Unemployment and Its Impact on Individual Well-being: A Study in Germany

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Abstract

This study investigates the relationship between employment status and happiness, focusing on the context of Germany. By employing comparative techniques and using reported life satisfaction as a proxy for well-being, we analyze how unemployment impacts self-reported happiness and explore potential contextual effects of unemployment on life satisfaction. Our findings reveal a positive association between employment and happiness, indicating that being employed contributes positively to individual well-being. This research underscores the importance of employment not only for economic stability but also for subjective well-being.

1 Introduction

Unemployment occurs when an individual actively seeks work but cannot secure employment. It serves as a key indicator for assessing a region's economic health. The unemployment rate, calculated by dividing the number of unemployed individuals by the total workforce, is the most commonly used measure of this condition. Additionally, many governments provide unemployment insurance to eligible jobless persons. Understanding that the unemployment rate is a key indicator of employment opportunities and economic growth, policymakers pay close attention to this metric. An increase in unemployment typically signifies a substantial reduction in the total Gross Domestic Product (GDP). Unemployment measures the segment of the population that is jobless and actively seeking work, but it does not account for those who have left the labor market, such as retirees, students, and those receiving disability support. Individuals who are unemployed often maintain a minimum level of consumption to meet basic survival needs, even during periods of joblessness. Consequently, while a high-unemployment economy may experience reduced economic output, the decline in fundamental consumption is not as pronounced.

On the other hand, high and persistent unemployment rates indicate significant economic turmoil in a nation, potentially leading to social and political instability. Conversely, low unemployment suggests that the economy is likely operating near its full capacity, which maximizes output, increases wages, and gradually improves living standards. However, extremely low levels of unemployment may also point to an overheated economy, characterized by inflationary pressures and tight labor market conditions that challenge businesses seeking to hire additional workers. The concept of unemployment is well-defined, yet economists distinguish between various types. The two broadest classifications are voluntary and involuntary unemployment. Voluntary unemployment occurs when individuals leave their jobs willingly to seek other employment, whereas involuntary unemployment happens when individuals are terminated or laid off and must look for new jobs. In the USA, the government began measuring unemployment in the 1940s. However, the highest unemployment rate was recorded during the Great Depression, reaching 24.9% in 1933. Throughout the decade from 1931 to 1940, the unemployment rate exceeded 14%, only to drop below 10% later. This rate remained below 10% until 1982, when it again surpassed that threshold. During the Great Recession in 2009, the unemployment rate rose again to ten percent. Then, in April 2020, during the peak of the COVID-19 pandemic, unemployment reached its highest point since then at 14.8%. As of February 2024, the unemployment rate stood at 3.9%.

Numerous factors contribute to unemployment, including economic downturns such as recessions, technological advancements that result in machines replacing human labor, and job outsourcing where multinational companies seek cheaper labor abroad. Other factors include individuals voluntarily quitting

their jobs in search of other opportunities in different organizations. According to the U.S. Bureau of Labor Statistics, the official definition of unemployment is: individuals are classified as unemployed if they do not have a job, have actively looked for work in the past four weeks, and are currently available for work. The level of unemployment serves as an indicator of an economy's health. Generally, fewer people unemployed signifies a healthier economy, whereas a high unemployment rate indicates economic distress.

In recent years, economists have increasingly focused on the statistical analysis of subjective well-being measures. Over the last decade, the range of topics addressed in this research has expanded significantly. However, particular emphasis has been placed on exploring the associations between well-being and income, as well as between well-being and labor market status, especially unemployment. This area has become a prominent focus in economic literature.

The study of happiness has consistently shown that unemployment leads to a decline in subjective well-being (Clark, 2006). Recent economic research has utilized large datasets to explore this issue further. For example, in single-country studies, Clark and Oswald (1994) analyzed data from the British Household Panel Survey (BHPS), while Winkelmann and Winkelmann (1998) used the German Socio-Economic Panel (GSOEP). Additionally, Woittiez and Theeuwes (1998), Korpi (1997), and Frey and Stutzer have employed Dutch, Swedish, and Swiss data, respectively. For cross-country analysis, Di Tella et al. examined data from 11 European countries, Blanchflower (1996) reviewed 23 different countries, and Blanchflower (2001) studied 23 transition economies in Eastern and Central Europe. Nevertheless, we must consider that the question of whether unemployment disproportionately affects certain groups has attracted limited interest. It is straightforward to identify numerous demographic groups (based on age, gender, educational level, etc.) that could be examined. Currently, two specific research questions are gaining attention in a growing body of literature.

First, researchers are investigating whether the distress from joblessness lessens when higher unemployment rates are prevalent within an individual's reference group. Additionally, they are examining how people adapt to unemployment over time, and whether the effects of long-term unemployment on well-being are less severe compared to short-term unemployment. Recent studies, including those by Clark (2003), suggest that the negative impact of unemployment is generally less pronounced in areas with higher unemployment rates. It is well understood that the length of unemployment significantly influences its perception; prolonged unemployment is often viewed as more harmful than brief periods. This understanding shapes government policies. Furthermore, individuals develop coping mechanisms over time that may lead to improved well-being. These include better budget management, forming new friendships with those in similar circumstances, and refining job search strategies. Adaptation or habituation also plays a role, as people's evaluations of their situations

are shaped by previous experiences. Winkelmann and Winkelmann (1998) along with Clark (2003) find no clear link between the duration of unemployment and life satisfaction. They note, however, that those unemployed for longer periods tend to be less psychologically affected by their current status.

The aim of this study is to assess the impact of unemployment on self-reported happiness in Germany through regression analysis. We use comparative techniques, employing reported life satisfaction as a proxy for well-being. Besides, we explore how contextual factors related to unemployment influence the relationship between unemployment and life satisfaction, examining potential negative spill overs as well as positive social norm spill overs, or both, across different contexts. To achieve these objectives, we apply a double robust method, specifically inverse-probability weighted regression adjustment (IPWRA). This paper contributes to empirical research by systematically examining these relationships within Germany.

This paper is organized into the following sections: Section two provides a literature review. Section three offers a brief explanation of the data and presents descriptive statistics of the estimation sample. Section four discusses the pooled regression results as well as panel results. Finally, section five concludes the paper.

2 Literature Review

Maslow's hierarchy of needs is structured as a pyramid, with the most basic physiological needs—such as food and sleep—at the foundation. Above this base, employment is positioned in the second tier, reflecting its role in fulfilling the need for safety and security. Employment is more than a societal expectation; it is a fundamental component of personal well-being, providing financial security and a sense of purpose. Therefore, unemployment represents a critical issue, threatening to undermine an individual's stability and overall well-being by depriving them of these essential needs.

However, the experience of unemployment is not uniform across all individuals. Some, during periods of unemployment, may find ways to adjust and adapt, partly due to government assistance. Consequently, the impact of unemployment on well-being can vary significantly. For some, well-being may improve due to government-provided income, a better work-life balance, or relief from workplace stress. For others, it may lead to decreased well-being, especially if unemployment impedes meeting basic needs as outlined in Maslow's hierarchy.

Building on this, research demonstrates a clear connection between unemployment and reduced mental and emotional well-being, as highlighted by Lucas and colleagues in 2004. Furthermore, work is pursued not just for financial gain. Diener and Biswas-Diener in 2008, as well as Salanova and her team in 2006, have shown that employment carries significance in many ways beyond just income. It has been emphasized that the act of working yields multiple positive outcomes, not only financial, thus reinforcing the notion that the value of employment extends across various dimensions of human experience. Employment also fosters personal growth, social recognition, and a structured lifestyle, all of which contribute significantly to one's self-esteem and social identity. This multifaceted value of work underscores its profound impact on psychological health and social well-being.

In a research paper conducted by Jan Eichhorn titled "The Effect of Unemployment on Life Satisfaction Between EU Countries," multilevel modeling techniques are employed on data from European Union countries, utilizing harmonized macro-economic indicators. Despite the inherent limitations of such metrics, the approach aims to provide a nuanced understanding of how extensive unemployment welfare benefits may alleviate the adverse effects of joblessness on life satisfaction. The study also accounts for other significant national-level variables to ensure the robustness of the findings and to confirm that the observed effects are not misattributed. The analysis focuses on how these national factors interact with unemployment issues. While the cross-sectional, multi-level framework used does not allow for causal inferences, the approach is justified. Previous panel studies referenced by researchers such as Winkelmann, Clark et al., Green, and Kassenböhmer Haisken-DeNew have consistently shown that un-

employment impacts life satisfaction. Despite the inability to establish causality, this limitation does not hinder the objectives of the current investigation. The study confirmed a negative impact of personal unemployment on life satisfaction and highlighted the importance of cross-country differences in this regard. Interestingly, the research found that life satisfaction is influenced by various factors beyond welfare provisions. Contrary to expectations, higher unemployment benefits did not necessarily correlate with greater life satisfaction among the unemployed, once other factors were considered. Additionally, cultural factors, especially the perceived sense of autonomy within a society, significantly influence variations in life satisfaction. The age-dependency ratio has emerged as a crucial factor, with higher ratios indicating a more pronounced negative impact of unemployment on life satisfaction. This suggests that societies with a larger proportion of older dependents face greater challenges. Inflation rates also play a role; higher inflation appears to exacerbate the adverse effects of unemployment on life satisfaction.

Interestingly, neither the direct nor the moderating effects of unemployment rates were substantial. Therefore, higher levels of unemployment benefits or overall unemployment rates did not necessarily alleviate the impact of unemployment on life satisfaction within a country. Furthermore, a study by Andrew Clark analyzes proxy utility data to examine how social norms and comparisons, based on employment status, affect well-being. It defines reference groups at the regional, couple, and household levels to assess conformity to the employment norm. The findings reveal a distinct divide in how the unemployment of others influences individual well-being. For those employed, another person's joblessness often correlates negatively with their well-being, while for the unemployed, there appears to be a positive correlation with their own well-being, suggesting that a shared experience mitigates the personal impact of joblessness. This pattern is more pronounced in men than in women.

The study's findings remain consistent even after accounting for individual characteristics that do not change over time. The heuristic takeaway is that while unemployment invariably has adverse effects, its sting is somewhat lessened in communities with higher unemployment rates. Studies show that the protective effects of unemployment benefits on well-being are not universal, highlighting the influence of cultural and demographic factors. For example, age-dependency ratios and inflation rates tend to intensify the negative impact of unemployment on life satisfaction. The social context, such as the unemployment levels within one's community, shapes the individual experience of joblessness. In areas where unemployment is more common, its psychological impact may be less severe, illustrating the significance of social norms and collective experiences on personal well-being. Future research should leverage robust datasets to further explore these phenomena and validate these insights across various contexts. By doing so, we can deepen our understanding of how employment, or the lack thereof, is intricately linked to the fabric of well-being.

3 Sample and Summary Statistics

To construct our sample, we gathered yearly information on 59,187 individuals from a database from the German Institute for Economic Research (DIW Berlin), spanning the years 1984 to 2016. These individuals are residents from Germany.

We utilize 18 distinct variables as follows:

1. Sex: Dummy variable that represents the gender of the individual, coded as 0 for female and 1 for male.

2. Age: Indicates the age of the individual.

3. HH Post-Government Income: Refers to the household's income after receiving government assistance.

4. Overall life satisfaction: A subjective measure of how satisfied the individual is with their life, rated on a scale from 0 to 10.

5. Frequency of being angry in the last 4 weeks: Measures how often the individual felt angry over the past four weeks rated on a scale from 1 to 5.

6. Frequency of being worried in the last 4 weeks: Measures how often the individual felt worried over the past four weeks rated on a scale from 1 to 5.

7. Frequency of being happy in the last 4 weeks: Measures how often the individual felt happy over the past four weeks rated on a scale from 1 to 5.

8. Frequency of being sad in the last 4 weeks: Measures how often the individual felt sad over the past four weeks rated on a scale from 1 to 5.

9. Post-secondary education (postsec): Indicates whether the individual has completed post-secondary education, coded as 1 for completed and 0 for not completed.

10. Employed: Indicates whether the individual is currently employed, coded as 1 for employed and 0 for unemployed.

11. Unemployed: Indicates whether the individual is currently unemployed and seeking employment, coded as 1 for unemployed and 0 for employed.

12. Retired: Indicates whether the individual is retired from work, coded as 1 for retired and 0 for not retired.

13. Other: Represents other employment statuses or categories not covered by the previous variables.

14. HH Pre-Government Income: Refers to the household's income before receiving government assistance.

15. Lonely: This variable indicates the degree of loneliness experienced by the individual, with the following scale:

16. Syear: Represents the year of data collection.

17. Region: Indicates the geographical region where the individual resides.

18. Recession: Binary variable indicating whether the country is in a recession or not, with 1 representing a recession and 0 representing no recession.

We have restricted all regressions and analyses to include only individuals who are actively seeking employment, excluding those who are retired or under other conditions preventing them from working.

Table 1 presents descriptive statistics for all the interest variables, providing insights into the characteristics of the sample units. In line with the explanation of each variable meaning previously mentioned.

In Table 2, we examine the correlation between our treatment variable, henceforth referred to as "Employed" and other variables within our study across all periods in our sample.We can see that Employed is the inverse of Unemployed. Notably, we observe a negative correlation with Sex, suggesting that men may exhibit slightly lower levels of happiness compared to women. Additionally, Age shows a negative correlation, which aligns with our expectations.

Of particular interest is the strong correlation between variables related to income and employment status. This observation raises a concern regarding the inclusion of income variables as controls when testing the causality of employment status on happiness. The dilemma arises because controls should directly affect the outcome variable, happiness, while higher income often results from being employed.

If we exclude income variables, our analysis may lead to conclusions regarding the effect of employment status on happiness, potentially overlooking the indirect influence of income. Conversely, including income variables may absorb some of the effects we attribute to employment status, complicating the interpretation of causality. Therefore, careful consideration is warranted in determining the appropriate approach to address this issue in our analysis.

Overall life satisfaction exhibits a strong positive correlation with employment, providing support for the notion that employment contributes to overall well-being. Conversely, loneliness and the recession indicator demonstrate negative relationships with employment. Moreover, there is a positive relationship between post-secondary education and employment status.

Table 1: Summary Statistics

	Median	SD	Min	Max
Sex	0	0.5	0	1
Age	41	12.17	16	85
HH Post-Government Income	2716.5	2259.13	0	207465.67
Overall Life Satisfaction	7	1.74	0	10
Frequency of Being Angry in the Last 4 Weeks	3	0.98	1	5
Frequency of Being Worried in the Last 4 Weeks	2	0.95	1	5
Frequency of Being Happy in the Last 4 Weeks	4	0.82	1	5
Frequency of Being Sad in the Last 4 Weeks	2	1	1	5
Post-Secondary Education	0	0.41	0	1
Employed	1	0.27	0	1
Unemployed	0	0.27	0	1
Retired	0	0	0	0
Other	0	0	0	0
HH Pre-Government Income	41100	45290.57	0	4678929
Lonely	3	0.86	1	4
Year	2004	9.01	1984	2016
Region	8	3.82	1	16
Recession	0	0.47	0	1

Table 2: Correlation with variable Employed

Variable	Correlation
Sex	-0.0264
Age	-0.0188
HH Post-Government Income	0.1577
Overall life satisfaction	0.2136
Frequency of being angry in the last 4 weeks	0.0208
Frequency of being worried in the last 4 weeks	0.0177
Frequency of being happy in the last 4 weeks	0.0295
Frequency of being sad in the last 4 weeks	0.0155
Post-Secondary Education	0.0967
Unemployed	-1
HH Pre-Government Income	0.1996
Lonely	-0.008
Survey Year	-0.0027
Region	-0.0789
Recession	-0.0013

In Figure 1, we delve into the sample distribution of the random variable related to happiness. While happiness in our dataset is discrete and categorical, we represent it as if it were continuous for analytical purposes. What emerges is a revealing pattern: densities of unemployment are notably higher for discrete values below 3, whereas for values ranging from 3 to 5, the density accumulates more prominently among the employed. Individuals in employment tend to rate their happiness level higher, often selecting 4 on the scale for the past 4 weeks. Conversely, the unemployed are inclined towards a rating of 3, indicating a somewhat neutral stance on happiness. With 3 representing a midpoint between unhappiness and genuine contentment, this pattern underscores a clear positive association between employment and happiness.

Transitioning to Figure 2, we observe a temporal evolution of happiness levels, uncovering a noteworthy upward trajectory over time, suggestive of a discernible trend. However, amid economic downturns, particularly notable in 2008 and 2011, happiness levels exhibit a discernible dip. This underscores the profound impact of economic recessions on individuals' subjective well-being, transcending employment status. Furthermore, the data underscores a persistent disparity, with employed individuals consistently reporting higher levels of happiness compared to their unemployed counterparts.

Figure 1:

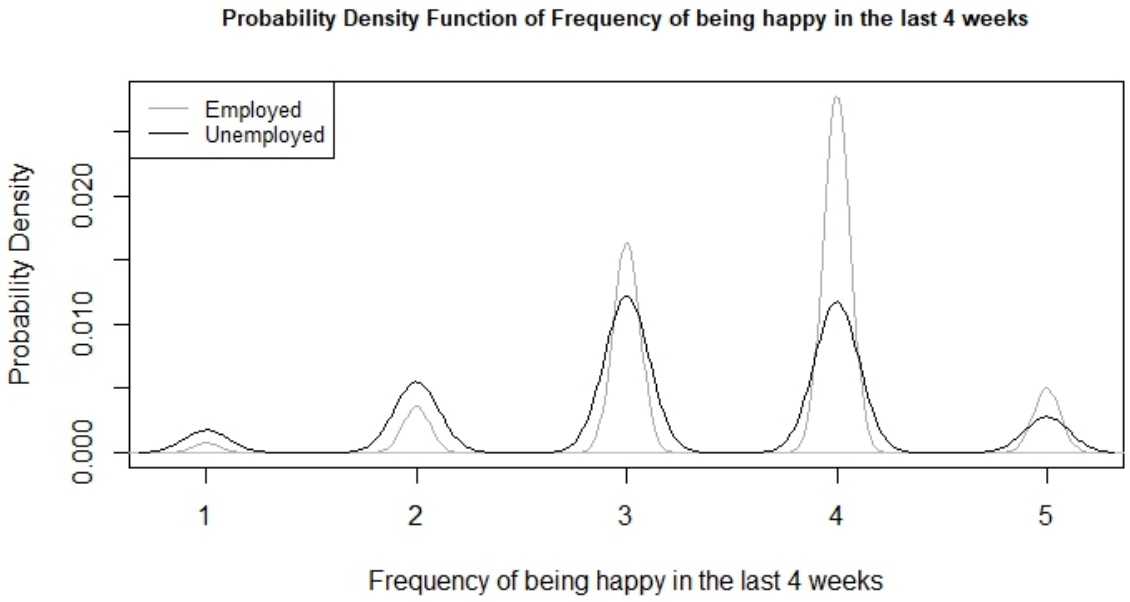
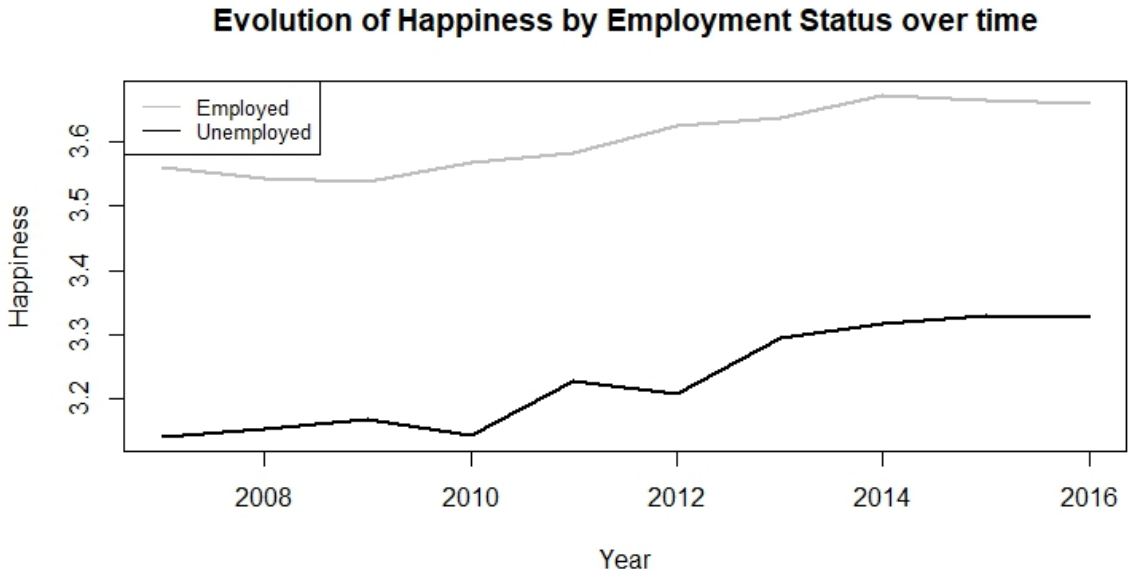


Figure 2:



In Figure 3, we delve into the intriguing dynamics of happiness levels across different age groups, revealing a nuanced narrative that aligns with our correlation matrix findings. While a general trend of declining happiness with advancing age is evident, an intriguing anomaly emerges among individuals aged between 70 and 80. Unlike the gradual decline observed in other age cohorts, this particular group exhibits a notable dispersion in happiness levels, suggesting complex dynamics at play.

Further analysis reveals that this divergence is primarily driven by men, as illustrated in Figure 4. Among male respondents in this age bracket, the deviation from the typical age-related decline in happiness is particularly pronounced. This gender-specific pattern hints at underlying factors that uniquely shape the subjective well-being of older men. Given that our dataset extends up to the year 2016, it's plausible that individuals in this age cohort have been influenced by significant historical events, such as the aftermath of the Second World War or the ensuing economic challenges faced by post-war Germany.

It's important to note that while historical events like the aftermath of the Second World War or economic challenges in post-war Germany could indeed influence subjective well-being, there might be other factors at play as well. For instance, in datasets spanning a wide timeframe, errors in data collection or interpretation could potentially skew results. Additionally, individual experiences such as the death of family members or partners, especially for those under this age bracket, could significantly impact happiness levels and contribute to the observed deviations. Therefore, while historical contexts are undoubtedly crucial, it's essential to acknowledge the possibility of other influencing variables when analyzing subjective well-being trends.

Figure 3:

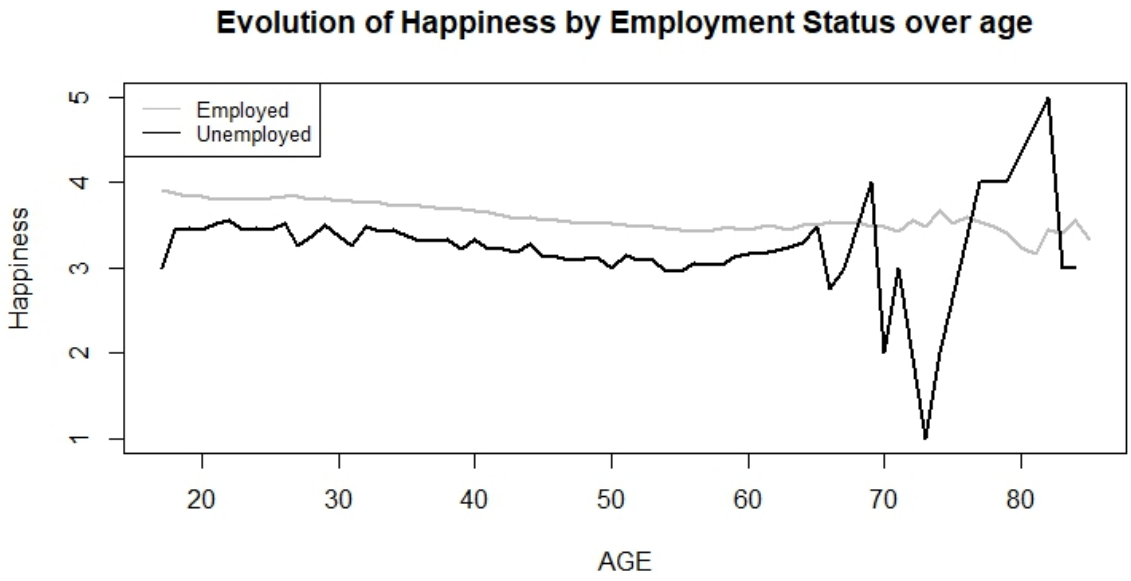
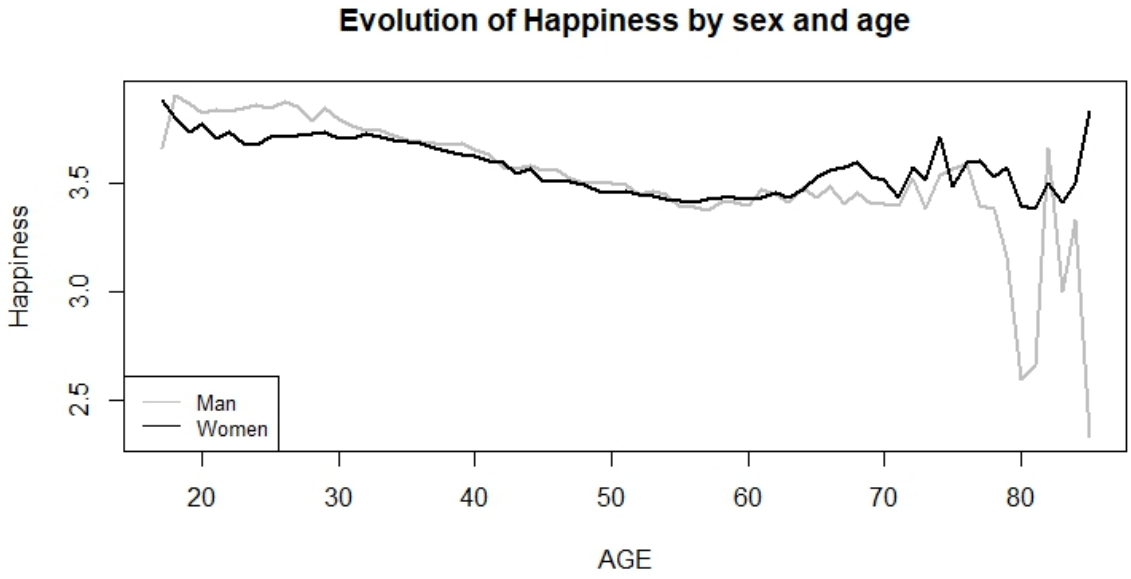


Figure 4:



4 Empirical Analysis: Panel Regression Results

4.1 IPWRA Regression and Main Results

We employ an Inverse Probability Weighting with Regression Adjustment (IPWRA) approach to estimate the effect of employment on happiness. This method utilizes double robust estimators, which are particularly effective due to their ability to combine the strengths of both Regression Adjustment (RA) and Inverse Probability Weighting (IPW) techniques. Notably, these estimators provide consistent results even if either the propensity score model for treatment assignment or the outcome model is only correctly specified. This robustness acts as a safeguard against model misspecification, addressing a potential weakness in our analysis and helping to mitigate bias to yield reliable estimates.

To calculate the weights, we use a standard logistic regression model that estimates the probability of an individual being employed. Our propensity model includes various covariates such as age, region, recession status, survey year, personal and family income, and personal identification. These covariates help to predict the likelihood of employment for each individual in our dataset. Using the fitted propensity model, we then compute propensity scores for each individual, which represent the estimated probability of employment based on their observed characteristics. These scores form the basis for calculating the weights for each observation in our dataset.

Weights for employed individuals are assigned as the reciprocal of their propensity score, while for unemployed individuals, the weight is the reciprocal of one minus their propensity score. These weights are normalized to ensure comparability across all observations.

With the calculated weights, we proceed to fit an IPWRA regression model to examine the relationship between happiness and employment status while adjusting for potential confounders. The IPWRA model includes employment status as the treatment variable, along with covariates such as age, recession status, region, survey year, individual, sex, lonely. The regression model we evaluate is as follows:

$$\begin{aligned} \text{happy} = \beta_0 + \beta_1 \cdot \text{employed} + \beta_2 \cdot \text{age} \\ + \beta_3 \cdot \text{recession} + \beta_4 \cdot \text{region} + \beta_5 \cdot \text{syear} \\ + \beta_6 \cdot \text{pid} + \beta_7 \cdot \text{Loneliness} + \beta_8 \cdot \text{Income} + \epsilon \end{aligned} \quad (1)$$

By applying the weights obtained from the propensity scores to the IPWRA regression model, we effectively adjust for any biases introduced by the sampling design or potential confounding variables and adjust for mistakes in the specification of the model. This allows us to obtain unbiased estimates of the effect of employment status on happiness, while accounting for the complex interplay of covariates.

Table 3 presents the results of the regression analysis. Significantly, the impact of employment is both positive and statistically significant. Levels of significance are denoted by ***, **, and *, indicating parameter estimates that are significantly different from zero at the 1%, 5%, and 10% levels, respectively. Additionally, the variable "Sex" shows a positive coefficient, which contrasts with its negative correlation in the correlation matrix. This discrepancy might be explained by the fluctuations in happiness levels, as illustrated in Figure 4.

Age and recession exhibit a negative relationship, whereas individual identification (Pid), loneliness, and household post-government income show positive correlations. Notably, the coefficient for 'Recession' is not significant. Among all variables, 'Employed' has the most substantial impact, with all signs aligning logically with the expected results.

The model's overall fit is moderate, with a Multiple R-squared value of 0.0756, indicating that the model explains approximately 7.56% of the variance in the dependent variable. The F-statistic is significant, demonstrating that the overall regression model is statistically significant.

In the third column, the results of regressing solely with the 'Employed' variable against happiness indicator are presented. Remarkably, similar coefficient is observed between the full regression and this individual regression settings, indicating robustness in the predictive power of 'Employed' across different model specifications.

Table 3: IPWRA results

Variable	**Estimate**	**Ind.Est**
(Intercept)	-21.1598194597***	3.23230***
	(1.9476543235)	(0.00347)
Employed	0.3232226668***	0.37936***
	(0.0050881485)	(0.00479)
Sex	0.0544084358***	
	(0.0047086706)	
Age	-0.0103150318***	
	(0.0001872867)	
Recession	-0.0053304293	
	(0.0052726179)	
Region	0.0021262077***	
	(0.0005844606)	
Syear	0.0122657676***	
	(0.0009692586)	
Pid	0.0000000037***	
	(0.0000000002)	
Lonely	0.0018021944**	
	(0.0006364823)	
HH Post-Government Income	0.0000389008***	
	(0.0000010568)	
Residual standard error: 534 on 140872 DF		
Multiple R-squared: 0.0756		
R-squared: 0.0756		
F-statistic: 1.44e+03 on 8 and 140872 DF		

4.2 Heterogeneity analysis

In Table 4, we examine the differences between genders, differentiating between women (sex=0) and men (sex=1). While variations in the coefficients are observed, the signs remain consistent across genders. The results align closely with our previous analyses. Notably, the coefficient for 'Employed' is slightly higher for women than for men, confirming trends seen in our correlation matrix, though the difference in magnitude is minor. However, a more significant difference is evident in the coefficient for 'Lonely', which suggests that loneliness has a greater impact on women than on men, indicating potential gender-specific dynamics in how loneliness is experienced.

Regarding the specific results, 'Employed' shows a positive and statistically significant association with the outcome variable for both genders, underscoring the importance of employment status irrespective of sex. 'Age' reveals a negative association with the outcome for both sexes, suggesting that older individuals typically report lower values associated with the outcome. Interestingly, the impact of 'Recession' is similar for both genders, with only negligible effects observed. On the other hand, 'Region' and 'Survey Year' (Syear) display positive associations with the outcome variable for both genders, though the effects are slightly more pronounced for women. 'Personal Identification' (Pid) shows minimal, statistically insignificant effects on the outcome for both genders. Lastly, 'Household Post-Government Income' has a positive impact on the outcome variable for both sexes, with men experiencing slightly higher coefficients. Overall, while there are nuanced differences in the effects of certain variables between genders, the general trends indicate consistently similar dynamics across genders in influencing the outcome variable.

In Table 5, we assess the impact of employment on two distinct age groups: individuals under 41 and those 41 and older. The findings generally reflect the patterns observed in Table 3's initial regression but exhibit some subtle differences. Notably, disparities related to age are less pronounced compared to those observed by sex, yet several key insights emerge. Employment shows a consistently positive and significant effect on the outcome for both age groups, underscoring its importance. However, the 'Age' coefficient is negative for both, suggesting that older individuals typically report lower outcomes.The influence of 'Recession' varies, with a negative effect observed in the younger cohort and a positive one in the older group, indicating age-related differences in economic resilience. 'Region' impacts both age groups positively, more so among the younger individuals. 'Survey Year' also shows a positive relationship with the outcome, slightly more pronounced in the older group. 'Personal Identification' (Pid) yields minimal, insignificant effects across both cohorts. The 'Lonely' variable shows a greater impact on those aged 41 and above, hinting at a stronger link between loneliness and outcomes in this group. 'Household Post-Government Income' positively affects both groups, with a marginally higher

coefficient for the older individuals. Overall, while employment acts as a consistent determinant across all ages, the effects of recession, loneliness, and other socio-economic factors reveal a complex interplay in shaping outcomes, varying subtly between age groups.

Table 4: Sex Heterogeneity analysis

Variable	**Women**	**Men**
(Intercept)	-25.80161386***	-21.072657***
	(2.71420325)	(1.949687)
Employed	0.353522931***	0.321706***
	(0.007098643)	(0.005092)
Age	-0.008283587***	-0.010443***
	(0.000251642)	(0.000188)
Recession	-0.005754833	-0.005684
	(0.007342332)	(0.005277)
Region	0.001542912.	0.002185***
	(0.00081769)	(0.000585)
Syear	0.014534174***	0.012239***
	(0.001350666)	(0.000970)
Pid	0.000000004656***	0.000000***
	(0.000000336)	(0.000000)
Lonely	0.002896286***	0.001650**
	(0.000870662)	(0.000638)
HH Post-Government Income	0.0000316187***	0.000039***
	(0.00000141124)	(0.000001)
Residual standard error: 383 on 70253 DF, 534 on 140872 DF		
Multiple R-squared: 0.0777, 0.0756		
Adjusted R-squared: 0.0776, 0.0756		
F-statistic: 740 on 8 and 70253 DF, 1.44×10^3 on 8 and 140872 DF		

Table 5: Age Heterogeneity analysis

Variable	**age < 41**	**age > 41**
(Intercept)	-16.84422249***	-27.299327***
	(3.191742242)	(2.527971)
Employed	0.345329442***	0.309805***
	(0.007956436)	(0.006810)
Age	-0.009414628***	-0.003580***
	(0.00057757)	(0.000457)
Recession	-0.015095392	0.007470
	(0.008379223)	(0.006972)
Region	0.004440437***	0.000572***
	(0.000918733)	(0.000779)
Syear	0.010130023***	0.015143***
	(0.001588513)	(0.001258)
Pid	2.754E-09***	0.000000***
	(3.97E-10)	(0.000000)
Lonely	0.000989637	0.002023*
	(0.001027686)	(0.000834)
HH Post-Government Income	0.000035 ***	0.000043***
	(0.000002)	(0.000001)
Residual standard error:365 on 54819 DF, 381 on 82177 DF		
Multiple R-squared:0.0614, 0.0683		
Adjusted R-squared:0.0613, 0.0682		
F-statistic: 448 on 8 and 54819 DF, 753 on 8 and 82177 DF		

5 Conclusions

The study delved into the intricate relationship between employment status and happiness within the German context, employing reported life satisfaction as an indicator of well-being. Through meticulous comparative analysis, we sought to elucidate the effects of unemployment on self-reported happiness and to pinpoint contextual factors that might influence life satisfaction. Our findings offer valuable insights into the interaction between employment and well-being, emphasizing the subtle yet significant interplay among these variables.

A pivotal finding from our research is the distinct positive correlation between employment and happiness. The analysis revealed that employed individuals consistently report higher levels of happiness compared to their unemployed counterparts. This robust link underscores the substantial positive influence of gainful employment on individual well-being. This conclusion is supported by existing literature, which uniformly recognizes employment as a crucial factor in subjective well-being.

The positive association between employment and happiness can be attributed to several key factors. Initially, employment imbues individuals with a sense of purpose and adds meaningful structure to their lives. Engaging in productive work fosters a sense of accomplishment and fulfillment, significantly enhancing overall life satisfaction. Furthermore, employment ensures financial security, which not only meets basic material needs but also allows individuals to enjoy leisure activities that enrich their quality of life. Additionally, the workplace serves as a venue for social interaction and camaraderie, cultivating essential social connections and support networks that are crucial for psychological well-being.Employment also typically provides structured routines and a sense of stability, fostering psychological well-being by reducing feelings of uncertainty and anxiety.The autonomy and control that come with employment empower individuals to direct their lives in line with their goals and aspirations, thereby boosting their agency and self-esteem. Moreover, employment opens pathways for personal growth and development, offering opportunities for skill acquisition and career advancement. These opportunities are intrinsically linked to enhanced feelings of competence and self-fulfillment.

In conclusion, our study underscores the comprehensive benefits of employment for individual well-being and happiness. Employment not only provides a sense of purpose and financial security but also fosters social connections and offers opportunities for personal growth.These elements collectively play a critical role in enhancing subjective well-being. Gaining insight into how employment impacts happiness is crucial for policymakers and organizations. This knowledge enables the design of targeted interventions and policies that promote well-being and improve the quality of life across the community.

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