KYKLOS ,Vol. 71 – May 2018 – No. 2, 279–309

The Cost of Banking Crises: New Evidence from Life Satisfaction Data

Alberto Montagnoli and Mirko Moro*

I. INTRODUCTION

The shock of a financial crisis imposes a considerable burden on both economies and individuals. There is an extensive literature on the economic costs and the channels through which these crises impact the functioning of the financial markets and the real economy via credit disruption and wealth and output losses (e.g., Bernanke, 1983; Cecchetti *et al*., 2009). When compared to all other types of financial crises, banking crises are distinctive in that they independently affect the whole economic system and have both direct (e.g. decrease in GDP and employment) and indirect (e.g. higher government spending and lower tax revenue) economic impacts on individuals.[1]

* Alberto Montagnoli Division of Economics, Stirling Management School, University of Stirling, UK mirko.moro@stir.ac.uk Mirko Moro Division of Economics, Stirling Management School, University of Stirling, UK mirko.moro@stir.ac.uk. We would like to thank David Bell, Danny Blanchflower, Christopher Boyce, Sascha Becker, Sarah Brown, Jérémy Celse, Andrew Clark, David Comerford, Liam Delany, Andy Dickerson, Robert Dur, Oliver Falck, John Gathergood, Bob Hart, Stephan Heblich, Alex Kontonikas, Andrew Oswald, Georgios Panos, Nick Powdthavee, Eugenio Proto, Arne Risa Hole, Ronnie Schöb, Andrea Vaona, Alex Wood, participants at the European Economic Association 2015 annual congress, "SIRE Workshop on Economics and Psychology" at the University of Stirling, at the workshop on the "Causes and Consequences of Happiness", Erasmus School of Economics, at the International Congress in Applied Psychology, Paris and seminar participants at the University of Keele University, University of Sheffield, University of Verona. We are very grateful to Robin Ruffell for excellent research assistance. Any remaining errors are our own.

[1]Dell'Ariccia et al. (2008) and Kroszner et al. (2007), looking at industrial and sectoral data, find that there is a real cost to banking crises; similarly, using US data from 1866, Giesecke et al. (2014) find support to the theories that emphasize the unique role that banks play in amplifying macroeconomic shocks. Jordà et al. (2013) and Reinhart and Rogoff (2009a, 2009b, 2011) show that recessions which follow a banking-crisis are more severe, and the recovery is slower, compared to other types of recessions. The literature has also highlighted that alongside these aggregate costs there is some evidence that banking crises scar individuals. For instance Osili and Paulson (2014) show how banking crises change the behaviour of depositors, more specifically they show that individuals who have experienced a systemic banking crisis are less likely to use banks in the U.S. Moreover, corporate managers born during the U.S. Great Depression of the 1930s are less likely to use external financing (Malmendier and Tate, 2005) and are more risk averse (Malmendier and Nagel, 2011).

Starting from this premise, the aim of this paper is to test whether banking crises across Europe had an effect on individual's life satisfaction.[2] To this end, our framework is built upon the economics of 'happiness' (or subjective well-being, SWB henceforth). This literature has extensively investigated individuals' SWB by using surveys, which reliably collect individual life satisfaction or happiness scores. SWB is typically found to be associated with micro- and macro-economic factors (e.g., income, job status, unemployment rate) in a predictable fashion (for reviews see Frey and Stutzer, 2002; MacKerron, 2012). The conclusions of the seminal papers by Di Tella *et al*. (2001 and 2003) are particularly relevant to us; they were the first to show a negative association between recessions and SWB across Europe. More recently, Deaton (2011) analysed the evolution of daily and monthly measures of SWB (life satisfaction and affect states) in the United States during the latest crisis.[3] His analysis revealed a significant drop in Americans' life satisfaction and a sharp increase in worry and stress, suggesting that well-being measures were very successful at capturing uncertainty and fear about the future. In particular, he points out that the return of SWB to its pre-crisis levels coincided with the end of the period of uncertainty, as measured by the Dow Jones trend. This work also shows that the SWB losses in USA followed by the Great Recession were large, but people fully recovered within two years. A very similar analysis and conclusion was reached by Graham *et al*. (2010).[4]

These papers leave us with a testable hypothesis: banking crises should cause a distress that would lower SWB *above and beyond* the psychological losses caused by changes in objective personal and macroeconomic conditions. We also explicitly address the potential endogeneity of banking crises and study their persistence in the economy.

We require, therefore, (a) a definition of banking crises that can discriminate between crises that impact the population as a whole (not just shareholders or big investors), and (b) a clear identification of the effects of banking crises.

We follow the literature on financial stability and the costs of banking crises by constructing event dummies using datasets from Reinhart and Rogoff (2011) and Laeven and Valencia (2013). Specifically, we focus our attention on crises

[2]We are aware of the differences in the psychological literature on subjective well-being, happiness and life satisfaction, but for sake of brevity we will be using them interchangeably throughout the paper.

[3]Deaton's (2011) set of measures capture two well-being dimensions. The first variable, that Deaton's label life evaluation, is also known as the "ladder of life" capture something very similar to our life satisfaction. People are asked to report whether they are satisfied with their life as a whole using a 11-point scale, where 0 is the "worst possible life for you" and 10 is the "best possible life for you". The second dimension of well-being is capturing emotions (such as stress, worry, happiness) and it is the yes-no answer to questions about whether they experienced a lot of each on the previous day. The literature seems to agree that the latter capture instantaneous utility better.

[4]Graham *et al*. (2010) conclude that "people seem to adapt their expectations downward at a time of crisis, and then are happier with less overall wealth once a sense of hope about an end to the crisis has set in or, at minimum, that the uncertainty about the downward spiral in the markets/economy has abetted" (p. 730).

involving commercial banks, hence, excluding those events implicating merchant banks exclusively.[5] We do this because the outcome variable is the well-being of the whole population rather than some macroeconomic or financial outcome.[6]

We then match these data to individual SWB data extracted from the Eurobarometer surveys covering an unbalanced panel of twenty-nine European countries for the period 1980-2011. Our final dataset includes five episodes of banking crises preceding the great financial crash and seventeen crises during the 2007-08.[7]

Although unexpected, banking crises may still be endogenous if unobservables (e.g., level of greed, optimisms, euphoria) are correlated with both SWB and financial shocks. A simple model regressing SWB on a banking crisis dummy would implicitly assume that these events are randomly assigned to countries and/or that there are no omitted variables. In an effort to establish causality between macroeconomic events and well-being we take advantage of the spatial and temporal variation of crises in our European dataset. This approach can be thought of as a (dynamic) difference-in-differences (henceforth DD) strategy (see Angrist and Pischke, 2009).[8] Specifically, we compare the SWB of individuals living in European countries before and after a banking crisis (i.e., multiple treatment groups), with individuals living in countries that, in the same period, do not experience a banking crisis (i.e., multiple control groups). The identifying assumption is that the SWB of individuals living in countries that did not experience a crisis form a valid counterfactual for the SWB of individuals living in treatment countries (after conditioning on micro and macro characteristics, country and year fixed effects). We verify this assumption known as the *common trend* assumption by allowing for leads of the banking crisis effects. Statistically similar trends *before* the crisis suggest that the control group forms a valid counterfactual. This is also a placebo test confirming that non-banking crisis years do not lead to a SWB loss (above and beyond standard economic factors). [9]

Our results can be summarised as follows.

[5]Full information about each crisis episode is reported in Appendix A in the SI.

[6]It is worth noting that macroeconomic conditions have an impact on the individuals' SWB, particularly, but not exclusively, if these conditions are determinants of change in job status. Inflation and unemployment rates are often found to be negatively related to individual life satisfaction, even after controlling for individual characteristics (see e.g., Blanchflower *et al*., 2014; Di Tella *et al*., 2001 and 2003; Wolfers, 2003). In our empirical specification, we do control for such a scenario; nevertheless, our focus is on effects that go above and beyond these standard macroeconomic channels.

[7]We deliberately stop our sample at 2011 in order to avoid to capture the European debt crisis.

[8]For similar dynamic DD models in finance, see e.g., Goetz *et al*. (2013); Kerr and Nanda (2009). For simplicity, we will refer to this as dynamic DD models in the remainder of the paper.

[9]We use a sample of individuals living in European countries that share common rules, institutions, markets and exchange rate regimes in the period covered. We are aware of important differences between the units of this analysis. Although, a very close similarity between individuals (or countries) is certainly a welcome feature in a DD framework, the identification rests solely on the parallel trend assumption, which we convincingly satisfy.

First, we show that banking crises have a negative and statistically significant effect on the SWB of Europeans. For these events, we show that the psychological losses are highly persistent. We show that these losses are partially explained by the decline in GDP, wealth losses and fiscal costs. However, they extend beyond these conventional channels of transmission. The estimated parameters are also relatively large, about one standard deviation of SWB. We also compute the trade-off between income and the banking crisis that will leave people, on average, with the same level of SWB. We estimate that during the first year of the banking crisis, individuals would require an increase in income equivalent to moving from the first to the second income quartile to offset the decline in SWB.

Second, the average coefficient on the 2007-8 crash is estimated to be slightly smaller than previous banking crises. There are various explanations for this; the probability of banking crisis contagion is higher in recent years and this reduces the differences (and hence the detectable effects) between countries that are directly impacted and the others. In an effort to provide further investigation, we document that the loss might be larger for those countries that experienced a credit boom before the crisis started.

Third, we study whether banking crises impact more heavily on some socioeconomic groups. Overall, the results suggest that banking crises has a pronounced impact across all groups.

The remainder of the paper is structured as follows. Section II highlights the previous literature on the costs of financial, especially banking crises, and the channels through which banking crises impact well-being. Section III highlights the empirical strategy. Section IV focuses on the data sets. Section V contains the results and in Section VI we offer our conclusions.

II. THE COSTS OF BANKING CRISES

There is general agreement that banking crises impose costs on the economy as a whole that goes beyond direct costs borne by stakeholder, borrowers, depositors and taxpayers who sustain the fiscal burden of the resolution of the crisis. These general welfare costs have been usually measured in terms of output decline and are generated by disruption of credit intermediation (Hutchison and Noy, 2005) and in general a contraction of credit supply via numerous different and self-reinforcing mechanisms. Cerra and Saxena (2008), employing panel data from 192 countries, find strong evidence of a large reduction in economic output. Similar evidence is provided by Cecchetti *et al*. (2009); looking at 40 crises since 1980, their results show sharp and persistent contractions in output. Hoggarth *et al*. (2002) suggest that output loss is about 15-20% of annual GDP, on average. More recently, Jordá *et al*., (2013) and Reinhart and Rogoff (2009a; 2009b and 2011), using a sample that spans centuries and several countries, show that banking crises have a long-lasting effect on both real economic activity and asset

prices. Reinhart and Rogoff document that unemployment rises, on average, for five years with an average rate of seven percentage points. Real GDP per capita falls by an average of about nine per cent, and the duration of the economic downturn is two years. Housing and equity markets are severely hit; the decline is about 35% and 56%, respectively. For instance, Jordá *et al*. (2013) show that recessions following a banking-crisis are costlier than other recessions and Barrell *et al*. (2006) show that banking crises have a non-negligible effect on consumption, particularly in the presence of high leverage.

The recent availability of richer longitudinal household surveys has prompted researchers to attempt to quantify the microeconomic costs of financial crises. Particular emphasis has been placed on the consequence of the recent financial crisis. Bricker *et al*. (2011) conclude that 60% of U.S. households experienced a decline in wealth between 2007 and 2009, and that about 25% of them lost more than half of their wealth. Chakrabarti *et al*. (2011) and Hurd and Rohwedder (2010) show how these losses have affected large numbers of households across all age, income, and education brackets. Bosworth and Smart (2009) calculate that this loss was about 20% for households aged over 50. Financial losses were associated with reductions in consumption, and many households reduced consumption even without experiencing financial losses (e.g. Christelis *et al.,* 2011; Shapiro, 2010).

In addition to these conventional welfare losses, financial crises and economic recessions in general, impose costs that are more difficult to measure but are nevertheless important. These intangible, non-monetary economic disruptions are linked to a decrease in individuals' mental well-being resulting from increased uncertainty, fear and a decline in trust of the economic system. For thought-out analyses on this, see Deaton, (2011), Graham *et al*. (2010), which study daily and monthly variation in SWB in the United States during the latest financial crisis. Particularly relevant to our paper is their finding the decline in wellbeing almost fully recovered by the end of 2010, even though the economy was still characterised by high unemployment and declining real income, following closely the stock market. Deaton concludes that the stock market and SWB measures were highly correlated because they were both probably picking up the fear of the future and uncertainty associated with evolving economic situation. Gathergood (2012), using longitudinal data from the UK, finds that problems with mortgage debt affect individuals' mental well-being. Banking crises strongly affect the mutual level of confidence and trust between firms, households and banks. Any lack of confidence created by financial crises generates a higher system uncertainty which will ultimately have a negatively impact the level of consumption and investment and more generally on individuals' well-being. Related to this, Zingales (2011) shows a strong relation between the trust that respondents place in banks and their willingness to keep savings in the form of bank deposits.

The next section provides details on how this paper estimates these psychological losses using individual SWB data.

III. EMPIRICAL STRATEGY

The aim of the paper is to estimate the effects of banking crises on SWB across European countries over time. Simple averages a country level supports the idea that SWB is lower in the aftermath of a banking crisis (see Appendix B in the Supplementary Information, hereinafter SI). More formally, we start our analysis by testing the relationship between SWB and banking crises by OLS in which SWB is regressed on a banking crisis indicator. The baseline equation at the individual level is given by:

$$SWB_{ijt} = \lambda_t + \alpha_j + \boldsymbol{X}_{jt}\boldsymbol{\beta} + \boldsymbol{Z}_{ijt}\boldsymbol{\gamma} + \xi D_{jt} + \boldsymbol{\epsilon}_{ijt} \tag{1}$$

where i indexes individuals, j indexes nations, and t indexes time. λ_t and α_j are the year effects and the country fixed effects, respectively. D_{jt} is a dummy variable which takes the value of 1 for the year of a banking crisis and 0 otherwise, $\boldsymbol{Z}_{ijt}$ are individual-specific covariates, while $\boldsymbol{X}_{jt}$ accounts for macroeconomic variables that control for time-varying general characteristics at a country level. Our hypothesis is that parameter ξ should be negative and statistically significant. This indicates the presence of a correlation between banking crises and SWB. This parameter ξ equates to the average treatment effect only under the assumptions of unconfoundedness (i.e., there are enough controls so that the banking crisis assignment is essentially randomised). A specific problem here is that the banking crisis might be correlated with $\boldsymbol{\epsilon}_{ijt}$ because of either omitted or simultaneous factors being correlated with both the timing of the banking crisis and life satisfaction at country-year level; for example, banking crises may occur in countries that are affected by higher or lower levels of optimism. Variables may be omitted from even the best dataset, especially at the macro level.

In an effort to develop causal estimates of banking crisis on the individual's life satisfaction, and to study whether this effect is persistent we use a dynamic DD approach. The starting point of this approach is that other things being equal, one would expect that individuals living in a country hit by a financial shock in year t (i.e., treatment group) are more affected than a *comparable* group of individuals living elsewhere after year t, i.e., after the banking crisis occurred. The identifying assumption is that variations in SWB between treatment and control groups would have the same trend after the banking crisis, if the banking crisis did not occur. In a DD setting, this is usually known as the common trend assumption and cannot be verified. However, a common trend in SWB between treatment and control groups *before* the banking crisis is satisfactory evidence to indicate that banking crises are indeed exogenous.[10] A natural way to check

[10]Our econometric model is complicated by having multiple treatment groups and multiple periods (moreover, the same treatment group can receive the treatment more than once).

for the applicability of the assumption is to allow for leads of the treatment (i.e. the banking shock). The equation at the individual level is:

$$SWB_{ijt} = \lambda_t + \alpha_j + \boldsymbol{X}_{jt}\boldsymbol{\beta} + \boldsymbol{Z}_{ijt}\boldsymbol{\gamma} + \sum_{n=-m}^{q} \xi_n D_{jt\ (t=k+n)} + \boldsymbol{\epsilon}_{ijt} \quad (2)$$

Where $\sum_{n=-m}^{q} \xi_n D_{jt(t=k+n)}$ is the term of interest; k is the time at which the treatment is being switched on. We allow for m leads and q lags of the treatment effect. ξ_n is the coefficient of interest on the nth lag or lead. ξ_0 is then the normalised year corresponding with the beginning of the crisis. $\sum_{n=0}^{q} \xi_n$ with $q=1,2,3,4$ are the parameters capturing the persistence of banking crisis. The battery of m leads provides evidence of the common trend assumption. If the control group represents a valid counterfactual, we would expect that all the coefficients leading to the introduction of the treatment are not statistically different from zero, $\beta_n = 0$, $n < 0$. If leads effects are statistically different from zero, then the future treatment would predict current outcomes, suggesting that banking crises may not be exogenous. Because there is one crisis every five years roughly, we present the results using four leads and lags when using the 1980-2003 sample (i.e., every year from ξ_{-4} through ξ_{+4}). For the 2003-2011 sample, we adopt a model that uses every year from ξ_{-4} to ξ_{+2}.[11]

This addition of lags enhances the analysis in two ways: first, lagged effects relax the implicit assumption, common to standard estimators, of constant treatment effects. Furthermore, the addition of lags in equation 2 allows us to study how long it takes to individuals to adapt to the banking crisis.[12]

This dynamic framework has been used extensively in the literature to test the causal impact of policy or shocks rolled out in different states at different times in Unite States[13]. We are aware that there are more differences between European countries than states, but this does not invalidate the use of a DD *per se* (see, e.g., Hanushek and Wößmann, 2006 using a DD in a sample of OECD countries),[14] However, European countries in the Eurobarometer share rules, markets,

[11]In the last case, the reference category is the third and/or fourth lag (ξ_{+3} and ξ_{+4}, i.e., either 2010 or 2011).

[12]It is well known that shocks to SWB are temporary, lasting only a few years, after which adaptation is mostly completed. The literature has documented adaptation to changes in income (Di Tella *et al.,* 2010 and Gardner and Oswald, 2007), and changes in status, e.g., disability (Oswald and Powdthavee, 2008), marriage and divorce (e.g., Clark *et al.*).

[13]The number of studies using DD at state level is vast and growing exponentially. For methodologies very similar to ours, one should check the identification strategy based on staggered banking deregulation across states in the United States, see, e.g., Strahan (2003), Kerr and Nanda (2009), Chava et al. (2013), and more recently Sun and Yannelis (2016) among many others.

[14]Having said that there are striking differences across Alabama and California or Massachussets and Michigan.

governing institutions and exchange rates regimes in the period of interest. A very close similarity between units in a difference-in-difference approach is certainly welcome but ultimately the validity of the approach always relies on *common trends* before the shock. Our analysis shows that our sample satisfies this assumption. Setting this aside, the effect of the banking crisis is identified at country-year level and one may be concerned about the presence of potential simultaneous unobservable country-year factors. Note that the set of leads provide also a powerful *placebo test* by showing that non-banking crisis years do not lead to a SWB loss ruling the existence of confounding factors that may arise independently from banking crisis. We cannot rule out that something else might have happened in the year and in the country every single time that our banking crisis dummy is turned on. It is however had to imagine that this is not somehow related to the banking crisis itself. Ultimately, our approach is an improvement upon running naïve OLS regressions that assumes banking crisis (and in general events) being uncorrelated with national mood and at minimum can be seen as a step towards developing causal estimates of macro events.

Another identification issue is that banking crises in a country might have spillovers to other "control" countries. In this sense the control countries "are contaminated". In the presence of this contagion, our coefficient might provide a lower bound of psychological loss, i.e., our strategy provides conservative estimates. Note that our estimates tend to be on the lower bound for another aspect. As we will explain in detail in section IV.2 is very difficult to identify a precise date as the starting point of a banking crisis. From a technical point of view, attributing the crisis to the whole year instead to a precise date, means that our indicator variables measure the event with an error (some people may have been interviewed before the manifestation of the episode). This looks like classical measurement error that would bias the estimates downward.

Following Ferrer-i-Carbonell and Frijters (2004), and more generally Angrist and Pischke (2009), we estimate all our regressions using linear probability models.[15] In all specifications, we clustered the standard errors at the country level as suggested by Bertrand *et al*. (2004) with improved critical values using a t-distribution, rather than the normal, to correct for the bias arising from small clusters (Cameron and Miller, 2015 and Brewer *et al*., 2013).[16]

[15]Angrist and Pischke (2009) show that the linear probability model is the best (linear) approximation for non-linear conditional expectation functions, whereas Ferrer-i-Carbonell and Frijters (2004) demonstrate that the ordinal nature of happiness scores can be studied by using OLS with empirical examples.

[16]t- distribution has degrees of freedom equal to the number of clusters minus one. We also estimated standard errors using the two-way approach of Cameron *et al*. (2011) to account for dependence across countries and over the years. The two methods yield very similar errors but we prefer the former as it performs better when the number of clusters is small. We also estimated the equations using standard errors clustered at country x year level, which yield smaller standard errors in most of the cases.

IV. DATA

IV.1. Life satisfaction and individual characteristics

Our main data source is the Eurobarometer Survey Series, a repeated cross-section survey in which a random sample of Europeans is asked a series of demographic and socio-economic questions, including one on life satisfaction. These are conducted twice a year on average and each survey consist of approximately 1,000 face-to-face interviews per country.[17] These interviews take place between March and October each year. The main question of interest is: "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?" Answers to the question can be split into four categories.

For the entire sample period, we use samples of individuals living in seventeen European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom. Questions are not systematically asked in all countries each year; hence, technically this is an unbalanced panel of countries. [18] Since the income variable is dropped from the Eurobarometer surveys after 2003, we analyse two periods separately: from 1980 to 2003 and from 2003 to 2011. This also implies analysing separately the Great Recession from the previous episodes which its interesting in its own way. For this late period, we also include twelve extra countries; these are: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia (FYROM), Poland, Slovakia, Slovenia and Romania. There is a double reason why we include these countries; firstly, data were not available before, but they were all included in the Eurobarometer after 2003 when each country made formal request to join the EU.[19] Second, as we will explain with greater detail the next section, this allows us to expand the control group.

We stop examining in year 2011 because the Great Recession -- initiated by a housing and banking crisis in the USA -- it later developed into a sovereign debt crisis in Southern Europe, confounding the effect of the banking crisis.

Finally, each regression includes a set of individual characteristics typically used in the literature: age, age-squared, dummy variables indicating gender, marital status (married, single, divorced or separated, widowed), educational attainment (i.e., age-left-school dummies), work status (employed, self-employed, unemployed), and whether retired, keeping house or a student.

[17]http://ec.europa.eu/public_opinion/archives/eb_arch_en.htm.

[18]In particular, we have the following years of data by country: Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, UK (1980-2011); Greece (1981-2011); Portugal, Spain (1986- 2011); Germany (1992-2011) Austria, Finland, Sweden (1995-2011); Norway (1990-1996, 2001 and 2005); Iceland (2005, 2010-2011).

[19]These are the so called candidate countries.

IV.2. Banking crises

Defining a variable that fully captures the intensity of banking crises is a problematic task. The financial literature does not provide a single definition of a banking crisis since banking crises are complex events and proxies might be imperfectly correlated with the crises themselves (see e.g., Barrell *et al.,* 2010). As explained in Barrell *et al*. (2010, p. 3) "The problem lies in the fact that a banking crisis is an event, so proxies for banking crises would not necessarily be perfectly correlated with banking crises themselves". If a quantitative candidate variable is found, it is usually not unique, is highly inconsistent and involves a degree of subjectivity (Kaminsky and Reinhart, 1999; Demirguc-Kunt and Detragiache, 1998). More specifically, banking problems can stem both from the liabilities and the assets sides of the banks' balance sheets. In the former case, a measure for banking insolvency could be a good proxy; thus, even though a government intervention or deposit insurance schemes could prevent the crisis, the threshold could still be violated. However, when crises arise from banks' assets, for instance, problems in asset quality eroding banking capital, a unique proxy would not pick up all the events across countries and across time.

For this reason, the financial literature relies on databases identifying banking crisis periods (e.g., specifying the country and year in which the banking crisis started), compiled on the basis of various criteria.[20] The two most recent and popular databases used are those of Reinhart and Rogoff (2011) and Laeven and Valencia (2013). Reinhart and Rogoff (2011) collected and updated data from a variety of sources, such as Caprio and Klingebiel, 1996, 2003) and Kaminsky and Reinhart (1999). Following Reinhart and Rogoff (2011, p. 1680), a banking crisis is 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 [...]." This definition is very similar to the one used by Laeven and Valencia (2010, p. 6), who define a banking crisis "as systemic if two conditions are met: 1) significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations); 2) significant banking

[20]It is extremely difficult to pin-point the exact starting point of a financial crisis; this can be seen by looking at the events that took place in 2007 before the Northern Rock bank-run episode. For instance, on the 7th of February 7, 2007, HSBC announced losses linked to US subprime mortgages. And on June 2007: Two Bear Stearns-run hedge funds with large holdings of subprime mortgages run into large losses and are forced to offload assets. The trouble transmitted to other financial e.g. Merrill Lynch, and Goldman Sachs.

Table 1

Banking crises included in the dataset

	Banking crisis years								
Countries	1984	1987	1990	1991	1994	1995	2000	2007	2008
Austria								✓	
Belgium									✓
Denmark		✓							✓
France					✓				✓
Germany									✓
Greece				✓					✓
Spain									✓
Ireland								✓	
Italy			✓						✓
Luxembourg									✓
The Netherlands									✓
Portugal									✓
Sweden									✓
United Kingdom				✓				✓	
Hungary									✓
Slovenia									✓

Notes: The table portrays episodes for which we have life satisfaction data from Eurobarometer Surveys merged with the first year of the crisis. The year of the crisis is reported after each country name. See Table A1 for a more detailed description of each banking crisis episode.
Life satisfaction data are available for this set of countries: Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, UK (1980-2011); Greece (1981-2011); Portugal, Spain (1986- 2011); Germany (1992-2011) Austria, Finland, Sweden (1995-2011); Norway (1990-1996, 2001 and 2005); Iceland (2005, 2010-2011); Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia (FYROM), Poland, Slovakia, Slovenia and Romania (2004-2011).

policy intervention measures in response to significant losses in the banking system."

Although this latter definition is very close to that of Reinhart and Rogoff (2011), it is far more restrictive since it excludes near-systemic crises, hence, there are very few episodes affecting our sample of countries. Moreover, there are several notable cases (Italy, 2008; Luxembourg, 2008; Sweden, 2008) wherein Laeven and Valencia (2013) report a crisis, whereas none are reported by Reinhart and Rogoff (2011). Based on the discussion above, we extract information on both databases to obtain information on banking crises events.[21]

The next step is to map these episodes to the Eurobarometer Surveys. Table 1 provides a snapshot of the countries for which we are able to merge life satisfaction data around each banking crisis identified. There are five episodes between 1980 and 2003. Given that we have an unbalanced panel of countries – see footnote 18 for the full Eurobarometer data coverage– each episode has a different set of countries as comparison group. Denmark 1987 is compared with ten countries,

[21]Table A1 in Appendix A (in the SI) describes each banking crisis episode in detail.

Italy 1990, Greece 1991 and UK 1991 with eleven, France 1994 with twelve. The global nature of the latest financial crisis meant that there we have more *treatment* than *comparison* countries for the 2003-2011 period. As mentioned in section IV.1, to increase the number of comparison countries and improve the analysis, we expand the number of countries in the 2003-2011 by including twelve Eastern European countries that joined the Eurobarometer after 2003. As a result, we have three banking crisis episodes in 2007 and thirteen in 2008 out of twenty-nine countries. [22]

It is important to stress that crises vary in length, and, as reported in Cerra and Saxena (2008), the end of a crisis is never clearly defined. Our models are able to resolve this issue by estimating the immediate impact of the crisis as well as its persistence.[23]

IV.3. Macroeconomic controls

Some studies examine the relationship between macroeconomic events and individual SWB. For instance, Di Tella *et al*. (2001 and 2003) show that SWB decreases when the unemployment rate and inflation increase (see also Welsch, 2010 and Blanchflower *et al*., 2014).[24] Thus, our final dataset comprises a set of macroeconomic variables typically used to control for time-varying country effects and, in general, business cycle fluctuations. Data for unemployment, GDP (at constant 2005 US$) and inflation are collected from the World Bank's World Development Indicators (WDI). When the WDI data are missing, we supplement them with data from the Penn World Tables and from the IMF World Economic Outlook as in Stevenson and Wolfers (2013).

Summary statistics of all the variables discussed in this Section can be found in Table 2.

[22]As reported previously, we have discontinuous life satisfaction data for Norway (1990-1996, 2001 and 2005); and Iceland (2005, 2010-2011). This implies that we cannot capture the crisis in Norway in 1987 and Iceland in 2008 (see Table A1). Note also that life satisfaction data for Sweden and Finland starts after their 1991 crisis (see Table A1 again). In all these cases, we keep these countries in, which implies that some observations will represent leads or lags when running the dynamic DD (equation 2). In particular, for Finland and Sweden, surveys are available only for year ξ_{+4}, while for Norway only for ξ_{+3} and ξ_{+4}. For Iceland, Eurobarometer surveys are available only for year ξ_{+3} and ξ_{+4}, and year ξ_{-2}.

[23]A similar approach, albeit in a time-series context and therefore without control groups, is adopted by Barrell *et al*. (2010b), who capture the long run impact of banking crises with dummies that take the value of 0 prior to the crisis and 1 from the time of the crisis onwards.

[24]Wolfers (2003) found that volatility, and therefore macroeconomic uncertainty, plays a role too. Unemployment volatility has a pronounced impact on well-being; interestingly, the effects of inflation volatility on well-being are less evident.

Table 2

Descriptive statistics

	Before the 2007-8 financial crisis (1980-2003) N=459,799		2007-8 Financial crisis (2003-2011) N=530,434	
	Mean	St Dev	Mean	St Dev
SWB (Life satisfaction)	3.05	0.77	2.94	0.82
Occupational status:				
Unemployed	0.07	0.25	0.08	0.27
Self-employed	0.08	0.27	0.07	0.26
Retired	0.20	0.40	0.28	0.45
House keeping	0.15	0.36	0.07	0.26
Student	0.06	0.24	0.08	0.27
Military	0.01	0.02	0.08	0.27
Income:				
First income quartile	0.25	0.43		
Second income quartile	0.25	0.43		
Third income quartile	0.25	0.43		
Fourth income quartile	0.25	0.43		
Marital status:				
Married	0.63	0.48	0.62	0.48
Single	0.23	0.42	0.19	0.40
Divorced/separated	0.06	0.23	0.08	0.27
Widowed	0.08	0.28	0.10	0.30
Female	0.51	0.50	0.55	0.50
Age	44.11	17.80	47.89	18.08
Education:				
No full-time education	0.01	0.14	0.01	0.08
Still in full-time education	0.08	0.27	0.08	0.27
Up to 14 years	0.26	0.44	0.13	0.34
15 years	0.08	0.27	0.07	0.26
16 years	0.12	0.32	0.08	0.27
17 years	0.07	0.26	0.07	0.26
18 years	0.11	0.31	0.18	0.39
19 years	0.05	0.23	0.09	0.29
20 years	0.04	0.21	0.05	0.22
21 years	0.03	0.18	0.04	0.19
22 years or older	0.14	0.35	0.19	0.40
Macroeconomic controls				
Inflation	0.05	0.05	0.028	0.024
Unemployment rate	0.09	0.04	0.09	0.05
Log of GDP	26.84	1.21	26.09	1.62

Notes: Summary statistics for the microeconomic variables, including SWB, and macroeconomic variables. Microeconomic variables are from the Eurobarometer database (1980-2011); definition of the variables is provided in the text. Macroeconomic controls are from the World Bank's World Development Indicators (WDI). Log of GDP corresponds to the GDP in constant 2005 US$. When the WDI data are missing, we supplement them with data from the Penn World Tables and from the IMF World Economic Outlook. Unemployment rate and inflation are calculated as the annual rate of change in the unemployment and consumer price index, respectively.

V. RESULTS

We first present the results from the linear OLS specification in which the effect of banking crises on SWB is estimated by regressing life satisfaction on a

banking crisis dummy, and controlling for a set of micro and macro variables as presented in equation 2.[25]

Table 3 shows that the sign on the variable of interest is negative and statistically significant at the usual level of significance in each column.

The first two columns report results of naïve regressions (see equation 2). The next two columns study persistency by augmenting this simple with lags effects only, while the remaining two columns report estimates from equation 3 – our favourite model with both lags and leads (pre-trends).

The size and precision of the effect of the banking crisis in the first year slightly increase when including lags (column 3 and 4) and controlling for pre-trends (e.g., leads in column 5 and 6), hinting that omitted variables may bias the relationship downward. However, note that there is not statistical difference between coefficients. This SWB decline is identified after controlling for individual and macroeconomic conditions such as income, job status, GDP, unemployment and the inflation rate. This implies that there are non-negligible costs associated with the banking crisis.[26] We discuss the mechanisms that may be responsible for these results in the next Section.

When considering our preferred specifications in the last two columns, the magnitude of the coefficient ξ_0, is equivalent to more than one standard deviation of SWB for the period 1980-2003, and slightly less for the period 2003-2009. We compare the negative coefficient of 0.102 and 0.068 in the first year of the crisis with the size of other coefficients in the same regression in order to put these findings into a broader context. Estimates for the 1980-2003 period include household income as a covariate, so what about the trade-off between household income and banking crisis? Considering that the coefficient on the second income quartile is about 0.1 (and that the first income quartile is the reference category), a move from the first to the second income quartile would be required to keep happiness constant during the year of the crisis. These examples clearly show that the coefficient is measuring a substantial loss in well-being.

When we examine the recent financial crisis, we note that the estimated banking crisis parameters are smaller than perhaps expected. There are various plausible explanations for this result. The first reason is that financial globalization and the introduction of the euro have led to the development of a highly interconnected banking industry.[27] Hence, we do not find a strong impact from

[25]To save space, we do not report the estimates of our numerous control variables. They are in line with previous research and do not differ at all from past studies which use the same data source. SWB is higher for female, married individuals and, among labour market status, for students; it is U-shaped in age; being unemployed is associated with lower SWB. Higher income groups report higher SWB. The macroeconomic variables have the usual sign; however they are not always statistically significant. These results are available upon request.

[26]Table A2 presents similar analysis when all banking crises are included.

[27]Starting from the late 1990s, banks took advantage of cross-border openness to exploit economies of scale. See Claessens *et al.* (2010) and Allen *et al.* (2011) for a discussion.

Table 3

The impact and persistency of banking crises on subjective wellbeing across Europe

Sample period	Before the 2007-8 financial crisis (1980-2003) (1)	2007-8 Financial crisis (2003-2011) (2)	Before the 2007-8 financial crisis (1980-2003) (3)	2007-8 Financial crisis (2003-2011) (4)	Before the 2007-8 financial crisis (1980-2003) (5)	2007-8 Financial crisis (2003-2011) (6)
Banking crisis (ξ_0)	-0.073** (0.030)	-0.032** (0.014)	-0.091** (0.039)	-0.052*** (0.016)	-0.102** (0.041)	-0.068** (0.029)
+ 1 year (ξ_{+1})			-0.089 (0.057)	-0.057** (0.024)	-0.096 (0.056)	-0.069** (0.030)
+2 years (ξ_{+2})			-0.068** (0.024)	-0.008 (0.024)	-0.074*** (0.023)	-0.018 (0.022)
+ 3 years (ξ_{+3})			-0.045 (0.027)		-0.052* (0.027)	
+ 4 years (ξ_{+4})			-0.041* (0.023)		-0.048** (0.020)	
- 4 year (ξ_{-4})					-0.013 (0.019)	-0.024 (0.025)
-3 years (ξ_{-3})					-0.042 (0.026)	0.008 (0.032)
-2 years (ξ_{-2})					-0.012 (0.019)	-0.006 (0.027)
- 1 year (ξ_{-1})					-0.022 (0.021)	-0.038 (0.025)
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes
Household income	Yes	No	Yes	No	Yes	No
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Pre-trends (leads)	No	No	No	No	Yes	Yes
Observations	459,799	530,434	459,799	530,434	459,799	530,434
R-squared	0.188	0.275	0.188	0.276	0.188	0.276

Notes: Each column reports coefficients from separate OLS regressions, corresponding to equation 1 (columns 1 and 2), equation 2 (columns 3, 4, 5 and 6). The dependent variable is individual SWB. Independent variables include: the reported banking crisis indicators measuring the impact of the crisis in the year of the crisis (ξ_0) and in each of the four years after (from column 3 to 6). The last two columns control for, and reports, SWB trends (pre-trends) up to four years before the crisis. Macroeconomic controls include log of GDP, inflation and unemployment rate at country level; country and year fixed effects; and a set of individual characteristics, which include gender, age and age-squared, indicators of marital status, education and a complete set of employment status dummy variables. Household income is included when specified in the table. Standard errors in parentheses are adjusted for clustering at country level. ***p<0.01, **p<0.05, *p<0.1.

the 2008 financial crash since all countries in our sample have been hit to some extent by the financial or economic turmoil. This reduces the differences (and hence the detectable effects) between countries that are directly impacted and the others. Note that also the absence of income as control variable after 2003 could be put forward as a reason for this result. If income losses are positively correlated with the banking crisis and SWB, then, the omission of income quartiles may lead to an overestimation of the effect of the banking crisis. In order to check this potential bias, we run a specification for the 1980-2003 sample excluding household income; the size of the banking crisis dummy is larger when income quartiles are controlled for.[28] Assuming that the same is true for the more recent financial event, a *happiness regression* estimation carried out without controlling for income quartiles – as we are forced to do for the other samples due to data availability –represents a conservative estimate of the latest banking crisis.

Focussing on persistency, there is evidence of lagged effect of the crises prior to 2007-8, while the negative effects are smaller for the most recent financial crisis. The specifications estimated in column 5 and 6 -- with full set of leads and lags -- offer stronger evidence of psychological losses going beyond the first year of the crisis. The impact of a banking crisis is highly persistent and is at least twice the length of the average GDP drop found in other studies (e.g. Reinhart and Rogoff, 2009a and 2009b). This would suggest that banking crisis may affect SWB over and above negative growth.

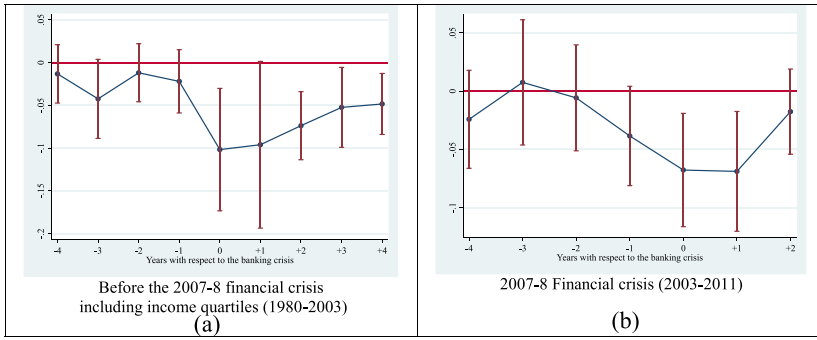
Models in column 5 and 6 are not only richer of controls, but the inclusion of pre-trends provide a direct test for the identifying assumption behind the empirical strategy – trends in SWB being similar across individuals before the crisis. Figure 1 provides a graphical analysis of this by showing that the banking dummy variables are not significantly different from zero for all years before the crisis.[29] There is no statistically significant difference in SWB before the event either in countries affected by the crisis or in those that are not affected. We take this as an indication that countries spared from the crisis represent a good counterfactual. In other words, conditioning on our set of covariates and including pre-trends, banking crises are exogenous shocks with respect to SWB. As mentioned already, this offers also a placebo test, as we can check how SWB behaves in non-banking crisis years. Our analysis clearly shows that SWB declines only after the crisis in the countries affected by it.

[28]See Table A3 in the SI.

[29]Pre-crisis trend coefficients are not reported here, but they are available upon request.

Figure 1

Subjective wellbeing trends before and after the crisis. [Colour figure can be viewed at wileyonlinelibrary.com]



Note: Each dot represents the estimated effect of banking crisis on SWB with respect to the beginning of the banking crisis. The beginning of the banking crises is normalised at year 0. On the horizontal axis, the labels: -1, -2, … (+1, +2, …) represent the number of years leading to (following) the starting date of the banking crisis. They correspond to parameters ξ_{-4} through ξ_{+4} in equation (2). Each SWB regression controls for macroeconomic variables (log of GDP, inflation and unemployment rate) country fixed effects, year fixed effects and a typical set of individual characteristics (gender, age and age-squared, indicators of marital status, education and a complete set of employment status dummy variables). Income quartiles are included as covariates in panel (a) only. 90% confidence intervals based on clustered standard errors at country level are reported.

V.3. Further robustness Checks: Channels

We have shown that banking crises generate a loss of well-being that goes beyond that generated by changes in individual and macroeconomic factors such as inflation, unemployment rates and log of GDP within year and countries. In Section II we have reported a variety of other channels through which banking crises may affect individuals' SWB. These could be grouped into three sets: economic recessions, fiscal and wealth losses. Disentangling the structural relationships between these variables would require a number of ad hoc identifying assumptions and a structural model; this goes beyond the scope of this work. Hence, in this sub-section, we focus on additional controls that may explain the decline in SWB that follows banking crises.

It is well documented that banking crises are accompanied by economic recessions when looking at recent times (e.g., Cecchetti et al., 2009) or over centuries (e.g., Reinhart and Rogoff 2009a). Although our specifications include a variety of factors that already captures negative economic changes (such as unemployment rates with country and fixed effects), it is therefore instructive to include changes in GDP directly, rather than its level. This should be able to capture whether the decline in SWB can be entirely attributed to a decline in economic growth. We label this the *economic growth channel*.

Since banking crises are complex financial situations that may result in overall financial and economic instability, governments are prone to intervene promptly and directly when a crisis hit. This intervention could have some tangible repercussions both on the overall economy and the individuals' SWB. For instance, direct intervention to rescue financial institutions could create fiscal constraints for a government that is bound by budgetary regulations. The result could be either a decrease in government expenditures and/or an increase in the tax burden. Moreover, if we accept the Ricardian equivalence postulate, households may reduce their current consumption in the expectation of future increases in taxation. All these factors would have direct and indirect impacts on individuals' income and ultimately on their welfare and well-being.[30]

Beyond the *fiscal channel*, SWB may change via the *wealth channel*. One of the consequences of a banking crisis is turmoil in stock markets; Reinhart and Rogoff (2009b), for example, find that equity markets experience an average drop of 55%. This sharp and prolonged decline is associated with a loss in wealth, both at the institutional level (e.g., pension funds) and the individual level (e.g., savings) and consequently, an individual's SWB.[31]

We therefore test the hypothesis of a link between banking crises and SWB by re-estimating equation 2 in order to include changes in GDP, government intervention (consumption and level of taxation) and via a wealth effect (proxied by a decline in the stock market).[32] If one of these channels is verified we expect the banking crisis dummy indicators to become smaller and to lose statistical significance. [33]

Table 4 shows that our results are robust to the inclusion of a variety of other macroeconomic variables. The coefficients get slightly smaller in size and lose precision. We take this as evidence that banking crises are accompanied by a decline in economic output and wealth and fiscal changes that affects happiness.

However, the estimated coefficients are still statistically significant at the usual level of confidence and large: non-negligible loss of wellbeing equal to one standard deviation.[34] In light of these estimates, and the evidence presented above,

[30]Hessami (2010) presents evidence on the link between government expenditure and SWB. See also Di Tella and MacCulloch (2006)

[31]An indirect wealth channel is also taken into account by controlling for inflation. In fact, a higher inflation rate leads to a redistribution of wealth between borrowers and lenders.

[32]The housing market is also part of the wealth channel, however given the data limitation, we include it only in the next section, when we investigate the recent financial crisis.

[33]Government consumption and tax burdens are normalized by GDP. Total tax burden is estimated excluding imputed social security contributions and reported as a percentage of GDP at market prices. We take these data from the AMECO database of the European Commission (http://ec.europa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm). Data on stock markets is computed based on the share price index for each country as provided by the Reuters Thomson Datastream database.

[34]We also experimented with the inclusion of positive and negative growth since SWB may respond asymmetrically as suggested in De Neve et al. (2015). The results are reported in the SI, Appendix A, Table A4. The response of SWB to a banking crisis is qualitatively and quantitatively similar to the results presented in the previous tables. We thank a referee for this point.

Table 4

Is the effect of banking crisis robust to the inclusion of economic, fiscal and wealth losses?

	Sample period 1980-2003					Sample period 2003-2011					
Event years ξ_n	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
-4 years	-0.021	-0.011	-0.010	0.010	0.008	0.008	0.006	0.000	-0.033	0.042	0.022
	(0.019)	(0.022)	(0.024)	(0.027)	(0.027)	(0.024)	(0.026)	(0.027)	(0.032)	(0.032)	(0.022)
-3 years	-0.047*	-0.032	-0.031	-0.008	-0.012	0.039	0.043	0.034	-0.005	0.047	0.026
	(0.025)	(0.030)	(0.032)	(0.031)	(0.035)	(0.034)	(0.035)	(0.036)	(0.042)	(0.037)	(0.031)
-2 years	-0.003	-0.001	0.001	-0.032	-0.029	0.017	0.025	0.016	-0.017	0.048	0.024
	(0.016)	(0.030)	(0.031)	(0.022)	(0.020)	(0.028)	(0.029)	(0.030)	(0.041)	(0.035)	(0.043)
-1 year	-0.026	-0.020	-0.016	-0.007	-0.010	-0.024	-0.015	-0.023	-0.048	0.007	-0.011
	(0.018)	(0.035)	(0.031)	(0.041)	(0.043)	(0.026)	(0.026)	(0.028)	(0.041)	(0.025)	(0.034)
Banking crisis (ξ_0)	-0.077*	-0.078**	-0.074***	-0.052***	-0.058*	-0.064**	-0.052*	-0.060*	-0.086*	-0.034	-0.058*
	(0.040)	(0.030)	(0.024)	(0.017)	(0.032)	(0.032)	(0.030)	(0.033)	(0.044)	(0.029)	(0.034)
+1 year	-0.066	-0.059	-0.057	-0.065	-0.058	-0.079**	-0.063*	-0.068**	-0.092**	-0.061*	-0.076**
	(0.055)	(0.036)	(0.036)	(0.040)	(0.038)	(0.034)	(0.032)	(0.033)	(0.041)	(0.032)	(0.036)
+2 years	-0.060**	-0.068***	-0.065***	-0.056**	-0.058***	-0.026	-0.016	-0.018	-0.030	-0.026	-0.047*
	(0.024)	(0.019)	(0.017)	(0.022)	(0.020)	(0.023)	(0.022)	(0.023)	(0.031)	(0.019)	(0.024)
+3 years	-0.065	-0.072**	-0.072**	-0.073*	-0.067**						
	(0.038)	(0.028)	(0.031)	(0.036)	(0.031)						
+4 years	-0.041**	-0.056***	-0.056***	-0.044**	-0.052**						
	(0.014)	(0.015)	(0.015)	(0.016)	(0.025)						
Observations	633,687	583,560	583,560	552,822	527,673	530,434	507,627	507,627	426,252	436,707	372,493
R-squared	0.164	0.171	0.171	0.168	0.173	0.276	0.282	0.282	0.291	0.279	0.283
Channels controlled for:											
GDP growth	Yes	No	No	No	Yes	Yes	No	No	No	No	Yes
Government consumption	No	Yes	No	No	Yes	No	Yes	No	No	No	Yes
Tax burden	No	No	Yes	No	Yes	No	No	Yes	No	No	Yes
Annual stock market returns	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes

(Continues)

Table 4. (Continued)

	Sample period 1980-2003					Sample period 2003-2011					
Event years ξ_n	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
House prices growth	No	No	No	No	No	No	No	No	No	Yes	Yes
Further controls:											
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column reports coefficients from separate OLS regressions, corresponding to equation 2, in which individual SWB is regressed on the banking crisis indicators measuring the impact of the crisis in the year of the crisis (ξ_0) and in each of the four years before (pre-treatments) and after (post-treatments). Additional variables that represent economic, fiscal and wealth channels are included. These are annual GDP growth, government consumption, tax burden, annual stock market returns and annual house price change. Each regression also includes country and year fixed effects, inflation and unemployment rate and a set of individual characteristics, which include gender, age and age-squared, indicators of marital status, education and a complete set of employment status dummy variables. Data on house prices are from the Bank of International Settlements (http://www.bis.org/statistics/pp.htm)Standard errors in parenthesis are adjusted for clustering at country level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

we suggest that there is a "residual effect" that is hard to capture; a psychological effect of banking crises that is not accounted for in traditional economic studies.[35] This non-monetary effect could involve fear and distress and a deep failure of trust caused by banking crises, such as trust in financial institutions or trust in political/regulatory institutions. These effects might well be picked up by our SWB variable. Evidence of this can be found in Ehrmann *et al*. (2013). They analyse how trust in the European Central Bank (and other European Institutions) evolved around the great recession of 2007-8 and show that there is a decline across European countries, which is in line with our findings.

V.4. The role of the credit boom

The current financial crisis began during 2007-8 when financial stability replaced inflation as central banks' main concern. The roots of the crisis go back much further, and there are many views on the fundamental causes including imprudent mortgage lending, deregulatory legislation, credit default swaps, fragmented regulation, and lack of a systemic risk regulator. One of the most important and distinctive elements of the current crisis lies in the nature of the so-called credit cycle (Kindleberger, 1978, Minsky, 1982 and more recently Borio, 2012). The term describes the tendency of the financial system to excessively increase its credit supply during the upswing and to strongly cut down lending during recessions (when everybody tries to evade risk). Several authors (e.g., Lindsey, 2007) have documented the similarities between the recent boom–bust pattern and earlier episodes, recently Mian and Sufi (2014) highlighted how the rise in household debt preceding the crisis that led to a big decline in spending, real output and a large rise in unemployment. In our context, the hypothesis is that when the credit flow halted in 2007-2008, individuals living in countries that experienced a credit boom (which is countries whose economies relied the most on consumption based on credit) suffered a higher loss than countries where the credit market did not expand too rapidly. We proceed by defining a credit boom indicator. Specifically, we use two separate definitions, first we employ the methodology suggested by Dell'Ariccia *et al*. (2012); for robustness we also use the definition provided by Mendoza and Terrones (2012).

The results are presented in Table 5. This models control for GDP growth, stock market returns and fiscal variables, such as the tax burden and government consumption. We find that the average loss in well-being is much more pronounced and persistent across those countries which experienced a credit boom when using Dell'Ariccia *et al*. (2012). The loss in SWB is the largest

[35]One may conjecture that SWB losses could be a consequence of a reduction in physical health. However reasonable this may appear, the bulk of the literature clearly shows that health actually improves when the macro economy worsens (for a recent review see Ruhm (2006) or Adda et al. (2009)).

observed, equal to two standard deviations of SWB and persisted for the two periods. Two years after the coefficient is large but not statistically significant. The results here have great policy implications; they lend support to the view that financial stability should be at least as important as monetary stability. However, these findings are not replicated when using Mendoza and Terrones' (2012) definition of credit boom. The effects are always negative but very similar and their standard errors are larger. Overall we take this as evidence that there might be some differences between countries with credit boom, but the evidence is not too strong.

V.5. Heterogeneity

The above results indicate that, on average, banking crises have a deep and prolonged effect on the SWB of individuals across Europe. A potential issue with the pooled regressions presented above is that they might conceal heterogeneity between groups of individuals. Hence it is important to understand whether banking crises have had any distributional psychological cost. We focus our

Table 5

Subjective wellbeing losses from banking crises preceded (or not) by a credit boom

Credit boom definition	Ariccia *et al.* (2012)		Mendoza and Terrones (2012)	
Event years ξ_n	No credit boom	Credit boom	No credit boom	Credit boom
-4 years	-0.013	-0.025	-0.010	-0.064*
	(0.058)	(0.014)	(0.025)	(0.030)
-3 years	0.062	-0.019*	0.030	-0.029
	(0.072)	(0.009)	(0.045)	(0.059)
-2 years	0.032	-0.039	-0.009	-0.027
	(0.054)	(0.036)	(0.040)	(0.082)
-1 year	-0.030	-0.062	-0.027	-0.046
	(0.034)	(0.058)	(0.031)	(0.071)
Banking crisis	-0.041	-0.118*	-0.056	-0.068
	(0.043)	(0.062)	(0.035)	(0.073)
+1 year	0.006	-0.164***	-0.070	-0.063
	(0.030)	(0.046)	(0.045)	(0.048)
+2 years	0.061	-0.089**	-0.008	-0.055**
	(0.055)	(0.032)	(0.031)	(0.022)
Full set of controls		Yes	Yes	Yes
Observations	238,807	187,445	267,226	159,026
R-squared	0.319	0.241	0.337	0.198

Notes: Each column shows estimated coefficients from OLS regressions by sub-groups in which SWB is regressed on the banking crises leads and lags (see equation 2). The sample period for the estimation is 2003-2011. Further controls are country and year fixed effects, macroeconomic variables (inflation and unemployment rate, GDP growth, government consumption, tax burden, annual stock market returns, house prices growth), individual characteristics, which include household income, gender, age and age-squared, indicators of marital status, education and a complete set of employment status dummy variables. Boom period are defined as in Dell'Ariccia *et al.* (2012) and Mendoza and Terrones (2012). Standard errors adjusted for clustering at country level are in parentheses, ***p<0.01, **p<0.05, *p<0.1.

Table 6

Heterogeneity of the effect of banking crises on subjective wellbeing

	Sample period 1980-2003										
	…by age groups (quintiles)					…by gender		…by job status			
Event years ξ_n	(13-27)	(28-38)	(39-50)	(51-63)	(64-99)	Male	Female	Employed	Unemployed	Self	Retired
-4 years	-0.012	-0.009	-0.032	0.018	-0.029	-0.026	-0.001	-0.001	-0.030	-0.061*	-0.023
	(0.023)	(0.035)	(0.020)	(0.023)	(0.032)	(0.020)	(0.019)	(0.018)	(0.052)	(0.031)	(0.032)
-3 years	-0.073	-0.027	-0.044*	-0.034	-0.023	-0.060*	-0.030	-0.046	-0.012	-0.075**	-0.030
	(0.043)	(0.035)	(0.023)	(0.026)	(0.020)	(0.034)	(0.027)	(0.033)	(0.064)	(0.035)	(0.028)
-2 years	-0.032*	0.004	0.008	0.006	-0.047*	-0.016	-0.013	-0.013	-0.013	0.052	-0.041*
	(0.018)	(0.031)	(0.026)	(0.031)	(0.023)	(0.016)	(0.023)	(0.021)	(0.034)	(0.041)	(0.021)
-1 year	0.009	-0.016	-0.018	-0.036	-0.048*	-0.031	-0.015	-0.020	-0.022	-0.052	-0.036*
	(0.026)	(0.021)	(0.035)	(0.026)	(0.026)	(0.022)	(0.021)	(0.027)	(0.053)	(0.043)	(0.021)
Banking crisis	-0.057	-0.108***	-0.103*	-0.132**	-0.106	-0.103**	-0.100**	-0.066**	0.035	-0.179***	-0.106*
	(0.039)	(0.030)	(0.051)	(0.059)	(0.067)	(0.042)	(0.042)	(0.030)	(0.055)	(0.056)	(0.055)
+1 year	-0.067	-0.082*	-0.095	-0.142**	-0.096	-0.094*	-0.099	-0.073*	-0.074*	-0.116**	-0.096
	(0.045)	(0.047)	(0.056)	(0.057)	(0.069)	(0.051)	(0.061)	(0.039)	(0.038)	(0.052)	(0.063)
+ 2 years	-0.059***	-0.076**	-0.080**	-0.066*	-0.076***	-0.079***	-0.073***	-0.071***	-0.094***	-0.089	-0.062**
	(0.020)	(0.027)	(0.029)	(0.037)	(0.026)	(0.023)	(0.024)	(0.020)	(0.022)	(0.052)	(0.022)
+3 years	-0.013	-0.052**	-0.073	-0.057*	-0.061*	-0.050**	-0.054	-0.033	-0.103**	-0.099**	-0.047
	(0.023)	(0.024)	(0.043)	(0.030)	(0.034)	(0.020)	(0.033)	(0.024)	(0.049)	(0.039)	(0.032)
+4 years	-0.001	-0.045*	-0.077**	-0.045	-0.081**	-0.025	-0.075***	-0.036**	-0.073	-0.036	-0.070**
	(0.019)	(0.025)	(0.026)	(0.048)	(0.032)	(0.027)	(0.017)	(0.015)	(0.066)	(0.032)	(0.027)
Observations	100,010	102,746	91,001	82,316	83,726	225,357	236,227	201,005	30,649	37,434	92,280
R-squared	0.168	0.198	0.206	0.202	0.192	0.179	0.190	0.178	0.160	0.173	0.181

(Continues)

Table 6. (Continued)

	Sample period 2003-2011										
	…by age groups (quintiles)					…by gender		…by job status			
Event years ξ_n	(13-27)	(28-38)	(39-50)	(51-63)	(64-99)	Male	Female	Employed	Unemployed	Self	Retired
-4 years	0.027	0.001	-0.046	-0.038	-0.021	-0.032	-0.017	-0.021	-0.003	-0.054*	-0.025
	(0.024)	(0.023)	(0.033)	(0.030)	(0.038)	(0.029)	(0.023)	(0.024)	(0.038)	(0.031)	(0.034)
-3 years	0.012	0.021	0.009	0.003	0.031	-0.006	0.020	0.004	0.007	-0.021	0.028
	(0.036)	(0.033)	(0.036)	(0.035)	(0.046)	(0.034)	(0.031)	(0.031)	(0.052)	(0.032)	(0.040)
-2 years	0.007	0.012	-0.002	-0.008	-0.007	-0.003	-0.006	-0.003	0.006	0.025	-0.008
	(0.034)	(0.032)	(0.032)	(0.034)	(0.028)	(0.027)	(0.028)	(0.028)	(0.039)	(0.037)	(0.027)
-1 year	-0.011	-0.032	-0.047	-0.025	-0.054*	-0.038	-0.039	-0.029	-0.013	-0.025	-0.058*
	(0.031)	(0.021)	(0.031)	(0.027)	(0.031)	(0.024)	(0.027)	(0.024)	(0.052)	(0.039)	(0.033)
Banking crisis	-0.046	-0.081**	-0.066*	-0.060*	-0.066**	-0.056*	-0.078**	-0.062**	-0.066	-0.073	-0.068**
	(0.027)	(0.033)	(0.034)	(0.030)	(0.031)	(0.030)	(0.029)	(0.028)	(0.041)	(0.049)	(0.032)
+1 year	-0.053	-0.071**	-0.068**	-0.057*	-0.081**	-0.076**	-0.064**	-0.061**	-0.083*	-0.077*	-0.064*
	(0.036)	(0.031)	(0.030)	(0.029)	(0.037)	(0.031)	(0.031)	(0.027)	(0.049)	(0.046)	(0.033)
+ 2 years	-0.010	-0.024	-0.019	0.002	-0.027	-0.010	-0.024	-0.019	0.004	-0.001	-0.018
	(0.028)	(0.024)	(0.024)	(0.021)	(0.020)	(0.023)	(0.021)	(0.023)	(0.035)	(0.033)	(0.021)
Observations	84,664	96,494	111,348	115,749	122,179	238,593	291,841	219,191	41,302	38,240	150,922
R-squared	0.191	0.262	0.295	0.306	0.309	0.278	0.275	0.257	0.220	0.226	0.293

(Continues)

Table 6. (Continued)

	sample period 1980-2003)			
	…by income quartiles			
Event years ξ_n	First	Second	Third	Fourth
-4 years	-0.021	0.016	-0.010	-0.030
	(0.033)	(0.017)	(0.025)	(0.019)
-3 years	-0.040	-0.022	-0.049	-0.068**
	(0.035)	(0.024)	(0.037)	(0.030)
-2 years	-0.026	-0.010	-0.029	0.014
	(0.037)	(0.018)	(0.025)	(0.016)
-1 year	-0.029	-0.029	-0.019	-0.012
	(0.022)	(0.033)	(0.027)	(0.017)
Banking crisis	-0.091*	-0.112**	-0.121**	-0.077*
	(0.046)	(0.047)	(0.047)	(0.038)
+1 year	-0.117**	-0.151*	-0.077	-0.037
	(0.053)	(0.082)	(0.050)	(0.043)
+ 2 years	-0.089***	-0.076***	-0.056*	-0.075**
	(0.023)	(0.024)	(0.028)	(0.026)
+3 years	-0.067**	-0.051*	-0.066*	-0.018
	(0.026)	(0.028)	(0.037)	(0.028)
+4 years	-0.093***	-0.030	-0.036	-0.048
	(0.021)	(0.027)	(0.023)	(0.032)
Observations	115,354	115,307	116,217	114,706
R-squared	0.173	0.159	0.158	0.158

Notes: Each column shows estimated coefficients from OLS regressions by sub-groups in which SWB is regressed on the banking crises leads and lags (see equation 2). Further controls are country and year fixed effects, macroeconomic variables (log of GDP, inflation and unemployment rate), individual characteristics, which include household income, gender, age and age-squared, indicators of marital status, education and a complete set of employment status dummy variables. Standard errors adjusted for clustering at country level are in parentheses, ***p<0.01, **p<0.05, *p<0.1.

attention, therefore, on the degree of heterogeneity of the response of SWB to a banking crisis across socio-economic groups. We do this by investigating the dynamics of the leads and lags within individuals' socio-economic characteristics. In particular, we study the effect of a crisis across marital status, gender, income quartiles and labour market status.[36] This provides us with a direct test of whether a banking crisis affects some groups more than others.

We run separate regressions for each set of social or demographic indicators: income quartiles, gender, education and employment status. For instance, when studying heterogeneous effects across labour market status we run separate regression for each economic group.[37] What is striking in the results reported in Table 6 is the similarity of the size and statistical significance of coefficients across groups; for instance if we look at males and females the impact during the year of the crises is 0.103 and 0.100 in absolute value for the first period and 0.056 and 0.078, respectively, for the most recent period. When looking across income groups, again we cannot reject the hypothesis that banking crises have a similar impact across groups. This equality of treatments is confirmed for the period 1980-2003 and post 2003. There are no particular reasons to believe that, after conditioning on our rich set of characteristics, SWB losses are more pronounced for the lower income groups. Moreover, the analysis does not find strong evidence that unemployed people are more affected than employed and retired individuals.[38]

VI. CONCLUSIONS

This paper contributes to the literature by providing evidence of the impact of banking crises on SWB in Europe for the period 1980-2011.

We do this by combining databases of banking crisis events, compiled by the financial stability literature over the last three decades and updated by Reinhart and Rogoff (2011) and Laeven and Valencia (2013), with the Eurobarometer surveys. Since endogeneity can be quite severe, this paper utilizes difference-in-differences techniques to address potential bias.

Overall, our results strongly suggest that financial crises add a non-negligible cost to individual well-being, above and beyond that which can be attributed to losses of personal income, job and GDP and increasing inflation and unemployment rates. Because of differences in the surveys, we analyse separately two periods, 1980-2003 and 2003-2011.

For the crises before 2007, these costs appear to last for at four years after the crisis and are relatively large. The SWB loss in the first year of the crisis is

[36]Given the nature of the data the analysis on income quantile is done only for the period pre-2003.

[37]We also run regressions where we estimate the triple interaction between leads, lags and the individual characteristic of interest; results, not reported here but available upon request, show that the impact is statistically similar across groups.

[38]Working from home and being a student are not shown. Results are available upon request.

equivalent to a decrease by one standard deviation. A change in income equivalent to moving somebody from the first to the second income quartile is required to hold SWB constant in the first year of the crisis. The effect becomes smaller, but SWB never fully recovers.

SWB losses following the great recession of 2007-8 appear to be slightly smaller. In the paper, we explain that this might be because of contagion. In an effort to investigate this further, we find suggestive evidence that the loss in SWB may be considerable for those individuals living in countries which had previously experienced a credit boom.

Interestingly, we do not detect any discernible differential impacts across socio-economic groups, suggesting that all individuals appear to be equally affected by the crisis.

Furthermore, we found that the loss in SWB is partly explained by a fiscal channel (e.g., government intervention) an economic growth channel and a wealth channel, but interestingly the psychological loss is robust and still present after their inclusion, i.e., it goes beyond their inclusion.

Our paper provides some of the first robust evidence that banking crises have far-reaching consequences and lead to major, widespread and lasting psychological losses.

We interpret these effects as causal by showing that, conditioning on a set of micro and macro controls and fixed effects, individual's SWB trends were very similar in countries hit and spared by a banking crisis up to four years before the crisis itself. This finding supports the identifying assumption – known as the common trend assumption – that respondents living in countries that did not experience a financial crisis provide a valid counterfactual for individuals in countries in crisis.

What might explain the robustness of these results? We put forward an explanation by referring to the literature on uncertainty and trust and suggest that these effects may reveal a deep failure of trust, such as trust in financial institutions or trust in political/regulatory institutions, caused by banking crisis and picked up at psychological level by our SWB variable. This is certainly a stimulating topic which deserves further research. Unfortunately, surveys on trust at European level are either very sporadic (The World Value Surveys include European countries but there are considerable gaps between successive waves) or began too late (The European Social Surveys start in 2001-2003, while the Eurobarometer includes questions on trust in European Institutions from 1999 only). Future research needs to focus on other World regions. This failure of trust could also be a powerful determinant of Knightian uncertainty (i.e., unquantifiable uncertainty, as described, for instance, by Caballero and Krishnamurthy, 2008).

Finally, we conjecture that these psychological losses may scar individuals, providing an explanation for the findings in the literature that depression and economic crisis may shape individuals' future decisions. This result could also

provide a plausible explanation to the findings that people born during, or witnessed a financial crisis, have a lower propensity to risk (Malmendier and Tate, 2005, Malmendier and Nagel, 2011 and Malmendier *et al*. 2011.).

This brings us to the policy conclusion that financial stability should be at least as important as monetary stability.

REFERENCES

Adda, Jérôme, Hans-Martin Gaudecker, and James Banks. 2009. "The Impact of Income Shocks on Health: Evidence from Cohort Data." *Journal of the European Economic Association*, 7 (6): 1361-1399.

Allen, Franklin, Thorsten Beck, Elena Carletti, Philip Lane, Dirk Schoenmaker, and Wolf Wagner. 2011. *Cross-Border Banking in Europe: Implications for Financial Stability and Macroeconomic Policies*. London: Centre for Economic Policy Research (CEPR).

Angrist, Joshua D. and Jörn-Steffen Pischke. 2009. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, NJ: Princeton University Press.

Dell'Ariccia, Giovanni, Deniz Igan, Giovanni, Luc Laeven, and Hui Tong. 2012. "Policies for Macrofinancial Stability: How to Deal with Credit Booms." IMF Staff Discussion Note No. 12/06.

Dell'Ariccia, Giovanni, Detragiache Enrica and Rajan, Raghuram. 2008. "The real effect of banking crises," *Journal of Financial Intermediation, Elsevier*, vol. 17(1), pages 89-112, January.

Barrell, Ray, E. Philip Davis, Dilruba Karim, and Iana Liadze. 2010. "Bank Regulation, Property Prices and Early Warning Systems for Banking Crises in OECD Countries." *Journal of Banking & Finance*, 34 (9): 2255-2264.

Barrell, Ray, E. Philip Davis, and Olga Pomerantz. 2006. "Costs of Financial Instability, Household-Sector Balance Sheets and Consumption." *Journal of Financial Stability*, 2 (2): 194-216.

Bernanke, Ben S. 1983. "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *The American Economic Review*, 73 (3): 257-276.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How Much should we Trust Differences-in-Differences Estimates?" *The Quarterly Journal of Economics*, 119 (1): 249-275.

Blanchflower, David G., David Bell, Alberto Montagnoli, and Mirko Moro. 2014. "The Happiness Trade-off between Unemployment and Inflation." *Journal of Money, Credit and Banking*.46(2), October: 117-141.

Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, and Maria Soledad Martinez-Peria. 2001. "Financial Crises: Lessons from the Last 120 Years." *Economic Policy*, 16 (32): 51-82.

Borio, Claudio. 2012. "The financial cycle and macroeconomics: What have we learnt?," BIS Working Papers 395, Bank for International Settlements.

Bosworth, Barry and Rosanna Smart. 2009. "The Wealth of Older Americans and the Sub-Prime Debacle the Wealth of Older Americans and the Sub-Prime Debacle." Center for Retirement Research Working Paper 2009-21.

Brewer, M., Crossley, T. and Joyce, R. (2013). Inference with difference-in-differences revisited, *IZA Discussion Papers 7742*, Institute for the Study of Labor (IZA).

Bricker, Jesse, Brian K. Bucks, Arthur Kennickell, Traci L. Mach, and Kevin Moore. 2011. "Drowning Or Weathering the Storm? Changes in Family Finances from 2007 to 2009." NBER Working Paper 16985.

Caballero, Ricardo J. and Arvind Krishnamurthy. 2008. "Collective Risk Management in a Flight to Quality Episode." *Journal of Finance* 63(5): 2195-2230.

Cameron, A. Colin, Douglas L. Miller. 2015. "A Practitioner's Guide to Cluster-Robust Inference." *Journal of Human Resources*, 50 (2), 317-372.

Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller. 2011. "Robust Inference with Multiway Clustering." *Journal of Business and Economic Statistics*, 29 (2): 238-249.

Caprio, Gerard and Daniela Klingebiel. 1996. "Bank Insolvencies: Cross-Country Experience." *World Bank Policy Research Working Paper 1620*, World Bank.

Caprio, Gerald, Jr. and Daniela Klingebiel. 2003. "Episodes of Systemic and Borderline Financial Crises." http://go.worldbank.org/5DYGICS7B0 (Dataset 1, Accessed February 2014).

Cecchetti, Stephen G., Marion Kohler, and Christian Upper. 2009. "Financial Crises and Economic Activity." NBER Working Paper 15379.

Cerra, Valerie and Sweta Chaman Saxena. 2008. "Growth Dynamics: The Myth of Economic Recovery." *The American Economic Review*, 98 (1): 439-457.

Chakrabarti, Rajashri, Donghoon Lee, Wilbert Van der Klaauw, and Basit Zafar. 2011. "Household Debt and Saving during the 2007 Recession." NBER Working Paper 16999.

Chava, S., Oettl, A., Subramanian, A., & Subramanian, K. V. (2013). "Banking deregulation and innovation". *Journal of Financial Economics*, 109(3), 759-774.

Christelis, Dimitrios, Dimitris Georgarakos, and Tullio Jappelli. 2011. "Wealth Shocks, Unemployment Shocks and Consumption in the Wake of the Great Recession." CSEF Working Paper 279.

Claessens, Stijn, Richard Herring, and Dirk Schoenmaker. 2010. "A Safer World Financial System: Improving the Resolution of Systemic Institutions." 12th Geneva Report on the World Economy, International Centre for Monetary and Banking Studies, Geneva, and CEPR.

Clark, Andrew E., Ed Diener, Yannis Georgellis, and Richard E. Lucas. 2008. "Lags and Leads in Life Satisfaction: A Test of the Baseline Hypothesis." *The Economic Journal*, 118 (529): F222-F243.

Deaton, Angus S. 2011. The Financial Crisis and the Well-being of Americans. NBER Working Paper 17128.

Demirguc-Kunt, Asli. and Enrica Detragiache. 1998. "The Determinants of Banking Crises in Developed and Developing Countries." *IMF Staff Paper*, 45(1).

De Neve, J., G. Ward, F. Dekeulenaer, B. Van Landeghem, G. Kavetsos and M. Norton. 2015. "Individual Experience of Positive and Negative Growth Is Asymmetric: Global Evidence from Subjective Well-Being Data". IZA Discussion Paper, n. 8914.

Di Tella, Rafael, John Haisken-De New, and Robert MacCulloch. 2010. "Happiness Adaptation to Income and to Status in an Individual Panel." *Journal of Economic Behavior and Organization*, 76 (3): 834-852.

Di Tella, Rafael and Robert MacCulloch. 2006. "Some Uses of Happiness Data in Economics." *The Journal of Economic Perspectives*, 85(4): 25-46.

Di Tella, Rafael, Robert J. MacCulloch, and Andrew J. Oswald. 2003. "The Macroeconomics of Happiness." *Review of Economics and Statistics*, 85 (4): 809-827.

Di Tella, Rafael, Robert J. MacCulloch, and Andrew J. Oswald. 2001. "Preferences Over Inflation and Unemployment: Evidence from Surveys of Happiness." *American Economic Review*, 91 (1): 335-341.

Ehrmann, M., Soudan, M., and Stracca, L. 2013. "Explaining European Union Citizens' Trust in the European Central Bank in Normal and Crisis Times." *The Scandinavian Journal of Economics*, 115(3): 781-807.

Ferrer-i-Carbonell, Ada and Paul Frijters. 2004. "How Important is Methodology for the Estimates of the Determinants of Happiness?" *The Economic Journal*, 114 (497): 641-659.

Frey, Bruno S. and Alois Stutzer. 2002. "What can Economists Learn from Happiness Research?" *Journal of Economic Literature*, 40 (2): 402-435.

Gardner, Jonathan and Andrew J. Oswald. 2007. "Money and Mental Wellbeing: A Longitudinal Study of Medium-Sized Lottery Wins." *Journal of Health Economics*, 26(1): 49-60.

Gathergood, John. 2012. "Debt and Depression: Causal Links and Social Norm Effects." *The Economic Journal*, 122 (563): 1094-1114.

Giesecke, Kay, Francis A. Longstaff, Stephen Schaefer and Strebulaev, Ilya A., 2014. "Macroeconomic effects of corporate default crisis: A long-term perspective", *Journal of Financial Economics, Elsevier, vol.* 111(2), pages 297-310.

Goetz, Martin R., Luc Laeven, and Ross Levine. 2013. "Identifying the valuation effects and agency costs of corporate diversification: Evidence from the geographic diversification of US banks." *Review of Financial Studies*, vol. 26(7): 1787-1823.

Graham, Carol, Siymya Chattopadhyay, and Mario Picon. 2010. "Adapting to Adversity: Happiness and the 2009 Economic Crisis in the United States." *Social Research: An International Quarterly*, 77 (2): 715-748.

Hanushek, Eric, Ludger Wößmann. 2006. "Does educational tracking affect educational inequality and performance? Differences-in-differences evidence across countries". *The Economic Journal*, 116: C63–C76.

Hessami, Zohal. 2010. "The Size and Composition of Government Spending in Europe and its Impact on Well-Being." *Kyklos*, 63 (3): 346-382.

Hoggarth, Glenn, Ricardo Reis, and Victoria Saporta. 2002. "Costs of Banking System Instability: Some Empirical Evidence." *Journal of Banking and Finance*, 26 (5): 825-855.

Hurd, Michael D. and Susann Rohwedder. 2010. "Effects of the Financial Crisis and Great Recession on American Households." NBER Working Paper 16407.

Hutchison, Michael M. and Ilan Noy. 2005. "How Bad are Twins? Output Costs of Currency and Banking Crises." *Journal of Money, Credit and Banking*, 37(4): 725-752.

Jonung, Lars Birger and Thomas Hagberg. 2005. How Costly was the Crisis of the 1990s? A Comparative Analysis of the Deepest Crises in Finland and Sweden Over the Last 130 Years. European Commission Economic Papers 224.

Jordà, Òscar, Moritz Schularick and Alan M. Taylor. 2013. "When Credit Bites Back." *Journal of Money, Credit and Banking*, 45 (2): 3-28.

Kaminsky, Graciela L. and Carmen M. Reinhart. 1999. "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems." *American Economic Review*, 89(3): 473-500.

Kerr, William R. and Nanda Ramana, 2009. "Democratizing entry: Banking deregulations, financing constraints, and entrepreneurship." *Journal of Financial Economics*, 94(1):124-149.

Kindleberger, Charles P. 1978. *Manias, Panics and Crashes: A History of Financial Crises*. Macmillian.

Kroszner, Randall S., Laeven, Luc and Daniela Klingebiel. 2007. "Banking crises, financial dependence, and growth," *Journal of Financial Economics, Elsevier*, vol. 84(1), pages 187-228, April.

Laeven, Luc and Fabián Valencia. 2010. "Resolution of Banking Crises: The Good, the Bad, and the Ugly," IMF Working Papers No. 10146.

Laeven, Luc and Fabián Valencia. 2013. "Systemic Banking Crises Database." *IMF Economic Review*, 61 (2): 225-270.

Lindsey, Lawrence B. 2007. "Fear and greed: why the American housing credit crisis is worse than you think." *The International Economy*, 21 (2): 22–55, 68–73.

MacKerron, George. 2012. "Happiness Economics from 35 000 Feet." *Journal of Economic Surveys*, 26 (4): 705-735.

Malmendier, Ulrike and Stefan Nagel. 2011. "Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?" *The Quarterly Journal of Economics*, 126 (1): 373-416.

Malmendier, Ulrike and Geoffrey Tate. 2005. "CEO Overconfidence and Corporate Investment." *The Journal of Finance*, 60 (6): 2661-2700.

Malmendier, Ulrike, Geoffrey Tate, and Jon Yan. 2011. "Overconfidence and early-life experiences: the effect of managerial traits on corporate financial policies." *The Journal of finance* 66.5: 1687-1733.

Mendoza, Enrique G. and Marco E. Terrones, 2012. "An Anatomy of Credit Booms and their Demise," NBER Working Papers 18379, National Bureau of Economic Research.

Mian, Atif and Amir Sufi, 2014. *House of Debt*. University of Chicago Press.

Minsky, Hyman. 1982. *Can't it Happen again? Essays on Instability and Finance*. Armonk, N.Y.: M. E. Sharpe.

Osili, Una Okonkwo and Anna Louise Paulson. 2014. "Crises and Confidence: Systemic Banking Crises and Depositor Behavior", *Journal of Financial Economics*, 111 (3): 646-660.

Oswald, Andrew J. and Nattavudh Powdthavee. 2008. "Does Happiness Adapt? A Longitudinal Study of Disability with Implications for Economists and Judges." *Journal of Public Economics*, 92 (5): 1061-1077.

Reinhart, Carmen M., and Kenneth Rogoff. 2009a. *This time is different: Eight centuries of financial folly*. Princeton, NJ: Princeton University Press.

Reinhart, Carmen M., and Kenneth Rogoff. 2009b. "The aftermath of financial crises." *American Economic Review*, 99 (2), 466-72.

Reinhart, Carmen M. and Kenneth S. Rogoff. 2011. "From Financial Crash to Debt Crisis." *American Economic Review*, 101 (5): 1676-1706.

Ruhm, Christopher J. 2006. "Macroeconomic Conditions, Health and Mortality" In Jones, A. M. (Ed.). *The Elgar companion to health economics*. Chicago: Edward Elgar.

Shapiro, Matthew D. 2010. "The Effects of the Financial Crisis on the Well-being of Older Americans: Evidence from the Cognitive Economics Study." University of Michigan Retirement Research Centre Working Paper 2010-228.

Stevenson, Betsey and Justin Wolfers, 2013. "Subjective Well-Being and Income: Is There Any Evidence of Satiation?," *American Economic Review, vol.* 103(3), pages 598-604.

Strahan, P. E., "The Real Effects of US Banking Deregulation," *Review of the Federal Reserve Bank of St. Louis* 85:4 (2003), 111-128.

Sun, T S and Yannelis, C. 2016 "Credit constraints and demand for higher education: evidence from financial deregulation", *Review of Economic and Statistics*, 98(1):12-24.

Welsch, Heinz. 2010. "The Magic Triangle of Macroeconomics: How do European Countries Score?" *Oxford Economic Papers*, 63 (1): 71-93.

Wolfers, Justin. 2003. "Is Business Cycle Volatility Costly? Evidence from Surveys of Subjective well-being." *International Finance*, 6 (1): 1-26.

Zingales, Luigi. 2011. "The Role of Trust in the 2008 Financial Crisis." *The Review of Austrian Economics*, 24 (3): 235-249.

SUMMARY

It is known that banking crises produce large economic costs. Yet might their consequences be even more far-reaching? We investigate an issue as yet largely unexplored and provide some of the first evidence that banking crises also lead to major, widespread, and lasting psychological losses. We estimate the costs of banking crises with individual life satisfaction; we show that these extend beyond GDP declines and other macroeconomic and financial leakages. For the 2007-8 financial crisis, we find some evidence that the losses are larger for those countries that had previously experienced a credit boom.

