The effects of macroeconomic shocks on well-being

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18th March 2013

Abstract

Previous literature has found that both unemployment and inflation lower happiness. The macroeconomist Arthur Okun characterised the negative effects of unemployment and inflation by the *misery index* - the sum of the unemployment and inflation rates. This paper extends the literature by looking at more countries over a longer time period. We find, conventionally, that both higher unemployment and higher inflation lower happiness. We also discover that unemployment depresses well-being more than inflation. We characterise this wellbeing trade-off between unemployment and inflation using what we describe as the misery *ratio*. Our estimates with European data imply that a one percentage point increase in the unemployment rate lowers well being by two and a half times as much as a one percentage point increase in the inflation rate. We also find that banking crises lower individual well-being, including crises before the Great Recession.

Keywords

Inflation, Misery-index, Unemployment, Well-being, Banking crises

Unemployment and inflation are major targets of macroeconomic policy, presumably because policymakers believe that a higher level of either variable has an adverse effect on welfare. The well-known macroeconomist, Arthur Okun, developed a measure known as the "misery index" – the sum of the unemployment rate and the inflation rate – which was intended to capture how increasing values of unemployment and inflation reduced national welfare. The measure conveys some information on how the economy is performing, however it also implicitly assigned equal weights to inflation and unemployment rates. Economic times characterised by high inflation and low unemployment are seen as bad as times characterised by low inflation and high unemployment. However, there is disagreement on the relative cost of unemployment and inflation. Standard macroeconomic models typically find small costs associated with unemployment, but they heavily depend on the representative agent framework (i.e., individual consumption mirrors aggregate consumption) and on a set of assumptions concerning for example risk aversion.[1] These findings contrast with concerns expressed in surveys by the public over the size of inflation and unemployment and the need for stabilization (Shiller, 1997). Furthermore, these models impose utility functions, assuming preference structure, and make inferences about the cost of business cycles or inflation. But the rapidly developing study of happiness, also known as subjective well-being, means that a more direct approach can be taken to investigating how unemployment and inflation affect welfare.

In this paper we use this approach to estimate the relative effects of unemployment and inflation as well as banking crises on well-being. This approach is based on assumptions about preferences that standard economics usually do not make in that it takes self reported happiness as a proxy of some underlying concept of utility. Nevertheless these assumptions are not stronger than the typical assumptions underlying standard models, so they can serve, at minimum, as complement to standard approaches. It is more direct than standard models because it relies on happiness surveys, but not as direct as asking opinions and views (á la Shiller).

We use a dataset comprising more than a million Europeans over the period 1975 to 2012 taken from the Eurobarometer Survey which is conducted by the European Commission in all member states one or more times every year.[2] We extend previous literature in this area by including the recent recession and covering a wider group of countries. Our estimates imply that, across European countries, on average a one percentage point increase in the unemployment rate lowers well-being by over three and a half times as much as a one percentage point increase in the inflation rate. The various European banking crises that have occurred over the last few decades turn out to also lower well-being, and this is true both of the Great Recession as well as earlier banking crises. Furthermore, we find a certain degree of heterogeneity in the inflation-unemployment trade off across groups of European countries.

We also examine individuals' views on the relative importance of inflation and unemployment. It turns out that unemployment is most often cited as the most important problem a country is

[1] Models based on endogeneous growth or individual-level data on earnings and consumption show bigger welfare costs (Barlevy, 2004; 2005).

[2] http://ec.europa.eu/public_opinion/index_en.htm

currently facing. There is also majority support in Europe for loosening deficit reduction programs to create jobs.

Section 1 considers the different approaches that have been developed to deal with welfare losses associated with inflation and unemployment, first by macroeconomists and then by researchers into subjective well-being. Section 2 considers how unemployment, inflation and the misery index have changed over time in both the US and Europe. We also examine individuals' views in Europe on the relative importance of unemployment and inflation as well as how they are expected to change in the next year. Additional information on the relative welfare weight attached to unemployment and inflation is derived by analysing support across countries for policies to stimulate the number of jobs rather than deficit reduction. Section 3 reports econometric evidence using macroeconomic data from an unbalanced country panel and estimates the size of the marginal rate of substitution between unemployment and inflation along the social welfare function. Is unemployment more costly than inflation? The answer is unequivocally 'yes'. Not only do inflation and unemployment have a negative effect on well-being, it is reasonable to expect that financial crises that involve banking instability would also adversely affect subjective well-being. In a further extension, we consider whether banking crises also lower happiness. Section 4 therefore extends our analysis into the welfare effects of financial crises. The final section concludes.

1. Welfare Losses Associated with Inflation and Unemployment

The misery index was developed by Arthur Okun. It is simply the unemployment rate added to the inflation rate. It is assumed that both a higher rate of unemployment and higher inflation create both economic and social costs for a country. A combination of rising inflation and more people out of work implies deterioration in economic performance and a rise in the misery index.[3]

Not all macroeconomists would concur with this interpretation of Okun's misery index. A variety of approaches to the welfare losses associated with unemployment and inflation have emerged in the macroeconomics literature. Interpretations of the welfare costs of inflation focus on the real resource costs associated with asynchronous price changes or the reallocation of resources to government associated with increases in the money supply (inflation) and the resulting "inflation tax" - see Bailey (1956), Friedman (1969) and Lucas (2000). Models of the costs of inflation associated with asynchronous pricing models include Lucas (1973), Barro (1976), Benabou and Gertner (1993) and Rotemberg and Woodford (1997). For example, using structural VARs, Rotemberg and Woodford assess the relative costs of inflation and unemployment (incomplete stabilization) in a model where prices changes are staggered. The underlying welfare function ultimately depends on consumption and leisure. The welfare losses of inflation are indirect – they are due to the misallocation of resources associated with price instability, rather than with a direct effect of inflation on utility. Using this analysis to calibrate a welfare loss function based on the price level and the output gap, Woodford (2001) suggests that "the relative weight on the output gap measure should only be about 0.1" (p.47), implicitly concluding that the welfare gains from price stability are significantly greater than those from stabilizing output and therefore unemployment.

[3] In the US in January 2013 the number is 9.49 having hit a high of 12.87 in August 2011 which was well below the post WW2 high of 20.8 in 1980 – see http://www.miseryindex.us/

Shiller (1997) used public attitudes surveys to investigate individual perceptions of the costs of inflation. He showed that a primary concern of individuals is that inflation will cause a reduction in their standard of living. They also are concerned about being exploited by unscrupulous individuals or companies that cause prices to rise. He summarises that as the bad-actor-sticky-wage explanation of perceived welfare losses from inflation. It is quite distinct from the macroeconomic literature on the welfare effects of inflation.

This literature relies on the indirect approach to the measurement of utility (we treat welfare and utility as synonymous). Typically, a representative agent's utility is inferred through observation of her revealed preference and any broader implications for the economy derived by assuming that there is no aggregation problem associated with the replication of outcomes for the representative agent.[4] This approach contrasts with efforts to measure utility based on individual surveys. The literature in this field typically assumes that questions relating to "happiness" or "life satisfaction" provide useful information relating to the latent utility measure widely used by economists.[5] The motive for asking such questions is to understand how far individuals judge their lives to be satisfactory. Psychologists view it as natural that a concept such as happiness should be studied in part by asking people how they feel. Economists typically find this concept somewhat more difficult. Surveys of subjective well-being have attracted the attention of medical statisticians, psychologists, economists, and other investigators including Blanchflower (2007), Blanchflower and Oswald (2011), Easterlin (2003), Frey and Stutzer (2002), Gilbert (2006), Graham (2010, 2011), Lucas et al (2004), Layard (2011), Oswald and Wu (2010); Powdthavee. (2010), Smith et al (2005), Ubel et al (2005). [6] In general economists have focused on modelling two fairly simple questions, one on life satisfaction and one on happiness. These are typically asked as follows.

Q1. Happiness – (e.g. from the US General Social Survey)

"Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy or not too happy?"

Q2. Life satisfaction – from the Eurobarometer Surveys

"On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?"

The size of the signal-to-noise ratio linking utility to these subjective measures cannot be determined, but there are corroborating objective measures such as

1. Assessments of the person's happiness by friends and family members.

[4] Other assumptions regarding the degree of risk aversion and homogeneity between individual and aggregate consumption have to be made, implicitly or explicitly.

[5] As Krueger (2007) puts it, "the results are any less significant [for policy makers] if the results are just interpreted as reflecting determinants of some component of subjective well being or one measure of subjective well being" (p.358) instead of true utility.

[6] For a recent survey on happiness research see Mackerron (2012).

2. Assessments of the person's happiness by his or her spouse.
3. Heart rate and blood-pressure measures of response to stress.
4. The risk of coronary heart disease.
5. Duration of authentic or so-called Duchenne smiles. A Duchenne smile occurs when both the zygomatic major and obicularus orus facial muscles fire, and human beings identify these as 'genuine' smiles (Ekman, Friesen and O'Sullivan (1988); Ekman, Davidson and Friesen (1990)).
6. Skin-resistance measures of response to stress.
7. Electro-encephalogram measures of prefrontal brain activity (Davidson and Fox, 1982).

The standard statistical approach to assessing responses to happiness questions is to estimate an equation with the happiness response as the dependent variable using ordinary least squares (OLS) or ordered logit from a large-scale individual survey. Higher values of the dependent variable are associated with higher levels of happiness. Generally, it makes little difference if you use an OLS or an ordered logit, although the size of the coefficients will differ (Ferrer-i-Carbonell and Frijters, 2004).

The happiness approach in measuring the importance of inflation and unemployment on welfare is therefore based on estimating regressions of the form (see e.g., Di Tella and MacCulloch, 2007):

$$(1) \quad Life\ Satisfaction_{cti} = \alpha\ Unemployment_{ct} + \beta\ Inflation_{ct} + \gamma\ Being\ unemployed_{cti} + \delta\ \boldsymbol{\Omega}_{cti} + \gamma_c + \eta_t + \mu_{cti}.$$

Where $Life\ Satisfaction_{cti}$ is the proxy for utility of individual i in country c at time t and comes directly from individual answering those subjective wellbeing questions. $Unemployment_{ct}$ and $Inflation_{ct}$ measure the respective macroeconomic rates at country and year in which the respondent live. $Being\ unemployed_{cti}$ is one of the set of dummies reflecting employment status and takes the value of 1 if the respondent is unemployed (and actively seeking) when surveyed. The other employment status dummies (e.g., being self-employed, student) together with other relevant personal characteristics (age, gender, income, marital status, education) are denoted by $\boldsymbol{\Omega}_{cti}$. γ_c, η_t denotes country and time fixed effects, while μ_i is the error term. Equation (1) can be seen as a reduced form of a (subjective) welfare function in which inflation and unemployment are assumed to affect directly the individual's utility instead of indirectly via consumption as in standard economic models. In this regression, the estimate of α and β provide the size of the weight of unemployment and inflation on welfare, respectively, and their ratio α/β can be seen as marginal rate of substitution between inflation and unemployment. Note that because equation (1) controls for individual's job market status, the cost of unemployment measured by α provide an estimate for the *average* person. Therefore both the *total* cost of unemployment and the inflation/unemployment ratio need to include the individual cost of becoming unemployed γ (see also Di Tella et al., 2001). Previous studies have found that both inflation and unemployment decrease life satisfaction in OECD countries and Latin America, however there is less agreement about the size of the marginal rate of substitution (Ruprah and Luengas, 2011). We will turn on this in Section 3.

This approach begs the question as to whether comparisons of life satisfaction across individuals are meaningful given language and cultural differences even within countries. One way to overcome this in a simple way is to compare countries where the same language is spoken - Australia, Canada, New Zealand, UK, USA (as in Blanchflower and Oswald and Oswald, 2005,

2006a). In those papers it was argued that Australia's high ranking on the HDI measure was a paradox given its much lower ranking on happiness and job satisfaction scores. Wolfers and Leigh (2006) disagreed.

Another approach is to look for objective measures that might corroborate these findings. A recent paper by Banks, Marmot, Oldfield and Smith (2006) argued that Americans are less healthy than Europeans; differences in blood pressure form part of the author's evidence. Blanchflower and Oswald (2008) found that happier nations report systematically lower levels of hypertension. Happiness and blood pressure are negatively correlated across countries (r = -0.6). This seems to represent a first step toward the validation of cross-country estimates. Denmark has the lowest reported levels of high blood pressure in their data. Denmark also has the highest happiness levels. Portugal has the highest reported blood pressure levels and the lowest levels of life satisfaction and happiness. It appears there is a case to take more seriously the subjective 'happiness' measurements made across countries and it seems meaningful to do cross-country comparisons (Blanchflower 2007).

It is apparent that there is a great deal of stability in happiness and life satisfaction equations, no matter what country is looked at, what dataset or time period used, whether the question relates to life satisfaction or happiness, or how the responses are coded (whether in three, four, five or even as many as ten categories).

The main findings from happiness and life satisfaction equations such as (1) concerning personal characteristics $\boldsymbol{\Omega}_{cti}$ are as follows (Blanchflower, 2007) .

Happiness across countries is higher among:
Women
Married people
The highly educated
The healthy
Those with high income
The young and the old – happiness is U-shaped in age (Blanchflower and Oswald, 2008a, 2008b; 2009)

Happiness is lower among:
Newly divorced and separated people
Adults in their mid to late 40s
The unemployed
The disabled
Immigrants and minorities
Those in poor health
Commuters (Kahneman et al, 2004)
Those who live in polluted areas (Levinson, 2012)

Wellbeing is correlated with life events such as being unemployed or being married (Clark et al. 2008 and Frijters et al. 2011). In particular, economics research has been focussing on the relationship between income and happiness and interdepence of preferences. Gardner and Oswald

(2007) have found that Britons who receive lottery wins of between £1,000 and £120,000 go on to exhibit better psychological health. But individuals in the USA were found to be less happy if their incomes are far above those of the poorest people (Blanchflower and Oswald, 2004). People, however, do appear to compare themselves more with well-off families, so that perhaps they get happier the closer their income comes to that of rich people around them. Relative income certainly appears to matter. Luttmer (2005), for the USA, finds that higher earnings of neighbours are associated with lower levels of self-reported happiness, controlling for an individual's own income. Alesina et al (2004), find, using a sample of individuals across the USA (1981-1996) and Europe (1975-1992) that individuals have a lower tendency to report themselves as happy when inequality is high, even controlling for individual income. The effect is stronger in Europe than in the USA.

2. Trends in Misery

Table 1 shows that the misery index in the US reached a high of 13 in the 1970s and hit another high of 12 in 2011. Currently it is just over ten. In the final column of Table 1 we introduce the concept of a *misery ratio*. Rather than adding the two rates, our ultimate interest is in the relative effects of unemployment and inflation on welfare. We define the misery ratio as the ratio of the unemployment rate to the inflation rate. Thus, if the unemployment rate is 4% and the inflation rate is 4%, the misery index is 8. But the misery *ratio* is 1. Below we will link this concept to the marginal rate of substitution between unemployment and inflation – the rate at which at which individuals (or societies) trade off inflation and unemployment, while keeping welfare constant. The misery index and ratio implicitly assume equal weights for inflation and unemployment rate, while the happiness approach will provide evidence on the weights from a subjective well being point of view. Note that we arbitrarily treat the unemployment rate as the numerator and the inflation rate as the denominator in our misery ratio. Thus, higher rates of unemployment imply a higher misery ratio for a given inflation rate.

Table 2a uses equivalent data for fourteen Western European countries from the 1970s through 2010. Just as for the US, it shows that the misery ratio has risen since the 1970s, reflecting the greater success that governments have had in controlling inflation, compared with their ability to reduce unemployment. Table 2b presents the most recent unemployment and inflation rates as well as the misery index. It is especially low in Germany, Finland, the Netherlands and Luxembourg, countries which tend to give relatively more weight to the importance of maintaining low inflation. The misery ratio is especially high in the countries most impacted by the Great Recession Greece (30); Spain (10); Portugal (7); and Ireland (8). Given the sharp increases in unemployment in these countries, while inflation has been relatively muted, it is no surprise that they score relatively high on the misery ratio.

Table 3 reports evidence on this issue. In two recent Eurobarometer surveys, taken in May 2010 and November 2011, Europeans were asked to categorise what they saw as their two most important problems. We focus on only two – unemployment and rising prices/inflation.[7] It turns

[7] Other options that were available included crime (18); economic situation (43); rising prices/inflation (19); taxation (19); unemployment (51); terrorism (4); defence (1); housing (3); immigration (7); health care (16); education (6); pensions (10); environment (3) and energy (3). Numbers in parentheses are sample wide proportions in Eurobarometer #73.4 where n=30,215

out that in many other surveys respondents report that 'the economy,' variously defined, is their major concern.[8] The overall proportion of respondents saying that unemployment was the most important problem was 51%, compared with 19% who highlighted inflation, while 7% said both. Thus, in the perception of European citizens, unemployment exceeded inflation as the more important problem by a factor of 2.5. In 2010, in each country other than in Malta, the proportion who believed that unemployment was more important was higher than the proportion judging that inflation was the more salient issue. In 2011, the proportion focussing on inflation as the more important issue was higher in several Eurozone countries - Austria, Belgium, Estonia, Lithuania, Malta and the Czech Republic. Monetary crises may understandably stimulate uncertainty and consequently concern over the real value of assets and incomes.

Columns 1 and 2 of Table 4 models the responses summarised in Table 3 using the micro data on 61,374 individuals from Eurobarometers #73.4 and #76.3 for May 2010 and November 2011 respectively. The dependent variable is set to one if the individual ranked rising prices/inflation as one of the two most important problems facing the country and zero otherwise. Results are shown in the first column. The second column is based on a similarly constructed dependent variable where unemployment is viewed as one of the two most important problems. The equations are estimated with a probit model where coefficients can be interpreted as marginal effects. Independent variables are a year dummy, age group, gender, age left school (ALS), marital status, economic activity and country.

The coefficient on the 2011 dummy shows that inflation rose in prominence as a concern for respondent during that year, while for unemployment it declined. Between 2010 and 2011 the standard deviation of 10 year bond yields in the Eurozone rose from 1.54 to 3.45 (Source: European Central Bank), a reflection of substantially increased monetary instability for some European countries. There was also a concern across the Eurozone and in other European countries of monetary contagion, which may have increased anxiety in states that were not apparently directly implicated in fiscal and monetary instability. Hence the switch from unemployment to inflation as a major concern between 2010 and 2011 is understandable, and indeed the coefficients on the 2011 dummy in columns 1 and 2 are of approximately equal but opposite magnitude (6%) indicating an almost one-for-one shift from unemployment as a major concern to inflation.

Young people are especially likely to report unemployment is a major problem, which is unsurprising given the high levels of youth unemployment. The unemployed are more likely to want a boost to job creation, as do home workers, who are often forced to leave the labor force due to lack of jobs (discouraged workers). The least educated also want jobs. The Germans, the Austrians, the Estonians, the Maltese and the Poles are especially concerned about inflation. The Swedes, the Portuguese, the Irish, the Croatians and especially the Spanish, are concerned about unemployment. Note that unemployment is likely to be a concern not only to the unemployed

[8] Between March 4th and 5th 2013 YouGov asked a sample of 1906 UK residents 'Which of the following do you think are the most important issues facing the country at this time? The economy 76%; immigration and asylum 54%; health 32%; Europe 20%; pensions 18%; tax 17%; crime 15%; education 13%; family life and childcare 9%; environment 7%; Afghanistan 5% and transport 3%.
http://cdn.yougov.com/cumulus_uploads/document/rh23ttfmhf/YG-Archive-Pol-Sun-results-050313.pdf

themselves, but also to their family and friends and to those employees who are concerned that they may be laid off. This is an issue to which we return.

In Eurobarometer #75.3 we also have views on whether the government should increase public deficits to create jobs – that is to reverse austerity. Table 5 reports the estimates. The majority agree – saying they tend to agree or totally agree - in all but six countries. The exceptions are Belgium; France; Germany; Greece; Malta and the Netherlands. Column 3 of Table 4 estimates an OLS equation with the dependent variable one of the four possible responses in Table 5. It confirms the young, the least educated, the unemployed and women want a boost to jobs. Opposition to a jobs boost is most notable in Germany, the Netherlands, France and somewhat surprisingly Greece.

Not only do we have data on individual's views on how important a problem unemployment and inflation are viewed as being, the European Union also collects data on how much people think both unemployment and inflation are going to change over the next year. These data are published monthly for every EU country. Table 6 reports on the latest data available on what people expect to happen to the number of people unemployed over the next twelve months as well as to how they expect consumer prices to change over the next year. The estimates are reported as balances – details of how they are calculated are reported in the footnotes to the table. A higher number means the numbers are expected to rise more. To place the numbers in context, we report both the long run average from 1985 and the average for the last six months. Unemployment expectations currently are above long run averages in all countries except Estonia; Latvia and Malta. Inflation expectations are more in line with long-run averages suggesting that they are well anchored to the inflation target. Exceptions are again among a few Eurozone countries Austria; Belgium, Finland, France and the Netherlands, despite the fact that inflation in these countries is low.[9] So it appears that not only do Europeans believe that unemployment is a more serious problem than inflation, they do not expect it to disappear in the near term, but rather they seem to expect unemployment to rise further.

The evidence thus suggests that unemployment is perceived as a more important problem than inflation. Exceptions are key member countries of the Eurozone such as Austria, France, the Netherlands and Germany.

3. Trends in Life Satisfaction

Now consider trends in the life satisfaction data. Table 7 reports on changes in happiness using the first of these two measures for the United States for the period which shows that well-being according to this measure, since 1972 has been essentially flat (see Blanchflower and Oswald, 2004). It is notable though that between 2008 and 2010, as unemployment doubled the proportion saying they were very happy fell to its lowest ever level of 26%. So this has been a happiness reducing recession in the United States.

Table 8 reports on the most recent data available from nine Eurobarometer surveys using data on life satisfaction from the second question above, where very satisfied =4; fairly satisfied=3 and so

[9] Inflation rates from Table 2b are Austria 2.6%; Belgium 2.5%, Finland 3.1%, France (2.1%) and the Netherlands 2.9%

on. Interestingly there has been little change in the score in most countries. In only Greece, Malta, Portugal and Spain is the 2012 number more than 0.1 below the 2008 number.

These findings beg the question as to whether such comparisons are meaningful given language and cultural differences One way to overcome this in a simple way is to compare countries where the same language is spoken - Australia, Canada, New Zealand, UK, USA (as in Blanchflower and Oswald and Oswald, 2005, 2006a). In those papers it was argued that Australia's high ranking on the HDI measure was a paradox given its much lower ranking on happiness and job satisfaction scores. Wolfers and Leigh (2006) disagreed.

Another approach is to look for objective measures that might corroborate these findings. A recent paper by Banks, Marmot, Oldfield and Smith (2006) argued that Americans are less healthy than Europeans; differences in blood pressure form part of the author's evidence. Blanchflower and Oswald (2008) found that happier nations report systematically lower levels of hypertension. Happiness and blood pressure are negatively correlated across countries ($r = -0.6$). This seems to represent a first step toward the validation of cross-country estimates. Denmark has the lowest reported levels of high blood pressure in their data. Denmark also has the highest happiness levels. Portugal has the highest reported blood pressure levels and the lowest levels of life satisfaction and happiness. It appears there is a case to take more seriously the subjective 'happiness' measurements made across countries and it seems meaningful to do cross-country comparisons (Blanchflower 2007).

For developed countries there is little evidence that happiness or life satisfaction have increased over time (Table 7). Two facts stand out from studies of life satisfaction and happiness in the UK and the USA over time. First, it is interesting how little has changed – the distributions in the early 1970s are virtually identical to those observed in 2006. Second, only a very small proportion of respondents report that they were 'not at all satisfied' with their lives, or in the case of the USA, that they were 'not at all happy'. Most people report that they are happy or satisfied with their lives.

So why doesn't happiness increase when a wealthy country gets richer? We are not certain, but possible explanations include:

a) Social comparisons (you compare your 3 BMWs to others who also have 3 BMWs)

b) Habituation: people adapt to their current lifestyle

c) Mistaken choices: people make incorrect predictions about the effect of important decisions on their happiness (e.g. long commutes and working hours).

However, happiness is positively correlated with higher GDP per capita (Wolfers and Leigh (2006)). When a nation is poor it appears that extra riches raise happiness. However, income growth in richer countries is not correlated with growth in happiness: this is the Easterlin hypothesis (Easterlin, 1974). Wolfers and Stevenson (2008) dispute this. Di Tella, McCullough and Oswald (2001) show that people are happier when both inflation and unemployment are low. They find that unemployment depresses well-being more than does inflation. Wolfers (2003), has shown that greater macro volatility undermines wellbeing. Wolfers found that eliminating

unemployment volatility would raise wellbeing by an amount roughly equal to that from lowering the average level of unemployment by a quarter of a per cent. Interestingly, the effects of inflation volatility on well-being are markedly smaller. We build on and update these findings below.

Having defined the misery ratio at the macro level, we now examine a closely related micro concept. We estimate the relative weight of unemployment and inflation in individual well-being equations. We assemble the data for this exercise as follows: a 4-step life satisfaction question, Q2 above, has been asked in some, but not all, *Eurobarometer* Surveys conducted for the EU since 1973 for all member countries. As new countries such as Greece, Spain and Portugal joined, they were added to the surveys so there are fewer years of data available for them. In 2004, the year in which they joined the EU, the A8 countries – the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia – were added. Bulgaria and Romania also joined in that year, as did two further EU Candidate Countries - Croatia and Turkey. Data are available on Norway for 1990-1995 when it was an EU Candidate Country, and a member of the OECD. Overall, we make use of micro-data on over 1.1 million individuals from thirty one countries - Austria; Belgium; Bulgaria; Croatia; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; the Netherlands; Norway; Poland; Portugal; Romania; Slovakia; Slovenia; Spain; Sweden, Turkey and the UK. We then map in annual data on unemployment, inflation for each country using Eurostat and the OECD as data sources.[10]

In Table 9 we estimate life satisfaction equations using OLS, with the 4-step life satisfaction question as reported in Table 7 but now also include OECD estimates of both the inflation rate (the Harmonised Index of Consumer Prices or HICP) and the unemployment rate as additional control variables at the country level. The distributions of the two variables are shown below. The implied misery ratio at the macro level is 1.9 = 8.6/4.5.

	Unemployment rate (%)	Inflation rate (%)
Mean	8.6	4.5
Standard deviation	4.0	4.4
Minimum	0.2	-4.5
Maximum	32.0	32.0

All five equations in Table 9 include a full set of year and country dummies. Columns 2-5 also include a standard set of controls for gender, marital status, age, homeworking, retired and being a student.

In all cases the standard errors are clustered to overcome the problem of the common error component caused by the inclusion of country and year level variables in an individual-level regression. This is widely known as the Moulton (1986, 1991) problem. As expected, both the unemployment rate and the inflation rate have negative coefficients, suggesting that an increase in

[10] We have the following years of data by country - Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, Netherlands, UK (1975-2012); Austria, Finland, Sweden (1995-2012); Greece (1981-2012); Portugal, Spain (1985-2012); Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia, (2004-2012), Norway (1990-1995), Turkey (2004-2011); Iceland (2010-2011).

either lowers happiness; below we use these data to estimate the misery index. Column 2 adds personal controls, which have little impact on our overall estimates. In all cases both the unemployment rate and the inflation rate are highly significant and negative. In addition the unemployment dummy is also significantly negative with a T-statistic of nearly fifty. It appears that unemployment makes people very unhappy, which suggests it is unlikely to be voluntary. Marx's reserve army of the unemployed is a conscript army not a volunteer army.

What do our estimates suggest about the relative size of the effects from the unemployment rate and the inflation rate? These are summarised in Table 10. The effects of unemployment and inflation, in row 1 of Table 10 - which is taken from column 2 of Table 9 - have coefficients of -.0141 and –.0048 respectively. These represent the effect upon wellbeing of a one percentage point change in each of the two independent variables. Following Di Tella et al (2001) – henceforth DMO – the implicit welfare-constant trade-off between inflation and unemployment can now be calculated. As in conventional economic theory, the DMO methodology leads to a measure of the marginal rate of substitution between inflation and unemployment – the slope of the indifference curve. This is analogous to the misery ratio, though it is weighted by the parameters α and β (see equation 1) and it is conditioned by the explanatory variables absent inflation and unemployment. The misery ratios discussed previously were unconditional.

There are two consequences of unemployment – society as a whole becomes more fearful of unemployment (Blanchflower, 1991) and some people actually lose their jobs; there are aggregate and personal effects of unemployment. DMO argue that a way has to be found to measure the two unpleasant consequences of a rise in unemployment. DMO develop a way to take account of the extra cost of joblessness, namely, to work out the sum of the aggregate and personal effects of unemployment. They do so first by calculating the direct effect of an increase in the unemployment rate on society, as we have done above. Our estimate is -.0141.

DMO argue that it is apparent from the microeconomic life satisfaction and happiness data that the person who becomes unemployed experiences a much larger cost. We concur. The loss to the individual from being unemployed can be calculated from the coefficient on being 'unemployed' in a life-satisfaction micro regression, like the one reported in row 1 of Table 6, estimated by ordinary least squares to keep the units consistent – we get -.3927. The entire well-being cost of a 1 percentage-point increase in the unemployment rate is therefore given by the sum of two components. Combining the two, we have .0141 + .0039 = .0180 as society's overall wellbeing cost of a one percentage point rise in the unemployment rate. This can be interpreted as a combination of the direct effect of unemployment on well-being, plus the happiness costs associated with increased fear of unemployment and welfare interdependency effects on the associates of the unemployed.

Our results suggest that the wellbeing cost of a 1 percentage point increase in the unemployment rate equals the loss brought about by an extra 3.76 percentage points of inflation. How do we get this? The reason is that (0.0180/0.0048) = 3.76, where 0.0180 is the marginal unemployment effect on well-being, and 0.0048 is the marginal inflation effect on well-being from row 2 of column 2 of Table 9. Hence 3.76 is the marginal rate of substitution between inflation and unemployment, conditional on the other explanatory variables. It is therefore our estimate of the misery ratio based on individual data and correcting for individual characteristics. This is more than double the 1.66

obtained by DMO. Note that Di Tella et al (2001) use rolling three year averages and adjust for omitted variable bias by running first stage micro life satisfaction equations in each country and year cell and then using the averaged residuals at the second stage of the regression. Using the micro data and adjusting the standard errors by clustering, the RHS variables by country and year accomplishes essentially the same adjustment. DMO do not make clear why they use three year rolling averages and we can see no compelling reasons to do so here; in any case this is unlikely to matter.

It is then feasible to obtain estimates for sub-groups. Table 10 shows that the misery ratio for the EU27 is similar to that of the Euro Zone (3.7 and 3.8 respectively). Western Europe has a higher elasticity than for Eastern Europe (4.39 and 2.0 respectively). Interestingly, the five core Eurozone countries - Germany, Austria, France, Finland, Netherlands and Austria – have an elasticity of 0.73 suggesting they fear inflation more than unemployment. Excluding these five 'inflation hawk' countries our elasticity estimate rises to 6.4. This estimate is in line with the textbook notion that individuals in the core countries of the Euro Area prefer "hard-nosed" governments (i.e. a governments which attach a lot of weight to fighting inflation), while the periphery has a predisposition for "wet governments" (i.e. governments which attach a higher weight to fighting unemployment).[11] Females are more worried about unemployment than men (3.9 and 3.5 respectively). The least educated, the married, the widowed and the old are more concerned about unemployment – they put the *highest weight on unemployment*. Conversely, the young and the most educated put the greatest weight on inflation.[12] This runs counter to the idea that older people care more about inflation as they are more likely to have experienced it during their adult lives. Chances are these older folk have experienced unemployment and realise its lasting consequences. Unemployment hurts for a long time, especially long duration unemployment, which is more likely to affect the old (Bell and Blanchflower, 2011a, 2011b).

4. Banking crises and their impact on well-being

It is also of interest to determine whether banking crises have separate effects on overall well-being, following the suggestions of Montagnoli and Moro (2013) – henceforth MM. There are two accepted databases for banking crisis: Reinhart and Rogoff (2008) and Laeven and Valencia (2010) – henceforth RR and LV respectively. The former define a banking crisis as marked "by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions [...]; and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions [...]".

[11] As a corollary, this result gives an indication of the possible tensions between the core and the periphery of the Euro Area; in this context it is of vital importance for the smooth functioning of the Eurosystem the institutional framework and by decision-making process of the European Central Bank.

[12] In contrast Lombardelli and Saleheen (2003) show that older people in the UK have higher *expectations* for inflation because they have experienced periods of higher inflation over their adult lives. They found that people in the age group 45–54 had experienced the highest level of inflation, an average inflation rate of 7.3% over their adult lives. They found that lifetime inflation experience has a significant effect on people's inflation expectations.

Laeven and Valencia define a banking crisis as "a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted. This situation may be accompanied by depressed asset prices, sharp increases in real interest rates, and a slowdown or reversal in capital flows. In some cases, the crisis is triggered by depositor runs on banks, though in most cases it is a general realization that systematically important financial institutions are in distress." Although this definition is very close to the one provided by RR, it is more restrictive. We follow MM by defining the following 11 banking crises.

1. UK, 1984; 1991; 1995; 2007
2. Denmark, 1987
3. Greece, 1991,
4. Finland, 1991
5. Italy, 1990
6. Sweden, 1991
7. Ireland 2007
8. All other countries except UK & Ireland, 2008.

As reported in Cerra and Saxena (2008) the end of the crisis is never clear, but MM show that banking crises on average last for three years so we simply follow them and assume each crisis starts in the data noted above and last for a further two years. So, for example we set our banking variable to 1 for the UK in 1984-6; 1991-3; 1995- 7 and 2007-2009. When we tested a banking variable covering just one or two years they were not significant, hence our choice of three year time span.

In comparison with when there was no banking crisis the mean life satisfaction score was 2.99 compared with 2.95 when there was.[13] In column 3 of Table 9 we include a banking crisis dummy that enters significantly negative, with a T-statistic of 2.4. So banking crises lower life satisfaction, and by a large amount, over and above its impact on inflation or unemployment. Recall of course that these equations also control for country and year effects. The results are essentially unchanged in column 4 which estimates as the more statistically correct procedure, an ordered logit. The final column restricts the sample to the years before the Great Recession and we get the same result that banking crises lower well-being. So our finding that banking crises lower well-being is not driven solely by the Great Recession. Interestingly, the misery ratio is markedly higher during banking crisis years than in more normal times (7.5 and 3.1 respectively).

We find strong evidence that unemployment lowers well-being markedly more than inflation does. Times have changed. Banking crises lower well-being over and above those effects.

[13] The banking crisis variable has a coefficient of -.087 with a t-statistic of 2.08 when it is entered on its own in a life satisfaction equation (n=1,146,336, R^2=.0016) over the same sample as used in columns 1 and 2. Sample size is larger dues to less missing data. When country and year dummies are added the banking crisis variable has a coefficient of -.035 with a t-statistic of 2.13 when it is entered on its own in a life satisfaction equation (n=1,146,336, R^2=.1557). In both cases standard errors are clustered at country and year level, without them the t-statistics are 43.4 and 9.5 respectively.

5. Conclusions

European monetary policy for the last twenty years has focussed on controlling the inflation rate as its primary objective. It is currently conducted by one central bank covering the seventeen Euro Zone countries and ten other independent central banks for the remaining countries that are EU members and have their own currencies. Most importantly, the two most important – the Bank of England and the European Central Bank have been inflation targetters, although the former is allowed to take account of government policy on growth.[14] This was intended to bring much needed stability. For the period 1997-2007 it appeared this stability had been attained. But since the start of the Great Recession, unemployment has increased rapidly. In the UK, despite inflation being well above target, the MPC's behaviour suggests that it is concerned about growth and unemployment, even though inflation has been above target, at a time when the UK government has been tightening fiscal policy. Our estimates of the misery ratio suggest that this is the correct approach if the objective is to maximise national well-being. The ECB has continued to focus on inflation and has kept rates higher than the MPC has and has not had such a loose monetary policy, hence the high levels of unemployment existing in the Eurozone, and especially so in Greece, Portugal, Spain. In the Great Recession, unemployment has been a much bigger problem than inflation for ordinary people.

The main results of this paper can be summarized as follows:

- Unemployment lowers happiness of the unemployed but also the happiness of everyone else.
- A higher proportion of individuals report that unemployment is the major problem the economy faces than is the case for inflation in most countries. Exceptions are the core Eurozone countries such as Germany and the Netherlands.
- Europeans don't appear to expect unemployment to come down any time soon.
- The majority of respondents in Europe back a deficit financed burst to growth to create jobs.
- Banking crises lowers happiness over and above their effects on inflation and unemployment and there is evidence these effects are long lasting.
- We find that the least educated, women and, somewhat surprisingly, the old put the highest weight on unemployment. Conversely, the young, men and the most educated put the greatest weight on inflation.
- We estimate the unemployment/inflation trade-off as approximately 3.8. That is to say a 1 percentage point increase in unemployment lower well-being nearly four times more than an equivalent rise in inflation. Excluding the five main euro area countries that are

[14] Under the Bank of England Act of 2009, the objectives of the Bank of England are:
(a) to maintain price stability, and
(b) subject to that, to support the economic policy of Her Majesty's Government, including its objectives for growth and employment.

especially worried about inflation – Germany, Austria, France, Finland and Austria – the elasticity rises to over six times.

Unemployment hurts more than inflation does.

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Table 1: US Misery Index and Misery Ratio

USA	Unemployment	Inflation	Misery Index (U+I)	Misery Ratio (U/I)
1948-1959	4.57	2.28	6.85	2.00
1960-1969	4.78	2.36	7.14	2.03
1970-1979	6.21	7.08	13.29	0.88
1980-1989	7.27	5.55	12.82	1.31
1990-1999	5.75	3.01	8.76	1.91
2000-2010	5.91	2.56	8.47	2.31
1942-2012	5.55	4.16	9.71	1.33
2011	8.9	3.2	12.1	2.78
2012	8.1	2.1	10.2	3.86

ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt

Table 2a: European Misery Ratio

Misery Ratio	1975-1979	1980-1989	1990-1999	2000-2010
Belgium	0.76	2.46	4.26	4.34
Denmark	0.68	1.31	3.68	2.29
Finland		1.30	10.30	4.69
France	0.43	2.38	4.85	5.19
Germany	0.92	0.40	2.50	5.43
Greece		1.81	0.76	3.07
Ireland	0.66	1.03	5.10	1.80
Italy	0.44	0.30	2.57	3.84
Luxembourg	0.07	4.15	0.77	1.16
Netherlands	0.78	0.54	2.38	1.35
Portugal			0.72	2.39
Spain			4.09	4.15
UK	0.29	1.56	2.23	3.14

Table 2b. Europe - Unemployment rate 2013, Inflation rate Jan12-Jan13 and Misery ratio

	Unemployment rate	Inflation rate	Misery ratio
Austria	4.9	2.6	1.88
Belgium	7.4	2.5	2.96
Bulgaria	12.4	2.4	5.17
Cyprus	14.7	3.0	4.90
Czech Republic	7.0	3.4	2.06
Denmark	7.4	2.2	3.36
Estonia	9.9	4.1	2.41
Finland	7.9	3.1	2.55
France	10.6	2.1	5.05
Germany	5.3	2.1	2.52
UK	7.7	2.7	2.85
Greece	27.0	0.9	30.00
Hungary	11.1	5.4	2.06
Ireland	14.7	1.9	7.74
Italy	11.7	3.2	3.66
Latvia	14.4	2.0	7.20
Lithuania	13.3	3.1	4.29
Luxembourg	5.3	2.8	1.89
Malta	7.0	3.3	2.12
Netherlands	6.0	2.9	2.07
Poland	10.6	3.5	3.03
Portugal	17.6	2.5	7.04
Romania	6.6	3.6	1.83
Slovakia	14.9	3.6	4.14
Slovenia	10.2	2.9	3.52
Spain	26.2	2.5	10.48
Sweden	8	0.9	8.89
EZ17	11.9	2.4	4.96

Table 3: Views on Unemployment and Inflation

	Unemployment		Inflation	
	2010	2011	2010	2011
Austria	38	20	34	41
Belgium	44	26	20	29
Bulgaria	53	55	22	29
Croatia	63	68	18	14
Cyprus	40	60	24	15
Czech Republic	48	29	21	35
Denmark	37	51	3	11
Estonia	70	47	21	49
Finland	51	35	11	23
France	58	49	16	29
Germany East	44	25	39	41
Germany West	39	16	23	29
Great Britain	31	44	12	18
Greece	44	61	25	10
Hungary	60	57	29	31
Iceland	51	n/a	14	n/a
Ireland	65	62	12	12
Italy	49	42	26	30
Latvia	67	52	9	20
Lithuania	60	41	28	42
Luxembourg	42	35	28	25
Macedonia	63	64	14	26
Malta	16	15	37	44
Montenegro	n/a	47	n/a	17
Netherlands	19	16	9	13
Northern Ireland	39	47	18	22
Poland	49	50	26	45
Portugal	62	63	32	31
Romania	39	32	26	29
Slovakia	64	44	22	41
Slovenia	51	56	19	11
Spain	72	79	10	8
Sweden	57	48	3	4
Turkey	68	50	12	17

Source: Eurobarometers #73.4 May 2010 & #76.3 November 2011

Notes: Question - What do you think are the two most important issues facing (OUR COUNTRY) at the moment? Unemployment or rising prices/inflation

Table 4: Econometric analysis of views on inflation and unemployment and creating jobs

	Inflation most important issue	Unemployment most important issue	Increase public deficits to create jobs?
2011	.0592 (17.62)	-.0568 (13.53)	n/a
Age <25	.0171 (2.03)	.0407 (3.85)	.1403 (4.91)
Age 25-34	.0245 (4.09)	.0150 (2.02)	.0771 (3.92)
Age 35-44	.0137 (2.47)	.0036 (0.52)	.0274 (1.50)
Age 55-64	-.0155 (2.81)	.0049 (0.71)	-.0179 (1.01)
Age >=65	-.0211 (3.29)	-.0063 (0.78)	-.0185 (0.88)
Male	-.0149 (4.26)	-.0190 (4.35)	-.0230 (1.97)
ALS 16-19	-.0027 (0.16)	-.0366 (1.67)	-.0211 (1.23)
ALS 20+	-.0360 (2.06)	-.0453 (2.06)	-.1195 (6.34)
Still studying	-.0866 (5.17)	-.0684 (3.10)	-.0424 (1.29)
No FT education	-.0797 (4.57)	-.0593 (2.44)	.0180 (0.27)
Single	.0104 (1.98)	-.0001 (0.03)	-.0040 (0.23)
Living together	.0160 (2.57)	-.0016 (0.21)	-.0257 (1.25)
Divorced/separated	.0275 (4.06)	.0010 (0.12)	-.0256 (1.17)
Widowed	.0171 (2.64)	-.0228 (2.83)	.0216 (0.97)
Home worker	.0262 (3.68)	.0314 (3.51)	.0431 (1.75)
Unemployed	-.0028 (0.48)	.1466 (19.34)	.0888 (4.38)
Retired	-.0007 (0.14)	-.0152 (2.19)	-.0026 (0.15)
Austria	.1366 (10.83)	-.1113 (7.48)	.2643 (7.09)
Bulgaria	.0413 (3.48)	.1388 (9.62)	.1984 (4.74)
Croatia	-.0612 (5.58)	.2462 (17.43)	.1265 (3.34)
Cyprus	-.0219 (1.54)	.0979 (5.37)	.0115 (0.24)
Czech Republic	.0565 (4.71)	-.0150 (1.02)	-.0004 (0.01)
Denmark	-.1296 (11.87)	.0649 (4.42)	.0883 (2.36)
Estonia	.1343 (10.63)	.1891 (13.22)	.1134 (2.91)
Finland	-.0324 (2.83)	.0514 (3.51)	-.0142 (0.38)
France	.0076 (0.66)	.1415 (9.87)	-.3164 (8.42)
Germany	.0873 (7.96)	-.1056 (8.00)	-.3906 (11.94)
Greece	-.0478 (4.32)	.1189 (8.20)	-.4480 (12.02)
Hungary	.0718 (5.96)	.1846 (12.91)	-.0016 (0.04)
Iceland	-.0432 (2.98)	.0471 (2.57)	.0216 (0.46)
Ireland	-.1029 (9.77)	.2195 (15.41)	.2851 (7.41)
Italy	.0470 (3.98)	.0620 (4.27)	.0986 (2.63)
Latvia	-.0699 (6.39)	.1820 (12.71)	.1751 (4.67)
Lithuania	.1396 (11.11)	.1027 (7.12)	.2640 (6.88)
Luxembourg	.0571 (3.76)	.0020 (0.11)	.0610 (1.27)
Macedonia	-.0258 (2.31)	.2051 (14.45)	.4887 (12.55)
Malta	.1571 (9.75)	-.2796 (14.44)	-.3128 (5.98)
Netherlands	-.0950 (8.73)	-.2406 (16.13)	-.3323 (9.02)
Poland	.1373 (10.89)	.1057 (7.29)	.1085 (2.74)
Portugal	.0651 (5.36)	.2110 (14.60)	.0331 (0.86)

Romania	.0551 (4.62)	-.0446 (3.05)	.2870 (7.26)
Slovakia	.0905 (7.39)	.1433 (9.94)	.1792 (4.76)
Slovenia	-.0635 (5.80)	.1423 (9.92)	.1810 (4.88)
Spain	-.1349 (13.19)	.3259 (23.25)	-.1172 (2.98)
Sweden	-.1764 (16.39)	.1528 (10.65)	.0323 (0.88)
Turkey	-.0969 (9.07)	.1693 (11.33)	.2280 (5.53)
UK	-.0589 (5.80)	-.0122 (0.90)	.2227 (6.36)
Constant			2.5499
N	61,374	61,374	26867
Pseudo R^2	.0640	.0622	

Source: Columns 1 & 2 Eurobarometer #73.4, May 2010 and #76.3 November 2011. Column 3 Eurobarometer #75.3 May 2011.

Notes: excluded categories: single: Belgium; ALS <16 and age 45-54. Columns 1 and 2 are estimated with a dichotomous dependent variable where the coefficients can be interpreted as marginal effects and estimated as a dprobit. Column 3 estimated by Ordinary Least Squares.T-statistics are included in parentheses.
Question 1. What do you think are the two most important issues facing (OUR COUNTRY) at the moment - crime; economic situation; *rising prices\inflation*; taxation; *unemployment*; terrorism; defence\foreign affairs; housing; immigration; healthcare system; the educational system; pensions; the environment; energy; other?" Dependent variable in column 1 is set to 1 if unemployment mentioned, zero otherwise and 1 if rising prices/inflation mentioned, zero otherwise.

Question 2. Do you agree that the government should increase public deficits to create jobs? Totally disagree (=1); tend to disagree (=2); tend to agree (=3); totally agree (=4).

Table 5 – Views on austerity (%)

Question – should the government increase public deficits to create jobs?

	Totally Disagree	Tend to disagree	tend to agree	Totally agree
Austria	6	28	44	21
Belgium	16	39	35	9
Bulgaria	9	23	55	13
Croatia	19	22	34	26
Cyprus	23	24	28	25
Czech Republic	13	35	38	14
Denmark	14	30	42	14
Estonia	15	24	46	16
Finland	16	32	42	11
France	26	36	29	8
Germany - West	31	38	24	7
Germany East	23	38	29	10
Great Britain	8	24	54	14
Greece	31	39	20	10
Hungary	16	30	38	16
Iceland	11	36	43	10
Ireland	7	23	50	20
Italy	13	26	44	16
Latvia	12	23	47	18
Lithuania	10	22	47	21
Luxembourg	15	29	40	16
Macedonia	10	14	39	38
Malta	27	30	34	8
Montenegro	12	21	47	19
Netherlands	20	48	28	4
Northern Ireland	8	21	56	16
Poland	12	26	46	15
Portugal	12	30	44	14
Romania	11	21	44	25
Slovakia	9	27	48	17
Slovenia	15	24	37	25
Spain	25	24	33	18
Sweden	18	30	37	15
Turkey	13	21	37	29

Source: Eurobarometer #75.3 May 2011

Table 6. Unemployment and inflation – expectations

	Unemployment expectations		Inflation expectations	
	1985-2013	Sept12-Feb13	1985-2013	Sept12-Feb13
Austria	24	30	21	37
Belgium	28	56	20	34
Bulgaria	28	48	36	41
Cyprus	45	69	29	11
Czech Republic	29	44	38	42
Denmark	9	16	n/a	n/a
Estonia	25	4	41	42
Finland	3	22	18	37
France	32	54	14	31
Germany	23	23	27	29
UK	25	30	27	27
Greece	45	81	36	8
Hungary	34	40	52	52
Ireland	23	24	19	14
Italy	31	55	20	10
Latvia	24	9	31	26
Lithuania	13	15	46	52
Luxembourg	35	49	n/a	n/a
Malta	20	15	n/a	n/a
Netherlands	17	64	22	31
Poland	23	42	32	32
Portugal	37	72	30	37
Romania	41	44	49	47
Slovakia	22	48	43	47
Slovenia	29	48	35	38
Spain	21	49	13	12
Sweden	7	32	17	8
EZ17	27	45	21	25

Source: unemployment rate and inflation rate (HICP) Eurostat
http://ec.europa.eu/economy_finance/db_indicators/surveys/index_en.htm
Guides are at
http://ec.europa.eu/economy_finance/db_indicators/surveys/documents/userguide_en.pdf
Unemployment expectations balance How do you expect the number of people unemployed in this country to change over the next 12 months? The number will... PP= increase sharply; P=increase slightly; E=remain the same; M=fall slightly; MM=fall sharply.
Balance =B = (PP + ½P)−(½M + MM)
Inflation expectations balance how do you expect that consumer prices will develop in the next 12 months? They will have…PP=risen a lot;P=risen moderately; E=risen slightly; M=stayed about the same; MM=fallen
Balance not seasonally adjusted = (PP + P/2 -M/2 - MM)

Table 7. Happiness in the United States

	Very happy	Pretty happy	Not too happy
1972	30	53	17
1973	36	51	13
1974	38	49	13
1975	33	54	13
1976	34	53	13
1977	35	53	12
1978	34	56	10
1980	34	53	13
1982	31	55	15
1983	31	56	13
1984	35	52	13
1985	29	60	11
1986	32	56	11
1987	29	57	13
1988	34	57	9
1989	33	58	10
1990	33	58	9
1991	31	58	11
1993	32	57	11
1994	29	59	12
1996	30	58	12
1998	32	56	12
2000	32	58	11
2002	30	57	12
2004	31	55	13
2006	31	56	13
2008	30	55	16
2010	26	58	16
Total	32	56	12

Source: General Social Survey

Table 8. 4–step life satisfaction by country

Country	2008	2009	2010	2011	2012
Austria	3.0	3.0	3.0	3.1	3.1
Belgium	3.1	3.2	3.1	3.2	3.2
Bulgaria	2.2	2.2	2.2	2.2	2.2
Croatia	2.8	2.8	2.8	2.7	2.7
Cyprus	3.1	3.1	3.1	3.1	3.0
Czech Republic	2.9	2.9	2.9	2.9	2.8
Denmark	3.6	3.7	3.6	3.7	3.7
Estonia	2.8	2.7	2.8	2.7	2.7
Finland	3.3	3.3	3.3	3.3	3.3
France	2.9	2.9	3.0	3.0	2.9
Germany	2.9	3.0	3.0	3.1	3.1
Greece	2.7	2.4	2.3	2.3	2.2
Hungary	2.3	2.3	2.4	2.4	2.3
Ireland	3.3	3.3	3.2	3.2	3.2
Italy	2.6	2.6	2.7	2.8	2.6
Latvia	2.6	2.4	2.5	2.6	2.7
Lithuania	2.6	2.5	2.5	2.6	2.6
Luxembourg	3.4	3.6	3.4	3.4	3.4
Malta	3.1	3.0	2.9	3.0	2.9
Netherlands	3.4	3.5	3.4	3.5	3.5
Poland	2.8	2.8	2.9	2.8	2.8
Portugal	2.5	2.3	2.3	2.4	2.3
Romania	2.5	2.4	2.2	2.3	2.4
Slovakia	2.7	2.7	2.8	2.8	2.7
Slovenia	3.1	3.0	3.0	3.0	3.0
Spain	3.0	2.9	2.9	2.9	2.8
Sweden	3.4	3.5	3.4	3.5	3.5
Turkey	2.6	2.6	2.7	2.7	
UK	3.3	3.2	3.3	3.3	3.2

Source: Eurobarometers #69.2; #71.1; #71.3: #73.4: #74.2: #75.3: # 75.4: #76.4; #77.4 Question. “

Table 9: Life satisfaction, unemployment and inflation in Europe, 1975-2012

	(1) OLS	(2) OLS	(3) OLS	(4) Ordered logit	(5) OLS Pre 2007
Unemployment rate	-.0137 (10.83)	-.0141 (11.30)	-.0140 (10.99)	-.0359 (10.79)	-.0116 (7.01)
Inflation rate	-.0048 (3.75)	-.0048 (3.73)	-.0047 (3.65)	-.0107 (3.09)	-.0093 (5.23)
Unemployed	-.4000 (46.25)	-.3927 (47.77)	-.3927 (47.78)	-1.0324 (43.83)	-.3779 (33.77)
Banking crises (3 years)			-.0405 (2.39)	-.1214 (2.50)	-.0319 (1.99)
Home worker	-.0302 (7.07)	-.0586 (13.61)	-.0586 (13.61)	-.1465 (12.12)	-.0486 (10.63)
Student	.1461 (22.19)	.1019 (16.79)	.1020 (16.80)	.2927 (16.79)	.0828 (13.53)
Retired	-.0831 (16.02)	-.0886 (17.39)	-.0887 (17.35)	-.2279 (16.24)	-.0692 (11.66)
Belgium	.1266 (5.16)	.1262 (5.23)	.1261 (5.19)	.3817 (5.03)	.0628 (2.18)
Bulgaria	-.8137 (26.72)	-.8320 (27.19)	-.8317 (26.96)	-2.1167 (26.18)	-.9598 (28.56)
Croatia	-.1751 (8.02)	-.1893 (8.80)	-.1890 (8.73)	-.5282 (7.93)	-.2438 (8.14)
Cyprus	.0224 (0.96)	-.0029 (0.12)	-.0019 (0.08)	.0886 (1.19)	-.0632 (1.97)
Czech Republic	-.1650 (7.74)	-.1702 (8.07)	-.1694 (8.00)	-.5127 (7.79)	-.1981 (6.47)
Denmark	.5287 (23.01)	.5305 (23.14)	.5337 (23.18)	1.7024 (22.83)	.4754 (17.75)
Estonia	-.2515 (8.92)	-.2373 (8.33)	-.2370 (8.30)	-.6950 (8.59)	-.3526 (13.67)
Finland	.2006 (8.20)	.2062 (8.93)	.2063 (8.90)	.5614 (7.85)	.1372 (4.81)
France	-.1487 (6.50)	-.1518 (6.56)	-.1508 (6.47)	-.4053 (5.69)	-.2176 (8.26)
Germany	-.0710 (3.34)	-.0698 (3.32)	-.0670 (3.14)	-.2014 (2.98)	-.1271 (5.21)
Greece	-.3792 (11.91)	-.3939 (12.52)	-.3932 (12.53)	-1.0602 (11.73)	-.3645 (11.64)
Hungary	-.5873 (26.35)	-.5795 (26.56)	-.5792 (26.34)	-1.5203 (23.37)	-.5769 (18.82)
Iceland	.4700 (11.23)	.4619 (10.34)	.4629 (10.38)	1.4487 (11.17)	
Ireland	.2187 (10.01)	.2137 (9.69)	.2144 (9.71)	.6739 (9.75)	.1598 (6.12)
Italy	-.2065 (7.77)	-.2137 (8.09)	-.2103 (7.82)	-.5875 (7.37)	-.2277 (7.69)
Latvia	-.3778 (14.56)	-.3694 (14.49)	-.3694 (14.40)	-1.0181 (13.99)	-.4639 (11.98)
Lithuania	-.4128 (17.00)	-.4015 (16.36)	-.4012 (16.27)	-1.0958 (15.12)	-.5194 (19.31)
Luxembourg	.2094 (9.19)	.2035 (9.07)	.2040 (9.04)	.6563 (9.22)	.1539 (6.02)
Malta	-.0176 (0.57)	-.0344 (1.14)	-.0336 (1.11)	-.0608 (0.68)	-.0259 (0.62)
Netherlands	.3236 (14.95)	.3202 (15.05)	.3204 (14.93)	.9850 (14.42)	.2615 (10.73)
Norway	.2826 (8.94)	.2830 (8.53)	.2813 (8.45)	.8856 (8.40)	.2425 (6.90)
Poland	-.1484 (7.05)	-.1573 (7.49)	-.1570 (7.43)	-.4671 (7.20)	-.1955 (5.52)

Portugal	-.4331 (14.80)	-.4504 (15.32)	-.4512 (15.40)	-1.2076 (14.94)	-.4314 (13.81)
Romania	-.6753 (20.55)	-.6954 (20.95)	-.6951 (20.97)	-1.8190 (20.89)	-.6911 (17.88)
Slovakia	-.2297 (7.38)	-.2373 (7.63)	-.2372 (7.58)	-.6951 (8.11)	-.3689 (10.19)
Slovenia	.0124 (0.50)	.0011 (0.05)	.0019 (0.08)	-.0194 (0.27)	.0081 (0.31)
Spain	.0604 (2.78)	.0533 (2.46)	.0520 (2.38)	.1050 (1.58)	.0022 (0.08)
Sweden	.3363 (13.75)	.3446 (14.48)	.3448 (14.39)	1.0317 (13.69)	.2657 (10.95)
Turkey	-.2108 (4.54)	-.2474 (5.29)	-.2475 (5.31)	-.5514 (4.09)	-.1649 (5.02)
UK	.1616 (7.61)	.1567 (7.43)	.1641 (7.63)	.5202 (7.72)	.1067 (4.44)
Country dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Personal controls	No	Yes	Yes	Yes	Yes
Constant/Cut 1	3.1128	3.1670	3.1626	-3.7077	3.2536
Cut 2				-1.9157	
Cut 3				.9536	
N	1,134,785	1,101,512	1,101,512	1,101,512	788,991
R^2/Pseudo R^2	.1803	.1937	.1938	.0971	.0829

Source: Eurobarometers, 1975-2012. Excluded categories is Austria. Standard errors are clustered at the level of country and year. Personal controls are 5 age dummies; 4 marital status dummies plus gender

Table 10. Estimates of the misery ratio

	Unemployment rate	Inflation rate	Unemployment coefficient	Misery ratio
All (column 2 Table 9)	-.0141	-.0048	-.3927	3.76
Eurozone (17)	-.0154	-.0053	-.4251	3.71
5 core Eurozone countries*	-.0153	-.0270	-.4314	0.73
Non-core Eurozone countries	-.0134	-.0027	-.3803	6.37
EU (27)	-.0137	-.0047	-.4187	3.81
Western Europe	-.0145	-.0042	-.3930	4.39
Eastern Europe	-.0102	-.0071	-.4045	2.01
All Di Tella et al	-.0144	-.0043	-.4000	4.28
All Di Tella et al <1992	-.0152	-.0105	-.4024	1.83
All Di Tella et al >=1992	-.0129	-.0046	-.3977	3.67
Age<25	-.0092	-.0070	-.3321	1.79
Age 25-34	-.0124	-.0073	-.3780	2.22
Age 35-44	-.0152	-.0052	-.4441	3.78
Age 45-54	-.0174	-.0050	-.4661	4.41
Age 55-64	-.0160	-.0052	-.3932	3.83
Male	-.0141	-.0053	-.4655	3.54
Female	-.0140	-.0044	-.3245	3.92
ALS<16	-.0174	-.0032	-.3711	6.60
ALS16-19	-.0143	-.0057	-.3677	3.15
ALS >=20	-.0109	-.0053	-.3546	2.73
Banking crisis years	-.0132	-.0023	-.4062	7.51
Non-banking crisis years	-.0144	-.0060	-.3894	3.05

Notes: all coefficients are statistically different from zero at the 5% level. Each row is obtained from a separate regression with age and its square, gender, 5 marital status dummies, year dummies and country dummies. ALS=age left school. For calculation of unemployment/inflation trade-off see text. 'Di Tella countries' are Belgium; France; Denmark; Greece; Germany; Great Britain; Ireland; Italy; Luxembourg; Netherlands; Portugal and Spain from 1975-1991. Standard errors are clustered by country and year. Five core Eurozone countries = Germany, Austria, France, Finland and the Netherlands