Everybody Hurts: Non-monetary effects of banking crises *

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Abstract

It is known that banking crises produce large economic costs. Yet might their consequences be even more far-reaching? We investigate an issue largely unexplored and provide some of the first evidence that banking crises also lead to major, widespread and lasting, psychic losses. We show that these are causal and extend beyond GDP losses and other macroeconomic and financial leakages for the episodes preceding the recession of 2007-8. For the latter, we document a universal negative trend in wellbeing. We interpret these costs as uncertainty and lack of trust brought about by the disruption of the banking systems.

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1. Introduction

A financial crisis' shock imposes a considerable burden both on 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, 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. More specifically, Dell'Ariccia *at 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. Jorda *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 these premises, we explore the mechanism through which banking crisis may affect individuals. In fact, in addition to the well understood impacts of banking crises, there are more subtle consequences. Crises erode the fundamental trust on which the entire financial system is based upon, strongly affecting the mutual level of confidence among firms, households and banks and deteriorating of the confidence necessary for investment and consumption. Ultimately, this increases the overall level of uncertainty; as stated in Dow (2012, p. 3), "in a [banking] crisis situation uncertainty increases as the range of apparently possible outcomes increases and as awareness increases of the extent of potential 'unknown unknowns' which cannot feasibly be incorporated into calculations.".[1]

We cannot over-emphasize the importance of uncertainty in the economic system; uncertainty is intrinsic to every transaction. Every economic system is characterized a certain level of uncertainty; uncertainty about the borrowers' ability to repay the lender; uncertainty that commercial banks will be able to provide liquidity on demand; uncertainty that the central bank will provide all the liquidity necessary to the commercial banks once it has set the interest rate; and uncertainty about the long term

[1] The importance of trust has been recently investigate in the finance literature by Gennaioli *et al.* (2014a), Guiso *et al.* (2008) and Zingales (2011); moreover Gennaioli *et al.* (2014b) provide the economic consequences of shocks to trust in a theoretical settings.

consequences of government finances.[2] Hence, any lack of confidence created by financial crises generates a higher system uncertainty, which will have a negatively impact on the level of consumption and investment and ultimately on individuals' well-being.[3] The consequences of banking crises can therefore be far-reaching in that they involve non-monetary, psychic losses, which may stem from the erosion of trust, confidence and built up of uncertainty, fear of the future and stress.

Our paper is the first to provide evidence of a causal link between banking crises and uncertainty-generated psychic losses; to this end our framework built upon the economics of 'happiness' (or subjective well-being, SWB henceforth) and more specifically on the recent works by Deaton (2011) on the US economy. 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 in United States during the latest crisis. His analysis revealed a significant drop in Americans' life evaluation 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. A very similar analysis and conclusion was reached by Graham *et al.* (2010).[4]

These leave us with a testable hypothesis: banking crises should lower SWB above and beyond the psychic losses caused by changes in objective personal and macroeconomic conditions. Our paper helps to bridge the gap in research on the costs of banking crises and that on SWB by estimating these costs in terms of loss of life satisfaction using European data.

We also 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.

Defining a variable that fully captures the intensity of banking crises is a problematic task. Such crises are complex events and proxies might be imperfectly correlated with the crises themselves (see

[2] The asymmetric information paradigm is based on the assumption that agents in any economic transaction possess different pieces of information. This paradigm has been extensively used to explain, for instance, the role of banks in the economic system and highlighting the structural weaknesses of banks and more generally of the financial sector. For a review see e.g. Freixas and Rochet (2008).

[3] Both consumption and investment are in fact mainly driven by perceptions of risk.

[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).

e.g., Barrell *et al.,* 2010a).[5] The literature on financial stability and costs of banking crises has resolved this issue by constructing event dummies based on several criteria that vary slightly according to the study. Establishing our own definition goes beyond the scope of this paper, therefore, we adopt this approach and utilize the databases compiled by Bordo *et al.* (2001), Caprio and Klingebiel (1996, 2003), Jonung and Hagberg (2005), Kaminsky and Reinhart (1999), and recently updated by Reinhart and Rogoff (2011). Although different definitions of a banking crisis are adopted in these databases, there is substantial agreement regarding the episodes that occurred during our period of interest across Europe. We focus our attention on crises involving commercial banks, hence, excluding those events implicating merchant banks exclusively. 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 this data to individual SWB data from the Eurobarometer surveys covering eighteen European countries for the period 1980-2011. Our final dataset includes sixteen episodes of banking crises that can be categorized as borderline systemic crises. Five of these occurred before the 2007-2008 financial crisis in different countries at different times.

We start the analysis by running regressions of individual SWB on banking crises controlling for micro, macroeconomic variables, country and year fixed effects. The coefficient on the banking crisis can be interpreted causally only under the assumption of unconfoundedness (see e.g., Imbens and Wooldridge, 2009 and Roberts and Whited, 2012). Establishing causality between macroeconomic events and well-being (both subjective and objective) is challenging. In this particular case, financial crises might be endogenous to SWB because of simultaneous and omitted factors that could be correlated with SWB and the year of the crisis. Therefore, even when using a large array of micro and macro controls, these *naïve* regressions potentially result in biased coefficients. In other words, it is difficult to assume a *priori* that banking crisis are "as good as randomly assigned" to countries and years (see, Angrist and Pischke, 2008). In order to improve upon this, 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 [7]. 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). The

[5] Section 4.2 provides a detailed explanation.

[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] For similar dynamic DD models in finance, see e.g., Goetz *et al.* (2013); Thorsten *et al.* (2010); Kerr and Nanda (2009). For simplicity, we will refer to this as dynamic DD models in the remainder of the paper.

DD framework verifies this assumption directly by allowing for leads of the banking crisis effects. Statistically similar trends *before* the crisis suggest that the control group forms a valid counterfactual.

Our results can be summarised as follows.

First, we show that OLS and dynamic DD estimates are very similar in most cases. If anything, DD estimates show slightly larger coefficients suggesting that OLS estimates might be downward-biased.

Second, banking crises, in general, have a negative and statistically significant effect on the SWB of Europeans; however, we find a statistically significant relationship only for the episodes prior to the 2007-2008 financial crash and SWB. For these events, we show that the psychological losses are highly persistent –lasting about four years from the onset of the crisis. These losses not only extend beyond the conventional macroeconomic controls (unemployment and inflation rates), but also beyond declines in economic output, wealth losses and fiscal costs which might be associated with a banking crisis resolution. The estimated parameters are also relatively large. The loss in SWB brought about by the crisis during the first year is equivalent to an increase in the unemployment rate of ten percentage points. This may seem large, but because we are controlling for job status, the coefficient on the unemployment rate is likely to capture additional factors, such as the fear of being unemployed, rather than actual unemployment *per se* (see e.g., Di Tella *et al.*, 2001; Blanchflower, 1991; Blanchflower and Shadforth, 2009). 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.

Third, although we estimate a negative coefficient for the 2007-8 crash, this is not statistically significant at the usual level of confidence. One explanation is that the episode was so severe and complex that it involved every country in our sample including the ones that technically did not suffer from a banking crisis. The data seem to support this hypothesis. We uncover two important facts related to the great recession: a) utilizing a triple DD we shows that the loss in SWB is sizeable for those countries that had previously experienced a credit boom and b) by means of an event study, we document that for the majority of the countries (treated and control) there is a negative trend in SWB starting about three years before the crisis.

Fourth, we study whether banking crises impact more heavily on some socio-economic groups. We do this by interacting banking crisis indicators with individuals' socio-economic characteristics. Overall, the results suggest that banking crises has a pronounced impact across groups.

Fifth, we find that banking crisis episodes hurt more individuals living in regions which host financial centres than statistically comparable individuals living in the rest of the country. This holds for the latest financial crisis too.

We interpret the decline in SWB as a non-monetary-cost associated with individuals' distress caused by increased uncertainty and lack of trust brought about by the disruption of the banking systems. Moreover we conjecture that this result could 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.). Our analysis supports the idea of the long-term scarring effects of banking crises.

The remainder of the paper is structured as follows. Section 2 highlights the previous literature on the costs of financial, especially banking crises, and the channels through which banking crises impact well-being. Section 3 highlights the empirical strategy. Section 4 focuses on the data sets. Section 5 contains the results and in Section 6 we offer our conclusions.

2. 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 (Bernanke, 1983). 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. Jordá *et al*. (2013) show that banking-crisis recessions are costlier than other recessions. 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. Askitas and Zimmermann (2011) use web searches to document how the great economic crisis has affected people's well-being and health.[8] 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. Given that uncertainty is intrinsic to every economic transaction it is difficult to over-emphasized the effect it has on the aggregate economy and markets. In support of this notion, the data show that bank deposits in the UK make up more than 90 per cent of all money used in the economy. A reliance on mutual trust may well be the best mechanism to deal with this unquantifiable level of risk. "In a crisis situation, uncertainty increases as the range of possible outcomes increases and as awareness increases of the extent of potential 'unknown unknowns' which cannot feasibly be incorporated into calculations." (Dow, 2012, p. 3). As a result, it is to be expected that banking crises are followed by a deep failure of trust and an increase in the level of uncertainty. 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 psychic losses using individual SWB data.

3. Empirical Strategy

In this paper, we estimate the effects of banking crises on SWB across European countries over time. The central feature of the methodology employed is the use of individual-level data (repeated cross-section surveys) to compare the experience of individuals that live in countries hit by a banking

[8] Conversely, bad times seem to improve physical health (for a review see Ruhm, 2006)

crisis to a similar but unaffected group.

The (indirect) well-being function (W) can be described as:

$$W = f(\boldsymbol{Z}, \boldsymbol{X}) \tag{1}$$

where $\boldsymbol{Z}$ is a set of demographic and personal characteristics, including income, and $\boldsymbol{X}$ is a set of macroeconomic controls to account for country-specific, time-varying factors (e.g., generic business cycle influences).

The economics of 'happiness' literature estimates functions like W directly by employing SWB data (e.g., life satisfaction or happiness scores) as a proxy for W. This approach has been used extensively in economics in recent years. It has been applied successfully in the study of attributes linked to experienced utility and in the assessment of psychological losses associated with socio-demographic and economic (e.g., Blanchflower and Oswald, 2004; Di Tella and MacCulloch, 2006). According to this framework, a well-being function such as equation (1) can be estimated by regressing individual scores of SWB on a variety of individual, economic, demographic and social variables. The implicit assumption is that self-reported happiness is a good proxy for underlying true well-being, experience utility or mental health. A number of studies support the use of SWB; self-reported happiness or life satisfaction strongly correlates with life events, physical measures and objective circumstances in a predictable way.[9] We find this approach very convincing as indicated by the consistency of findings across different datasets and different countries.[10]

Some studies examine the relationship between macroeconomic events and individual SWB. The seminal papers by Di Tella *et al.* (2001 and 2003), for example, show that SWB decreases when the unemployment rate and inflation increase (see also Welsch, 2010 and Blanchflower *et al.*, 2014).[11] This research unequivocally shows contemporaneous movements of SWB with macroeconomic measures, but, so far, has not successfully identified clear causal links, implicitly assuming that variations in macroeconomic conditions are as good as randomly assigned.

One of the contributions of our paper is a simple framework to establish causality between

[9] For example, happiness or life satisfaction are associated with the duration of an authentic smile, which involves involuntary contraction of the muscles surrounding the eyeball (the so-called "Duchenne smile" Ekman *et al.*, 1990), blood pressure and heart rate (Blanchflower and Oswald, 2008a), prefrontal brain activity (e.g., Davidson, 2004) and disability (Oswald and Powdthavee, 2008).

[10] There is a vast literature studying a variety of determinants of SWB in countries such as USA, Germany, Britain, Australia, Japan, Korea, South Africa, and most recently China. Regional and Worldwide surveys also exist (Eurobarometer Surveys, European Social Surveys, Latinobarometer Surveys, Gallup World Poll and World Values Surveys to cite the most common). Life satisfaction is typically found to be positively correlated with income – however, the relationship is curvilinear with richer individuals deriving less happiness than poorer individuals (e.g., Clark *et al.*, 2008a) even within twins (Li *et al.*, 2014). Following the tradition of Veblen (1973) and Duesenberry (1949), SWB data have been used to study interdepence of preferences in a variety of settings. In particular, relative income does matter (e.g., Card *et al.*, 2012 and Luttmer, 2005). Being unemployed decreases SWB (e.g., Winkelmann and Winkelmann, 1998; Daly and Delaney, 2013), while being married is positively associated with it (e.g. Blanchflower and Oswald, 2004). Across a variety of datasets, SWB is also found to be U-shaped with respect to age (see e.g., Blanchflower and Oswald, 2008b; Wunder *et al.*, 2013).

[11] 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.

macroeconomic events and SWB. The (average) effects of a banking crisis can be written in terms of potential outcomes and treatment effects as follows:

$$\xi(D=1,J=1)=E[W^1\,|D=1,J=1,\boldsymbol{Z},\boldsymbol{X}]-[W^0\,|D=1,J=1,\boldsymbol{Z},\boldsymbol{X}]. \quad (2)$$

W^1 and W^0 are potential well-being outcomes with and without the banking crisis, respectively. The banking crisis is identified by D and J, binary crisis-year and country indicators, respectively. The term $\xi(D=1,J=1)$ represents the average treatment effect on the treated, i.e., the mean of these treatments effects across those individuals living in country J after a crisis hit. $\boldsymbol{Z}$ and $\boldsymbol{X}$ are defined as above. The effect of the crisis can then be estimated by running SWB regressions on the country-year of the crisis. Implementation of this method is complicated by the presence of simultaneous or omitted factors at country-year level that are not observed by the researcher but do correlate with the year of the crisis. The specifications we use in this paper include (a) typical happiness regressions on banking crises and (b) a dynamic DD estimator in which we control for pre-trends in SWB. In what follows, we briefly review the econometric theory behind each of these approaches. The analysis will then study whether these psychological costs extend beyond economic losses typically associated with financial crises (e.g., income, job status, wealth). Furthermore, we compare banking crises to more general economic crises; this will serve to establish whether the effects arise from banking crises rather than from general economic downturns. Finally, we investigate the impact of crises on different socio-demographic groups and, for the latest crisis, on countries that experience a credit boom.

Following Ferrer-i-Carbonell and Frijters (2004), and more generally Angrist and Pischke (2008), we estimate all our regressions using linear probability models.[12] In all specifications, we clustered the standard errors at the country level as suggested by Bertrand *et al.* (2004) and improved critical values using a t-distribution, rather than the normal (Cameron and Miller, 2013).[13] 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.[14] The two methods yield very similar errors but we prefer the former as it performs better when the number of clusters is small.

3.1 Econometric model

The aim of the paper is to investigate whether banking crises produce a psychic loss on the individual experiencing these events. In order to test this, we first investigate the relationship between SWB and

[12] Angrist and Pischke (2008) 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.
[13] t- distribution has degrees of freedom equal to the number of clusters minus one.
[14] Note that this is not the same as simply clustering at country*year level, which typically provide much smaller standard errors and suffer from biases first noted by Bertrand et al. (2004). When using country*year standard errors, our estimated effects are statistically significant at 1% in the majority of cases.

banking crises by OLS in which SWB is regressed on a banking crisis indicator. The baseline equation at the individual level is given by:

$$SWB_{ijt} = \lambda_t + \alpha_j + \boldsymbol{X}_{jt}\boldsymbol{\beta} + \boldsymbol{Z}_{ijt}\boldsymbol{\gamma} + \xi D_{jt} + \epsilon_{ijt} \quad (3)$$

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 positive and statistically significant. This indicates the presence of a correlation between banking crises and SWB.

In order to study whether the psychic loss is long lasting, the model in equation (3) is augmented by including lags of the banking crises indicator:

$$SWB_{ijt} = \lambda_t + \alpha_j + \boldsymbol{X}_{jt}\boldsymbol{\beta} + \boldsymbol{Z}_{ijt}\boldsymbol{\gamma} + \sum_{n=0}^{q} \xi_n D_{jt\,(t=n)} + \epsilon_{ijt} \quad (4)$$

Where $\sum_{n=0}^{q} \xi_n$ with *q=1,2,3,4* are the parameters of interest, capturing the persistence of banking crisis. This approach 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 (4) allows us to study how long it takes to individuals to adapt to the uncertainty brought about by the banking crisis.[15]

In these specifications, the effect of a banking crisis is measured by the coefficient(s) ξ. This parameter 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 ϵ_{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 order to attenuate this issue, we propose to check for the common trend assumption in a dynamic DD approach.

3.2 Accounting for endogeneity: a difference-in-differences approach

In this section we take into account the potential endogeneity of banking crises by adopting a dynamic

[15] 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.*, 2008b and Frijters *et al.*, 2011).

DD framework. The starting point of this approach is common to the model in equation (2): 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.[16] A natural way to check 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:

$$SWB_{ijt} = \lambda_t + \alpha_j + \boldsymbol{X}_{jt}\boldsymbol{\beta} + \boldsymbol{Z}_{ijt}\boldsymbol{\gamma} + \sum_{n=-m}^{q} \xi_n \, D_{jt\,(t=k+n)} + \epsilon_{ijt} \qquad (5)$$

where i indexes individuals, j indexes nations, and t indexes time. λ_t and α_j are the year and country effects, respectively; ϵ_{ijt} is an individual specific error term. $\sum_{n=-m}^{q} \xi_n \, D_{jt(t=k+n)}$ is the term of interest , where *k* is the time at which the treatment is being switched on. We then 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.

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 which uses every year from ξ_{-4} to ξ_{+2}. [17]

4. Data

4.1 Life satisfaction and individual characteristics

Our main data source is the Eurobarometer Survey Series, a repeated cross-section survey in which a

[16] 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).
[17] 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).

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.[18] 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.

In this paper, we use samples of individuals living in eighteen European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom, Switzerland and Iceland.[19]

We consider four different samples by including or excluding the latest banking crisis (i.e., the 2007-2008 financial crash). The first sample includes all individuals interviewed between 1980 and 2003; this gives us 633,687 observations. We are interested in studying the effect of including and excluding income on our treatment effects since the income variable is dropped from the Eurobarometer surveys after 2003, but understanding the impact of income on the treatments' SWB is important. Thus when personal income is included in the specification, the number reduces to 459,799; this is the second sample. The third sample includes 315,877 observations from interviews after 2003 to 2011, i.e., just before and during the current financial crisis.[20] Finally, our fourth sample includes all individuals who participated in the surveys from 1980 to 2011 (including the individuals who did not report income during all periods considered); this sample size is 933,943.

The use of separate samples is beneficial: for instance, excluding the latest banking crisis from some of the analyses is necessary as the effect of the banking crisis may be confused with other macroeconomic shocks.[21]

In summary, we have four sample periods that we will use for the analyses: 1) the period 1980-2003, which includes individuals who reported their income; 2) the period 1980-2003 in which individuals' income is excluded; 3) the period 2003-2011 (i.e., just before and after the 2007-2008 financial crisis); 4) the whole period 1980-2011.

Every 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.

[18] http://ec.europa.eu/public_opinion/archives/eb_arch_en.htm.
[19] Questions are not systematically asked in all countries each year, hence, technically this is an unbalanced panel of countries. In particular, we have the following years of data by country: Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, UK (1980-2011); Germany (1992-2011) Austria, Finland, Sweden (1996-2011); Greece (1981-2011); Portugal, Spain (1986- 2011); Norway (1991-1993, 2001 and 2005); Iceland (2005, 2010-2011); Switzerland (2005) .
[20] The year 2003 is included in each of these three samples. Its exclusion does not affect the results.
[21] The Great Recession was initiated by a housing and banking crisis in the USA but it later developed into a sovereign debt crisis in Southern Europe.

4.2 Banking crises

The financial literature does not provide a single definition of a banking crisis. As explained in Barrell *et al.* (2010a, 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, several different databases compiled on the basis of various criteria, can be found in the financial literature.[22] 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).[23] 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 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). Furthermore, there is disagreement on the latest crisis for Ireland; Laeven

[22] For instance, Caprio and Klingebiel (1996) define a systemic crisis as an event when "all or most of the banking capital is exhausted"; their final database includes 93 countries. Kaminsky and Reinhart (1999) identified 26 systemic banking crises over 20 countries during the period 1970-1995. The criteria adopted are similar to Demirguc-Kunt and Detragiache (1998); a crisis is recorded if one of the following criteria is met: i) the ratio of nonperforming assets to total assets in the banking system exceeds 10 per cent; ii) the cost of the rescue operation is at least 2 per cent of GDP; iii) large scale nationalisation of banks; and iv) extensive bank runs or emergency measures were implemented by the Government in response to the banking crisis.

[23] The dataset accompanying the Reinhart and Rogoff (2011) paper can be found at http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.5.1676. The most recent updates of the database can be found here: http://www.reinhartandrogoff.com/data/browse-by-topic/topics/7/.

and Valencia (2013), for example, date the start of the crisis in 2008 rather than 2007. In general, recent papers tend to agree with Reinhart and Rogoff (2011) (e.g., Borio and Drehmann, 2009).[24]

Based on the discussion above, we rely on the dataset of Reinhart and Rogoff (2011), and references therein.

Because our paper is a study of non-monetary costs for the whole population using SWB, a close examination of two "minor" 1984 and 1995 UK crises leads us to exclude these events, since they were related to merchant banks which hold no deposits from the general public.[25] Table A1 in the Appendix is drawn from Reinhart and Rogoff (2011) and describes every episode affecting our sample of 18 countries. A total of twenty one near-systemic banking crises were identified over the entire period. [26]

The next step is to map these episodes in the Eurobarometer Surveys. Since these surveys are not run every year for every country in our sample, we cannot merge life satisfaction data with ξ_0 – the beginning of the crisis – for every episode. Life satisfaction data are missing for the year of the crisis in five cases, namely, Finland (1991), Sweden (1991), Norway (1987), Iceland (2008) and Switzerland (2008), this limit our sample to sixteen banking crises. In all these cases, instead of dropping observations when running the dynamic DD model, we use information on life satisfaction data as leads or lags if the surveys were conducted in years leading up to or following the financial crisis. 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}, while for Switzerland, the only Eurobarometer survey was conducted 3 years before its crisis (ξ_{-3}). Table 1 provides a snapshot of the countries for which we are able to merge life satisfaction data with the year ξ_0.

[TABLE 1 ABOUT HERE]

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 dynamic DD model is able to resolve this issue by estimating the immediate impact of the crisis as well as its persistence.[27]

4.3 Macroeconomic controls

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

[24] Investigating the latest financial crisis, Borio and Drehmann (2009) provide further evidence that a banking crisis did not occur in either Italy or Sweden.
[25] Results do not change substantially when including these two UK crises.
[26] In the period covered, only Luxembourg has never experienced a banking crisis, while some countries have experienced it more than once. See Table A1 for details.
[27] 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.

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.

[TABLE 2 ABOUT HERE]

5. Results

5.1 A first look at the link between banking crises and SWB

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 3.[28]

[TABLE 3 ABOUT HERE]

There are two main conclusions that can be made from Table 3. Firstly, the sign on the variable of interest is negative and statistically significant at the usual level of confidence, only for the sample covering the period before the latest banking crisis. The absence of a statistically significant coefficient for the latest crisis comes as unexpected and bears further investigation: there are various plausible explanations, such as the 'non-exclusivity' of the 2007-2008 financial crisis, i.e., the crisis was extremely severe and developed simultaneously in all European and overseas countries. In the next sections we will examine this further.

Focussing on the first four columns, the results pre-2008 suggest a statistically significant psychological cost associated with the year of the crisis itself. The first column in Table 3 indicates a stronger negative effect on well-being compared to the next four columns. However, these columns are not fully comparable since the inclusion of income quartiles implies the (contemporaneous) exclusion of the latest crisis. This is due to the fact that surveys did not include income levels after 2003[29]. 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. To make the coefficients comparable

[28] For simplicity, 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.

[29] The income variable was not collected also for the year 1995. Effectively, when controlling for income, one is excluding the Great Recession from the analysis.

and check this potential bias, we run a specification for the 1980-2003 sample excluding household income and report the estimated parameters in the second column. Note that the size of the banking crisis dummy is larger when income quartiles are controlled for (see the first column). 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.

We study the persistency of these losses by adding lags (see equation 4). Results are reported from columns 5 to 8 for the same samples. The results follow a similar pattern as above. There is evidence of lagged non-monetary effect of the crises prior to 2007-8, while the negative effects are smaller and non statistically significant for the other samples. The inclusion or exclusion of income does not make a substantial difference. If anything, excluding income slightly underestimate the losses.

The analysis so far as implicitly assumed that banking crises are "as good as" randomly assigned spatially and temporally. We now turn to this issue.

5.2 Addressing endogeneity

The analysis indicates that there is a statistically significant correlation between SWB and the banking crisis, however it does not explicitly address the issue of endogeneity. In order to resolve this we adopt a dynamic DD (see Section 3.2). Table 4 reports the estimated coefficients of such a model.

[TABLE 4 ABOUT HERE]

Various interesting facts emerge from Table 4. First, the coefficients on the banking dummy variables are not significantly different from zero for all years before the crisis (i.e., there are no anticipated effects), indicating similar trends in SWB prior to the banking crisis in treatment and comparison groups. This supports the identifying assumption of the dynamic DD model. 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. This is also shown in Figure 1 in which estimated coefficients from Table 4 are graphically reported with 90% confidence level.[30]

[FIGURE 1 ABOUT HERE]

Second, when we exclude the 2008 financial crisis, we find that banking crises have a statistically

[30] For completeness, Table A2 in appendix shows the results when UK merchant bank crises are included in the sample (see Section 4.2).

significant negative effect on the SWB of individuals across Europe: the magnitude of the coefficient ξ_0, in absolute value, is 0.102 and significant at the 5% confidence level, which is equivalent to 1.5 standard deviations of SWB. When we exclude income quartiles its value falls to 0.085. This value is in agreement with the result in Table 3 and supports the notion that, when income is excluded, the estimates are more conservative. We then compare the negative coefficient of 0.102 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. For instance, the estimated coefficient on unemployment rate is -1.06,[31] Thus, the non-monetary loss arising from banking crises is equivalent to the fear associated with an increase in the unemployment rate by about ten percentage points. Recall that every specification in our paper controls for job status. In this instance, the literature has argued convincingly that changes in unemployment rate pick up fear of becoming unemployed (Blanchflower and Shadforth, 2009 and Luechinger *et al*., 2010 provides evidence of this). Some of our specifications 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.

Third, the 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, non-monetary costs associated with the banking crisis. We discuss the mechanisms that may be responsible for these results in the next Section.

Fourth, this model with its full set of leads and lags offer stronger evidence of psychic 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, something we will test in Section 5.3.

Fifth, when we examine the recent financial crisis, we note that the estimated banking crisis parameters are roughly half the size and are statistically insignificant. Although this sample corresponds to almost one third of the whole period, the same result is found when pooling all crises.

One explanation for this unexpected result is that we simply have a confounding problem. We think that there are two reasons for this. First, only four countries in our database did not have a banking crisis, and therefore form our control group, Finland, Sweden, Italy and Luxembourg.[32] However, Italy and Luxembourg were indirectly affected by the crisis, while Finland experienced a different type of financial crisis – a crash of its stock market (see Reinhart and Rogoff, 2011). More specifically,

[31] Estimated parameters for unemployment rate and the other covariates are not shown but are available upon request.
[32] Sweden and Norway are not hit by the banking crisis either, however, Eurobarometer surveys were not conducted in those years in either countries, so they are not included in the control group. See Table 1.

Luxembourg's economy is heavily reliant on the financial industry; about one quarter of Gross Value Added (GVA) is generated by financial and insurance activities.[33] Italy was hit by a debt crisis and banks were negatively affected by firms' and households' solvency and, consequently, had to raise additional cash.[34] We interact the banking shock variables with the contribution of the financial system to the GVA in each country to analyse this situation.[35] Results are presented in Table A3 in appendix and show that there is no differential effect even when accounting for individual's countries financial sectors.

A second reason is that financial globalization and the introduction of the euro have led to the development of a highly interconnected banking industry.[36] Hence, we do not find a significant impact from the 2008 financial crash since all countries in our sample have been hit, directly or indirectly, by the financial or economic turmoil, from which banking crises are difficult to separate.

In other words, the fact that our regression does not detect a difference between treatment and control group is because it is not possible to clearly identify a control group *after* the crisis. This is corroborated by the plot of the average SWB of treatment and control groups for the years around the latest crisis (see Figure A1 in the Appendix). Clearly, although statistically similar (see Table 4) there is less evidence of a common trend before the crisis; most importantly, the drop in SWB is of similar magnitude and occur around the same years. It is therefore more instructive to focus the analysis of the latest financial crisis on a country by country basis. We do this in Section 5.4.

5.3 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) for the 1980-2003 period. In Section 2 we have reported a variety of other channels through which banking crises may affect individuals' SWB. These include: 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 and log of GDP with country and fixed effects), it is therefore instructive to include

[33] Data from Eurostat on the percentage of financial and insurance activities of the total GVA (at basic prices) for the years 2007, 2008, 2009 are 28.0%, 25.5%, 25.4%, respectively.
[34] See Messori (2009).
[35] GVA data by sectors were collected from the EUROSTAT database.
[36] 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.

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.[37]

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.[38]

We therefore test the hypothesis of a link between banking crises and SWB by re-estimating equation (5) 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).[39] If one of these channels is verified we expect the banking crisis dummy indicators to become smaller and to lose statistical significance.[40]

[TABLE 5 ABOUT HERE]

Table 5 shows that the coefficients get 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 sizes are still substantial indicating a loss of wellbeing equal to about one standard deviation. Table 5 clearly indicate that even when these extra variables are included, the coefficients on the banking crisis episodes prior to 2007 remain negative and persistent.[41]

In light of these estimates, and the evidence presented above, we suggest that there is a "residual

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

[38] 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.

[3939] 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.

[40] 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.

[41] Furthermore, none of the additional control variables included are statistically significant.

effect" that is hard to capture; a fundamental psychic effect of banking crises that is not accounted for in traditional economic studies.[42] This non-monetary effect could involve fear and distress and a deep failure of trust, such as trust in financial institutions or trust in political/regulatory institutions. This failure could also be a powerful determinant of Knightian uncertainty and have a non-negligible impact on an individuals' level of risk, stress and ultimately affect SWB.

5.4 The 2007-2008 financial crash and SWB

In the previous sections we have showed that the estimates of the effect of the last financial crisis on individuals' SWB are negative but statistically insignificant; we have already discussed one possible explanation for this, which is there are confounding factors at macroeconomic level such as banking interconnectedness and sovereign debt crisis, that hinder the identification the effect of the banking crisis. In this section, firstly we provide a country by country analysis; then we expand our control group of countries and finally we further test the hypothesis by looking at differential impacts across countries (in a triple DD settings).

We start by looking at averages of SWB (Table A4) and then move onto running standard event studies at country level (Figure 2). Norway, Iceland and Switzerland have been excluded from the analysis because some of the key years are missing. The total countries analysed here is thus fifteen. Simple averages of life satisfaction for each year from 2003 onwards in the countries considered highlight the following patterns: a) there is a substantial decline in SWB starting in 2005 up to the onset of the crisis for all the countries considered (treated and control); b) the fall is larger between 2005 and the year preceding the crash (ξ_{-1}, either 2007 or 2008) than in the year of the crash (ξ_0) in more than 50% of the cases) there is evidence of a strong and quick recovery in SWB in the vast majority of countries, which may be the result of adaptation.

Figure 2 presents event studies that provide us with a picture of the dynamic of the well-being in each country around the years of the latest crisis and helps us to deepen our understanding for the lack of a statistically significant difference between treated and control groups. The analysis focuses on 8 years, 4 years before and 3 years after the crisis (panel 1). The added vertical line indicates the year when the banking crisis started for each country in the treatment. With regards to the countries forming the control group (panel 2), we focus on the 8 years between 2004 and 2011. Each event study is a regression of individual SWB on personal characteristics (age, age-squared, gender, marital status, educational, age-left-school dummies, work status, and whether retired, keeping house or a student) and year fixed effects. These largely confirm the descriptive analysis and add additional insights.

First, there is a clear decreasing trend in wellbeing starting two-three years before the banking crisis

[42] 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)).

(in ξ_{-2} or ξ_{-3},) in the majority of countries (including countries forming the comparison group).

Second, contrary to Table A4, and just by looking at the point estimates, the drop is more pronounced in year ξ_0 rather than in the previous years for six countries. Third, the negative effect in year ξ_0 is statistically significant for six countries (Greece, Ireland, Portugal, Austria, UK and Italy 2008) while it is the year just after the crisis which is statistically significantly negative in Spain. Fourth, there is no sign of persistence, but SWB fully adapts within at least two years with the exception of Greece, while Italy fully adapted by 2011. Finally, when looking at the whole 8-year period, the change in SWB is negative and statistically significant at 10% level for at least two consecutive years in one third of countries: Ireland (from 2006 to 2008), Austria (from 2005 to 2007), Portugal (2008 and 2010) and UK (from 2006-2008).

This country by country analysis is useful in that it clearly highlights how the period 2005-2008 has been generally characterised by a consistent drop in SWB in the whole sample of countries considered and that it is difficult to pin-point this to a single event, namely, in this case, the banking crisis.[43] This universal drop in SWB reinforces our idea that banking crises are associated with large psychic losses.

In order to improve our control group for the latest crisis, we have estimated DD models that include Central and Eastern European countries, some of which did not experience a banking crisis.[44] However, the results do not change substantially as shown by Figure 3 which plots the coefficients of the corresponding regression. This Figure compares with panel 3 of Figure 1. Including these Eastern and Central European countries in the 2007-8 sample reduces the size of each negative coefficient while at the same time moderately improves their precision. As a consequence, the negative effect of the Great Recession is now (marginally) statistically significant at 10% level for the year after its onset. [45]

5.4.1 The role of the credit boom and the housing market

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. In our context,

[43] The evidence seems to suggest that in some countries other macro events, perhaps the European debt crisis, have had a bigger impact on individuals' SWB than the banking crisis itself. Investigating this is outside the scope of this paper; further research is needed to assess this aspect.

[44] Following the same dataset by Reinhart and Rogoff (2011), the Central and East European Countries included in the control group are: Czech Republic, Estonia, Lithuania, Poland, Slovakia, Bulgaria, Romania, Turkey, Croatia, Bulgaria, Romania, Turkey, Croatia and Macedonia; whilst the treatment group now includes Hungary and Slovenia.

[45] The regression estimates a coefficient of 0.053 with a clustered standard error of 0.032 (p-value=0.098).

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 as in the IMF Systemic Banking Crises Database of Laeven and Valencia (2013), which follows Dell'Ariccia *et al*. (2012). It follows from this that countries with a credit boom are: Belgium, Greece, Iceland, Ireland, Spain and the United Kingdom.

[TABLE 6 ABOUT HERE]

The results are presented in Table 6. We find that the average loss in well-being is much more pronounced across those countries which experienced a credit boom, but only in year following the crisis, ξ_{+1}. This result is robust even after controlling for GDP growth, stock market returns and fiscal variables, such as the tax burden and government consumption (second column of Table 6).

Although the financial crisis was a widespread phenomenon, the consequent recession might have had the most severe impact on those countries that experienced a collapse of the housing market.[46] In order to investigate this we interact the shock variables with the annual rate of growth of house prices in each European country.[47] Results in Table 6, clearly show that there are not such differential impacts across countries.

5.5 Searching for heterogeneity

The above results indicate that, on average, banking crises have a long and lasting effect on the SWB of individuals across Europe in the pre-2007 years. A potential issue with the pooled regressions presented above is that they might conceal heterogeneity between groups of individuals and regions. This section aims to test this hypothesis.

5.5.1 Differences across socio-demographic groups

It frequently argued in the popular press that financial and economic downturns have differential impacts on groups of individuals with specific characteristics, hence it is important to understand whether banking crises have had any distributional psychic cost. We focus our 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 (this can be done only for period 1980-2003) and labour market status. This provides us with a direct test of whether a banking crisis affects some groups more than others. This analysis is particularly

[46] The house market may also have been an additional transmission mechanism.
[47] Data on annual house prices are collected from the Bank of International Settlements (http://www.bis.org/statistics/pp.htm).

of interest for the latest financial crisis because, even though never statistically significant, the sign on the latest financial crash is always negative, indicating perhaps that some categories of individuals may have been shielded from the crisis.

[TABLE 7 ABOUT HERE]

Table 7 contains estimates for the early banking crises and for the most recent financial event, respectively. We run separate regressions for each set of social or demographic indicators: income quartiles (only pre-2003), gender, education and employment status. For instance, when studying heterogeneous effects across labour market status we run separate regression for each economic group.[48] What is striking in the results reported in Table 7 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, respectively. 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.[49]

That the impact of banking crises is not different across groups may come as a surprise but is in line with the idea that a generalised increase in Knightian uncertainty is behind the drop in SWB.

5.5.2 Heterogeneity across regions

In this sub-section the possibility of heterogeneity arising across European regions is investigated. One meaningful way to look at this is by distinguishing between regions that host financial centres (e.g., The Amsterdam region in the Netherlands, London region in UK and so forth) and regions that do not. The hypothesis is that financial centres are more likely to be impacted by the crash than the rest of the country. The coefficient on the triple difference is reported in Table 9 for our four samples. This analysis shows that banking crises hurt more individuals living in regions hosting a financial centre than statistically comparable individuals living in the rest of the country. This effect is statistically significant for every sample considered, including for the latest crisis. For the samples prior to 2007-8, the effect is 0.111 in absolute value for the year immediately after the onset of the crash; this is a 1.3 times bigger compared to a similar specification (Table 4 column 2).

The loss of wellbeing is statistically significant also for individuals in financial centres who experienced the latest crisis. However there is evidence that the drop started before the crisis itself.

[48] 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.
[49] Working from home and being a student are not shown. Results are available upon request.

[TABLE 8 ABOUT HERE]

6. 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 two decades and updated by Reinhart and Rogoff (2011), with the Eurobarometer surveys. This allows us to use sixteen banking crises, five of which occurred prior to the latest financial crash. Since the issue of 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 non-monetary 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. There is some evidence that crises hurt more individuals living in regions which host financial centres.

For the crises before 2007, these non-monetary costs appear to last for at least three years after the crisis and are relatively large. The SWB loss in the first year of the crisis is equivalent to an increase in the unemployment rate of 10 percentage points. 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.

For the great recession of 2007-8, we find that the loss in SWB is considerable for those individuals living in countries which had previously experienced a credit boom. Moreover, using an event study, we find a negative trend in SWB for the majority of the countries starting about three years before the crisis. We are reluctant to call this an anticipatory effect, but we find this an interesting observation which calls for further research.

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

Finally, we argued that the loss in SWB above and beyond that generated by GDP and unemployment could be absorbed when a fiscal channel (e.g., government intervention) and a wealth channel are taken into consideration. When such tests are implemented, the psychological loss is still present.

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 that respondents living in countries that did not experience a financial crisis provide a valid

counterfactual for individuals in countries in crisis. In addition, we run a falsification test, which shows that our results do not replicate when analysing the effects of negative growth on SWB.

The results presented in this paper suggest that some fundamental effects of banking crises are not accounted for in the standard literature on the costs of the crises. We suggest that these neglected effects include a deep failure of trust, such as trust in financial institutions or trust in political/regulatory institutions. 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). [50] 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), hence our definition of this as a non-monetary effect which, we found, has a non-negligible impact on individuals' level of risk, stress and consequently, on individuals' SWB.

Finally, we conjecture that these psychic losses may scar individuals for a long time, providing an explanation for the findings in the literature that depression and economic crisis shapes individuals' future decisions.

[50] Ehrmann et al. (2013) analyse how trust in the European Central Bank (and other European Insitutions) evolved around the great recession of 2007-8 and show that there is a decline across European countries.

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Table 1. Treatment group of countries and year ξ_0 of the banking crisis

Before the 2007-8 financial crisis (1980-2003)	2007-8 financial crisis (2003-2011)
Denmark, 1987	Denmark, 2008
Greece, 1991	Greece, 2008
France, 1994	France, 2008
UK, 1991	UK, 2007
Italy, 1990	
	Ireland, 2007
	Germany, 2008
	The Netherlands, 2008
	Austria, 2007
	Portugal, 2007
	Belgium, 2008
	Spain, 2008
Crises for which data is partially available	
Norway, 1987	Iceland, 2007
Finland, 1991	Switzerland, 2007
Sweden, 1991	

Notes: The table portrays episodes for which we have life satisfaction data for the first year of the crisis. There are five episodes for which we have life satisfaction data around the starting of the banking crisis, but not for year ξ_0 (see equation (5)) because Eurobarometer surveys were discontinuous in those countries. They are Norway 1987, Finland 1991, Sweden 1991, Iceland 2007 and Switzerland, 2007. 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},, while for Switzerland, the only Eurobarometer survey is conducted 3 years before its crisis (ξ_{-3}). Luxembourg is the only country in our database that has not experienced a banking crisis in the period considered.

Table 2. Descriptive statistics

	Before the 2007-8 financial crisis (1980-2003)		2007-8 Financial crisis (2003-2011)	
	Mean	St Dev	Mean	St Dev
SWB (Life satisfaction)	3.05	0.77	3.13	0.76
Occupational status:				
Unemployed	0.07	0.25	0.06	0.24
Self-employed	0.08	0.27	0.08	0.27
Retired	0.20	0.40	0.27	0.44
House keeping	0.15	0.36	0.09	0.29
Student	0.06	0.24	0.08	0.26
Military	0.01	0.02	-	-
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	0.49
Single	0.23	0.42	0.21	0.41
Divorced/separated	0.06	0.23	0.08	0.27
Widowed	0.08	0.28	0.09	0.28
Female	0.51	0.50	0.53	0.50
Age	44.11	17.80	48.42	18.14
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	0.16	0.37
15 years	0.08	0.27	0.08	0.27
16 years	0.12	0.32	0.10	0.30
17 years	0.07	0.26	0.07	0.25
18 years	0.11	0.31	0.13	0.33
19 years	0.05	0.23	0.07	0.25
20 years	0.04	0.21	0.05	0.22
21 years	0.03	0.18	0.04	0.21
22 years or older	0.14	0.35	0.22	0.41
Macroeconomic controls				
Inflation	0.05	0.05	0.02	0.01
Unemployment rate	0.09	0.04	0.08	0.03
Log of GDP	26.84	1.21	27.07	1.15

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.

Table 3. Measuring non-monetary effects: The impact and persistency of banking crises on SWB across Europe

	Before the 2007-8 financial crisis (1980-2003)		2007-8 Financial crisis (2003-2011)	All period (1980-2011)	Before the 2007-8 financial crisis (1980-2003)		2007-8 Financial crisis (2003-2011)	All period (1980-2011)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Banking crisis (ξ_0)	-0.073**	-0.056**	-0.007	-0.033	-0.091**	-0.072**	-0.031	-0.044
	(0.030)	(0.022)	(0.015)	(0.021)	(0.039)	(0.031)	(0.034)	(0.034)
+ 1 year (ξ_{+1})					-0.089	-0.062	-0.063	-0.055
					(0.057)	(0.053)	(0.049)	(0.054)
+2 years (ξ_{+2})					-0.068**	-0.059**	-0.020	-0.030
					(0.024)	(0.025)	(0.035)	(0.037)
+ 3 years (ξ_{+3})					-0.045	-0.060		-0.005
					(0.027)	(0.038)		(0.032)
+ 4 years (ξ_{+4})					-0.041*	-0.036**		0.017
					(0.023)	(0.017)		(0.023)
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income	Yes	No	No	No	Yes	No	No	No
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	459,799	633,687	315,877	933,943	459,799	633,687	315,877	933,943
R-squared	0.188	0.163	0.236	0.186	0.188	0.164	0.237	0.186

Notes: Each column reports coefficients from separate OLS regressions, corresponding to equation 3 (columns 1 to 4) and 4 (columns 5 to 8). 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 5 to 8); macroeconomic controls: 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. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table 4. Accounting for endogeneity: SWB losses relative to the year of the banking crisis

	Before the 2007-8 financial crisis (1980-2003)		2007-8 Financial crisis (2003-2011)	All period (1980-2011)
Event years ξ_n	(1)	(2)	(3)	(4)
-4 years	-0.013	-0.023	-0.019	-0.007
	(0.019)	(0.023)	(0.027)	(0.014)
-3 years	-0.042	-0.046	-0.028	-0.021
	(0.026)	(0.029)	(0.022)	(0.023)
-2 years	-0.012	-0.008	-0.033	-0.005
	(0.019)	(0.018)	(0.025)	(0.025)
-1 year	-0.022	-0.032	-0.025	-0.012
	(0.021)	(0.023)	(0.037)	(0.033)
Banking crisis (ξ_0)	-0.102**	-0.085**	-0.050	-0.048
	(0.041)	(0.033)	(0.048)	(0.041)
+1 year	-0.096	-0.070	-0.078	-0.058
	(0.056)	(0.052)	(0.055)	(0.057)
+2 years	-0.074***	-0.065**	-0.032	-0.033
	(0.023)	(0.024)	(0.035)	(0.039)
+3 years	-0.052*	-0.068*		-0.007
	(0.027)	(0.038)		(0.033)
+4 years	-0.048**	-0.044**		0.014
	(0.020)	(0.016)		(0.023)
Macroeconomic controls	Yes	Yes	Yes	Yes
Household income	Yes	No	No	No
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Individual characteristics	Yes	Yes	Yes	Yes
Observations	459,799	633,687	315,877	933,943
R-squared	0.188	0.164	0.237	0.186

Notes: Each column reports coefficients from separate OLS regressions, corresponding to equation 5. 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 before (pre-treatments) and after (post-treatments). Pre-treatment effects compare SWB of individuals 'treated' by the crisis with SWB of individuals 'not treated' by the crisis before the event. Statistically similar trends provide evidence that countries that did not experience the crisis form a valid counterfactual for treated countries. Each regression also includes country and year fixed effects, macroeconomic variables (log of GDP, inflation and unemployment rate at country level) 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. Standard errors in parentheses are adjusted for clustering at country level. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table 5. Channels: including economic, fiscal and wealth losses

	Before the 2007-8 financial crisis (1980-2003)				
Event years ξ_n	(1)	(2)	(3)	(4)	(5)
-4 years	-0.021	-0.015	-0.014	0.017	0.008
	(0.019)	(0.021)	(0.024)	(0.028)	(0.027)
-3 years	-0.047*	-0.035	-0.033	-0.005	-0.012
	(0.025)	(0.030)	(0.032)	(0.033)	(0.035)
-2 years	-0.003	-0.003	-0.001	-0.031	-0.029
	(0.016)	(0.031)	(0.032)	(0.022)	(0.020)
-1 year	-0.026	-0.023	-0.020	-0.004	-0.010
	(0.018)	(0.035)	(0.032)	(0.043)	(0.043)
Banking crisis (ξ_0)	-0.077*	-0.081**	-0.078***	-0.048**	-0.058*
	(0.040)	(0.030)	(0.023)	(0.018)	(0.032)
+1 year	-0.066	-0.061	-0.059	-0.064	-0.058
	(0.055)	(0.035)	(0.035)	(0.039)	(0.038)
+2 years	-0.060**	-0.069***	-0.068***	-0.053**	-0.058***
	(0.024)	(0.018)	(0.016)	(0.021)	(0.020)
+3 years	-0.065	-0.074**	-0.074**	-0.072*	-0.067**
	(0.038)	(0.027)	(0.030)	(0.037)	(0.031)
+4 years	-0.041**	-0.058***	-0.058***	-0.042**	-0.052**
	(0.014)	(0.016)	(0.016)	(0.016)	(0.025)
Channels controlled for:					
GDP growth	Yes	No	No	No	Yes
Government consumption	No	Yes	No	No	Yes
Tax burden	No	No	Yes	No	Yes
Annual stock market returns	No	No	No	Yes	Yes
Further controls:					
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes
Household income	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Individual characteristics	Yes	Yes	Yes	Yes	Yes
Observations	633,687	583,560	583,560	552,822	527,673
R-squared	0.164	0.171	0.171	0.168	0.173

Notes: Each column reports coefficients from separate OLS regressions, corresponding to equation 5, in which individual SWB is regressed on 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 before (pre-treatments) and after (post-treatments). Pre-treatment effects compare SWB of individuals 'treated' by the crisis with SWB of individuals 'not treated' by the crisis before the event. Statistically similar trends provide evidence that countries that did not experience the crisis form a valid counterfactual for treated countries. Additional variables that represent economic, fiscal and wealth channels are included. These are annual GDP growth, government consumption, tax burden and annual stock market returns. 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. Standard errors in parenthesis are adjusted for clustering at country level. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table 6. The causal effect of the 2007-8 financial crisis on SWB following the credit boom episodes and different house price growth

	Credit boom		House price	
Interaction with event years ξ_n	(1)		(2)	
(credit boom) (-4 years)	0.023	0.005		
	(0.050)	(0.035)		
(credit boom) (-3 years)	-0.008	-0.018		
	(0.042)	(0.038)		
(credit boom) (-2 years)	-0.000	0.007		
	(0.041)	(0.031)		
(credit boom) (-1 year)	-0.055	-0.040		
	(0.045)	(0.033)		
(credit boom) (Banking crisis)	-0.049	-0.044		
	(0.038)	(0.034)		
(credit boom) (+1 year)	-0.122*	-0.124*		
	(0.070)	(0.066)		
(credit boom) (+2 years)	-0.068	-0.058		
	(0.061)	(0.050)		
(house price growth) (-4 years)			-0.004	-0.001
			(0.005)	(0.003)
(house price growth) (-3 years)			-0.003	0.001
			(0.003)	(0.002)
(house price growth) (-2 years)			0.000	0.003
			(0.003)	(0.003)
(house price growth) (-1 year)			-0.007	-0.005
			(0.004)	(0.003)
(house price growth) (Banking crisis)			-0.007	-0.004
			(0.005)	(0.003)
(house price growth) (+1 year)			-0.007	-0.001
			(0.007)	(0.006)
(house price growth) (+2 years)			0.001	0.001
			(0.004)	(0.003)
Full set of controls	Yes	Yes	Yes	Yes
GDP growth	No	Yes	No	Yes
Government consumption	No	Yes	No	Yes
Tax burden	No	Yes	No	Yes
Annual stock market returns	No	Yes	No	Yes
Observations	315,877	314,160	292,486	292,486
R-squared	0.237	0.237	0.237	0.237

Notes: This table shows the estimated interaction terms from four separate OLS regressions in which SWB is the dependent variable. The first and second columns are regressing SWB on interactions between the banking crisis leads and lags and the credit boom indicator, while the third and fourth column presents interactions with house price growth. Data on credit boom episodes are from Laeven and Valencia (2013) (see also Dell'Ariccia *et al*., 2012), while data on house prices are from the Bank of International Settlements (http://www.bis.org/statistics/pp.htm). Each regression includes the "main terms" of the interaction model, country and year fixed effects, macroeconomic variables (log of GDP, inflation and unemployment rate at country level); 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. The second and fourth columns include GDP growth, government consumption, tax burden and stock returns. Standard errors in parenthesis are adjusted clustering at country level. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table 7. Heterogeneity of the effect of banking crises on SWB

Regression…	Before the 2007-8 financial crisis (1980-2003)										
	…by age groups (quintiles)					…by gender		…by job status			
	(13-27)	(28-38)	(39-50)	(51-63)	(64-99)	Male	Female	Employed	Unemployed	Self	Retired
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)
Similar pre-treatments	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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
Regression…	2007-8 Financial crisis (2003-2011)										
	…by age groups (quintiles)					…by gender		…by job status			
	(13-27)	(28-38)	(39-50)	(51-63)	(64-99)	Male	Female	Employed	Unemployed	Self	Retired
Banking crisis	-0.073	-0.052	-0.043	-0.065	-0.028	-0.046	-0.056	-0.053	-0.074	-0.032	-0.037
	(0.050)	(0.057)	(0.056)	(0.041)	(0.049)	(0.042)	(0.054)	(0.042)	(0.065)	(0.086)	(0.038)
+1 year	-0.107*	-0.075	-0.052	-0.059	-0.095*	-0.081	-0.076	-0.051	-0.158*	-0.059	-0.074*
	(0.059)	(0.068)	(0.060)	(0.051)	(0.049)	(0.055)	(0.056)	(0.052)	(0.078)	(0.097)	(0.041)
+ 2 years	-0.045	-0.021	-0.029	-0.022	-0.040	-0.016	-0.046	-0.011	-0.072	-0.004	-0.043*
	(0.044)	(0.047)	(0.039)	(0.032)	(0.026)	(0.039)	(0.033)	(0.039)	(0.051)	(0.051)	(0.023)
Similar pre-treatments	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	47,618	56,701	68,327	67,462	75,769	147,394	168,483	133,505	19,681	24,916	84,529
R-squared	0.181	0.243	0.253	0.255	0.267	0.232	0.243	0.219	0.207	0.240	0.239

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 5). Each regression includes the pre-treatment effects which are not statistically significant implying parallel pre-trends. 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, *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table 7. Heterogeneity of the effect of banking crises on SWB (cont'd)

Regression…	Before the 2007-8 financial crisis (1980-2003)			
	…by income quartiles			
	First	Second	Third	Fourth
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)
Similar pre-treatments	Yes	Yes	Yes	Yes
Observations	115,354	115,307	116,217	114,706
R-squared	0.173	0.159	0.158	0.158

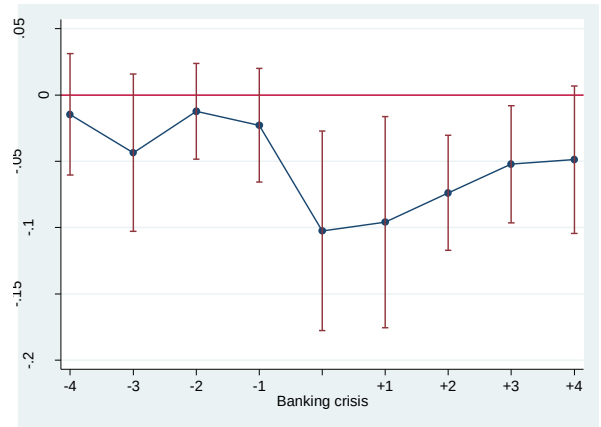
Notes: Each column shows estimated coefficients from OLS regressions by sub-groups in which SWB is regressed on the banking crises leads and lags (see equation 5). Each regression includes the pre-treatment effects which are not statistically significant implying parallel pre-trends. Further controls 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, *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table 8. The effect of banking crises on SWB in regions with financial centres

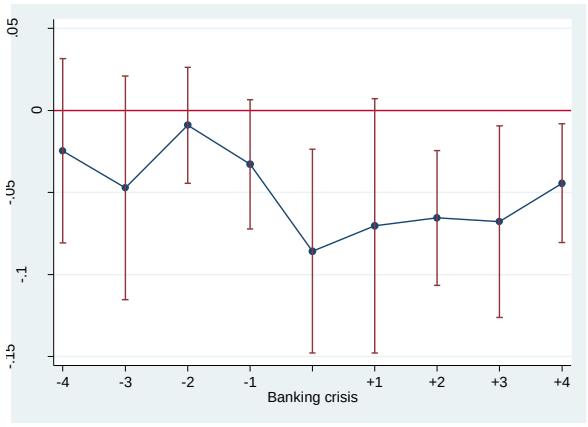
	Before the 2007-8 financial crisis (1980-2003)		2007-8 financial crisis (2003-2011)	All period (1980-2011)
Event years ξ_n				
(financial centre) (-4 years)	-0.045**	0.017	-0.038	-0.021
	(0.019)	(0.055)	(0.029)	(0.030)
(financial centre)(-3 years)	-0.068**	-0.032	-0.064**	-0.064**
	(0.023)	(0.052)	(0.029)	(0.027)
(financial centre)(-2 years)	-0.142***	-0.052*	-0.043*	-0.051***
	(0.024)	(0.027)	(0.024)	(0.017)
(financial centre)(-1 year)	-0.012	0.019	-0.033	-0.021
	(0.024)	(0.039)	(0.023)	(0.022)
(financial centre)(Banking crisis)	-0.056	-0.016	-0.058**	-0.053***
	(0.038)	(0.038)	(0.021)	(0.018)
(financial centre)(+1 year)	-0.123***	-0.134***	-0.061**	-0.089***
	(0.020)	(0.032)	(0.027)	(0.028)
(financial centre)(+2 years)	-0.082**	-0.038	-0.083***	-0.075**
	(0.034)	(0.041)	(0.018)	(0.028)
(financial centre)(+3 years)	-0.068	-0.097		-0.094***
	(0.056)	(0.056)		(0.029)
(financial centre)(+4 years)	-0.036	0.005		-0.015
Full set of controls	Yes	Yes	Yes	Yes
Household income	Yes	No	No	No
Observations	361,925	602,623	312,277	899,914
R-squared	0.202	0.166	0.235	0.188

Notes: This table shows the estimated interaction terms from four separate OLS regressions in which SWB is regressed on between the banking crisis leads and lags and an indicator whether the respondents lives in a region hosting a financial centre. Each regression includes the "main terms" of the interaction model, country and year fixed effects, macroeconomic variables (log of GDP, inflation and unemployment rate at country level); 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. The second and fourth columns include GDP growth, government consumption, tax burden and stock returns. Standard errors in parenthesis are adjusted clustering at country level. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

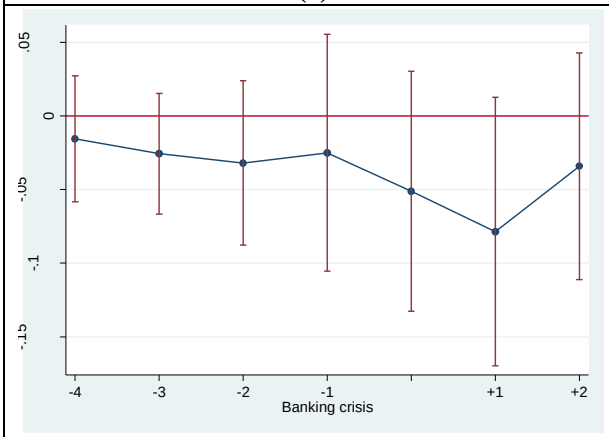
Figure 1. The effect of banking crises on SWB in Europe: Pre- and post-treatments



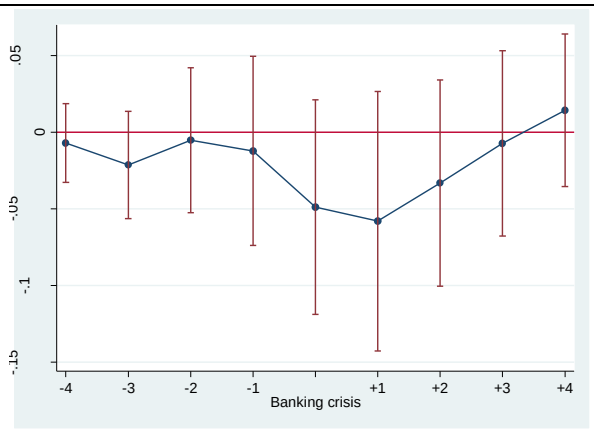
Before the 2007-8 financial crisis
including income quartiles (1980-2003)
(1)



Before the 2007-8 financial crisis
excluding income quartiles(1980-2003)
(2)



2007-8 financial crisis
(2003-2011)
(3)

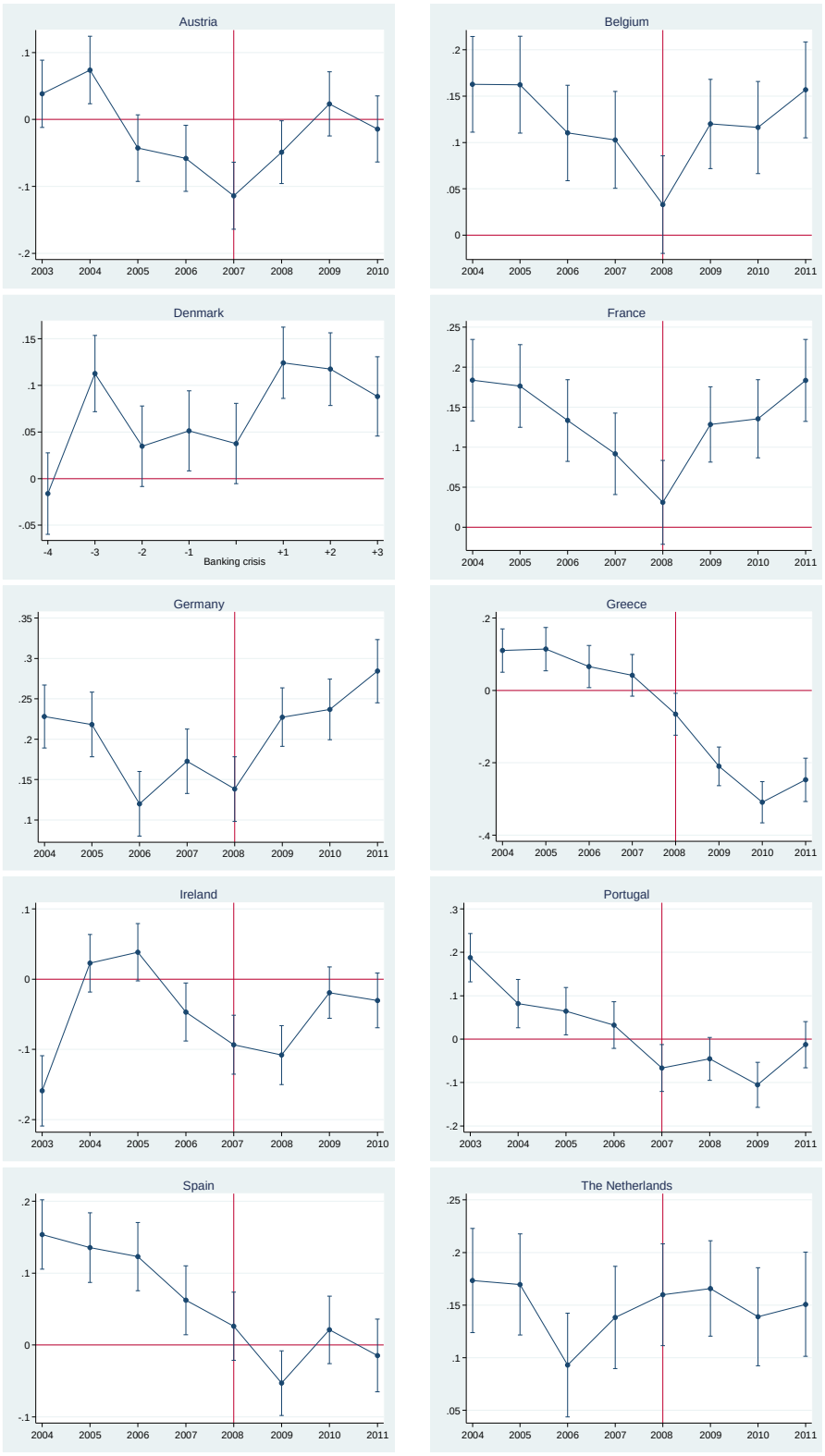


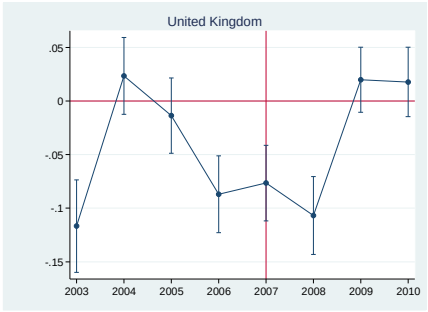
All period
(1980-2011)
(4)

Note: Each plot summarises OLS regression results from Table 4 in which SWB is regressed on banking crisis indicators and a set of controls. These are four plots corresponding to the four columns (i.e., samples) of Table 4. 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 (5). 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 (1) only. 90% confidence intervals based on clustered standard errors at country level are reported.

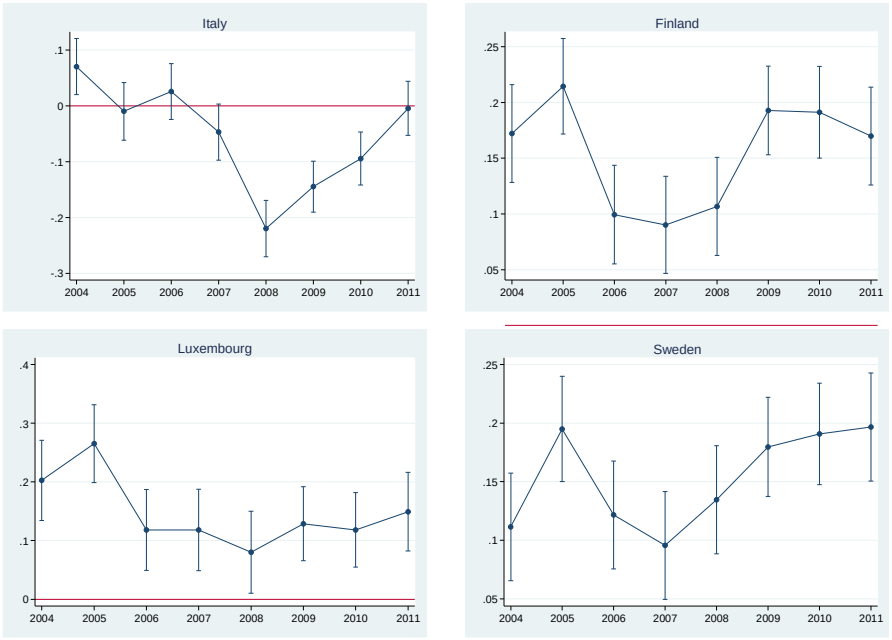
Figure 2. SWB around the 2007-8 financial crisis by treatment and control countries (event studies regressions at country level)

(1) Countries that experienced the banking crisis (treatment countries)



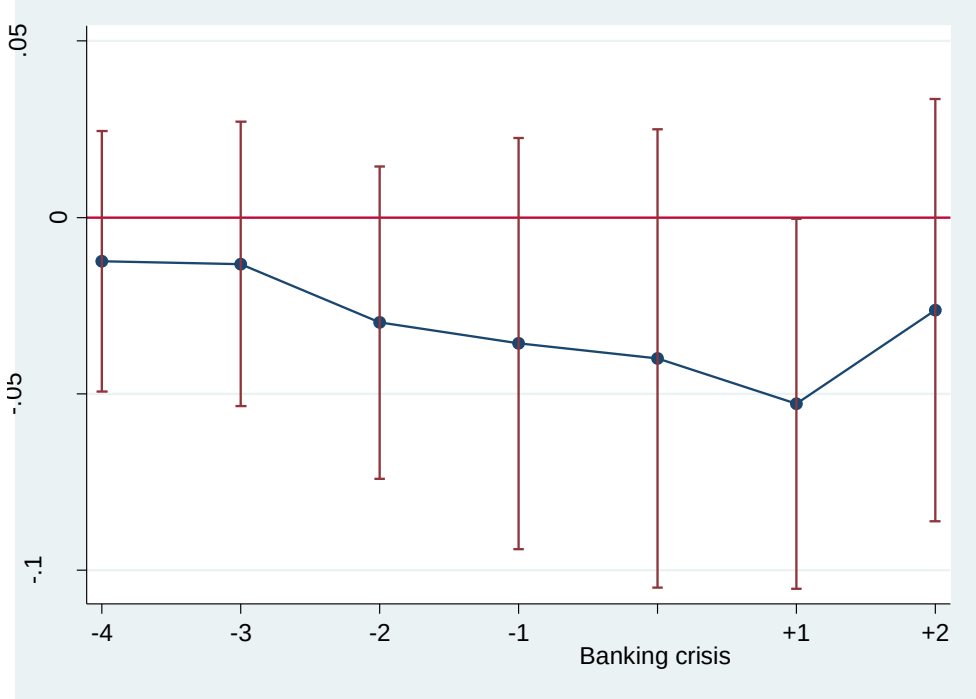


(2) Countries that did not experience the banking crisis (control countries)



Note: Each diagram plots coefficients of year dummies from separate SWB regressions by country. Each regression controls for individual characteristics (age, age-squared, gender, marital status, educational, age-left-school dummies, work status, and whether retired, keeping house or a student). For the countries in the top panel, each dot represents the estimated effect of the latest 2007-2008 banking crisis on SWB with respect to the beginning of the banking crisis, which vary between 2007 and 2008 depending on the country. The added vertical line indicates when the crisis started. For Finland, Italy, Luxembourg and Sweden, which are depicted in the second panel and did not experienced technically a banking crisis according to Reinhart and Rogoff (2011), the graphs plot the value of the estimated year fixed effect. Norway, Iceland and Switzerland have been excluded from the analysis because some of the key years are missing. 90% confidence intervals based on clustered standard errors at country level are reported.

Figure 3. The effect of the 2007-8 financial crisis on SWB when the sample includes Central and Eastern European countries



Note: This Figure compares with panel 3 of Figure 1, the only difference being the inclusion of Central and Eastern European countries. 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 (5). Each SWB regression controls for macroeconomic variables (log of GDP, inflation and unemployment rate at country level) 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 (1) only. 90% confidence intervals based on clustered standard errors at country level are reported.

Appendix

Table A1: A Summary of near systemic banking crises by events across our sample of 18 European countries, 1980-2011

Country	Brief Summary	Year ξ_0	Sources
Belgium	2007-8 Financial crisis	2008	Reinhart and Rogoff (2011)
Denmark	Two small banks collapsed and shook the banking system leading to moves to curb bank lending. Cumulative losses over 1990–92 were 9% of loans; 40 of 60 problem banks were merged.	1987	Kaminsky and Reinhart (1999); Caprio and Klingebiel (2003); Bordo et al. (2001); Reinhart and Rogoff (2011)
	2007-8Financial crisis	2008	Reinhart and Rogoff (2011)
Germany	2007-8 Financial crisis	2008	Reinhart and Rogoff (2011)
Greece	Localized problems required significant injections of public funds	1991	Bordo et al. (2001), Reinhart (2002), Caprio and Klingebiel (2003); Reinhart and Rogoff (2011)
	2007-8 Financial crisis	2008	Reinhart and Rogoff (2011)
Spain	2007-8 Financial crisis	2008	Reinhart and Rogoff (2011)
France	Crédit Lyonnaise had serious solvency problems	1994	Caprio and Klingebiel (2003); Bordo et al. (2001)
	2007-8 Financial crisis	2008	Reinhart and Rogoff (2011)
Ireland	2007-8 Financial crisis	2007	Reinhart and Rogoff (2011);
Italy	Fifty-eight banks, with 11 percent of lending, merged with other institutions	1990	Caprio and Klingebiel (2003); Bordo et al. (2001); Reinhart and Rogoff (2011)
The Netherlands	2007-8 Financial crisis	2008	Reinhart and Rogoff (2011)
Austria	2007-8 Financial crisis	2007	Reinhart and Rogoff (2011)
Portugal	2007-8 Financial crisis	2007	Reinhart and Rogoff (2011)
UK	The Bank of Credit and Commerce International failed	1991	Caprio and Klingebiel (2003); Reinhart and Rogoff (2011)
	2007-8 Financial crisis	2007	
Norway[a]	Two regional saving banks failed. The banks were eventually merged and bailed out. The Central Bank provided special loans to six banks suffering from the recession of 1985–86 and from problem real estate loans. The state took control of the three largest banks with 85% of banking system assets.	1987	Reinhart and Rogoff (2011)
Sweden[a]	The Swedish government rescued Nordbanken, the second largest bank. Nordbanken and Gota Bank, accounting for	1991	Kaminsky and Reinhart (1999); Jonung and Hagberg (2002); Caprio and Klingebiel (2003); Bordo et al. (2001); Reinhart and

	22 percent of banking system assets, were insolvent. Sparbanken Foresta, accounting for 24 percent of banking system assets, intervened. Overall, five of the six largest banks, accounting for more than 70 percent of banking system assets, experienced difficulties.		Rogoff (2011)
Finland[a]	A large bank (Skopbank) collapsed on September 19 and was intervened. Savings banks were badly affected; the government took control of three banks that together accounted for 31 percent of system deposits.	1991	Kaminsky and Reinhart (1999); Jonung and Hagberg (2002); Caprio and Klingebiel (2003); Bordo et al. (2001); Reinhart and Rogoff (2011)
Iceland[a]	2007-8 Financial crisis	2007	Reinhart and Rogoff (2011)
Switzerland[a]	2007-8 Financial crisis	2007	Reinhart and Rogoff (2011)

Note: This table draws from Reinhart and Rogoff (2011). Our banking crisis database excludes crises involving merchant banks (see Section 4.2).

[a] Eurobarometer surveys are not administered every year in Finland, Sweden, Norway, Iceland and Switzerland. As a result, life satisfaction data for the 5 countries at the bottom of this table cannot be merged with the date of the beginning of the crisis for those episodes. Instead of dropping those observations, we use information on life satisfaction data as leads or lags if surveys were conducted in years leading to or following the financial crisis. In particular, for Finland and Sweden, surveys are available only four years later (event year ξ_{+4}, in equations 4 and 5), while for Norway only three and four years later (ξ_{+3} and ξ_{+4}). For Iceland, Eurobarometer surveys are available only three and four years later (ξ_{+3} and ξ_{+4}), and two years before (the even year ξ_{-2} in equation 5), while for Switzerland, the only Eurobarometer survey is conducted three years before its crisis (ξ_{-3}).

Table A2. The causal effect of banking crises on SWB – including commercial banking crisis

	Before the 2007-8 financial crisis (1980-2003)		All period (1980-2011)
Event years ξ_n	(1)	(2)	(3)
-4 years	-0.009	-0.017	-0.015
	(0.015)	(0.018)	(0.014)
-3 years	-0.047	-0.044	-0.028
	(0.029)	(0.029)	(0.017)
-2 years	-0.005	-0.002	-0.000
	(0.015)	(0.016)	(0.021)
-1 year	-0.015	-0.021	-0.009
	(0.016)	(0.016)	(0.027)
Banking crisis (ξ_0)	-0.074*	-0.062*	-0.040
	(0.042)	(0.034)	(0.037)
+1 year	-0.066	-0.056	-0.053
	(0.056)	(0.048)	(0.049)
+2 years	-0.059*	-0.051	-0.030
	(0.028)	(0.030)	(0.037)
+3 years	-0.037	-0.044	-0.011
	(0.030)	(0.042)	(0.030)
+4 years	-0.033*	-0.040***	-0.014
	(0.017)	(0.011)	(0.019)
Household income	No	Yes	No
Full set of controls	Yes	Yes	Yes
Observations	459,799	633,687	933,943
R-squared	0.188	0.164	0.186

Notes: Each column reports coefficients from separate OLS regressions, corresponding to equation 5. 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 before (pre-treatments) and after (post-treatments). The banking crisis indicator here includes crises that affected merchant banks, hence investors, instead of the whole population. See 4.2 for details. Pre-treatment effects compare SWB of individuals 'treated' by the crisis with SWB of individuals 'not treated' by the crisis before the event. Statistically similar trends provide evidence that countries which did not experience the crisis form a valid counterfactual for treated countries. Each regression also includes country and year fixed effects, macroeconomic variables (log of GDP, inflation and unemployment rate at country level); 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. Standard errors in parenthesis are adjusted for clustering at country level. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table A3. The causal effect of the 2007-8 banking crisis in countries with different financial structures

Interaction with event years ξ_n	(1)	(2)
(financial structure) (-4 years)	-0.003	-0.002
	(0.019)	(0.018)
(financial structure) (-3 years)	-0.005	-0.008
	(0.012)	(0.013)
(financial structure) (-2 years)	-0.007	-0.014
	(0.017)	(0.016)
(financial structure) (-1 year)	-0.007	-0.005
	(0.018)	(0.014)
(financial structure) (Banking crisis)	0.000	0.004
	(0.011)	(0.010)
(financial structure) (+1 year)	0.015	0.015
	(0.016)	(0.017)
(financial structure) (+2 years)	0.011	0.004
	(0.011)	(0.008)
Full set of controls	Yes	Yes
GDP growth	No	Yes
Government consumption	No	Yes
Tax burden	No	Yes
Stock returns	No	Yes
Observations	295,802	294,085
R-squared	0.245	0.244

Notes: This table shows the interaction terms of banking crisis indicators with the size of the financial sector (relative to each country Gross Value Added, GVA). The dependent variable is individual SWB. Data on GVA by sector were drawn from the EUROSTAT database. Each regression controls for country and year fixed effects, log of GDP, inflation and unemployment rate, individual characteristics, which include gender, age and age-squared, indicators of marital status, education and a complete set of employment status dummy variables. Standard errors in parenthesis are adjusted for clustering at country level. *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

Table A4: Evolution of SWB during the 2007-8 crisis

Panel A: Average annual SWB by country

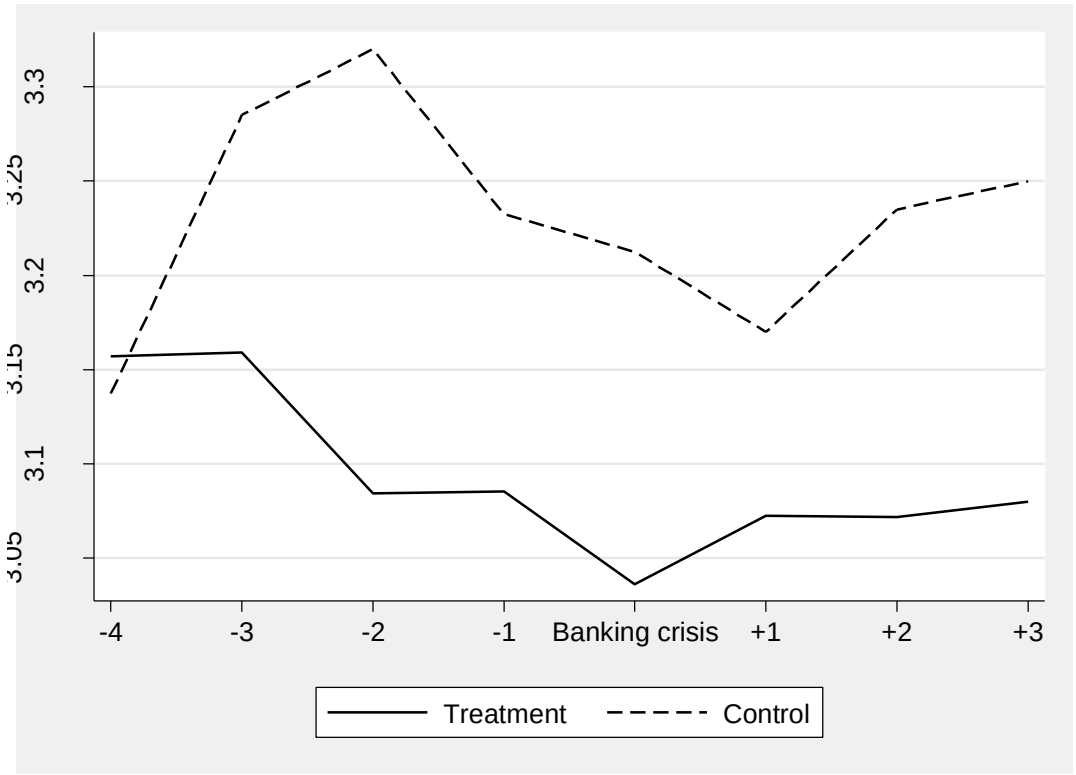
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Belgium	3.04	3.25	3.25	3.19	3.18	3.12	3.21	3.20	3.25
Denmark	3.57	3.57	3.69	3.61	3.63	3.61	3.70	3.69	3.64
Germany	2.76	3.02	3.03	2.90	2.97	2.94	3.03	3.05	3.09
Greece	2.67	2.78	2.77	2.71	2.68	2.57	2.43	2.34	2.38
Spain	3.02	3.14	3.13	3.10	3.06	2.99	2.90	2.97	2.93
Finland	3.15	3.33	3.38	3.25	3.26	3.27	3.36	3.35	3.31
France	2.85	3.05	3.04	2.99	2.96	2.90	2.98	3.00	3.02
Ireland	3.16	3.36	3.38	3.28	3.23	3.22	3.29	3.28	3.29
Italy	2.86	2.92	2.85	2.87	2.79	2.62	2.70	2.76	2.85
Luxembourg	3.25	3.47	3.54	3.38	3.39	3.34	3.39	3.40	3.42
The Netherlands	3.29	3.46	3.48	3.39	3.44	3.47	3.48	3.47	3.47
Austria	3.08	3.14	3.16	3.05	3.05	2.98	3.04	3.12	3.07
Portugal	2.50	2.64	2.53	2.50	2.52	2.41	2.42	2.34	2.44
Sweden	3.29	3.42	3.51	3.43	3.41	3.45	3.49	3.49	3.47
UK	3.19	3.32	3.29	3.21	3.22	3.19	3.32	3.33	3.30

Panel B: Average annual change in SWB by country

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Belgium		7%	0%	-2%	0%	-2%	3%	0%	2%
Denmark		0%	3%	-2%	0%	0%	2%	0%	-1%
Germany		10%	0%	-4%	3%	-1%	3%	1%	2%
Greece		4%	0%	-2%	-1%	-4%	-5%	-4%	2%
Spain		4%	0%	-1%	-1%	-2%	-3%	2%	-1%
Finland		6%	1%	-4%	0%	0%	3%	0%	-1%
France		7%	-1%	-1%	-1%	-2%	3%	1%	1%
Ireland		6%	1%	-3%	-1%	0%	2%	0%	0%
Italy		2%	-2%	1%	-3%	-6%	3%	2%	3%
Luxembourg		7%	2%	-4%	0%	-1%	1%	0%	1%
The Netherlands		5%	0%	-2%	1%	1%	0%	0%	0%
Austria		2%	1%	-4%	0%	-2%	2%	3%	-2%
Portugal		5%	-4%	-1%	1%	-4%	0%	-3%	4%
Sweden		4%	3%	-2%	-1%	1%	1%	0%	-1%
UK		4%	-1%	-2%	0%	-1%	4%	0%	-1%

Notes: Results in panel A are obtained by averaging the SWB (life satisfaction) across all individuals within a given country and year. Norway, Iceland and Switzerland have been excluded from the analysis because some of the key years are missing.

Figure A1 Sample average SWB (life satisfaction) around the 2007-2008 financial crisis between treatment vs. control countries



Note: Treatment countries are Austria, Belgium, Denmark, Germany, Greece, France, Ireland, Portugal, Spain, The Netherlands and United Kingdom. Finland, Italy, Luxembourg and Sweden form the control group