem to be significantly associated with the difference in between improvements in subjective well-being of the B40 and improvements in income of the B40.

Table 3: OLS Estimates: Dependent variable: Differences shared prosperity and shared well-being (d(LSB40-IncB40)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Corruption in Government: No	-0.072						0.035
	(0.053)						(0.070)
Change Corruption in Government: No	-0.461**						-1.029***
	(0.181)						(0.340)
Get ahead by Working hard: Yes		-0.072**					-0.020
		(0.031)					(0.051)
Change Get ahead by Working hard: Yes		-0.207					0.175
		(0.300)					(0.305)
Satisfaction with Roads: Yes			-0.080**				-0.071
			(0.036)				(0.069)
Change in Satisfaction with Roads: Yes			-0.095				-0.247
			(0.167)				(0.156)
Perceived Freedom in Life				-0.095**			-0.038

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(0.040)			(0.049)
Change in Perceived Freedom in Life				-0.324			0.346
				(0.541)			(0.550)
WGI: Voice and Accountability					0.021***		0.017
					(0.007)		(0.012)
WGI: Change in Voice and Accountability					0.144		0.046
					(0.167)		(0.174)
WGI: Regulatory Quality						0.015**	-0.001
						(0.007)	(0.016)
WGI: Change Regulatory Quality						0.109	0.258
						(0.254)	(0.176)
Constant	-0.005	0.031	0.019	0.041	-0.017***	-0.021***	0.049*
	(0.010)	(0.021)	(0.019)	(0.027)	(0.006)	(0.006)	(0.025)
Observations	61	63	63	62	63	63	61
R-squared	0.128	0.105	0.058	0.086	0.101	0.044	0.313

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.

2.6 Discussion and Conclusions

Shared prosperity has many faces (Global Monitoring Report, 2016) and its quantification is therefore an arduous task. Most notably, income based metrics of prosperity have been heavily criticized for limiting the concept of welfare to monetary measures (The UNDP's Human Development Reports, 1990) and therefore income data are seen as inadequate for capturing social changes and other social phenomena. In response to this critique, other approaches have been used as alternatives to monitor progress, including the incorporation of other objective factors such as literacy rates, infant mortality and life expectancy measures. Yet, the use of such objective data can sometimes be problematic in terms of inability to capture the relevant aspects of a phenomenon, the arbitrariness of indicators that are chosen and availability. In this study, we proposed using subjective well-being data to overcome this problem. Our findings suggest that there are large discrepancies in the progress of the bottom 40 percent as measured by monetary data and subjective well-being data. Countries that are making progress using the income metrics of shared prosperity are not necessarily the countries that make progress when using shared well-being. Plausible explanations for the discrepancy between shared prosperity and shared well-being were put into three categories: monetary well-being, multidimensional poverty indicators and institutional quality and satisfaction with public services.

We found that the differences between the shared prosperity and shared well-being indicators are for a large part driven by experienced deterioration in standards of living. Changes in Gini and changes in inflation were found to be weakly, even insignificantly, related to the differences between shared income and shared well-being. These findings would support the notion that subjective data includes information that is often absent in objective measures. In addition, the discrepancy between the shared prosperity and shared well-being is partly driven by other factors with respect to multidimensional poverty. Changes in unemployment rates and perceptions about local job market were largely associated with differences between income-based shared prosperity and shared well-being indicators. Finally, we found that differences between shared well-being and shared prosperity were also explained by improvements in the perceptions about the presence of corruption in government. In sum, the factors found to be conditionally associated with the

discrepancy observed by alternative welfare measures were related to both monetary and non-monetary dimensions. These findings illustrate that monetary measures such as income or expenditures are too limited in scope to use to evaluate economic development and that development and progress has many faces.

The use of subjective well-being as an alternative welfare measure was based on its several advantages to capture unobserved components of social phenomena. Subjective well-being data are, however, far from perfect. In terms of validity, self-reported subjective well-being data have been criticized for reflecting other phenomena that may affect the subjective well-being measures. Answers on the happiness questions may reflect normative notions and desires, instead of the degree to which respondents are satisfied with their life-as-a-whole. Therefore, happiness measures might suffer from systematic biases from unrelated sources (Bertrand and Mullainathan, 2001; Redelmeier, Katz, and Kahneman, 2003). Even when objective factors, such as income and expenditures in the household surveys, are measured by self-report, a survey question may evoke responses that differ from those that the investigator initially had in mind and, hence such variables suffer from similar problems. For instance, sometimes it is not clear to a respondent whether they are reporting consumption over a week or 2 week period and whether the survey takes place before or after harvest which matters in low income countries. Likewise, it might not always be clear whether to report personal income or family income, gross income or net income, and whether capital revenues and non-monetary income should be included.

In terms of reliability, subjective well-being measures have also received criticism. Subjective well-being is a self-reported measure, normally, on a scale of 0-10. Apart from the fact that these scales are rather imprecise, responses can be inconsistent and dependent on the mood and reference point of the respondent (Podsakoff, 2003). In addition, respondents have the tendency to conform to social desirability and answers can be affected by psychological factors (Bertrand and Mullainathan, 2001; Redelmeier et al., 2003). The same amount of well-being may be rated by one respondent with a 6 and by another with a 7. Moreover, when the same subjective well-being question is asked twice in a survey, responses to this question are not always identical. There may also be systematic distortions in interviewing, item sequence, and response-formats (Schwartz and Strack, 1999). A related concern involves comparability of subjective well-being across nations, where observed

differences in average scores might not reflect actual differences in pleasure in life. Similar problems exist in household income data. Some examples include issues related to misreporting of income and cross-country comparability issues in monetary measures as in many developing countries household data on income are so unreliable that household expenditures are used instead to track welfare changes.

Despite these concerns, the performance of subjective well-being measures can be empirically validated since they are widely available in representative studies. Evidence shows that despite the random noise that characterizes subjective well-being data, they tend to yield consistent results in large samples (Diener, 2009). Moreover, subjective well-being measures constitute a valuable source of information that are difficult to observe in an objective way. The inclusion of subjective well-being alongside objective data is highly recommended when studying the social and economic development of countries

Appendices

Appendix A

Table A1: Annualized Income and Subjective Well-Being Growth in a Selection of Developing Countries

Groups	Country	Code	Period	Inc. GrowthB40	Inc. Growth	growthl sb40	growthls
Compensation	Albania	ALB	2008-2012	-0.012	-0.013	0.015	0
Progress	Argentina	ARG	2007-2012	0.064	0.031	0.017	0.013
Deprivation	Armenia	ARM	2008-2013	-0.015	-0.011	-0.003	-0.018
Progress	Bangladesh	BGD	2005-2010	0.017	0.014	0.033	0.033
Dissonance	Bulgaria	BGR	2008-2013	0.013	0.014	-0.015	0.041
Dissonance	Belarus	BLR	2006-2011	0.091	0.081	-0.019	-0.018
Progress	Bolivia	BOL	2007-2012	0.101	0.043	0.02	0.014
Progress	Brazil	BRA	2007-2012	0.069	0.045	0.025	0.018
Progress	Chile	CHL	2006-2011	0.039	0.028	0.022	0.013
Dissonance	China	CHN	2005-2010	0.072	0.079	-0.006	0.005

Groups	Country	Code	Period	Inc. GrowthB40	Inc. Growth	growth lsb40	growthls
Progress	Congo Braz.	COG	2005-2011	0.072	0.043	0.035	0.058
Progress	Colombia	COL	2008-2012	0.06	0.036	0.003	0.008
Dissonance	Costa Rica	CRI	2010-2013	0.013	0.032	-0.007	-0.005
Dissonance	Czech Republic	CZE	2008-2013	0.002	0.004	-0.002	-0.006
Progress	Dominican Rep.	DO	2007-2012	0.018	-0.002	0.026	0
Progress	Ecuador	ECU	2007-2012	0.055	0.01	0.058	0.037
Deprivation	Estonia	EST	2008-2013	-0.021	-0.012	-0.009	-0.005
Progress	Georgia	GEO	2008-2013	0.029	0.026	0.022	0.005
Deprivation	Guatemala	GTM	2006-2011	-0.019	-0.046	-0.002	-0.025
Deprivation	Honduras	HND	2007-2012	-0.032	-0.027	-0.038	-0.02
Dissonance	Croatia	HRV	2004-2010	0.016	0.003	-0.01	-0.009
Compensation	Hungary	HUN	2008-2013	-0.019	-0.007	0.012	-0.01
Progress	Indonesia	IDN	2011-2014	0.038	0.034	0.053	0.025
Dissonance	India	IND	2004-2011	0.032	0.037	-0.011	-0.021
Dissonance	Iran	IRN	2009-2013	0.031	-0.012	-0.006	0
Progress	Iraq	IRQ	2007-2012	0.003	0.01	0.012	-0.007

Groups	Country	Code	Period	Inc. GrowthB40	Inc. Growth	growthlsb40	growthls
Dissonance	Jordan	JOR	2006-2010	0.027	0.026	-0.01	0
Progress	Kazakhstan	KAZ	2009-2013	0.089	0.076	0.026	0.018
Compensation	Kyrgyzstan	KGZ	2008-2012	-0.001	-0.024	0.045	0.026
Dissonance	Cambodia	KHM	2007-2012	0.085	0.041	-0.014	-0.015
Dissonance	Lao PDR	LAO	2007-2012	0.013	0.02	-0.034	-0.019
Dissonance	Sri Lanka	LKA	2006-2012	0.022	0.017	-0.015	-0.009
Compensation	Lithuania	LTU	2008-2013	-0.018	-0.012	0.015	0.009
Compensation	Latvia	LVA	2008-2013	-0.03	-0.043	0.026	0.016
Progress	Moldova	MDA	2008-2013	0.05	0.018	0.032	0.011
Progress	Mexico	MEX	2008-2012	0.012	-0.002	0.04	0.018
Progress	Mali	MLI	2006-2009	0.023	-0.015	0.017	-0.024
Compensation	Montenegro	MNE	2008-2013	-0.048	-0.036	0.017	0.015
Progress	Mauritania	MRT	2008-2014	0.033	0.016	0.009	0.012
Dissonance	Nepal	NPL	2003-2010	0.075	0.041	-0.039	-0.017
Progress	Pakistan	PAK	2004-2010	0.038	0.027	0.009	0.006
Dissonance	Panama	PAN	2008-2012	0.041	0.036	-0.02	0

Groups	Country	Code	Period	Inc. GrowthB4	Inc. Growth	growthlsb40	growthls
Progress	Peru	PER	2007-2012	0.086	0.04	0.036	0.022
Progress	Philippines	PHL	2006-2012	0.012	0.004	0.015	0.021
Progress	Poland	POL	2007-2012	0.02	0.014	0	0
Progress	Paraguay	PRY	2007-2012	0.072	0.052	0.031	0.018
Dissonance	Romania	ROU	2008-2013	0.006	-0.003	-0.014	-0.014
Progress	Russia	RUS	2007-2012	0.059	0.053	0.02	0.015
Dissonance	Rwanda	RWA	2005-2010	0.05	0.039	-0.095	-0.091
Deprivation	Senegal	SEN	2005-2011	-0.002	0.003	-0.035	-0.029
Progress	El Salvador	SLV	2007-2012	0.002	-0.015	0.032	0.022
Compensation	Serbia	SRB	2007-2010	-0.018	-0.013	0.088	0.023
Dissonance	Slovakia	SVK	2008-2013	0.055	0.067	-0.024	-0.017
Deprivation	Slovenia	SVN	2008-2013	-0.008	-0.003	-0.003	0
Deprivation	Togo	TGO	2006-2011	-0.022	0.01	-0.018	-0.019
Progress	Thailand	THA	2008-2012	0.048	0.04	0.024	0.03
Dissonance	Turkey	TUR	2007-2012	0.043	0.048	-0.002	-0.011

Groups	Country	Code	Period	Inc. GrowthB4	Inc. Growth	growthlsb4 0	growthls
Progress	Tanzania	TZA	2007-2011	0.035	0.016	0.189	0.098
Progress	Uganda	UGA	2009-2012	0.039	0.03	0.006	-0.009
Progress	Ukraine	UKR	2008-2013	0.035	0.023	0.001	-0.02
Progress	Uruguay	URY	2007-2012	0.079	0.043	0.03	0.023
Progress	Vietnam	VNM	2004-2010	0.062	0.078	0.003	0
Dissonance	South Africa	ZAF	2006-2011	0.041	0.044	-0.041	-0.026

Appendix B

Table B1: Description of Variables.

Alternative Indicators for Changes in Monetary Well-being				
Indicators	Variable	Used Question	Level Indicator	Source
Level and changes in satisfaction with standards of living	Wp30	Are you satisfied or dissatisfied with your standard of living, all the things you can buy and do?	% Satisfied (B40)	Gallup World Poll
Level and changes in capability that people have to meet their basic needs for food	Wp40	Have there been times in the past twelve months when you did not have enough money to buy food that you or your family needed?	% Having Not Enough Money (B40)	Gallup World Poll
Level and changes in expectations regarding standards of living	Wp31	Right now, do you feel your standard of living is getting better or getting worse?	% Standard of living Worse (B40)	Gallup World Poll
Level and changes in income inequality (Gini)	Gini Index			World Bank
Level and changes in inflation	Inflation rate			World Bank
Indicators for other Aspects of Poverty (multidimensional poverty)				
Level and changes in percentage of people with health problems	Wp23	Do you have any health problems that prevent you from doing any of the things people your age normally can do?	% with Health Problems	Gallup World Poll
Level and changes in satisfaction with healthcare	Wp97	In the city or area where you live, are you satisfied or dissatisfied with the availability of quality health care	% Dissatisfied	Gallup World Poll

Level and changes in Unemployment rate		Unemployment Rate		World Bank
Level and changes in job market expectations	Wp89	Thinking about the job situation in the city or area where you live today, would you say that it is now a good time or a bad time to find a job?	% Good Time to find a job (B40)	Gallup World Poll
Level and changes in education system satisfaction levels	Wp93	In the city or area where you live, are you satisfied or dissatisfied with the educational system or the schools	% Satisfied (B40)	Gallup World Poll
Institutional Quality and Public Services				
Level and changes in perceived corruption	Wp146	Is corruption widespread throughout the government, or not?	% No (Corruption Widespread) (B40)	Gallup World Poll
Level and changes in approval leadership Level and changes in confidence in government	Wp150 Wp139	Do you approve or disapprove of the job performance of the leadership of this country? In #COUNTRY#, do you have confidence in each of the following, or not? -How about National government?	%Approve (B40) % Having Confidence(B40)	Gallup World Poll
Level and changes in quality of public services	wp91-wp92; wp94-wp95	WP91 In the city or area where you live, are you satisfied or dissatisfied with _____? -The public transportation systems - The roads and highways - The quality of air - The quality of water	% Dissatisfied	Gallup World Poll
Level and changes in self-reported freedom	Wp134	In #COUNTRY# are you satisfied or dissatisfied with Your freedom to choose what you do with your life?	% Satisfied (B40)	Gallup World Poll
Level and changes in the		Control of Corruption, Voice and Accountability,		World Bank

Kaufmann Indicators		Rule of Law, Regulatory Quality, Political Stability Government Effectiveness		

Chapter 3| Unhappy Development: Dissatisfaction with Life on the Eve of the Arab Spring[13]

Abstract

Despite progress with economic and social development over several decades, life satisfaction was relatively low and declining in many developing Arab countries in the second half of the 2000s – a situation described in this paper as the 'unhappy development' paradox. The paper empirically tests the direction and strength of association of a range of objective and subjective factors with subjective well-being in the Middle East and North Africa in the years immediately preceding the Arab Spring uprisings (2009-10). The findings suggest a significant, negative association between life satisfaction levels and each of the main perceived grievances voiced during the 2011 uprisings—dissatisfaction with the standard of living, poor labor market conditions, and corruption in the form of nepotism or cronyism. The increased prevalence of dissatisfaction with the standard of living contributed the most to the decline in subjective well-being during this period, followed by worsening labor market conditions manifested in increased unemployment and decline in self-reported earnings. In addition, perceptions about corruption became more important for people's life satisfaction, particularly in the Arab Spring countries where the uprisings were most intense.

3.1 The 'Unhappy Development' Paradox in Developing Arab Countries

In the 2000s, many developing countries in the Middle East and North Africa (MENA) did well according to the regularly tracked poverty statistics and human development indicators. Absolute poverty, measured at $1.25 a day, declined in all economies, except the Republic of Yemen, and was low on average. The incomes of the bottom 40 percent, measured as 2005 PPP-adjusted per capita expenditure, grew at higher rates than average expenditures in many developing Arab countries for which information was available (Ianchovichina, Mottaghi, and Devarajan, 2015). The Gini inequality indexes were moderate by international standards and did not worsen in most MENA economies (Ianchovichina et al., 2015). Importantly, over the past decades the region had made notable strides in reaching not only the Millennium Development Goals related to poverty and access to infrastructure services (especially drinking water and sanitation and Internet connectivity), but also those related to reducing hunger and child and maternal mortality, and increasing school enrollment (Iqbal and Kiendrebeogo, 2016).

Prior to the Arab Spring uprisings, most developing MENA countries were seen as relatively stable places. Only two MENA countries—Iraq (7th) and the Republic of Yemen (15th) —made it to the top 25 of the 2010 Failed States Index[14] of Foreign Policy. Libya and Tunisia were ranked 111th and 118th of 177 countries, respectively, and so they appeared among the stronger and less fragile countries in the world (Goodwin, 2011). With autocratic rulers in power for many years, the cracks in these countries' models of government remained invisible to most observers, including political scientists (Gause, 2011), while some considered Islam a stabilizing force (Bromley, 2015). Thus, the Arab Spring transitions of 2011 took most economists, political scientists, and policymakers by surprise (Gause, 2011; Goodwin, 2011; Bellin, 2012; Bromley, 2015).

Despite the region's consistent progress with poverty reduction, shared prosperity, and human development, life satisfaction in many MENA countries remained below the average expected for their level of development (Figure 1a) and it had dropped significantly in the years prior to the Arab Spring, especially in Tunisia, Egypt, Syria, Libya, and Yemen

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[14] The Failed States Index measures stability based on economic, political, and military indicators.

– the Arab Spring countries where the uprisings were most intense (Figure 1b). The phenomenon of declining levels of happiness during a time of moderate-to-rapid development represents an 'unhappy development' paradox. This paradox is related to the Easterlin (1974) paradox of growth without a corresponding increase in reported happiness levels and to Graham's and Lora's (2009) 'unhappy growth' paradox. In his seminar work, Easterlin (1974) argues that as economies grow and nations get richer, they do not get happier.[15] He also provides evidence that in the developed world, where the basic standard needs are satisfied, richer societies are not much happier than poorer ones. More recently, attention has shifted to a pattern observed in several transition countries, where high economic growth was accompanied by declining well-being levels within countries (e.g., Brockmann et al., 2009; Easterlin et al., 2012; Graham, Zhou and Zhang, 2017). Controlling for per capita incomes, several recent cross-country studies by Deaton (2008), Graham and Lora (2009), and Stevenson and Wolfers (2008) even find that people living in fast-growing economies are on average less happy than those living in slow-growing economies. This phenomenon, referred to by Graham and Lora (2009) as the 'unhappy growth' paradox, highlights the importance of taking into account people's perceptions when attempting to understand a nation's well-being. The concepts of unhappy growth and unhappy development are related, however they differ in that "unhappy development" captures broader aspects of progress than those associated with income growth alone, including factors related to inequality, employment conditions, and access to infrastructure, health and education services (World Bank and International Monetary Fund, 2015).

Why did development in MENA not translate into higher levels of subjective well-being? Objective measures – such as income, education, and longevity, can capture the objectively measurable part of people's standards of living, but they often fail to capture all its relevant components (Jahedi and Méndez, 2014). For example, household expenditures may rise as a result of an increase in food prices. Although this increase in expenditures could be considered an indication of an objective improvement in the quality of life in a country, in and of itself it does not signify progress as the decline in living standards remains obscured. In MENA, the social contract between the state and its citizens delivered progress

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[15] For a critique on this viewpoint, see Veenhoven and Hagerty, (2003) and Stevenson and Wolfers, (2008). For further discussion, see Clark, Frijters and Shields, (2008).

visible in the improvement of some objective development measures. As part of this social contract, Arab governments subsidized food and fuel, provided free education, health, and other public services, and provided jobs in the public sector. These benefits were offered in exchange for political support and limited voice (Devarajan and Ianchovichina, 2018). However, over the years and especially in the 1990s and the 2000s, the social contracts became fiscally unsustainable as these states did not have the fiscal resources to finance the food and fuel subsidies, provide government jobs to new graduates entering the labor market, and improve the quality of public services (Devarajan and Ianchovichina, 2018). Reforms implemented in the 1990s delivered economic growth (World Bank, 2011), but this growth was not inclusive as the private sector did not create jobs fast enough to absorb the large number of young people entering the labor force. As a result, the MENA region's unemployment rate was highest in the developing world and the rate for youth and women was double the average. Better educated than their parents, young people expected to do better than the previous generation, but instead they struggled to find good quality jobs and to get ahead no matter how hard they worked. While public services were free, their quality was so poor that people ended up paying for services provided by the private sector. Teacher absenteeism was high (Brixi, Lust and Woolcock, 2015) and learning outcomes were disappointing (Devarajan and Ianchovichina, 2018).

The discontent and the quality-of-life issues generated by the broken social contract could not be easily detected in standard objective indicators used to measure poverty reduction, shared prosperity and welfare. However, they are captured in subjective wellbeing data (Veenhoven, 2012), which are increasingly perceived as a meaningful and consistent way of measuring people's welfare (Senik, 2011). Life satisfaction in many MENA countries was below the average for the group of countries at a similar level of development (Figure 1a) and had dropped significantly in the years prior to the Arab Spring events (Figure 1b). By the end of the 2000s, many people in the developing parts of MENA, especially in the Arab Republic of Egypt, Iraq, the Syrian Arab Republic, Tunisia, and the Republic of Yemen, were among the least happy people in the world (see Appendix A1).[16] In Egypt, for instance, average life-evaluation levels plunged on a 0-10 scale[17] from 5.5 in 2007 to 4.6 in

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[16] The incidence of depression was also observed to be high in MENA, according to Ferrari et al. (2013).

[17] The two extreme ends of the range capture worst possible life (0) and best possible life (10).

2010 (see Appendix A2)—a deep drop in the context of improvements observed in socioeconomic statistics and growth in per capita incomes (see Figure 1b).

Figure 1a: Satisfaction with Life and GDP per Capita, 2007-10
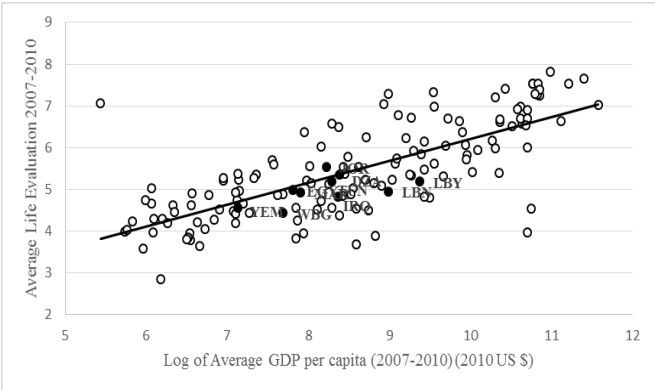
Sources: Log of Average GDP per capita, PPP (constant 2011 international $): World Bank Development Indicators; Life Evaluation: Gallup World Poll, 2012. *Note:* Numbers are weighted averages for 145 countries. Abbreviations: EGY=Egypt; JOR=Jordan; LBN=Lebanon; MAR=Morocco; WBG=West Bank and Gaza; YEM=the Republic of Yemen, DZA=Algeria, IRQ=Iraq, TUN=Tunisia, LBY=Libya. GDP per capita for SYR=Syrian Arab Republic is missing.

Figure 1b: Change in Satisfaction with Life and GDP Growth, 2007-10
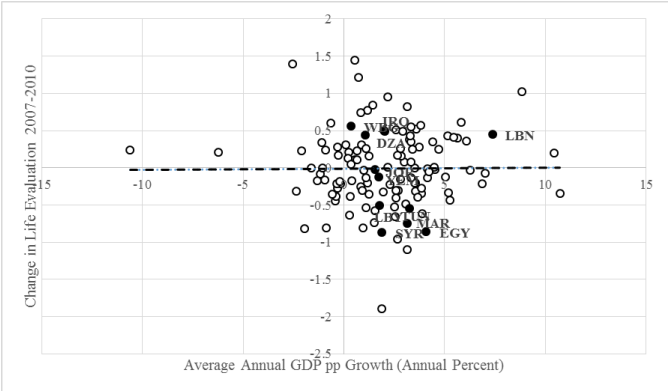
Sources: GDP per capita growth (annual %), 2007-2010: World Bank Development Indicators; Life Evaluation: Gallup World Poll. *Note*: Numbers are weighted averages for 124 countries. Abbreviations: EGY=Egypt; JOR=Jordan; LBN=Lebanon; MAR=Morocco; WBG=West Bank and Gaza; YEM=the Republic of Yemen, DZA=Algeria, DJI=Djibouti, TUN=Tunisia, LBY=Libya, SYR=Syrian Arab Republic.

A rise in people's expectations and aspirations, particularly those of youth who had acquired better education than their parents and expected to find good jobs after graduation (Campante and Chor, 2012), may have widened the gap between actual and expected welfare. This in turn may have increased people's aversion to inequality and social injustice (Verme et al., 2014; Cammett and Diwan, 2013) and it may have negatively affected their levels of happiness. Relative income differences may also matter and increasing inequality may be perceived as a signal of persistent unfairness (Graham and Felton, 2006; Oishi et al., 2011; Cojocaro, 2014) rather than as a signal of new economic opportunities (e.g. Clark, 2003). According to Graham and Pettinato (2004), the economic growth in Arab countries may have been accompanied by the rise of a middle class consisting of 'frustrated achievers'. This reasoning is in line with the 'tunnel effect', introduced by Hirschman (1973). This effect occurs in situations similar to a traffic congestion in a tunnel where one of the lanes starts moving while the other lanes are still jammed. The people who are still stuck initially feel hope as the end of the traffic jam seems to be in sight. After some time, though, if their lane remains blocked, hope will give way to envy and frustration. In the Arab world, the 'tunnel effect' may have been felt by the middle class, in particular, as reforms implemented to boost economic growth benefited instead a happy few, especially those with connections to the regimes in power.

Yet, even in the absence of a shift in expectations or social injustice, people may have become more frustrated with difficult-to-measure factors related to the quality of life in the Arab world, such as the deterioration in the quality of public services, the ability to get good jobs, and institutional and environmental quality. For instance, although access to free public health and education improved dramatically over the years, teacher and doctor absenteeism became a severe problem hurting learning outcomes and forcing people to pay out of pocket for better quality private-sector services (Brixi et al. 2015; Devarajan and Ianchovichina, 2018). Worsening of other subjective indicators, such as the ability to voice concerns and demand accountability and perceptions of corruption and cronyism, may have also contributed to the deterioration in subjective well-being. Evidence from the World Happiness Report (2013, p. 16) shows that trust as measured by whether people have someone to count on declined in MENA and perceptions of corruption and the freedom to

make life choices also deteriorated, in contrast to improvements in other regions (e.g. Latin America).

The purpose of this paper is to empirically test the direction and strength of the associations between the symptoms of the broken social contract and life dissatisfaction in MENA countries in the years immediately preceding the Arab Spring uprisings (2009-10). We do so by employing both objective and perceptions data regarding different aspects of life and society. In addition, we compare the factors significantly associated with life dissatisfaction on the eve of the Arab Spring to the main grievances motivating people to participate in demonstrations during the Arab Spring, as reported by individuals included in Arab Barometer surveys.

The paper adds to the literature in three ways. To our knowledge, we are the first to examine empirically the relative importance of different explanations provided for the declining life satisfaction in developing MENA on the eve of the Arab Spring. In particular, we examine several hypotheses for the fall in life satisfaction in developing MENA countries that are linked to the symptoms of the broken social contract and include dissatisfaction with: (1) the political system of autocracy and limited civil freedoms, (2) the standard of living, (3) the high unemployment and poor quality of available jobs, and (4) corruption in the form of nepotism or cronyism. Second, we investigate systematically the factors behind the decline in life satisfaction by decomposing the decline into two components: an effect associated with changes in the prevalence of dissatisfied individuals and an effect associated with changes in the relative importance of these factors for life satisfaction. In other words, this decomposition allows us to determine whether life satisfaction declined because of an increase in the percentage of people dissatisfied with a certain aspect of life or whether this domain became relatively more important for subjective well-being. Third, we compare the factors related to unhappiness in developing MENA with the grievances of participants in the Arab Spring protests. We find that the main grievances that motivated people to join demonstrations are also the factors associated significantly and negatively with subjective well-being levels in developing MENA during this period. Our findings suggest that perceptions provide valuable information about public preferences and needs, which are typically not reflected in objective data (Veenhoven, 2002). In other words, we make the case that both objective and subjective (or perceptions) data matter for understanding the

relative importance of grievances for the collective action observed during the Arab Spring (cf. Okulicz-Kozaryn, 2013; Jahedi and Méndez, 2014).

The remainder of this paper is organized as follows. Section 2 discusses the potential root causes of dissatisfaction with life in developing MENA. Section 3 presents the concepts, methodology, and data used in the empirical exploration. The results of this empirical analysis are presented in section 4. Finally, section 5 concludes with a summary of findings, a discussion of how these results link to the grievances voiced during the Arab Spring uprisings, and a few caveats.

3.2 Major Factors behind Life Dissatisfaction in Developing MENA Countries

A look at the universal conditions for happiness, as presented in cross-country studies focusing on life satisfaction, provides limited understanding of the factors behind the low levels of life satisfaction in the Arab world. To understand the factors shaping the subjective well-being in the developing Arab countries prior to the Arab Spring, we must factor in explicitly the grievances associated with the broken social contract as well as objective indicators such as income, life expectancy, and education and evaluate their relative importance for life satisfaction.

Several explanations have been put forward for the grievances that led to the rise in dissatisfaction rates on the eve of the Arab Spring. These include: (1) limited freedom and voice in predominantly autocratic states; (2) dissatisfaction with the standards of living; (3) unhappiness with persistently high unemployment and lack of high-quality jobs; and (4) dissatisfaction with corruption and cronyism, which have constrained the opportunities for economic growth of those who work hard. Shifts in expectations are not explored as a unique factor to explain dissatisfaction, because each of the other explanations entail possible shifts in expectations in the corresponding domain. Therefore, changes in dissatisfaction with any particular domain partly incorporates the mismatch between expectations and reality, which are captured indirectly. The remainder of this section discusses each of these explanations in detail.

- Autocracy

On the eve of the Arab Spring, most Arab states were longstanding autocracies (Chekir and Diwan, 2012; Bromley, 2015; Cammett and Diwan, 2013). Power was concentrated in the hands of one person or a small group of elites, backed by the military, who made decisions subject to few legal restraints and mechanisms of popular control. At the same time, the public had few if any channels of safe expression of opinions and grievances and opportunities to develop diverse civil society. The longstanding regimes managed to stay in power through a combination of repressive practices and a social contract which extended benefits, such as free public education and health services, subsidized energy and food products, and guarantees of public employment, in exchange for political support (Bellin, 2004; Bromley, 2015; Cammett and Diwan, 2013).[18] Thus, despite human development and economic progress after independence, the developing MENA countries scored low in terms of economic and social freedoms and the Freedom House ranked the region as the most repressive in the world (Freedom House, 2008).

The extent to which people are free to make choices and voice opinions has a major impact on their happiness (Inglehart et al., 2008; Verme, 2009). Democracies are, on average, happier than autocracies (Frey and Stutzer, 2000), but the effect of democracy on happiness is stronger in countries with established democratic traditions (Dorn et al., 2007). Fereidouni, Najdi, and Amiri (2013) obtained no significant relationship between voice and accountability and happiness in developing MENA countries. Ott (2010) also found that the correlation between happiness and democracy is relatively weak in the MENA region. The 'autocratic bargain' may have weakened the direct link between happiness and limited freedom in developing MENA. Individuals who obtain 'material benefits' in exchange for political support may initially express dissatisfaction with their standards of living rather than with the system responsible for their deterioration.

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[18] Cammett and Diwan (2013) refer to this social contract as an 'autocratic bargain.'

- Dissatisfaction with Standards of Living

After independence, natural resource rents enabled many Arab governments to finance redistributive policies without imposing a heavy tax burden on citizens. But in the 1990s and 2000s, fiscal pressures increased, reflecting disappointing growth in the 1980s and growing recurrent expenditures, especially on public wages and subsidies. Governments responded by downsizing the public sector, removing the guarantees of secure public jobs, and initiating reforms of the food and energy subsidy programs.[19] During this period, unemployment increased and many households noted deterioration in their standard of living. High dependence on imported food and limited fiscal space meant that the global commodity price increases of the 2000s would transmit to domestic markets despite the presence of food subsidies (Korotayev and Zikina, 2011; Ianchovichina, Loening, and Wood, 2014). Inflation stemming from increases in food and energy prices put a strain on households as they spent more of their income on meeting basic needs.[20] The global economic crisis of 2008 put additional stress on the MENA economies. In Egypt, the crisis was associated with a steep decline in real earnings growth; in Tunisia, it reinforced the upward trend in unemployment; and in Jordan, it slowed employment growth. Dissatisfaction with basic public services such as healthcare, housing, schools, and infrastructure also grew in the developing MENA countries, according to Gallup World Poll data, reflecting the erosion in the quality of public services.

By the end of the 2000s, the erosion in standards of living was felt not only by the poor, but also by other segments of the population, including the middle class.[21] Reflecting diminishing marginal utility, the widespread system of subsidies could not compensate for the erosion of living standards; food and energy subsidies mattered less for the well-being

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[19] Some governments were more successful than others in cutting subsidies and improving targeting. Most economies made only partial reforms to their subsidy systems and reversed the reforms in response to the Arab Spring events.

[20] According to Maslow (1943), in the hierarchy of individual demands, a person's physiological needs for basics such as food, water, and shelter dominate all other needs. In other words, if these basic needs are not supplied, all other human needs are pushed into the background and the individual only seeks to satisfy his or her hunger. Individual anxiety over rising costs of food or shelter can trigger unhappiness and, in some cases, riots (Lagi, Bertrand, and Bar-Yam, 2011). The risk of riots is particularly high in lower-income countries where the share of food and other necessities in household expenditure is high (Arezki and Brückner, 2011).

[21] See Dang and Ianchovichina (2018) for a discussion of middle-class welfare dynamics in the developing MENA countries during this period.

of the middle class than they did for the well-being of the poor and vulnerable (Ianchovichina, Mottaghi, and Devarajan, 2015; World Bank, 2010; Araar and Verme, 2016).[22]

- Unemployment and Low Quality Jobs

Dissatisfaction with job market conditions was particularly strong in the developing MENA countries on the eve of the Arab Spring. In the preceding decade, the MENA region's average, aggregate and youth unemployment rates were the highest in the world. Without guarantees of secure public jobs, young people, who entered the labor market better prepared than their parents in terms of educational qualifications (Barro and Lee, 2010; Campante and Chor, 2012), were forced to queue for public sector jobs or take part-time or low-quality jobs in the private sector (Chamlou, 2014)[23] which did not generate enough formal jobs (Ianchovichina, 2018). Employment in the informal private sector offered little protection at old age and limited access to quality healthcare and benefits, such as paid maternity and annual leave (Angel-Urdinolaand Kuddo, 2011; World Bank, 2014b).

The mismatch between educational attainment and economic opportunities created a gap between reality and expectations, lowering youth's life satisfaction, amplifying perceptions of inequality and unfairness, and potentially contributing to social unrest (Campante and Chor, 2012). In the literature, the negative association between happiness and unemployment is well-established and can be explained by a combination of income loss and psychic costs related to psychological distress and loss of identity and self-respect (Veenhoven, 1989; Gallie and Russel, 1998). The deterring effect of unemployment on happiness is more severe for the long-term unemployed (Clark and Oswald, 1994), which is

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[22] World Bank (2010) reports that in fiscal year 2008/09, the share of food subsidies in the total consumption of the poorest 20 percent of the Egyptian population was 15 percent, whereas the corresponding share for the richest 20 percent of Egyptians was just 7.4 percent. Araar and Verme (2016) show that in 2014 for all countries and all food products, as well as for liquefied petroleum gas and electricity, the household budget shares of expenditure on subsidized products was higher for poorer and progressively lower for richer households, and the decrease was very steep in general. This was not the case for gasoline and diesel. The richer households spent more on gasoline and diesel than the poorer households, but the expenditure shares of the rich on these two energy products were small, at close to or below 3 percent.

[23] The informal sector consists of firms, workers, and activities that operate outside the legal and regulatory frameworks.

particularly high in the MENA region, and for people with limited job opportunities (Clark, Knabe, and Rätzel, 2010).

- Crony Capitalism and 'Wasta'

On the eve of the Arab Spring, many people were frustrated because they could not get ahead by working hard and share in the prosperity generated by the relatively few large and successful Arab firms; they were mostly state-owned or privately owned companies (OECD, 2009).[24] At a time when public sector employment was contracting, private sector growth was sluggish, stifled by distortions, including policies that offered advantages to a few firms with political connections.[25] Reforms in the 1990s were implemented in an uneven way, benefiting mainly the elites (Chekir and Diwan, 2012; Rijkers et al., 2014) who dominated a range of economic sectors (Malik and Awadallah, 2013).

Corruption and cronyism flourished in developing MENA with detrimental effects not only on aggregate economic growth, but also on people's subjective well-being (Ott, 2010). There was growing frustration with inequality of opportunity in labor markets and the increased importance of 'wasta' or connections with the elites in getting good quality jobs. These feelings were broadly shared and reflected the perceptions of citizens that 'wasta' mattered more than credentials for getting good jobs. The worsening perceptions about corruption and crony capitalism were reflected in the retreat of MENA countries' rankings on the Corruption Perceptions Index of Transparency International between 2000 and 2010. Tunisia's score, for instance, declined from 5.2 in 2000 to 4.3 in 2010 (lower scores indicate highly corrupt countries). Similarly, Morocco's score decreased from 4.7 to 3.4 during the same period. In Syria, the index dropped from 3.4 in 2003 to 2.5 in 2010. In some countries, including Egypt, Jordan and Libya, the index was stable in the 2000s, but most MENA countries scored below the worldwide average on various governance indicator rankings (for example, Kaufmann, Kraay, and Mastruzzi, 2011).

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[24] According to OECD (2009), very few large Arab firms are publicly traded companies.
[25] There was fear that a rise of the 'nouveau rich" class would challenge existing power relations. The ruling elites controlled large parts of the private sector and profited from monopoly rights and cheap access to land and other resources (Cammett and Diwan, 2013).

In summary, it can be argued that the growing dissatisfaction on the eve of the Arab Spring was fueled by a mix of grievances related to the standards of living, unemployment and low quality jobs, and 'wasta' or cronyism[26]. The rest of the paper tests these hypotheses, the relative importance of different grievances for life satisfaction and its decline during the period immediately preceding the Arab Spring.

3.3 Concepts, Methodology, and Data

The word 'happiness' is used in various ways (Veenhoven, 2012). In the broadest sense it is an umbrella term for all that is good. Accordingly, 'happiness' is often used interchangeably with 'well-being' or 'quality of life' and in this case denotes both individual and social welfare. However, in the social sciences the word 'happiness' is also used in a more specific way, which refers to 'subjective well-being', indicative of an individual's subjective appreciation of his or her own life or 'life satisfaction'. Accordingly, the concept of 'happiness' has been defined as '*the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably'* (Veenhoven, 1984, Chapter 2).

Thus defined, happiness is something on one's mind that can be measured using surveys. Common survey questions[27] read: '*Taking all together, how happy would you say you are: very happy, quite happy, not very happy, not at all happy?*' (standard item in the World Value Studies) or '*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time*' (standard item in the Gallup World Poll). Responses to this latter question are used in the empirical part of this paper.[28]

How happy people are depends on *objective conditions* and *subjective factors*, including perceptions and expectations. According to Layard (2006), objective factors such as gender, age, marital and education status, financial situation, and health determine to a large extent life satisfaction, but subjective factors associated with perceptions and

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[26] Grievances related to these domains possibly entail unmet expectations about standards of living, quality of jobs and cronyism.
[27] See Veenhoven (2012) for a discussion of the limitations of direct questioning.
[28] This question captures the cognitive component of happiness.

expectations about family relationships, work, community and friends, personal freedom, institutional quality, and personal values are also imperative to individual happiness. These domains of life reflect the most important human needs as identified by Maslow (1943). The relative importance of the objective and subjective determinants of life satisfaction vary over time and across individuals. (Diener and Suh, 2000 Easterlin and Sawangfa, 2007).

To analyze the roots of dissatisfaction with life in developing MENA on the eve of the Arab Spring, we used cross-sectional data from the Gallup World Poll for the years 2009 and 2010 and a standard life satisfaction model (see Di Tella, MacCulloch, and Oswald, 2003; Arampatzi, Burger, and Veenhoven, 2015):

$$LS_{jit} = \Theta Individual\_Perceptions_{jit} + \Sigma Personal\_Characteristics_{jit} + \varepsilon_j + \lambda_t + \mu_{jit.} \qquad (1)$$

In this model, LS, the overall life satisfaction of individual j in country i in year t, depends on a vector of Individual_Perceptions about social conditions and domain satisfactions of individual j in country i in year t, a vector of objective Personal_Characteristics of individual j in country i in year t, a vector ε_i of country dummies to control for time-invariant country-specific characteristics, a vector λ_t of month-year dummies[29] capturing time-related shocks common for all countries in the developing MENA region, and a residual error μ_{jit}. We estimate model (1) using weighted least squares regression (WLS) with robust standard errors and weighting observations using the sampling weights provided by the Gallup World Poll.[30]

The annual Gallup World Poll includes at least 1,000 randomly selected respondents (adult population of 15 years and older) per country and is representative at the national level. It covers entire countries including rural areas except for unsafe or inaccessible regions in few countries.[31] Despite the small anomalies in these few cases, the uniqueness of Gallup

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[29] The month-year of data collection for most countries are generally concentrated in two periods, the first quarters of 2009 and 2010 and the last quarters of 2009 and 2010.

[30] Following Ferrer-i-Carbonell and Frijters (2004), we treat the dependent variable as cardinal and not as ordinal variable.

[31] In Algeria, some sparsely populated areas of the south, home to 10% of the population, were excluded. In Jordan, excluded areas are home to 12% of the population. In Morocco, people in the southern provinces, representing 3% of the population, were not interviewed by Gallup World Poll. In Yemen, gender-matched sampling was used, while the sample for Palestinian territories includes people in East Jerusalem.

World Poll data for the developing MENA region is indisputable. The Gallup World Poll constitutes an almost exclusive source of information supplied by individuals to inform on several aspects of their life, including how satisfied they are with their life as a whole and how satisfied they are with different domains of their life. The data source also allows for cross-country comparisons and region-based aggregation of micro-level information given the use of identical questions across countries and years. The common sample we use in this paper comprises in total 25,244 respondents from 10 developing MENA economies, including Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Palestinian territories, Syria, Tunisia, and the Republic of Yemen.

Figure 2a: Distribution of Life Satisfaction Scores in Developing MENA in 2009-10
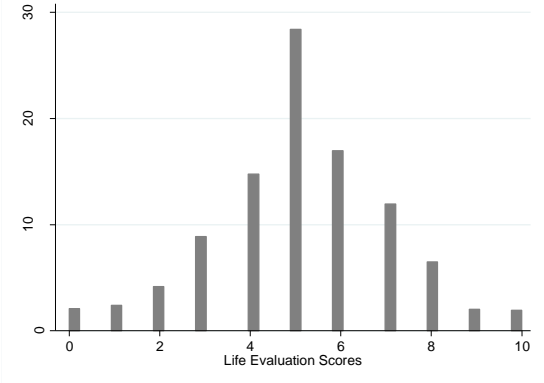
Note: The Mean Life Satisfaction Score for developing MENA is 5.11.

Figure 2b: Distribution of Life Satisfaction Scores in Latin America and the Caribbean in 2009-10
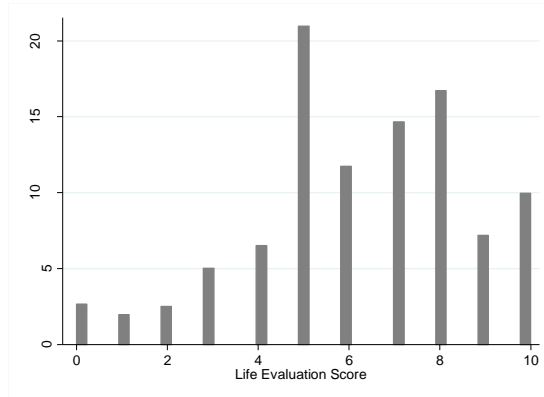
Note: The Mean Life Satisfaction Score for Latin America and the Caribbean is 6.24.

Figure 2c: Distribution of Life Satisfaction Scores in Sub-Saharan Africa in 2009-10
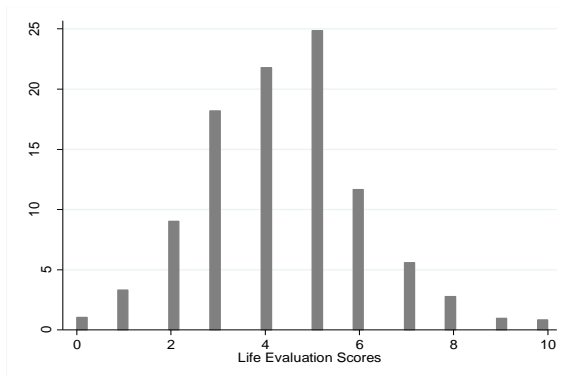
Note: The Mean Life Satisfaction Score for Sub-Saharan Africa is 4.35.

Source: Gallup World Poll 2012. Developing MENA includes: Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia, and the Republic of Yemen. Latin America and the Caribbean includes: Venezuela, Brazil, Mexico, Costa Rica, Argentina, Bolivia, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Paraguay and Peru Sub-Saharan Africa includes: Nigeria, Kenya, Tanzania, Ghana, Uganda, Malawi, South Africa, Botswana, Mali, Mauritania, Nigeria, Rwanda, Senegal, Zambia, Burkina Faso, Cameroon, Sierra Leone, Zimbabwe, Burundi, Central African Republic, Chad, Comoros, Ivory Coast, Liberia and Sudan. The Kolmogorov – Smirnov test of equality of distributions indicates that the three distributions are not equal.

Life satisfaction was measured using a single question, known as the 'Cantril Ladder' or 'Self-Anchoring Striving Scale' (Cantril, 1965). This question asks on which step of the ladder, with steps from 0 to 10, a person feels he or she stands at present. The higher the score on the ladder, the closer one's life is seen to his or her ideal life. Figure 2 shows the distribution of life evaluation scores in the developing MENA region (in panel a), Latin America and the Caribbean (in panel b), and Sub-Saharan Africa (in panel c) during the 2009-10 period. In developing MENA region 61 percent of the population has life satisfaction scores of 5 or lower, while only 10 percent gives his or her life a score of 8 or higher. The three distributions are distinctly different as indicated by the results from the Kolmogorov-Smirnov test for equality of distributions. The MENA distribution is different from the one for Latin America and the Caribbean and is closer to the one for Sub-Saharan Africa as seen on Figure 2, although the latter is shifted to the left of MENA's. This is expected, as the average per capita income in Sub-Saharan Africa is lower than that in developing MENA.

Table 1: Sample Statistics on Life Satisfaction in Developing MENA Countries (2009-10)

Variable	Observations	Mean	SD	Min.	Max.
Algeria	3,588	5.58	1.65	0	10
Egypt, Arab. Rep.	1,628	4.88	2.14	0	10
Jordan[32]	691	6.23	1.81	0	10
Iraq	2,432	5.07	1.72	0	10
Lebanon	3,382	5.29	2.29	0	10
Morocco	3,144	4.97	1.67	0	10
Palestine	2,942	4.83	2.14	0	10
Syrian Arab Republic	2,169	4.86	2.12	0	10
Tunisia	2,048	5.17	1.69	0	10
Yemen, Rep.	3,184	4.66	2.21	0	10

Source: Gallup World Poll 2012.

Within developing MENA, the mean life satisfaction scores vary by country, ranging from 4.66 in the Republic of Yemen to 6.23 in Jordan (Table 1). It is worth noting that when expectations do not meet reality, a person with high expectations is more likely to be

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[32] The limited sample size for Jordan is due to non-response on some questions for 2010.

dissatisfied with his life than a person with low expectations. Thus, the life satisfaction variable captures indirectly the effect of a gap between expected and actual welfare.

Our main variables of interest relate to the domain-specific characteristics thought to have a most profound influence on life satisfaction on the eve of the Arab Spring, as discussed in Section 2. All questions were originally coded as follows: (1) satisfied, (2) dissatisfied, (3) don't know, and (4) refuse. However, people answering "don't know" or who refused to answer this and other questions were omitted from the sample. In the restricted sample, 0.27% of the respondents did not respond to the life evaluation question, while a small percentage of the respondents were dropped from the sample because they did not respond to question on satisfaction with living standards (0.55%), satisfaction with efforts of the government to increase the number of available quality jobs (1.61%), cronyism (2.16%), freedom in life (1.79%), presence of corruption in government (9.10%)[33] and satisfaction with education questions (1.93%), respectively. Consequently, the explanatory variables related to subjective domain-specific characteristics are binary and are recoded as 0 if the respondent is satisfied and 1 if dissatisfied. The binary nature of the variables possibly limits the expressive capacity of respondents and consequently some variation is lost. For instance, respondents cannot indicate a neutral attitude. In that respect, binary coded measures adequately capture the direction of an attitude, although they perform less well in capturing the intensity of agreement or disagreement. The debate on the optimal numbers in scale response is longstanding. Evidence shows that at least in verbally labelled variables longer scales increase the internal consistency and reliability, but no large differences are found (Weng, 2004). However, obtaining internal consistency and reliability only happens when respondents actually use the whole range of available options (Diener, 2006).

The Gallup World Poll does not have a question on the degree to which people are satisfied with the political system in the MENA countries. Since in autocracies people's ability to make political choices is restricted, we instead turn to the question: "*Are you satisfied or dissatisfied with your freedom to choose what you do with your life?*". We recognize, however, that this question also reflects how satisfied people are with their

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[33] Non-respondents were further examined but were not found to have significant differences in life evaluation compared to respondents. Despite this finding, our results may underestimate the importance of the corruption domain relative to the other domains, especially given that part of the non-response might be due to fear from the government.

freedom to make individual choices about education, marriage, children, and employment. The answer to this question is recorded as zero for those who are satisfied and one for those who are dissatisfied with their freedom to make choices.

We control for objective measures of standards of living by including individual income (given in international dollars). We also include subjective evaluations of living standards based on the answers to the following question: "*Are you satisfied or dissatisfied with your standard of living, all the things you can buy and do?*" The answers to this question are coded as 0 if satisfied and 1 if dissatisfied and capture the effect of both monetary and non-monetary factors on people's experience with living conditions.

To examine the effects of unemployment, underemployment, and job market conditions, we include subjective and objective variables related to employment and the education system. With regard to employment status, we distinguish between individuals who are paid employees (reference category), self-employed, underemployed, unemployed, or out of the workforce. The underemployed are respondents who are employed part-time, but who would like to work full-time, while the unemployed respondents are not employed at all and are looking for job opportunities. Respondents who are out of the workforce include homemakers, students, and retirees.[34] In addition, we control for whether people are employed in government positions or not (reference category is "Other"). To reflect on job market conditions and the availability of high-quality jobs, respondents were asked: "*Are you satisfied or dissatisfied with efforts to increase the number of quality jobs?*" and to this question they could either reply that they are satisfied, recorded as 0, or dissatisfied, coded as 1. The question: "*In the city or area where you live are you satisfied or dissatisfied with the education system or the schools?*" allows us to capture the effect on life satisfaction of service provision, in particular, education services, which determine employment opportunities later in life. The answer to this question is coded as 0 if satisfied or 1 if dissatisfied.

To explore the effect of corruption, cronyism, and 'wasta' on life satisfaction, we focus on perceived government corruption as a proxy for perceptions of corruption. The answer to the question: "*Is corruption widespread within government?*" could be that the

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[34] "Undetermined non-full-time employed" is an additional category, which is a result of older categorization of the employment status variable. Since this group is not clearly determined, it cannot be interpreted and it is therefore omitted from the analysis.

level of corruption within government is limited, recorded as 0, or widespread, recorded as 1. When information regarding corruption in government was not available, the question "*Is corruption widespread within business?*" was used (cf. Helliwell, Layard, and Sachs, 2015). In addition, we reflect the extent to which cronyism and inequities affect people's life satisfaction by incorporating people's opinions on whether working hard pays off. The answers to the question: "*Can people in this country get ahead by working hard or not?*" are coded as 0 if the response is positive and 1 if the response is negative.[35] Finally, we control for personal characteristics (demographic characteristics) that may confound the relationship between the designated factors and life satisfaction in developing MENA. These personal characteristics are related to gender, age, marital status and household composition, education level, migration status, and religion. An overview of all variables included in the analysis (including descriptive statistics) and variance inflation factor analysis are provided in Appendices B1, B2, and B3.

3.4 Empirical Results

This section discusses the baseline results and the results from alternative specification, the sensitivity of the results to changes in variable specifications and data aggregations, as well as endogeneity bias issues. It also presents a decomposition of life satisfaction changes in order to understand the main drivers of change in well-being on the eve of the Arab Spring.

3.4.1 Baseline and Alternative Specifications: Weighted Least Squares Results

Table 2 reports results from different specifications of our life satisfaction model. In the first model specification (1), we have LS as a dependent variable regressed only on control variables for personal characteristics. In models 2 through 6, we separately include each of the subjective domain satisfaction variables associated with dissatisfaction in developing MENA, along with related objective factors. In model specification 7, all subjective and objective variables are included simultaneously, as shown in the fully

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[35] Given the unfavourable responses to the cronyism question, reverse coding is used to record the answers, with 0 indicating a positive response and 1 indicating a negative one.

specified life-satisfaction model equation (1). Model 8 replicates model 7 using a reduced sample of Arab Spring countries where the uprisings were most intense.[36] Finally, model 9 replicates model 7 using a reduced sample of non-Arab-Spring (non-AS) developing MENA countries. All specifications include country and time dummies. The country dummies capture time-invariant, country-specific factors, such as the size of the country, culture, language, distance to markets and the structural features of the political and economic environment. The time dummies control for exogenous factors that changed over the period of interest, including contagion effects in the aftermath of the global financial crisis.

In line with the empirical literature on happiness, education and marriage are positively associated with life satisfaction in developing MENA. Against prevailing perceptions in the West, Arab women are on average happier than men. This finding is consistent with the discussion in Bromley (2015) who emphasizes the sources of unhappiness and frustration for men that doom men to solitude and frustration.[37]

The main findings related to the subjective factors, representing the main grievances on the eve of the Arab Spring, can be summarized as follows. First, although dissatisfaction with freedom to choose what one does with his or her life has a negative and significant effect on life satisfaction (model 2, table 2), this effect disappears after controlling for other perceptions (model 7, table 2). This finding is in line with the view that the 'autocratic bargain' has weakened the direct link between authoritarianism (for example, lack of freedom) and life satisfaction. Suppressed citizens compromised their voice and freedom in exchange for material benefits provided by the state (Devarajan and Ianchovichina, 2018). The results suggest that disappointment with the economic aspects of the failed social contract dominates the effect of grievances associated with limited freedoms. Dissatisfaction with standards of living has the largest and strongly significant negative effect on life satisfaction among all other subjective domains (models 3 and 7, table 2). On average, in the

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[36] These countries are Egypt, Arab. Rep, Syrian Arab Republic, Tunisia, and Yemen, Rep. Libya is an Arab Spring country but it is not in this sample due to missing data.

[37] These findings are also confirmed in the World Happiness Report, 2015. A possible explanation for this finding are the distinct gender roles within the Arab world. Women are mainly nurturers and caregivers, while men are providers and protectors of the family. Given current socio-economic conditions in many developing Arab nations, men have much more difficulties living up to these expectations than women, explaining the gender gap in happiness favouring women. Other research on gender differences in well-being finds that women report higher satisfaction scores than men, but more stress (Nolen-Hoeksema and Rusting, 1999).

fully specified model 7 in table 2, the life satisfaction score of dissatisfied respondents is 1.24 points lower than the life satisfaction score of respondents who are satisfied with their living standards.

Poor job market conditions are significantly and negatively related to life dissatisfaction in developing MENA countries—a result that remains significant even after including all other subjective domains (models 4 and 7, table 2). The unemployed report life satisfaction scores that are 0.34 points lower than people in paid employment. Lack of quality jobs is another reason for the discontent and remains a significant factor even after controlling for employment status. On average, respondents who indicate dissatisfaction with the availability of high quality jobs report 0.15 points lower life satisfaction than those who are satisfied with job quality (model 7, table 2). Not surprisingly, people working for the government are, on average, significantly happier than people working in the private sector. Public sector jobs often offer higher wages and more job security than private sector jobs as well as generous social security coverage (Bodor, Robalino, Rutkowski, 2008). Such advantageous terms of employment are very attractive to workers. Dissatisfaction with the education system is associated with life dissatisfaction in developing MENA. Respondents who are dissatisfied with the educational system report 0.17 points lower satisfaction with life than those who are satisfied with the education system (models 4 and 7, table 2).

Perceptions of inequality of opportunities (or 'wasta') due to corruption and nepotism are significantly and negatively associated with life satisfaction in developing MENA (models 5, 6, and 7, table 2). Respondents who think that people cannot get ahead by working hard report, on average, a 0.22 points lower life satisfaction score than those who are satisfied with this dimension of life satisfaction (model 7, table 2). Respondents who believe that government corruption is widespread are on average 0.08 points less satisfied with life (model 7, table 2). Thus, in MENA, the governance problem is perceived to affect life satisfaction not so much through corruption in government, but through practices of nepotism and elite capture that affect all aspects of life and prevent people and those working in the private sector, more generally, from succeeding even when they make great efforts to excel and do a good job. This result is consistent with the findings in Freund, Nucifora and Rijkers (2014) and World Bank (2014a).

Finally, model 8 replicates model 7 with a reduced sample of Arab Spring countries where the uprisings were most intense. In this model all coefficients are similar to those in model 7. Therefore, the conclusions based on the full specification for the whole sample of developing MENA countries (model 7, table 2) hold for the reduced sample of Arab Spring countries (model 8, table 2). They also hold for the reduced sample of non-AS countries (model 9, table 2). Our weighted least squares (WLS) results largely hold when controlling for interview dates, mood, health (Appendix C1), examining heterogeneity with the MENA region (Appendix C2), and using alternative variable specifications (Appendix C3). Only when we add mood to our WLS baseline regression model 7, the coefficients on dissatisfaction with the availability of high quality jobs and dissatisfaction with the educational system become smaller in size and statistically insignificant. We present the marginal effects of our estimates in Appendix C4. These marginal effects are in line with our findings. For instance a discrete change from 0 being satisfied with standards of living to 1 being dissatisfied decreases life evaluation by 0.26 points in developing MENA and by 0.27 points in the Arab Spring countries.

Table 2: Determinants of Life Satisfaction in MENA: Weighted Least Squares Estimates

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Spring	Non-AS
Dissatisfied with freedom to choose life: Yes		-0.351***					-0.033	-0.019	-0.043
		(0.030)					(0.031)	(0.053)	(0.037)
Dissatisfied with standard of living: Yes			-1.333***				-1.238***	-1.213***	-1.230***
			(0.029)				(0.030)	(0.053)	(0.036)
Income (1,000's)			0.023***	0.029***			0.023***	0.025***	0.022***
			(0.002)	(0.002)			(0.002)	(0.003)	(0.002)
Dissatisfied with efforts to increase high quality jobs: Yes				-0.361***			-0.154***	-0.139***	-0.145***
				(0.031)			(0.032)	(0.053)	(0.039)
Dissatisfied with the educational system or the schools: Yes				-0.340***			-0.166***	-0.158***	-0.174***
				(0.030)			(0.029)	(0.051)	(0.036)

Table 2: Determinants of Life Satisfaction in MENA: Weighted Least Squares Estimates

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Spring	Non-AS
(Reference group: Full-time Employed)									
Self-employed				0.077			0.041	-0.024	0.130*
				(0.064)			(0.061)	(0.100)	(0.077)
Unemployed				-0.534***			-0.335***	-0.475***	-0.229**
				(0.082)			(0.079)	(0.145)	(0.093)
Out of workforce				0.003			-0.019	-0.028	0.026
				(0.049)			(0.047)	(0.076)	(0.060)
Underemployed				-0.267***			-0.114	-0.242*	0.022
				(0.082)			(0.080)	(0.133)	(0.100)
(Reference group: Other)									
Working for the government				0.245***			0.190***	0.309***	0.090
				(0.055)			(0.052)	(0.084)	(0.068)

Table 2: Determinants of Life Satisfaction in MENA: Weighted Least Squares Estimates

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Series	Non-AS
Undetermined				-0.011			-0.019	-0.280***	0.081
				(0.051)			(0.049)	(0.095)	(0.058)
Corruption widespread within government: Yes					-0.284***		-0.079**	-0.056	-0.083*
					(0.036)		(0.035)	(0.054)	(0.045)
People cannot get ahead by working hard: Yes						-0.496***	-0.223***	-0.210***	-0.214***
						(0.041)	(0.039)	(0.080)	(0.044)
(Reference group: Muslim)									
Not Muslim/Other religion	0.269***	0.237***	0.202***	0.168**	0.275***	0.239***	0.171**	0.176	0.177**
	(0.075)	(0.075)	(0.069)	(0.074)	(0.075)	(0.074)	(0.068)	(0.152)	(0.076)
(Reference group: Completed elementary education or less)									
Completed 9-15 years of education	0.452***	0.438***	0.295***	0.356***	0.448***	0.447***	0.282***	0.393***	0.212***
	(0.033)	(0.033)	(0.031)	(0.033)	(0.033)	(0.033)	(0.031)	(0.051)	(0.040)

Table 2: Determinants of Life Satisfaction in MENA: Weighted Least Squares Estimates

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Saving	Non-AS
Female	0.221***	0.224***	0.156***	0.203***	0.216***	0.209***	0.138***	0.236***	0.106***
	(0.029)	(0.029)	(0.027)	(0.031)	(0.029)	(0.029)	(0.029)	(0.052)	(0.035)
Age	-0.040***	-0.038***	-0.029***	-0.038***	-0.039***	-0.039***	-0.028***	-0.022**	-0.035***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)	(0.007)
Age ^2	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000**	0.000***
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(Reference group: Married with children)									
Married without children	0.092*	0.091*	0.037	0.081*	0.098**	0.088*	0.044	0.015	0.063
	(0.047)	(0.047)	(0.044)	(0.046)	(0.047)	(0.047)	(0.043)	(0.073)	(0.054)
Single with children	-0.140***	-0.122**	-0.101**	-0.088*	-0.136***	-0.145***	-0.075	0.053	-0.176***
	(0.050)	(0.050)	(0.047)	(0.049)	(0.050)	(0.050)	(0.047)	(0.079)	(0.059)
Single without children	-0.086*	-0.081	-0.102**	-0.067	-0.079	-0.088*	-0.077	-0.013	-0.136**
	(0.050)	(0.050)	(0.047)	(0.049)	(0.050)	(0.050)	(0.047)	(0.080)	(0.058)

Table 2: Determinants of Life Satisfaction in MENA: Weighted Least Squares Estimates

VARIABLES	Model 1 DEV MENA	Model 2 DEV MENA	Model 3 DEV MENA	Model 4 DEV MENA	Model 5 DEV MENA	Model 6 DEV MENA	Model 7 DEV MENA	Model 8 Arab Spring	Model 9 Non-AS
Separated/Divorced/Widow with children	-0.125	-0.098	-0.028	-0.085	-0.124	-0.108	-0.003	0.120	-0.091
	(0.083)	(0.082)	(0.077)	(0.081)	(0.083)	(0.082)	(0.076)	(0.119)	(0.098)
Separated/Divorced/Widow without children	-0.404***	-0.406***	-0.265***	-0.337***	-0.390***	-0.398***	-0.251***	-0.321**	-0.254**
	(0.099)	(0.099)	(0.091)	(0.095)	(0.099)	(0.098)	(0.090)	(0.148)	(0.112)
(Reference group: 1 person older than 15 in household)									
2 people older than 15 in household	0.018	0.007	0.005	0.008	0.022	0.021	0.01	-0.024	-0.153
	(0.086)	(0.086)	(0.084)	(0.084)	(0.086)	(0.086)	(0.084)	(0.112)	(0.116)-
More than 2 people older than 15 in household	0.030	0.008	-0.033	-0.031	0.03	0.03	-0.03	0.003	0.237**
	(0.081)	(0.082)	(0.080)	(0.080)	(0.081)	(0.081)	(0.079)	(0.107)	(0.108)
Separated/Divorced/Widow with children	-0.125	-0.098	-0.028	-0.085	-0.124	-0.108	-0.003	0.12	-0.091
	(0.083)	(0.082)	(0.077)	(0.081)	(0.083)	(0.082)	(0.076)	(0.119)	(0.098)

Table 2: Determinants of Life Satisfaction in MENA: Weighted Least Squares Estimates

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Spring	Non-AS
Country fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month and Year of Interview	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	5.560***	5.686***	5.708***	5.747***	5.768***	5.628***	5.824***	5.588***	6.161***
	(0.172)	(0.173)	(0.163)	(0.178)	(0.173)	(0.172)	(0.173)	(0.260)	(0.222)
Observations	25,244	25,244	25,244	25,244	25,244	25,244	25,244	9,065	16,179
R-squared	0.071	0.078	0.197	0.121	0.074	0.079	0.206	0.192	0.221

Note: i. Robust standard errors in parentheses; ***p<0.01; **p<0.05; *p<0.10; ii. Developing MENA includes Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia, and the Republic of Yemen; iii. Arab Spring countries include Tunisia, Egypt, Syria, and the Republic of Yemen. iv. Non-AS countries include Algeria, Iraq, Jordan, Lebanon, Morocco, and Palestine. v. Employment status includes an additional category (2009) which captures individuals other than employed.

3.4.2 Dealing with Reverse Causality: Lewbel IV Estimator

Our analysis possibly suffers from endogeneity bias, although we have no indication that the variables are endogenous. The Durbin–Wu–Hausman tests for endogeneity showed that the Weighted Least Square models perform relatively well.[38] However, reverse causality may be a problem since life evaluation Y_1 and domain satisfaction Y_2 are often jointly determined. The preferred model to be estimated would therefore be the following:

$$Y_1 = X'\beta + Y_2\gamma + \varepsilon_1, \qquad (2a)$$
$$Y_2 = X'\alpha + \varepsilon_2. \qquad (2b)$$

Although the usage of conventional instrumental variable (IV) methods would be preferred in a cross-section setting, finding credible instruments X which are present in Y_2 but not in Y_1 is difficult. Conventional IVs have to satisfy the following restrictions: the instrument X has to be correlated with the independent variables and it has to be uncorrelated with the dependent variable and the error term. In our case, a valid instrument should be correlated with the independent variables in our regression, the life domain perceptions, but not with life satisfaction. Given the general unavailability of good instruments with this property, we use the Lewbel IV estimator to address reverse causality. We resort to the implementation of an instrumental variable estimation using heteroskedasticity-based instruments for cross-sectional data. This method, suggested by Lewbel (2012), is based on the heteroskedasticity of the standard errors ε_2 in equation (2b). Identification is achieved in this context by having regressors that are uncorrelated with the product of heteroskedastic errors. The Lewbel IV estimator uses internally generated instruments comparable to difference Generalized Method of Moments (GMM) and system GMM in a panel data setting to isolate the effect of perceptions on life satisfaction. According to Lewbel (2012), in the absence of conventional IVs, a vector of exogenous variables X or a subset of X can be used to generate external instruments $[Z- E(Z)]\varepsilon$,[39] given that there is some heteroskedasticity in the standard errors ε, and

$$E(X\varepsilon)=0, \ \operatorname{cov}(Z, \varepsilon_1\varepsilon_2)=0 \ \text{ and } \operatorname{cov}(Z, \varepsilon_2^2) \neq 0. \qquad (3a)$$

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[38] P-values of endogeneity tests of variables are insignificant at 1% level indicating that they are not endogenous.

[39] A more detailed account on how the instruments are estimated can be found in the work of Lewbel (2012).

The generated instruments Z are constructed from the auxiliary equations' residuals, multiplied by each of the included exogenous variables X in mean-centered form:

$$Z_j = (X_j - \bar{X}) * \hat{\varepsilon}_2, \tag{3b}$$

where ε is the vector of residuals from the 'first-stage regression' equation (2b) of each endogenous regressor on all exogenous regressors, including a constant vector.

The validity of these assumptions for our data can be questioned, so we examine whether the Lewbel requirements are met. First, we test for the presence of heteroskedasticity. Following Lewbel (2012), we performed a Breusch-Pagan Lagrange Multiplier Test to test for heteroskedasticity. The results show that the test statistic is significantly different from zero in all cases, indicating that there is enough variance in our data to avoid weak instruments. Second, before estimating the second stage of the regressions using the generated instruments, we carefully consider the choice of Z. As indicated by Lewbel (2012), Z can be equal to X or a subset of X and therefore the obtained estimates could be largely dependent on the specific choice of X's. Although in general the choice of Z can be random, subject to the conditions above, we opted to follow a different strategy to select our instruments. Our strategy for choosing Z is based on the correlation matrix of the generated instruments. The subset of instruments Z had to satisfy two basic conditions: (i) it had to be uncorrelated with the dependent variable Y_1 and (ii) it had to be statistically correlated with X in the first place. The generated instruments that did not meet these conditions were excluded from the second-stage regression. This procedure was followed to instrument separately and simultaneously all independent variables, shown in Table 3. After testing whether the conditions (i) and (ii) were satisfied, we chose a set of instruments Z that passed the conventional reliability and validity tests,[40] and estimated the model using generalized method of moments (GMM). The coefficients of Lewbel estimates are directly comparable to our WLS estimates.

Table 3 provides a replication of Table 2 using the Lewbel IV estimator. Several results stand out. First, dissatisfaction with freedom to choose life is not significant in model

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[40] The following tests were used to establish that the conditions were satisfied: Underidentification test: Significant – instruments are relevant; Hansen J test (Overidentification test of all instruments): Insignificant; over-identifying restrictions are valid; Cragg-Donald F-test larger than Stock-Yogo weak threshold maximal IV relative bias at 10%: no weak instruments.

10 or in the full specification in model 15, showing that freedom does not explain variation in life satisfaction in developing MENA on the eve of the Arab Spring. This is in line with our initial findings (table 2, models 7, 8).   Second, in line with the WLS results, dissatisfaction with standards of living, income, and job status remain robust in sign and highly significant predictors across all specifications (models 11, 12, 15, 16, and 17). Third, perceived poor job conditions, reflected in dissatisfaction with the efforts of the government to improve the number of high quality jobs and the educational system, do not have a significant effect on life satisfaction (models 15, 16, and 17). It is highly likely that these domains are jointly determined or are partly reflected in dissatisfaction with standards of living. Fourth, the effect of cronyism and 'wasta' on satisfaction with life remains significant, but the effect of widespread corruption is no longer significant in the full specification of the model (models 15 and 16). This result supports our initial finding that people are predominantly dissatisfied by corruption associated with cronyism and nepotism ('wasta'). Since these results are in line with the WLS estimates and do not present a problem with reverse causality, we consider them our main results on determinants of life satisfaction in the MENA region and we use these results in the decomposition that allows us to identify the drivers of life satisfaction changes right before the Arab Spring events.

Table 3: Determinants of Life Satisfaction in MENA: Lewbel Estimates

VARIABLES	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Spring	Model Non-AS
Dissatisfaction with freedom to choose life	-0.243					-0.011	0.069	0.060
	(0.340)					(0.789)	(0.923)	(0.344)
Dissatisfied with standard of living: Yes		-1.299***				-1.181***	-1.288***	-1.135***
		(0.100)				(0.126)	(0.186)	(0.140)
Income (1,000's)		0.024***	0.030***			0.023***	0.026***	0.023***
		(0.002)	(0.002)			(0.002)	(0.003)	(0.002)
Dissatisfied with efforts to increase high quality jobs: Yes			-0.353***			-0.085	-0.218	-0.028
			(0.092)			(0.262)	(0.333)	(0.148)
Dissatisfied with the educational system or the schools: Yes			-0.118			-0.076	0.515	-0.200
			(0.245)			(0.245)	(0.524)	(0.243)

Table 3: Determinants of Life Satisfaction in MENA: Lewbel Estimates

VARIABLES	Model 10 DEV MENA	Model 11 DEV MENA	Model 12 DEV MENA	Model 13 DEV MENA	Model 14 DEV MENA	Model 15 DEV MENA	Model 16 Arab Spring	Model 17 Model Non-AS
Corruption widespread within government: Yes				-0.367***		-0.188	-0.216	-0.173
				(0.128)		(0.181)	(0.247)	(0.187)
People cannot get ahead by working hard: Yes					-0.589***	-0.324**	-0.512*	-0.258
					(0.134)	(0.154)	(0.269)	(0.158)
(Reference group: Muslim)								
Not Muslim/Other religion	0.245***	0.180***	0.165**	0.277***	0.233***	0.175*	0.238	0.181**
	(0.081)	(0.069)	(0.076)	(0.075)	(0.074)	(0.094)	(0.169)	(0.084)
(Reference group: Completed elementary education or less)								
Completed 9-15 years of education	0.443***	0.305***	0.360***	0.447***	0.445***	0.280***	0.368***	0.217***
	(0.035)	(0.032)	(0.033)	(0.033)	(0.033)	(0.037)	(0.062)	(0.040)
Completed four years of education beyond high school and/or 4-year college degree.	0.901***	0.569***	0.679***	0.918***	0.899***	0.539***	0.486***	0.528***
	(0.057)	(0.050)	(0.054)	(0.053)	(0.053)	(0.068)	(0.136)	(0.062)

Table 3: Determinants of Life Satisfaction in MENA: Lewbel Estimates

VARIABLES	Model 10 DEV MENA	Model 11 DEV MENA	Model 12 DEV MENA	Model 13 DEV MENA	Model 14 DEV MENA	Model 15 DEV MENA	Model 16 Arab Spring	Model 17 Model Non-AS
(Reference group: Not a migrant)								
Migrant	-0.141	-0.200**	-0.184*	-0.142	-0.155	-0.272***	-0.718***	-0.125
	(0.102)	(0.098)	(0.102)	(0.102)	(0.101)	(0.096)	(0.188)	(0.111)
Female	0.223***	0.157***	0.203***	0.215***	0.206***	0.140***	0.226***	0.107***
	(0.029)	(0.027)	(0.031)	(0.029)	(0.029)	(0.038)	(0.072)	(0.036)
Age	-0.039***	-0.029***	-0.038***	-0.039***	-0.038***	-0.029***	-0.022**	-0.037***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)	(0.007)
Age ^2	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000**	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(Reference group: Married with children)								
Married without children	0.091*	0.038	0.083*	0.100**	0.087*	0.047	0.036	0.064
	(0.050)	(0.047)	(0.049)	(0.050)	(0.050)	(0.047)	(0.082)	(0.059)

Table 3: Determinants of Life Satisfaction in MENA: Lewbel Estimates

VARIABLES	Model 10 DEV MENA	Model 11 DEV MENA	Model 12 DEV MENA	Model 13 DEV MENA	Model 14 DEV MENA	Model 15 DEV MENA	Model 16 Arab Spring	Model 17 Non-AS
Separated/Divorced/Widow with children	-0.106	-0.032	-0.100	-0.123	-0.105	-0.011	0.111	-0.099
	(0.086)	(0.076)	(0.082)	(0.083)	(0.082)	(0.089)	(0.124)	(0.101)
Separated/Divorced/Widow without children	-0.403***	-0.273***	-0.343***	-0.385***	-0.399***	-0.252***	-0.290*	-0.267**
	(0.099)	(0.091)	(0.095)	(0.099)	(0.098)	(0.093)	(0.153)	(0.113)
(Reference group: 1 person older than 15 in household)								
2 people older than 15 in household	0.010	0.017	0.007	0.023	0.024	0.010	-0.037	-0.146
	(0.087)	(0.084)	(0.085)	(0.086)	(0.086)	(0.089)	(0.125)	(0.116)
More than 2 people older than 15 in household	0.015	-0.022	-0.032	0.030	0.030	-0.032	-0.018	-0.230**
	(0.085)	(0.080)	(0.081)	(0.081)	(0.081)	(0.093)	(0.135)	(0.110)

Table 3: Determinants of Life Satisfaction in MENA: Lewbel Estimates

VARIABLES	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17
	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	DEV MENA	Arab Spring	Model Non-AS
Constant	5.159***	5.452***	5.471***	5.364***	5.116***	5.570***	5.446***	6.539***
	(0.213)	(0.159)	(0.182)	(0.196)	(0.168)	(0.198)	(0.254)	(0.255)
Observations	25,244	25,244	25,244	25,244	25,244	25,244	9,065	16,179
R-squared	0.077	0.193	0.117	0.074	0.079	0.204	0.076	0.219
Statistics								
Underidentification test: P-value	83.04	1105.8	194.93	503.81	454.68	29.508	23.872	116.22
	(0.000)	(0.000)	0(0.000)	(0.000)	(0.000)	(0.000)	(0.048)	(0.000)
Cragg-Donald Wald F statistic	42.14	563.35	31.23	729.53	425.07	1.826	1.533	6.036
Stock-Yogo VC 10%	10.27	10.27	10.89	19.53	10.83	NA	NA	NA
Hansen J statistic	4.25	4.63	5.13	0.133	0.924	8.327	7.516	15.89
	(0.234)	(0.200)	(0.953)	(0.715)	(0.921)	(0.871)	(0.873)	(0.600)

3.4.3 Drivers of Life Satisfaction Changes on the Eve of the Arab Spring

Perceptions about living standards, job market conditions, and cronyism have a considerable effect on life satisfaction in MENA. This section explores the degree to which each of these factors has contributed to the change in life satisfaction in the period 2009-10, immediately preceding the Arab Spring, using a procedure known as the Oaxaca–Blinder decomposition (Oaxaca, 1973; Blinder, 1973). This decomposition analysis allows us to examine group differences in an outcome variable and has been more recently used in studies on subjective well-being (e.g., Helliwell and Barrington-Leigh, 2010; Becchetti et al., 2010; Sarracino, 2013). For the purpose of the present article, the decomposition relates to a time-specified group comparison. The Oaxaca–Blinder decomposition divides the differential of an outcome, in our case the differences in life satisfaction between year A (2009) and year B (2010), into two parts as shown in equation (4). The explained part (Q) - or the "endowments effect" - shows how much of the overall differential in the average life satisfaction between 2009 and 2010 can be attributed to changes in the level of the explanatory variables (X) between 2009 and 2010. Hence, this "quantity effect' reflects the differences in the circumstances between the two years. The unexplained part (U) captures changes in coefficients based on their estimates estimated separately for 2009 and 2010. This effect shows the part of the unhappy development that can be attributed to changes in the size of the effects, based on the obtained coefficients, implying a change in the relative importance of each of the factors in the life satisfaction equation (LS) between the two years. The decomposition is represented by the following formula:

$$\Delta LS = [E(X_A) - E(X_B)]' \, \beta^* \ + \ [E(X_A)' \, (\beta_A - \beta^*) \ + \ E(X_B)' \, (\beta^* - \beta_B)] \ (4)$$

Explained (Q)   Unexplained (U)

where ΔLS is the difference in average subjective well-being between 2009 and 2010, β_{2009} and β_{2010} are vectors of coefficients estimated using WLS (Columns 7 and 8 in

Table 2),[41] and β* is a non-discriminatory vector of coefficients that is used to determine the contribution of each group of variables to the overall difference of means.[42]

Table 4 shows the Blinder-Oaxaca decomposition for developing MENA and Arab Spring countries, where the uprisings were most intense. In developing MENA, the life satisfaction differential between 2009 and 2010 is 0.275 points (on a 0 to 10 scale), while in the Arab Spring countries, as expected, the differential in mean life satisfaction between 2009 and 2010 is much larger at 0.555 points. The second part of Table 4 indicates that for both developing MENA and the Arab Spring countries over 60% of the life satisfaction between the two years is explained by deterioration in conditions or the change in circumstances (change in the explained component). The life satisfaction differential is only to a lesser extent (less than 40%) associated with changes in the relative importance of the factors (change in the unexplained component).

Table 4: Blinder–Oaxaca decomposition

	Developing MENA		Arab Spring	
Differential				
2009	5.224***	(0.017)	5.115***	(0.028)
2010	4.949***	(0.018)	4.560***	(0.034)
Difference	0.275***	(0.025)	0.555***	(0.044)
Decomposition				
Explained	0.171***	(0.019)	0.353***	(0.031)
Unexplained	0.104***	(0.027)	0.202***	(0.047)
Observations	25,244		9,065	

Figures 3-6 show a graphic representation of the decomposition of the differential between 2009 and 2010 for the developing MENA and the Arab Spring countries[43] (see Table 4). In developing MENA (Figure 3), growing dissatisfaction (i.e. average life satisfaction in 2009

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[41] Please note that the Blinder-Oaxaca decomposition for the Lewbel estimates was not possible due to computational constraints.

[42] We use a pooled equation to estimate a set of 'nondiscriminatory' coefficients β* for use in the decomposition (Jann, 2008).

[43] The detailed Blinder-Oaxaca decomposition can be found in Appendix D. The coefficient and their respective confidence intervals are available in Appendix D, Table D2.

minus average life satisfaction in 2010) can be related to decline in perceived standards of living, losses in income and growth of the percentage of unemployed individuals. [44] Changes in satisfaction with efforts to increase the quality of jobs, cronyism and corruption have a less prevalent but significant effects. Differences in coefficients between 2009 and 2010 also play a role (see Figure 4 and Appendix D). Most interestingly working for the government was less positively correlated with life satisfaction in 2010 compared to 2009, herewith increasing the difference in life satisfaction between 2009 and 2010. Hence, for developing MENA it can be concluded that worsening conditions and perceptions led to a decline in life satisfaction in the period 2009-2010 and changes in the importance of these domains (their weights in the life satisfaction equation) was not the main reason for this decline.

Figure 3: Decomposition of the explained part of ΔLS in developing MENA
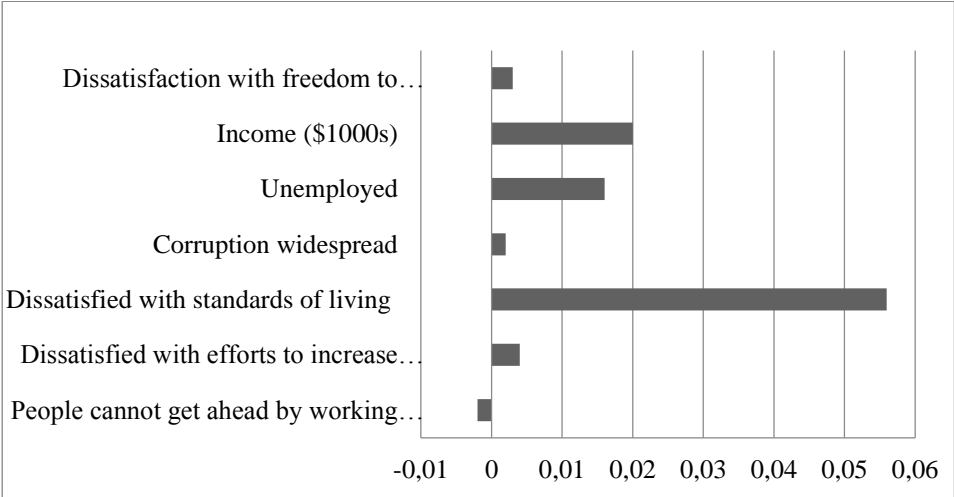
Note: Only significant coefficients of independent variables are displayed. ΔLS is life satisfaction in 2009 minus life satisfaction in 2010.

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[44] However, changes in coefficients for some of the control variables contributed to the difference in life satisfaction between 2009 and 2010. These results are available in Appendix D.

Figure 4: Decomposition of the unexplained part of ΔLS in developing MENA
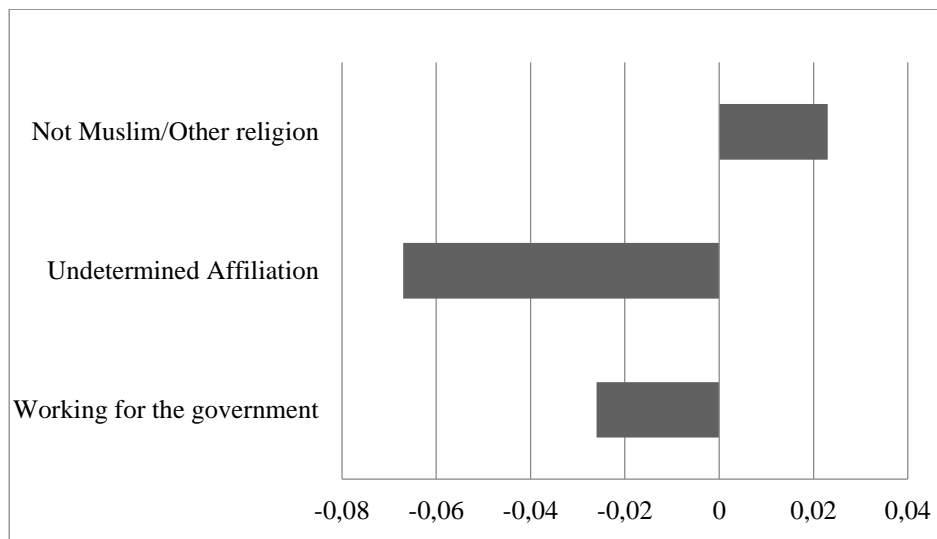
Note: Only significant coefficients of independent variables are displayed. ΔLS is life satisfaction in 2009 minus life satisfaction in 2010.

Figure 5: Decomposition of the explained part of ΔLS in Arab Spring countries
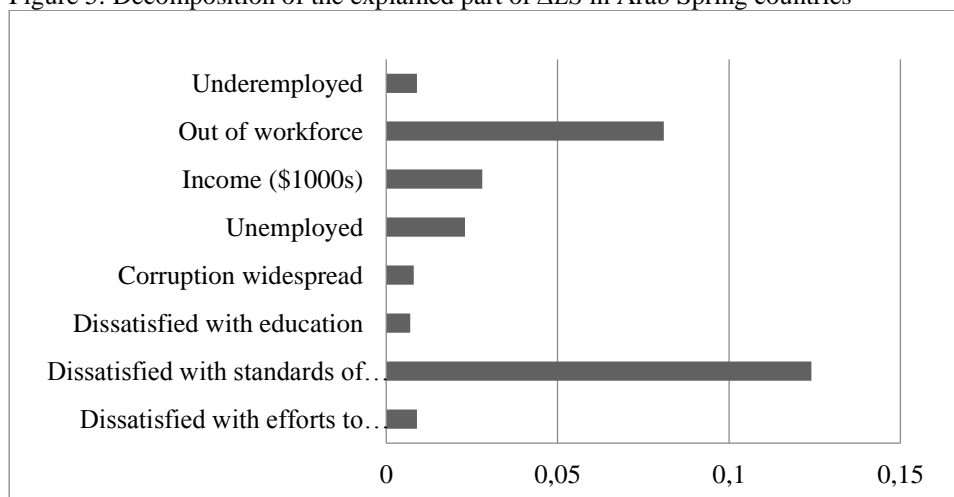
Note: Only significant coefficients of independent variables are displayed. ΔLS is life satisfaction in 2009 minus life satisfaction in 2010.

Figure 6: Decomposition of the unexplained part of ΔLS in Arab Spring countries
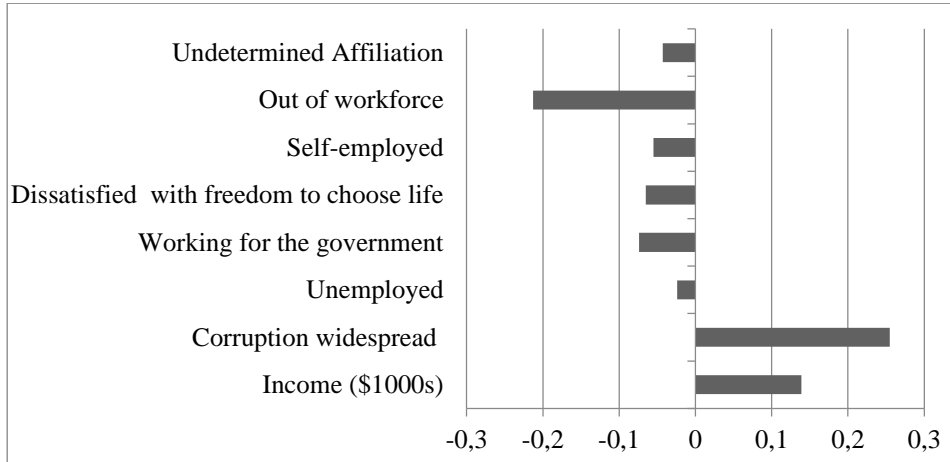
Note: Only significant coefficients of independent variables are displayed. ΔLS is life satisfaction in 2009 minus life satisfaction in 2010.

The decomposition for Arab Spring countries where the uprisings were most intense shows a similar pattern with regard to the explained part (Figure 5). The life satisfaction gap in Arab Spring countries between 2009 and 2010 can largely be explained by the deterioration in satisfaction with living standards, followed by losses in income and the increase in the percentage of unemployed individuals. A smaller (but significant) part of the decrease in life satisfaction can be attributed to an increase in the dissatisfaction with the education system and government efforts to increase the quality of jobs.[45] However, in the Arab Spring countries dissatisfaction emerged not only because a higher percentage of population became poorer, unemployed and dissatisfied, but also because some areas of concern became more important in people's life satisfaction function (Figure 6). In particular, corruption gained a stronger weight in the life satisfaction function of people in the Arab Spring countries. The decrease in life satisfaction was further caused by a weakening of the relationship between income and life satisfaction in Arab Spring countries. In sum, for the Arab Spring countries it can also be concluded that worsening conditions and

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[45] In addition, differences in the values of some control variables explain the difference in life satisfaction in Arab Spring countries between 2009 and 2010. These are solely related to occupational status and education level of respondents.

perceptions led to a decline in life satisfaction in the period 2009-2010, as well as changes in the importance of corruption and income.

3.5 Concluding Remarks

How is the declining dissatisfaction before the Arab Spring linked to the grievances voiced by protestors during the Arab Spring demonstrations? Unfortunately, the Gallup World Poll does not have information on the reasons for these protests. Therefore, to answer this question we turn to information from the third wave of the Arab Barometer, in which respondents in developing MENA countries (Algeria, Egypt, Iraq, Lebanon, Morocco, Palestine, Syria, Tunisia, and the Republic of Yemen) were asked to mention the three main reasons that led to the Arab Spring. The responses indicate that the main grievances behind the outburst of social discontent during the Arab Spring uprisings are closely linked to the domain satisfactions shaping the level of subjective well-being in developing MENA prior to the Arab Spring (Table 5).

Fighting corruption was mentioned as the most important reason for the Arab Spring by 64.3 percent of respondents, followed by betterment of the economic situation (63.6 percent) and social and economic justice (57.2 percent). These findings are in line with a poll by Zogby in 2005, in which respondents in developing MENA countries indicated that the lack of employment opportunities, corruption, healthcare, and schooling were seen as the most pertinent problems in developing MENA countries (Zogby 2005). Strikingly, civil and political freedom (42.4 percent) only comes in fourth place and is, hence, neither found associated with dissatisfaction in developing MENA nor regarded as one of the most important grievances related to the uprisings. Likewise, relations with the West (7.5 percent) and Israel (14.6 percent) as well as rule of law (15.7 percent) and dignity (28.8 percent) were less often mentioned as important issues related to the Arab Spring, and were not found to be an important determinant of dissatisfaction with life in developing MENA. Hence, perceptions about worsening standards of living, labor market conditions, corruption and 'wasta' are not only strongly associated with dissatisfaction with life and decline of subjective well-being levels before the Arab Spring, but are also viewed as the main grievances associated with the Arab Spring protests.

Table 5: Reasons for the Arab Spring according to the People in Developing MENA

Reason	% of the Respondents Choosing this Reason
Betterment of the economic situation	63.6%
Civil and political freedoms, and emancipation from oppression	42.4%
Dignity	28.8%
Fighting corruption	64.3%
Rule of law	15.7%
Social and economic justice	57.2%
Weakening economic and political relations with the West	7.5%
Weakening economic and political relations with Israel	14.6%

Source: Arab Barometer 2012-2014. Based on the following question: 'Which of the following were the main three reason that led to the Arab Spring?' Please note that inhabitants of Iraq and Lebanon were not able to choose the answer 'Weakening the political and economic relations with Israel'.

In sum, despite economic and human development progress in the prior two decades, a decline in life satisfaction from already relatively low levels preceded the Arab Spring uprisings – a situation described as 'unhappy development' paradox. The decline in life satisfaction on the eve of the Arab spring was associated primarily by an increase in the percentage of people dissatisfied with worsening standards of living, labor market conditions, and elite capture. In addition, perceptions about corruption became more important for people's subjective well-being in the Arab Spring countries where the uprisings were most intense. In this context, our study highlights that not only objective conditions count, but also the subjective awareness of shortcomings in these objective conditions. The rising awareness of social ills is partly due to the modernization process in which society is seen to be less of a moral order given by God, and in which an increasing number of people call for improvements in social conditions. Finally, dissatisfaction alone does not bring political action, which typically arises only in combination with perceived chances for change (Klandermans, 1997; Witte et al., 2018). This paper does not explore the question why some developing MENA countries experienced political violence and regime change, whereas in others the protests remained peaceful and limited in scope. This question should be addressed in future research.

Appendices

Appendix A

Table A1: Average Life Satisfaction (ALS) across Countries, 2006-12

Ran	Country	AL	Ran	Country	AL	Ran	Country	AL
1	Denmark	7.8	54	Poland	5.7	107	China	4.8
2	Switzerland	7.5	55	Saint Maarten	5.7	108	Djibouti	4.8
3	Norway	7.5	56	El Salvador	5.7	109	Zambia	4.8
4	Netherlands	7.5	57	Bolivia	5.7	110	India	4.7
5	Finland	7.5	58	Croatia	5.6	111	Bangladesh	4.7
6	Canada	7.4	59	Kazakhstan	5.6	112	Iraq	4.7
7	Sweden	7.4	60	Lithuania	5.5	113	Mozambique	4.7
8	Iceland	7.3	61	Jordan	5.5	114	Mongolia	4.7
9	Australia	7.3	62	Belarus	5.5	115	Serbia	4.7
10	New Zealand	7.3	63	Ecuador	5.5	116	Angola	4.6
11	Austria	7.3	64	Paraguay	5.5	117	Azerbaijan	4.6
12	Costa Rica	7.2	65	Mauritius	5.4	118	Mauritania	4.5
13	Israel	7.2	66	Moldova	5.4	119	Palestine	4.5
14	United States	7.1	67	Hong Kong SAR,	5.4	120	Tajikistan	4.5
15	Ireland	7.1	68	Uzbekistan	5.4	121	Egypt, Arab	4.5
16	Belgium	7.0	69	Vietnam	5.4	122	Macedonia,	4.5
17	Luxembourg	7.0	70	Bahrain	5.4	123	Armenia	4.4
18	United Arab	7.0	71	Peru	5.4	124	Botswana	4.4
19	Panama	6.9	72	Algeria	5.4	125	Malawi	4.4
20	Mexico	6.9	73	Cuba	5.4	126	Nepal	4.4
21	United	6.8	74	Estonia	5.3	127	Sudan	4.4
22	Venezuela, RB	6.8	75	Libya	5.3	128	Uganda	4.3
23	Oman	6.8	76	Albania	5.3	129	Congo, Dem.	4.3
24	Brazil	6.8	77	Kosovo	5.3	130	Cameroon	4.3
25	France	6.7	78	Russian	5.3	131	Syrian Arab	4.3
26	Germany	6.6	79	Honduras	5.3	132	Senegal	4.3
27	Spain	6.6	80	Turkey	5.2	133	Yemen, Rep.	4.2
28	Puerto Rico	6.5	81	Portugal	5.2	134	Kenya	4.2
29	Qatar	6.5	82	Indonesia	5.2	135	Sri Lanka	4.2
30	Saudi Arabia	6.5	83	Nicaragua	5.2	136	Côte d'Ivoire	4.2
31	Singapore	6.5	84	Montenegro	5.1	137	Madagascar	4.1
32	Kuwait	6.4	85	Romania	5.1	138	Mali	4.1
33	Cyprus	6.4	86	Pakistan	5.1	139	Niger	4.1
34	Belize	6.4	87	South Africa	5.0	140	Haiti	4.1
35	Argentina	6.3	88	Ukraine	5.0	141	Congo, Rep.	4.1
36	Czech Republic	6.3	89	Dominican	5.0	142	Zimbabwe	4.1
37	Trinidad and	6.3	90	Nigeria	5.0	143	Gabon	4.1
38	Italy	6.3	91	Lao PDR	5.0	144	Afghanistan	4.0
39	Suriname	6.2	92	Lebanon	4.9	145	Burkina Faso	4.0
40	Colombia	6.2	93	Tunisia	4.9	146	Cambodia	4.0
41	Chile	6.2	94	Iran, Islamic Rep.	4.9	147	Liberia	4.0
42	Guatemala	6.1	95	Hungary	4.9	148	Rwanda	4.0

43	Uruguay	6.0	96	Kyrgyz Republic	4.9	149	Chad	4.0
44	Japan	6.0	97	Lesotho	4.9	150	Guinea	4.0
45	Malta	6.0	98	Ghana	4.8	151	Georgia	3.9
46	Thailand	6.0	99	Myanmar	4.8	152	Bulgaria	3.9
47	Guinea-Bissau	5.9	100	Namibia	4.8	153	Central African	3.8
48	Slovak Republic	5.9	101	Philippines	4.8	154	Tanzania	3.8
49	Turkmenistan	5.9	102	Somalia	4.8	155	Sierra Leone	3.7
50	Korea, Rep.	5.8	103	Bosnia and	4.8	156	Comoros	3.7
51	Greece	5.8	104	Latvia	4.8	157	Burundi	3.6
52	Malaysia	5.8	105	Morocco	4.8	158	Benin	3.5
53	Jamaica	5.8	106	Swaziland	4.8	159	Togo	2.9

Source: Gallup World Poll. Note: Developing MENA countries are highlighted.

Appendix A2: Average Life Satisfaction (ALS) across Countries, 2007-10
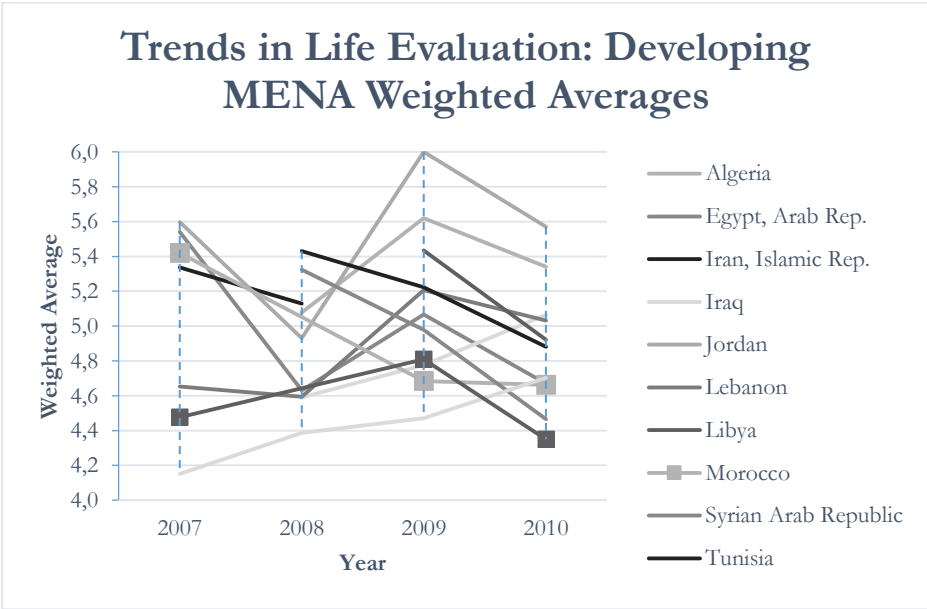
Source: Life Evaluation: Gallup World Poll, 2012. Missing data in 2007: Libya, Tunisia, Algeria, and Iraq. Missing data in 2008: Morocco, Yemen, and Libya. Missing data in 2009 and 2010: Iran

Appendix B: Descriptive Statistics

Appendix B1: Description of Variables

Category: Independent perception variables	Variable code	Exact question	Answer categories
Satisfaction with Standard of Living	Wp30	Are you satisfied or dissatisfied with your standard of living, all the things you can buy and do?	1 Yes 2 No
Satisfaction with Standard of Living (Index construction)	Wp40	Have there been times in the past twelve months when you did not have enough money to buy food that you or your family needed?	1 Yes 2 No
Satisfaction with Standard of Living (Index construction)	Wp43	Have there been times in the past twelve months when you did not have enough money to provide adequate shelter or housing for you and your family?	1 Yes 2 No
Satisfaction with Standard of Living (Alternative specification)	Index_fs	Construction of variable wp40 and wp43	Not applicable
Satisfaction with freedom to choose life	Wp134	Are you satisfied or dissatisfied with your freedom to choose what you do with your life?	1 Yes 2 No
Satisfaction with civil freedom (Alternative specification)	Wp143	Do you have confidence in the Quality and Integrity of the Media?	1 Yes 2 No
Perceptions about Corruption	Wp145	Is corruption widespread within business?	1 Yes 2 No
Perceptions about Corruption	Wp146	Is corruption widespread within government?	1 Yes 2 No
Perceptions about	Wp6762	Do you think the	1 Same or

Corruption		level of corruption in this country is lower, about the same or higher than it was 5years ago?	lower 2 Higher
Cronyism	Wp128	Can people in this country get ahead by working hard or not?	1 Yes 2 No
Quality of jobs	Wp133	Are you satisfied or dissatisfied with efforts to increase the number of quality jobs?	1 Yes 2 No
Quality of jobs (Alternative specification)	Wp89	Thinking about the job situation in the city or area where you live today, would you say that it is now a good time or a bad time to find a job?	1 Good time 2 Bad time
Satisfaction with education	Wp93	In the city or area where you live, are you satisfied or dissatisfied with the education system or the schools?	1 Approve 2 Disapprove

Category: Other control variables	**Personal information**		
Gender	Wp1219		1 Male 2 Female
Age	Wp1220		Until 99
Marital children = Computed from marital status and number of children	Marital_children	Combination to Wp 1223 and Wp 1230	1 Married with children 2 Married without children 3 Single with children 4 Single without children 5 S/D/W with children 6 S/D/W without

			children
Marital status (Index construction)	Wp1223	What is your current marital status?	1 Single/never been married 2 Married 3 Separated/ divorced/ widowed
Number of children (Index construction)	Wp1230	How many children under 15 years of age are now living in your household?	
Religion	wp1233	Could you tell me what your religion is?	1 Muslim 2 Non-Muslim/other religion
Migration status	Wp4657	Were you born in this country, or not?	1 Born in this country 2 Born in another country
Level of education	wp3117		1 Completed elementary education or less 2 Secondary - 3 year tertiary secondary 3 Completed four years of education beyond high school and/or received a 4-year college degree

Continued
Appendix B1

Employment status	emp_2010		1 Employed full time for an employer/ Employed part time/ do not want full time 2 Employed full time for self

			3 Unemployed 4 Out of workforce 5 Underemployed 6 Other
Government employee	Wp1227	Are you a government worker or not?	1 No 2 Yes 3 Undetermined
Household composition Adults	Wp12	Including yourself, how many people who are residents of age 15 or over currently live in this household?	1 One 2 Two 3 More than two
Household income (US$, thousands)	inc_001		Expressed in international dollars
Month and year of Interview	m_year		

Table B2: Descriptive Statistics – Dependent and Control Variables

Variable	Observations	Mean	SD	Min.	Max.
Life evaluation	25,244	5.09	2.00	0	10
Dissatisfied with standard of living: Yes	25,244	0.37	0.48	0	1
People cannot get ahead by working hard: Yes	25,244	0.17	0.37	0	1
Dissatisfied with efforts to increase with high quality jobs: Yes	25,244	0.66	0.47	0	1
Dissatisfied with freedom to choose life: Yes	25,244	0.38	0.48	0	1
Dissatisfied with the educational system or the schools: Yes	25,244	0.37	0.48	0	1
Corruption widespread within government*: Yes	25,244	0.78	0.41	0	1
Self-employed	25,244	0.08	0.27	0	1
Unemployed	25,244	0.04	0.20	0	1
Out of workforce	25,244	0.31	0.46	0	1
Underemployed	25,244	0.03	0.18	0	1
Other**	25,244	0.25	0.43	0	1
Government worker	25,244	0.09	0.29	0	1
Undetermined	25,244	0.28	0.45	0	1

Not Muslim	25,244	0.07	0.26	0	1
Completed 9-15 years of education	25,244	0.48	0.49	0	1
Completed four years of education beyond high school and/or 4-year college degree	25,244	0.11	0.31	0	1
Migrant	25,244	0.02	0.15	0	1
Income (1,000s)	25,244	10.16	12.20	0	229.99
Female	25,244	0.48	0.49	0	1
Age	25,244	35.23	14.54	15	99
Age squared	25,244	1,453.04	1,210.98	15	99
Married without children	25,244	0.15	0.35	0	1
Single with children	25,244	0.20	0.40	0	1
Single without children	25,244	0.17	0.37	0	1
Separated/divorced/widow with children	25,244	0.03	0.17	0	1
Separated/divorced/widow without children	25,244	0.03	0.16	0	1
2 people older than 15 years in household	25,244	0.23	0.42	0	1
More than 2 people older than 15 years in household	25,244	0.73	0.45	0	1
Alternative Measures					
Index_fs	21,376	0.41	0.67	0	2
Bad time to find a job: Yes	23,592	0.71	0.46	0	1
Are levels of corruption higher: Yes	10,926	0.55	0.65	0	1
Index positive affect	12,582	64.11	29.09	0	100
Index negative affect	4,739	33.13	29.96	0	100
Dissatisfaction with health: Yes	11,016	0.16	0.36	0	1

*When information was not available we used "*Corruption widespread within business*". See also Helliwell, Layard, and Sachs (2015).
**Category "Other" derives from the combination of two variables and indicates employed individuals who do not respond specifically on their employment status (working full time, part-time, ore being underemployed).

Table B3: Variance Inflation Factors

VARIABLES	VIF
Dissatisfied with freedom to choose life: Yes	1.27
Dissatisfied with standard of living: Yes	1.16
Income (1,000's)	1.23
Dissatisfied with efforts to increase high quality jobs: Yes	1.27
Dissatisfied with the educational system or the schools: Yes	1.14
(Reference group: Full-time Employed)	
Self-employed	1.50
Unemployed	1.37
Out of workforce	2.77
Underemployed	1.23
(Reference group: Other)	
Working for the government	1.36
Undetermined	3.00
Corruption widespread within government: Yes	1.14
People cannot get ahead by working hard: Yes	1.12
(Reference group: Muslim)	
Not Muslim/Other religion	1.46
(Reference group: Completed elementary education or less)	
Completed 9-15 years of education	1.35
Completed four years of education beyond high school and/or 4-year college degree.	1.22
(Reference group: Not a migrant)	
Migrant	1.03
Female	1.29
Age	1.93
(Reference group: Married with children)	
Married without children	1.35
Single with children	1.81
Single without children	1.73
Separated/Divorced/Widow with children	1.08
Separated/Divorced/Widow without children	1.10
(Reference group: Married with children	
2 people older than 15 in household	7.47

More than 2 people older than 15 in household	7.52
Mean VIF	3.33

Notes: This regression excludes age squared.

Appendix C: Additional Results

Appendix C1: Robustness Analysis: Omitted Variable Bias

Our analysis possibly suffers from simultaneity and omitted variable biases. It is well known that in survey research happier respondents, or those who are in a better mood during an interview, have a tendency to report more positively about different aspects of their life. For example, the amount of negative feelings one experiences during the day could possibly predispose people to lower their life satisfaction rating. When evaluating their satisfaction, respondents can reason as follows: "I am generally dissatisfied with my life, so apparently I am dissatisfied with my government" or "I feel sad now, so apparently I am dissatisfied with my government" (see also Diener 1984; Headey, Veenhoven, and Wearing, 1991). Similarly, low (subjective) evaluation of personal health implies that individuals possibly have a health problem that affects everyday mood, but also brings general dissatisfaction predisposing them to respond more negatively to the life evaluation question.

We use different strategies to cope with these problems in our baseline OLS analysis in model (7). First, we control for mood during the interview, by including: (1) interview date dummies, assuming that turbulent time indicators of satisfaction can be subject to daily developments; (2) affect indices by Gallup related to very recent positive[46] and (3) indices related to negative experiences,[47] both measured on a 0-100 scale. This way we are able to capture the daily mood of individuals, which may affect the responses related to satisfaction. Second, we control for (4) satisfaction with health measured on a 0-10 scale.

Table C1 shows the results of these additional robustness checks. The effects of dissatisfaction with the standard of living, income, and employment status remain significant and robust to controlling for interview dates, mood, and health satisfaction. Likewise, perceptions of wasta, corruption, and crony capitalism remain an important source of dissatisfaction in developing MENA. Dissatisfaction with not being able to get ahead by working hard and feelings about corruption in government are negative and statistically

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[46]The Gallup positive experience index is based on the following five questions: (1) "Did you feel well-rested yesterday?" (2) "Were you treated with respect all day yesterday?" (3) "Did you smile or laugh a lot yesterday?" (4) "Did you learn or do something interesting yesterday?" and (5) "Did you experience the following feelings during a lot of the day yesterday? How about enjoyment?"
[47]The Gallup negative experience index is based on the following question that asks about the presence of five negative feelings: "Did you experience the following feelings during a lot of the day yesterday?: physical pain, worry, sadness, stress, and anger."

significant in most specifications. In general, the inclusion of interview dates (column 1), positive experience index (column 2), or satisfaction with health (column 4) does not affect the main conclusions drawn from the results presented in table 2. However, when we add a negative experience index to our baseline regression, the coefficient for unemployed is reduced and becomes statistically insignificant (column 3). To some extent, this reflects the fact that when we include the experience index, the sample size reduces from 25,244 to 6,221 respondents.

Table C1: Determinants of Life Satisfaction in Developing MENA in Alternative Models (WLS)

VARIABLES	(1) +Interview Dates	(2) + Positive Experience Index	(3) + Negative Experience Index	(4) + Satisfaction with Health
Dissatisfied with freedom to choose life: Yes	-0.039 (0.030)	-0.019 (0.036)	-0.022 (0.044)	-0.046 (0.048)
Dissatisfaction with standard of living: Yes	-1.242*** (0.030)	-1.103*** (0.037)	-1.124*** (0.044)	-1.055*** (0.046)
Income (1,000's)	0.023*** (0.002)	0.020*** (0.002)	0.022*** (0.002)	0.019*** (0.002)
Dissatisfied with efforts to increase high quality jobs: Yes	-0.155*** (0.032)	-0.101*** (0.037)	-0.089* (0.046)	-0.108** (0.050)
Dissatisfied with the educational system or the schools: Yes	-0.169*** (0.029)	-0.115*** (0.035)	-0.099** (0.043)	-0.142*** (0.045)
Corruption widespread within government: Yes	-0.083** (0.035)	-0.104** (0.042)	-0.127** (0.050)	-0.080 (0.056)
People cannot get ahead by working hard: Yes	-0.238*** (0.039)	-0.228*** (0.047)	-0.199*** (0.055)	-0.340*** (0.061)
Positive experience index		0.007*** (0.001)		
Negative experience index			-0.007*** (0.001)	
Dissatisfied with personal health: Yes				-0.369*** (0.060)
Self-employed	0.054 (0.061)	0.113 (0.079)	-0.012 (0.117)	0.141* (0.081)
Unemployed	-0.352*** (0.078)	-0.234** (0.103)	-0.112 (0.137)	-0.291*** (0.105)
Out of workforce	-0.027 (0.047)	-0.005 (0.058)	-0.053 (0.088)	0.017 (0.065)

	(1) North Africa[A]	(2) Middle East[B]	(3) Levant Area 1[C]	(4) Levant Area 2[D]	(5) Iraq
Underemployed	-0.138*	-0.087	-0.141	-0.180*
	(0.080)	(0.097)	(0.166)	(0.101)
Individual characteristics	YES	YES	YES	YES
Country fixed effects	YES	YES[A]	YES[B]	YES[A]
Month and year of interview	NO	YES	YES	YES
Constant	5.839***	5.420***	6.221***	6.013***
	(0.198)	(0.207)	(0.250)	(0.246)
Observations	25,244	18,442	12,582	11,016
R-squared	0.230	0.201	0.198	0.191

Note: Robust standard errors are in parentheses. *** p<.01, ** p<.05, * p<.1.

[A] Morocco missing.

[B] Morocco and Tunisia missing.

Appendix C2: Robustness Analysis: Heterogeneity within Developing MENA

The developing MENA region encompasses a wide variety of Arab countries. Hence, the correlates of dissatisfaction with life might differ across different subgroups of countries. In our robustness analysis, we distinguish between (1) North Africa, (2) Middle East, (3) Levant (including and excluding Iraq), and (4) Iraq.

Table C2: Determinants of Life Satisfaction in Developing MENA by Subregion (WLS)

VARIABLES	(1) North Africa[A]	(2) Middle East[B]	(3) Levant Area 1[C]	(4) Levant Area 2[D]	(5) Iraq
Dissatisfied with freedom to choose life: Yes	0.017	-0.077*	-0.115**	-0.078*	-0.052
	(0.041)	(0.043)	(0.055)	(0.044)	(0.079)
Dissatisfaction with standard of living: Yes	1.211***	1.246***	-1.295***	-1.204***	0.657***
	(0.042)	(0.040)	(0.052)	(0.043)	(0.081)
Income (1,000s)	0.023***	0.022***	0.018***	0.021***	0.064***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.015)
Dissatisfied with efforts to increase with high quality jobs: Yes	0.117***	0.192***	-0.096	-0.190***	0.334***
	(0.039)	(0.048)	(0.061)	(0.050)	(0.098)
Dissatisfied with the educational system or the schools: Yes	0.218***	0.144***	-0.148***	-0.181***	0.285***
	(0.039)	(0.041)	(0.054)	(0.043)	(0.080)
Corruption widespread within government: Yes	-0.079*	-0.078	0.029	-0.082	0.472***
	(0.044)	(0.052)	(0.062)	(0.052)	(0.114)
People cannot get ahead by working hard: Yes	0.209***	0.233***	-0.283***	-0.245***	-0.172**

	(0.060)	(0.048)	(0.061)	(0.049)	(0.084)
Self-employed	0.380***	-0.143*	-0.209*	-0.115	0.105
	(0.085)	(0.083)	(0.107)	(0.087)	(0.145)
Unemployed	-0.168	-0.437***	-0.576***	-0.368***	-0.220
	(0.106)	(0.111)	(0.156)	(0.114)	(0.184)
Out of workforce	-0.011	-0.048	0.017	-0.009	-0.193
	(0.061)	(0.071)	(0.087)	(0.073)	(0.154)
Underemployed	-0.098	-0.167	-0.185	-0.158	-0.148
	(0.131)	(0.102)	(0.148)	(0.116)	(0.175)
Other	0.170***	0.269***	0.226**	0.202**	0.114
	(0.065)	(0.088)	(0.103)	(0.081)	(0.181)
Individual characteristics	YES	YES	YES	YES	YES
Country fixed effects	YES	YES	YES	YES	YES
Month and year of interview	YES	YES	YES	YES	YES
Constant	6.142***	5.956***	6.226***	5.561***	5.291***
	(0.223)	(0.243)	(0.297)	(0.246)	(0.911)
Observations	10,444	14,800	9,184	13,244	2,432
R-squared	0.249	0.188	0.206	0.180	0.174

Note: Robust standard errors are in parentheses. ***p<.01; **p<.05; *p<.10.
[A] North Africa includes Morocco, Algeria, Tunisia, and Egypt.
[B] Middle East includes Syria, Palestine, Jordan, Lebanon, the Republic of Yemen, and Iraq.
[C] Levant 1 includes Syria, Palestine, Jordan, and Lebanon.
[D] Levant 2 includes Syria, Palestine, Jordan, Lebanon, Egypt, and Iraq.

Table C2 shows the results of the subsample analyses, where three findings stand out. First, the socioeconomic correlates of satisfaction with life are fairly consistent across different groupings of countries in the developing MENA region. Second, satisfaction with freedom to choose life is not equally important for determining life satisfaction in the different MENA sub-regions. In North Africa (column 1) and Iraq (column 5), the effect of freedom has no significant value, while the most significant effect of satisfaction with freedom can be found in the Levant area (column 3). Third, the association between widespread corruption and life satisfaction is very sensitive to the selection of countries. The effect of widespread corruption is only negative and statistically significant for North Africa and Iraq.

Appendix C3: Robustness Analysis: Alternative Variable Specifications

We also tested the robustness of our controls using five alternative specifications, shown in Table C3. In specification 1, satisfaction with the standard of living is measured by the Gallup Food and Shelter Index, which uses the responses to the question whether individuals experienced a shortage of money to provide food and shelter for their family. In specification 2, dissatisfaction with efforts to increase the number of high quality jobs is replaced by a measure of job expectations based on answers to the question: "*Thinking about the job situation in the city or area where you live today, would you say that it is now a good time or a bad time to find a job?*". In specification 3, autocracy and lack of democracy are proxied by a variable related to the freedom and integrity of the media and measured using responses to the question: "*Do you have confidence in the quality and integrity of the media?".* Corruption was alternatively measured in specification 4 by perceptions about changes in the levels of corruption over the past years ("*Do you think the level of corruption in this country is lower, about the same or higher than it was 5 years ago?"*).

The results of these regressions are not directly comparable with the results in Table 2 because the alternative variables are not available for some countries and/or waves. Still, the results in Table C3 show that dissatisfaction with the standard of living and job opportunities remain important drivers of dissatisfaction with life in developing MENA, while freedom is again not important for explaining life dissatisfaction in the developing MENA region as a whole. Although perceptions of increased corruption seem to be associated with life satisfaction in developing MENA, its effect is smaller with the alternative measures reported in Table C3. The effects of perceptions that one cannot get ahead by working hard and dissatisfaction with the education system remain statistically significant across all specifications.

Table C3: Determinants of Life Satisfaction in developing MENA: Alternative Variable Specifications (WLS)

VARIABLES	(1) Alternative standards of living	(2) Alternative job opportunities	(3) Alternative civil freedom	(4) Alternative widespread corruption
Food and Shelter Index	-0.976*** (0.059)			
Would you say that it is now a good time or a bad time to find a job: Bad time		-0.141*** (0.033)		
Do you have confidence in each of the following? How about the quality and integrity of the media: No			-0.029 (0.042)	
Level of corruption is higher				-0.081***
People cannot get ahead by working hard: Yes	-0.305*** (0.042)	-0.195*** (0.040)	-0.225*** (0.057)	-0.200*** (0.039)
Dissatisfied with the educational system or the schools: Yes	-0.252*** (0.034)	-0.150*** (0.031)	-0.166*** (0.043)	-0.169*** (0.030)
Individual characteristics	YES	YES	YES	YES
Country fixed effects	YES[A]	YES[B]	YES	YES
Month and year of interview	YES	YES	YES	YES
Constant	6.470*** (0.200)	5.865*** (0.180)	5.902*** (0.267)	5.676*** (0.177)
Observations	21,376	23,592	10,926	24,012
R-squared	0.162	0.207	0.220	0.210

Note: Robust standard errors are in parentheses. ***p<.01; **p<.05; *p<.10.
A Morocco and Syria are missing.
B Morocco is missing.

Appendix C4: Marginal Effects

Table C4: Determinants of Life Satisfaction in MENA: Marginal Effects of Weighted Least Squares Estimates

VARIABLES	(1) Model 1 DEV MENA	(2) Model 2 DEV MENA	(3) Model 3 DEV MENA	(4) Model 4 DEV MENA	(5) Model 5 DEV MENA	(6) Model 6 DEV MENA	(7) Model 7 Arab Spring
Dissatisfied with freedom to choose life: Yes	-0.072***					-0.007	-0.004
	(0.006)					(0.006)	(0.011)
Dissatisfied with standard of living: Yes		-0.280***				-0.260***	-0.268***
		(0.006)				(0.007)	(0.012)
Income (1,000's)		0.005***	0.006***			0.005***	0.005***
		(0.000)	(0.000)			(0.000)	(0.001)
Dissatisfied with efforts to increase high quality jobs: Yes			-0.073***			-0.032***	-0.030***
			(0.006)			(0.006)	(0.011)
Dissatisfied with the educational system or the schools: Yes			-0.070***			-0.035***	-0.034***
			(0.006)			(0.006)	(0.011)
Self-employed			0.016			0.009	-0.005
			(0.013)			(0.013)	(0.022)
Unemployed			-0.116***			-0.073***	-0.110***
			(0.019)			(0.017)	(0.035)
Out of workforce			0.001			-0.004	-0.006
			(0.010)			(0.010)	(0.017)
Underemployed			-0.056***			-0.024	-0.054*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(continued)			(0.018)			(0.017)	(0.031)
Working for the government			0.049***			0.039***	0.064***
			(0.011)			(0.011)	(0.017)
Undetermined			-0.002			-0.004	-0.062***
			(0.011)			(0.010)	(0.022)
Corruption widespread within government: Yes				-0.057***		-0.016**	
				(0.007)		(0.007)	
People cannot get ahead by working hard: Yes					-0.104***	-0.047***	
					(0.009)	(0.008)	
Not Muslim/Other religion	0.047***	0.041***	0.034**	0.054***	0.048***	0.035***	0.037
	(0.015)	(0.014)	(0.015)	(0.015)	(0.014)	(0.014)	(0.032)
Secondary education and some education beyond	0.089***	0.061***	0.073***	0.091***	0.091***	0.059***	0.084***
	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.011)
Completed four years of education beyond high school	0.174***	0.110***	0.133***	0.178***	0.176***	0.109***	0.113***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.019)
Born in another country	-0.030	-0.056***	-0.043**	-0.029	-0.032	-0.055***	-0.172***
	(0.021)	(0.021)	(0.022)	(0.021)	(0.021)	(0.021)	(0.047)
Female	0.046***	0.032***	0.041***	0.044***	0.042***	0.029***	0.051***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.011)
Age.	-0.008***	-0.006***	-0.008***	-0.008***	-0.008***	-0.006***	-0.005***

	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Age^2	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married without children	0.018*	0.007	0.016*	0.020**	0.018*	0.009	0.003
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.016)
Single with children	-0.025**	-0.021**	-0.018*	-0.028***	-0.030***	-0.016	0.011
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.017)
Single without children	-0.017	-0.021**	-0.014	-0.016	-0.018*	-0.016	-0.003
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.017)
S/d/w with children	-0.020	-0.006	-0.018	-0.025	-0.022	-0.001	0.026
	(0.017)	(0.016)	(0.017)	(0.017)	(0.017)	(0.016)	(0.025)
S/d/w without children	-0.085***	-0.056***	-0.071***	-0.082***	-0.084***	-0.053***	-0.072**
	(0.022)	(0.020)	(0.021)	(0.022)	(0.021)	(0.020)	(0.034)
2 People older than 15 in hh	0.001	0.001	0.002	0.004	0.004	0.002	-0.005
	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)	(0.017)	(0.024)
More than 2 people older than 15 in hh	0.002	-0.007	-0.006	0.006	0.006	-0.006	0.001
	(0.017)	(0.017)	(0.016)	(0.017)	(0.017)	(0.016)	(0.023)
Observations	25,244	25,244	25,244	25,244	25,244	25,244	9,065

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.

Appendix D: Decomposition of Effects

Table D1: Blinder-Oaxaca Decompositions based on Life Satisfaction in 2009 minus Life Satisfaction in 2010

| | Developing MENA | | Arab Spring | |
| | (1) | (2) | (3) | (4) |
VARIABLES	explained	unexplained	explained	unexplained
People cannot get ahead by working hard: Yes	-0.002**	0.009	0.001	-0.008
	(0.001)	(0.011)	(0.001)	(0.014)
Dissatisfied with your freedom to choose what you do with your life?	0.003**	-0.010	0.003	-0.065**
	(0.001)	(0.020)	(0.002)	(0.032)
Dissatisfied with efforts to increase the number of quality jobs?	0.004***	0.019	0.009***	0.006
	(0.001)	(0.036)	(0.003)	(0.062)
Dissatisfied with Standard of Living	0.056***	0.001	0.124***	-0.026
	(0.008)	(0.019)	(0.014)	(0.033)
Dissatisfied with education	-0.002**	-0.000	0.007**	-0.023
	(0.001)	(0.019)	(0.003)	(0.037)
Corruption widespread within government: Yes	0.002**	-0.030	0.008*	0.255***
	(0.001)	(0.047)	(0.005)	(0.075)
Self-employed	0.000	0.005	0.016***	-0.055***
	(0.003)	(0.008)	(0.005)	(0.015)
Unemployed	0.016***	-0.008	0.023***	-0.024**
	(0.003)	(0.005)	(0.005)	(0.009)
Out of workforce	0.013	-0.015	0.081***	-0.213***
	(0.012)	(0.025)	(0.020)	(0.042)
Underemployed	0.002**	0.003	0.009***	-0.004
	(0.001)	(0.005)	(0.003)	(0.010)
Working for the government	-0.001*	-0.026***	0.001	-0.074***
	(0.001)	(0.009)	(0.001)	(0.019)
Undetermined affiliation	0.027**	-0.067***	0.030	-0.043***
	(0.012)	(0.019)	(0.021)	(0.012)
Completed 9-15 years of education	0.013***	0.015	0.026***	0.003
	(0.002)	(0.026)	(0.005)	(0.040)
Completed four years of	0.008***	0.010	0.019***	0.008

education beyond high school
and/or 4-year college degree.

	(0.002)	(0.010)	(0.004)	(0.014)
Female	0.000	-0.027	0.000	0.024
	(0.001)	(0.025)	(0.003)	(0.043)
Age	0.004	0.276	-0.008	-0.597
	(0.004)	(0.344)	(0.007)	(0.559)
Age^2	-0.003	-0.093	0.004	0.304
	(0.002)	(0.162)	(0.005)	(0.260)
Married without children	0.003***	-0.005	0.002	-0.028
	(0.001)	(0.011)	(0.001)	(0.018)
Single with children	0.002	0.002	-0.002	-0.031
	(0.001)	(0.017)	(0.003)	(0.029)
Single without children	-0.001	-0.015	0.000	-0.038*
	(0.001)	(0.014)	(0.004)	(0.020)
S/d/w with children	-0.000	-0.002	0.000	-0.007
	(0.000)	(0.004)	(0.000)	(0.008)
S/d/w without children	0.000	0.001	-0.001	-0.000
	(0.000)	(0.004)	(0.001)	(0.006)
2 people older than 15 in hh	0.000	0.009	-0.003	0.008
	(0.000)	(0.033)	(0.003)	(0.059)
More than 2 people older than 15 in hh	-0.001	0.009	-0.007*	-0.073
	(0.002)	(0.099)	(0.003)	(0.140)
Not Muslim/Other religion	-0.000	0.023***	0.003	0.008
	(0.001)	(0.009)	(0.002)	(0.006)
Born in another country	-0.001	0.000	-0.003	-0.003
	(0.001)	(0.004)	(0.002)	(0.005)
Income (1,000's)	0.020***	0.029	0.028***	0.139***
	(0.004)	(0.031)	(0.006)	(0.049)
wp5==003 morocco	-0.003**	-0.159***		
	(0.001)	(0.014)		
wp5==004 lebanon	-0.001	-0.110***		
	(0.002)	(0.018)		
wp5==007 syria	-0.009***	-0.042***	0.001	-0.030
	(0.002)	(0.011)	(0.003)	(0.036)
wp5==039 palestinian territories	0.000	-0.102***		
	(0.001)	(0.015)		
wp5==084 algeria	-0.014***	-0.059***		
	(0.003)	(0.016)		
wp5==131 iraq	-0.009***	-0.085***		
	(0.002)	(0.012)		
wp5==190 tunisia	-0.004***	-0.040***	0.007**	-0.008
	(0.002)	(0.009)	(0.003)	(0.031)
wp5==197 yemen	0.001	-0.064***	-0.026***	0.006

	(0.001)	(0.015)	(0.006)	(0.049)
Constant	--	0.580**	--	0.790*
		(0.281)		(0.433)
Observations	25,244	25,244	9,065	9,065

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table D2: Oaxaca-Binder decomposition: Coefficients and Confidence Intervals (Figure 3 - Figure 6)

Developing MENA	Explained	CILow	CIHigh
Get ahead by working hard	-0.002	-0.004	0.000
Dissatisfied with Efforts to increase quality jobs	0.004	0.002	0.007
Dissatisfied with Standards of living	0.056	0.041	0.071
Corruption widespread	0.002	0.000	0.003
Unemployed	0.016	0.010	0.022
Dissatisfaction with freedom to choose life	0.003	0.000	-0.005
Income (1000)	0.020	0.013	0.028
Developing MENA	Unexplained		
Working for the government	-0.026	-0.043	-0.009
Undetermined affiliation	-0.067	-0.105	-0.03
Not Muslim/Other religion	0.023	0.006	0.04
Arab Spring Countries	Explained	CILow	CIHigh
Dissatisfied with efforts to increase quality jobs	0.009	0.003	0.016
Dissatisfied with Standards of living	0.124	0.097	0.152
Dissatisfaction with education	0.007	0.001	0.014
Corruption widespread	0.008	-0.002	0.018
Unemployed	0.023	0.013	0.032
Income (1000)	0.028	0.016	0.04
Out of workforce	0.081	0.042	0.119
Underemployed	0.009	0.003	0.015
Arab Spring Countries	Unexplained		
Income (1000)	0.139	0.042	0.236
Corruption widespread	0.255	0.107	0.403
Unemployed	-0.024	-0.043	-0.006

Working for the government	-0.074	-0.112	-0.037
Dissatisfaction with freedom to choose life	-0.065	-0.128	-0.002
Self-employed	-0.055	-0.084	-0.025
Out of workforce	-0.213	-0.295	-0.130
Undetermined Affiliation	-0.043	-0.067	-0.019

Chapter 4| Financial distress of employees in times of economic crises[48]

Abstract

Using data for 28 European countries for the period 2008 to 2012, we examine whether employed individuals are affected by the economic crisis. We provide robust evidence that unfavourable macroeconomic conditions are negatively associated with the life satisfaction of employees. In addition, we find that higher levels of regional unemployment and inflation are predominantly associated with lower levels of life satisfaction for employees who are in a bad financial situation or who expect that their future financial situation will be worse. By contrast, employed people who do well financially and who have good prospects are not affected by the crisis.

4.1 Introduction

Economic crises are often characterized as periods of rising unemployment and inflation as well as decreasing material well-being. Not surprisingly, the most recent economic crisis in Europe has accompanied considerable losses in life satisfaction, particularly in several Mediterranean countries (Veenhoven, 2013) in which regional unemployment rates rose as high as 35%. The negative relationship between unemployment and subjective well-being is well documented in the economic literature and is explained by income loss and by the psychic costs of joblessness related to identity problems, psychological distress and low self-esteem (Veenhoven and Hagenaars, 1989; Gallie and Russell, 1998). However, economic crises also tend to affect the subjective well-being of those who manage to keep their jobs (Di Tella, MacCulloch and Oswald, 2003). As noted by Frey (2007), this phenomenon can be explained not only by the effect of economic crises on crime, public expenditures and income inequality but also by their effect on the financial distress of households. This financial distress can originate from the need to support unemployed family members, increased inflation, reduced average well-being and career prospects (Blanchflower and Oswald, 1994), longer working hours without overtime compensation (Stewart and Swaffield, 1997) and increased fear of becoming unemployed in the near future and losing material well-being (Luechinger, Meier, and Stutzer, 2010). There is a growing body of literature on the relationship between job insecurity and subjective well-being in times of crisis (e.g., Clark, Knabe and Rätzel, 2010; Luechinger et al., 2010; Green, 2011), but there is relatively little empirical evidence on how financial distress moderates the relationship between macroeconomic conditions and the life satisfaction of employees (for an exception, see Gudmundsdottir, 2013). It can be expected that the more an employee is attached to and reliant on his job to make ends meet, the higher the fear of losing this job and the more that worsening macroeconomic conditions negatively affect the employee's life satisfaction. Employees who are highly dependent on their jobs typically include blue-collar workers (Näswall and De Witte, 2003) and employees with lower education or in low-skilled occupations (Fugate, Kinicki and Ashforth, 2004). These groups have the lowest-paying jobs and a lower degree of employability or substantially lower chances to find alternative employment (Sverke, 2004).

4.2 Econometric Framework

To examine the relationships among financial distress, macroeconomic conditions and life satisfaction, we specify a simple reduced-form life satisfaction model (see also Di Tella et al., 2003; Frey Luechinger and Stutzer, 2009):

$$LS_{jit} = \Theta \text{ Macro}_{it} + \Omega \text{ Financial Distress}_{jit} + X \text{ Personal}_{jit} + \varepsilon_i + \lambda_t + \mu_{jit}$$

6 t, Personal$_{jit}$ is a vector of other personal characteristics of the employees, ε_i is a vector of region (NUTS-2) dummies to control for time-invariant regional characteristics, λ_t is a vector of time dummies included to capture global time-related external shocks and μ_{jit} is a residual error.

4.3 Data

Annual data on life satisfaction and personal characteristic variables for employees in the EU-28 (excluding Malta) and Iceland are taken from the Eurobarometer Survey Series. Overall, our sample consists of approximately 50,000 observations between 2008 and 2012. Subjective well-being is measured using a 4-point scale measure of life satisfaction on the following question: 'On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?'. Possible answers are (1) not at all satisfied, (2) not satisfied, (3) fairly satisfied and (4) very satisfied. To capture an employee's financial distress, we include variables related to the financial situation of the household and the future financial expectations of the household. The financial situation of the household corresponds to the following question: 'How would you judge the current financial situation of your household?'. Respondents choose between 'very bad', 'rather bad', 'rather good' and 'very good'. Likewise, our measure of financial expectations is measured by a self-report measure asking 'What are your expectations for the next twelve months: will the next twelve months be "better", "worse", or the "same", when it comes to the financial situation of your household?'. Other personal characteristics included in the analysis are related to gender, age, marital status, household composition, education and occupation type. With respect to macroeconomic conditions, we include variables related to the unemployment rate, GDP per

capita and inflation. Data on the unemployment rate are measured at the regional level (NUTS- 2) and obtained from Eurostat. Information on GDP per capita and inflation rates (consumer prices) are measured at the national level and obtained from the World Bank Development Indicators. An overview of all variables included in the analysis and descriptive statistics are provided in Appendices 1 and 2, respectively.

4.4 Empirical Results

Given the categorical nature of our dependent variable LS_{jit}, all models were estimated using ordered probit regressions. Table 1 presents the results using the full sample of employees. Financial distress is negatively associated with life satisfaction (column (1)). Compared to employees who are in a good to very good financial situation, employees who are in a bad or very bad financial situation are less satisfied. Likewise, employees who expect that the future financial situation of their household will worsen are generally less happy than employees who expect that the future financial situation of their household will improve or remain the same (column (2)). Turning to the effects of macroeconomic conditions on life satisfaction (Table 1, columns (3) and (4)), we find that the regional unemployment rate and inflation are negatively associated with the life satisfaction of employees. By contrast, we find no significant correlation between GDP per capita and individual life satisfaction.

Table 1: Life Satisfaction of the Employed, Ordered Probit Regressions

	(1)	(2)	(3)	(4)
Macroeconomic Characteristics				
Regional Unemployment Rate			-0.022**	-0.017**
			(0.004)	(0.005)
GDP per Capita			0.017	-0.003
			(0.009)	(0.011)
Inflation			-0.011**	-0.012**
			(0.004)	(0.004)
Personal Characteristics				
Female	0.003	-0.051**	0.004	-0.050**
	(0.011)	(0.011)	(0.011)	(0.011)
Married	0.219**	0.164**	0.221**	0.167**
	(0.014)	(0.013)	(0.012)	(0.014)
Age:				

Between 15-24 years old	0.366**	0.283**	0.368**	0.285**
	(0.024)	(0.025)	(0.023)	(0.025)
Older than 55 years	-0.054**	-0.054**	-0.059**	-0.060**
	(0.016)	(0.016)	(0.016)	(0.017)
Children:				
One Child	0.004	0.042**	0.002	0.040**
	(0.014)	(0.015)	(0.014)	(0.015)
Two or more childeren	0.022	0.074**	0.020	0.071**
	(0.016)	(0.016)	(0.015)	(0.016)
Education to Age:				
< 15 years old	-0.299**	-0.163**	-0.297**	-0.160**
	(0.025)	(0.025)	(0.023)	(0.025)
15-18 years old	-0.188**	-0.118**	-0.186**	-0.115**
	(0.013)	(0.013)	(0.013)	(0.013)
Blue collar labor	-0.344**	-0.177**	-0.344**	-0.179**
	(0.015)	(0.015)	(0.014)	(0.015)
Low-skilled labor	-0.185**	-0.086**	-0.179**	-0.082**
	(0.013)	(0.013)	(0.012)	(0.013)
Financial Situation:				
Rather good		-0.790**		-0.782**
		(0.028)		(0.028)
Rather bad		-1.607**		-1.600**
		(0.034)		(0.034)
Very bad		-2.254**		-2.244**
		(0.049)		(0.050)
Financial Expectations Next Year:				
Same		-0.162**		-0.160**
		(0.015)		(0.015)
Worse		-0.410**		-0.403**
		(0.019)		(0.019)
Region Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Pseudo R2	0.161	0.246	0.164	0.248
Observations	50,268	49,272	47,912	46,962

Cluster-robust standard errors in parentheses; ** $p<0.01$, * $p<0.05$

Tables 2 and 3 examine the hypothesis that the relationship between macroeconomic conditions and life satisfaction is contingent on the financial distress levels of employees. Here, we partition the sample by (1) the financial situation of the household and (2) the financial expectations of the household. Table 2 presents the results by the financial situation of the household. Although we find evidence of a strong negative association between the regional unemployment rate and life satisfaction for employees in a very bad financial

situation, the regional unemployment rate is not correlated with the life satisfaction of employees in a very good financial situation. The regional unemployment rate is also negatively associated with the life satisfaction of employees who are in a rather good or rather bad financial situation, but these groups seem to be less deterred by increasing unemployment rates. Similar results are found with regard to inflation, whereas the effect of GDP per capita does not seem to vary by the financial situation of the household.

Table 2: Life Satisfaction of the Employed by Financial Situation, Ordered Probit Regressions

	Very Good Financial Situation	Rather Good Financial Situation	Rather Bad Financial Situation	Very Bad Financial Situation
Macroeconomic Characteristics				
Regional Unemployment Rate	0.018	-0.019**	-0.016**	-0.043**
	(0.019)	(0.007)	(0.004)	(0.016)
GDP per Capita	0.034	0.009	0.002	-0.039
	(0.028)	(0.015)	(0.018)	(0.041)
Inflation	0.024	0.007	-0.024**	-0.044**
	(0.020)	(0.006)	(0.006)	(0.015)
Personal Characteristics	YES	YES	YES	YES
Region Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Pseudo R2	0.105	0.120	0.102	0.13
Observations	5,217	27,822	11,978	2,587

Cluster-robust standard errors in parentheses ** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3 shows the results for the different groups delimited by expectations regarding the financial situation of the household. The results support the notion that the responsiveness of life satisfaction to macroeconomic conditions differs between the three groupings. Whereas regional unemployment and inflation are negatively correlated with the life satisfaction of employees who expect that the financial situation of their household will worsen in the near future, regional unemployment and inflation are not associated with the life satisfaction of employees who expect that the financial situation of their household will improve. The reported differences between the different groups are not only statistically significant but also meaningful from a substantive point of view.

Table 3: Life Satisfaction of the Employed by Financial Expectations, Ordered Probit Regressions

	Expected Financial Situation: Better	Expected Financial Situation: Same	Expected Financial Situation: Worse
Macroeconomic Characteristics			
Regional Unemployment Rate	-0.008	-0.016**	-0.036**
	(0.008)	(0.006)	(0.004)
GDP per Capita	0.019	0.020	-0.063**
	(0.017)	(0.012)	(0.017)
Inflation	-0.007	-0.003	-0.017*
	(0.010)	(0.006)	(0.007)
Personal Characteristics	YES	YES	YES
Region Dummies	YES	YES	YES
Year Dummies	YES	YES	YES
Pseudo R2	0.127	0.176	0.157
Observations	9,860	26,762	10,597

Cluster-robust standard errors in parentheses ** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4 shows the percentage point change for those who become unhappy (not at all satisfied or not satisfied) by changes in the regional unemployment rate. In line with expectations, it appears that a 5-percentage point increase in the regional unemployment rate would increase the percentage of unhappy employees who are in a bad financial situation by 6.4 percentage points. An equal increase in the regional unemployment rate would increase the group of unhappy employees in a rather good financial situation by only 1.1 percentage points. Similar conclusions can be drawn when comparing employees by expectations.

Table 4: Percentage Point Change of Employed that are Unhappy (Rather Dissatisfied or Very Dissatisfied) by Financial Situation and Financial Expectations

	Unemployment +1%	Unemployment +5%	Unemployment +10%
All Employees	0.4%	1.9%	3.9%
Financial Situation			
Very Good	-0.0%	-0.0%	-0.0%
Rather Good	0.0%	1.1%	2.4%
Rather Bad	0.6%	2.8%	5.6%
Very Bad	1.4%	6.4%	11.8%
Financial Expectations			
Better	0.0%	0.0%	0.1%

Same	0.3%	1.4%	2.9%
Worse	1.2%	6.0%	12.1%

4.5 Discussion and Conclusion

Employees who are in financial distress are negatively affected by rising unemployment and inflation, but financially safe employees are not. Because employees in financial distress can be disproportionately found in groups that are already generally less satisfied with life (i.e., low educated, low-skilled, blue-collar workers), economic crises can increase inequality in subjective well-being. This finding should be further examined in future research. Such an effect should be interpreted with caution. The indicators regarding the measurement of financial distress (financial situation of the household and future expectations) are subjective. It is possible that individuals change their reference point when their evaluation of financial matters is performed during recession periods. Decreased life satisfaction during recessions cannot be justified only by financial difficulties. Future research could address whether other social and economic conditions, such as increased crime, reduced public expenditures, or income inequality (Frey, 2007), moderate the relationship between crisis and life satisfaction.

Appendices

Appendix A

Table A1: Description of variables

Dependent Variable			
Life satisfaction	Categorical	Very Satisfied, Fairly satisfied, Not very Satisfied, Not at all satisfied	Eurobarometer
Personal Characteristics			
Expectations (next 12 months for Financial situation	Categorical	Better, Worse, Same	Eurobarometer
Financial situation of the household	Categorical	Very good, Rather good, Rather Bad, Very bad	Eurobarometer
Age Group	Categorical	15-24, 25-54, 55+	Eurobarometer
Gender:	Categorical	Female-Male	Eurobarometer
Marital status	Categorical	Married-Otherwise	Eurobarometer
Occupation	Categorical	Unemployed-Employed	Eurobarometer
Children	Categorical	None, 1 child, 2 or more	Eurobarometer
Education to age	Categorical	<15,15-18, >20	Eurobarometer
Type of job:	Categorical	Blue collar vs. white collar, High-skilled vs. Low-skilled	Own calculation based on Eurostat ISCO-88 Code
Macroeconomic Characteristics			
Regional Unemployment Rate (%)	Continuous		Eurostat
GDP per Capita PPP (constant 2005 international $)	Continuous		WorldBank
Inflation Rate (Consumer prices %)	Continuous		World Bank

Appendix A2:

Table A2: Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum	N
Life Satisfaction	2.97	0.75	1	4	50,268
Macroeconomic Characteristics					
Regional Unemployment Rate	8.97	4.47	1.9	34.6	50,426
GDP per Capita	26.93	10.18	10.72	72.18	48,203
Inflation	2.97	2.55	-4.47	15.40	50,426
Personal Characteristics					
Female	0.48	0.50	0	1	50,426
Married	0.63	0.48	0	1	50,426
Age:					
Between 15-24 years old	0.07	0.25	0	1	50,426
Older than 55 years	0.16	0.37	0	1	50,426
Children:					
One Child	0.19	0.39	0	1	50,426
Two or more childeren	0.18	0.38	0	1	50,426
Education to age:					
< 15 years old	0.10	0.30	0	1	50,426
15-18 years old	0.54	0.50	0	1	50,426
Blue collar labor	0.32	0.46	0	1	50,426
Low-skilled labor	0.51	0.50	0	1	50,426
Financial Situation:					
Rather good	0.59	0.49	0	1	50,068
Rather bad	0.25	0.44	0	1	50,068
Very bad	0.05	0.23	0	1	50,068
Financial Expectations Next Year:					
Same	0.57	0.49	0	1	49,681
Worse	0.23	0.42	0	1	49,681

Chapter 5| Subjective well-being before and after the Greek Bailout Referendum: Expectations and Resilience to Adverse Events

Abstract

Can positive expectations help foster resiliency against adversity? In this study, we used high-frequency panel data, to examine how positive as compared to neutral and negative expectations can buffer the negative impact on subjective well-being generated by an adverse event, the announcement of the Greek bailout referendum in July 2015. Results show that individuals with more positive expectations for the future before the referendum announcement experienced smaller decreases in subjective well-being and adapted quicker to this adverse event. In addition, we found evidence that individuals who shifted from positive to negative expectations before and during the adverse event, respectively, had significantly lower subjective well-being than individuals who had consistent positive expectations. This finding supports the view that optimism, or consistent positive expectations, and even positive mindsets, as indicated by lacks of shifts to negativity, can be a source of resilience that helps individuals cope and adapt quicker to adverse events.

5.1 Introduction

There has been a surge of interest in the role of positive thinking for enhancing resiliency and well-being. In much of the self-help literature, there has been an emphasis placed on the power of positive thinking. For example, the book *The Power of Positive Thinking* has sold more than 5 million copies in print (Peale, 2007). With the advent of positive psychology, this notion has also taken on an increasing quality of truth in the lives of many individuals. Given this, it is important to understand and assess whether promoting and maintaining positive thinking can be protective of well-being.

Empirical evidence that has been drawn on to support the proposal that positive thinking can serve to promote well-being has primarily been through optimism research. Optimism is defined as a dispositional tendency for generalized positive outcomes (Scheier & Carver, 1985). More optimistic individuals tend to evaluate disappointing and stressful events more positively (Hecht, 2013) and are better able to accept the reality of a situation, especially a situation that is beyond their control. Optimists tend to show more active coping behavior in that they take a more proactive approach to changing situations that are harming their well-being (Scheier, Weintraub and Carver, 1986). By contrast, pessimists use more avoidance coping and tend to avoid coping with the stressful event as a psychological protection mechanism (Scheier, et al., 1986). Hence, positive expectations have an anxiety- and stress-buffering role that helps people remain happy in the wake of adverse events. In other words, being optimistic can be regarded as a source of psychological capital or an asset that individuals use to develop adaptive capacities to cope with challenges in life (Carver Scheier and Segerstrom, 2010; Cohn et al., 2009). In this regard, it has been found that resilient people are more positive about the future (Mak, Ng and Wong, 2011).

While there is a rich and robust findings that optimism is associated with, and predictive of, well-being, there is a need to go further to use time-based designs to capture how positive expectations can uphold well-being in the face of negative life events. This would provide stronger claims associated with the resilience effects of positive expectations. In this regard, Fredrickson et al. (2003) examined the effect of the 9/11 terrorist attack in the USA on the psychological well-being of young adults. Despite the uniform negative effect of this adverse, unexpected event on well-being, young adults who were more optimistic were better able to experience pre-crisis psychological benefits, more frequently experienced

positive emotions and coped better with adversity after the attack (Fredrickson et al, 2003). Likewise, health studies have found that more optimistic individuals experience lower decreases in subjective well-being after chemotherapy (Pinquart, Fröhlich and Silbereisen, 2007) or coronary artery bypass surgery (Scheier et al., 1989).

While there are strengths in these ecologically contextualized time-based designs, there are still critical questions of the extent in which positive expectations exert resilience effects. Foremost, it is now increasingly recognized that the negative thinking is more powerful than the positive thinking due to people's proclivity to loss aversion (Kahneman and Tversky, 1979; Tversky & Kahneman, 1991), and there is evidence that losses in financial resources have a greater impact on well-being than gains (Boyce et al., 2013). By extension, positive expectations as a psychological resource may also exhibit the same tendencies. If optimism is the opposite of pessimism, to what extent do positive expectations help protect well-being in the face of adversity as compared to neutral expectations – and to what extent are these effects comparable or different to negative expectations? Past studies have not disentangled these effects and it is difficult to determine if positive expectations (i.e., positive expectations as compared to neutral expectations) or lack of negative expectations (i.e., neutral expectations as compared to negative expectations) are driving protective effects on well-being. In other words, it is important to determine if avoiding negative thinking is driving the effects of resilience as opposed to positive thinking.

Second, past time-based designs have been primarily focused on pre-adversity optimism or positive expectations and their effects on subsequent well-being. While this provides greater resolution for understanding the directional effects of positive expectations on well-being, there is a need to go beyond a snapshot of positive expectations to understand these expectations more dynamically, in the processes before and during adversity. This addresses the critical question of whether maintaining positive expectations is the key to resilience – as viewed from an optimism dispositional lens, or if progressive positive expectations (i.e., having negative or normal expectations before adversity, to having positive ones during) may also have utility for well-being – as viewed from a positivity mindsets lens.

With these two critical issues in mind, our study builds on past time-sensitive studies by using a using high-frequency panel data in the face of an adverse ecological event, the

Greek bailout referendum in July 2015. Specifically, in this study, we assess the subjective well-being impact of the stress and uncertainty generated by the announcement of the Greek bailout referendum on the subjective well-being of Greek students. In July 2015, Greece experienced one of its most stressful events in recent history as its newly elected government failed to reach an agreement on the bailout terms with its creditors, placing the financial future of the country at risk. The unforeseen announcement of the referendum on the acceptance or rejection of the bailout terms presented a substantial dilemma for Greek citizens. Although the majority of Greeks did not approve of the bailout terms set by the Troika (European Commission, European Central Bank and the International Monetary Fund), they also feared exit from the Eurozone (Grexit) and a bankruptcy of Greece. The reinforcement of capital controls limited access to bank accounts, the gloomy prospect of worsening labor markets and liquidity problems, and potential loss of family savings made the bailout referendum announcement an adverse event for most Greeks, who in turn experienced lower subjective well-being. Going beyond past studies on this issue, our goals are to (a) compare the 'power' (i.e., effect size) of positive expectations as opposed to neutral expectations or negative expectations for well-being; and (b) assessing the role of stability and change in positive thinking during an adverse event for well-being.

5.2 Method

5.2.1 Participants

To examine the buffering effect of positive expectations, we utilize survey data[49] collected at Greek universities in the period May 2015–July 2015. The data were collected before (Wave 1), during (Waves 2 and 3) and after (Wave 4) the Greek bailout referendum (see Figure 1). More specifically, students were approached in May 2015 and asked to complete a survey on the state of Greece and their own personal situation. The survey was promoted at Greek universities across the country, predominantly at the Aristotle University

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[49] We conducted an online survey. The survey was completed anonymously, herewith ensuring confidentiality. Our online survey did not need to be reviewed by a research ethics committee (REC).

of Thessaloniki, University of Macedonia, University of Patras, and University of Piraeus, and via social media. Overall, 1,163 students completed this first survey. Of the initial 1,163 participants in the sample, 71% were female, while the median age was 22.5 years old. Most students were based in Thessaloniki (40%), Athens (19%), Patras (19%), and Ioannina (5%). The study participants included students from different disciplines, including economics (23%), business administration (9%), social and political sciences (16%), natural sciences and engineering (14%), educational studies (8%), computer science (7%), and medicine (4%). The students were equally divided across the different years of their study.

The 1,024 students in the first survey who provided their e-mail addresses received invitations by e-mail in July to complete a web-based questionnaire on the following three occasions: (1) the day after the announcement of the Greek referendum (Wave 2), (2) the day after the referendum (Wave 3), and (3) the day after an agreement with the Troika was reached (Wave 4). In total, 284, 166, and 162 students participated in the three additional waves.

Figure 1: Data Collection surrounding the Greek Bailout Referendum in 2015
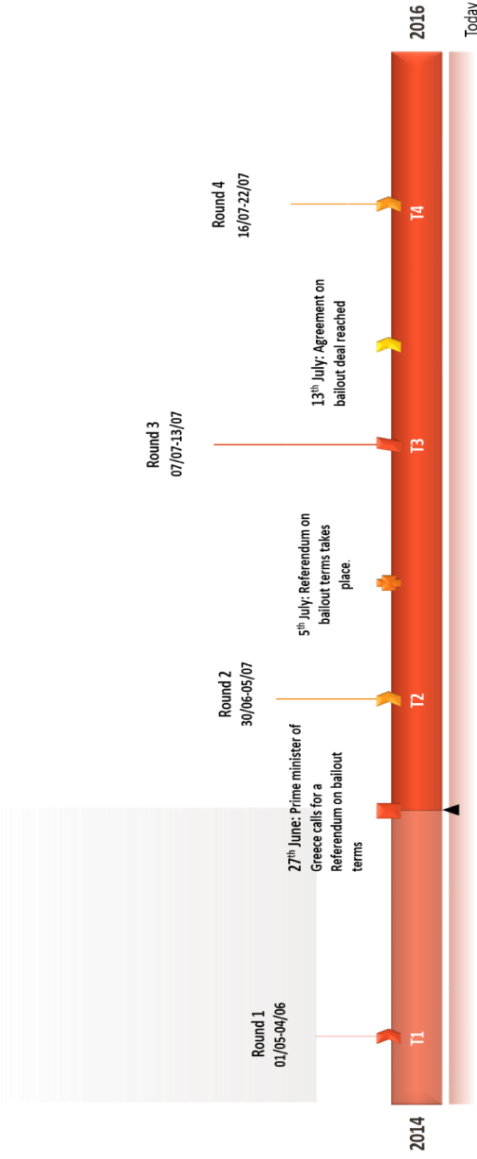
Note: The first wave occurred between May 4 and June 4 when the economic and political situation in Greece was relatively stable (Wave 1). Immediately after the failure to reach an agreement with the creditors, the prime minister called Greek citizens to determine the bailout terms and announced the referendum on June 27. The second wave of data collection started on June 30 and concluded on July 5 (Wave 2). Although the majority of the Greek people rejected the bailout terms on July 5, the negotiations continued for several days, and the reinforcement of capital controls in the banking system generated liquidity problems, additional uncertainty regarding financial institutions, especially in family savings, payments and transactions. Wave 3 occurred after the announcement of the results and during the reinforcement of capital controls between July 7 and 13 (Wave 3). Wave 4 signals the termination of negotiations on July 13, when the final agreement was also made and the financial threat was eliminated (July 16-22) (Wave 4). Figure 1: Data Collection surrounding the Greek Bailout Referendum in 2015

Table 1: Descriptive Statistics: Participation in the Survey

Participation and Response Rates	N	Total drop-out N	Response rate (% of total sample)
First Wave	1163		
		879	
First and Second Wave	284		24.41%
		84	
First, Second, and Third Wave	190		66.90%
		38	
All Waves	162		85.26%

5.2.2 Data Checks

Given the longitudinal design, a potential caveat is that our data might suffer from selection bias and panel attrition bias. Attrition bias arises if respondents drop out for the panel non-randomly, namely, when attrition is interrelated with a variable of interest. Table 1 shows the sample size of each wave of our survey, dropout data and the respective participation rate. We examine panel attrition bias using the demographic data, levels of expectations, and happiness scores of the students that were obtained in the first questionnaire.

Using logistic regression, we compared the students who completed all four waves of questions and the students who dropped out of the survey during or after Wave 1, Wave 2 or Wave 3. The results are presented in Table 2. The levels of happiness or expectations at Wave 1 did not differ significantly between individuals who participated in all four waves and those who did not participate in all four waves. Hence, we conclude that the selection effect with regard to our main variables of interest is limited. However, respondents who were older or male, who lived with their parents at the time of the interview, who saw their friends often and who were studying economics, business administration and/or political science were more likely to complete all four waves of the survey.

Table 2: Self-selection in Sample – Participation in all rounds versus only first round – Marginal Effects.

	(1)
Happiness (Wave 1)	-0.007
	(0.007)
Expectations index (5 domains)	-0.011
	(0.020)
Male	0.049**
	(0.024)
Age	0.013***
	(0.003)
Living with parents (same household)	0.057***
	(0.022)
Frequency meeting friends (reference: several times per week)	
Once per week/Several times a month	-0.051**
	(0.024)
Once per month/ Never	-0.042
	(0.027)
Program (reference: Other)	
Economics, Business Administration, and Political Science	0.044*
	(0.025)
Observations	1,163

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Note: model has been estimated using logistic regression; only significant coefficients and coefficients of main variables of interest displayed.

5.2.3 Measures

Subjective well-being, defined as "*the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably*" (Veenhoven 1984), was measured using an 11-point scale measure of happiness based on the following question: "*Taking all things together, how happy would you say you are?*" ((0) Not happy at all; (10) Very happy). In all four waves, the happiness question was asked at the beginning of the questionnaire. This happiness question used to measure subjective well-being has been frequently employed in earlier happiness economics studies. Most happiness economics studies have used single-item measures, which have been proven to be reliable and valid (Diener, Inglehart, & Tay, 2013) and perform relatively well as compared to multi-item scales like Diener's Satisfaction with Life Scale (see also Schimmack & Oishi, 2005).

In order to measure respondents' expectations, we use several self-report measures. A first set of questions were only answered in the first wave of the study before the bailout referendum announcement: *"What are your expectations for the year to come: will the next twelve months be better, worse or the same when it comes to ... (i) your life in general, (ii) the financial situation of your household, (iii) your personal job situation, (iv) the employment situation in Greece, and (v) the economic situation in Greece"*. Respondents choose between "Worse", "Same", and "Better". Based on these five single-item measures, an expectations index ranging from 0 (all components: "Worse") to 3 (all components: "Better") was created[50]. Cronbach's alpha (0.79) indicated that the index is internally consistent. These questions are used to examine whether positive expectations or the lack of negative expectations are driving resilience effects.

In this research, we are also interested to examine whether people with consistent positive expectations, as indicated by lacks of shifts to negativity over time, are resilient. Unfortunately, the different items on the expectations index were measured only in the first wave of the research. However, one comparable question related to expectations in the job market was included in both Waves 1 and 2: *"Some analysts say that the impact of the economic crisis on the job market has already reached its peak and things will recover little by little. Others, on the contrary, say that the worst is still to come. Which of these two statements is closer to your opinion? (1) The impact of the crisis on jobs has already reached its peak. (2) The worst is still to come. (3) Don't know"*. Whereas the first answer category denotes more positive expectations regarding developments in the job market, the second category reflects a more negative outlook. Although a neutral answer category is lacking, we can examine the effect of shifts to negativity over time by considering respondent answers in both Waves 1 and 2.

Finally, we included several control variables that could confound the relationship between expectations and change in subjective well-being in our econometric analysis. These variables include socio-demographic and personality characteristics of the individuals as well as political preferences and recent voting behavior. In addition to standard socio-demographic characteristics, such as age, gender, location of residence, health, income, and

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[50] The index is the average of the available items. Availability of at least three out of five items was the eligibility criterion for the construction of the index.

marital status, respondents had to answer questions with respect to the frequency of meeting friends, propensity to trust other people, and their religiosity. In terms of personality, the Big Five personality traits (neuroticism, extraversion, openness, agreeableness, and conscientiousness) were measured using a 10-item inventory (Gosling, Rentfrow and Swann, 2003). Political preferences of the respondents were captured by asking about their voting behavior during the last elections. A detailed description, summary statistics and the correlation matrix of the variables included in the analysis can be found in Appendix A.

5.3 Results

5.3.1 Descriptive statistics and preliminary analyses

Overall, young adults in our sample report an average happiness of 7.10 on a 10-point scale (Wave 1, common sample). This score for our sample is higher than other subjective well-being figures that have been reported in large-scale annual surveys for Greece. For instance, the Gallup World Poll 2014 reports an average life satisfaction score of 4.8 out of 10 for Greece using the Cantril ladder question (scale 0-10)[51], while in the Eurobarometer of March 2015 reports an average life satisfaction of 2.33 out of 4 for Greece. [52] Meanwhile, an examination of the Eurobarometer micro-data shows that Greek students are substantially more satisfied than other parts of the Greek population. The Eurobarometer of March 2015 reports an average life satisfaction score of 2.77 points (66% satisfied) for students and 2.29 points (45% satisfied) for non-students. Overall, Greek students appear to report being happier or more satisfied than the general population prior to the referendum announcement.

Starting with a visual inspection of the data, Figure 2 presents average happiness scores[53] for three distinct expectations groups (low, medium, high) created by the distribution of the expectations index and for the three answer category groups (worse, same,

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[51] The Cantril ladder question asks on which step of the ladder, with steps from 0 to 10, a person feels he or she stands at present. The higher the score on the ladder, the closer one's life is seen to his or her ideal life.

[52] The item measured by Eurobarometer is a 4-item life satisfaction indicator. European Commission, Brussels (2014): Eurobarometer 80.1 (2013). TNS Opinion, Brussels [producer]. GESIS Data Archive, Cologne. ZA5876 Data file Version 1.0.0, doi:10.4232/1.11881. The question reads: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?" Possible answers are (1) Not at all satisfied, (2) Not satisfied, (3) Fairly satisfied, and (4) Very satisfied. People are considered satisfied if they report (3) Fairly satisfied, or (4) Very satisfied.

[53] Figure 2 was produced based on the common sample for all periods.

better) for the five domains on which the index was based. Index groups were constructed in the following way: low expectations < 25th percentile; 25th percentile > medium expectations < 75th percentile; high expectations > 75th percentile (see Figure 3).

In Wave 1, average happiness scores differ slightly between individuals with different levels of expectations. The average for respondents who scored high on expectations is 0.77 points higher than the average for those with low expectations. The happiness of individuals who scored low on the expectations index at Wave 1 decreased by 2.2 points (on a 10-item scale), which is a much larger decrease than that for individuals with medium or high expectations, whose happiness decreased by 1.78 and 1.18 points, respectively. On average, happiness levels declined by 1.77 points in the wake of the announcement of the bailout referendum and rose again to an average of 6.27 after the final agreement. The pattern is consistent for all five expectations items in Figure 2.

Figure 2: Happiness Trends by Expectations

Financial Situation Household

Personal Job Situation

Employment Situation in Greece

Economic Situation in Greece
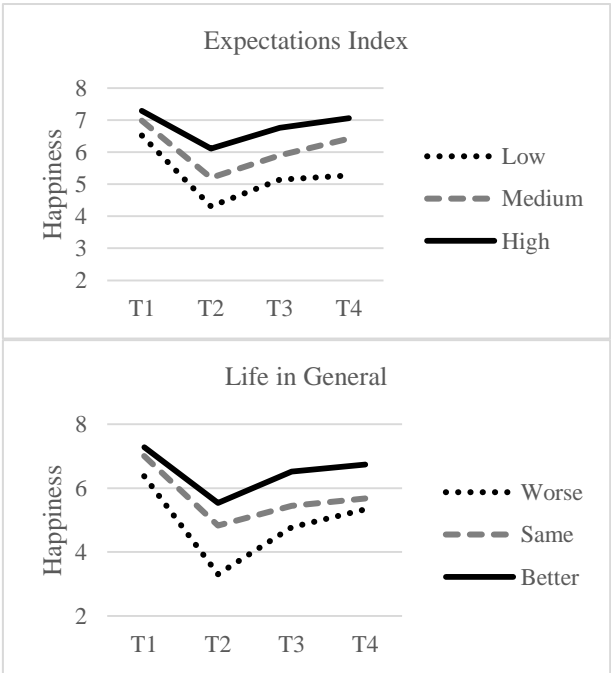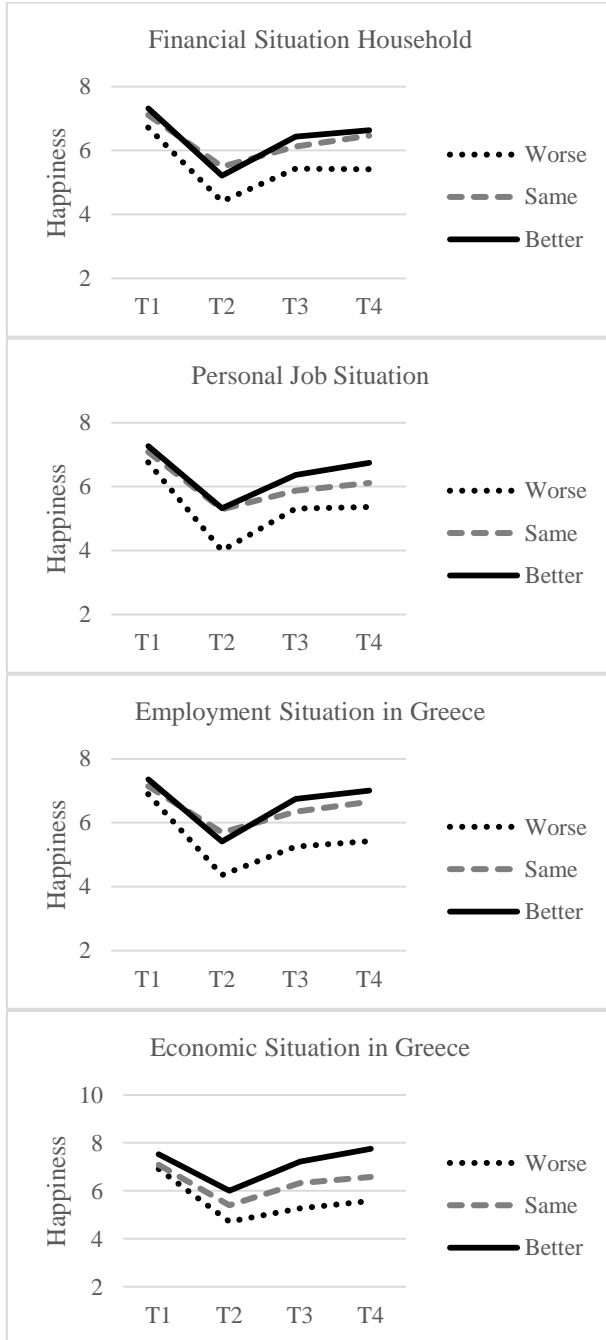
Note: The graphs refer to reported expectations based on the following question: What are your expectations for the year to come: will the next twelve months be better, worse or the same, when it comes to ... (i) your life in general, (ii) the financial situation of your household, (iii) your personal job situation, (iv) the employment situation in Greece, and (v) the economic situation in Greece". The construction of the expectations index is discussed in the main text.

Figure 3: Expectations Index
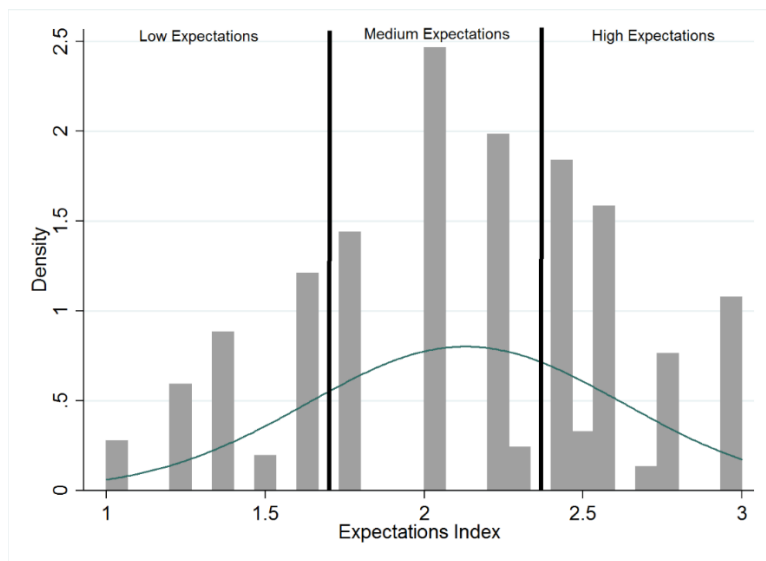
In addition to the finding that individuals with more positive expectations reported slightly higher happiness levels prior to the Greek bailout referendum, two observations are noteworthy. First, individuals with more positive expectations experienced a smaller decrease in happiness between the time of the first survey and the time of the Greek bailout referendum announcement. Second, compared to those with lower expectations, individuals with more positive expectations recovered to their original happiness level must faster between the time of the announcement and the time that the new deal with the European Union and IMF was made. Again, this general pattern is observed for the overall expectation index as well as for each element of the expectations index. This appears to generally support

the idea that positive expectations serve to buffer adverse event effects on subjective well-being.

5.3.2 Regression and Instrumental-variable analysis

To conduct statistical inference on the visualized trends, we specify a simple reduced-form happiness model (see also Di Tella, MacCulloch, and Oswald, 2003; Frey Luechinger and Stutzer, 2009) to examine the relationship between expectations and changes in subjective well-being:

$$\delta SWB_{jt} = \vartheta Expectations_{j1} + \omega Personal_{j1} + \rho SWB_{jt-1} + \mu_{jt}$$

where

δSWB_{jt} denotes the difference in a self-report measure of subjective well-being scores for individual j between waves. $\vartheta Expectations_j$ is a (vector of) self-report measure(s) of expectations for individual j measured in Wave 1. $Personal_j$ is a vector of control variables related to personal and sociodemographic characteristics (age, gender, marital status, frequency of social contacts, social trust, religion, health, personality traits and political preferences) and socio-demographic characteristics (self-reported amount of monthly expenses, household situation) and demographics (age, gender and marital status) of individual j, SWB_{jt-1} the reported subjective well-being in the previous wave, and μ_{jt} is a residual error.

In this model, we examined (a) the differences in subjective well-being between Wave 1 (situation before the announcement of the Greek bailout referendum) and Wave 2 (situation immediately after the announcement of the referendum) and (b) the differences in subjective well-being between Waves 2 and 4 (situation immediately after the deal with the Trojka) to test whether positive expectations are associated with resilience; that is, a smaller decrease in subjective well-being in the wake of an adverse event and a faster pace in bouncing back to the original level of subjective well-being. To address possible endogeneity issues caused by the simultaneous determination of dependent and independent variables and constrained by the limited availability of valid instruments, we apply an alternative approach to traditional instrumental variable (IV-2SLS) methods such as two-

stage least squares (2SLS): we use an instrumental variable estimation with heteroskedasticity-based instruments for cross-sectional data, also known as the Lewbel IV estimator (Lewbel, 2012). The Lewbel IV estimator uses internally generated instruments comparable to difference generalized method of moments (GMM) and system GMM in a panel data setting to isolate the effect of expectations on changes in subjective well-being. Following Lewbel (2012), in the absence of instrumental variables, a vector of exogenous variables Z equal to a set of independent variables X or a subset of X can be used to generate external instruments $[Z - E(Z)]\varepsilon$,[54] given that (1) there is some heteroskedasticity in the standard errors ε and (2) $E(X\varepsilon) = 0$ and $\text{cov}(Z,\varepsilon) \neq 0$.

As the validity of these assumptions for our data could be questioned, we first examine whether the Lewbel requirements are met for the regression model. First, we test for the presence of heteroskedasticity. In line with the work of Lewbel (2012), we performed a Breusch-Pagan Lagrange Multiplier Test. The results show that the Breusch-Pagan Lagrange Multiplier Test statistic is significantly different from zero in all regressions, indicating that the variance in our data is sufficient to avoid the creation of weak instruments. Second, before estimating the second stage of the regressions using the generated instruments, we carefully consider the choice of instruments. As indicated by Lewbel (2012), the vector of exogenous variables can be a subset of the independent variables X, and therefore, the obtained estimates could be largely dependent on the specific choice of these variables. In general, the choice of exogenous variables can be random, subject to the conditions above, we opted to follow a different strategy to select our instruments. Our strategy for choosing Z is based on the correlation matrix of the generated instruments. The subset of X had to satisfy two basic conditions: (i) it had to be uncorrelated with the dependent variable, and (ii) it had to be statistically correlated with the independent variable of interest. The generated instruments that did not meet these conditions were omitted from the second-stage regression. After testing whether the conditions were satisfied (based on the Hansen J test and Stock-Yogo weak ID test), we chose a set of instruments and estimated the model using GMM. In the regression tables, we report both the OLS and Lewbel IV estimates.

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[54]A more detailed account of how the instruments are estimated can be found in the work of Lewbel (2012).

Positive versus Neutral and Negative Expectations

The pattern observed from a simple visual inspection is reproduced by the estimated OLS and Lewbel regressions in Table 3. Controlling for the previous level of subjective well-being as well as personal and socio-economic characteristics of the respondents, we find that the expectations index is positively and significantly associated with the difference in happiness between Waves 1 and 2 (Table 3; Columns 1 and 2). On average, individuals with better future expectations (higher scores on the expectations index) before the announcement experienced a smaller decrease in subjective well-being between these time points than other individuals did. Directly comparing our regression results to the results in Figure 2, we find that individuals who belong to the 75th percentile on the expectations index experienced a smaller decrease between Waves 2 and 1 (b= 0.761, p<0.01) than did individuals on the bottom of the distribution of the expectation index[55]. Additionally, when examining the development of happiness between Waves 2 and 4, we find that individuals who scored higher on the expectations index also reported a we find that individuals who scored higher on the expectations index also reported a significantly larger increase in subjective well-being (Table 3; Columns 5 and 6)[56] .

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[55] Estimates are produced by using the ordinal measure of expectations index, as shown in Figure 1, and are available upon request.

[56] The sensitivity of our results regarding various time references is shown in Appendix B. Here, we focus again on the 5-item expectations index, which is explored using the happiness differences between Waves 4 and 3, between Waves 3 and 2 and between Waves 3 and 1. High expectations index scores are positively associated with differences in happiness in all periods showing the mitigating effect of expectations during stressful events and recovery periods.

Table 3: OLS and Lewbel Estimations on Expectations and Changes in Subjective Well-being

	Difference in happiness Wave 2 – Wave 1				Difference in happiness Wave 4 – Wave 2			
	OLS	Lewbel Estimator[1]	OLS Groups	Lewbel Groups[2]	OLS	Lewbel Estimator[3]	OLS Groups	Lewbel Groups[4]
Expectations index (5 domains)	0.824*** (0.297)	1.651* (0.969)			0.763*** (0.268)	0.629* (0.378)		
Expectation Groups (Low)			Reference	Reference			Reference	Reference
Expectation Groups (Medium)	--	--	0.485 (0.337)	0.485 (0.315)	--	--	0.761** (0.340)	1.414*** (0.445)
Expectations Groups (High)	--	--	1.003*** (0.289)	1.003*** (0.315)	--	--	1.038*** (0.266)	1.534*** (0.267)
			-0.341	-0.325			-0.334	-0.438
Male	0.233 (0.288)	0.237 (0.289)	0.237 (0.289)	0.237 (0.284)	-0.424 (0.273)	-0.437 (0.266)	-0.437 (0.266)	-0.392 (0.267)
Age	-0.062* (0.033)	-0.067** (0.033)	-0.067** (0.033)	-0.067** (0.032)	-0.071** (0.031)	-0.070** (0.031)	-0.070** (0.031)	-0.069** (0.030)
Married	0.803 (0.817)	0.857 (0.793)	0.857 (0.793)	0.857 (0.829)	0.08 (1.486)	-0.033 (1.456)	-0.033 (1.456)	-0.209 (0.771)
Separated	-0.04 (0.946)	-0.188 (0.842)	-0.188 (0.842)	-0.188 (1.622)	--	--	--	--

Table 3: OLS and Lewbel Estimations on Expectations and Changes in Subjective Well-being

	Difference in happiness Wave 2 – Wave 1				Difference in happiness Wave 4 – Wave 2			
	OLS	Lewbel Estimator[1]	OLS Groups	Lewbel Groups[2]	OLS	Lewbel Estimator[3]	OLS Groups	Lewbel Groups[4]
Single	-0.251	-0.271	-0.271	-0.271	-0.405	-0.385	-0.385	-0.354
	(0.276)	(0.276)	(0.276)	(0.269)	(0.256)	(0.256)	(0.256)	(0.250)
Living with parents	0.329	0.303	0.303	0.303	0.328	0.273	0.273	0.281
	(0.308)	(0.309)	(0.309)	(0.290)	(0.256)	(0.246)	(0.246)	(0.277)
Month expenses: €300-499	-0.048	-0.081	-0.081	-0.081	0.395	0.343	0.343	0.369
	(0.385)	(0.386)	(0.386)	(0.356)	(0.352)	(0.344)	(0.344)	(0.327)
Month expenses: above €500	0.293	0.285	0.285	0.285	0.572	0.583	0.583	0.685*
	(0.477)	(0.477)	(0.477)	(0.407)	(0.442)	(0.409)	(0.409)	(0.401)
Physical or mental health problems: Yes	0.461	0.494	0.494	0.494	-0.257	-0.221	-0.221	-0.266
	(0.661)	(0.644)	(0.644)	(0.644)	(0.706)	(0.734)	(0.734)	(0.605)
Frequency meeting friends Once per week/Sev. times a month	-0.328	-0.314	-0.314	-0.314	-0.247	-0.207	-0.207	-0.168
	(0.313)	(0.315)	(0.315)	(0.301)	(0.289)	(0.285)	(0.285)	(0.287)

Table 3: OLS and Lewbel Estimations on Expectations and Changes in Subjective Well-being

	Difference in happiness Wave 2 – Wave 1				Difference in happiness Wave 4 – Wave 2			
	OLS	Lewbel Estimator[1]	OLS Groups	Lewbel Groups[2]	OLS	Lewbel Estimator[3]	OLS Groups	Lewbel Groups[4]
Once per month/ Never	-0.620*	-0.552	-0.552	-0.552	0.328	0.441	0.441	0.552
	(0.353)	(0.353)	(0.353)	(0.344)	(0.346)	(0.351)	(0.351)	(0.339)
Trust in people	-0.027	-0.027	-0.027	-0.027	0.038	0.038	0.038	0.027
	(0.062)	(0.062)	(0.062)	(0.064)	(0.066)	(0.066)	(0.066)	(0.062)
Voting behavior: Syriza	0.987***	0.980***	0.980***	0.980***	-0.318	-0.294	-0.294	-0.311
	(0.283)	(0.283)	(0.283)	(0.287)	(0.267)	(0.268)	(0.268)	(0.277)
Voting behavior: Denied	0.219	0.225	0.225	0.225	0.175	0.160	0.160	0.031
	(0.445)	(0.460)	(0.460)	(0.400)	(0.305)	(0.299)	(0.299)	(0.344)
Religious	-0.125	-0.137	-0.137	-0.137	0.295	0.301	0.301	0.274
	(0.292)	(0.291)	(0.291)	(0.277)	(0.255)	(0.253)	(0.253)	(0.242)
Neuroticism	-0.065	-0.073	-0.073	-0.073	-0.036	-0.043	-0.043	-0.030
	(0.057)	(0.059)	(0.059)	(0.056)	(0.058)	(0.057)	(0.057)	(0.053)
Extraversion	-0.002	0.005	0.005	0.005	0.006	0.017	0.017	0.032
	(0.054)	(0.055)	(0.055)	(0.052)	(0.044)	(0.046)	(0.046)	(0.050)

Table 3: OLS and Lewbel Estimations on Expectations and Changes in Subjective Well-being

	Difference in happiness Wave 2 – Wave 1				Difference in happiness Wave 4 – Wave 2			
	OLS	Lewbel Estimator[1]	OLS Groups	Lewbel Groups[2]	OLS	Lewbel Estimator[3]	OLS Groups	Lewbel Groups[4]
Openness	-0.060	-0.062	-0.062	-0.062	0.001	-0.006	-0.006	-0.010
	(0.064)	(0.064)	(0.064)	(0.060)	(0.047)	(0.047)	(0.047)	(0.052)
Agreeableness	0.069	0.073	0.073	0.073	0.028	0.027	0.027	0.025
	(0.067)	(0.067)	(0.067)	(0.062)	(0.067)	(0.068)	(0.068)	(0.061)
Conscientiousness	0.088	0.087	0.087	0.087	0.095	0.095	0.095	0.094
	(0.082)	(0.082)	(0.082)	(0.079)	(0.070)	(0.071)	(0.071)	(0.069)
Non-economics, BA , Pol.Sciense	-0.025	-0.003	-0.083	-0.083	0.103	0.101	-0.019	-0.119
	(0.315)	(0.301)	(0.315)	(0.295)	(0.291)	(0.277)	(0.290)	(0.287)
Happiness Wave 1	-0.591***	-0.606***	-0.600***	-0.600***	--	--	--	--
	(0.091)	(0.083)	(0.092)	(0.080)				
Happiness Wave 2	--	--	--	--	-0.562***	-0.556***	-0.571***	-0.590***
					(0.062)	(0.054)	(0.063)	(0.055)

Table 3: OLS and Lewbel Estimations on Expectations and Changes in Subjective Well-being

	Difference in happiness Wave 2 – Wave 1				Difference in happiness Wave 4 – Wave 2			
	OLS	Lewbel Estimator[1]	OLS Groups	Lewbel Groups[2]	OLS	Lewbel Estimator[3]	OLS Groups	Lewbel Groups[4]
Constant	1.500	-0.441	2.896**	2.896**	2.763*	3.070*	3.891***	3.494***
	(1.568)	(2.693)	(1.465)	(1.451)	(1.667)	(1.574)	(1.408)	(1.345)
Observations	284	284	284	284	162	162	162	162
R-squared	0.265	0.242	0.267	0.267	0.521	0.520	0.531	0.515

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$. [1] Underidentification test (23.775), P-val =0.01, Cragg-Donald Wald F statistic: 2.518, Sargan statistic: 10.731 P-val = 0.22; [2] According to the Cragg-Donald Wald F statistic there is an indication of weak identification of instruments- Underidentification test (284.000), P-val =0.00, Cragg-Donald Wald F statistic:-0.000, Sargan statistic:55.337 P-val = 0.16; [3] Underidentification test (72.718), P-val =0.00, Cragg-Donald Wald F statistic 3.616, Sargan statistic: 38.773 P-val = 0.03; [4] Underidentification test (63.856), P-val =0.08,Cragg-Donald Wald F statistic: 1.119, Sargan statistic: 66.914 P-val =0.00

The respective comparison of the distribution groups shows that respondents within the 75th percentile of the distribution of the expectations index reported a larger increase between Waves 2 and 4 (b =1.038, p<0.01) than did respondents in the first quantile (25th percentile). Our results confirm the resilience-generating capacities of positive expectations and they are validated when we account for reverse causality using a Lewbel estimator, showing that better expectations for the future significantly predict differences in the development of subjective well-being for both periods.[57] In other words, it is positive expectations rather than the lack of negative expectations that are driving protective effects on well-being.

Changing Expectations over Time

Table 4 shows the OLS and Lewbel estimates of a regression on changes in well-being between Waves 1 and 2, taking in changes in expectations. As already mentioned in the methodology section, we use due to the unavailability of the other expectations measures in wave 2 and beyond, an alternative indicator for expectations, based on the question: *"Some analysts say that the impact of the economic crisis on the job market has already reached its peak and things will recover little by little. Others, on the contrary, say that the worst is still to come. Which of these two statements is closer to your opinion? (1) The impact of the crisis on jobs has already reached its peak. (2) The worst is still to come. (3) Don't know".*[58] Although a neutral category is lacking, we are able to gauge whether respondents' expectations become more positive (from (2) to (1)), become more negative (from (1) to (2)) or stay the same. Overall, 5.6% of the respondents indicate more positive expectations and 22.8 % of the respondents indicate more negative expectations. The percentages of respondents who held consistently positive and consistently negative expectations between Wave 1 and Wave 2 are 19.6 and 52% respectively.

Our results indeed show that the people who held consistently positive expectations – before and after the announcement of the referendum –experienced the smallest decline in

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[57] When we exclude the item related to expectations with regard to life in general in our index, which can alternatively be perceived as an overall evaluation, we reach similar conclusions. These results are available upon request.

[58] A limited number of respondents (11.9%) filled out 'Don't know' in either Wave 1 or Wave 2. For the analysis they were omitted from the common sample, reducing the common sample from 284 to 250.

subjective well-being in the wake of the referendum. However, people who switched from positive to negative expectations experienced a decline in well-being that was as strong as the decline experienced by people who held consistently negative expectations. Compared to respondents who were consistently positive, respondents who shifted to negative or were consistently negative, experienced an additional decline of -1.2 points on the 0-10 happiness scale.

Table 4: OLS Expectations at Wave 1 and 2 and Change in Happiness – OLS Estimates

	(1)	(2)	(3)	(4)
	OLS		Lewbel Estimates	
Expectations Labor Market (Wave 2 – Wave 1)				
Negative change (Peak-Worse)	-1.164***	-0.192	-1.157***	-0.479
	(0.412)	(0.376)	(0.443)	(0.704)
No change (Worse-Worse)	-0.973***	Reference	-0.965**	Reference
	(0.355)		(0.386)	
Positive change (Worse-Peak)	-0.709	0.264	-0.678	0.505
	(0.887)	(0.859)	(0.743)	(0.855)
No change (Peak-Peak)	Reference	0.973***	Reference	0.678
		(0.355)		(0.743)
Control Variables	YES	YES	YES	YES
Observations	250	250	250	250
R-squared	0.251	0.251	0.251	0.251

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Underidentification test (206.448), P-val =0.000, Cragg-Donald Wald F statistic: 112.185, Sargan statistic: 3.766 P-val = 0.8063

5.4 Discussion

At present day, limited attention has been devoted to the resilience-generating capacities of positive expectations in the wake of adverse events. In this paper, we use high-frequency panel data to assess the subjective well-being impact of the stress and anxiety generated by an adverse event, the announcement of the Greek bailout referendum in July 2015. Our analysis shows that the announcement of the Greek bailout referendum affected well-being levels considerably, most likely by creating anxiety and stress within the population. Moreover, our results show that positive expectations – and maintaining positive expectations – have resilience-generating capacities for subjective well-being. Individuals

with better expectations before the referendum announcement experienced smaller decreases in subjective well-being and adapted quicker to this adverse event than individuals who held negative expectations regarding the future.

The results support the view that positive expectations dispositionally and even as a mind-set can be a source of resilience that allows individuals to cope and adapt quicker to adverse events. However, additional analyses emphasize the importance of the persistence of these expectations. Hence, people who have a more positive outlook on life are particularly more resilient in times of crisis.

Although not the focus of this paper, further research should examine the precise mechanisms that might shape expectations during adverse events and their connection with experienced utility. Although the literature suggests that the tendency to have positive or negative expectations has a strong genetic basis and is generally stable (Hecht, 2013; Moser et al., 2014), expectations can also be shaped by external stimuli. We capture deviations in labor market expectations before and after the stressful event and find that negative changes in expectations predict larger declines in happiness and slower recovery to initial levels.

Additionally, our findings suggest the presence of the phenomenon of adaptation, but we are unable to observe complete recovery to the initial happiness levels, mainly because of the relatively short time frame for data collection. Possibly, an additional wave of data could indicate further or complete adaptation.

Considering the high-frequency data used in our analysis, further research is needed to consider to the effect of the exogenous event on different age groups and on the general population. However, it is not likely that our main findings should be disregarded when representative samples are employed, given the magnitude of the event and its wide coverage by the media, which escalated the negative influence to the level of crisis perception.

Appendices

APPENDIX A

Table A1: Description of variables

Variable	Exact question (Original)	Response
Expectations	What are your expectations for the year to come will the next twelve months be better, worse or the same, when it comes to ... ?	
	Life in general	Same/Better/Worse
	The financial situation of household	Same/Better/Worse
	Your personal job situation	Same/Better/Worse
	Employment situation in Greece	Same/Better/Worse
	Economic situation in Greece	Same/Better/Worse
Expectations regarding labor market conditions	"Some analysts say that the impact of the economic crisis on the job market has already reached its peak and things will recover little by little. Others, on the contrary, say that the worst is still to come. Which of the two statements is closer to your opinion?	(1)The impact of the crisis on jobs has already reached its peak (2) The worst is still to come (3) (DK)"
Happiness	Taking all things together, how happy would you say you are? Please use this picture	0 Not at all happy-10 Very happy
Gender	Are you..	0 Male 1 Female
Age		
Marital Status	Could you indicate which corresponds best to your own current situation?	In a relationship, Married, Single, Separated
Living with:	Could you indicate which corresponds best to your own current situation?	0- I live with my parents (same household) 1 I live in a separately of my parents (in a different household).
Amount of monthly expenses	What is the amount of total monthly expenses you make (IN EUROS)?	0-299, 300-500, Above 500
Health: Suffer	Do you suffer from a chronic physical or mental health problem which affects you in your daily life?	0- No, 1-Yes
Frequency meeting with friends..	How often do you meet socially with friends, relatives or work colleagues?	Every Day/Several times per week, Once per week/Several times per month, Once

		per month/Less than a month/Never.
Trust people	Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted.	0 You can't be too careful with people 10 Most people can be trusted
Voting behavior	Which political party did you vote in the last election?	Other, SYRIZA, Denied,
Religion	Regardless of whether you belong to a particular religion, how religious would you say you are?	Non-religious, Religious
Personality traits[59]		
Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness	Big Five	0-12
University	In which University are you studying?	Other, Aristotle, Patras, Piraeus, Macedonias
Department	In which department are you studying?	Open ended

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[59] Indexes were created for all four dimensions using the following questions on whether one seems himself as someone who..: *Neuroticism (N)* (1) Worries a lot, (2) Gets nervous easily, (3)Remains calm in tense situations (recoded), *Extraversion(E)* (1) Is talkative, (2) (3) Is outgoing, sociable, (4) Is reserved (recoded), *Openness to experience* (O) (1) Is original, comes up with new ideas, (2) Values artistic, aesthetic experiences, (3) Has an active imagination, *Agreeableness (A)* (1) Is sometimes rude to others (recoded) , (2) Has a forgiving nature, (3) Is considerate and kind to almost everyone, *Conscientiousness (C)* (1) Does a thorough job, (2) Tends to be lazy(recoded), (3) Does things efficiently.

Table A2: Descriptive Statistics for every round

Variables	Period 1 Mean	SD	Period 2 Mean	SD	Period 3 Mean	SD	Period 4 Mean	SD	Min	Max
Happiness	7.10	1.68	5.16	2.36	6.02	1.96	6.27	1.97	0	10
Gender										
Female	0.71	0.46	0.66	0.47	0.63	0.49	0.60	0.49	0	1
Male	0.29	0.46	0.34	0.47	0.37	0.49	0.40	0.49	0	1
Age	22.4	4.32	23.8	5.11	23.6	5.57	23.5	5.21	0	1
Marital Status										
In a relationship	0.41	0.49	0.43	0.50	0.44	0.50	0.44	0.50	0	1
Married	0.02	0.15	0.03	0.18	0.04	0.19	0.03	0.17	0	1
Separated	0.02	0.15	0.01	0.08	0.01	0.07	-	-	0	1
Single	0.54	0.50	0.53	0.50	0.52	0.50	0.52	0.50	0	1
Living with:										
Living without parents	0.49	0.50	0.43	0.50	0.40	0.49	0.40	0.49	0	1
Living with parents	0.51	0.50	0.57	0.50	0.60	0.49	0.60	0.49	0	1
Amount of monthly expenses										
0-299	0.59	0.49	0.61	0.49	0.61	0.49	0.60	0.49	0	1
300-499	0.23	0.42	0.20	0.40	0.21	0.40	0.23	0.42	0	1
Above 500	0.18	0.38	0.19	0.39	0.18	0.39	0.17	0.38	0	1
Health: Suffer										
Health No	0.96	0.19	0.96	0.20	0.94	0.23	0.96	0.19	0	1
Health Yes	0.04	0.19	0.04	0.20	0.06	0.23	0.04	0.19	0	1
F*requency meeting with friends..*										
Every Day/ Several times per week	0.41	0.49	0.42	0.49	0.45	0.50	0.46	0.50	0	1
Once per week/ Several times per month	0.35	0.48	0.36	0.48	0.34	0.48	0.33	0.47	0	1
Once per month/Never	0.24	0.43	0.23	0.42	0.21	0.40	0.21	0.41	0	1
Trust people	4.34	2.13	4.36	2.17	4.31	2.19	4.33	2.19	0	1

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[60] Indexes were created for all four dimensions using the following questions on whether one seems himself as someone who..: *Neuroticism (N)* (1) Worries a lot, (2) Gets nervous easily, (3)Remains calm in tense situations (recoded), *Extraversion(E)* (1) Is talkative, (2) (3) Is outgoing, sociable, (4) Is reserved (recoded), *Openness to experience* (O) (1) Is original, comes up with new ideas, (2) Values artistic, aesthetic experiences, (3) Has an active imagination, *Agreeableness (A)* (1) Is sometimes rude to others (recoded) , (2) Has a forgiving nature, (3) Is considerate and kind to almost everyone, *Conscientiousness (C)* (1) Does a thorough job, (2) Tends to be lazy(recoded), (3) Does things efficiently.

Table A3: Descriptive Statistics of Dependent and Independent Variables*

Variables	Obs	Mean	SD	Min	Max
Differences in Happiness T2-T1	284	-1.98	2.41	-10	5
Expectations Index (5 domains)*	284	2.07	0.48	1	3
Expectations regarding life in general- Same*	284	0.39	0.49	0	1
Expectations regarding life in general- Better*	284	0.56	0.50	0	1
Differences in Happiness T2-T4	162	1.04	1.99	-4	8
Differences in Happiness T2-T3	190	0.81	1.99	-6	8
Differences in Happiness T4-T3	156	0.32	1.29	-3	4
Differences in Happiness T3-T1	194	-1.10	1.97	-7	5
Expectations regarding financial situation of household- Same*	281	0.49	0.50	0	1
Expectations regarding financial situation of household- Better*	281	0.27	0.44	0	1
Expectations regarding personal job situation- Same*	281	0.48	0.50	0	1
Expectations regarding personal job situation- Better*	281	0.41	0.49	0	1
Expectations regarding employment |situation in Greece-Same*	270	0.47	0.50	0	1
Expectations regarding employment| situation in Greece-Better*	270	0.17	0.38	0	1
Expectations regarding economic| situation in Greece-Same*	269	0.46	0.50	0	1
Expectations regarding economic| situation in Greece-Better*	269	0.10	0.30	0	1

* Common Sample at T2-T1. ** The variation in the sample size is due to the nature of the indexes. Separate expectations items were included in the indexes when at least 3 items were available

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Table A4: Correlation Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Difference in Happiness T2-T1	1													
Expectations index	1.00													
HappinessT1	0.13	1.00												
Male	-0.38	0.12	1.00											
Age	0.11	-0.05	-0.09	1.00										
Married	-0.04	0.02	-0.13	0.05	1.00									
Separated	-0.03	0.06	0.07	-0.04	0.44	1.00								
Single	0.00	-0.07	-0.15	-0.06	0.18	-0.02	1.00							
Living with parents	-0.01	-0.07	-0.05	0.03	-0.28	-0.19	-0.09	1.00						
Monthly expenses: 300–499	0.09	-0.09	-0.12	0.02	-0.19	-0.17	-0.01	0.18	1.00					
Monthly expenses: Above 500	0.02	0.09	-0.07	0.07	0.06	-0.04	-0.04	-0.08	0.18	1.00				
Health problems: Yes	-0.04	0.03	0.10	0.00	0.35	0.33	-0.04	-0.18	-0.08	-0.24	1.00			
Several per month/Once per m	0.02	-0.05	-0.10	0.00	0.06	-0.04	0.19	0.02	-0.06	0.03	-0.06	1.00		
Less than a month/Never	-0.01	-0.02	-0.03	-0.04	0.18	0.07	-0.06	-0.06	0.06	-0.03	0.00	0.06	1.00	
Trust in people	-0.09	0.00	-0.04	-0.10	0.03	0.09	0.16	-0.07	-0.02	-0.04	0.00	0.05	-0.40	1.00
Syriza	-0.06	0.11	0.20	0.08	0.09	0.08	-0.01	-0.11	-0.24	0.11	0.19	-0.02	0.01	-0.14
Denied	0.21	0.04	-0.04	-0.02	-0.07	-0.03	-0.06	0.00	0.05	-0.06	-0.04	-0.06	0.07	-0.10
Religious	-0.03	0.08	-0.03	0.03	0.07	-0.07	-0.03	0.01	-0.11	0.01	0.06	0.02	0.06	-0.03
Neuroticism	0.04	0.05	0.07	-0.02	-0.03	0.02	-0.02	-0.06	0.03	0.08	0.09	0.00	0.02	-0.04
Extraversion	-0.05	-0.27	-0.17	-0.21	-0.07	-0.07	0.05	0.09	0.07	-0.03	-0.07	0.12	0.07	0.01

Table A4: Correlation Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Openness	-0.04	0.04	0.01	-0.12	0.09	-0.02	0.09	0.03	-0.05	-0.07	0.05	0.08	0.12	-0.07
Agreeableness	0.06	-0.02	0.04	-0.01	-0.01	-0.04	0.05	-0.03	0.05	-0.01	-0.02	-0.01	0.13	-0.08
Conscientiousness	0.00	0.06	0.13	0.09	0.25	0.13	-0.07	-0.10	-0.21	0.15	0.20	-0.05	0.07	-0.04
Aristotle	0.00	0.06	0.13	0.09	0.25	0.13	-0.07	-0.10	-0.21	0.15	0.20	-0.05	0.07	-0.04
Patra	-0.04	-0.13	0.02	-0.08	0.05	-0.05	0.05	0.11	-0.03	0.01	-0.03	0.09	-0.04	-0.10
Piraeus	0.05	0.06	-0.04	0.06	-0.05	-0.02	-0.04	0.01	0.08	0.09	-0.12	0.01	0.10	-0.01
Macedonias	-0.09	-0.03	0.13	0.00	-0.08	0.01	-0.03	0.04	-0.01	-0.11	0.02	-0.07	-0.08	0.12
Non-Economic,BA,Political Sc	0.01	0.01	0.05	0.09	-0.22	-0.11	0.05	0.10	0.11	-0.01	-0.10	0.04	-0.07	0.01
Openness	-0.04	0.04	0.01	-0.12	0.09	-0.02	0.09	0.03	-0.05	-0.07	0.05	0.08	0.12	-0.07
Agreeableness	0.06	-0.02	0.04	-0.01	-0.01	-0.04	0.05	-0.03	0.05	-0.01	-0.02	-0.01	0.13	-0.08
Conscientiousness	0.00	0.06	0.13	0.09	0.25	0.13	-0.07	-0.10	-0.21	0.15	0.20	-0.05	0.07	-0.04
Aristotle	0.00	0.06	0.13	0.09	0.25	0.13	-0.07	-0.10	-0.21	0.15	0.20	-0.05	0.07	-0.04

Appendix B: Additional Estimations

Table B1: Expectations Index and Alternative Time References – OLS Estimates

	(1) Change in happiness Wave 4 – Wave 3	(2) Change in happiness Wave 3 – Wave 2	(3) Change in happiness Wave 3 – Wave 1
Expectations index (5 domains)	0.441**	0.695***	1.003***
	(0.220)	(0.226)	(0.253)
Male	-0.202	-0.275	-0.132
	(0.237)	(0.268)	(0.291)
Age	-0.018	-0.056*	-0.050
	(0.026)	(0.031)	(0.036)
Married	1.177	-0.829	-0.805
	(0.781)	(1.155)	(1.056)
Separated	--	-1.965*	-0.855
		(1.173)	(1.155)
Single	-0.241	-0.224	-0.209
	(0.189)	(0.215)	(0.242)
Live with my parents (same household)	0.299	-0.284	-0.159
	(0.238)	(0.265)	(0.277)
Month expenses: 300-499	0.177	0.106	0.147
	(0.269)	(0.284)	(0.343)
Month expenses: above 500	0.175	0.262	0.196
	(0.357)	(0.352)	(0.426)
Physical or mental health problem: Yes	-0.432	-0.105	-0.069
	(0.317)	(0.543)	(0.431)
Frequency meeting friends Once per week/Several times a month	-0.410	-0.045	-0.177
	(0.254)	(0.251)	(0.303)
Once per month/ Never	0.227	-0.079	-0.327
	(0.259)	(0.359)	(0.345)
Trust in people	-0.001	0.072	0.041
	(0.058)	(0.063)	(0.068)
Voting behavior: Syriza	0.228	-0.154	0.397
	(0.243)	(0.266)	(0.295)
Voting behavior: Denied	0.437*	-0.286	0.015
	(0.246)	(0.265)	(0.311)
Religious	0.394**	-0.122	-0.335
	(0.183)	(0.243)	(0.257)
Neuroticism	-0.056	0.018	-0.023
	(0.051)	(0.054)	(0.060)
Extraversion	0.032	-0.047	-0.057

	(0.037)	(0.047)	(0.054)
Openness	0.018	0.018	0.012
	(0.047)	(0.049)	(0.051)
Agreeableness	0.057	0.012	0.062
	(0.048)	(0.060)	(0.063)
Conscientiousness	0.024	0.118	0.109
	(0.067)	(0.071)	(0.070)
Non-economics, BA , Political Science	0.127	0.025	-0.062
	(0.204)	(0.246)	(0.283)
Happiness in start period	-0.281***	-0.592***	-0.620***
	(0.066)	(0.052)	(0.080)
Uni/ Location dummies	YES	YES	YES
Constant	0.378	2.761*	1.629
	(1.464)	(1.473)	(1.876)
Observations	156	190	194
R-squared	0.304	0.510	0.399

Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Chapter 6| Subjective Well-Being and the 2008 Recession: Regional Quality of Governance as a Moderator

Abstract

How can we explain why some regions experienced large decreases in subjective well-being during the 2008 recession, while in other regions, the changes were only very modest? Building on the literature on resilience in subjective well-being during periods of crisis, this article explores a related but undervalued factor that moderates the localized relationship between macroeconomic developments and life evaluation: regional quality of governance. We use individual-level data on life satisfaction and personal information taken from Eurobarometer for 28 European countries for the period of 2005-2014, combined with macroeconomic variables and regional quality of governance data to test for the hypothesized moderating effect of quality of governance. The results demonstrate that increased regional unemployment and financial stress have a less aggravating effect on subjective well-being in regions characterized by a high quality of governance. These results support the capacity of quality of governance to buffer the negative effects of adverse macroeconomic conditions, most likely through generating trust and providing a safety net.

6.1 Introduction

Over the past few years, there has been increasing attention to subjective well-being, also known as happiness or life satisfaction (Veenhoven, 1984), in public policy and popular culture. In 2012, the General Assembly of the United Nations adopted a resolution that governments should try to increase the subjective well-being of their citizens. Along these lines, one of the key objectives of the 2020 European Strategy (European Commission, 2010) is the promotion of subjective well-being. However, subjective well-being as a policy issue is not confined to central governments, in that several regional and local authorities have also started to implement subjective well-being in policy (Burger, 2015). At the same time, the increasing public appreciation of subjective well-being is evidenced—amongst others—by the widespread media attention to rankings of places on the 'happiness ladder' as well as the fact that subjective well-being is currently rated the second most important component for a better life in the OECD Better Life Index, mattering more than topics such as education, income, and civic engagement.

Several European regions experienced substantial declines in subjective well-being during the Great Recession that started in 2008. Particularly, Mediterranean regions in Greece, Spain, Italy and Portugal suffered from substantial declines in subjective well-being between 2008 and 2013 (see also Eurobarometer). For instance, whereas in 2005, 63% of the adult population in Athens considered themselves fairly satisfied or very satisfied, this figure had dropped to 43% by 2014, with a low of 34% in 2012. However, in all West-European regions, the decrease in subjective well-being was limited and in most cases negligible during the Great Recession, even in West-European countries and regions that were hard hit during the economic crisis. Most notably, subjective well-being did not decrease in Iceland (Gudmundsdottir, 2013) after the collapse of the banking system, while in Ireland, the share of the population who considered themselves fairly or very satisfied with life only slightly decreased, from 91% in 2005 to 89% in 2014, with a low of 83% in 2013.

How can we explain why some regions experienced large decreases in subjective well-being during the crisis, while in other regions, the changes were only very modest? On the one hand, differences in subjective well-being development between regions can be explained by uneven development in unemployment rates and income losses. In Ireland, for example, although unemployment rates increased to almost 15% during the Great Recession, it would be fair to say that the unemployed experienced less hardship than Andalusia and the Canary Islands, where unemployment rates increased to over 30%. At the same time, research shows that during the most recent recession of 2008, the Mediterranean countries experienced much larger declines in subjective well-being than what would be explained or even predicted from losses in income and unemployment rates (World Happiness Report (WHR), 2013; Helliwell, Huang and Wang, 2014)[61].

Indeed, some regions appear to be more resilient in regard to subjective well-being than other countries and regions. Research has shown that unexpectedly large changes in subjective well-being are conditional upon other economic and social factors (WHR, 2013; Gonza and Burger, 2016; Helliwell et al., 2014; Bjornskov, 2014; Mikucka, Sarracino and Dubrow, 2017). More specifically, institutional and social trust (Helliwell et al., 2014), social capital (Gudmundsdottir, 2013), and the presence of unemployment support programmes and employment protection legislation (Morgan, 2015) have been identified as factors that can alleviate the negative impact of an economic crisis on subjective well-being.

Building on the literature on resilience in subjective well-being during periods of crisis, this article explores a related but undervalued factor that moderates the localized relationship between macroeconomic developments and life evaluation: regional quality of governance. Europe is a heterogeneous continent with a significant large variation in quality of governance between regions.[62] The positive association between quality of governance and subjective well-being has been well-established in the literature on subjective well-being (Ott, 2010; Alvarez-Diaz, Gonzalez and Radcliff, 2010; Helliwell and Huang, 2008). Good

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[61] Indeed, cross-country comparisons show that the international differences in subjective well-being during the Great Recession are explained by other factors than economic outcomes per se (WHR, 2013).

[62] European agencies are pioneers in the measurement of quality of governance focused on the regional level, with the first attempts to measure regional variation in the quality of governance in Europe taking place in 2010 with the initiative of European Commission and at the University of Gothenburg (Charron et al, 2011; Charron, Dijkstra and Lapuente, 2014).

governance entails numerous characteristics that are associated with subjective well-being, such as inclusive law-making and ensuring that policy-making procedures are fair (Frey and Stutzer, 2000a; Helliwell, Layard and Sachs, 2015), political participation (Frey and Stutzer 2000b; Dorn et al. 2007), and fighting corruption (Tay, Herian and Diener, 2014). In this article, we argue that good governance can also provide a buffer against the negative impact of the crisis through generating trust and providing a safety net. We use individual-level data on life satisfaction and personal information taken from Eurobarometer for 28 European countries for the period of 2005-2014, combined with macroeconomic variables and regional quality of governance data to test for the hypothesized moderating effect of quality of governance.

This paper adds to the existing literature in two distinct ways. First, it is, to the best knowledge of the authors, the first paper to explore the moderating role of quality of governance as an alleviating factor in response to the Great Recession in terms of subjective well-being. Second, our study explores these data on quality of governance at the regional level (NUTS 1) in Europe by using the combined Quality of Governance Index (see also Rodríguez-Pose and Di Cataldo, 2015, Charron et al., 2011; Charron et al., 2014). This links to Cortinovis et al. (2017) who show that formal institutions, like quality of governance, are necessary conditions for economic development, and for informal institutions like trust and social capital to interact with development *regionally*.

The remainder of the paper is organized as follows: Section 2 gives an overview of the findings on economic crises and subjective well-being and introduces quality of governance and its relationship to subjective well-being. Section 3 outlines the data and methodology used. Section 4 presents the results, and Section 5 concludes.

6.2 The Great Recession in Europe and Subjective Well-being

6.2.1 National and Regional Variations

Over the past few years, several studies have assessed the effects of economic crises on subjective well-being (e.g., Frey and Stutzer, 2002; Di Tella, MacCulloch and Oswald 2003; Arampatzi, Burger and Veenhoven, 2015; O'Connor, 2017). In these studies, joblessness and loss of income are found to be among the most important factors affecting

the subjective well-being of individuals in times of economic crisis (Di Tella et al., 2003). However, the effects of economic crises are not limited to the subjective well-being of people who experience job loss or income decrease (Deaton, 2011, Arampatzi et al., 2015, O'Connor, 2017). Controlling for individual unemployment and income, Di Tella et al. (2003) found a negative effect of macroeconomic unemployment and economic decline on subjective well-being. Likewise, increasing unemployment rates during the Great Recession affected the subjective well-being of the employed population, especially of those employees who experienced financial distress (Arampatzi et al., 2015).

Notwithstanding the considerable efforts to examine how subjective well-being fluctuates with macroeconomic changes, it is fair to say that the effect of the Great Recession on subjective well-being is not homogeneous across countries (Deaton, 2011; Gudmundsdottir, 2013; O'Connor, 2017; WHR, 2013). The effect of the Great Recession on subjective well-being in the United States was only short-lived (Deaton, 2011), while the collapse of the banking system in Iceland and consequent unemployment and income losses were not found to be consistently associated with lower happiness levels (Gudmundsdottir, 2013). In contrast, the 2013 World Happiness Report documented substantial losses in life evaluation during the economic downfall in Europe after 2007. Using data from Gallup World Poll, it was found that in the European Union, the Mediterranean countries in particular reported sizable declines in subjective well-being, the magnitude of which could not be explained by macroeconomic conditions alone. Greece ranked second in the worldwide list, with the largest declines in well-being between 2005 and 2012, followed by Spain, Italy and Portugal in the sixth, eighth and twentieth positions, respectively (WHR, 2013).

At the same time, there were considerable differences in subjective well-being developments within these countries. For instance, people in the Cataluña and Centro regions of Spain experienced hardly any decline in subjective well-being during the Great Recession, while the Northwest of Germany (Niedersachsen and Hamburg) experienced declines in subjective well-being when the rest of Germany was experiencing an increase in subjective well-being. Likewise, macroeconomic developments and quality of governance can also vary substantially between regions within countries, especially in countries such as Germany (East vs. West) and Italy (North vs. South). Formal institutions like property rights,

rule of law, competition monitoring and contractual agreements, are recognised as essential for economic growth and innovation (Acemoglu and Johnson, 2005), mostly referring to the coordination and uncertainty-reduction effects of formal institutions. When political authorities set clear rules, are prevented from taking advantage of their positions (like unduly extracting benefits from economic activities), and provide incentives stimulating the activity of economic actors, they can contribute to the growth and dynamism of an economy (Acemoglu and Robinson, 2012). Within a set of clear and inclusive rights and rules, individuals are able to pursue their economic interests. In such an environment of lower risks and uncertainties, well-functioning governments may implement policies making especially *local* actors better able to take advantage of the inflow of ideas, products and knowledge relating to region-specific specializations (Sterlacchini, 2008; Charron et al., 2014). While research on formal institutions is conducted primarily at the country level, even more pronounced arguments apply to the regional level. Significant within-country variations in the quality of formal institutions are expected to be important for economic development in interaction with well-being (Rodriguez-Pose, 2013). Regions characterized by quality government institutions are found to perform better in terms of socio-economic development (Charron et al., 2014), growth and convergence (Arbia, Batisti and Di Vaio, 2010) and innovation (Crescenzi and Rodriguez-Pose, 2013).

6.2.2 The Mitigating Effect of Quality of Governance

The idea that there are certain conditions that can mitigate or intensify crisis-related costs in terms of social-economic development and well-being is highly relevant for a body of literature that has examined why the crisis had a more aggravating impact on the happiness of certain people, regions and countries (Bjornskov, 2014; Helliwell et al., 2014; Morgan, 2015; Carr and Chung, 2014; Wulfgramm, 2014).

Among the moderators, the quality of the social fabric has been found to alleviate the impact of an economic crisis (WHR, 2013). Helliwell et al. (2014) found that communities with higher social capital and trust were happier during the crisis. Gudmundsdottir (2013) suggests that in the case of Iceland, the effect of the economic crisis was limited, a phenomenon that can be explained by the good social relationships of its citizens. Along similar lines, Mikucka et al., (2017) found that in the long run, economic growth improves subjective well-being when social trust does not decline.

On a different note, differences in unemployment benefits between countries have been found to be a factor that moderates the relationship between poor macroeconomic conditions and subjective well-being (Morgan, 2015; Carr and Chung, 2014; Wulfgramm, 2014). Voßemer et al. (2017) found that considerable unemployment benefits can mitigate the negative effects that unemployment has on subjective well-being.

This paper examines the moderating effect of good governance in explaining the differences in how European countries responded to the economic crisis. Substantial work has focused on the role of good governance as a determinant of subjective well-being. However, quality of governance, or what we call "good governance", is not strictly defined. Moreover, in empirical research, a large variety of indicators have been used as proxies for quality of governance, including institutional performance (Frey and Stutzer; 2000b), the quality of institutions, the ideological orientation of the elected government, economic freedom (Spruk and Keseljevic, 2016), the welfare state, civic rights, political participation and fairness (Stutzer and Frey, 2003). In this research, we take the most comprehensive and commonly used operationalization in economics: the Quality of Governance Index (QoG) by Kaufman, Kraay and Mastruzzi (2011)[63]. The six components developed to measure quality of governance are Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption, Political Stability and Absence of Violence, and Voice and Accountability, which are all found to be positively related to subjective well-being. Whereas the first four elements capture the quality of delivery or responsiveness of governments in their design and delivery of services, the last two components capture democratic quality (Helliwell and Huang, 2008). In our research, we focus primarily on the quality of delivery or responsiveness of governments in their design and delivery of services and we follow the literature referring on European regions (Charron et al 2014)[64].

In the context of economic crises, good governance signals the ability of governments and their institutions to handle and cope with adversities. It is therefore expected that the

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[63] Kaufmann, Kraay and Mastruzzi, (2011) define quality of governance as Quality of governance is defined as "*the traditions and institutions by which authority in a country is exercised. This includes (1) the process by which governments are selected, monitored and replaced (2) the capacity of a government to effectively formulate and implement sound policies and (3) the respect of its citizens and the state of institutions that govern economic and social interactions among them*" (Kaufman et al. (2011), *p4*).

[64] Following Charron et al (2014), we use four pillars to measure QoG at the national level: Control of corruption, Rule of law, Government effectiveness, Voice and accountability.

beneficial outcomes of good governance are even more important during economic downturns. At the same time, limited attention has been given to the role of quality of governance as a mitigating factor in times of crisis[65].

Quality of governance can be expected to have a buffering effect due to its inherent power to "protect" subjective well-being. This protective function is well-established in political science. In times of economic turbulence, economic instability affects the financial safety of individuals (Radcliff, 2001), resulting in distress (Brenner, 1977). The state can play an important role here by protecting well-being of individuals from the 'market forces' (Radcliff, 2001). In this regard, the generosity of the welfare state has been found to be positively related to both quality of governance (Rothstein, Samanni and Teorell, 2012) and life satisfaction (Ott, 2010), where particularly more leftist governments and social-democratic welfare systems (Pacek and Radcliff, 2008) provide more welfare benefits that are conducive to subjective well-being. Specifically, Rothstein et al. (2012) perceive quality of governance as a precondition for support of the welfare state and find that good governance is positively related to the size and generosity of the welfare state. In addition, public spending becomes more efficient with good governance (Rajkumar and Swaroop, 2008). In times of crisis, this would mean that funds are more effectively allocated, such that they can alleviate the negative effects associated with the loss of income and jobs and can safeguard the quality of life in a region.

Second, good governance creates trust, which in turn can increase subjective well-being by promoting the feeling that 'everything will be alright'. Indicators of good governance are not strictly related to the way governments function but extend to citizens' perceptions. In that respect, institutional trust has also received considerable attention in research. Institutional trust is defined as the expected utility of institutions performing satisfactorily (Mishler and Rose, 2001), and it can be considered a subjective measure of good governance. Institutional trust can be highly dependent on institutional performance, and hence, it is often suggested to be endogenous. When institutions underperform and the institutional trust of the citizens is damaged, people tend to show less-cooperative attitudes (e.g., are more likely to evade taxes; Orviska and Hudson, 2003) and are generally less

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[65] A notable exception is Bjornskov (2014), who examines the role of easy market regulations and institutions as moderators that alleviate negative impacts during recessions.

satisfied with their lives (Helliwell et al (2014). In this regard, Helliwell et al. (2014) find that the decline in different types of trust, including generalized social trust and trust in institutions, could explain decreases in life evaluation that cannot be attributed to changes in GDP and unemployment in times of crisis. The regional context of daily urban systems and localized institutionalized labour and housing policies is highly conditioning on this process.

6.3 Data and Model

6.3.1 Data: Dependent and Independent Variables

Economists increasingly use subjective well-being measures as proxies for *experienced utility* (see, e.g., Clark and Oswald, 1994; Di Tella, MacCulloch and Oswald 2001; Easterlin, 1974; Freeman, 1978; Frey and Stutzer, 2000a, b; Kahneman, Wakker and Sarin, 1997), especially due to their compliance with the idea that individuals depart from the classic utility model when it is assumed that actual choices represent preferences or *expected utility*. Subjective well-being can be defined as '*the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably*' (Veenhoven, 1984, Chapter 2)[66].

In our study, we primarily use the Eurobarometer survey for the period 2005-2014.

Overall, our sample consists of well over 250,000 observations for the period 2005-2014 for the EU-28 countries. Subjective well-being is measured using a 4-point scale measure of life satisfaction on the following question: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?" Possible answers are (1) Not at all satisfied, (2) Not satisfied, (3) Fairly satisfied, and (4) Very satisfied. This life satisfaction question is one of the most commonly used measures of subjective well-being in economics (Di Tella et al., 2003; Arampatzi et al., 2015).

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[66] Consequently, the terms happiness and life satisfaction are often used interchangeably for subjective well-being as two measures of overall appraisal. As noted by Veenhoven (1984), happiness, or the affective component of subjective well-being, is determined by the overall impression of how people feel most of the time; life satisfaction, or the cognitive component of subjective well-being, incorporates a cognitive judgment of standards of living. Happiness and life satisfaction are found to be highly correlated and to behave similarly in many cases (Fordyce, 1988).

In addition, respondents reported on their current unemployment status and the financial situation of their household. The latter is used as proxy for income mainly due to the lack of a real income metric at the individual or household level. Individuals are asked to rate their financial situation based on the following item: "*How do you judge the current situation in each of the following? Your financial situation*". Responses range from 1 to 4, where 1 is "Very good", 2 "Rather good", 3 "Rather bad" and 4 "Very bad". We use a wide set of additional individual-level information such as gender, age, education level, marital status and socio-economic characteristics as control variables.

Table 1: Descriptive statistics: Microdata from Eurobarometer 2005-2014

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
Life Satisfaction	255,374	2.896	0.804	1	4
Sex	255,374	1.546	0.498	1	2
Age groups	255,374	2.934	1.033	1	4
Marital Status	255,374	1.799	1.044	1	5
Education	255,374	2.232	1.162	1	5
Employment status	255,374	1.949	0.957	1	3
Financial Situation of hh	255,374	2.379	0.763	1	4

The individual-level data from Eurobarometer in our study are complemented with regional-level and country-level characteristics from two sources. First, we use information from Eurostat on regional (NUTS-1) unemployment rate (as a percentage of active population) and regional GDP growth for the same period. For the purpose of this paper, we account for regional positive and negative growth separately. The GDP growth rate was split into positive and negative to observe the asymmetric effect of growth, as suggested in previous studies (De Neve et al., 2017). Inflation rates are taken from the World Development Indicators of the World Bank.

6.3.2 Moderator Variable: Regional Quality of Governance

For our moderator variable, we obtained data from the University of Gothenburg on regional quality of governance and constructed the Regional Combined EQI (see Charron et al., 2014). To achieve that, we use the combined EQI Index (Rodríguez-Pose, and Di Cataldo, 2015, Charron et al., 2014) for 89 regions (NUTS 1) within EU Member States. Table 2 presents the descriptive statistics of the macro variables.

Table 2: Descriptive statistics of Macro Determinants

| | (1) | (2) | (3) | (4) | (5) |
VARIABLES	N	mean	sd	Min	max
Regional Positive GDP Growth	89	4.459	4.961	0	29.63
Regional Negative GDP Growth	89	1.241	3.680	0	27.59
Regional Unemployment Rate	89	9.096	4.584	2.7	35.1
Inflation	28	2.530	2.234	-4.479	15.40
Regional Combined QoG	89	0.00221	0.999	-2.686	1.789

The data on quality of governance are almost exclusively focused on the national level. The most widely used national-level information on quality of governance in Europe, the World Governance Indicators (WGI; Kaufmann et al., 2009), is available from the World Bank. Based on the WGI indicators and survey questions on citizens' perceptions on quality of governance[67] Charron et al. (2014) measured regional quality of governance in Europe for 2010 and 2013.

The index currently constitutes the most elaborate source of quality of governance at the regional level in Europe. Unfortunately, repeated measurements of regional quality of governance are not available for years other than 2010 and 2013, a limitation that drives the general unavailability of research on good governance at the regional level. To estimate the regional quality of governance for missing years, we follow Charron et al. (2014) and Rodríguez-Pose and Di Cataldo (2015) by implementing their combined Quality of Governance Index.

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[67] The survey includes 34,000 respondents and addresses three questions related to perception of quality, impartiality and corruption of public services.

To construct the combined Quality of Governance Index, we follow Charron et al. (2014) and use the four out of six pillars of quality of governance at the national level: (i) Control of Corruption, (ii) Rule of Law, (iii) Government effectiveness and (iv) Voice and Accountability. We combine these pillars with regional quality of governance data for 2010 and 2013[68], applying the following estimation (Rodríguez-Pose, and Di Cataldo, 2015, Charron et al., 2014):

$$CombinedEQI_{regionXcountryY} = WGI_{countryY} + (Rqog_{regionXcountryY} - CRqog_{countryY})$$

where *Combined EQI* is the final score from each region X or country Y in the EQI; *WGI* is the national average governance score for each country Y; *Rqog* is each region's X score from the regional survey; and *CRqog* is the country weighted average in country Y of all regions within country Y from the regional survey. To make it comparable to the EQI index, we normalize the Combined Index and its components to make them range from 0 to 1. Figure 1 shows regional averages of the Combined EQI Index for selected EU regions between 2005 and 2014. More-detailed information on economic development and quality of governance scores can be found in Appendix B.

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[68] Following Charron et al. (2014), we account for 4 out of 6 pillar of quality of governance. Political Stability and Regulatory Quality are therefore excluded.

Figure 1: Combined EQI Index in 89 EU regions, 2005-2014 Averages
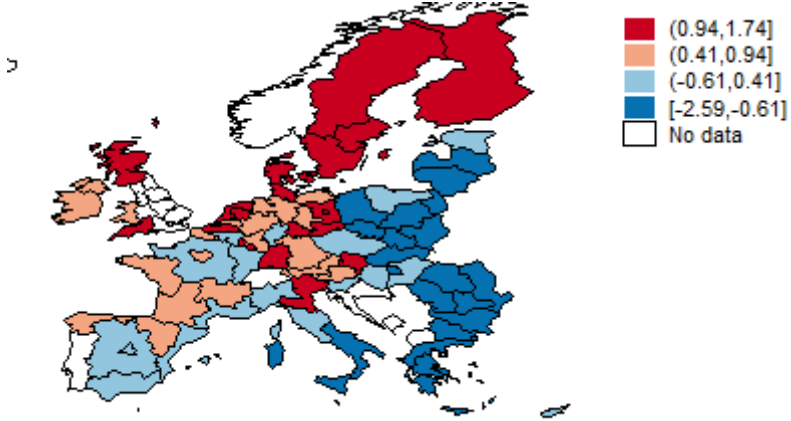
6.3.3 Model

To examine the moderating effect of good governance, we estimate the following reduced subjective well-being equation:

$$SWB_{ijt} = b_0 + V^* + b_1 Individual_{ijt} + b_2 RegMacroeconomic_{jt} + b_3 Combined\ EQI_{jt} + x_{ij} + t_t + \varepsilon_{ij}$$

where V^* is a vector of interaction effects of the following:

$V^* = b_1[Combined\ EQI * RegUnemployment]_{jt} + b_2[Combined\ EQI * RegionalGDPGrowth]_{jt} + b_3[Combined\ EQI * Inflation]_{jt} + b_4[Combined\ EQI * Unemployed]_{ijt} + b_5[Combined\ EQI * Financial\ Situation]_{ijt}$

where

SWB_{ijt} is the reported subjective well-being for individual i in region j in year t. $Individual_{ijt}$ is a vector of individual characteristics—including the financial situation of the household and unemployment status, gender age, marital status, educational level for individual i in region j and year t. $RegMacroeconomic_{jt}$ is a vector macroeconomic

indicators, including regional unemployment rate, regional economic growth rate and national-level inflation. x_i is a vector of region dummies, and t_t is a vector of year dummies. With regard to the vector of interaction effects, the $Combined\ EQI_{jt}$ is the Combined EQI Index in region j in year t. We examine the buffering effect of quality of governance at both the individual and national level by interacting quality of governance with (1) regional unemployment rate, (2) regional positive and negative growth rates, (3) inflation, (4) individual unemployment status, and (5) financial status of the household.

6.4 Results

Given the categorical nature of our dependent variable, all models were estimated using ordered logistic regression. Table 3 (Column 1) show the effects of regional quality of governance on life satisfaction. Controlling for region fixed effects (at the NUTS 1 level), year dummies and individual characteristics, the regional quality of governance has a positive and statistically significant effect on the probability that individuals will report higher life satisfaction levels; the higher the score is, the more satisfied individuals are. At the same time, we can see that adverse economic circumstances are negatively associated with individuals' subjective well-being. In line with previous literature, regional unemployment (Table 3, Column 2) and negative growth (Table 3, Column 3) are negatively associated with subjective well-being. The effects of regional unemployment remain unchanged when we condition on other factors, indicating its persistent negative influence on life satisfaction, as suggested in the literature. Negative growth loses its significance when controlling for quality of governance and the other macroeconomic factors. In contrast, the association between inflation and subjective well-being becomes statistically significant after controlling for regional quality of governance and the other macroeconomic factors (Table 3, Column 6). When we turn to the individual components of unemployment and income, we find, in line with the existing literature, that negative personal circumstances are negatively associated with subjective well-being in that unemployed individuals and individuals with a worse financial situation report significantly lower subjective well-being scores.

Table 3: Ordered Logit Regression: Dependent variable Life Satisfaction

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
QoG Combined Index[69]	0.375***					0.230***
	(0.073)					(0.071)
Regional Unemployment		-0.021***			-0.023***	-0.019***
		(0.003)			(0.004)	(0.004)
Positive growth (regional)			0.001		0.002	0.003
			(0.002)		(0.002)	(0.003)
Negative growth (regional)			-0.011***		-0.004	-0.003
			(0.003)		(0.003)	(0.003)
Inflation				-0.002	-0.016***	-0.014**
				(0.005)	(0.005)	(0.005)
Unemployed	-0.450***	-0.441***	-0.450***	-0.452***	-0.441***	-0.442***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Financial Situation: Rather good	-1.312***	-1.309***	-1.313***	-1.313***	-1.309***	-1.309***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Financial Situation: Rather bad	-2.914***	-2.907***	-2.916***	-2.916***	-2.907***	-2.907***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
Financial Situation: Very bad	-4.282***	-4.269***	-4.283***	-4.286***	-4.268***	-4.268***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)
Regions fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Personal controls	YES	YES	YES	YES	YES	YES

[69] Combined Index based on 2010 values. Values of Quality of governance combined Index are standardized. Results based on the Combined EQI Index with 2013 scores are presented in the Appendix.

Number of NUTS1	89	89	89	89	89	89
Observations	255,374	255,374	255,374	255,374	255,374	255,374

Clustered at NUTS1 year, Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Turning to the main focus of the paper, Table 4 tests the mitigating effect of regional quality of governance. Although regional unemployment has a negative effect on life satisfaction, this negative effect disappears in the presence of high quality of governance (Column 1). At the same time, the interaction effects between negative growth and regional quality of governance (Table 4, Column 3) and inflation and regional quality of governance (Table 4, Column 3) are statistically insignificant.

With regard to the cross-level interactions (Table 4, Column 5), we find—in line with our expectations—that the effect of being in a bad financial situation is less severe in regions characterized by good governance. In contrast, the effect of being unemployed on subjective well-being is more negative in countries characterized by good governance. Although this result is surprising, one explanation offered in the literature is that countries with good governance are also characterized by lower levels of unemployment and that being unemployed has a less detrimental effect on subjective well-being if there is high unemployment in the immediate vicinity. An explanation for this is that when unemployment is the social norm, becoming unemployed has little effect on social status (Clark, 2003). At the same time, a further analysis in which we examined how the interaction effect varied across welfare regimes revealed that the negative effect is primarily driven by regions with a Christian Democratic or Bismarckian welfare model (Austria, Belgium, France, Germany, and Luxembourg) and when adding an interaction. Bambra and Eikemo (2008)—who similarly found a large gap between self-reported health between employed and unemployed living in this welfare regime type—highlighted restricted access to social insurance benefits, the relatively short length of entitlement, and the stigma on unemployment originating from an emphasis on a male breadwinner model as potential reasons for this gap. However, more research is necessary to explain this finding.

Table 4: Moderating effects: (1) Regional Unemployment, (2) Negative Growth, (3) Inflation. Dependent Variable: Life Satisfaction

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES						
QoG Combined Index # Regional Unemployment	0.010***					0.008**
	(0.004)					(0.003)
QoG Combined Index # Negative growth (regional)		0.003				0.003
		(0.002)				(0.002)
QoG Combined Index# Inflation			-0.007			-0.001
			(0.005)			(0.005)
QoG Combined Index# Unemployed				-0.047**		-0.092***
				(0.021)		(0.021)
QoG Combined Index# Financial Situation: Rather good					0.234***	0.235***
					(0.029)	(0.029)
QoG Combined Index# Financial Situation: Rather bad					0.311***	0.316***
					(0.033)	(0.034)
QoG Combined Index# Financial					0.337***	0.348***

Situation: Very bad						
					(0.042)	(0.044)
QoG Combined Index	0.115	0.220***	0.242***	0.226***	-0.038	-0.141
	(0.082)	(0.071)	(0.071)	(0.071)	(0.078)	(0.088)
Regional Unemployment	-0.015***	-0.019***	-0.020***	-0.019***	-0.019***	-0.016***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Positive growth (regional)	0.003	0.003	0.002	0.003	0.004	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Negative growth (regional)	-0.002	-0.002	-0.003	-0.003	-0.003	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Inflation	-0.017***	-0.012**	-0.020***	-0.014**	-0.013**	-0.016**
	(0.006)	(0.006)	(0.007)	(0.005)	(0.005)	(0.007)
Unemployed	-0.443***	-0.442***	-0.442***	-0.457***	-0.448***	-0.474***
	(0.020)	(0.020)	(0.020)	(0.021)	(0.020)	(0.021)
Other	0.050***	0.050***	0.050***	0.049***	0.049***	0.048***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Financial Situation: Rather good	-1.309***	-1.308***	-1.309***	-1.308***	-1.478***	-1.476***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.031)	(0.031)
Financial Situation: Rather bad	-2.908***	-2.907***	-2.907***	-2.904***	-3.054***	-3.050***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.041)	(0.041)
Financial Situation: Very bad	-4.269***	-4.268***	-4.269***	-4.265***	-4.397***	-4.391***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.054)	(0.053)
Regions fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Personal controls	YES	YES	YES	YES	YES	YES
Number of NUTS1	89	89	89	89	89	89
Observations	255,374	255,374	255,374	255,374	255,374	255,374

Clustered at NUTS1 year, Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Combined Index based on 2010 values. Values of Quality of governance combined Index are standardized.

Figure 2 presents the marginal effects of regional unemployment on the probability that individuals will belong to any of the four categories of the dependent variable life satisfaction (Outcome 1: Not at all satisfied, Outcome 2: Not very satisfied, Outcome 3: Fairly Satisfied, Outcome 4: Very Satisfied) with higher Combined EQI Index values. The decreasing marginal value of regional unemployment on the first three outcomes of life satisfaction (Outcome 1: Not at all satisfied, Outcome 2: Not very satisfied, Outcome 3: Fairly Satisfied Outcome 4: Very satisfied) indicates that individuals are less likely to report one of the aforementioned outcomes with increasing values of quality of governance. Therefore, higher values of regional unemployment in combination with increasing values of regional quality of governance have a strong positive association with the probability of reporting being very satisfied.

Figure 2: Marginal Effects of Regional Unemployment by increasing values of QoG Combined: Outcome 1: Not at all satisfied, Outcome 2: Not very satisfied, Outcome 3: Fairly Satisfied, Outcome 4: Very satisfied.
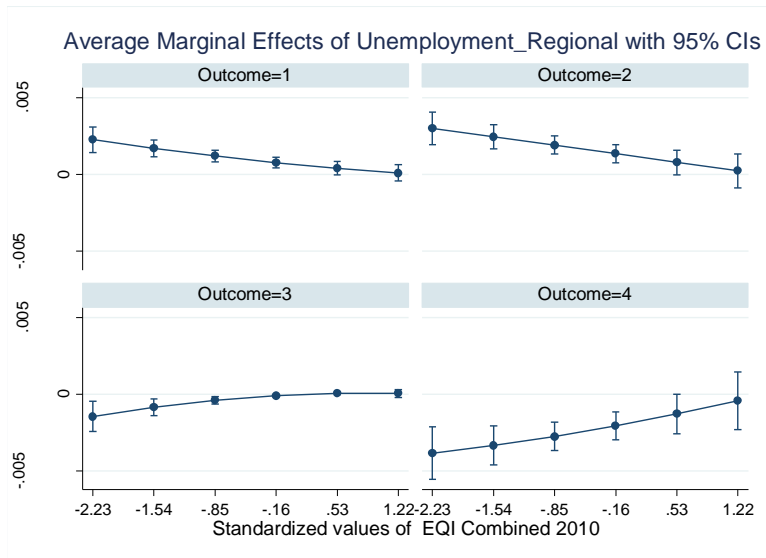
6.5 Conclusion

Surveys from international and European agencies have recorded considerable losses in happiness and life satisfaction scores during the Great Recession in Europe (Eurobarometer, Gallup). Previous research has shown that disproportionate changes in subjective well-being measures can been partly attributed to the different degrees to which the crisis hit European regions (WHR, 2013). We confirm previous findings on the negative impact of individual unemployment, financial difficulties, and regional indicators of unemployment, negative growth and inflation on life satisfaction amongst the European population during the Great Recession by accounting for the sub-national variation of the respective macroeconomic changes.

Our most remarkable findings, however, support that differences in quality of governance have a mitigating effect in times of crisis and that the additional gaps that are not explained by macroeconomic indicators are significantly predicted by these formal and predominantly localized institutions. The results demonstrate that increased regional unemployment and financial stress have a less aggravating effect on subjective well-being in regions characterized by a high quality of governance. These results support the capacity of quality of governance to buffer the negative effects of adverse macroeconomic conditions, most likely through generating trust and providing a safety net. Although these results are in line with earlier findings that trust and social capital moderate negative effects of the economic crisis, quality of governance indicators are less likely to be endogenous to life satisfaction compared with trust and social capital (Frey and Stutzer, 2000a,b,; Dorn et al.,2008).

A final issue is the question of whether and how policies can be informed from the recent findings, a question that should be addressed with caution. We acknowledge that quality of governance is an important determinant of subjective appreciation of life. More importantly, quality of governance is a protective mechanism in terms of well-being during adversities, indicating that societies are less fragile in terms of well-being when there are indications that governments can properly and effectively function. With respect to public-policies, however, findings based on cross-national and sub-national variations in quality of governance might be less informative. Within regions Quality of governance, is relatively stable over time, indicating that changes might not be easily implemented. For this reason,

further research focusing on the impact of improvements in specific pillars of quality of governance at the regional level on subjective well-being is needed

Appendices

APPENDIX A:

Table A1: EQI 2013: Ordered Logit Regression: Dependent variable Life Satisfaction

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
QoG Combined Index 2013	0.368***					0.226***
	(0.072)					(0.070)
Regional Unemployment		-0.021***			-0.023***	-0.019***
		(0.003)			(0.004)	(0.004)
Positive growth (regional)			0.001		0.002	0.003
			(0.002)		(0.002)	(0.003)
Negative growth (regional)			-0.011***		-0.004	-0.003
			(0.003)		(0.003)	(0.003)
Inflation				-0.002	-0.016***	-0.014**
				(0.005)	(0.005)	(0.005)
Unemployed	-0.450***	-0.441***	-0.450***	-0.452***	-0.441***	-0.442***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Other	0.049***	0.050***	0.050***	0.050***	0.050***	0.050***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Financial Situation: Rather good	-1.312***	-1.309***	-1.313***	-1.313***	-1.309***	-1.309***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Financial Situation: Rather bad	-2.914***	-2.907***	-2.916***	-2.916***	-2.907***	-2.907***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
Financial Situation: Very bad	-4.282***	-4.269***	-4.283***	-4.286***	-4.268***	-4.268***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)
Regions fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Personal	YES	YES	YES	YES	YES	YES

controls

	(1)	(2)	(3)	(4)	(5)	(6)
Number of NUTS1	89	89	89	89	89	89
Constant cut1	-6.153***	-6.610***	-6.464***	-6.484***	-6.641***	-6.409***
	(0.094)	(0.075)	(0.073)	(0.072)	(0.081)	(0.106)
Constant cut2	-3.924***	-4.380***	-4.236***	-4.256***	-4.411***	-4.178***
	(0.088)	(0.070)	(0.066)	(0.066)	(0.076)	(0.102)
Constant cut3	-0.333***	-0.788***	-0.646***	-0.666***	-0.819***	-0.586***
	(0.086)	(0.063)	(0.060)	(0.061)	(0.070)	(0.098)
Observations	255,374	255,374	255,374	255,374	255,374	255,374

Clustered at NUTS1 year, Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Combined Index based on 2010 values. Values of Quality of governance combined Index are standardized.

Table A2: EQI 2013: Moderation effects: Ordered Logit Regression: Dependent variable Life Satisfaction

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
QoG Combined Index 2013 # Regional Unemployment	0.013***					0.013***
	(0.004)					(0.004)
QoG Combined Index 2013 # Negative growth (regional)		0.004				0.003
		(0.002)				(0.002)
QoG Combined Index 2013 # Inflation			-0.006			0.002
			(0.005)			(0.005)
QoG Combined Index 2013 # Unemployed				-0.038*		-0.085***
				(0.023)		(0.023)

	(1)	(2)	(3)	(4)	(5)	(6)
QoG Combined Index 2013 # Other					0.028**	0.018
					(0.012)	(0.012)
QoG Combined Index 2013 # Financial Situation: Rather good					0.250***	0.251***
					(0.027)	(0.027)
QoG Combined Index 2013 # Financial Situation: Rather bad					0.333***	0.337***
					(0.031)	(0.032)
QoG Combined Index 2013 # Financial Situation: Very bad					0.356***	0.362***
					(0.041)	(0.042)
QoG Combined Index 2013	0.074	0.216***	0.235***	0.218***	-0.058	-0.216**
	(0.082)	(0.069)	(0.070)	(0.070)	(0.075)	(0.089)
Regional Unemployment	-0.013***	-0.019***	-0.019***	-0.019***	-0.019***	-0.013***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Positive growth (regional)	0.002	0.003	0.002	0.003	0.004	0.003
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Negative growth (regional)	-0.002	-0.002	-0.003	-0.003	-0.003	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Inflation	-0.018***	-0.012**	-0.019**	-0.014**	-0.013**	-0.013*
	(0.005)	(0.006)	(0.007)	(0.005)	(0.005)	(0.007)
Unemployed	-0.443***	-0.442***	-0.442***	-0.456***	-0.448***	-0.474***
	(0.020)	(0.020)	(0.020)	(0.021)	(0.020)	(0.021)
Other	0.050***	0.050***	0.050***	0.049***	0.049***	0.048***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)

Financial Situation: Rather good	-1.309***	-1.309***	-1.309***	-1.308***	-1.494***	-1.493***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.030)	(0.030)
Financial Situation: Rather bad	-2.909***	-2.907***	-2.907***	-2.904***	-3.068***	-3.065***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.040)	(0.040)
Financial Situation: Very bad	-4.269***	-4.268***	-4.269***	-4.265***	-4.412***	-4.407***
	(0.050)	(0.050)	(0.050)	(0.050)	(0.054)	(0.053)
Regions fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Personal controls	YES	YES	YES	YES	YES	YES
Number of NUTS1	89	89	89	89	89	89
Constant cut1	-6.442***	-6.417***	-6.425***	-6.408***	-6.600***	-6.627***
	(0.103)	(0.106)	(0.106)	(0.106)	(0.106)	(0.104)
Constant cut2	-4.209***	-4.186***	-4.194***	-4.178***	-4.359***	-4.385***
	(0.099)	(0.102)	(0.101)	(0.102)	(0.102)	(0.100)
Constant cut3	-0.617***	-0.593***	-0.602***	-0.585***	-0.766***	-0.791***
	(0.095)	(0.097)	(0.098)	(0.098)	(0.097)	(0.096)
Observations	255,374	255,374	255,374	255,374	255,374	255,374

Clustered at NUTS1 year, Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Combined Index based on 2010 values. Values of Quality of governance combined Index are standardized.

Appendix B:

Table B3: European NUTS 0, NUTS 1 and NUTS 1 Recoded

NUTS 0	NUTS1	NUTS1_REC	NUTS 0	NUTS1	NUTS1_REC
Austria AT	AT1	AT1	France FR	FRA	
	AT2	AT2	Croatia HR	HR0	HR0
	AT3	AT3	Hungary HU	HU1	HU1
Belgium BE	BE1	BE1		HU2	HU2
	BE2	BE2		HU3	HU3
	BE3	BE3	Ireland	IE0	IE0
Bulgaria BG	BG3	BG3	Italy IT	ITC	ITC
	BG4	BG4		ITH	ITH
Cyprus CY	CY0	CY0		ITI	ITI
Czech CZ	CZ0	CZ0		ITF	ITF
Germany DE	DE1	DE1		ITG	ITG
	DE2	DE2	Lithuania LT	LT0	LT0
	DE3	DE3	Luxembourg	LU0	LU0
	DE4	DE4	Latvia	LV0	LV0
	DE5	DE5	Malta	MT0	MT0
	DE6	DE6	Netherlands	NL1	NL1
	DE7	DE7		NL2	NL2
	DE8	DE8		NL3	NL3
	DE9	DE9		NL4	NL4
	DEA	DEA	Poland	PL1	PL1
	DEB	DEB		PL2	PL2
	DEC	DEC		PL3	PL3
	DED	DED		PL4	PL4

	DEE	DEE		PL5	PL5
	DEF	DEF		PL6	PL6
	DEG	DEG	Portugal	PT1	PT0
Denmark DK	DK0	DK0		PT2	--
Estonia EE	EE0	EE0		PT3	--
Greece EL	EL3	EL3	Romania RO	RO1	RO1
	EL4	EL4		RO2	RO2
	EL5	EL5		RO3	RO3
	EL6	EL6		RO4	RO4
Spain ES	ES1	ES1	Sweden SE	SE1	SE1
	ES2	ES2		SE2	SE2
	ES3	ES3		SE3	SE3
	ES4	ES4	Slovenia SI	SI0	SI0
	ES5	ES5	Slovakia SK	SK0	SK0
	ES6	ES6	UK	UKC	UKC/D/E
	ES7	ES7		UKD	
Finland FI	FI1	FI1		UKE	
	FI2			UKF	UKF/G/H
France FR	FR1	FR1		UKG	
	FR2	FR2		UKH	
	FR3	FR3		UKI	UKI/J
	FR4	FR4		UKJ	
	FR5	FR5		UKK	UKK
	FR6	FR6		UKL	UKL
	FR7	FR7		UKM	UKM
	FR8	FR8		UKN	UKN

APPENDIX C

Table C1: Average Regional GDP Growth, Combined EQI Index, 2005-2014

NUTS 1	Regional GDP Growth	Combined EQI 2010	NUTS1	Regional GDP Growth	Combined EQI 2010
AT1	3.04	1.18	**FR7**	3.36	0.73
AT2	2.72	0.71	**FR8**	2.62	0.08
AT3	3.01	0.91	**UKC/UKD/UKE**	3.31	0.80
BE1	-1.66	-0.96	**UKF/UKG/UKH**	-16.89	0.66
BE2	3.73	1.23	**UKI/UKJ**	-14.30	0.52
BE3	1.97	-0.26	**UKK**	4.75	1.06
DE1	3.16	1.14	**UKL**	3.56	0.58
DE2	2.03	0.50	**UKM**	8.19	1.28
DE3	4.61	0.97	**UKN**	5.80	0.80
DE4	2.37	1.14	**EL3**	-8.09	-0.33
DE5	2.17	1.10	**EL4**	-5.13	-1.02
DE6	2.56	0.89	**EL5**	-2.42	-2.22
DE7	2.42	0.56	**EL6**	-3.10	-1.68
DE8	3.54	0.84	**IE0**	-2.47	0.66
DE9	2.41	0.93	**ITC**	-2.45	0.22
DEA	3.41	0.44	**ITH**	0.32	0.90
DEB	2.14	0.67	**ITI**	3.22	-0.49
DEC	3.24	1.26	**ITF**	1.10	-2.17
DED	4.90	1.08	**ITG**	-2.75	-1.70
DEE	1.60	0.81	**LU0**	0.65	0.99
DEF	3.01	1.63	**NL1**	3.38	1.77
DEG	1.07	1.60	**NL2**	2.17	1.04
DK0	-3.70	1.49	**NL3**	-0.24	1.18

ES1	6.19	0.54	**NL4**	2.76	0.77
ES2	0.71	0.46	**PT0**	4.43	-0.18
ES3	6.95	-0.33	**SE1**	8.96	1.29
ES4	0.53	-0.07	**SE2**	-17.73	1.46
ES5	0.00	-0.37	**SE3**	3.58	1.14
ES6	-2.29	-0.02	**CY0**	-2.94	-0.07
ES7	0.50	0.33	**CZ0**	-2.68	-0.59
FI1	4.66	1.39	**EE0**	17.36	-0.14
FR1	0.39	0.47	**HU1**	2.01	-1.15
FR2	0.00	0.18	**HU2**	-1.16	-0.47
FR3	0.81	0.50	**HU3**	3.23	-0.53
FR4	3.80	0.27	**LV0**	21.79	-0.81
FR5	3.49	0.88	**MT0**	0.00	0.06
FR6	3.19	0.81	**PL1**	-13.39	-0.75
PL2	14.06	-1.06	**BG3**	0.00	-1.98
PL3	11.94	-0.59	**BG4**	1.59	-1.17
PL4	4.81	-0.44	**RO1**	22.22	-0.99
PL5	17.46	-0.84	**RO2**	3.57	-1.86
PL6	15.79	-0.78	**RO3**	24.42	-2.62
SK0	4.62	-0.68	**RO4**	22.73	-1.73
SI0	1.67	-0.20	**HRO**	-0.96	-1.28
LT0	14.86	-0.86			

Chapter 7| Conclusions

7.1 Main findings and contributions

Do circumstances in one's external environment, such as the achievement of economic growth in many Arab Spring countries or the experience of economic downturns such as the euro-crisis, influence Subjective Well-Being (SWB) considerably? This question is not new. Nevertheless, our understanding of the causes and wider consequences of these phenomena is limited by 1) the use of particular tools to measure economic and social progress and 2) the existing framework for assessing how and when these circumstances have a more profound effect on SWB. Considering SWB measures alongside objective measures can further improve our understanding of what really matters for human progress.

From the outset, three objectives are set in this dissertation:

1) To explore the relative performance of an income-based indicator of prosperity compared to a SWB indicator of prosperity and to identify what possibly drives their differences.

2) To explain why positive economic growth might not be accompanied by respective improvements in SWB.

3) To identify factors that mitigate the effect of crises on SWB.

The findings are summarized in Figure 1. In Chapter 2, I compare progress with shared prosperity based on the monetary measures, reported in the Global Monitoring Report (World Bank and International Monetary Fund, 2015), and progress with shared prosperity ('shared well-being') based on SWB measures. The findings suggest large discrepancies between income-based shared prosperity and SWB indicators. These discrepancies can be attributed to both objective and subjective conditions. Some of the identified differences are driven by deterioration in perceived changes in standards of living. We find qualitatively different results and argue that both types of measures should be used to judge progress with 'true' shared prosperity. The analysis of the factors associated with the discrepancy between the shared prosperity and shared well-being indicators observed in parts of the developing

world, suggests that four key factors – perceptions about standards of living, unemployment rates, perceptions about local job market and perceptions about corruption in government– explain the discrepancy between the two types of measures.

The second question is explored in Chapter 3. The Arab Spring uprisings in developing MENA countries were preceded by a decline in life satisfaction from already low levels, despite economic and human development progress in the prior two decades. In many developing MENA countries, the so-called "unhappy development" paradox was accompanied by social discontent. Our findings suggest a significant negative association between life satisfaction levels in the region, driven by poor or worsening standards of living, labour market conditions, and crony capitalism.

Figure 1: Research Questions and Answers
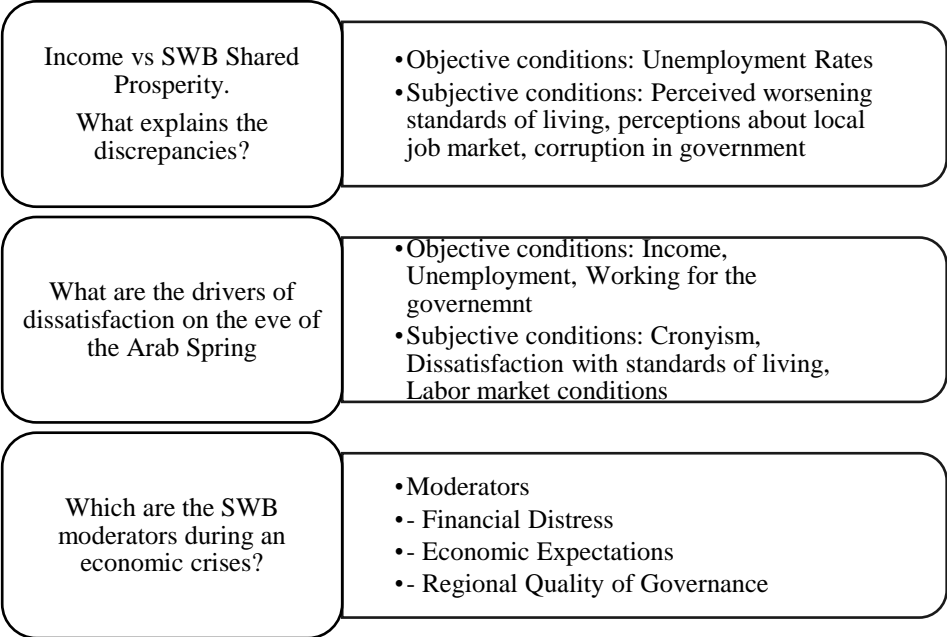
My last question is related to the advancement of our knowledge of crisis moderators. It seeks to provide insights into additional circumstances that cause people to become less happy during crises (Figure 2).

I use an if-then approach to identify three moderators of SWB (see Chapter 1.5 of this dissertation). The European recession of 2008 serves as a compelling example through which I can examine how individuals experience crises. First, I unravel the question of whether financial distress is a SWB moderator in times of crisis. Second, I explore the alleviating impact of positive expectations in shaping happiness. I explore unique panel data collected at Greek universities in 2015, a process that coincided with an exogenous shock the announcement of the bailout referendum. Third, I explore regional quality of governance as a factor that moderates the localized relationship between macroeconomic developments and life evaluation and support that objective quality of governance has the capacity to buffer the negative effects of adverse macroeconomic conditions.

In Chapter 4, I show that macroeconomic conditions are negatively associated with the life satisfaction of the employed population in Europe, but not in a linear fashion. We find that employees who are in financial distress are negatively affected by rising unemployment and inflation, but financially safe employees are not. Therefore, we can support the view that the negative impact of unemployment and inflation is moderated by the extent to which households are financially safe. We could not find evidence for the impact of GDP on life satisfaction.

Figure 2: Overview of the SWB moderators presented in Chapters 4, 5 and 6.
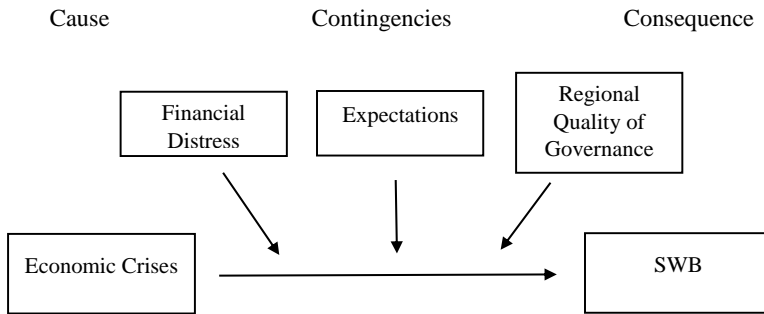
Chapter 5 presents evidence from a natural experiment. It explores the impact of an exogenous shock on SWB: the announcement of the Greek bailout referendum and the reinforcement of the capital controls in Greece in 2015. The ideal setting of this natural experiment shows that the event had a detrimental impact on the happiness of the respondents. This drop, however, was closely associated with the expectations of the respondents regarding their future. Those with higher expectations before the announcement of the referendum experienced smaller decreases in SWB and adapted more quickly to this adverse event compared to individuals who held negative expectations regarding the future. This supports the view that positive expectations can be a source of resilience, allowing individuals to cope with and adapt more quickly to adverse events. At the same time, differences in the resilience of SWB between people with positive expectations and neutral expectations were relatively limited.

Chapter 6 examines the moderating role of quality of governance as an alleviating factor in response to the Great Recession in terms of subjective well-being. It confirms previous findings and provides strong evidence that regional quality of governance is positively related to SWB during the crisis and moderates the impact of persistent unemployment and losses in income (negative GDP growth). The results show quality of governance has a mitigating effect in times of crisis and that the additional gaps that are not explained by macroeconomic indicators are significantly predicted by these formal and predominantly localised institutions.

7.2 Methodological Issues and further Contributions

One of the greatest issues that happiness research faces at the moment is the difficulty in establishing causal relationships, mainly due to the simultaneous determination of SWB and perception data. For example, in Chapter 3, cronyism or dissatisfaction with living standards can "cause" dissatisfaction with life; but individuals who are more dissatisfied with life might be predisposed to evaluate their living standard, corruption and satisfaction with freedom less favourably. Likewise, in Chapter 5, expectations regarding the future can shape the happiness function; however, happier people might have higher expectations.

The applicable solutions to these issues are narrowed by the lack of panel data, the absence of consistent and valid instruments and the inability to resort to an experimental design for SWB data during crises. These issues have limited the SWB literature on causal inferences.

First, most of the available data on SWB and satisfaction with other domains are cross-sectional (exceptions are the GSOEP Panel, HILDA). Because of the limitations, inferences drawn upon such data are limited.

Second, in the absence of panel data, the preferred method to address endogeneity is instrumental-variable estimation. However, finding an instrument to satisfy the necessary assumptions in order to explore the causality between the variables of interest is an arduous task.

Third, natural experiments are infeasible. Researchers cannot "cause" crises and cannot simulate the conditions of such situations in a laboratory experiment that would assist in isolating some of the effects of interest. This dissertation contributes to overcoming these methodological issues in three original ways.

Figure 3: Methodological issues and contributions of this dissertation.
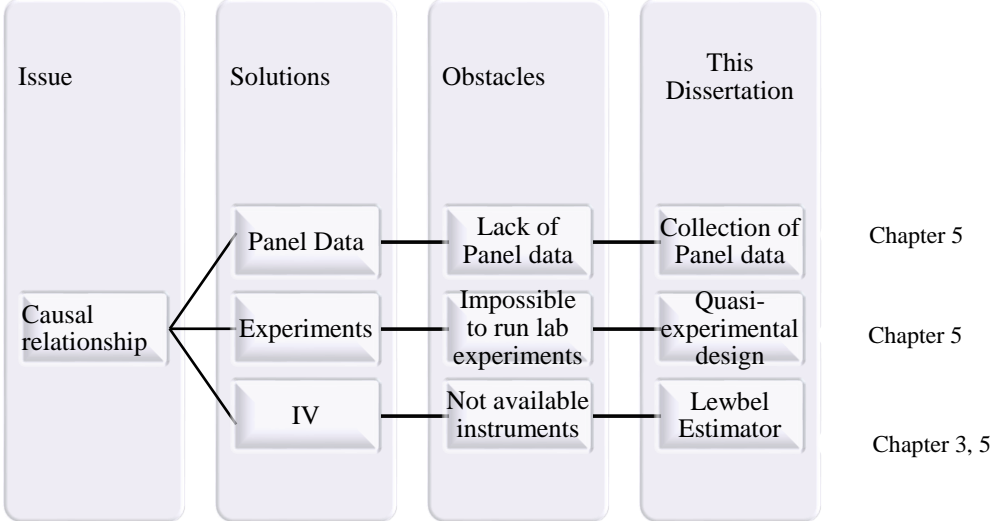
First, it includes a panel data collection from Greek universities in 2015. The data include several happiness questions, domain satisfaction, perceptions, political preferences and other demographic characteristics. The panel consists of 4 rounds between May and August 2015. The use of panel data in Chapter 5 grants us the privilege of observing changes in happiness within individuals, which solves some of the endogeneity issues faced in cross-sectional studies.

The data collection process coincided with another phenomenon in Greece. One of the most stressful events in Greece's recent history occurred immediately after the first wave of our panel and before the second. The announcement of the Greek Bailout Referendum on the acceptance or rejection of the terms set by the creditors threatened the continuation of funding and was followed by capital controls, which constituted an exogenous economic shock. This resembled a natural experiment where I was able to measure the happiness of the respondents before, during and after the stressful event.

Despite the availability of a panel dataset, endogeneity due to the simultaneous determination of our moderator was not completely solved, since I suspect that expectations and happiness might be interrelated to some extent (a detailed discussion can be found in

Chapter 5). However, it is practically impossible to find an instrument that satisfies the theoretical assumptions of independency from the dependent variable. In the absence of an instrument that is related to expectations data but unrelated to happiness, this dissertation suggests the use of an alternative method proposed by Lewbel (2012). I resort to the implementation of a Lewbel estimator (Chapter 5), a method that satisfies the technical assumptions of an instrument by exploring the heteroscedasticity of the standard errors to create instruments. The Lewbel estimator (Lewbel, 2012) is also applied in Chapter 3, where there are plausible reasons to expect that domain satisfaction and perception data are endogenous to SWB.

7.3 Lessons and Policy Implications

The scope of this dissertation includes incorporating SWB measures in the study of progress, identifying sources of dissatisfaction and examining what the preconditions are for economic and social progress to coincide. This chapter summarizes the main lessons based on the findings of this dissertation and discusses some policy implications.

7.3.1 Lessons

Progress in societies is not assured solely by achieving economic growth. Gains or losses in income do not guarantee improvements in life, especially due to the presence of other conditions that co-determine our thriving. In that respect, SWB measures are valuable sources of supplementary information on other underlying conditions that are difficult to observe.

SWB measures are complementary to objective measures of progress. SWB inherently carries other type of information than do objective measures. However, this does not imply that objective indicators of progress should be dismissed.

We are in need of a systematic effort to identify under which circumstances economic development is a prerequisite for well-being and whether there are other conditions that satisfy well-being during hardships. This effort would involve the incorporation of SWB measures that can improve our understanding of what matters for shared progress. Most importantly, these findings can provide a solid basis for policies focused on reducing

the severity of future unfavourable events. For this aim, we need to understand and systematically track objective and subjective conditions that improve human life in order to design more focused policies that enable the protection of specific population groups and invest in the factors for SWB in societies.

Differences between shared prosperity (income growth) and shared well-being (growth in SWB) in developing countries are explained by perceived living standards, unemployment, perceptions about the local job market and corruption. The relevant circumstances that further explain the differences between income growth and growth in SWB should be further advanced with the use of additional data. Additionally, further research regarding progress with income and progress with well-being for developed economies is necessary.

The low life evaluation scores prior to the uprisings in developing MENA countries can be attributed to perceptions about living standards, job market conditions, and cronyism. These factors were associated with general discontent in the wake of the Arab Spring events. Although the factors coincide with the reasons for the Arab Spring as mentioned in the Arab Barometer, this does not imply that dissatisfaction alone does not bring political action. This dissertation does not explore the question of why some developing MENA countries experienced political violence and regime change, whereas in others, the protests remained peaceful.

Research needs to further identify SWB moderators in times of crisis. The effect of macroeconomic fluctuations during crises directly correlates with SWB measures; however, they only explain part of the asymmetries observed in SWB losses. The contingency approach in this dissertation provides a framework for identifying crisis moderators. I find that SWB outcomes are further explained by other circumstances, including financial distress, expectations regarding the future and regional quality of governance. The approach can be further used to identify other relevant aspects that improve or deteriorate the experience of negative economic fluctuations on SWB.

7.3.2 Policy Implications

Fundamental to public policy is economic and social progress. It is suggested that SWB is central to public policy in the interest of monitoring progress, informing policy design and evaluating policies (OECD, 2013). It is especially seen as beneficial for supporting cost-benefit analysis in policy evaluation and identifying potential policy problems. However, it is difficult to provide recommendations on avoiding SWB losses during or before crises, as many crisis episodes do not share common features. Furthermore, as noted in the Report by the Commission on the measurement of economic performance and social progress (Stiglitz, Sen and Fitoussi 2010), the most important policy questions relate to both economic and social spheres and focus on whether developments in one area affect those in others. Given the complexity of such decisions, information on several aspects of quality of life is necessary. Therefore, it is important that governments and statistical offices collect SWB data systematically within countries. A systematic collection of data can improve SWB research regarding its determinants and help governments shifting the emphasis from measuring only economic progress to societal well-being.

The findings of this dissertation highlight the inequalities in subjective experiences, where inequalities refer to the different distributions of SWB measures, based on demographics and other socioeconomic factors (financial distress, expectations).

To design better policies based on the findings, the following advice can be considered relevant: Governments can benefit from giving priority to measuring self-reported financial distress of households along with income or expenditure data and other socio-economic variables. High levels of distress during crises might characterise groups of individuals who at the same time experience other hardships that are often not reflected in income data (increased expenditure might occur due to increased investments in health or education expenses). Public policies can therefore target the least satisfied citizens experiencing objective and subjective financial distress. Another core finding is that individuals with lower economic expectations experienced the hardships of the recessions more intensely in terms of life satisfaction. Policy-makers can be better informed about the distribution of expectations and SWB among population subgroups. Policies specifically targeted at individuals who are more threatened due to their occupation, level of education or geographic location can assist in minimising SWB losses. Finally, regional quality of

governance is an important SWB determinant and an SWB moderator during crises. Investments in the improvement of quality of governance at the regional level can be made on the basis of citizens' satisfaction with government and public services, which can further assist in identifying the sectors that citizens are least satisfied with.

7.4 Limitations and further research

The limitations and suggestions for further research for each of the studies are discussed in each chapter. Nevertheless, this paragraph discusses the general conceptual and methodological limitations that arose from the study of SWB, and it highlights the contributions of this dissertation.

A first limitation is the lack of a framework to classify and define crises, which makes the further classification of the Arab Spring crisis and the euro-crisis unattainable. For instance, within the management discipline, a crisis is defined as "*a major occurrence with a potentially negative outcome affecting an organization, company, or industry, as well as publics, services or good name. It interrupts normal business transactions and can sometimes threatens the existence of the organization.*" (Fearn-Banks, 2009). It is further classified based on several criteria such as the predictability and influence of the cause (Gundel, 2005), the probability of occurrence and its impact or payoff (Taleb, 2007), the locus of the cause and its controllability (Weiner, 1995) or the locus of causes and intent (Coombs, 1995). In economics, the definition of a crisis is more straightforward, despite its different sources. Crises can be classified as currency crises, debt crises, banking crises or sudden stops, and it is not uncommon that they might even overlap. Regardless of the different sub-types of crisis, they all have a commonality: i.e. a direct impact on the real economy. Unlike recessions, which are part of business cycles, the losses of crises are typically larger and are mainly associated with significant declines in economic activity such as consumption, investment, industrial production (GDP), employment, exports and imports. Crises typically influence market production and trigger recessions (Claessens, Kose, and Terrones, 2009; 2012). The euro-crisis has been classified as a typical example of the classical balance of payments crisis, which is a situation in which a sovereign entity has developed an unsustainable balance of payment deficit, in combination with a 'sudden stop'

of cross-border capital flows to peripheral countries (Wolf, 2014; Merler and Pisani-Ferry 2012).

Notwithstanding the ambiguity of the term, one commonality in the definitions of a crisis across disciplines is that they all refer to a "disruption" in ongoing processes. It can be broadly summarised in the words of Wallerstein (1988) as a "*…circumstance in which a historical system has evolved to the point where its cumulative internal contradictions make it impossible for the system to resolve its dilemmas by "adjustments" in its ongoing institutional patterns"*. This definition of a crisis is relevant for the social uprisings observed in MENA, where many of the uprisings resulted in regime changes or large-scale conflicts.

A second limitation is with respect to the comparability of the impacts of crises. Events that can be classified as "crises" are of different magnitudes and durations, and their overall impact is therefore unsystematic. One should be very careful when comparing the significance of crises in affecting happiness, since immediate comparable conclusions cannot be drawn. It could be the case that crises that are of a smaller magnitude or a shorter period have a smaller impact on SWB measures.

Finally, to measure SWB, this dissertation focuses on cognitive judgements of life, where the terms happiness and life satisfaction are often used interchangeably. However, these measures are not exhaustive of subjective well-being. Broader definitions of SWB that include eudemonic experiences such as affect and eudemonic measures (Diener, 2006) are not considered in this dissertation. Future research could compare how these measures perform during crises.

7.5 Epilogue

Writing this dissertation in the beginning of 2013, in the midst of social turbulence and one of the most intense economic crisis of the last few decades, I wondered why similar economic conditions were not enough for countries or regions to progress similarly. Why did some countries experience social unrest while others did not? I was also genuinely interested in finding out why some countries or regions are "doing better" than others in terms of SWB.

Looking at the conditions under which people thrive, it seems that economic and social progress alone cannot compensate for the damage caused by high inequality, corruption and cronyism (see also chapter 3). The grievances observed in many MENA countries prior to the Arab Spring were all related to those reported to be the roots of the uprisings during the Arab Spring. Of course, dissatisfaction alone does not necessarily lead to political action, although more-recent evidence might suggest otherwise. Looking at the most recent developments in the EU e.g. Brexit (withdrawal of the United Kingdom from EU, decided by a referendum in 2016), it seems that dissatisfaction might have led to "revenge" in the form of protest votes during the Brexit Referendum (Rodríguez-Pose, 2018). In the "places that did not matter" people experienced a lack of opportunities, felt they were left behind and voted differently at the referendum compared to the prosperous and dynamic regions. It has been also suggested that the rise of populism in Europe and in the USA, a phenomenon that was very limited in western world, could have been expected if academics and researchers would focus on examining the correct type of externalities such as social and economic, real or perceived distress and interpersonal inequality (Rodríguez-Pose, 2018). Naturally, one might wonder about the usefulness of SWB measures in such occasions and their power to explain other socioeconomic phenomena. To this end, SWB research focusing on how SWB trends looked prior to the Catalan Independence referendum in 2017 or whether (dis)satisfaction or domain (dis)satisfaction preceded the Brexit decision would bring further evidence related to SWB on the eve of a crisis.

My results highlight the importance and the relevance of SWB and its moderators in enhancing our ability to evaluate the wider causes and consequences of socioeconomic phenomena. The relevance of my findings, especially related to the usefulness of SWB measures and its moderators, go beyond economic crises and social turbulence. Other social phenomena, such as the advent of social network sites and the consequent computer-mediated communication are currently the focus of well-being research. The relevant research focuses on how social network site activity influenced SWB and questions whether online social contacts replace the importance of real-life social connections in our pursuit of happiness (see, additional material of this dissertation (Arampatzi et al, 2018)). The most interesting findings (see Additional material) show that extensive use of social network sites (Facebook, etc.) is negatively related to happiness only for users who feel socially

disconnected and lonely (low social capital), while on average, no relationship is found between the amount of time spent on social network sites and happiness. Once again, the importance of examining who becomes less happy, when and under which circumstances is of high importance.

Appendix A| Social Network Sites, Individual Social Capital, and Happiness[70]

Abstract

Can online social contacts replace the importance of real-life social connections in our pursuit of happiness? With the growing use of social network sites (SNSs), attention has been increasingly drawn to this topic. Our study empirically examines the effect of SNS use on happiness for different subgroups of young adults. More specifically, we examine whether the effect of SNSs on happiness is moderated by individual social capital, as measured in terms of frequency of social contacts and feelings of loneliness. Using Dutch data from the Longitudinal Internet Studies for the Social Sciences panel, we provide robust empirical evidence that there is, on average, no relationship between the amount of time spent on SNSs and happiness. However, we find a negative association between the numbers of hours spent on SNS and happiness for SNS users who feel socially disconnected and lonely. The results hold when we control for socio-demographic characteristics, trust, hours spent on other Internet sites and household income. Hence, SNSs are not a substitute for real-life social connections and, at most, complement them.

Introduction

Happiness is currently considered one of the most important individual goals in human life. This pursuit of happiness calls for comprehension of the conditions that are necessary for a good life; thus, the subject has received considerable attention in the academic literature (Layard, 2005; Veenhoven, 2015). One of the key factors that affect happiness is the level of individual social capital, or an individual's pattern and intensity of social contacts with other people. In this regard, several studies have reported a positive association between individual social capital and the different components of subjective well-being, including happiness and life satisfaction[71] (e.g., Helliwell and Barrington-Leigh, 2010; Van der Horst and Coffé, 2012; Portela, Neira, and del Mar Salinas-Jiménez, 2013; Ateca-Amestoy Aguilar and Moro-Egido, 2014; Rodríguez-Pose and Von Berlepsch, 2014).

However, several scholars have recently expressed strong concerns about declining levels of individual social capital – or the quality and quantity of social relationships – in Western countries[72]. Most notably, in his seminal work Bowling Alone, Putnam (2000) argues that over the past decades, people in the United States have become increasingly disconnected from one another to the point that traditional civic, social and fraternal organizations have experienced a decline in membership. Research by McPherson, Smith-Lovin and Brashears (2006) shows that the number of confidants with whom Americans discuss important matters decreased by approximately one-third between 1985 and 2004. Although such declining trends in individual social capital have been identified in Europe to only a limited extent (e.g., Scheepers and Janssen, 2003; Adam, 2008; Sarracino, 2010), on both sides of the Atlantic, there are increasing concerns that social isolation and loneliness are reducing happiness in modern Western society (De Jong Gierveld, Van Tilburg and Dykstra, 2006). Because a lack of social connectivity is associated with negative health

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[71] Following Diener et al. (1999), subjective well-being is a broad concept that encompasses 'people's emotional responses, domain satisfactions, and global judgments of life satisfaction'. In this article, we predominantly focus on global judgments, using overall happiness as the dependent variable.

[72] Following Portes (2000), social capital has both individual dimensions (e.g., relationships and reciprocity) and collective dimensions (e.g. trust and social cohesion). In this research, we focus predominantly on the individual dimensions of social capital in general and on social connections in particular.

outcomes (Cacioppo and Patrick, 2008), the World Health Organization has argued that social isolation and loneliness will be major challenges in the coming thirty years.

On the bright side, other scholars have argued that online communication, such as activity on social network sites (SNSs) such as Facebook and Twitter (see Boyd and Ellison, 2007), is gradually replacing traditional social interactions such as face-to-face communication and that, hence, the extent to which we are experiencing a decline in individual social capital remains questionable. Related to the previous point, several studies have reported a positive relationship between the use of SNSs and individual social capital (e.g., Ellison, Steinfield and Lampe, 2007; Steinfield, Ellison, and Lampe, 2008; Valenzuela, Park and Kee, 2009; Johnston et al. 2013; Sabatini and Sarracino 2014).

Nevertheless, there is growing concern that computer-mediated communication is less socially and emotionally satisfying than face-to-face interaction (Turkle 2012), and the evidence found in studies that have examined the relationship between SNSs and subjective well-being has been inconsistent at the minimum. Studies by Kim and Lee (2011) and Manago, Taylor and Greenfield (2012) find a positive relationship between SNS use and subjective well-being, while research by Helliwell and Huang (2013) and Lönnqvist and Itkonen (2014) find no relationship between SNS use and subjective well-being. Kross et al. (2013) find that Facebook use predicts declines in happiness and life satisfaction among young adults, while Sagioglou and Greitemeyer (2014) report that Facebook activity negatively affects people's happiness. In particular, it has been found that the use of Facebook can trigger negative emotions such as jealousy, social tension, and social overload (Krasnova et al. 2013).

One reason for these ambiguous results is that the relationship between SNS use and subjective well-being likely involves both positive and negative effects, the balance of which is likely to vary across people and environments. In the current article, we argue that particularly for people who lack individual social capital, i.e., those characterized by social isolation, dissatisfaction with social contacts and social loneliness, SNS activity has a negative effect on subjective well-being. Here, social isolation is defined as the objective physical separation from other people, such as infrequent contact with friends or family. In contrast to social isolation, social loneliness is often regarded as an unfavourable balance between the actual and desired social contact (Ernst and Cacioppo 1999) and, hence, the

more subjective feeling of being alone, such as feeling socially lonely and dissatisfied with one's social contacts. In this paper, we argue that SNS activity has a different effect on the happiness of people who lack individual social capital compared to people who have more abundant individual social capital because these two groups use and experience SNSs differently. These differences in usage and experience are related to both active participation and passive following behaviour on SNSs.

Active participation on SNSs mainly involves posting, commenting, liking and chatting and is generally found to be positively related to subjective well-being because of the positive effects of active sharing and communication on subjective well-being (Lee, Noh and Koo, 2013; Wang, 2013). However, active participation can negatively affect subjective well-being through frequent negative posting (Locatelli, Kluwe and Bryant, 2012). Although SNSs can provide a substitute for face-to-face interaction for socially isolated and lonely people and can thus enhance their well-being, socially isolated and lonely people tend to post more negative items compared with non-isolated and non-lonely people (see also Jin, 2013), which negatively affects their levels of well-being. In addition to relatively more frequent negative posts, people who lack individual social capital may be unable to express their true self online (Reinecke and Trepte, 2014) because of the social norms on SNSs that encourage the posting of predominantly positive status updates and messages. Positive status updates on SNSs are associated with higher social attractiveness of the sender (Antheunis, Valkenburg and Peter, 2010; Bazarova 2012) and receive a larger number of reactions (Utz, 2011) and more positive reactions (Forest and Wood, 2012) from SNS contacts. Because a lack of contact with friends and feelings of loneliness and dissatisfaction with social contacts is not perceived as positive or in line with social norms, people who lack individual social capital are not only less likely to feel authentic on SNSs but also receive less happiness from expressing their true self online (see also Reinecke and Trepte 2014). In this regard, it is not surprising that lonely people's satisfaction with Facebook was found to be lower than that of non-lonely people (Jin, 2013). Examining differences in active participation (experiences), we expect that the lack of individual social capital negatively moderates the relationship between SNS use and happiness.

Passive following refers to browsing other people's profiles and can enhance subjective well-being by building a sense of connectedness (Valenzuela et al. 2009) and

serving as a pleasurable experience (Wise, Alhabash and Park, 2010). However, the passive following of SNSs or the following of information that others share on the platform can negatively affect subjective well-being through exacerbation of negative emotions such as envy and jealousy. According to Krasnova et al. (2013) and Tandoc, Ferruci and Duffy (2015), scrolling through the status updates of others might give the impression that other people have a more enjoyable social life. Such social comparisons can aggravate feelings of envy and jealousy, which in turn decrease subjective well-being (Muise, Christofides and Desmarais, 2009; Utz and Beukeboom 2011; Appel, Gerlach and Crusius, 2016). For example, as SNS user might become envious of the many 'likes' on photos or birthday wishes that others receive or jealous about being the only individual who was not invited on a weekend trip. In particular, people who lack individual social capital are more prone to experiencing feelings of envy and jealousy because they already feel a lack of connectedness or communality and tend to attribute the positive content presented on a given SNS page to the owner's personality rather than to situational factors (Chou and Edge, 2012). In this regard, several scholars have pointed to the link between loneliness and envy (Schoeck, 1969; Ninivaggi, 2010), while jealousy and envy are considered conventional emotional responses to social exclusion (Leary, 1990). Hence, based on differences in passive following behaviour, we expect that a lack of individual social capital negatively moderates the relationship between SNS use and happiness.

Building on the previous literature, the current study focuses on SNSs, individual social capital, and happiness using a representative sample of young adults (15-44 years old) in the Netherlands. In this research, happiness is regarded as one of the components of subjective well-being (Diener et al. 1999) that captures how much positive emotion people are experiencing, whereas individual social capital reflects the quantity (frequency) and quality (assigned value) of the social contacts people have. We first investigate the extent to which SNS use, measured as the amount of time spent on SNSs, provides a substitute for real-life interactions in terms of happiness. Second, we explore the heterogeneity in the relationship between SNS use and happiness by analysing the extent to which the association between SNS use and happiness is moderated by social isolation and loneliness. Unlike previous work and motivated by the mixed findings on the effect of SNS use on happiness, this article provides a better understanding of the conditions under which SNSs can

positively or negatively affect happiness. Here, we expect that the happiness of young adults who lack social contacts, are dissatisfied with their social contact, and feel lonely is particularly negatively affected by spending an excessive amount of time on SNSs.

Data and Methodology

Data and Variables

To analyse the relationship between SNS use, individual social capital, and happiness among young adults (15-44 years), we used the Dutch Longitudinal Internet Studies for the Social Sciences (LISS) panel for the years 2012-2013. In the LISS survey, individuals report on several aspects of their life, including their happiness, Internet use, and individual social capital. Our sample included 1,339 respondents who indicated that they ever used SNSs.[73] Of these respondents, 605 individuals completed the survey in both 2012 and 2013.

- *Happiness.*

In our research, happiness was measured using an 11-point scale of happiness in response to the question "On the whole, how happy would you say you are?", 0 being equal to "totally unhappy" and 10 being equal to "totally happy".

- *Activity on Online Social Network Sites.*

Our analysis included respondents who had ever engaged in online activities. We measured the respondents' online activity by reporting the average number of hours spent per week on SNSs. Here, SNS use is defined as the time spent on social media, such as Facebook, Hyves, Myspace, Sugababes, Twitter, or dating sites (such as Relatieplanet or Lexa). Respondents who reported an unrealistic number of hours per week (>168 hours) spent on all online activities were excluded from the sample. To limit the effect of outliers, any extreme values in our SNS analysis were winsorized at the 99th percentile.

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[73] Of the full sample, 73% of the respondents (15-44 years) indicated that they had ever spent time on social network sites.

Individual social capital was measured by the quantity (frequency) and quality (assigned value) of social contacts with family and friends. The frequency of contacts was measured using the following two questions: (1) How often do you do the following: Spend an evening with family? (2) How often do you do the following: Spend an evening with friends? For both questions, the respondents could answer (1) almost every day, (2) once or twice per week, (3) a few times per month, (4) about once per month, (5) a number of times per year, (6) about once per year, (7) never, (8) don't know, or (9) not applicable. Because social isolation is considered the situation of almost never or never seeing family or friends, the categories were aggregated to (i) a few times per week to about once per month (labelled "frequent contacts with family or friends") and (ii) a number of times per year to never (labelled "infrequent contacts with family or friends") (cf. Forsman et al. 2012)[74]. Respondents who answered "don't know" or "not applicable" were excluded from our sample[75]. Regarding loneliness embodied in the experienced quality of face-to-face interaction, we included subjective measures of satisfaction with contacts and social loneliness. Satisfaction with contacts was measured using the following question (with responses on a scale of 1-10): How satisfied are you with your social contacts? Social loneliness was measured using the social loneliness index suggested by De Jong Gierveld and Van Tilburg (2006, 2010), which is also used in Toepoel (2013). This index is based on the following items: (i) There are enough people I can count on in case of a misfortune (yes/don't know/no), (ii) I know many people on whom I can completely rely (yes/don't know/no), and (iii) There are enough people to whom I feel closely connected (yes/don't know/no). Cronbach's alpha (0.75) indicated that the index is internally consistent.

- *Control Variables.*

In our analysis, we included control variables that could confound the relationships among SNS use, individual social capital and happiness. The control variables included in the

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[74] Please note that data were aggregated because there were few young adults in the sample who indicated that they were seeing friends very frequently or seeing friends never or only a few times per year. When re-estimating our baseline regressions (Table 3) using the frequency of contacts as continuous variable, the main conclusions do not change. These results are in Appendix B, Table 1.
[75]The categories "Don't know" and "Not Applicable" were completed by fewer than 3.2% and 1.5% of the respondents, respectively.

analysis were other time spent online, online gaming, trust in other people (i.e., collective social capital), gender, age, civil status, education, occupation and household income. The control variables were chosen on the basis of being potentially important confounders of the relationship between SNS use, individual social capital and happiness and/or being commonly regarded as important determinants of happiness (Layard, 2005). The summary statistics and the correlation matrix of the variables included in the analysis can be found in Tables 1 and 2, respectively;. a detailed description of the variables included in the analysis can be found in Appendix A, Table 1, and a frequency table of the categorical variables in our analysis can be found in Appendix A, Table 2.

Table 1: Descriptive Statistics

	N	Mean	Std. Dev.	Min	Max
Outcome variable					
Happiness	1944	7.49	1.21	0	10
Independent variables					
Time spent on social network sites (x10h)	1944	0.49	0.83	0	4.0
Infrequent contact with friends	1944	0.31	0.46	0	1
Infrequent contact with family	1944	0.20	0.40	0	1
Social loneliness index	1944	1.20	1.81	0	6
Satisfaction with social contacts	1944	7.27	1.54	0	10
Control variables					
Time spent online					
Time spent on internet (other) (x10h)	1944	1.65	1.41	0	7.6
Time spent on online games (x10h)	1944	0.14	0.32	0	2.0
Collective social capital					
Trust in people	1944	6.06	2.04	0	10
Gender					
Female	1944	0.59	0.49	0	1
Age groups					
25-34 years old	1944	0.31	0.46	0	1
35-44 years old	1944	0.39	0.49	0	1
Occupational status					
Unemployed	1944	0.03	0.16	0	1
Employed	1944	0.63	0.48	0	1
School	1944	0.27	0.44	0	1

Civil status					
Married	1944	0.33	0.47	0	1
Separated/ Divorced	1944	0.05	0.19	0	1
Income level					
Household Income (x €1000)	1944	3.10	1.54	0	13
Education					
Medium level	1944	0.44	0.50	0	1
High level	1944	0.36	0.48	0	1
Year					
2013	1944	0.48	0.50	0	1

Table 2: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10
(1) Time spent on social network sites (x10h)	1.00									
(2) Infrequent contact with friends	-0.08	1.00								
(3) Infrequent contact with family	0.01	0.19	1.00							
(4) Satisfaction with social contact	0.01	0.19	-0.14	1.00						
(5) Social loneliness index	0.09	0.14	0.14	-0.44	1.00					
(6) Time spent on internet (other) (x10h)	0.36	0.05	-0.01	-0.02	0.04	1.00				
(7) Time spent on online games (x10h)	0.21	0.01	0.05	0.00	0.06	0.23	1.00			
(8) Trust in people	-0.10	-0.11	-0.07	0.22	-0.23	0.00	-0.04	1.00		
(9) Female	0.03	0.04	-0.01	0.01	0.01	-0.17	-0.15	-0.03	1.00	
(10) Age: 25-34 years old	-0.08	-0.02	-0.11	0.01	-0.03	0.02	-0.05	0.02	0.00	1.00
(11) Age: 35-44 years old	-0.19	0.23	0.06	-0.08	0.03	-0.07	-0.05	0.00	0.02	-0.51
(12) Occupational status: Unemployed	0.01	0.01	0.05	-0.05	0.05	0.02	-0.02	-0.08	-0.01	0.01
(13) Occupational status: Employed	-0.24	0.11	-0.07	-0.01	-0.07	-0.03	-0.10	0.11	-0.08	0.33
(14) Occupational status: School	0.27	-0.21	0.04	0.08	0.02	0.06	0.07	-0.01	0.00	-0.35
(15) Civil status: Married	-0.17	0.22	-0.01	-0.04	0.01	-0.10	-0.06	0.09	0.05	0.02
(16) Civil status: Separated/Divorced/Widowed	-0.06	0.04	0.05	-0.10	0.06	-0.01	0.01	-0.05	0.03	-0.04
(17) Household Income (x€1000)	-0.06	-0.03	0.03	0.10	-0.10	-0.01	-0.06	0.13	0.00	-0.01
(18) Education: Medium level	0.06	0.01	0.01	0.03	0.00	-0.02	0.08	-0.01	0.02	0.13
(19) Education: High level	-0.15	0.01	0.01	0.01	-0.09	0.07	-0.13	0.19	0.00	0.28
(20) Year: 2013	0.02	0.01	0.03	0.03	0.14	0.04	0.02	-0.01	0.00	-0.02

Empirical Strategy

To analyse the relationships between SNS use, individual social capital, and happiness, we used a random effects model in which we considered that observations are clustered within individuals given the longitudinal structure of the dataset; for some individuals, we had observations at two points in time (2012 and 2013). A random effects estimator is preferred over a simple pooled linear regression (pooled OLS) because ignoring the clustering of observations within individuals can result in biased coefficients and standard errors (Hox, 2002). We prefer a random effects estimator to a fixed effects estimator because the LISS data have a limited time dimension, information is not available at both time points for all individuals, and most of the variance is between individuals rather than within individuals. Hence, the use of a fixed effects estimator severely reduces the sample size, and variables can become statistically insignificant despite being economically significant. In addition, the measurement of our SNS use variable is known to be subject to memory distortion, in that individuals often have difficulty precisely recalling the average amount of time that they spent on specific activities (Pantic et al. 2012). Hence, we prefer to explore both the between- and within-individuals variation in SNS use rather than the within-individuals variation alone.

More specifically, we estimated the following random effects regression:

$$\text{Happiness}_{it} = \Theta \ \text{SNSUse}_{it} + \Omega \ \text{Individual Social Capital}_{it} + \Psi \ (\text{SNS Use}_{it} \ \text{x} \ \Omega \ \text{IndividualSocialCapital}_{it}) + \Sigma \ \text{Control}_{it} + \mu_i + \varepsilon_{it}$$

where Happiness it is the reported happiness of individual i in year t, SNSUse it is the average number of hours per week individual i spends on online social network sites, Individual SocialCapitalit is a vector of individual social capital variables for individual i in year t and includes our measures of social isolation and loneliness, SNS Useit x ΩIndividualSocial Capitalit denotes the interaction effect between SNS use and our individual social capital variables, Controlit is a vector of the control variables for individual i in year t, μ_i is the individual random effect, and ε it is the residual error. We added the interaction effects between SNS use and the individual social capital variables because we

expected social isolation and loneliness to moderate the relationship between SNS use and happiness. Hence, we expected the effect of SNS on happiness to differ for different levels of individual social capital. Accordingly, this relationship is contingent upon individual social capital rather than mediated by it.

Empirical Results

Baseline Results

Table 3 presents the results of our random effects estimation. All of our models were estimated using cluster-robust standard errors. Controlling for socio-demographic characteristics, trust, hours spent on other Internet sites, hours spent on online gaming and household income, we found no significant association between the use of SNS and happiness. At the same time, individual social capital affected happiness (Table 3, Columns 2-4). Although we found that infrequently meeting with friends was not significantly related to happiness, the young adults who infrequently met with family reported, on average, a 0.2-point lower happiness score when all else was held constant. There appears to be a strong association between social loneliness and happiness. The respondents who were satisfied with their social contacts and scored low on the social loneliness index were generally happier than the respondents who were dissatisfied with their social contacts and scored high on the social loneliness scale. Compared to the young adults who rated their satisfaction with social contacts as a 7 (on a scale from 0-10), the young adults who rated their satisfaction with contacts as a 6 also reported, on average, a 0.22-point lower happiness score. Likewise, the respondents who scored 1 point higher on the social loneliness index (on a scale from 0-6) reported, on average, a 0.1-point lower happiness score. When all dimensions of social isolation and loneliness were included (Table 3, Column 7), we found no significant association between SNS use and happiness. We also observed that the quality of social capital rather than the quantity of social capital drove the variation in happiness. While we did not find that the frequency of meeting with family and friends had a significant effect on happiness, we observed a significant effect of satisfaction with contacts and social loneliness on happiness.

Table 3: Random effects estimation: SNS, Individual Social Capital, and Happiness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Time spent on SNS (x10h)	-0.123**	-0.022	-0.024	-0.025	-0.042	-0.014	-0.037
	(0.059)	(0.061)	(0.061)	(0.060)	(0.058)	(0.058)	(0.053)
Infrequent contact with friends			-0.073				0.039
			(0.055)				(0.053)
Infrequent contact with family				-0.196***			-0.101
				(0.067)			(0.066)
Satisfaction with social contacts					0.227***		0.207***
					(0.023)		(0.025)
Social loneliness index						-0.106***	-0.042**
						(0.016)	(0.017)
Time spent on Internet (other) (x10h)		-0.033	-0.033	-0.033	-0.026	-0.029	-0.025
		(0.023)	(0.023)	(0.023)	(0.022)	(0.023)	(0.022)
Time spent on online games (x10h)		-0.062	-0.059	-0.053	-0.075	-0.046	-0.065
		(0.097)	(0.097)	(0.096)	(0.089)	(0.094)	(0.089)
Trust in people		0.131***	0.130***	0.130***	0.100***	0.116***	0.097***
		(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)
Male		•	•	•	•	•	•
Female		0.053	0.054	0.052	0.032	0.053	0.032
		(0.061)	(0.061)	(0.061)	(0.057)	(0.060)	(0.057)
Age: 15-24 years old		•	•	•	•	•	•
Age: 25-34 years old		-0.135	-0.132	-0.150	-0.137	-0.126	-0.143
		(0.115)	(0.115)	(0.115)	(0.099)	(0.111)	(0.099)
Age: 35-44 years old		-0.238*	-0.227*	-0.237*	-0.213**	-0.224*	-0.215**
		(0.122)	(0.122)	(0.122)	(0.107)	(0.118)	(0.108)
Occupational status: Retired (Pension)		•	•	•	•	•	•
Occupational status: Unemployed		-0.017	-0.030	-0.006	-0.042	0.002	-0.019
		(0.254)	(0.254)	(0.250)	(0.226)	(0.250)	(0.225)
Occupational status:		0.276*	0.264*	0.267*	0.193	0.252	0.193

Employed							
		(0.158)	(0.158)	(0.157)	(0.149)	(0.155)	(0.148)
Occupational status: School		0.092	0.076	0.084	-0.013	0.078	-0.004
		(0.183)	(0.183)	(0.183)	(0.168)	(0.178)	(0.168)
Civil status: Single/Never married		•	•	•	•	•	•
Civil status: Married		0.209***	0.217***	0.207***	0.226***	0.227***	0.226***
		(0.080)	(0.080)	(0.080)	(0.076)	(0.078)	(0.075)
Civil status: Separated/Divorced/Widowed		0.034	0.037	0.053	0.168	0.084	0.183
		(0.168)	(0.168)	(0.167)	(0.161)	(0.161)	(0.159)
Household income (x€1000)		0.076***	0.076***	0.079***	0.059***	0.068***	0.059***
		(0.017)	(0.017)	(0.017)	(0.016)	(0.017)	(0.016)
Low level education		•	•	•	•	•	•
Medium level education		0.059	0.059	0.052	0.032	0.025	0.017
		(0.095)	(0.095)	(0.094)	(0.088)	(0.094)	(0.088)
High level education		0.096	0.096	0.086	0.099	0.054	0.077
		(0.104)	(0.104)	(0.104)	(0.097)	(0.103)	(0.096)
Year: 2012		•	•	•	•	•	•
Year: 2013		-0.002	-0.002	0.006	-0.019	0.053	0.008
		(0.040)	(0.040)	(0.040)	(0.039)	(0.041)	(0.042)
Constant		6.293***	6.330***	6.350***	4.976***	6.529***	5.198***
		(0.239)	(0.239)	(0.239)	(0.267)	(0.236)	(0.280)
Number of observations	1,944	1,944	1,944	1,944	1,944	1,944	1,944
Number of respondents	1,339	1,339	1,339	1,339	1,339	1,339	1,339
Within R^2	0.001	0.017	0.018	0.024	0.025	0.026	0.029
Between R^2	0.007	0.113	0.121	0.148	0.227	0.148	0.231
Overall R^2	0.007	0.104	0.111	0.134	0.203	0.134	0.207

Notes: Cluster-robust standard errors in parentheses; ***$p<0.01$, **$p<0.05$, *$p<0.10$, • Reference category

Table 4: Random effects estimation: SNS and SWB. Moderation Analysis: 1) Frequency of contacts with family 2) Frequency of contacts with friends 3) Satisfaction with Contacts 4) Social Loneliness Index

	(1)	(2)	(3)	(4)
Infrequent contact with friends* Time spent on online social networks (x10h)	0.128 (0.117)			
Infrequent contact with family* Time spent on online social networks (x10h)		-0.079 (0.107)		
Satisfaction with contacts* Time spent on online social networks (x10h)			0.065** (0.027)	
Social loneliness index* Time spent on online social networks (x10h)				-0.053** (0.021)
Time spent on online social networks (x10h)	-0.066 (0.054)	-0.020 (0.054)	-0.025 (0.049)	0.000 (0.050)
Infrequent contact with friends	-0.014 (0.067)	0.037 (0.053)	0.036 (0.053)	0.039 (0.053)
Infrequent contact with family	-0.098 (0.066)	-0.063 (0.084)	-0.100 (0.066)	-0.104 (0.066)
Satisfaction with social contacts	0.207*** (0.025)	0.207*** (0.025)	0.204*** (0.025)	0.205*** (0.025)
Social loneliness index	-0.042** (0.017)	-0.042** (0.017)	-0.040** (0.017)	-0.038** (0.017)
Time spent on Internet (other) (x10h)	-0.025 (0.022)	-0.026 (0.022)	-0.027 (0.021)	-0.027 (0.022)
Time spent on online games (x10h)	-0.066 (0.089)	-0.059 (0.089)	-0.069 (0.086)	-0.066 (0.087)
Trust in people	0.097*** (0.017)	0.098*** (0.017)	0.097*** (0.017)	0.096*** (0.016)
Male	●	●	●	●
Female	0.034 (0.057)	0.032 (0.057)	0.030 (0.057)	0.034 (0.057)
Age: 15-24 years old	●	●	●	●
Age: 25-34 years old	-0.149 (0.099)	-0.136 (0.099)	-0.105 (0.096)	-0.115 (0.096)
Age: 35-44 years old	-0.219** (0.108)	-0.208* (0.108)	-0.179* (0.105)	-0.190* (0.106)
Occupational status: Retired	●	●	●	●

(Pension)				
Occupational status: Unemployed	-0.029	-0.021	-0.006	-0.002
	(0.224)	(0.225)	(0.221)	(0.224)
Occupational status: Employed	0.194	0.193	0.203	0.204
	(0.148)	(0.149)	(0.149)	(0.148)
Occupational status: School	-0.006	-0.000	0.032	0.024
	(0.167)	(0.168)	(0.165)	(0.165)
Civil status: Single/Never married	•	•	•	•
Civil status: Married	0.227***	0.226***	0.224***	0.220***
	(0.075)	(0.075)	(0.075)	(0.075)
Civil status: Separated/Divorced/Widowed	0.187	0.179	0.166	0.170
	(0.159)	(0.159)	(0.159)	(0.159)
Household income (x€1000)	0.060***	0.059***	0.059***	0.060***
	(0.016)	(0.016)	(0.016)	(0.016)
Low level education	•	•	•	•
Medium level education	0.017	0.017	0.017	0.014
	(0.088)	(0.088)	(0.087)	(0.087)
High level education	0.076	0.076	0.074	0.079
	(0.097)	(0.096)	(0.096)	(0.096)
Year: 2012	•	•	•	•
Year: 2013	0.006	0.009	0.005	0.006
	(0.041)	(0.042)	(0.041)	(0.042)
Constant	5.212***	5.183***	6.651***	5.126***
	(0.280)	(0.282)	(0.225)	(0.274)
Number of observations	1,944	1,944	1,944	1,944
Number of respondents	1,339	1,339	1,339	1,339
Within R^2	0.030	0.028	0.030	0.036
Between R^2	0.231	0.231	0.236	0.239
Overall R^2	0.208	0.208	0.212	0.212

Notes: Cluster-robust standard errors in parentheses; ***$p<0.01$, **$p<0.05$, *$p<0.10$, • Reference category

Please note that the interaction term in model (3) and (4) are demeaned, so that the linear terms capture the effect at the mean.

Nevertheless, the main goal of this study was to examine the extent to which social isolation and loneliness moderate the association between the time spent on SNSs and happiness. As shown in Table 4, social isolation did not moderate the relationship between SNS use and happiness. The interaction effects between SNS use and infrequently meeting with friends (Table 4, Column 1) and SNS use and infrequently meeting with family were statistically insignificant (Table 4, Column 2). However, we found evidence that social loneliness moderates the relationship between SNS and happiness. Young adults who were not satisfied with their contacts and excessively used SNS were, on average, less happy than

young adults who were not satisfied with their contacts and used SNS only to a limited extent (Table 4, Column 3). Likewise, young adults who scored high on the social loneliness scale and frequently used SNS were, on average, less happy than young adults who scored high on the social loneliness scale and did not use SNS frequently (Table 4, Column 4).

Sensitivity Analysis: Selection Bias and Propensity Score Matching

A potential drawback of the random effects estimation described in the previous paragraphs is that the observed effect of SNS use can result from the self-selection of individuals into SNS use. What would the results mean if unhappy young adults who experience social loneliness heavily use SNS to substitute their real-life contacts? This is possible because lonely people tend to use SNS more frequently (Kim, Chung and Ahn, 2012; Song et al., 2014). However, under these conditions, the level of happiness that lonely individuals would have reported if they had not used SNS extensively remains unclear. In other words, specific personal characteristics can predispose young adults to self-select into SNS use.

Propensity score matching (Rosenbaum and Rubin, 1983; Caliendo and Kopeinig, 2008) reduces this selection bias by comparing the happiness of excessive SNS users to that of non-excessive SNS users who are as similar as possible in all other respects (Becker and Ichino, 2002) and has recently been applied in other happiness studies (e.g., Binder and Coad, 2013; Nikolova and Graham, 2014; Tiefenbach and Kohlbacher, 2014; Hessels et al. 2015). This statistical technique can best be compared to a randomized control trial in which two groups of individuals are randomly assigned to the treatment under study or to a control group. In our case, the treatment is excessive SNS use, which is defined as the highest 10th percentile of the distribution and exceeding 10 hours per week, on average (approximately more than 1 SD above the mean). The effect of the treatment is referred to as the average treatment effect on the treated (ATT), and in our case, it can be defined as the difference between excessive and non-excessive users of SNS in their expected happiness.

However, as indicated by Shadish, Cook and Campbell (2002), it is challenging to find exact matches when matching for multiple individual characteristics. Hence, propensity score matching variables are often combined into a multivariate composite that is utilized to match untreated individuals to treated individuals. In the present research, we used the 5-

nearest neighbour matching estimator, which is often used in propensity score matching (Becker and Ichino, 2002). We chose this matching estimator because we had many comparable untreated respondents in our sample (Caliendo and Kopeinig, 2008). The Gaussian kernel estimator, which is also often used when working with this type of data, was not applied here because not all of the groupings met the common support assumption of this estimator[76] .The respondents were matched using a probit model that included the following matching variables: gender, age, marital status, level of education, occupational status, household income, the time spent on Internet activities, and other dimensions of individual social capital. In addition to the estimation for the total sample, we estimated the propensity for eight groups with a high or low quality of social capital based on our social isolation and loneliness variables. We estimated the ATTs for the eight subgroups that resulted from the division of individuals based on their quantity and quality of social capital. The eight subgroups were based on (1) infrequent vs. frequent contacts with friends, (2) infrequent vs. frequent contact with family, (3) dissatisfaction with contacts (ratings lower than 7) vs. satisfaction with contacts (ratings of 7 or above), and (4) feeling lonely (social loneliness index of 3 or higher) vs. not feeling lonely (social loneliness index of lower than 3).

The main results of the propensity score matching are presented in Table 5 and are broadly in line with our random effects regressions. Based on our estimation for the total sample (Row 1), we found that young adults who used SNS excessively (10 hours or more per week) were not significantly less happy than young adults who only used SNS to a limited extent. Consistent with our findings from the random effects regression, the greatest differences in happiness between excessive and non-excessive SNS users were found within the group of young adults that was characterized by a high degree of social loneliness. In

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[76] It should be noted that propensity score matching relies on the following two main assumptions: the unconfoundedness of control variables and the common support. The first implies that the control variables used to match the observations in our sample capture all of the differences between those who use SNS excessively and those who do not and, thus, any observed differences in happiness levels are attributable to the use of SNS. The latter assumption, which is testable, assumes that individuals (observations) with same characteristics have equal probabilities of belonging to either of the two SNS-use groups (i.e., excessive users vs. non-excessive users). After the test was run, the results for the 5-nearest neighbour matching showed that this assumption was most often not violated because the bias of each single variable in all estimations slightly exceeded the 10% threshold only in a few cases (D'Agostino, 1998). These test statistics are available upon request.

other words, excessive SNS use has a stronger negative association with happiness within the group of people with a low quality of social capital than within the group of people with a high quality of social capital. Within the group of young adults who were dissatisfied with their social contacts, the happiness of excessive SNS users was approximately 1.20 points lower than that of non-excessive users. Within the group of young adults who scored high on the social loneliness index, the happiness of excessive SNS users was approximately 0.87 points lower than that of non-excessive users. When the ATT within subgroups was compared, we found that within the groups that had infrequent contact with family or friends, excessive SNS users were not significantly less happy than non-excessive SNS users. Likewise, within the groups that were characterized by a high quantity and quality of social capital, excessive SNS users were not significantly less happy than non-excessive SNS users.

Table 5: Average Treatment to the Treated: Closest five neighbours matching method

Closest five neighbours matching method	Treated	Untreated	Difference
Total sample	7.186	7.392	-0.206 (0.134)
Infrequent Contact with Friends	7.048	7.180	-0.132 (0.324)
Frequent Contact with Friends	7.228	7.381	-0.153 (0.145)
Infrequent Contact with Family	6.703	7.103	-0.400 (0.337)
Frequent Contact with Family	7.314	7.493	-0.179 (0.140)
Less Satisfied with Contacts	5.618	6.824	-1.206*** (0.383)
Satisfied with Contacts	7.559	7.596	0.037 (0.137)
Lonely	6.083	6.954	-0.871*** (0.330)

Not Lonely	7.597	7.504	0.093
			(0.119)

Discussion and Conclusion

In this article, we examined the extent to which online interactions on SNSs might be replacing traditional face-to-face interactions as a source of happiness for young adults (15-44 years old). Starting with the observation that young people increasingly use SNSs in everyday life, the extent to which and conditions under which SNS affects happiness remain largely unknown. Subsequently, we examined the extent to which the effect of SNS on happiness is moderated by individual social capital, as measured in terms of social isolation and loneliness. Here, we considered both whether the respondents were physically disconnected from their friends (quantity of individual social capital) and whether they felt lonely and dissatisfied with their social contacts (quality of individual social capital).

Our main results showed that time spent on SNSs had a negative but insignificant effect on happiness for the total sample. This finding is in line with the studies of Helliwell and Huang (2013) and Lönnqvist and Itkonen (2014), who also did not find a relationship between SNS use and subjective well-being. At the same time, both the quantity and quality of social relationships were positively associated with happiness in our study, whereas SNSs did not affect the relationship between individual social capital and happiness. Overall, these findings support the view that SNSs are not a substitute for real-life social connections in terms of happiness and, at most, complement these connections.

Nevertheless, we found a negative association between the number of hours spent on SNSs and subjective well-being for SNS users who experienced feelings of loneliness and dissatisfaction with their contacts. Although there is no relationship between excessive SNS use and happiness for young adults with a high quality of individual social capital, excessive SNS use negatively affects the happiness of individuals who feel lonely and dissatisfied with their social contacts. These findings echo earlier research by Jin (2013), who found that lonely people are more dissatisfied with SNS as a communication platform. At the same time, the quantity of social capital, as measured in terms of the frequency of meetings with friends or family, did not moderate the relationship between SNS use and happiness.

In sum, our findings highlight that the relationship between SNS use and happiness is very nuanced and heterogeneous in nature, which also explains (in part) the conflicting findings regarding the relationship between happiness and SNS use in the present literature. Our study underlines the fact that it is pivotal to examine for which type of people and under which conditions SNS use is conducive or detrimental to happiness and other facets of subjective well-being.

Limitations and Future Research

Regarding the heterogeneity of the relationship between SNS use and happiness, a limitation of our study is that we only examined individual social capital as a moderator. There could be other factors that moderate the relationship between SNS use and happiness. Most notably, our data regarding SNS use do not provide detailed information about how the participants spent their time on SNSs, which is a major limitation when discussing the implications in terms of social capital-based comparisons. Specifically, the average time spent online only accounts for the duration of SNS activity and not for the purposes of using such networks. For example, the participants did not report how much time they spent sharing their own activities online compared with the time they spent observing the activities of others. In this regard, recent research by Wenninger, Krasnova and Buxmann (2014) suggests that while active participation on SNSs is positively associated with subjective well-being, passive following generally has the opposite effect (see also Lin and Utz, 2015). Likewise, future research could further distinguish between the different types of SNS platforms. For example, the relationship between Twitter use and happiness might be different from the relationship between Facebook use and happiness.

Furthermore, we lack detailed information about the personality (see Lönnqvist and & große Deters, 2016) as well as the emotions that young adults experience when using SNSs. Specifically, it would be interesting to examine the interplay among social loneliness, envy, inauthenticity, and happiness. In this regard, several studies have focused on negative emotions experienced, such as envy (Krasnova et al. 2013; Muise et al. 2009; Tandoc et al. 2015; Utz and Beukeboom, 2011) and inauthenticity (Reinecke and Trepte, 2014). However, research in which these factors are jointly examined is currently lacking in the literature on SNS and happiness. In addition, future research should address the positive emotions that

can be experienced when using SNS to examine under which conditions SNSs are conducive to subjective well-being.

Finally, this study has a number of limitations with regard to the data that were utilized that should be addressed in future research. First, because the participants only reported the time that they spent online and did not indicate their number of online connections compared with real-life interactions, our conclusion that SNS is not a substitute in terms of happiness for conventional means of social interaction needs further examination. Second, our study focused only on global judgements of subjective well-being and did not take into account other measures of subjective well-being, such as positive affect. Third, SNS use was measured in terms of the time spent on SNSs. Although this is likely the most common way to measure SNS use in the empirical literature, such self-reported measures of SNS use are subject to memory distortions (Pantic et al., 2012). Alternatively, a time use and diary research (see also Kross et al., 2014) could be used to examine the association between SNS use and SWB.

Although we find no relationship between SNS use and happiness among young adults in the Netherlands, it appears that SNSs can negatively affect the happiness of people who experience a low quality of social contacts. These findings imply that it would be better for individuals with a low quality of social capital to avoid intensive use SNS platforms because these platforms may further lower their happiness level. At the same time, following this advice could create a Catch-22 situation because SNSs may be one of the only ways for these people to maintain contact with others. In this regard, it would be important to address how people use SNSs. It may well be that lonely users who chat frequently on SNSs gain happiness from spending time online, whereas lonely users who spend most of their time scrolling through other people's profiles become less happy. However, more research is needed to verify this claim.

Appendices

Appendix A

Table A1: Descriptions of the Variables Included in the Analysis

Dependent Variables	Measure	Question	Answer Categories
Happiness	0-10	On the whole, how happy would you say you are? 0 is equal to "totally unhappy" and 10 to "totally happy".	0-10
Time spent on	Continuous: Average number of hours spent (per week)	Please indicate how many hours per week, on average, you spend on these online activities: (a) On one or any of the following social network sites: Facebook, Hyves, Myspace, Sugababes, or others, (b) Twitter, and (c) dating sites (such as Relatieplanet, Lexa, or others).	
Individual Social Capital			
Social Isolation			
Frequency of spending an evening with family	Frequent-Infrequent 0-1	How often do you do the following: spend an evening with family (other than members of your own household)?	(1) Almost every day, (2) once or twice per week, (3) a few times per month, (4) about once per month, (5) a number of times per year, (6) about once per year, (7) never, (8) don't know, or (9) not applicable.
Frequency of spending an evening with friends	Frequent-Infrequent 0-1	How often do you do the following: spend an evening with friends (outside your neighbourhood)?	(1) Almost every day, (2) once or twice per week, (3) a few times per month, (4) about once per month, (5) a number of times per year, (6) about once per year, (7)

			never, (8) don't know, or (9) not applicable.
Subjective Measures			
Social Loneliness Index	0-6		
		(i) There are enough people I can count on in case of a misfortune, (ii) I know many people on whom I can completely rely, and (iii) There are enough people to whom I feel closely connected.	(i) Yes/Don't know/No (ii) Yes/Don't know/No (iii) Yes/Don't know/No
Satisfaction with personal contacts	0-10	How satisfied are you with your social contacts?	0-10
Control Variables			
Other Internet use	Continuous: Average number of hours spent (per week)	Please indicate how many hours per week, on average, you spend on these online activities: other activities[77]	
Online gaming	Continuous: Average number of hours spent (per week)	Please indicate how many hours per week, on average, you spend on these online activities: online games.	
Trust in people	0-10	Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people? Please indicate a score of 0 to 10.	

[77] Such activities include hours spent emailing, searching for information on the Internet (e.g., about hobbies, work, business hours, and day trips); searching for and comparing products/product information on the Internet; purchasing items via the Internet; watching short films (e.g., via YouTube) or watching online films or TV programs; downloading software, music or films; Internet banking; reading online news and magazines; newsgroups; reading and/or writing blogs; Skype or similar services; chatting/MSN; Twitter; dating websites; visiting forums and Internet communities; other activities on the Internet.

Gender	0-1	Gender	Female-Male
Age groups	1, 2, 3	Age	15-24 years old, 25-34, 35-44
Occupation	1,2,3,4	Primary occupation	Pension ,Unemployed, Employed, School
Civil status	1,2,3	Civil status	Single, Married, Separated/Divorced/Widowed
Household income (1000)	Continuous: Income in euros *100	Household income in Euros	
Level of education	1,2,3	Highest level of education with diploma	Low Education (ISCED 1-2), Medium Education (ISCED 3-4), High Education (ISCED 5-6)
Year		Year in which the survey took place	2012, 2013

Table A2: Frequencies of Categorical Variables in Sample

	Frequency	Percent	Cum
<u>Independent variables</u>			
Infrequent contact with friends	1336	68.7	68.7
Frequent contact with friends	608	31.3	100
Infrequent contact with family	1549	79.7	79.7
Frequent contact with family	395	20.3	100.0
Gender			
Male	801	41.2	41.2
Female	1143	58.8	100.0
Age groups			
15-24 years old	611	31.4	31.4
25-34 years old	602	31.0	62.4
35-44 years old	731	37.6	100.0
Occupational status			
Pension	144	7.4	7.4
Unemployed	51	2.6	10.0
Employed	1233	63.4	73.4
School	516	26.5	100.0
Civil status			
Single	1223	62.9	62.9
Married	648	33.3	96.2
Separated/Divorced/Widowed	73	3.8	100.0
Education			
Low level	391	20.1	20.1
Medium level	854	43.9	64.0
High level	699	36.0	100.0
Year			
2012	1002	51.5	51.5
2013	942	48.5	100.0

Appendix B: Treating Social Capital as a Continuous Indicator

Table B1: Random effects estimation: SNS, Individual Social Capital as Continuous, and SWB

	(1)	(2)	(3)	(4)	(5)	(6)
Time spent on social network sites (x10h)	-0.022	-0.024	-0.025	-0.042	-0.014	-0.037
	(0.061)	(0.061)	(0.060)	(0.053)	(0.058)	(0.053)
Contact with friends (continuous)		-0.073				0.039
		(0.055)				(0.053)
Contact with family (continuous)			-0.196***			-0.101
			(0.067)			(0.066)
Satisfaction with social contacts				0.227***		0.207***
				(0.023)		(0.025)
Social loneliness index					-0.106***	-0.042**
					(0.016)	(0.017)
Year: 2013	-0.002	-0.002	0.005	-0.019	0.053	0.008
	(0.040)	(0.040)	(0.040)	(0.039)	(0.041)	(0.041)
Personal characteristics	YES	YES	YES	YES	YES	YES
Demographics	YES	YES	YES	YES	YES	YES
Other time spent online	YES	YES	YES	YES	YES	YES
	(0.095)	(0.095)	(0.095)	(0.088)	(0.093)	(0.088)
Constant	6.294***	6.330***	6.350***	4.976***	6.529***	5.198***
	(0.240)	(0.239)	(0.239)	(0.267)	(0.236)	(0.280)
Observations	1,944	1,944	1,944	1,944	1,944	1,944
Number of IDs	1,339	1,339	1,339	1,339	1,339	1,339

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table B2: Random effects estimation: SNS and SWB. Moderation Analysis: 1) Frequency of contacts with family as continuous 2) Frequency of contacts with friends as continuous 3) Satisfaction with contacts 4) Social Loneliness Index

	(1)	(2)	(3)	(4)
Infrequent contact with friends continuous)* Time spent on online social networks (x10h)	0.128 (0.117)			
Infrequent contact with family continuous)* Time spent on online social networks (x10h)		-0.079 (0.107)		
Satisfaction with contacts* Time spent on online social networks (x10h)			0.065** (0.027)	
Social loneliness index* Time spent on online social networks (x10h)				-0.053** (0.021)
Time spent on online social networks (x10h)	-0.066	-0.020	-0.498**	0.063
	(0.054)	(0.054)	(0.208)	(0.058)
Infrequent with friends (continuous)	-0.025	-0.026	-0.026	-0.027
	(0.022)	(0.022)	(0.021)	(0.022)
Infrequent with family (continuous)	-0.066	-0.059	-0.069	-0.066
	(0.089)	(0.089)	(0.086)	(0.087)
Satisfaction with social contacts	-0.014	0.037	0.036	0.039
	(0.067)	(0.053)	(0.053)	(0.052)
Social loneliness index	-0.098	-0.063	-0.100	-0.104
	(0.066)	(0.084)	(0.066)	(0.066)
Year: 2013	0.006	0.009	0.005	0.006
	(0.041)	(0.041)	(0.041)	(0.042)
Personal characteristics	YES	YES	YES	YES
Demographics	YES	YES	YES	YES
Other time spent online	YES	YES	YES	YES
Constant	5.212***	5.183***	5.402***	5.142***
	(0.280)	(0.282)	(0.304)	(0.279)
Observations	1,944	1,944	1,944	1,944
Number of ID	1,339	1,339	1,339	1,339

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix B| Life Satisfaction and Self-Employment in Different Types of Occupations[78]

Abstract

In this research, we investigate whether a positive relationship between life satisfaction and self-employment (versus paid employment) exists while simultaneously considering two occupational dimensions: white-collar versus blue-collar work, and high-skilled versus low-skilled work. Using Eurobarometer data for a large number of European countries (2008-2012) our findings confirm that self-employed workers are more satisfied with their lives than paid employees are. A life satisfaction premium is also found when the self-employed and paid employees are compared within similar occupations in terms of collar type and skill level. Finally, self-employment can help to overcome low life satisfaction scores associated with blue-collar and low-skilled work.

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Introduction

A decisive factor in determining life satisfaction is whether one works. Indeed, research has clearly shown that being unemployed has severe negative consequences in terms of life satisfaction (Clark & Oswald, 1994; Winkelmann & Winkelmann, 1998). Likewise, the influences of various work-related aspects on life satisfaction have received considerable attention in the life satisfaction literature (Helliwell and Huang, 2011; Erdogan et al., 2012). However, previous studies have largely neglected to examine the occupational choice between entrepreneurship and paid employment (Nieß and Biemann, 2014). Although several studies indicate that the self-employed report higher levels of work satisfaction than paid employees do (e.g, Hundley, 2001; Benz and Frey, 2008; Millan et al., 2013), much less is known about their levels of life satisfaction.

Some cross-sectional evidence suggests that the self-employed have higher levels of life satisfaction than paid employees do (Blanchflower and Oswald, 1998; Alesina et al., 2004; Andersson 2008) and that a switch from paid employment to self-employment increases life satisfaction (Binder and Coad, 2013).

Building on the previous literature, the current paper focuses on life satisfaction levels of the self-employed in different types of occupations. First, we investigate whether the self-employed are more satisfied with their lives than paid employees are using a large sample of workers from a substantial number of European countries. The self-employed differ from paid employees in the sense that self-employed individuals act as independent actors in the market, whereas paid employees operate in hierarchical organizations (Benz and Frey, 2008). Because of this difference, self-employed individuals have more freedom in their work, such as freedom in choosing their work tasks and working hours, whereas paid employees work in a hierarchal setting in which they need to obey orders from others to some extent. As a result, self-employed individuals derive higher utility from the procedures in their work rather than the outcomes than employees working in organizations and are thus more satisfied with their work as a whole (Benz and Frey, 2008). Such higher procedural utility and work satisfaction could also lead to higher life satisfaction for the self-employed, partly because of the positive relationship between work and life satisfaction (see also Erdogan et al., 2012). Furthermore, the jobs of entrepreneurs are typically more active, combining high levels of job control and job demand, which can enhance the experience of

flow (Stephan and Roesler, 2010; Patzelt and Shepherd, 2011). This tendency suggests that self-employed workers are more likely than paid employees to consider their work meaningful and challenging, and such a view may result in higher levels of well-being (Csíkszentmihályi, 1975). However, one aspect that should be considered in the domain of self-employment is that a high level of involvement in work-related activities could result in work-family conflicts and hence in lower satisfaction levels in other life domains (Ford et al., 2007), potentially harming overall life satisfaction levels (Matthews et al., 2014).

Second, we explore heterogeneity with regard to the relationship between self-employment and life satisfaction by turning attention to different groups of self-employed workers. In the current literature, there is lack of knowledge about how diverse the group of self-employed individuals is with respect to life satisfaction. The amount of life satisfaction that results from self-employed work could differ because the work varies, for example, in terms of physical demands, mental challenges, and the degree of routineness. Because we know that considerable heterogeneity exists within the group of self-employed workers, for example, in terms of opportunity-based and necessity-based motivations (Kautonen and Palmroos, 2010), different groups of self-employed workers may experience different levels of life satisfaction and may not always be more satisfied than paid employees in a similar occupation. In this study, we consider two occupational distinctions that could be relevant to life satisfaction of the self-employed: collar type (white- versus blue-collar workers) and skill level (high-skilled versus low-skilled workers). White-collar and high-skilled workers often differ from blue-collar and low-skilled workers not only in terms of the type of work that they perform (work in an office environment vs. manual labor) but also in terms of their level of education, expectations and aspirations. In addition, the different types of occupations often vary in terms of objective characteristics, such as working conditions, promotional prospects and occupational prestige.

The remainder of this paper is organized as follows. Section II describes the data and empirical strategy. Section III presents the results. Concluding remarks follow in Section IV.

Data and Methodology

Data and Variables

To examine the relationship between occupation and life satisfaction, we use data from the Gesis Eurobarometer and utilize individual information on life satisfaction and occupational status. Repeated cross-section data are pooled over time (for 2008-2012), yielding a sample of nearly 50,908 paid employed and self-employed individuals in 205 regions in 28 European countries. Unemployed individuals and other groups that were originally included in the survey, such as students, retirees and individuals who are unable to work, are omitted from our sample to allow for a direct comparison between self-employed workers and paid employees and to ignore any possible effects that derive from the inclusion of the economically inactive population.

Our dependent variable is a four-point scale measure of life satisfaction in which people are asked to respond to the following question: "*On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead*?" Possible answers are (1) not at all satisfied, (2) not very satisfied, (3) fairly satisfied and (4) very satisfied.[79] This life satisfaction question used to measure SWB has been frequently employed in earlier research (see Veenhoven, 2016). Higher values indicate more satisfied individuals.

An individual's self-employment status was assessed based on whether his/her (self-reported) primary occupation is in self-employment or paid employment. However, it is important to account for heterogeneity within the self-employed and paid employee groups. In this research, we further distinguish between different occupations along two lines: collar type and skill level. With regard to collar type, white-collar workers are those who perform professional jobs, typically in an office setting. Blue-collar work involves more hands-on duties and includes manual labor. The distinction between white-collar and blue-collar workers is based on the ISCO-88 (International Standard Classification of Occupations) 1-digit classification, where ISCO-88 major occupational groups 1-5 are defined as white-collar labor and ISCO-88 major occupational groups 6-9 are designated as blue-collar labor

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[79] Non-respondents and those who answered "Don't know" were excluded from the sample.

(see Appendix A). Skill level is based on the range and complexity of tasks involved, with the complexity of tasks having priority over the range of tasks. Skill level distinguishes between individuals who perform high-skilled tasks from those who perform tasks requiring little skill. High-skilled occupations fall into ISCO-88 categories 1, 2, 3, 6 and 7, whereas low-skilled jobs fall into categories 4, 5, 8 and 9. A more detailed explanation and a taxonomy of occupations can be found in Appendix A. Based on this taxonomy, an initial division of four occupational groups was made: white-collar and high-skilled employment, white-collar and low-skilled employment, blue-collar and high-skilled employment, and blue-collar and low-skilled employment.

In addition to the main variables of interest, our analysis includes a set of control variables denoting personal characteristics (demographics and socio-economic characteristics) that may confound the relationship between occupational type and life satisfaction. These personal characteristics are gender, age, marital status, number of children and education level[80], perceived financial situation, and perceived job situation. An overview of all variables included in the empirical analyses can be found in Appendix B, while descriptive statistics can be found in Appendix C.

Table 1 displays the prevalence of collar type and skill level among the groups of self-employed and paid employed workers. It can be seen that blue-collar occupations are more prevalent among self-employed workers (57.7%) than among paid employees (32.1%). The differences in skill level are much smaller; almost 58% of the self-employed are involved in high-skilled work, while this is true for 48.5% of the paid employees.

Table 1: Descriptive statistics: prevalence of occupational groups among paid employees and the self-employed

	White collar & high-skilled	White collar & low-skilled	Blue collar & high-skilled	Blue collar & low-skilled
Paid employees	24.4%	43.5%	24.1%	8.0%
Self-employed	17.5%	24.9%	40.3%	17.4%

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[80] Please note that the correlation coefficients between education level and the occupational characteristics were moderate at most (full set of correlation coefficients available from the authors upon request). High-skilled workers, white-collar workers, and paid employees tend to be higher educated than low-skilled workers, blue-collar workers, and self-employed workers.

Econometric Model

To examine the relationships between occupation type and life satisfaction, we specify a simple reduced-form life satisfaction equation (see also Di Tella et al., 2003; Arampatzi et al., 2015):

$$LS_{jit} = \Omega \text{ Occupational Type }_{jit} + \Sigma \text{ Personal }_{jit} + \varepsilon_i + \lambda_t + \mu_{jit},$$

where LS_{jit} is a self-reported measure of life satisfaction for individual j in region i in year t and *Occupational Type$_{jit}$* is a vector of the occupational characteristics of individuals (self-employed versus paid employed, white-collar versus blue-collar work, high-skilled versus low-skilled work), *Personal$_{jit}$* is a vector of other personal and socioeconomic characteristics of individuals, ε_i is a vector of region (NUTS-2) dummies[81] to control for time-invariant regional characteristics, λ_t is a vector of time dummies included to capture global time-related external shocks, and μ_{jit} is a residual error. Given the ordinal nature of our dependent variable LS_{jit}, ordered probit regressions were performed with corrected (robust) standard errors.

Empirical Results

Table 2 presents the marginal effects resulting from ordered probit regressions using the full sample of self-employed and paid employees[82], where we focus on the marginal effects belonging to the "very satisfied" category of the dependent variable (highest category). In line with our expectations, the results indicate that individuals who are self-employed are significantly more satisfied with their lives than are paid employees (Column 1). After controlling for collar type and skill type the self-employed are still significantly

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[81] The region-fixed effects were found to be jointly significant. Robustness-check interaction terms between time and regions were applied (see also Di Tella et al., 2003), yielding similar results.
[82] We are interested mainly in the marginal effects of the job characteristics. With regard to the control variables, we find significant positive relationships between life satisfaction and the level of education, financial situation of the household, and personal job situation. Likewise, young, female, and married respondents are significantly more likely to report to be very satisfied than old, male, and unmarried respondents. The relationship between having children and life satisfaction was positive but small. These findings are in line with the existing literature.

more satisfied than paid employees (Columns 2 and 3).[83] We find that, compared with being in paid employment, being self-employed increases the probability of reporting to be very satisfied by 0.017 (1.7 percentage points)[84]. This figure raises to 0.022 when controlling for collar type and skill level. At the same time, it can be observed that compared to the group of white-collar and high-skilled workers, respondents belonging to the white-collar and low-skilled, blue-collar and high-skilled, and blue-collar and low-skilled groups are significantly less satisfied with their lives. The absolute difference between paid employed and self-employed (0.022) is smaller than between the white-collar and high-skilled workers and both groups of blue-collar workers (0.030 and 0.043).[85]

Table 2: Marginal effects of occupational characteristics on the probability of being 'very satisfied' based on ordered probit regressions

	(1)	(2)	(3)
Paid employees	Reference		Reference
Self-employed	0.017***	--	0.022***
	(0.003)		(0.003)
White-collar and high-skilled labor	--	Reference	Reference
White-collar and low-skilled labor	--	-0.017***	-0.016***
		(0.003)	(0.003)
Blue-collar and high-skilled labor	--	-0.027***	-0.030***
		(0.004)	(0.003)
Blue-collar and low-skilled labor	--	-0.039***	-0.043***
		(0.005)	(0.005)
Control variables	Included	Included	Included
Region fixed effects	Included	Included	Included
Time fixed effects	Included	Included	Included
Observations	50,908	50,908	50,908

Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

[83] Based on the estimation in Column 3, the predicted probabilities of belonging to the four categories of the dependent variables (including the extreme categories) are 0.05 for "not at all satisfied", 0.17 for "not very satisfied", 0.56 for "fairly satisfied", and 0.22 for "very satisfied".

[84] The raw coefficients and a full report of the marginal effects are available upon request.

[85] In a similar vein, the differences between lowest and highest educated respondents are more pronounced. Compared to having less than 15 years of education, having enjoyed more than 20 years of education increases the probability of reporting to be very satisfied by 3.5 percentage points. Although, self-employment is significantly associated with life satisfaction, other occupational characteristics seem to matter more.

Next, we distinguish between 8 occupational categories based on the three occupational dimensions: self-employment versus paid employment, white-collar versus blue-collar labor, and high-skilled versus low-skilled work ($2\times2\times2$). Table 3 presents the resulting 8 marginal effects, one for each category. Each column of Table 3 takes another category as the reference category such that we test directly for statistically significant differences across the occupational categories. Again, marginal effects are presented for the highest category of the dependent variable ("very satisfied"). This analysis is conducted to examine the differences in life satisfaction between self-employed and paid employees for different types of occupations.

The results can be summarized as follows. First, within every occupational category (collar type by skill level), self-employed individuals have a significantly higher probability of being very satisfied with their lives than paid employees. Among the white-collar high-skilled workers, the probability of being "very satisfied" among the self-employed is 1.8 percentage-points (marginal effect is 0.018) higher than among paid employees. Similar results are found for the other occupational categories: the marginal effects range from 0.016 (blue-collar high-skilled; Column 5) to 0.033 (blue-collar low-skilled; Column 7). Hence, the life satisfaction premium for the self-employed can be observed within different occupational types.

Second, the results for occupational categories suggest that self-employment can help to overcome the low life satisfaction scores associated with blue-collar versus white-collar work, and with low-skilled versus high-skilled work. Most notably, (1) blue-collar low-skilled self-employed workers do *not* have a significantly lower probability of being "very satisfied" than blue-collar high-skilled paid employees (Table 3, Column 5) or white-collar low-skilled paid employees (Table 3, Column 3); and (2) white-collar low-skilled self-employed workers do *not* have a significantly lower probability of being "very satisfied" than white-collar high-skilled paid employees (Column 1). In fact, the only group of self-employed workers that is significantly less satisfied with life than any of the groups of paid employees is that of blue-collar high-skilled self-employed workers (who are significantly less satisfied than white-collar high-skilled employees; Column 1). Hence, self-employment appears to make people more satisfied than paid employees, even when they do not have the same skills or perform the same type of labor.

Third, collar type by skill level has a less profound effect on life satisfaction among self-employed workers than among paid employees, signified by the smaller variation in marginal effects for the 4 occupational categories within self-employment than within paid employment. For example, the two white-collar categories in self-employment do not have significantly different marginal effects, and this also holds true for the two blue-collar categories in self-employment. In paid employment all categories have significantly different marginal effects. An explanation for this finding could be the important role of job autonomy in self-employment which could diminish the relevance of other job characteristics for determining life satisfaction.

Table 3: Marginal effects of occupational characteristics on the probability of being 'very satisfied': 8 occupational

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
White-collar & High-skilled								
Paid Employee	Reference	-0.018**	0.017***	-0.01	0.029***	0.013**	0.046***	0.016**
		(0.007)	(0.003)	(0.006)	(0.004)	(0.005)	(0.005)	(0.008)
Self-employed	0.018**	Reference	0.035***	0.008	0.047***	0.031***	0.064***	0.035***
	(0.007)		(0.007)	(0.009)	(0.008)	(0.008)	(0.009)	(0.010)
White-collar & Low-skilled								
Paid Employee	-0.017***	-0.035***	Reference	-0.027***	0.012***	-0.004	0.029***	-0.001
	(0.003)	(0.007)		(0.006)	(0.003)	(0.005)	(0.005)	(0.008)
Self-employed	0.01	-0.008	0.027***	Reference	0.039***	0.023***	0.056***	0.026***
	(0.006)	(0.009)	(0.006)		(0.006)	(0.007)	(0.007)	(0.010)
Blue-collar & High-skilled								
Paid Employee	-0.029***	-0.047***	-0.012***	-0.039***	Reference	-0.016***	0.017***	-0.013
	(0.004)	(0.008)	(0.003)	(0.006)		(0.005)	(0.005)	(0.008)
Self-employed	-0.013**	-0.031***	0.004	-0.023***	0.016***	Reference	0.033***	0.003
	(0.005)	(0.008)	(0.005)	(0.007)	(0.005)		(0.006)	(0.009)

Blue-collar & Low-skilled

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Paid Employee	-0.046***	-0.064***	-0.029***	-0.056***	-0.017***	-0.033***	Reference	-0.030***
	(0.005)	(0.009)	(0.005)	(0.007)	(0.005)	(0.006)		(0.009)
Self-employed	-0.016**	-0.035***	0.001	-0.026***	0.013	-0.003	0.030***	Reference
	(0.008)	(0.010)	(0.008)	(0.010)	(0.008)	(0.009)	(0.009)	
Personal characteristics	Included	Included	Included	Included	Included	Included	Included	Included
Region fixed effects	Included	Included	Included	Included	Included	Included	Included	Included
Time fixed effects	Included	Included	Included	Included	Included	Included	Included	Included
Observations	50,908	50,908	50,908	50,908	50,908	50,908	50,908	50,908

Robust standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.10; full table including marginal effects of personal characteristics is available upon request.

Concluding Remarks

This study aimed to investigate the variation in life satisfaction among self-employed workers and paid employees, accounting for heterogeneity within the group of self-employed workers. We found that the self-employed are generally more satisfied with their lives than paid employees are and that self-employment can even help to overcome the low life satisfaction scores associated with low-skilled and blue-collar work. This finding complements the limited existing empirical evidence in this area and contributes to the debate on whether self-employed workers who have consistently been found to be more satisfied with their work than paid employees are also more satisfied with their lives. This finding is not straightforward because an extensive focus on work may come at the expense of satisfaction in other life domains (e.g., having less time for leisure and spending time at home) and hence may reduce life satisfaction.

Appendices

Appendix A

Table A1: Classification for four occupational groups

Collar type	White-collar	Legislators, senior officials and managers (Code 1), professionals (Code 2), technicians and associate professionals (Code 3). Clerks (Code 4) and service workers and shop and market sales workers (Code 5).
	Blue-collar	Skilled agricultural and fishery (Code 6) workers and craft and related trades workers (Code7). Plant and machine operators (Code 8) and assemblers and elementary occupations (Code 9).
Skill level	High-skilled	Legislators, senior officials and managers (Code 1), professionals (Code 2), technicians and associate professionals (Code 3). Skilled agricultural and fishery (Code 6) workers and craft and related trades workers (Code7)
	Low-skilled	Clerks (Code 4) and service workers and shop and market sales workers (Code 5). Plant and machine operators (Code 8) and assemblers and elementary occupations (Code 9).

Appendix B

Table B1: Description of all variables included in the analysis

Variable	Type	Categories
Dependent variable		
Life satisfaction	Ordinal	Not at all satisfied; not very satisfied; fairly satisfied; very satisfied
Job characteristics		
Occupation	Binary	Self-employed; paid employees
Collar type	Binary	White-collar; blue-collar
Skill level	Binary	High-skilled; low-skilled
Demographics		
Gender	Binary	Male; female
Age group	Categorical	15-24; 25-39; 40-54; 55+
Socio-economic characteristics		
Marital status	Categorical	Single or unmarried; divorced, widowed or separated; married
Number of children in the household	Categorical	No children; 1 child; 2 children or more
Education (to age)	Categorical	Less than 15; 15-20 years; More than 20 years; No full time education
(Perceived) financial situation of the household	Ordinal	Very bad; rather bad; rather good; very good
(Perceived) personal job situation	Ordinal	Very bad; rather bad; rather good; very good

Appendix C

Table C1: Descriptive statistics for the full sample

	N	Mean	SD	Min	Max
Dependent variable					
Life satisfaction	50,908	2.95	0.77	1	4
Job characteristics					
Self-employed	50,908	0.16	0.36	0	1
White-collar	50,908	0.64	0.48	0	1
High-skilled	50,908	0.50	0.50	0	1
Demographics					
Female	50,908	0.48	0.50	0	1
Age groups (reference = 15-24)	50,908	0.37	0.48	0	1
25-39 years old					
40-54 years old		0.40	0.49	0	1
55+ years old		0.17	0.37	0	1
Socio-economic characteristics					
Marital status (reference = single)	50,908	0.11	0.31	0	1
Divorced/separated/widowed					
Married		0.66	0.47	0	1
Number of children in household (reference = 0 children)	50,908	0.19	0.39	0	1
One child					
2 or more		0.18	0.39	0	1
Education (to age) (reference = 15-20 years)	50,908				
16-19 years		0.52	0.50	0	1
> 20 years		0.37	0.48	0	1
No full-time education		0.01	0.11	0	1
Financial situation household (reference = very	50,908				

bad financial situation)					
Rather bad financial situation		0.26	0.44	0	1
Rather good financial situation		0.57	0.49	0	1
Very good financial situation		0.10	0.31	0	1
Personal job situation (reference = very bad job situation)	50,908				
Rather bad job situation		0.20	0.40	0	1
Rather good job situation		0.56	0.50	0	1
Very good job Situation		0.18	0.38	0	1

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Summary (English)

Over the last few years, policy-makers and scholars have highlighted the (complementary) role of subjective well-being indicators in evaluating economic and social progress, however, research on subjective well-being related to the causes and consequences of socioeconomic phenomena such as social uprisings and economic crises is generally limited. This dissertation uses *subjective judgements of how well we do in life* to provide evidence on the wider impact of economic crises and turmoil on subjective well-being. The scope of this dissertation includes incorporating subjective well-being measures in the study of progress, identifying sources of dissatisfaction and examining what the preconditions are for economic and social progress to coincide.

In the first part of this dissertation, I explore the relative performance of an income-based indicator of prosperity compared to a subjective well-being indicator of prosperity and empirically examine the factors that possibly drive their differences. My findings suggest that four key factors – perceptions about standards of living, unemployment rates, perceptions about local job market and perceptions about corruption in government– explain the discrepancy between the two types of measures.

In the second part, I examine the sources and preconditions in which positive economic progress goes hand in hand with dissatisfaction and in which negative economic progress is less painful. Despite the economic and human progress observed in many Arab Spring countries prior to the social uprisings, a decline in life satisfaction from already relatively low levels preceded the Arab Spring uprisings. The decline in life satisfaction on the eve of the Arab spring was associated primarily with dissatisfaction with the standard of living, poor labor market conditions, and corruption in the form of nepotism or cronyism. Regarding the impact of economic downturns on subjective well-being, I identify three contingencies that moderate subjective well-being losses; financial distress, expectations and regional quality of governance. In a first study, I find that during the euro-crisis macroeconomic conditions are negatively associated with the life satisfaction of the employed population in Europe, but not in a linear fashion. Employees who are in financial distress are negatively affected by rising unemployment and inflation, but financially safe employees are not. Therefore, I support the view that the negative impact of unemployment and inflation is mediated by the extent to which households are in financial distress amongst

the employed population. In a second study, I explore the impact of an exogenous event, the announcement of the Greek bailout referendum in 2015 and find that the event had a considerable impact on the happiness of the respondents. This drop, however, was closely associated with the expectations of the respondents regarding their future. Those with higher expectations before the announcement of the referendum experienced smaller decreases in subjective well-being and adapted more quickly to this adverse event compared to individuals who held negative expectations regarding the future. This supports the view that positive expectations can be a source of resilience, allowing individuals to cope with and adapt more quickly to adverse events. In a third study, I examine the moderating role of quality of governance as an alleviating factor in response to the Great Recession in terms of subjective well-being. The results show quality of governance has a mitigating effect in times of crisis and that the additional gaps that are not explained by macroeconomic indicators are significantly predicted by these formal and predominantly localized institutions. My results highlight the importance and the relevance of SWB and its moderators in enhancing our ability to evaluate the wider causes and consequences of socioeconomic phenomena.

Samenvatting (Nederlands)

In de afgelopen jaren hebben beleidsmakers en academici de (complementaire) rol van subjectief welzijn benadrukt in de evaluatie van economische en sociale ontwikkeling. Desalniettemin is onderzoek naar subjectief welzijn in relatie tot de determinanten en gevolgen van socio-economische fenomenen zoals sociale onrust en economische crises over het algemeen beperkt. Deze dissertatie maakt gebruik van *subjectieve oordelen van hoe goed we het in het leven doen* om bewijs te leveren over de bredere impact van economische crises en onrust op subjectief welzijn. De reikwijdte van deze dissertatie omvat het toepassen van maten van subjectief welzijn in onderzoek naar maatschappelijke ontwikkeling, het identificeren van bronnen van ontevredenheid en het onderzoeken van de voorwaarden voor het samengaan van economische en sociale ontwikkeling.

In het eerste deel van deze dissertatie verken ik de relatieve prestaties van een inkomens-gebaseerde indicator van voorspoed vergeleken met een subjectieve-welzijnsindicator van voorspoed en verken ik empirisch de factoren die mogelijk hun verschillen verklaren. Mijn bevindingen suggereren dat vier centrale factoren – percepties van levensstandaarden, werkloosheidspercentages, percepties van de lokale arbeidsmarkt en percepties van corruptie in de overheid – de discrepantie tussen de twee typen maten verklaren.

In het tweede deel verken ik de bronnen en omstandigheden waarin positieve economische ontwikkeling hand in hand gaat met ontevredenheid en waarin negatieve economische ontwikkeling minder pijnlijk is. Ondanks de sociale en economische vooruitgang die geobserveerd kan worden in veel Arabische Lente-landen daalde de toch al lage levenstevredenheid verder in de aanloop naar de maatschappelijke opstanden. Deze dalende levenstevredenheid was primair gerelateerd met ontevredenheid over de levensstandaard, omstandigheden op de arbeidsmarkt en nepotisme.

Met betrekking tot de impact van economische krimp op subjectief welzijn, identificeer ik drie mogelijke factoren die verliezen in subjectief welzijn modereren; financiële stress, verwachtingen en regionale kwaliteit van de overheid. In een eerste studie vind ik dat tijdens de euro-crisis macro-economische condities negatief verbonden zijn met de levenstevredenheid van de werkzame beroepsbevolking van Europa, maar niet op lineaire wijze. Werknemers die financiële stress ervaren, worden negatief beïnvloed door

toenemende werkloosheid en inflatie, maar financieel zekere werknemers worden dat niet. Daarom onderschrijf ik het idee dat de negatieve invloed van werkloosheid en inflatie gemedieerd wordt door de mate waarin huishoudens met mensen die behoren tot de werkende bevolking financiële stress ervaren.

In een tweede studie verken ik de invloed van een exogene gebeurtenis, de bekendmaking van het Griekse 'bail-out' referendum in 2015, en vind dat de gebeurtenis een aanzienlijke invloed had op het geluk van de respondenten. Deze afname was echter sterk geassocieerd met de verwachtingen van de respondenten met betrekking tot hun toekomst. Degenen met hogere verwachtingen vóór de bekendmaking van het referendum ervoeren een kleinere afname van subjectief welzijn en pasten zich sneller aan na deze negatieve gebeurtenis, vergeleken met individuen die negatieve verwachtingen hadden van de toekomst.

Dit onderschrijft het perspectief dat positieve verwachtingen een bron van weerbaarheid kunnen zijn die individuen in staat stelt het hoofd te bieden aan, en zich aan te passen aan, negatieve gebeurtenissen. In een derde studie verken ik de modererende rol van de kwaliteit van bestuur als een verzachtende factor tijdens de kredietcrisis met betrekking tot subjectief welzijn. De resultaten laten zien dat de kwaliteit van bestuur verzachtende effecten heeft in tijden van crisis en dat de aanvullende hiaten, die niet verklaard kunnen worden door macro-economische indicatoren, op significante wijze kunnen woorden voorspeld aan de hand van deze formele en voornamelijk lokale instituten.

Mijn resultaten onderstrepen het belang en de relevantie van subjectief welzijn, en de moderatoren hiervan, in het verbeteren van ons vermogen om de bredere oorzaken en gevolgen van socio-economische fenomenen te evalueren.

Περίληψη (Greek)

Τα τελευταία χρόνια, πολλοί ερευνητές αλλά και υπεύθυνοι φορείς για τη χάραξη πολιτικής υπογράμμισαν την (συμπληρωματική) αξία των υποκειμενικών δεικτών ευημερίας για την αξιολόγηση της οικονομικής και κοινωνικής προόδου, ωστόσο η έρευνα για την υποκειμενική ευημερία που σχετίζεται με τις αιτίες και τις συνέπειες διάφορων κοινωνικοοικονομικών φαινομένων όπως οι κοινωνικές εξεγέρσεις και οι οικονομικές κρίσεις είναι γενικά περιορισμένη. Αυτή η διατριβή χρησιμοποιεί υποκειμενικούς δείκτες ευημερίας ώστε να παρέχει στοιχεία σχετικά με τον ευρύτερο αντίκτυπο των οικονομικών κρίσεων και των κοινωνικών αναταραχών.

Σκοπός της παρούσας διατριβής λοιπόν είναι η ενσωμάτωση των υποκειμενικών δεικτών ευημερίας στην αξιολόγηση της οικονομικής και κοινωνικής προόδου, ο εντοπισμός των πηγών της κοινωνικής δυσαρέσκειας και η εξέταση των προϋποθέσεων για την επίτευξη της οικονομικής και κοινωνικής προόδου.

Το πρώτο μέρος αυτής της διπλωματικής εργασίας, ερευνά τη επίδοση ενός εισοδηματικού δείκτη ευημερίας συγκριτικά με έναν δείκτη υποκειμενικής ευημερίας και εξετάζει εμπειρικά τους παράγοντες που ενδεχομένως εξηγούν τις διαφορές τους. Τα ευρήματά δείχνουν ότι τέσσερις βασικοί παράγοντες - οι αντιλήψεις για το βιοτικό επίπεδο, τα ποσοστά ανεργίας, οι αντιλήψεις για την τοπική αγορά εργασίας και οι αντιλήψεις για τη διαφθορά στην κυβέρνηση - εξηγούν τις αποκλίσεις μεταξύ των δύο δεικτών.

Το δεύτερο μέρος αυτής της διπλωματικής εργασίας εξετάζει τις πηγές και τις προϋποθέσεις στις οποίες η οικονομική πρόοδος συμβαδίζει με την υποκειμενική δυσαρέσκεια και τις προϋποθέσεις βάσει τον οποίων η αρνητική οικονομική πρόοδος είναι λιγότερο οδυνηρή.

Παρά την οικονομική και ανθρώπινη πρόοδο που παρατηρήθηκε σε πολλές χώρες της Αραβικής Άνοιξης πριν από τις κοινωνικές εξεγέρσεις, η πτώση των δεικτών της ικανοποίησης με τη ζωή, από ήδη σχετικά χαμηλά επίπεδα, προηγήθηκε των εξεγέρσεων της Αραβικής Άνοιξης. Η πτώση της ικανοποίησης με την ζωή την παραμονή της αραβικής άνοιξης συνδέεται κυρίως με την δυσαρέσκεια με το βιοτικό επίπεδο, τις συνθήκες στην αγορά εργασίας και την ευνοιοκρατία.

Όσον αφορά τον αντίκτυπο της οικονομικής ύφεσης στην υποκειμενική ευημερία, εντοπίζονται τρεις παράγοντες που μετριάζουν τις απώλειες στους δείκτες υποκειμενικής

ευημερίας; οι οικονομικές δυσχέρειες, οι προσδοκίες και η περιφερειακή ποιότητα διακυβέρνησης. Σε μια πρώτη μελέτη, διαπιστώνεται ότι κατά τη διάρκεια της κρίσης της ευρωζώνης, οι μακροοικονομικές συνθήκες συνδέονται αρνητικά με την ικανοποίηση της ζωής του απασχολούμενου πληθυσμού στην Ευρώπη, αλλά αυτή η συσχέτιση δεν είναι γραμμική. Οι εργαζόμενοι που αντιμετωπίζουν οικονομικές αντιξοότητες επηρεάζονται αρνητικά από την αύξηση της ανεργίας και του πληθωρισμού, ενώ οι οικονομικά ασφαλείς εργαζόμενοι όχι. Ως εκ τούτου, υποστηρίζω την άποψη ότι οι αρνητικές επιπτώσεις της ανεργίας και του πληθωρισμού μετριάζονται από το βαθμό στον οποίο τα νοικοκυριά αντιμετωπίζουν οικονομικές αντιξοότητες.

Σε μια δεύτερη μελέτη, διερευνώνται οι επιπτώσεις ενός εξωγενούς γεγονότος, της ανακοίνωσης του ελληνικού δημοψηφίσματος διάσωσης το 2015, και διαπιστώνεται ότι το γεγονός είχε σημαντικό αντίκτυπο στην ευτυχία των ερωτηθέντων. Η πτώση αυτή, ωστόσο, συνδέεται στενά με τις προσδοκίες των ερωτηθέντων σχετικά με το μέλλον τους. Όσοι είχαν υψηλότερες προσδοκίες πριν από την ανακοίνωση του δημοψηφίσματος εμφάνισαν μικρότερες μειώσεις στην υποκειμενική ευημερία τους και προσαρμόστηκαν ταχύτερα σε σύγκριση με άτομα που είχαν αρνητικές προσδοκίες σχετικά με το μέλλον. Τα αποτελέσματα αυτά στηρίζουν την άποψη ότι οι θετικές προσδοκίες μπορούν να αποτελέσουν πηγή ανθεκτικότητας επιτρέποντας στα άτομα να αντιμετωπίσουν και να προσαρμοστούν πιο γρήγορα σε ανεπιθύμητα συμβάντα. Σε μια τρίτη μελέτη, εξετάζεται ο διαμεσολαβητικός ρόλος της ποιότητας της διακυβέρνησης ως ανακουφιστικός παράγοντας των αρνητικών συνεπειών της οικονομικής κρίσης το 2010 στην υποκειμενική ευημερία. Τα αποτελέσματα δείχνουν ότι η ποιότητα της διακυβέρνησης έχει ελαφρυντική επίδραση σε περιόδους κρίσης και ότι οι πρόσθετες απώλειες που δεν εξηγούνται από τους μακροοικονομικούς δείκτες προβλέπονται σημαντικά από αυτούς τους επίσημους και κατά κύριο λόγο περιφερειακούς θεσμούς.

Τα αποτελέσματά τονίζουν τη σημασία και τη συνάφεια τον υποκειμενικών δεικτών ευημερίας και των παραγόντων που τους καθορίζουν στην ενίσχυση της ικανότητάς μας να αξιολογούμε τα ευρύτερα αίτια και τις συνέπειες κοινωνικοοικονομικών φαινομένων.

About the author

Efstratia holds a degree in International and European studies from the University of Macedonia in Greece and a master's degree in Economics and Business from Erasmus University in the Netherlands. She started her PhD in 2014 under the supervision of Harry Commandeur, Frank van Oort and Martijn Burger. Her research focuses on happiness economics and the determinants of subjective well-being, including the effects of economic shocks and the role of governance, occupational choice, and social network sites. She has co-authored several articles published in the Journal of Happiness Studies and Applied Economic Letters.

Portfolio of Efstratia Arampatzi

Academic degrees

2018: (PhD) Erasmus School of Economics, *Rotterdam, Netherlands*
2013: (MSc) Economics and Business, Specialization in Entrepreneurship and Strategy Economics, Erasmus School of Economics, *Rotterdam, Netherlands*
2011: (BA) International and European studies, Specialization in International and European Economic Studies, *University of Macedonia, Thessaloniki, Greece*

Refereed publications

- Hessels, J., Arampatzi, E., van der Zwan, P., & Burger, M. (2017). Life satisfaction and self-employment in different types of occupations. *Applied Economics Letters*, 1-7.
- Arampatzi, Efstratia, Martijn J. Burger, and Ruut Veenhoven. "Financial distress and happiness of employees in times of economic crisis." *Applied Economics Letters* 22.3 (2015): 173-179.
- Arampatzi, E., Burger, M. J., & Novik, N. (2016). Social Network Sites, Individual Social Capital and Happiness. *Journal of Happiness Studies*, 1-24.
- Arampatzi, E., Burger, M. J., Ianchovichina, E., Röhricht, T., & Veenhoven, R. (2018) Unhappy Development: Dissatisfaction with Life in the Wake of the Arab Spring. *Review of Income and Wealth*

Professional Publications

Martijn Burger & Efstratia Arampatzi (2014), Geluk en werkloosheid in tijden van economische crisis, *SMO*.

Working Papers

- Arampatzi, Martijn Burger, Spyridon Stavropoulos, Louis Thai "The Role of Positive Expectations for Resilience to Adverse Events: Subjective Well-being before, during and after the Greek Bailout Referendum". Working Paper.
- Jolanda Hessels, Efstratia Arampatzi, Peter van der Zwan & Martijn J. Burger, 'Happiness of self-employed versus paid employed: A comparison of high-skilled, low-skilled, blue-collar, and white-collar workers'. Working Paper.
- Efstratia Arampatzi, Martijn Burger, Spyridon Stavropoulos Frank van Oort, "Subjective Well-Being and the 2008 Recession; Regional Quality of Governance as a Moderator." Working Paper.

- Martijn J. Burger, Elena I. Ianchovichina, Efstratia Arampatzi, Shantayanan Devarajan, Ruut Veenhoven and Caroline T. Witte, "Beyond Shared Prosperity: Measuring Progress with Shared Well-being Using Subjective Data" Working Paper.
- Efstratia Arampatzi, Martijn J. Burger, Frank van Oort & Spyridon Stavropoulos, "The impact of industrial change on subjective well-being: evidence from European regions". Working Paper

Valorisation

Arampatzi E., Burger M.J., Stavropoulos S. tvxs.gr "Χαρούμενες εκλογές κ. Πρωθυπουργέ" [Happy Elections, Mr. Prime Minister] (In Greek), 2015

AD interview and article "*Ongelukkige mensen nog ongelukkiger door Facebook*", 2016

Teaching

Seminar: Multinationals and Business Networks, Master Entrepreneurship and Strategy Economics, (Master, 2014-Present), Erasmus School of Economics

Seminar: Multinationals and Business Networks, Master Urban Port and Transport Economics, (Master, 2014-Present), Erasmus School of Economics

Minor Quality of Life and Happiness Economics, Topics in Quality of Life and Happiness Economics, (Bachelor-3, 2014), Erasmus School of Economics

Guest lecturer: Institute of Housing and Urban Studies, 2015

Participations

- International Conference on Policies for happiness and health conference, Siena, Italy, 2018
- 15th ISQOLS Annual Conference, Innsbruck, Austria, 2017
- Conference of the International Association for Research in Income and Wealth (IARIW), Seoul, South Korea, April 2017.
- Conference of the Erasmus Happiness Economics Research Organisation (EHERO) and the Erasmus Institute for Philosophy and Economics (EIPE), Rotterdam, the Netherlands, March 2017.
- 14th International Conference Cyberspace, Brno, 2016
- 14th ISQOLS Annual Conference, Seoul, South Korea, 2016
- HEIRS Conference, Università LUMSA, Rome, 2016
- Econometrics Winter School, Porto, 2015

- 13th ISQOLS Annual Conference, Phoenix, Arizona, 2015
- 12th International Conference Cyberspace, Brno, 2014
- 7th European Conference in Positive Psychology, Amsterdam, 2014
- Get in the Ring (Global Entrepreneurship Week), Rotterdam, 2012
- Member of Study Association EUREOS, Rotterdam 2012
- Thessaloniki International Student Model United Nations (ThessISMUN), Thessaloniki 2007

Dissertations in the last four years

Abbink, E.J., *Crew Management in Passenger Rail Transport*, Promotors: Prof. L.G. Kroon & Prof. A.P.M. Wagelmans, EPS-2014-325-LIS, http://repub.eur.nl/pub/76927

Acar, O.A., *Crowdsourcing for Innovation: Unpacking Motivational, Knowledge and Relational Mechanisms of Innovative Behavior in Crowdsourcing Platforms*, Promotor: Prof. J.C.M. van den Ende, EPS-2014-321-LIS, http://repub.eur.nl/pub/76076

Akemu, O., *Corporate Responses to Social Issues: Essays in Social Entrepreneurship and Corporate Social Responsibility,* Promotors: Prof. G.M. Whiteman & Dr S.P. Kennedy, EPS-2017-392-ORG, https://repub.eur.nl/pub/95768

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Hurk, E. van der, *Passengers, Information, and Disruptions*, Promotors: Prof. L.G. Kroon & Prof. P.H.M. Vervest, EPS-2015-345-LIS, http://repub.eur.nl/pub/78275

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Over the last few years, policy-makers and scholars have highlighted the (complementary) role of subjective well-being (SWB) indicators in evaluating economic and social progress, however, research on SWB related to the causes and consequences of socioeconomic phenomena such as social uprisings and economic crises is in general limited. In his dissertation I use subjective judgments of how well we do in life to provide evidence on the wider impact of economic crises and turmoil on SWB.

In the first part of this dissertation, I explore the relative performance of an income-based indicator of prosperity compared to a subjective well-being indicator of prosperity and empirically examine the factors that possibly drive their differences. My findings suggest that four key factors – perceptions about standards of living, unemployment rates, perceptions about local job market and perceptions about corruption in government– explain the discrepancy between the two types of measures.

In the second part, I examine the sources and preconditions in which positive economic progress goes hand in hand with dissatisfaction and preconditions in which negative economic progress is less painful. Despite the progress observed in many Arab Spring countries prior to the social uprisings, the decline observed in life satisfaction on the eve of the Arab spring was associated primarily with dissatisfaction with the standard of living, poor labor market conditions, and corruption in the form of nepotism or cronyism. Regarding the impact of economic downturns on SWB, I find three factors that moderate SWB losses; financial distress, economic expectations and regional quality of governance.

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