



**International Journal of Happiness and Development**

ISSN online: 2049-2804 - ISSN print: 2049-2790

<https://www.inderscience.com/ijhd>

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Lucía Macchia, Anke C. Plagnol, Richard A. Easterlin

**DOI:** [10.1504/IJHD.2023.10061263](https://doi.org/10.1504/IJHD.2023.10061263)

**Article History:**

|                   |                   |
|-------------------|-------------------|
| Received:         | 16 April 2023     |
| Last revised:     | 01 September 2023 |
| Accepted:         | 18 September 2023 |
| Published online: | 15 April 2024     |

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## Trends and fluctuations in financial satisfaction and macroeconomic indicators in times of economic changes: the case of Latin America

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Lucía Macchia\* and Anke C. Plagnol

School of Health and Psychological Sciences,  
University of London,

Rhind Building, EC1V 0HB, London, UK

Email: lucia.macchia@city.ac.uk

Email: anke.plagnol.1@city.ac.uk

\*Corresponding author

Richard A. Easterlin

Department of Economics,  
University of Southern California,  
Los Angeles, CA 90007, USA  
Email: easterl@usc.edu

**Abstract:** The association between subjective well-being and macroeconomic conditions has been extensively studied across the social sciences, with most evidence stemming from US and Europe due to data constraints. Using time-series analysis, this paper explores trends (long-term tendencies) and fluctuations (short-term movements) of financial satisfaction and macroeconomic indicators in Latin America during a period of great economic changes. We show that between 1996 and 2015, the trend in financial satisfaction was significantly negatively associated with the trend in the unemployment rate but it was not associated with the trends in the log of gross domestic product per capita (GDP) or the inflation rate. In the short-term, financial satisfaction, the unemployment rate, the inflation rate, and the log of GDP per capita move together. This study demonstrates that unemployment is the key macroeconomic indicator to tackle long-term financial satisfaction and thus likely improve citizens' overall well-being.

**Keywords:** happiness; financial satisfaction; Easterlin paradox; Latin America; time-series analysis.

**Reference** to this paper should be made as follows: Macchia, L., Plagnol A.C. and Easterlin, R.A. (2024) 'Trends and fluctuations in financial satisfaction and macroeconomic indicators in times of economic changes: the case of Latin America', *Int. J. Happiness and Development*, Vol. 8, No. 3, pp.295–312.

**Biographical notes:** Lucía Macchia is a Lecturer in Psychology at City, University of London. Integrating methods from psychology and behavioural economics, she explores how socioeconomic factors shape mental well-being and physical pain.

Anke C. Plagnol is a Senior Lecturer in Behavioral Economics at City, University of London, UK. Her research focuses on the economic choices individuals make and how these affect their subjective well-being. She was previously a Postdoctoral Research Fellow at the University of Cambridge in the Department of Sociology. At Cambridge, she had an Early Career Fellowship from the Leverhulme Trust and the Isaac Newton Trust, Cambridge. She obtained her PhD in Economics from the University of Southern California.

Richard A. Easterlin is University Professor Emeritus, University of Southern California, a member of the National Academy of Sciences, and Distinguished Fellow of the American Economic Association. He has recently published an Economist's Lessons on Happiness: Farewell Dismal Science, New York, Springer 2021.

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## 1 Introduction

To what extent are changes in subjective well-being associated with changes in macroeconomic conditions? Are subjective well-being and macroeconomic indicators related in the long run? The relevance of these questions is clear: They provide insights for governments to improve citizens' well-being (see Hicks et al., 2013; Stiglitz et al., 2009). However, evidence from regions other than US and Europe rarely exists. Here, we explore the extent to which trends (long-term tendencies) and fluctuations (short-term movements) in subjective well-being are associated with trends and fluctuations in macroeconomic indicators in a region that has to date received little attention in the subjective well-being literature: Latin America. We hereby focus on a 20-year time period (1996–2015) in which economic conditions, such as unemployment, inflation, and GDP per capita, changed considerably in the countries included in the study. Understanding how subjective well-being is linked to macroeconomic indicators during times of profound economic changes is crucial to improving citizens' well-being.

### *1.1 Subjective well-being and macroeconomic conditions*

A growing literature across the social sciences investigates the association between subjective well-being and macroeconomic conditions (see Dolan et al., 2008 for a review). The seminal work that started the field documented the Happiness-Income paradox which states that at one point in time, GDP per capita is significantly positively associated with subjective well-being whereas over time, the association between economic growth and subjective well-being is nil (Easterlin, 1974). Considering the difference between short- and long-term relationships between subjective well-being and income is thus key to comprehending and asserting the existence of the Paradox. Previous research has challenged the validity of the Paradox by claiming a positive link between subjective well-being and GDP (Sacks et al., 2012; Stevenson and Wolfers, 2008). However, subsequent research showed that the time-series that were used to make these claims were too short as more than ten years of data are required to perform a sound test of the Paradox (e.g., Easterlin et al., 2010). The Happiness-Income paradox has been

shown in developed and developing regions (Easterlin, 1995, 2005, 2010; Easterlin et al., 2010), including Latin America (Easterlin et al., 2010). Our study extends the work presented in Easterlin et al. (2010) by exploring additional macroeconomic indicators in a 20-year period of profound economic changes.

Both the unemployment rate and the inflation rate have been found to be negatively associated with subjective well-being (Clark and Oswald, 1994; Di Tella et al., 2003). However, the unemployment rate is a stronger predictor of subjective well-being than the inflation rate (Di Tella et al., 2001). It is possible that the inflation rate is not very salient to people in regions where it tends to remain fairly stable – an aspect which our study addresses by focusing on a region which has seen considerable fluctuations in this indicator. While inflation affects people's purchasing power and thus their financial well-being, unemployment is associated with both pecuniary (i.e., loss of income) and non-pecuniary costs (Winkelmann and Winkelmann, 1998). People do not appear to fully adapt to being unemployed in terms of subjective well-being (Lucas et al., 2004), even displaying evidence of a scarring effect of unemployment: those who were unemployed in the past are, on average, less satisfied than those who have never been unemployed (Clark et al., 2001). In Latin America, unemployment has also been found to be negatively associated with individuals' subjective well-being (Graham and Pettinato, 2001).

### *1.2 Macroeconomic conditions in Latin America from 1996 to 2015*

Many of the Latin American countries in our study experienced periods of severe macroeconomic crises between 1996 and 2015. This 20-year time span reflected profound changes in economic growth and unemployment. For example, between 1998 and 2002, a decrease in the prices of agricultural commodities led to a recession in one of the region's main trade activities (Ocampo, 2017). The 1998 Russian financial crisis caused investors to abandon emerging markets resulting in reduced access to international credit and capital for Latin American countries (Talvi, 2015). By 2001, the abandonment of the fixed exchange rate in some of the largest economies of the region, Argentina and Brazil, brought economic imbalance and instability (Independent Evaluation Office, 2003). These internal and external shocks led to an increase in the unemployment rate and a decline in economic growth, with rates between 0% and 2% across the region. Around 2003, most Latin American countries implemented policies and aid packages to address the issues that the crisis had brought. One of the main measures involved stimulus payments to increase local production which resulted in greater employment and economic growth (Stiglitz, 2003).

However, the Great Recession of 2007–2009 brought additional economic issues. The region was affected not only by the worldwide economic slowdown but also by a decrease in food production that resulted from a decline in global demand, once again causing an increase in unemployment and reduction in economic growth (Economic Commission for Latin America and the Caribbean, 2008). Brazil, the largest economy of the region, experienced a drop in GDP of 13.6% in the first quarter of 2008 and a loss of 700,000 jobs at the start of 2009 (Regalado, 2009). One of the largest economies of the region, Argentina, similarly suffered from the global financial crisis by experiencing slow economic growth and higher rates of unemployment than in the preceding two decades (Reuters, 2011). From 2010 onwards, the region entered a recovery period with greater economic growth and lower unemployment. The economic conditions seen in Latin

America during this time period provide a unique scenario to explore whether trends and fluctuations in macroeconomic indicators are related to trends and fluctuations in subjective well-being in times of great economic changes.

The present study investigates whether trends and fluctuations in the unemployment rate, the inflation rate, and the log of GDP per capita are related to trends and fluctuations in financial satisfaction in Latin America. We focus on the 1996–2015 time period – two decades of profound economic changes that impacted the macroeconomic indicators studied here. Overall, subjective well-being and the log of GDP per capita trended upwards over the 1996–2015 time period whereas the unemployment and inflation rates trended downwards. The trend in the unemployment rate is significantly positively associated with the trend in financial satisfaction. However, the trend in the log of GDP per capita and the trend in the inflation rate are unrelated to the trend in financial satisfaction. The three macroeconomic indicators included in this study and financial satisfaction move synchronously in the short term.

## 2 Methods

### 2.1 Data

The subjective well-being measure used in this study is from the Latinobarómetro (LB, [www.latinobarometro.org](http://www.latinobarometro.org)), a repeated cross-sectional survey that is representative of the population in the majority of the 17 Latin American countries included in the study. The Latinobarómetro includes about 1000 respondents per country in each survey year, and we average their responses for each country and survey year to obtain country-level indicators of subjective well-being. Our dependent variable, financial satisfaction, was collected in 17 countries and in 16 years between 1996 and 2015; except for 1999, 2007, 2012, and 2014. Our final dataset is thus restricted to these 17 countries and 16 survey years as the financial satisfaction data is essential for the analysis.

To assess financial satisfaction respondents were asked to provide a subjective assessment of their economic situation: “In general, how would you describe your present economic situation and that of your family?” with answers ranging from very good (1), good (2), about average (3), bad (4) to very bad (5). The measure was reverse coded so that a higher value denotes a more positive evaluation of one’s economic situation. This measure was used in Easterlin et al. (2010).

The Latinobarómetro further includes a question on life satisfaction. However, after careful consideration, we deemed this measure to be unsuitable for time-series analysis because its response categories changed several times over the survey period. Moreover, the placement of the life satisfaction question in the survey changed over time, which is problematic as responses to subjective well-being questions can be influenced by preceding questions (Schuman and Presser, 1981). In contrast, the questions preceding the financial satisfaction measure remained the same during the survey period.

Our macroeconomic indicators were obtained from World Bank data (WB data, [www.data.worldbank.org](http://www.data.worldbank.org)) and the World Development Indicators (WDI Series, [www.data.worldbank.org/data-catalog/world-development-indicators](http://www.data.worldbank.org/data-catalog/world-development-indicators)), a specific World Bank publication of global development data. We include the following standard macroeconomic indicators: the unemployment rate computed as a percentage of the total labour force in each country (WB data); the log of GDP per capita (in constant 2010 US\$,

WDI Series); and the inflation rate measured by the consumer price index (CPI, WDI Series).

Across the survey period, unemployment rates ranged widely across countries and years, from a minimum of 1.3% in Guatemala in 2001 to a maximum of 18.3% in Argentina in 2001. Similarly, inflation rates differed dramatically between countries, ranging from a negative inflation rate of -1.07% in Argentina in 2000 to 99.88% in Venezuela in 1996 (Table 1). Table A1 in Appendix shows the mean of each indicator by survey year.

**Table 1** Descriptive statistics

| <i>Variable</i>        | <i>N</i> | <i>Mean</i> | <i>Std. deviation</i> | <i>Min</i> | <i>Max</i> |
|------------------------|----------|-------------|-----------------------|------------|------------|
| Financial satisfaction | 271      | 3.028       | 0.205                 | 2.51       | 3.5        |
| Unemployment rate (%)  | 271      | 7.212       | 3.391                 | 1.3        | 18.3       |
| Log GDP per capita     | 271      | 8.497       | 0.688                 | 7.07       | 9.59       |
| Inflation rate (CPI)   | 271      | 8.847       | 10.861                | -1.07      | 99.88      |

*N* = 271 represents 17 countries\*16 survey years except for Venezuela 2015 due to lack of data. Financial satisfaction presents the population mean.

## 2.2 Statistical analysis

We use time-series analysis, a methodology that has been widely used in prior research on the topic (e.g., Easterlin et al., 2010; Easterlin and O'Connor, 2022). Our study involves two types of time-series analysis to demonstrate the ways in which residents' financial well-being is associated with our three macroeconomic indicators over time:

- 1 *time trends* (long-term tendencies)
- 2 *fluctuations* (short-term movements).

Long-term time trends were obtained by fitting OLS trend lines for each country over the full 16-year time span for each variable. Specifically, we ran OLS regressions using the different indicators (i.e., financial satisfaction, the unemployment rate, the log of GDP per capita, and the inflation rate) as the dependent variable and the survey wave (1–16) as the independent variable. We then extracted the survey wave coefficient and created a dataset with one data point per country across the four dependent variables (*N* = 17). Short-term fluctuations were computed as the deviation of the actual value from the fitted trend value in each year. Thus, the fluctuations analysis yielded one data point per country and year (*N* = 271<sup>1</sup>).

To explore the extent to which trends in financial satisfaction were associated with trends in macroeconomic indicators, we first ran simple OLS regressions on trends in financial satisfaction with trends in only one of the macroeconomic indicators as a predictor, and then multiple regression analyses with different combinations of predictors. We repeated the same procedure using fluctuations in financial satisfaction and fluctuations in macroeconomic indicators (see equations (1) and (2)).

$$\text{TREND\_FS}_i = \alpha + \beta_1 \text{TREND\_MI}_i + \varepsilon_i \quad (1)$$

where  $TREND\_FS_i$  denotes the level of financial satisfaction in country  $i$ ,  $TREND\_MI_i$  is the trend of the relevant macroeconomic indicators in country  $i$ , and  $\varepsilon_i$  represents the usual error term.

$$FLUCTUATION\_FS_{it} = \alpha + \beta_1 FLUCTUATION\_MI_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

where  $FLUCTUATION\_FS_{it}$  denotes the deviation from the trend in financial satisfaction in country  $i$  in year  $t$ ,  $FLUCTUATION\_MI_{it}$  is the deviation from the trend in the relevant macroeconomic indicators in country  $i$ ,  $\eta_i$  represents country fixed effects and  $\varepsilon_{it}$  the usual error term.

We also conducted fixed effects analyses with micro-level data ( $N=297,020$ ) to explore whether this method yields similar results as what we find with the aggregated macro-level data.

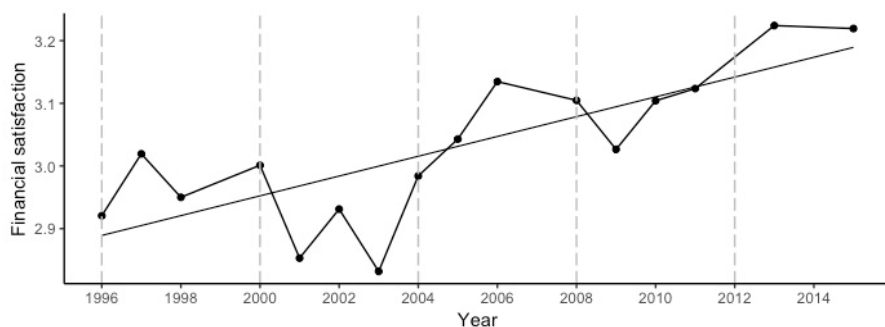
### 3 Findings

We first considered time trends in financial satisfaction and our three macroeconomic indicators between 1996 and 2015, before exploring short-term fluctuations in the same measures over the same time span.

#### 3.1 Trends

Financial satisfaction steadily increased across Latin America between 1996 and 2015 (Figure 1, straight line). This upward trend is significant in 12 of the 17 Latin American countries studied here (see Table A2 in Appendix for trends in each country). Despite this general upward trend, financial satisfaction temporarily declined in 2001, 2003, and 2009 (Figure 1, point-to-point graph).

**Figure 1** Annual mean unweighted financial satisfaction (point-to-point graph) and trend in financial satisfaction (straight line), 17 Latin American countries, 1996–2015



The fitted regression is  $y = 2.866 + 0.019x(\text{survey wave})$ .

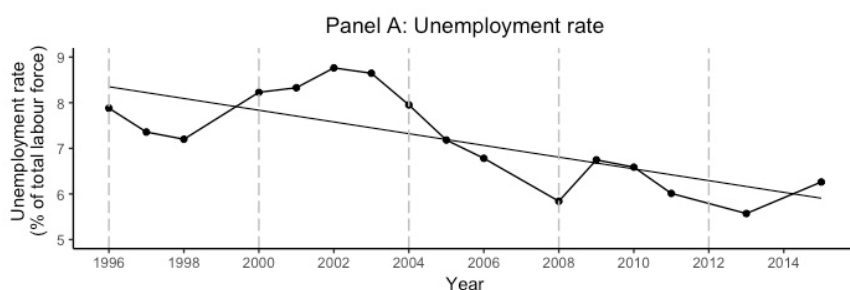
t-stats (71.63) (4.61).

Adj.  $R^2 = 0.57$ .

The macroeconomic indicators included in this study also show significant time trends. Overall, the unemployment rate (Figure 2, panel A) and inflation rate (Figure 2, panel C) decreased significantly between 1996 and 2015 in Latin America, while the log of GDP

per capita increased overall (Figure 2, panel B). These time trends were significant in each of the 17 Latin American countries included in the analysis for the log of GDP per capita and in ten of the 17 countries for the inflation rate (see Table A3 in Appendix for trends in each country). However, the unemployment rate shows considerable variation around the overall downward trend with a peak around 2002 and a temporary increase in 2009 which is also reflected in temporary declines in the log of GDP per capita around the same years. Correlation coefficients between the trend growth rate of the variables included in the analysis can be found in Table A4.

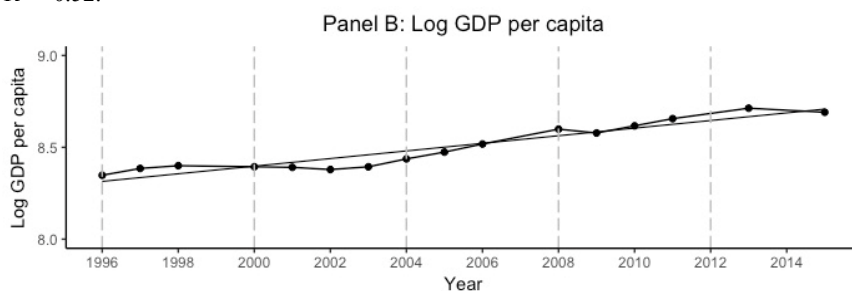
**Figure 2** Annual mean unweighted values (point-to-point graph) and trends (straight line) for three macroeconomic indicators, 17 Latin American countries, 1996–2015



The fitted regression is  $y = 8.552 - 0.158x(\text{survey wave})$ .

t-stats (23.08) (−4.12).

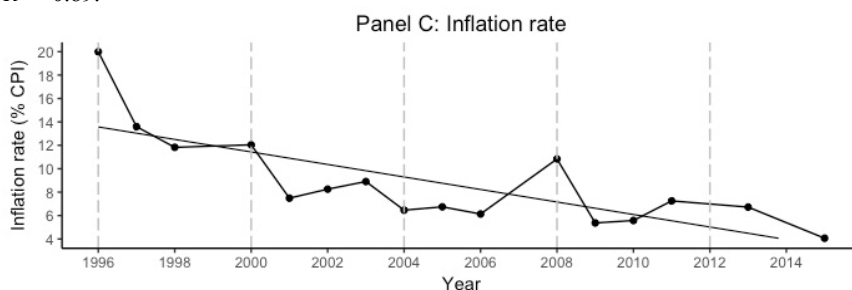
Adj.  $R^2 = 0.52$ .



The fitted regression is  $y = 8.285 + 0.025x(\text{survey wave})$

t-stats (396.2) (11.6)

Adj.  $R^2 = 0.89$ .



The fitted regression is  $y = 14.414 - 0.656x(\text{survey wave})$

t-stats (10.53) (−4.64)

Adj.  $R^2 = 0.58$ .

In the next step, we ran OLS regressions with the trend of one macroeconomic indicator entered as a predictor in each regression<sup>2</sup> (Table 2). The goal of this approach is to explore the association between each macroeconomic indicator and the time trend in financial satisfaction without the influence of other macroeconomic indicators. These models indicate that the trend in financial satisfaction was significantly negatively associated with the trend in the unemployment rate (Table 2, column 1) during the time period we studied. However, the associations between the trend in financial satisfaction and trends in the log of GDP per capita (Table 2, column 2) and the inflation rate (Table 2, column 3) were nil. Relatedly, the F-statistics of these models are not significant, suggesting that they do not provide a better fit to the data than models without any predictor variables.

**Table 2** OLS regressions of the trend in financial satisfaction on trends in macroeconomic indicators, 17 Latin American countries, 1996–2015. One macroeconomic indicator at a time

|                                      | <i>Dependent variable: Time trend in financial satisfaction</i> |                  |                     |
|--------------------------------------|-----------------------------------------------------------------|------------------|---------------------|
|                                      | (1)                                                             | (2)              | (3)                 |
| Time trend in the unemployment rate  | −0.027**<br>(0.010)                                             | –                | –                   |
| Time trend in the log GDP per capita | –                                                               | 0.560<br>(0.306) | –                   |
| Time trend in the inflation rate     | –                                                               | –                | 0.004<br>(0.004)    |
| Constant                             | 0.015***<br>(0.003)                                             | 0.004<br>(0.009) | 0.022***<br>(0.004) |
| Number of countries                  | 17                                                              | 17               | 17                  |
| $R^2$                                | 0.309                                                           | 0.182            | 0.064               |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . The regression table shows unstandardised regression coefficients with standard errors in parentheses.

We then extended the first models by adding different combinations of macroeconomic trend predictors (Table 3). The significant negative association between the trend in financial satisfaction and the trend in the unemployment rate that was observed in the models shown in Table 2 remained in the regression model that also controlled for the trend in the inflation rate (Table 3, column 2), but not when the time trend of the log of GDP per capita was accounted for (Table 3, columns 1 and 4). However, the F-statistic is not significant for Model 2 (Table 3), suggesting poor model fit. Consistent with the bivariate analyses (Table 2), the association between the trend in financial satisfaction and the trend in the log of GDP per capita was not significant in any of the regression models that included other macroeconomic indicators (Table 3, columns 1, 3 and 4).

### 3.2 *Fluctuations*

We saw in the previous section that the *long-term trend* in financial satisfaction appears to be related to the long-term trend in the unemployment rate, but not the other two macroeconomic indicators. In addition, in years in which the unemployment rate

fell below the trend, financial satisfaction tended to be above, and when the unemployment rate was above the trend, financial satisfaction was below. Similarly, when the log of GDP per capita was above (below) the trend, financial satisfaction tended to be above (below). However, the association between the trend in financial satisfaction and the trend in the log of GDP per capita was not significant in the regression analysis.

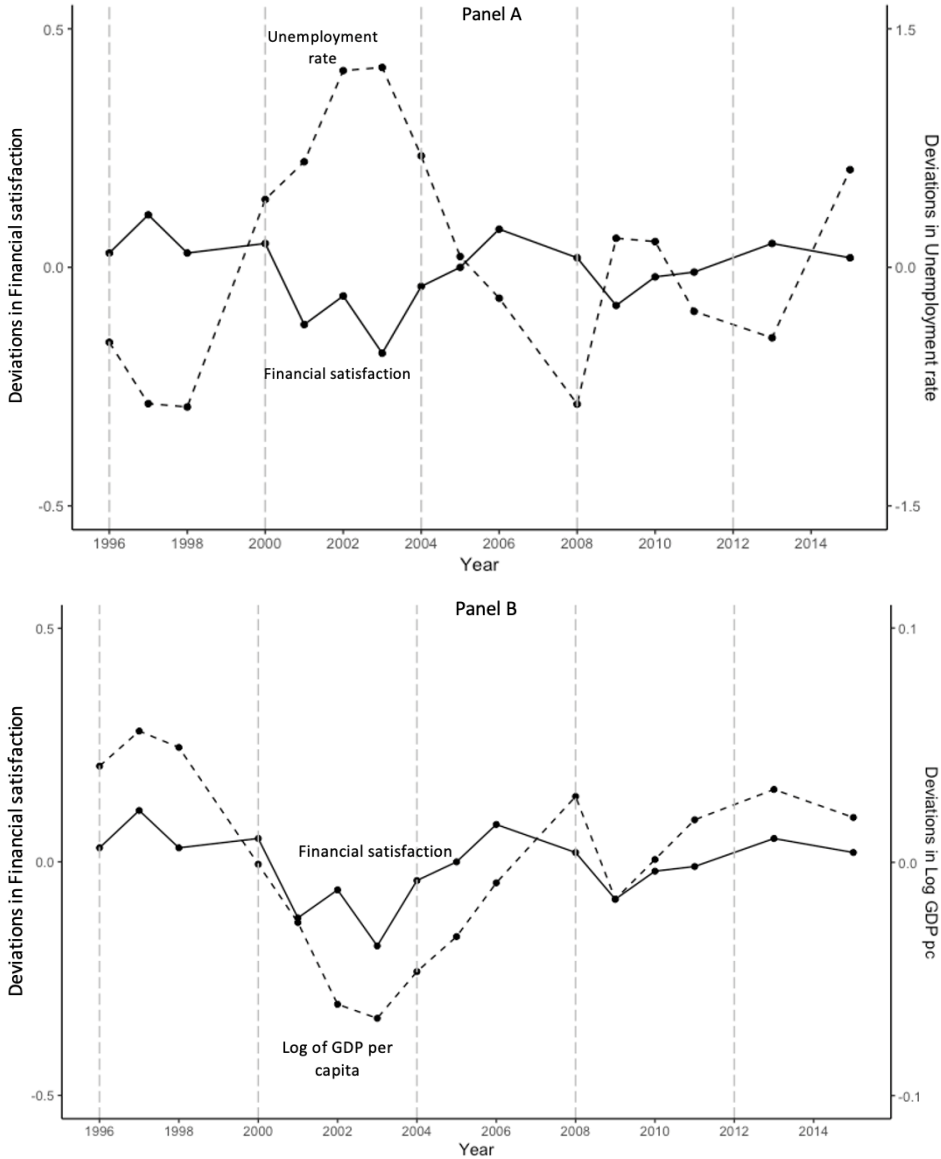
**Table 3** Multiple OLS regressions of the time trend in financial satisfaction on time trends in macroeconomic indicators, 17 Latin American countries, 1996–2015

|                                      | <i>Dependent variable: Time trend in financial satisfaction</i> |                     |                  |                    |
|--------------------------------------|-----------------------------------------------------------------|---------------------|------------------|--------------------|
|                                      | (1)                                                             | (2)                 | (3)              | (4)                |
| Time trend in the unemployment rate  | –0.022*<br>(0.011)                                              | –0.025**<br>(0.011) | –                | –0.022*<br>(0.011) |
| Time trend in the log GDP per capita | 0.337<br>(0.300)                                                | –                   | 0.505<br>(0.331) | 0.304<br>(0.300)   |
| Time trend in the inflation rate     | –                                                               | 0.002<br>(0.003)    | 0.002<br>(0.004) | 0.001<br>(0.004)   |
| Constant                             | 0.007<br>(0.869)                                                | 0.017***<br>(3.983) | 0.007<br>(0.010) | 0.009<br>(0.010)   |
| Number of countries                  | 17                                                              | 17                  | 17               | 17                 |
| $R^2$                                | 0.367                                                           | 0.330               | 0.198            | 0.374              |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . The regression table shows unstandardised regression coefficients with standard errors in parentheses.

We now turn our attention towards *short-term changes* in financial satisfaction and macroeconomic indicators to investigate whether these show synchronous movements despite their nil relationship – with the exception of the unemployment rate – over the long-term. For this analysis, we computed the mean deviation for all 17 countries of actual financial satisfaction, the unemployment rate, and the log of GDP per capita from their fitted trend value in each survey year. A value of 0 in Figure 3 suggests that the actual value lies on the trend curve, while a value greater (smaller) than 0 suggests a value above (below) the fitted trend lines which we saw in Figures 1 and 2. Across the 17 Latin American countries studied here, financial satisfaction showed synchronous fluctuations – as reflected in similar deviations from their long-term trend – with both the unemployment rate (Panel A, Figure 3) and the log of GDP per capita (Panel B, Figure 3). For example, the unemployment rate deviated substantially from its long-term trend around 2002–2003, the same years in which financial satisfaction was considerably lower than suggested by its long-term trend. The short-term deviations from the long-term trend in the log of GDP per capita resemble closely those in financial satisfaction, suggesting that these two measures are related in the short-run, contrary to their long-term trajectories. Correlation coefficients between the fluctuations in the variables included in the analysis can be found in Table A5.

**Figure 3** Unweighted mean deviations from the long-term trend for financial satisfaction (both panels, solid line), the unemployment rate (Panel A, broken line), and the log of GDP per capita (Panel B, broken line), 17 Latin American countries, annually 1996–2015



The unemployment rate was rescaled by a factor of 3, and the GDP multiplied by 3 based on the range of the financial satisfaction measure.

However, a visual inspection of short-term fluctuations as presented in Figure 3 does not confirm that these are indeed significantly related. To investigate this point further, we ran OLS analyses which showed that between 1996 and 2015 there was a significant negative association between fluctuations of financial satisfaction and fluctuations of the unemployment rate (Table 4, column 1), and fluctuations of the inflation rate (Table 4,

column 3). We further observed a significantly positive association between fluctuations of financial satisfaction and fluctuations of the log of GDP per capita (Table 4, column 2). Fluctuations in the log of GDP per capita explained more of the variance in fluctuations of financial satisfaction than fluctuations of the unemployment rate (Unemployment rate  $R^2 = 0.137$  vs. GDP per capita  $R^2 = 0.230$ ; Table 4).

**Table 4** OLS regressions of fluctuations in financial satisfaction on fluctuations in indicated variables, 17 Latin American countries, 1996–2015. One macroeconomic indicator at a time

|                                          | <i>Dependent variable: Fluctuations in financial satisfaction</i> |                     |                     |
|------------------------------------------|-------------------------------------------------------------------|---------------------|---------------------|
|                                          | (1)                                                               | (2)                 | (3)                 |
| Fluctuations in the unemployment rate    | −0.040***<br>(0.006)                                              | –                   | –                   |
| Fluctuations in the log GDP per capita   | –                                                                 | 1.169***<br>(0.135) | –                   |
| Fluctuations in the inflation rate (CPI) | –                                                                 | –                   | −0.003**<br>(0.001) |
| Country fixed effects                    | Yes                                                               | Yes                 | Yes                 |
| Constant                                 | −0.003<br>(0.033)                                                 | −0.003<br>(0.031)   | −0.002<br>(0.035)   |
| Number of country-year                   | 271                                                               | 271                 | 271                 |
| $R^2$                                    | 0.137                                                             | 0.230               | 0.024               |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . The regression table shows unstandardised regression coefficients with standard errors in parentheses.

These patterns were supported by OLS regression analyses even when all the macroeconomic measures were included in a single regression model (Table 5, column 4). It is worth noting that the regressions displayed a significant negative association between financial satisfaction and the inflation rate in the short-term but as seen in the previous section, not in the long-term.

**Table 5** OLS regressions of fluctuations in financial satisfaction on fluctuations in indicated variables, 17 Latin American countries, 1996–2015. Multiple macroeconomic indicators combined

|                                        | <i>Dependent variable: Fluctuations in financial satisfaction</i> |                      |                      |                      |
|----------------------------------------|-------------------------------------------------------------------|----------------------|----------------------|----------------------|
|                                        | (1)                                                               | (2)                  | (3)                  | (4)                  |
| Fluctuations in the unemployment rate  | −0.013*<br>(0.008)                                                | −0.043***<br>(0.006) | –                    | −0.016**<br>(0.007)  |
| Fluctuations in the log GDP per capita | 0.990***<br>(0.171)                                               | –                    | 1.207***<br>(0.132)  | 0.990***<br>(0.166)  |
| Fluctuations in the inflation rate     | –                                                                 | −0.004***<br>(0.001) | −0.004***<br>(0.001) | −0.004***<br>(0.001) |
| Country fixed effects                  | Yes                                                               | Yes                  | Yes                  | Yes                  |

**Table 5** OLS regressions of fluctuations in financial satisfaction on fluctuations in indicated variables, 17 Latin American countries, 1996–2015. Multiple macroeconomic indicators combined (continued)

|                        | <i>Dependent variable: Fluctuations in financial satisfaction</i> |                   |                   |                   |
|------------------------|-------------------------------------------------------------------|-------------------|-------------------|-------------------|
|                        | (1)                                                               | (2)               | (3)               | (4)               |
| Constant               | –0.003<br>(0.031)                                                 | –0.003<br>(0.032) | –0.003<br>(0.030) | –0.003<br>(0.029) |
| Number of country-year | 271                                                               | 271               | 271               | 271               |
| $R^2$                  | 0.238                                                             | 0.178             | 0.267             | 0.280             |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . The regression table shows unstandardised regression coefficients with standard errors in parentheses. Standardised coefficients from model 4: Fluctuations in the unemployment rate = –0.145, Fluctuations in the log GDP per capita = 0.406, Fluctuations in the inflation rate = –0.205.

These analyses suggest that in the short-term financial well-being varies in lockstep with macroeconomic conditions: between 1996 and 2015, fluctuations of financial satisfaction were significantly negatively associated with fluctuations of the unemployment and the inflation rate and significantly positively associated with fluctuations of the log of GDP per capita. Fixed effects analyses with country clustering using individual-level data confirm these results and can be found in Table A6.

#### 4 Discussion and conclusions

This paper contributes to the study of macroeconomic conditions and subjective well-being by focusing on Latin America – a region that has received less attention in the subjective well-being literature than regions with more stable economic conditions. We use a cross-national dataset that consists of 17 Latin American countries covering a 20-year time span that was marked by profound economic changes. We explore whether trends and fluctuations in macroeconomic indicators are linked to trends and fluctuations in financial well-being in Latin America between 1996 and 2015.

Over this time period, financial satisfaction trended upward with clear peaks and troughs. Troughs in financial well-being in 2001, 2003, and 2009 may reflect the consequences of the economic crises that the region experienced. The recovery of financial satisfaction starting in 2003 may be related to the policies that governments implemented to attenuate the negative impact of the 1998–2002 economic crisis (see also Graham and Sukhtankar, 2004).

Macroeconomic indicators also show clear patterns. The unemployment rate and the inflation rate trended downwards whereas the log of GDP per capita trended upwards. Around 2002, during the first economic crisis covered in the period of analysis, the unemployment rate showed a peak whereas the log of GDP per capita exhibited a trough. The same movements can be observed around 2009, possibly reflecting the consequences of the 2007–2009 global financial crisis.

Our study shows that changes in financial satisfaction were related to changes in macroeconomic conditions affected by the crises that Latin America experienced in the 1996–2015 time period. Regression analyses show that the long-term tendency in the unemployment rate was significantly negatively related to the long-term tendency in

financial satisfaction. In the short-term, the unemployment rate, the inflation rate, and the log of GDP per capita show synchronous movements with subjective well-being. Overall, during economic crises that led to a decline in employment and economic growth, people reported lower financial satisfaction. In years of greater employment and economic growth people reported greater financial well-being.

It is worth noting that fluctuations of the log of GDP per capita are related to fluctuations of financial satisfaction whereas trends in the log of GDP per capita are not related to trends in financial satisfaction. This finding supports the Happiness-Income Paradox that suggests that economic growth and subjective well-being are related in the short but not in the long run (Easterlin, 1974, 2021; Easterlin et al., 2010). As in previous research that explores the Paradox, the short-term relationship between economic growth and financial satisfaction is statistically significant whereas the long-term relationship is nil.

One limitation of this study concerns the cross-sectional nature of the data, which does not allow us to establish causality. The relationships shown in this study do not prove that a change in macroeconomic indicators necessarily causes a change in subjective well-being. However, the long time span used in this study provides a unique opportunity to examine how economic conditions and subjective well-being are related. Furthermore, it could be argued that aggregating micro-level data on financial satisfaction leads to some loss of information on the variability in financial satisfaction within countries. We contend that this approach is appropriate for the purpose of this analysis as we are interested in the trends and fluctuations of macroeconomic indicators over time. In addition, our fixed effects analysis of individual-level data confirms that this statistical approach yields the same substantive results as the macro-level analysis.

Despite these limitations, the current study provides additional evidence for the Easterlin Paradox. It further provides valuable information for policymakers and other researchers who are interested in promoting citizens' quality of life by highlighting the role of employment in increasing long-term wellbeing. Prior work has shown that welfare state policies tend to increase the happiness of nations (Easterlin and O'Connor, 2022). Our study complements this work by documenting that in Latin America, citizens' financial satisfaction is associated with the unemployment rate, the inflation rate, and GDP per capita in the short term. However, only the unemployment rate is associated with financial satisfaction in the long term, suggesting that policy efforts could be focused on lowering unemployment rates and lessening the negative consequences of unemployment. For instance, local governments could support those who are looking for employment by establishing or expanding job centres which provide job training, interview practice, and support with job applications. Overall, policies that create opportunities for and keep people in employment should be carefully considered by governments.

## **Conflict of interests**

The authors declare no conflict of interests.

## Data availability

Scripts for analysis can be found in [https://osf.io/pwvn4/?view\\_only=dac512fb88b94b46af8399d3250bd651](https://osf.io/pwvn4/?view_only=dac512fb88b94b46af8399d3250bd651). The Latinobarómetro data can be accessed for free at <https://www.latinobarometro.org/lat.jsp>

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## Notes

<sup>1</sup>Venezuela 2015 is missing due to missing values in the Latinobarómetro and macroeconomic data.

<sup>2</sup>OLS regressions with only one predictor are statistically equivalent to bivariate correlations. However, we chose OLS regressions for this part of the analysis because we add more predictors to the models in the next set of regressions in Table 3.

## Appendix

**Table A1** Mean of each variable by survey year across 17 Latin American countries

| <i>Year</i> | <i>Financial satisfaction</i> | <i>Unemployment rate</i> | <i>Log GDP per capita</i> | <i>Inflation rate (CPI)</i> |
|-------------|-------------------------------|--------------------------|---------------------------|-----------------------------|
| 1996        | 2.921                         | 7.882                    | 8.348                     | 19.995                      |
| 1997        | 3.019                         | 7.359                    | 8.385                     | 13.594                      |
| 1998        | 2.950                         | 7.200                    | 8.400                     | 11.829                      |
| 2000        | 3.001                         | 8.229                    | 8.394                     | 12.042                      |
| 2001        | 2.853                         | 8.329                    | 8.391                     | 7.489                       |
| 2002        | 2.931                         | 8.765                    | 8.379                     | 8.254                       |
| 2003        | 2.832                         | 8.647                    | 8.394                     | 8.907                       |
| 2004        | 2.984                         | 7.953                    | 8.437                     | 6.461                       |
| 2005        | 3.043                         | 7.182                    | 8.474                     | 6.745                       |
| 2006        | 3.135                         | 6.782                    | 8.518                     | 6.133                       |
| 2008        | 3.105                         | 5.841                    | 8.599                     | 10.836                      |
| 2009        | 3.026                         | 6.747                    | 8.578                     | 5.371                       |
| 2010        | 3.104                         | 6.588                    | 8.617                     | 5.579                       |
| 2011        | 3.124                         | 6.012                    | 8.656                     | 7.253                       |
| 2013        | 3.224                         | 5.571                    | 8.713                     | 6.724                       |
| 2015        | 3.219                         | 6.263                    | 8.691                     | 4.066                       |

**Table A2** Trend coefficients for financial satisfaction, 17 Latin American countries in rank order, 1996–2015

| <i>Country</i> | <i>Financial satisfaction</i> |
|----------------|-------------------------------|
| <b>Mean</b>    | <b>0.019***</b>               |
| Argentina      | 0.047***                      |
| Uruguay        | 0.036***                      |
| Brazil         | 0.034***                      |
| Panama         | 0.030***                      |
| Peru           | 0.028***                      |
| Nicaragua      | 0.025***                      |
| Colombia       | 0.022***                      |
| Ecuador        | 0.020***                      |
| Paraguay       | 0.019***                      |
| Venezuela      | 0.015***                      |
| Bolivia        | 0.014***                      |
| Costa Rica     | 0.014***                      |
| Chile          | 0.012***                      |
| Mexico         | 0.008***                      |

**Table A2** Trend coefficients for financial satisfaction, 17 Latin American countries in rank order, 1996–2015 (continued)

| <i>Country</i> | <i>Financial satisfaction</i> |
|----------------|-------------------------------|
| Honduras       | 0.007***                      |
| Guatemala      | −0.001***                     |
| El Salvador    | −0.005***                     |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**Table A3** Trend coefficients for the unemployment rate, log of GDP per capita and the inflation rate, 17 Latin American countries in rank order, 1996–2015

| <i>A</i>       |                          | <i>B</i>       |                           | <i>C</i>       |                             |
|----------------|--------------------------|----------------|---------------------------|----------------|-----------------------------|
| <i>Country</i> | <i>Unemployment rate</i> | <i>Country</i> | <i>Log GDP per capita</i> | <i>Country</i> | <i>Inflation rate (CPI)</i> |
| <b>Mean</b>    | <b>−0.158***</b>         | <b>Mean</b>    | <b>0.025***</b>           | <b>Mean</b>    | <b>−0.656***</b>            |
| Panama         | −0.801***                | Panama         | 0.051***                  | Ecuador        | −3.107***                   |
| Argentina      | −0.714***                | Peru           | 0.044***                  | Venezuela      | −1.888***                   |
| Venezuela      | −0.423***                | Uruguay        | 0.033***                  | Mexico         | −1.309***                   |
| Colombia       | −0.329***                | Costa Rica     | 0.032***                  | Colombia       | −1.049***                   |
| Uruguay        | −0.228***                | Chile          | 0.031***                  | Honduras       | −0.964***                   |
| Ecuador        | −0.162**                 | Colombia       | 0.029***                  | Uruguay        | −0.748***                   |
| Peru           | −0.162***                | Bolivia        | 0.026***                  | Costa Rica     | −0.695***                   |
| Bolivia        | −0.121***                | Nicaragua      | 0.026***                  | Paraguay       | −0.407***                   |
| El Salvador    | −0.102***                | Ecuador        | 0.024***                  | Guatemala      | −0.345***                   |
| Paraguay       | −0.079***                | Honduras       | 0.024***                  | Peru           | −0.331***                   |
| Brazil         | −0.061***                | Argentina      | 0.023***                  | El Salvador    | −0.262**                    |
| Chile          | −0.014***                | Brazil         | 0.023***                  | Nicaragua      | −0.233***                   |
| Guatemala      | 0.018***                 | El Salvador    | 0.021***                  | Brazil         | −0.219***                   |
| Honduras       | 0.077***                 | Paraguay       | 0.017***                  | Chile          | −0.195***                   |
| Mexico         | 0.095**                  | Guatemala      | 0.015***                  | Bolivia        | −0.039***                   |
| Nicaragua      | 0.156***                 | Venezuela      | 0.014***                  | Panama         | 0.229**                     |
| Costa Rica     | 0.201***                 | Mexico         | 0.011***                  | Argentina      | 0.666**                     |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table A4** Correlation coefficients between the trend growth rate of indicated variables, 17 Latin American countries, 1996–2015

|                      | <i>Financial satisfaction</i> | <i>Unemployment rate</i> | <i>Log GDP per capita</i> |
|----------------------|-------------------------------|--------------------------|---------------------------|
| Unemployment rate    | −0.556<br>( $p = 0.02$ )      | —                        | —                         |
| Log GDP per capita   | 0.427<br>( $p = 0.09$ )       | −0.368<br>( $p = 0.14$ ) | —                         |
| Inflation rate (CPI) | 0.253<br>( $p = 0.33$ )       | −0.202<br>( $p = 0.44$ ) | 0.317<br>( $p = 0.21$ )   |

**Table A5** Correlation coefficients between deviations from the trend of indicated variables, 17 Latin American countries, 1996–2015

|                      | <i>Financial satisfaction</i> | <i>Unemployment rate</i>  | <i>Log GDP per capita</i> |
|----------------------|-------------------------------|---------------------------|---------------------------|
| Unemployment rate    | –0.369<br>( $p < 0.001$ )     | –                         | –                         |
| Log GDP per capita   | 0.478<br>( $p < 0.001$ )      | –0.618<br>( $p < 0.001$ ) | –                         |
| Inflation rate (CPI) | –0.152<br>( $p = 0.012$ )     | –0.131<br>( $p = 0.031$ ) | 0.082<br>( $p = 0.179$ )  |

**Table A6** Fixed effects analyses, 17 Latin American countries, 1996–2015

|                         | <i>Dependent variable: Financial satisfaction</i> |                     |                     |                     |
|-------------------------|---------------------------------------------------|---------------------|---------------------|---------------------|
|                         | (1)                                               | (2)                 | (3)                 | (4)                 |
| Unemployment rate       | –0.028***<br>(0.008)                              | –                   | –                   | –0.021*<br>(0.010)  |
| Log of GDP per capita   | –                                                 | 0.767***<br>(0.163) | –                   | 0.549*<br>(0.226)   |
| Inflation rate          | –                                                 | –                   | –0.003**<br>(0.001) | –0.004**<br>(0.001) |
| Constant                | 3.286***<br>(0.110)                               | –3.923**<br>(1.464) | 2.991***<br>(0.044) | –1.638<br>(2.098)   |
| Country fixed effects   | Yes                                               | Yes                 | Yes                 | Yes                 |
| Year fixed effects      | Yes                                               | Yes                 | Yes                 | Yes                 |
| Individual observations | 297,020                                           | 297,020             | 297,020             | 297,020             |
| $R^2$                   | 0.044                                             | 0.044               | 0.041               | 0.046               |

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . The regression table shows unstandardised regression coefficients with standard errors clustered by country in parentheses.