Working Paper
2024-07

Is financial inclusion a source of happiness?

Axelle Heyert & Laurent Weill

October 2024

Is financial inclusion a source of happiness?

Axelle Heyert[#]
University of Strasbourg

Laurent Weill[*]
EM Strasbourg Business School, University of Strasbourg

Abstract

This paper investigates whether financial inclusion affects life satisfaction. We perform regressions at the individual level on a large dataset of 59,209 individuals from 29 countries. We find evidence that financial inclusion improves life satisfaction. We further establish that the beneficial effect of financial inclusion takes place through a better health, education and to a lesser extent through the launch of a business. We observe that the positive impact of financial inclusion on life satisfaction is greater in countries with higher income per capita, and lower in countries recently struck by a financial crisis. Our results indicate that promoting financial inclusion can enhance happiness.

[#]Sciences Po Strasbourg, 7 rue de l'Ecarlate, CS 20024, 67082 Strasbourg, France. Email: aheyert@unistra.fr
[*]Corresponding author. Sciences Po Strasbourg, 7 rue de l'Ecarlate, CS 20024, 67082 Strasbourg, France. Email: laurent.weill@unistra.fr

1 Introduction

Financial inclusion, i.e. the use of formal financial services, has been progressively part of the global development agenda (Sahay et al., 2015; Demirgüç-Kunt et al., 2017). Country-level studies have shown that financial inclusion fosters economic growth (Kim et al., 2018), lowers poverty (Neaime and Gaysset, 2018), impairs tax evasion (Beck et al., 2014), reduces energy inequality (Dong et al., 2023), and enhances financial stability (Cull et al., 2012; Ahamed and Mallick, 2019) and bank performance (Ahamed et al., 2021). There is therefore a consensual view that financial inclusion can tackle underdevelopment issues.

However, evidence on the effects of financial inclusion at the individual level remains scarce. In particular, we can question whether financial inclusion affects happiness of people. At first glance, it may seem obvious that the benefits of financial inclusion in terms of economic growth should increase life satisfaction. Nevertheless, literature has shown that living in a growing country is not necessarily associated with life satisfaction (e.g., Guriev and Melnikov, 2018). The question whether happiness follows the evolution of income per capita remains hotly debated (e.g., Easterlin, 1995; Stevenson and Wolfers, 2008).

Furthermore, from an identification perspective, a positive relation between financial inclusion and economic growth at the country level does not imply a positive relation between being financial included and life satisfaction at the individual level.

Our aim in this study is to examine whether financial inclusion influences life satisfaction. In its most basic definition, financial inclusion refers to the fact that a person owns an account at a formal financial institution. We test the hypothesis that having a bank account increases life satisfaction. A bank account is expected to bring benefits for an individual. First, it makes everyday life easier since a bank account facilitates financial transactions. Second, it brings confidentiality and safety by lowering the incidence of crimes associated with the use of cash. Third and foremost, an account in a formal financial institution gives an easier access to credit allowing individuals to invest in essential commodities such as education, dwelling, or business.

As explained by Diener et al. (2011), three main theoretical approaches can explain life satisfaction. The first one is needs-based and assumes greater life satisfaction when various needs are met. The second one is activity-based and considers that life satisfaction is higher when a person is engaged in activities that are experienced as meaningful. The third one is about genetic and personality-predisposition theories, according to which a certain level of life

satisfaction would be rooted in each person's personality. From this perspective, financial inclusion can enhance life satisfaction through two ways. First, it contributes to satisfy needs through safety and confidentiality, and through easier access to education, dwelling, or business. Second, it helps persons to be engaged in meaningful experiences by increasing their possibilities to launch business.

To undertake our work, we utilize data from the three waves (2006, 2010, and 2016) of the Life in Transition Survey conducted by the European Bank for Reconstruction and Development. This survey provides individual-level information on financial inclusion and on life satisfaction, in addition to other socio-demographic determinants for the three waves considered. The sample gathers 59,209 observations from 29 countries, mostly located in Central and Eastern Europe and Central Asia. This cross-country dataset enables us to have heterogeneity in financial inclusion, but also in terms of economic and institutional development. To the best of our knowledge, the Life in Transition survey is the best source of data for our research question since it is the only cross-country dataset providing individual data jointly on financial inclusion and on life satisfaction.

Our primary finding is that financial inclusion favors life satisfaction. We confirm this result in a battery of robustness checks, tackling potential endogeneity concerns, including controlling for regional fixed effects, and using alternative econometric models. We further investigate the channels through which financial inclusion affects life satisfaction. We establish that the beneficial effect of financial inclusion takes place through education, health, and the launch of a business. Being financially included increases the probability to have a better education, a better health, and to launch a business, resulting in greater life satisfaction. We also observe that the positive impact of financial inclusion on life satisfaction differs with the country characteristics. It is higher in countries with higher income per capita, and lower in countries recently struck by a financial crisis.

Our investigation contributes to two strands of the literature. First, we augment the literature on the effects of financial inclusion. As surveyed by Ozili (2021), research on financial inclusion has investigated different effects of financial inclusion. We add to this body of analysis by focusing on the key outcome of human life: happiness. The closest paper to ours is the study from Sakyi-Nyarko et al. (2022) examining the influence of financial inclusion on household well-being in Ghana. They consider the impact of financial inclusion on a set of dimensions of household well-being like improvement of food consumption, medical treatment and school attendance outcomes. They find evidence of beneficial effects of financial inclusion.

Our work differs from their study by focusing on life satisfaction as a whole and by adopting a cross-country perspective rather than being focused on one developing country.

Second, we extend the vast literature that examines the individual determinants of life satisfaction. Existing studies have identified a large set of individual factors like health or marital status (e.g., Deaton, 2008; Clark et al., 2017; Guriev and Melnikov, 2018). We augment the literature by emphasizing the influence of financial inclusion.

The paper proceeds as follows. Section 2 describes the data and methodology. Section 3 presents the results. Section 4 explores the channels and section 5 the moderating effects. Section 6 provides the robustness tests. Section 7 reviews our conclusions.

2 Data and methodology

2.1 Measuring financial inclusion and life satisfaction

To investigate our research question, we use individual data coming from the three waves (2006, 2010, and 2016) of the Life in Transition Survey (LiTS). The LiTS is an international program initiated in 2006 and conducted by the European Bank for Reconstruction and Development in collaboration with the World Bank. The survey covers former communist countries from Central and Eastern Europe and Central Asia, as well as some Western European countries for comparison. Its objective is to assess the impact of political, economic, and social changes on the lives of people in the regions surveyed. It asks representative samples of individuals in each country about a wide range of topics such as life conditions and perceptions. Our final sample includes 59,209 observations collected in 2006, 2010 and 2016 from 29 countries.

As traditionally measured in the literature (e.g., Demirgüç-Kunt et al., 2017), we define financial inclusion as the ownership of a bank account. Our measure of financial inclusion is taken from the answers to the following questions of the surveys:

"Does anyone in your household have a bank account? Yes (1), No (2)." (LiTS 2006)

"Do you or anyone in your household own a bank account? Cross whether that applies." (LiTS 2010)

"Do you have a bank or postal account? Yes, I have at least one account and I own at least one of them alone (1), Yes, I have at least one account but I own all of them jointly with someone else (2), No (3)." This question was asked to the primary and secondary respondents. (LiTS 2016)

The responses of the surveys have been recoded, so that the variable *Bank account* corresponds to a dummy variable taking the value one when the respondent or anyone in the household owns at least one bank account, and zero otherwise. For the question of the LiTS 2016, the first two choices have therefore been recoded as one and the last one as zero.

Since we investigate the impact of financial inclusion on life satisfaction, we need to take care to have enough variance in financial inclusion for each country-year. For instance, financial inclusion can be almost 100% of the population in some countries like Germany, which is meaningless for our investigation. To this aim, we have skipped from our sample each country-year for which the mean for *Bank account* was lower than 10% or higher than 90%. All country-year couples used in this study can be found in Table 2.

Life satisfaction is measured using the answers to the following question that remains similar in the three waves of the LiTS:

"*To what extent do you agree with the following statement? All things considered, I am satisfied with my life now. Strongly disagree (1), Disagree (2), Neither disagree nor agree (3), Agree (4), Strongly agree (5).*"

We define our dependent variable *Life satisfaction* with the answers to this question. *Life satisfaction* is an ordered variable taking values on a five-point scale.

2.2 Methodology

To perform our empirical investigation, we estimate OLS regressions in line with former works explaining life satisfaction with individual characteristics and using LiTS data (e.g., Djankov et al., 2016; Guriev and Melnikov, 2018). We use the following model specification:

$$Life\ satisfaction_i = \alpha + \beta_1\ Bank\ account_i + \beta_2\ Individual\ controls_i$$
$$+ \beta_3\ PSU - year\ fixed\ effects + \varepsilon_i$$

where i indexes the individual. We incorporate primary sampling unit PSU-year fixed effects: primary sampling units correspond to the region where the respondent lives. They are geo-administrative divisions provided by the Life in Transition Survey and specific to the wave of the survey (EBRD, 2016). We therefore account both for the characteristics of region and the year of the survey by including PSU-year fixed effects. We cluster standard errors by country to address potential correlations between observations within the same country. Our sample includes 3,551 PSU- year.

We employ a large set of individual controls to isolate potential confounding factors based on former studies on life satisfaction (Guriev and Melnikov, 2018). *Female* controls for gender

5

and assigns a value of one if the individual is a female, and zero otherwise. *Age/10* and *Age²/100* account for the age of the respondent in years. *Education* is an ordered variable with values between zero and three, corresponding to the highest degree obtained by the individual. It is equal to zero for individuals having no degree nor education, one for those having compulsory or primary education, two for secondary education and three for tertiary or higher education. *Income* depicts the self-reported income level of the respondent, on a scale from one to ten, relative to other people in the country. *Income* is derived from the answers to the subsequent question:

> *"Please imagine a ten-step ladder where on the bottom, the first step, stand the poorest 10% people in our country, and on the highest step, the tenth, stand the richest 10% people in our country. On which step of the ten is your household today?"*

Married captures the marital status of the individual and is equal to one if the respondent is married, and zero otherwise. *Urban* is a dummy variable equal to one when the individual lives in an urban area, and zero in a rural environment. *Health* corresponds to the self-assessed level of health of respondents on a five-point scale and is recoded so that five represents the greater level of health. The variable *Health* is based on the answer on the following question:

> *"How would you assess your health? Very good (1), Good (2), Medium (3), Bad (4), Very bad (5)."*

Family size considers the number of individuals in the respondent's household. The variable is equal to ten when the household comprises ten or more members. We control for the employment status with the variable *Job*, a dummy variable equal to one when the individual has worked for income during the past year, and zero otherwise. *General trust* reflects the self-assessed degree of social trust on a five-point scale, that the respondent generally feels towards most people. It is coded with the answers to the question:

> *"Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please answer on a scale of 1 to 5, where 1 means that you have complete distrust and 5 means that you have complete trust."*

To account for the ownership of the dwelling, we include *Property owner*, a dummy variable equal to one when the individual's dwelling is owned by a member of the household, and zero otherwise.

In addition, we also include one country control in some estimations: *GDP per capita*, corresponding to the logarithm of the real GDP per capita in the country during the survey year from the World Development Indicators, following Guriev and Melnikov (2018) using similarly LiTS data to explain life satisfaction. Regressions including PSU-year fixed effects

already consider the characteristics of the region of the respondent at the time of the survey. Therefore, we only include *GDP per capita* and year fixed effects in the specifications without PSU-year fixed effects. Table 1 provides a summary of the descriptive statistics for all variables considered in the study.

3   Results

In this section, we examine whether financial inclusion affects life satisfaction. We first provide a univariate analysis by country-year pair. We then present the results of the main estimations obtained with regressions.

3.1   Univariate analysis

We launch the empirical investigation by performing a univariate analysis by country-year pair. This approach offers insights about the impact of financial inclusion on life satisfaction across countries and years. To this end, we display the mean level of life satisfaction for individuals owning a bank account and for those who do not for each country-year pair in Table 2.

We find that financially included people have a significantly higher life satisfaction than non-financially included people in the vast majority of the country-year pairs (56 out of 59). In the three remaining country-year pairs, we never observe that non-financially included people have a significantly higher life satisfaction than financially included people. These findings tend to support a positive impact of financial inclusion on life satisfaction, while this conclusion is not conditional to the country or the year.

3.2   Main estimations

Table 3 reports the results of the OLS regressions. We consider three different specifications to test the sensitivity of the results. All specifications include all individual control variables. In column (1), we include year fixed effects controlling for the year of the survey. In column (2), we again include year fixed effects and add *GDP per capita* to control for macroeconomic changes at the country level. In column (3), we include PSU-year fixed effects.

We observe that *Bank account* is significantly positive in all specifications. Therefore, our key finding conclusion is that being financially included improves life satisfaction. We

consequently support the hypothesis that financial inclusion is beneficial for life satisfaction. It corroborates the view that owning a bank account brings benefits for an individual, which can be in terms of convenience for financial transactions, of safety and confidentiality, and of easier access to credit, leading to a happier life.

For economic significance, we consider the coefficient of *Bank account* in the specification in column (3) including all controls and fixed effects. We observe that the level of life satisfaction increases by 0.134 points when the respondent is financially included. In comparison with the mean life satisfaction for the full sample (3.104), the effect of financial inclusion appears economically significant. Furthermore, financial inclusion has a greater economic effect on life satisfaction than some other socio-demographic characteristics. To be financially included has a positive effect on life satisfaction which is much larger than the effect of gender (to be a woman increases life satisfaction by 0.023 points) or the effect of education (a greater education leads to a rise of 0.049 for life satisfaction).

Regarding the control variables, their effects on life satisfaction are overall consistent with previous literature (Hayo, 2007; Djankov et al., 2016; Guriev and Melnikov, 2018). We observe that the coefficient of *Female* is significant and positive, meaning greater happiness for women. The coefficients of *Age/10* and *Age²/100* are significant suggesting a non-linear effect of age: life satisfaction first diminishes until 49 years old and then increases with age. The coefficients of *Education, Income* and *Married* are positive and significant in all specifications. It means that more educated, high-income and married individuals are more satisfied in their life.

The coefficient of *Urban* is negative in all estimations but is not significant when we include PSU-year fixed effects, which may absorb the effect of *Urban*. This tends to indicate that living in an urban area may have a negative impact on life satisfaction. The coefficients of *Health, Job, Property owner* and *General trust* are always significant and positive. This provides evidence that healthier, working and more trusting people are happier in their life. As well, individuals owning their dwelling have better life satisfaction. We find an unclear effect of family size with a significantly coefficient which is negative depending on the inclusion of PSU-year fixed effects.

4   Examining the channels

In this section, we question through which channels financial inclusion can improve life satisfaction. In accordance with the expected benefits from financial inclusion and the

availability of data, we consider four factors through which financial inclusion can affect life satisfaction: health, education, the launch of a business, and the grant of a loan.

Regarding health, we examine the following hypothesis. Research on the consequences of financial inclusion has found that being financially included facilitates the access to medical treatment (Sakyi-Nyarko et al., 2022) and improves mental health (Ajefu et al., 2020). Furthermore, former studies on the determinants of life satisfaction have shown evidence that a better health is positively associated with happiness (e.g., Singh et al., 2023). Therefore, we suppose that financial inclusion can favor health, which improves life satisfaction in turn.

Concerning education, we hypothesize that financial inclusion fosters education, which has in turn a positive effect on life satisfaction. Financial inclusion can give easier access to credit, which helps for finance education-related expenses such as tuition fees or books and can facilitate transactions related to education. In addition, financial inclusion enhances namely school attendance (Sakyi-Narko et al., 2022). As education has been shown to favor quality of human life (e.g., Hayo, 2007), financial inclusion can improve life satisfaction through higher education.

Regarding launching a business, we test the hypothesis that having a bank account helps individuals to launch a business, which can boost their satisfaction in life. Financial inclusion gives access to financial services enabling individuals to conduct financial transactions with greater efficiency and security and to ask for a loan. This can encourage people to create their business (Demirgüç-Kunt et al., 2017). In turn, the launch of a business can be perceived as a sense of accomplishment and of achievement for the entrepreneur. A business can also yield money, which can enhance life satisfaction.

Finally, we test the hypothesis that being financially included increases the likelihood to borrow which can impact their life satisfaction. Having a bank account is a first step to access to other financial services proposed by a financial institution. Owning a bank account therefore increases the probability to obtain a loan (Demirgüç-Kunt et al., 2017). We suppose that a credit can have a double-sided effect on happiness. On the one hand, a loan allows individuals to invest in goods and services that can improve their satisfaction in life. On the other hand, the indebtedness situation due to the loan can cause troubles related to repayment issues, thus deteriorating happiness (Brown et al., 2005; Tay et al., 2017; Liu et al., 2020).[1] Therefore, getting a loan can mediate the positive effect of financial inclusion on happiness.

---

[1] Consistent with this argument, Yue et al. (2022) have shown that the expansion of digital finance in China can favor financial inclusion but at the same time also increase the likelihood of financial distress for households.

To explore these channels, we use the previously defined variables *Health* and *Education* and we define two new variables: *Business,* and *Loan.* Data for these two variables are available for LiTS II (2010) and LiTS III (2016) only. *Business* is a dummy variable equal to one when the respondents have managed to set up their own business, and zero otherwise. *Loan* is a dummy variable equal to one when the individual repays a loan for the purchase of his/her dwelling, and zero otherwise. We have excluded individuals repaying a loan but without bank account from the sample for more accuracy.

To test the mediation hypotheses, we use the structural equation modeling (SEM) / path analysis approach and conduct our structural equation model for each of the four mediators mentioned (*Health, Education, Business,* and *Loan*). In line with former studies using path analysis (Bentley-Goode et al., 2019; Callen et al., 2020), we perform regressions of life satisfaction on financial inclusion and on the tested mediating variable. Furthermore, we regress the mediator on financial inclusion. All regression equations incorporate all control variables and PSU-year fixed effects employed before. We employ the Sobel, Aroian and Goodman tests to assess the significance of the mediated effect, following Messersmith et al. (2011). Figure 1 depicts the structural equations model, along with the specific paths and their connections to life satisfaction as the outcome variable. Table 4 presents the results of the path analysis.

We first observe significantly positive direct path [*p(Bank account, Life satisfaction)*] coefficients of *Bank account* on *Life satisfaction*, controlling for the mediator studied in all models. This verifies that financial inclusion improves life satisfaction in all models. The indirect path [*p(Bank account, Mediator)*] coefficients between *Bank account* and the mediators are all significant and positive, supporting our hypotheses. Financial inclusion influences positively health, education, the launch of a business, and the grant of a loan. Then, the indirect path [*p(Mediator, Life satisfaction)*] effects between the mediators and *Life satisfaction* are significant and positive for *Health, Education,* and *Business*. This means that health, education, and the launch of a business directly enhance happiness. For *Health* and *Education,* the mediated path [*p(Bank account, Mediator)*p(Mediator, Life satisfaction)*] is indeed significantly positive with the three tests employed (Sobel, Aroian, and Goodman). This indicates that being financially included improves life satisfaction via a better health and a better education. More precisely, 3.82% of the positive effect of financial inclusion on life satisfaction goes through a better health. As well, the beneficial effect of financial inclusion on life satisfaction passes by a better education at 5.50%. The mediating effect of *Business* is slightly significantly positive with the Sobel and Goodman tests. 0.57% of the positive effect

of being financially included, can be due to the launch of a business. These results corroborate our three first hypotheses about the mediation effects of health, education and the launch of a business. Finally, *Loan* has no direct significant impact on life satisfaction, and no significant mediating effect on life satisfaction, meaning that the beneficial effect of financial inclusion on life satisfaction is not mediated by the repayment of a debt.

In a nutshell, we find evidence that the effect of financial inclusion on life satisfaction takes place through three channels: health, education, and to a lesser extent through the launch of a business. Having a bank account increases the probability to have a better health, a better education and to launch a business, which in turn leads to a greater satisfaction in life. Furthermore, we find evidence that financial inclusion is not mediated by the repayment of a loan.

As explained above, we do not claim that these three channels are the only ones through which financial inclusion exerts an influence on life satisfaction. Based on former literature on the expected benefits of financial inclusion for individuals and data available in LiTS, we concentrated our investigation on four potential channels.

5   Moderating variables

In this section, we complement our main results by examining whether they are affected by four moderating variables. We question whether these variables reduce or amplify the positive influence of financial inclusion on life satisfaction.

First, we examine whether gender affects the relation between financial inclusion and life satisfaction. We test the hypothesis that the positive impact of financial inclusion on life satisfaction is stronger for females relative to males. This hypothesis is motivated by the gender gap in financial inclusion: women are less financially included than men worldwide (Demirgüç-Kunt et al., 2018). Having a bank account can be therefore especially valuable for females, benefiting from greater confidentiality and control over their income and savings (Demirgüç-Kunt et al., 2017). Financial inclusion can hence strengthen women's empowerment improving their satisfaction in life.

Second, we consider the influence of GDP per capita on the effect of financial inclusion on life satisfaction. We assume that a greater income per capita amplifies the effect. Indeed, cross-country literature about financial inclusion has found evidence that GDP per capita positively influences the level of financial inclusion in a country (Sha'ban et al., 2020). In

countries with higher GDP per capita, individuals are therefore more likely to make transactions requiring a bank account, such as wire transfers or transactions with credit card. Thus, non-financially included individuals in these countries are marginalized and face difficulties to deal with others, which can hamper their life satisfaction.

Third, we investigate the influence of bank concentration on the relation between financial inclusion and life satisfaction. We test the hypothesis that higher bank concentration moderates the beneficial impact of financial inclusion on life satisfaction. The rationale behind this hypothesis is that higher bank concentration allows banks charging higher prices for services to customers. Consequently, individuals can benefit less from their bank account.

Fourth, we consider the impact of the occurrence of a financial crisis. We assume that such an event moderates the positive effect of financial inclusion on life satisfaction. The reason is that a financial crisis hits more financially included people since they can lose their savings.

To test these hypotheses, we redo the regressions by adding an interaction term between the tested factor and *Bank account*. To investigate the influence of gender and of *GDP per capita*, we use previously defined variables *Female* and *GDP per capita*. To examine the impact of bank concentration, we define the variable *Bank concentration* corresponding to the assets of the five largest banks as a share of total commercial banking. Data come from the Global Financial Development Database. The sample is slightly smaller when considering bank concentration since this variable is missing for Kosovo. To analyze the influence of the occurrence of a financial crisis, we define *Financial crisis* as a dummy variable equal to one when a financial crisis took place in the country of the respondent during the five years before the survey year, and zero otherwise. Information on financial crises comes to the Systemic Banking Crises Database II (Laeven and Valencia, 2020).

Table 5 provides the results for the moderating variables. We use the specification with all controls and PSU-year fixed effects in all estimations. First, we find no evidence that the positive impact of financial inclusion on life satisfaction would differ between men and women. The coefficient of *Female × Bank account* is not significant. Therefore, we do not support the hypothesis that women would benefit from financial inclusion in terms of life satisfaction. Second, we show that GDP per capita affects the relation between financial inclusion and life satisfaction with the significantly positive coefficient of *GDP per capita × Bank account.* It accords with our hypothesis that the beneficial effect of financial inclusion on life satisfaction is amplified by income per capita. Third, we find evidence that bank concentration does not affect the relation between financial inclusion and life satisfaction: the coefficient of *Bank concentration × Bank account* is not significant. It does not confirm the hypothesis that greater

bank concentration moderates the beneficial impact of financial inclusion on life satisfaction. Fourth, we point out a significantly negative coefficient for *Financial crisis × Bank account*. It supports the hypothesis according to which the occurrence of a financial crisis recues the benefits associated with financial inclusion for individuals.

To sum it up, our findings show that the impact of financial inclusion on life satisfaction is higher in countries with higher income per capita, lower in countries with higher bank concentration and a recent occurrence of a financial crisis.

6 Robustness checks

This section presents robustness tests to examine the sensitivity of our findings. We first provide an instrumental variable analysis. We then use alternative estimation models with logistic regressions. We finally check whether the results hold when considering each survey year separately.

6.1 Instrumental variable approach

We are aware that our main results might be confounded by a potential endogeneity problem. Reverse causality could exist with a positive influence of life satisfaction on financial inclusion. Furthermore, we could have some omitted variables that simultaneously affect financial inclusion and life satisfaction. In our regressions, we included a large number of control variables in addition to PSU-year fixed effects to partially address unobserved endogeneity concerns.

We tackle the potential endogeneity problem by running the two-stage (2SLS) IV regression between financial inclusion and life satisfaction. The instrument is *Mean PSU bank account*, corresponding to the mean financial inclusion in the PSU of the individual excluding his/her own level of financial inclusion from the calculation. Financial inclusion in the region is expected to be related to financial inclusion of the individual, in line with evidence of the influence of peers on the use of financial services (Patacchini and Rainone, 2017). At the same time, no theoretical association can be conjectured between mean financial inclusion in the region and life satisfaction of the individual. We exclude from the estimations the PSUs with only one observation.

Table 6 displays the first-stage estimations and the second-stage regressions. Since we use the mean financial inclusion of the respondent's PSU-year as instrument, we do not add PSU-

year fixed effects in our instrumental variable models: PSU-year fixed effects accounting for the characteristics of the respondent's PSU at the time of the interview may absorb the effect of our instrument *Mean PSU bank account*. Thus, we replace PSU-year fixed effects by country fixed effects for these estimates. Our two specifications include individual controls, year fixed effects and country fixed effects to account for the time-invariant characteristics of the country. We further control for GDP per capita in specification (2). The sizeable and significant Cragg-Donald Wald F-statistics indicate that *Mean PSU bank account* has a strong effect on *Bank account*: the level of the average regional financial inclusion influences the likelihood of the individual's financial inclusion. This supports the view that *Mean PSU bank account* is a relevant instrument for the study. Moreover, regional financial inclusion excluding the individual does not directly explain the individual's life satisfaction, we can therefore consider it as a valid instrument. The Durbin-Wu-Hausman endogeneity test was used to assess the endogeneity of financial inclusion. The tests are insignificant suggesting that our OLS estimates are consistent and efficient. The first-stage results reveal a statistically significant and positive association between *Mean PSU bank account* and *Bank account*. This means that an individual belonging to a region with a high level of financial inclusion is more likely to be financially included. This corroborates the choice of our instrument.

Results from the second-stage regressions are in line with the main estimations. We still find a positive and significant coefficient for *Bank account* in all regressions. This indicates that having a bank account does improve life satisfaction. Therefore, the results suggest that the positive relation between financial inclusion and life satisfaction is not driven by an endogeneity bias.

6.2   Logistic regressions

As our dependent variable *Life satisfaction* is a discrete variable, we further complement our robustness tests by estimating logistic regressions. We test the same three specifications as before. First, we consider an ordered logit model to explain *Life satisfaction*. Table 7 reports the estimations. We find again that *Bank account* is significantly positive in all estimations. Second, we use a logit model to explain *Life satisfaction dummy*, a dummy variable equal to one if individuals positively answer to the question on life satisfaction by replying "*Agree*" or "*Strongly agree*", and equal to zero otherwise. Guriev and Melnikov (2018) consider a similar measure in their work. Table 8 displays the estimations. We obtain the same results than in the main estimations with a positive and significant coefficient for *Bank account* in all estimations.

14

Hence, the use of logistic regressions corroborates our finding that financial inclusion improves happiness.

6.3 Estimations by year

We redo the estimations by survey year. These estimations are motivated by two reasons. First, we want to investigate whether our findings are not specific to one period. Second, we aim at accounting for the potential bias arising from the slight differences in survey questions.

Table 9 displays the estimations. We present the results for the model including all individual control variables and PSU-year fixed effects for each survey year. We find that *Bank account* is significantly positive for each survey year. Therefore, our conclusion of a beneficial impact of financial inclusion on life satisfaction is observed for each survey year.

7 Conclusion

This paper addresses the issue of the impact of financial inclusion on life satisfaction. Using a cross-country dataset at the individual level, we find that financial inclusion improves life satisfaction. This result still holds when conducting various robustness checks, such as instrumental variable analysis, alternative estimation models, or the inclusion of regional fixed effects.

We further document that the effect of financial inclusion is channeled through education, health, and to a lesser extent through the launch of a business. Being financially included increases the probability to have a better education, a better health, and to launch a business, resulting in greater life satisfaction. Additionally, we observe that the positive impact of financial inclusion on life satisfaction differs with the country characteristics. It is higher in countries with higher income per capita, and lower in countries struck by a recent financial crisis.

Our results add to the research knowledge about the effects of financial inclusion and to the determinants of life satisfaction. From a policy standpoint, the results of this study provide an additional motivation to promote financial inclusion worldwide. Policymakers should foster financial inclusion not only to reach economic goals but also to bring happiness to people.

15

References

Ahamed, M.M. and Mallick, S.K., 2019. Is financial inclusion good for bank stability? International evidence. *Journal of Economic Behavior & Organization, 157*, pp.403-427.

Ahamed, M.M., Ho, S.J., Mallick, S.K. and Matousek, R., 2021. Inclusive banking, financial regulation and bank performance: Cross-country evidence. *Journal of Banking & Finance, 124*, p.106055.

Ajefu, J. B., Demir, A., and Haghpanahan, H. (2020). The impact of financial inclusion on mental health. *SSM-population Health, 11,* 100630.

Beck, T., Lin, C. and Ma, Y., 2014. Why do firms evade taxes? The role of information sharing and financial sector outreach. *The Journal of Finance, 69*(2), pp.763-817.

Bentley-Goode, K. A., Omer, T. C., and Twedt, B. J. (2019). Does business strategy impact a firm's information environment?. *Journal of Accounting, Auditing and Finance, 34*(4), 563-587.

Brown, S., Taylor, K., and Wheatley Price, S. (2005). Debt and distress: Evaluating the psychological cost of credit. *Journal of Economic Psychology, 26*(5), 642–663.

Callen, J. L., Fang, X., and Zhang, W. (2020). Protection of proprietary information and financial reporting opacity: Evidence from a natural experiment. *Journal of Corporate Finance, 64,* 101641.

Cull, R., Demirgüç-Kunt, A., and Lyman, T. (2012). *Financial inclusion and stability: What does research show?* (Consultative Group to Assist the Poor, 71305), pp. 1–3. Washington, DC: CGAP.

Deaton, A. (2008). Income, health, and well-being around the world: Evidence from the Gallup World Poll. *Journal of Economic Perspectives*, 22(2), 53-72.

Demirgüç-Kunt, A., Klapper, L., and Singer, D. (2017). *Financial inclusion and inclusive growth: A review of recent empirical evidence* (Policy Research Working Paper, No.8040), pp. 1–25. washington, DC: The World Bank.

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S. and Hess, J. (2018). The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. *World Bank Publications.*

Diener, E., Kahneman, D., and Helliwell, J. (2010). *International differences in well-being.* Oxford University Press.

Djankov, S., Nikolova, E., and Zilinsky, J. (2016). The happiness gap in Eastern Europe. *Journal of Comparative Economics, 44*, 108-124.

Dong, B., Jiang, Q., Dou, Y., and Dong, X. (2023). Can financial inclusion reduce energy inequality? Evidence from China. *Applied Economics*, 1–17.

Easterlin, R. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization* 27(1),35–47.

EBRD. (2016). *Life in transition: A decade of measuring transition.* European Bank for Reconstruction and Development. London.

Guriev, S., and Melnikov, N. (2018). Happiness convergence in transition countries. *Journal of Comparative Economics, 46*(3), 683-707.

Hayo, B. (2007). Happiness in transition: An empirical study on Eastern Europe. *Economic Systems, 31*(2), 204-221.

Kim, D. W., Yu, J. S., and Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance, 43*, 1–14.

Laeven, L., and Valencia, F. (2020). Systemic banking crises database II. *IMF Economic Review, 68*(2), 307–361.

Liu, Z., Zhong, X., Zhang, T., and Li, W. (2020). Household debt and happiness: evidence from the China Household Finance Survey. *Applied Economics Letters, 27*(3), 199–205

Messersmith, J. G., Patel, P. C., Lepak, D. P., and Gould-Williams, J. S. (2011). Unlocking the black box: exploring the link between high-performance work systems and performance. *Journal of applied psychology, 96*(6), 1105.

Neaime, S., and Gaysset, I. (2018). Financial inclusion and stability in MENA: Evidence from poverty and inequality. *Finance Research Letters, 24*, 230–237.

Ozili, P. K. (2021). Financial inclusion research around the world: A review. *Forum for social economics, 50*(4)*,* 457-479.

Patacchini, E., and Rainone, E. (2017). Social ties and the demand for financial services. *Journal of Financial Services Research, 52,* 35-88.

Sahay, R., Cihak, M., N'Diaye, P. M. B. P., Barajas, A., Mitra, S., Kyobe, A., Yousefi, S. R. (2015). *Financial inclusion: can it meet multiple macroeconomic goals? IMF Staff Discussion Notes, No. 15/17* (pp. 1–33). Washington, DC: International Monetary Fund.

Sakyi-Nyarko, C., Ahmad, A. H., and Green, C. J. (2022). The role of financial inclusion in improving household well-being. *Journal of International Development, 34*(8), 1606-1632.

Sha'ban, M., Girardone, C., and Sarkisyan, A. (2020). Cross-country variation in financial inclusion: a global perspective. *The European Journal of Finance, 26*(4-5), 319-340.

Singh, S., Kshtriya, S., and Valk, R. (2023). Health, hope, and harmony: a systematic review of the determinants of happiness across cultures and countries. *International Journal of Environmental Research and Public Health, 20*(4), 3306.

Stevenson, B., and Wolfers, J., 2008. Economic growth and subjective well-being. *Brookings Papers on Economic Activity*, Spring, 1–87.

Tay, L., Batz, C., Parrigon, S., and Kuykendall, L. (2017). Debt and subjective well-being: The other side of the income-happiness coin. *Journal of Happiness Studies*, 18(3), 903–937.

Yue, P., Korkmaz, A.G., Yin, Z., and Zhou, H. (2022). The rise of digital finance: Financial inclusion or debt trap? *Finance Research Letters*, 47(A), 102604.

Table 1
Descriptive statistics

This table reports the descriptive statistics for the variables employed in this study.

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Life satisfaction	59,209	3.104	1.132	1	5
Life satisfaction dummy	59,209	0.440	0.496	0	1
Bank account	59,209	0.531	0.499	0	1
Female	59,209	0.572	0.495	0	1
Age/10	59,209	4.716	1.722	1.8	9.9
Age^2/100	59,209	25.210	17.208	3.24	98.01
Education	59,209	2.013	0.703	0	3
Income	59,209	4.397	1.746	1	10
Married	59,209	0.583	0.493	0	1
Urban	59,209	0.594	0.491	0	1
Health	59,209	3.643	0.848	1	5
Family size	59,209	2.932	1.625	1	10
Job	59,209	0.536	0.499	0	1
Property owner	59,209	0.868	0.338	0	1
General trust	59,209	2.793	1.123	1	5
GDP per capita	59,209	9.662	0.534	8.036	10.661
Bank concentration	57,625	76.826	12.406	49.184	100
Financial crisis	59,209	0.248	0.432	0	1
Business	40,457	0.093	0.291	0	1
Loan	33,341	0.047	0.213	0	1

Table 2
Univariate analysis

This table provides the mean level of life satisfaction by country and by year, comparing individuals having a bank account and the others. The p-value is based on a two-sided test and gives the probability that the two means are equal. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Country	Year	Observations	Bank account = 0	Bank account = 1	Difference	
Albania	2006	974	3.156	3.707	0.551	***
Albania	2010	928	2.978	3.309	0.331	***
Albania	2016	1,070	3.061	3.528	0.467	***
Armenia	2016	1,245	2.189	2.595	0.406	***
Bosnia and Herzegovina	2006	948	2.471	2.896	0.425	***
Bosnia and Herzegovina	2010	931	2.691	3.108	0.417	***
Bulgaria	2006	959	2.650	3.260	0.610	***
Bulgaria	2010	785	2.769	3.082	0.313	***
Bulgaria	2016	1,179	2.259	3.044	0.785	***
Belarus	2006	893	3.629	3.762	0.133	*
Belarus	2010	805	3.343	3.511	0.167	*
Belarus	2016	1,367	2.858	3.157	0.299	***
Kosovo	2010	875	3.191	3.526	0.335	***
Kosovo	2016	709	2.746	3.204	0.459	***
Croatia	2006	924	2.673	3.505	0.832	***
Croatia	2010	907	2.766	3.305	0.539	***
Czech Republic	2006	947	3.105	3.603	0.498	***
Estonia	2010	939	3.000	3.348	0.348	***
Georgia	2016	1,122	2.580	2.954	0.374	***
Hungary	2006	968	2.378	2.781	0.403	***
Hungary	2010	1,028	2.231	2.601	0.370	***
Hungary	2016	1,249	2.602	2.970	0.367	***
Italy	2010	1,012	2.699	3.330	0.631	***
Kazakhstan	2006	951	3.373	3.510	0.136	
Kazakhstan	2010	892	3.202	3.469	0.266	**
Kazakhstan	2016	1,086	3.389	3.722	0.333	***
Kyrgyz Republic	2016	806	3.763	3.690	-0.073	
Latvia	2006	986	3.008	3.472	0.464	***
Latvia	2010	952	2.507	2.993	0.486	***
Lithuania	2006	994	2.914	3.496	0.582	***
Lithuania	2010	908	2.778	2.986	0.208	**
Mongolia	2006	871	3.019	3.417	0.398	***
Mongolia	2010	838	3.166	3.557	0.391	***
Moldova	2016	1,083	2.624	2.798	0.174	*
Montenegro	2006	855	2.625	2.965	0.340	***

Montenegro	2010	791	2.998	3.275	0.277	***
Montenegro	2016	955	2.878	3.325	0.446	***
Poland	2006	951	3.030	3.493	0.463	***
Poland	2010	1,489	3.096	3.597	0.501	***
Poland	2016	1,321	3.267	3.498	0.230	***
Romania	2006	941	2.709	3.353	0.644	***
Romania	2010	904	2.356	2.683	0.327	***
Romania	2016	1,195	2.907	3.375	0.468	***
Slovak Republic	2006	925	3.054	3.547	0.493	***
Slovak Republic	2016	1,280	2.921	3.341	0.420	***
Tajikistan	2016	805	3.969	3.928	-0.042	
Turkey	2006	969	3.009	3.355	0.346	***
Turkey	2010	955	3.126	3.471	0.344	***
Turkey	2016	780	3.000	3.173	0.173	*
Ukraine	2006	960	2.840	3.447	0.607	***
Ukraine	2016	1,304	2.645	2.769	0.124	*
North Macedonia	2006	877	2.543	3.022	0.479	***
North Macedonia	2010	1,020	2.722	2.917	0.195	***
Russia	2006	925	3.081	3.325	0.244	***
Russia	2010	1,355	3.070	3.394	0.324	***
Russia	2016	1,200	2.868	3.068	0.200	***
Uzbekistan	2016	992	4.190	4.291	0.101	**
Serbia	2006	934	2.433	2.690	0.257	***
Serbia	2010	1,395	2.581	2.877	0.295	***
Total		59,209	2.941	3.249	0.308	***

Table 3
Main estimations

This table presents the results of OLS regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.122**	0.120**	0.134***
	(0.050)	(0.050)	(0.014)
Female	0.046***	0.046***	0.023**
	(0.014)	(0.014)	(0.009)
Age / 10	-0.274***	-0.275***	-0.253***
	(0.038)	(0.036)	(0.026)
$Age^2 / 100$	0.028***	0.028***	0.026***
	(0.004)	(0.004)	(0.003)
Education	0.095***	0.096***	0.049***
	(0.022)	(0.021)	(0.009)
Income	0.198***	0.198***	0.212***
	(0.010)	(0.010)	(0.008)
Married	0.131***	0.131***	0.130***
	(0.016)	(0.016)	(0.011)
Urban	-0.052*	-0.052*	-0.125
	(0.026)	(0.026)	(0.136)
Health	0.114***	0.114***	0.111***
	(0.018)	(0.018)	(0.010)
Family size	0.029	0.030	-0.009*
	(0.019)	(0.019)	(0.004)
Job	0.073**	0.073**	0.054***
	(0.027)	(0.028)	(0.016)
Property owner	0.074***	0.075**	0.106***
	(0.023)	(0.028)	(0.014)
General trust	0.130***	0.130***	0.107***
	(0.011)	(0.010)	(0.005)
GDP per capita		0.007	
		(0.091)	
Year FE	Yes	Yes	No
PSU-year FE	No	No	Yes
Observations	59,209	59,209	59,209
Adjusted R-squared	0.184	0.184	0.361

Table 4
Mediation effects

This table presents the results from the path analysis depicted in Figure 1. Four mediating variables are tested: *Health*, *Education, Business* and *Loan*. Direct, mediated and total mediated paths are displayed. Sobel, Aroian and Goodman tests are used to assess the significance of the total mediated path. *Percentage* represents the proportion of the total effect of *Bank account* on *Life satisfaction* that is mediated by the variable studied. It is equal to the total mediated effect over the sum of the total mediated effect and the direct effect of *Bank account* on *Life satisfaction*, controlling for the mediator, in percentage. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Mediator	Health	Education	Business	Loan
Direct path				
p(Bank account, Life satisfaction)	0.134***	0.134***	0.126***	0.126***
	(0.014)	(0.014)	(0.015)	(0.017)
Mediated path for Mediator				
p(Bank account, Mediator)	0.048***	0.161***	0.019***	0.054***
	(0.015)	(0.012)	(0.006)	(0.009)
p(Mediator, Life satisfaction)	0.111***	0.049***	0.038*	-0.048
	(0.010)	(0.009)	(0.020)	(0.011)
Total mediated path				
p(Bank account, Mediator)*p(Mediator, Life satisfaction)	0.005	0.008	0.001	-0.003
Sobel statistic	2.991***	4.857***	1.652*	-1.214
	(0.002)	(0.002)	(4.368e-04)	(0.002)
Aroian statistic	2.980***	4.845***	1.596	-1.197
	(0.002)	(0.002)	(4.522e-04)	(0.002)
Goodman statistic	3.002***	4.869***	1.715*	-1.231
	(0.002)	(0.002)	(4.208e-04)	(0.001)
Percentage	3.82%	5.50%	0.57%	
Individual controls	Yes	Yes	Yes	Yes
Country control	No	No	No	No
Year FE	No	No	No	No
PSU-year FE	Yes	Yes	Yes	Yes
Observations	59,209	59,209	40,457	33,341

Table 5
Moderating effects

This table presents the results of OLS regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Female × Bank account	2.156e-04			
	(0.016)			
GDP per capita × Bank account		0.090**		
		(0.034)		
Bank concentration × Bank account			3.899e-04	
			(0.001)	
Financial crisis × Bank account				-0.063***
				(0.023)
Bank account	0.134***	-0.706**	0.109	0.149***
	(0.015)	(0.328)	(0.077)	(0.016)
Female	0.023*	0.038***	0.021**	0.023**
	(0.012)	(0.010)	(0.009)	(0.009)
GDP per capita		-0.003		
		(0.353)		
Bank concentration			-0.042***	
			(0.002)	
Financial crisis				0.432***
				(0.024)
Year FE	No	Yes	No	No
PSU-year FE	Yes	No	Yes	Yes
Country FE	No	Yes	No	No
Observations	59,209	59,209	57,625	59,209
Adjusted R-squared	0.361	0.240	0.359	0.361

Table 6
Instrumental variable estimates

This table presents the results of instrumental variable models. The upper part of the table displays the results of the second stage regression. *Bank account* is instrumented by *Mean PSU bank account*. The dependent variable is *Life satisfaction*. The lower part of the table shows the results of the first-stage regression with the dependent variable *Bank account*, as well as the instrument test, and the endogeneity test. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)
Bank account	0.211***	0.212***
	(0.059)	(0.060)
Individual controls	Yes	Yes
Country control	No	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Observations	59,195	59,195
Adjusted R-squared	0.239	0.239
First-stage		
Mean PSU bank account	0.791***	0.790***
	(0.016)	(0.016)
Instrument test		
Cragg-Donald Wald F-statistic	2,419.46***	2,496.96***
Endogeneity test		
Durbin-Wu-Hausman test statistic	1.179	1.151

Table 7
Ordered logit regressions

This table presents the results of ordered logit regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.212**	0.209**	0.270***
	(0.092)	(0.092)	(0.028)
Individual controls	Yes	Yes	Yes
Country control	No	Yes	No
Year FE	Yes	Yes	No
PSU-year FE	No	No	Yes
Observations	59,209	59,209	59,209
Pseudo R-squared	0.070	0.070	0.178

Table 8
Logit regressions

This table presents the results of logit regressions. The dependent variable is *Life satisfaction dummy*. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.231**	0.217***	0.313***
	(0.101)	(0.019)	(0.039)
Individual controls	Yes	Yes	Yes
Country control	No	Yes	No
Year FE	Yes	Yes	No
PSU-year FE	No	No	Yes
Observations	59,209	59,209	56,347
Pseudo R-squared	0.100	0.100	0.253

Table 9
Estimations by year

This table presents the results of OLS regressions. The dependent variable is *Life satisfaction*. Standard errors are reported in parentheses and clustered by country. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Bank account	0.145***	0.113***	0.134***
	(0.022)	(0.014)	(0.025)
Individual controls	Yes	Yes	Yes
Country control	No	No	No
Year FE	No	No	No
PSU-year FE	Yes	Yes	Yes
Observations	18,752	19,709	20,748
Adjusted R-squared	0.343	0.335	0.403

Figure 1

Paths between financial inclusion and life satisfaction

This figure illustrates both the direct and indirect paths through which financial inclusion (*Bank account*) potentially impacts life satisfaction. To examine these paths, a structural equation model (SEM) is employed to estimate the following system of equations below. The path coefficient β_1 between *Bank account* and *Life satisfaction* represents the direct effect of *Bank account* on *Life satisfaction*, while controlling for the mediator of interest. The path coefficients γ_1 and β_2 between *Bank account* and the mediator and between the mediator and *Life satisfaction* respectively, indicate the indirect mediating effect of the mediator on the relationship between *Bank account* and *Life satisfaction*. The composite coefficient $\gamma_1 \times \beta_2$ quantifies this indirect effect.

The path analysis is conducted using the following system of equations :

$$Life\ satisfaction\ =\ \beta_0\ +\beta_1\ Bank\ account + \beta_2\ Mediator +\ \beta_3\ Individual\ and\ country\ controls +\ \beta_4\ PSU - year +\ \varepsilon$$

$$Mediator\ = \gamma_0 + \gamma_1 Bank\ account +\ \gamma_2 Individual\ and\ country\ controls +\ \gamma_3\ PSU - year\ fixed\ effects\ +\ \varepsilon$$