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Happiness Economics: Life Domains, Comparisons and Migration

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Happiness Economics: Life Domains, Comparisons and Migration

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"Happiness grows from gratitude;

wealth grows from accumulation.

Only one can satisfy the soul."

To my mother,
for the quiet perseverance that makes meaningful achievements possible.

To my father,
For the calm that turns challenges into small, manageable steps.

To Gianvito,
for the love that speaks even in silence.

To Silvia,
for showing that sacrifice is often the hidden face of happiness.

“Happiness depends more on the warmth of our bonds

than on the weight of our possessions.”

Aristotle

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“Happiness is only real when shared.”

Christopher McCandless

Contents

"A happy life is one which is in accordance

with its own nature."

Seneca

Essay Summary

This dissertation investigates the determinants, mechanisms, and comparative dynamics of subjective well-being (SWB) through three stand-alone but conceptually integrated empirical essays. The overarching question that motivates the thesis is how individuals evaluate their lives when the economic, social, or relational environment around them changes. Drawing on large-scale longitudinal data, rigorous non-parametric and fixed-effects methods, and original conceptual contributions, the dissertation advances the understanding of SWB across three domains: the **individual life course**, the **social comparison** structure faced by migrants, and the **intergenerational relational** effects of international migration on family members who remain in the origin country. Together, the essays highlight the multidimensional and context-dependent nature of subjective well-being, demonstrating both its stability and its sensitivity to life events, reference environments, and family structures.

The first empirical essay examines well-being from a life-course perspective, addressing one of the most debated questions in happiness economics: *does life satisfaction follow a U-shaped trajectory over age?* The existence and meaning of the U-shape remain contested, with cross-sectional studies typically documenting a mid-life dip and panel-data analyses questioning its robustness once individual fixed effects, cohort heterogeneity, and personality traits are taken into account. Building on this debate, the essay exploits the long longitudinal component of the German Socio-Economic Panel (SOEP) and adopts a fully non-parametric framework to study life satisfaction trajectories. This approach avoids imposing functional restrictions on the age profile and allows life satisfaction to emerge freely from the data.

The results provide no evidence of a stable U-shape once unobserved heterogeneity and cohort dynamics are controlled for. Instead, the life satisfaction curve appears gently declining across adulthood, consistent with the findings of Frijters and Beatton (2012) and other longitudinal studies. The comparison between ordinary least squares (OLS) and individual fixed-effects (FE) estimates reveals important discrepancies, especially in the magnitude and even the sign of

some age gradients. This indicates that unobserved, time-invariant personality traits or dispositions play a substantial role in shaping subjective evaluations of life.

The essay goes beyond overall life satisfaction and offers a detailed examination of domain-specific age trajectories. These trajectories display substantial heterogeneity. Domains related to physical conditions such as: health satisfaction and sleep satisfaction, show a pronounced and monotonic decline across age. Work satisfaction also declines but exhibits a flatter profile, potentially reflecting stronger selection or behavioural adaptation in late career. By contrast, satisfaction with dwelling conditions, household income, and personal income improves over the life course, mirroring increasing financial stability and better housing conditions among older adults. Family satisfaction and social satisfaction remain remarkably stable across age, suggesting that relational well-being is less sensitive to the ageing process than economic or physical domains. Other domains, such as housework and leisure, present non-linear patterns, highlighting the necessity of flexible modelling strategies.

A second major contribution of the essay is the identification of the core **pillars** of subjective well-being and the analysis of whether their relative importance changes over the life cycle. To address this question, the essay adopts a *bottom-up model* of life satisfaction, i.e. a framework in which overall life evaluation is understood as the cumulative result of satisfaction across multiple life domains. The empirical strategy combines Constrained Non-Negative Sum *(CNS)* estimation with Shapley value decomposition of explanatory power. These complementary approaches converge on a coherent conclusion: health and family satisfaction consistently emerge as the central pillars of *SWB*, showing the largest and most stable contributions to overall life evaluations across age groups. Income-related domains rank next, reflecting their growing salience as individuals approach later stages of life. Although the main pillars remain broadly constant across the life cycle, their relative importance shifts, with economic dimensions gaining weight in older age and non-material domains becoming more prominent earlier in the life course.

These findings offer a nuanced perspective on ageing and happiness, rejecting simplistic U-shaped narratives and highlighting the multidimensionality of SWB. They underscore the need

to combine non-parametric modelling with component-based approaches to understand how different life dimensions contribute to well-being at different stages of life.

The second essay examines subjective well-being through the lens of **comparative environments**, investigating whether and how individuals adjust the **reference groups** they use when evaluating their own lives. **Migrants** provide a particularly revealing population for studying dynamic reference groups: by moving across national borders, they experience a deep transformation in their economic and social context, becoming simultaneously exposed to origin-country standards, host-country norms, and transnational comparison frameworks.

The theoretical background draws on social comparison theory (Festinger, 1954), the economics of relative income (Duesenberry, 1949; Clark & Oswald, 1996), transnationalism, and the psychology of emotional contagion. These frameworks suggest that migrants' reference groups may shift as they integrate into the host society, and that upward and downward comparisons may have asymmetric effects on subjective well-being.

Using the *SOEP* linked with *UNU-WIDER* income datasets, the essay constructs three innovative relative income indices, each reflecting a distinct reference environment:

- R_1: income rank relative to the origin-country distribution
- R_2: income rank relative to the host-country (Germany) distribution
- R_3: income rank relative to the migrant's co-ethnic group within Germany

The empirical strategy relies on individual and year fixed-effects, capturing within-individual changes in relative position over time.

The results reveal a clear hierarchy among reference effects. A higher R_2, which captures an improvement in migrants' position within the host-country income distribution, strongly increases life satisfaction. This indicates that migrants internalize German income standards and derive well-being from moving upward within the host society. The coefficient of R_3 is also positive and statistically significant, showing that relative position within the co-ethnic community contributes to well-being as well, although its impact is more modest.

By contrast, R_1 turns negative once R_2 and absolute income are included. This is one of the most unexpected findings of the dissertation: outperforming the origin population is associated with *lower* life satisfaction once migrants' standing within Germany is held constant. Several mechanisms may jointly explain this counterintuitive pattern. A first possibility concerns **moral and reputational considerations**. Migrants may experience discomfort when their economic progress exceeds that of relatives and compatriots who remain in more disadvantaged conditions. Rather than generating pride, this widening gap can evoke empathy, guilt, or a sense of responsibility toward those left behind. This interpretation connects naturally with a second mechanism, namely **remittances pressure**. Economic success relative to the home population often increases expectations of financial support from family or community members. When these expectations intensify, they may translate into moral or financial obligations that raise stress and diminish subjective well-being. Moreover, part of the negative association may stem from **asymmetric comparison sensitivity**. Migrants are typically ambitious and upward-oriented; outperforming those left behind yields limited psychological reward once the implicit benchmark shifts toward the standards of the host country. In contrast, falling short of host-country norms can generate intense frustration, which outweighs the limited satisfaction derived from doing better than compatriots.

Taken together, these mechanisms suggest that a higher R_1, rather than signaling success, may capture a complex combination of moral tension, social distance, and comparison dynamics that ultimately reduce life satisfaction. Heterogeneity analysis shows that the negative effect of R_1 is concentrated among recent arrivals, gradually disappearing with time spent in Germany. This pattern is consistent with the remittances-pressure interpretation: financial obligations and moral expectations are strongest in the early years and weaken as migrants settle.

The third essay focuses on **relational intra-family interdependence**, studying how the international migration of one household member affects the subjective well-being of those who remain in the origin country. The unit of analysis is explicitly the **left-behind** family members, an often overlooked group in migration research. Using the large-scale Social Diagnosis dataset from Poland, the essay investigates how the well-being of those who remain changes following the separation caused by a family member's migration abroad, and identifies the mechanisms through which this relationship is mediated.

Three key findings emerge. First, the mig**ration of a household member increases the life satisfaction of those who remain** by a sizeable amount i.e. approximately half the magnitude of the marriage effect. This positive effect is robust across all specifications. Second, the improvement is not universal: it is strongest among partners and adult children in stable family structures, while no significant effects appear for household heads or individuals in complex households. Third, the mechanism analysis shows that **financial channels explain only part of the improvement**. Emotional and relational domains respond strongly to migration, and the increase in overall life satisfaction persists even in cases where financial satisfaction does not improve.

Based on these findings, the essay introduces the novel concept of **happiness remittances**: *the non-material psychological benefits transmitted from migrants to relatives who stay behind.* These benefits may arise from perceptions of the migrant's success, improved living conditions abroad, pride, emotional contagion, or a sense of collective advancement. The concept suggests that migration generates emotional spillovers that complement but do not replace traditional monetary remittances. Although still speculative, the notion of happiness remittances opens a promising avenue for future research on transnational families and the multidimensional effects of migration.

Together, the three essays advance a comprehensive understanding of subjective well-being across individual, social, and relational dimensions. The dissertation demonstrates that well-being is shaped not only by personal characteristics and economic conditions but also by the social environment and transnational family ties. It offers new empirical evidence, conceptual innovations, and methodological contributions that enrich happiness economics, migration research, and behavioural economics.

"Happiness is the meaning and the purpose of life,

the whole aim and end of human existence."

Aristotle

1 | INTRODUCTION TO THE THESIS

This thesis investigates the determinants and dynamics of *subjective well-being (SWB)* across different stages and events of the life course, social contexts, and family arrangements. While the economic analysis of happiness has expanded rapidly over the past three decades, important questions remain regarding how individuals evaluate their lives when their economic, social, or familial circumstances change. This work contributes to this broader field by examining three interrelated mechanisms through which subjective well-being is shaped: life-cycle patterns in life satisfaction, the role of reference groups and relative income among migrants, and the well-being repercussions of international migration on the family members who remain in the country of origin.

The structure of the essay reflects an analytical progression from individual trajectories, to social comparisons, to relational dynamics within transnational families. The first empirical chapter re-evaluates the long-standing debate on the U-shaped relationship between age and life satisfaction, leveraging longitudinal data and fixed-effects specifications to reassess how well-being evolves over the life course. The second chapter turns to social comparison mechanisms, analysing how migrants' reference income, defined with respect to multiple concentric comparison groups, shapes subjective well-being after migration. The final empirical chapter focuses on the "left-behind" phenomenon, exploring how the migration of a family member affects the life satisfaction of those who stay, with particular attention to psychological costs, economic remittances, and happiness spillovers.

Organised into three stand-alone but conceptually connected essays, the dissertation provides a comprehensive perspective on subjective well-being from micro, social, and familial viewpoints. Each essay contributes distinct empirical evidence and theoretical insights, while collectively advancing the scientific understanding of subjective well-being within happiness economics, migration research, and behavioural economics.

1.1 The Philosophical Foundations and Historical Evolution of Happiness

The quest for happiness is as old as human thought. From classical philosophy to contemporary behavioural science, humans have attempted to define what it means to live well and to understand the forces that shape a fulfilling life. Yet, despite its universal appeal, *happiness* has never been a stable or unambiguous concept. Across centuries and cultures, it has shifted dramatically from a state granted by fate or divine favour to a subjective evaluation of one's life, and more recently to a scientifically measurable construct.

The earliest systematic reflections on happiness can be traced to ancient Greek philosophy. For Aristotle, *eudaimonia*, often translated as "flourishing", represented the highest human good: a life guided by virtue, reason, and the fulfilment of one's potential. Crucially, *eudaimonia* was not a fleeting emotion but a long-term evaluative judgement about one's life. In contrast, the hedonistic tradition, from Epicurus to later utilitarians, conceptualized happiness as pleasure and the absence of pain, emphasising affective experience rather than reflective assessment.

These two philosophical traditions, eudaimonic and hedonic, continue to influence modern approaches to well-being. However, for much of history, happiness was not considered fully within human control. Oishi et al. (2013) show, through a meticulous analysis of historical language corpora, that pre-modern conceptions of happiness across many societies were deeply intertwined with luck, fortune, or divine favour. Their study examined millions of words from dictionaries, literary texts, and archival sources across several centuries, coding how often the concept of "happiness" appeared in proximity to terms such as *luck*, *fate*, or *blessing*. This linguistic evidence revealed a clear pattern: until the modern era, **happiness was largely conceptualised as an external, uncontrollable condition**. The Greek root of *eudaimonia*, literally "having a good spirit (δαίμων) on one's side," exemplifies this early conception.

This view persisted for centuries. In medieval Christian thought, Saint Augustine argued that true happiness was unattainable in earthly life, while Saint Thomas Aquinas contended that it could only be partially approached through virtue, its fullness belonging to divine beatitude. A profound transformation occurred gradually between the Reformation and the Enlightenment.

The Protestant emphasis on personal responsibility, combined with the rise of rationalism and political liberalism, reframed **happiness as something that individuals could actively pursue**. For the first time, happiness became a secular goal, independent of divine intervention. This intellectual shift culminated symbolically in the U.S. Declaration of Independence (1776), where the "pursuit of happiness" was elevated to a fundamental political right.

Oishi et al. (2013) empirically document this shift by comparing the semantic evolution of the word "happiness" across Western and non-Western languages. Their cross-cultural analyses reveal that **Western societies increasingly associated happiness with** personal agency, autonomy, and **intentional life choices**, **whereas collectivistic societies maintained stronger associations with fortune**, external circumstances, and social harmony. Importantly, countries where happiness is linguistically linked to luck tend to report lower levels of *SWB*, though whether this reflects causality or reverse causality remains unresolved.

Given this conceptual heterogeneity, modern scientific research has progressively adopted the term *subjective well-being* (SWB) in place of "happiness." Seminal works by Diener (1984), Diener et al. (1999), and the OECD Guidelines (2013) explicitly argue that SWB is a more precise construct, free from the semantic ambiguities of the everyday term "happiness." SWB refers specifically to how individuals *evaluate* and *experience* their lives. This distinction is crucial: **SWB** encompasses both **evaluative components** (life satisfaction, overall judgements about one's life) **affective components** (positive and negative emotions), and empirical evidence confirms that these dimensions are related but not identical.

The evolution from philosophical reflection to scientific measurement marks a conceptual bridge between the qualitative traditions of ancient thought and the quantitative traditions of modern social science. Subjective well-being stands precisely at this intersection. It transforms a historically philosophical question "*what does it mean to live well?*" into an empirically analysable framework, allowing researchers to quantify life evaluations, compare individuals and societies, and identify the determinants of human flourishing.

In this sense, **SWB serves as the ideal analytical tool for studying happiness in contemporary research**. It preserves the philosophical ambition of understanding the good life while grounding the concept in observable, measurable, and theoretically coherent dimensions. This *essay* builds on this modern framework, acknowledging that today the study

of happiness is not a metaphysical speculation but a rigorous, interdisciplinary science rooted in the long intellectual tradition that precedes it.

1.2 Happiness and Economics: From Utility to Subjective Well-Being

The relationship between happiness and economics is deeper than it might appear. Although classical economics has traditionally avoided direct engagement with the concept of happiness, the discipline has always been implicitly concerned with human well-being. Utility i.e. the cornerstone of microeconomic theory, was originally conceived as a measure of satisfaction, pleasure, or felicity. In his seminal *Introduction to the Principles of Morals and Legislation*, **Jeremy Bentham (1789)** explicitly equated utility with happiness, defining the goal of society as *"the greatest happiness of the greatest number."*

Modern economics has progressively returned to this foundational connection. As Rayo and Becker (2007, p. 487) argue, *"maximizing happiness is the fundamental goal of the individual when making decisions"* and happiness functions as an evolved decision-making device that guides human behaviour. Similarly, Krugman and Wells (2013) emphasize that economic welfare ultimately refers not to money, but to the well-being that economic resources enable. These perspectives help explain why subjective well-being (SWB) has become central in contemporary empirical economics.

However, economists quickly realized that "happiness" in its colloquial sense is too imprecise to be operationalized. Building on the **seminal work of Diener (1984)** and **Diener et al. (1999)**, the field adopted *subjective well-being* as the scientific construct capable of capturing the evaluative and emotional dimensions of human experience. SWB is now understood as a multidimensional measure that includes three components:

1. **Evaluative well-being** — a cognitive, reflective assessment of one's life (e.g., life satisfaction, Cantril ladder).

2. **Affective or experienced well-being** — the frequency and intensity of positive and negative emotions (joy, stress, worry, sadness).

3. **Eudaimonic well-being** — meaning, purpose, and psychological functioning.

The OECD Guidelines (2013) formalized this tripartite framework, which has become the standard reference for comparative international research. These components reflect different facets of the good life: while evaluative well-being captures long-term evaluations, emotional well-being reflects daily experiences, and eudaimonic well-being addresses existential fulfilment.

The growing precision of SWB measurement has reshaped the role of happiness within economic analysis. On the microeconomic side, SWB provides a direct empirical proxy for individual utility, allowing economists to test hypotheses about preferences, adaptation, comparison effects, employment, marriage, and income dynamics in ways that traditional revealed-preference data cannot capture. On the macroeconomic side, SWB has become a complementary indicator of societal progress. The Stiglitz–Sen–Fitoussi Commission (2009) explicitly recommended shifting emphasis from GDP growth to multidimensional measures of well-being, and SWB indicators have since been incorporated into national statistical frameworks in the UK, Germany, New Zealand, and several OECD countries.

This methodological and institutional shift helped produce one of the most rapid expansions in modern social science. While in the 1980s only a handful of academic articles examined subjective well-being, the volume of research has exploded over the last three decades. Diener et al. (2018) document more than **14,000** scholarly publications on SWB, spanning economics, psychology, sociology, neuroscience, and political science. Happiness economics, once a niche area, has now become a mature interdisciplinary field, with dedicated journals, internationally coordinated surveys (e.g., Gallup World Poll, European Social Survey), and annual World Happiness Reports.

In this context, happiness has re-emerged not as a vague philosophical ideal but as a measurable empirical object with direct implications for economic behaviour and public policy. Economists now study how institutions, labour markets, migration, inequality, and social comparisons shape life evaluations, using subjective well-being not only as an outcome but increasingly as a predictor of productivity, health, and long-term economic performance.

This conceptual evolution: from happiness as utility, to subjective well-being as its empirical counterpart, provides the theoretical foundation for this dissertation, which analyses the determinants of life satisfaction across the life cycle, across social comparison contexts, and within transnational family dynamics.

1.3 Main Theories in Happiness Economics

The theoretical foundations of happiness economics draw from a range of perspectives that converge on a central insight: subjective well-being is shaped by the interaction between individual dispositions, social environments, and economic conditions. Although early economic models equated utility with happiness in a narrow hedonic sense, contemporary research integrates emotional, cognitive, social, and institutional dimensions into a unified approach to the study of well-being.

A first major distinction that informs modern analysis is between the **hedonic** and **eudaimonic** traditions. The former, rooted in utilitarian philosophy, defines well-being as the balance of pleasurable over painful experiences and aligns naturally with the affective dimension of subjective well-being. The latter, drawing from Aristotelian thought and revived in contemporary psychology, conceptualizes happiness as meaning, purpose, and self-realization. These perspectives entered economics through the capability approach (Sen, 1985), behavioural economics, and psychological theories of functioning, creating the conceptual ground on which subjective well-being (SWB) rests.

The **cognitive–affective model** proposed by Diener (1984) and Diener et al. (1999) represented a turning point. Their seminal work clarified that SWB encompasses (i) evaluative well-being (life satisfaction), (ii) emotional well-being (positive and negative affect), and (iii) eudaimonic well-being (purpose and meaning).

Within this framework, **adaptation mechanisms**, often described as the *hedonic treadmill*, have played an important role. Individuals tend to adjust to changes in income, health, and social conditions, returning toward a baseline level of well-being over time. Classic longitudinal studies by Lucas et al. (2006) on major life events and by Lucas, Clark, Diener, and Georgellis, (2003) on marital transitions and unemployment show that many shocks have only temporary effects, but others such as: long-term unemployment or disability, produce lasting declines in life satisfaction. These findings suggest that *adaptation is powerful but incomplete*, and they help explain longstanding macroeconomic puzzles, including the limited long-run relationship between economic growth and average life satisfaction.

Closely related is the debate around **set-point theory**, which proposes that individuals possess relatively stable baseline levels of well-being. Genetic evidence from twin studies (Lykken & Tellegen, 1996; Tellegen et al., 1988) suggesting heritability rates around 30–50% initially led some authors (Headey & Wearing, 1989; Lucas, Diener & Suh, 1996) to question how meaningful it was to study life satisfaction as an outcome of social and economic conditions. If well-being were almost entirely genetically fixed, variations related to employment, income, or family context would reflect minor fluctuations around a biological baseline. However, later longitudinal research demonstrated that sustained shocks such as: persistent unemployment, divorce, widowhood, or chronic illness, can shift life satisfaction for many years, and sometimes permanently (Lucas et al., 2003; Clark et al., 2008). As a result, set-point theory is now interpreted not as a denial of policy relevance, but as a framework that highlights the interplay between stable dispositions and environmental factors.

Another central mechanism is **social comparison**, a longstanding theme in economics and psychology. Building on Duesenberry's (1949) notion of relative income and Festinger's (1954) theory of social comparison, Clark and Oswald (1996) and Clark et al. (2008) provided compelling evidence that individuals evaluate their circumstances relative to peers or reference groups. Income rank, rather than absolute income, often predicts life satisfaction, offering a powerful explanation for why inequality can depress well-being and why migration by reshaping reference groups can produce substantial changes in subjective evaluations.

Within this broader framework, **the Easterlin Paradox** has arguably become the *single most debated issue* in happiness economics. Easterlin (1974, 1995) observed that, within a country at a given point in time, richer individuals report higher life satisfaction, yet over long periods rising per capita income does not systematically translate into higher average happiness. This apparent disconnect between micro and macro evidence has fuelled a large literature organised around a simple but profound question: *does money buy happiness?* Subsequent contributions have challenged, refined, or partially confirmed Easterlin's claim. On the one hand, cross-country and time-series analyses by Deaton (2008), Stevenson and Wolfers (2008), and Sacks, Stevenson and Wolfers (2012) document a positive association between income and life satisfaction even at high levels of development, suggesting that growth does matter for well-being. On the other hand, proponents of the paradox emphasize the roles of adaptation and relative income in attenuating the long-run impact of growth, especially in wealthy societies. The fact that this debate remains unresolved underscores the complexity of the relationship

between economic conditions, expectations, and subjective evaluations, and provides an important motivation for micro-based analyses such as those in this dissertation.

More recently, the focus of happiness economics has expanded to include **institutions, social capital, and governance**. A growing body of macro-level evidence, much of it synthesized in the *World Happiness Report*, shows that countries with higher institutional quality, measured through: trust, rule of law, corruption control, and public service effectiveness, consistently rank among the happiest in the world. The Nordic countries (Finland, Denmark, Iceland, Sweden, Norway) offer a well-documented case: strong welfare states, high interpersonal trust, and robust civic institutions are associated with exceptionally high levels of life satisfaction (Helliwell, Layard & Sachs, various editions of the *World Happiness Report*). This evidence suggests that well-being is not only an individual assessment but also a reflection of the broader social and institutional environment in which people live. Theoretical developments combining the capability approach with SWB measurement emphasize that opportunities, freedoms, and social trust shape not only objective life conditions but also subjective evaluations.

Together, these theoretical perspectives: hedonic and eudaimonic approaches, the cognitive–affective model of SWB, adaptation and set-points, social comparison, and the role of institutions, form the intellectual foundation of modern *happiness economics*.

This conceptual apparatus is not only the backbone of the broader literature but also provides the analytical lens through which this dissertation develops its three empirical studies. Each essay engages with a specific subset of these life-cycle dynamics, social comparison and relative income, and the intergenerational transmission of well-being within migrant families.

Section 1.4 explains how the dissertation positions itself within this theoretical landscape, and how the three essays collectively contribute to the ongoing debate in happiness economics.

1.4 Conceptual And Empirical Positioning In The Happiness Economics Literature

The theoretical foundations outlined in the previous sections converge toward the idea that subjective well-being emerges from the interplay between economic incentives, psychological mechanisms, and social embeddedness. This essay is situated precisely within this multidimensional perspective. It adopts the view that individuals are at once economic agents responding to constraints and opportunities, psychological subjects influenced by adaptation, expectations, and affective processes, and members of interdependent social and family networks whose well-being is shaped by the circumstances and behaviour of others. This integrated framework motivates the structure of the work: three empirical essays that differ in their specific focus but share a common analytical question ***"how do individuals revise their life evaluations when their economic, social, or relational context changes?"***

The first empirical essay *(Chapter 2)* examines well-being from an **individual life-course** perspective, evaluating whether life satisfaction follows a stable pattern across age once unobserved heterogeneity, cohort dynamics, and individual-specific traits are accounted for. The analysis also identifies the core pillar dimensions of subjective well-being and assesses whether their relative importance changes over the life cycle, shedding light on whether, and in what ways, individuals weigh different dimensions of life at different stages.

The second essay *(Chapter 3)* shifts the focus to the **comparative environment** and investigates whether, and in what ways, individuals change the groups they use as reference points. To explore this question, the essay concentrates on a particularly informative population: migrants. Migration generates a substantial transformation in individuals' social and economic context, exposing them to the standards of the origin country, the host country, and broader transnational settings. This unique configuration makes migrants an ideal case for analysing how reference groups are selected, revised, and weighted when people experience major changes in their social environment.

Finally, the third empirical essay *(Chapter 4)* turns to **relational interdependence** and examines how the departure of a household member affects the subjective well-being of those

who remain in the origin country. In this essay, the unit of analysis is explicitly the left-behind family members, allowing the study to isolate how separation influences their evaluations of life. The analysis identifies both material and non-material transmission channels and introduces the notion of "happiness remittances," suggesting that migrants may generate emotional spillovers for relatives who stay at home through perceptions of success abroad, improved living conditions, strengthened hopes for upward mobility, or shared aspirations.

Taken together, the three essays follow an internally coherent trajectory: from the individual dimension of well-being (ageing, adaptation, and intra-personal dynamics), to the comparative dimension (relative income and the construction of reference groups), and finally to the family and relational dimension (interdependencies shaped by migration decisions and transnational ties). This trajectory reflects the broader evolution of happiness economics, which has progressively expanded from narrowly defined utility-based models toward approaches that also incorporate relational, contextual, and institutional determinants of well-being. Within this conceptual landscape, the essay offers several contributions: it refines the empirical assessment of the U-shaped age–well-being relationship; it provides a new way of operationalising relative income for migrants; and it advances the discussion of how migration affects left-behind households by highlighting psychological spillovers that go beyond monetary remittances.

Methodologically, the work relies on rich longitudinal datasets and on identification strategies that isolate within-person changes, thereby reducing concerns about unobserved heterogeneity and selection biases. The systematic use of fixed-effects models, combined with domain-specific measures of well-being, reinforces the robustness of the findings across the three empirical components. Beyond their academic relevance, these results carry broader implications for migration policy, social protection, labour markets, and welfare interventions. They suggest that subjective well-being should be treated not merely as an individual evaluation but as an outcome shaped by comparison processes, relational ties, and institutional settings.

In this sense, the three empirical chapters do not represent isolated contributions. Rather, they collectively articulate a unified perspective on how subjective well-being responds to life-course dynamics, relative position, and the relational consequences of international mobility. By integrating economic, psychological, and sociological insights, the essay contributes to a more comprehensive understanding of the determinants of human well-bei

“Happiness is a direction, not a place.”
Sydney J. Harris

2| THE ARCHITECTURE OF HAPPINESS ACROSS THE LIFE COURSE

Understanding how happiness evolves over time is one of the central questions in the economics of subjective well-being. Individuals move through different phases of life, and as they do so their priorities, constraints, and aspirations evolve. These transitions make the analysis of subjective well-being inherently dynamic, calling for an individual life-course perspective capable of capturing how people reassess what truly matters as they age.

This chapter places Life Satisfaction and its underlying domains at the centre of the discussion and asks how the architecture of happiness is built and rebuilt throughout life. The goal is not merely to describe how overall life satisfaction varies with age, but to identify the primary pillars that sustain well-being and to understand whether their relative importance shifts as individuals progress through adulthood and older age. Some domains, such as health and family relationships, may represent stable foundations, while others, such as work, leisure, or income, may gain or lose relevance as roles and responsibilities change.

By studying how these components are reweighted across the life course, the chapter aims to reveal the mechanisms through which individuals construct and revise their own evaluation of a good life.

Hypothesis Testing:

i. *How do life satisfaction and the various domain satisfactions evolve over the life span?*
ii. *Which life domains constitute the main pillars that sustain overall Life Satisfaction?*
iii. *Do these pillars change in relative importance as individuals age?*

Keywords: Subjective well-being; Life satisfaction; Domains satisfaction; Age trajectories; Happiness pillars; U-shape debate; Multidimensional well-being.

2.1 Introduction

The existing literature has long debated the connection between age and life satisfaction. The well-known *U-shaped* pattern, with higher satisfaction in youth, a trough in midlife, and a recovery in older age (Blanchflower & Oswald, 2008; Clark et al., 2018; Blanchflower, 2020), has dominated the discussion. However, recent longitudinal contributions (Frijters & Beatton, 2012; Cheng et al., 2017) have challenged this conventional narrative, showing that much of the apparent U-shape reflects *between-person differences* rather than *within-person changes*. Moreover, Frijters and Beatton (2012) demonstrate that such a relationship exhibits only when controlling for a set of socio-economic covariates, such as: income, employment, marital status, education, and family composition, while it largely vanishes once unobserved individual heterogeneity is accounted for through fixed-effects estimation. This suggests that the traditional U-shape may be, at least partly, a *statistical artefact* arising from compositional and selection effects rather than from genuine age-related dynamics in well-being.

Following Frijters and Beatton's methodological insight, the first part of this analysis examines how both *life satisfaction* and its underlying *life domains satisfaction* (health, income, family, work, sleep, leisure, social, housework, dwelling conditions) evolve with age without imposing any specific functional form, thus avoiding quadratic or higher-order polynomial constraints, and without including additional control variables. This *non-parametric specification* allows the age-satisfaction relationship to emerge freely from the data. *Section 2.2* estimates age coefficients for both *overall LS* and the ten *life domains*, using *pooled OLS* and *individual fixed-effects* models, thereby distinguishing *between-person* and *within-person* variation and providing a more accurate depiction of how happiness and its components evolve across the life course.

The results clearly suggest that *life satisfaction does not follow a conventional U-shape*. In the fixed-effects specification, in particular, life satisfaction tends to decline steadily from early adulthood to midlife, stabilise for a period, and then decline again at older ages, revealing a pattern that is different from the classical U-curve often documented, supporting recent findings of Frijters and Beatton (2012).

As concerns *domain-specific trajectories*, they exhibit substantial heterogeneity. Satisfaction in **domains closely related to physical conditions**, such as *health* and *sleep*, **shows a pronounced decline over the life course**, a pattern that is mirrored, though more moderately, in work satisfaction. By contrast, **domains linked to material conditions**, such as *dwelling satisfaction, household income, and personal income*, **generally improve with age**, reflecting better financial stability and housing conditions later in life. Other domains either remain remarkably stable over time (e.g., *family satisfaction, social satisfaction*) or display non-linear trajectories, as in the case of *housework satisfaction* and *leisure satisfaction*, which exhibit more complex age profiles.

Overall, OLS and fixed-effects estimates point in broadly similar directions, although differences in scale or even in the sign appear for some domains, like for work and family satisfaction, highlighting the importance of accounting for unobserved heterogeneity.

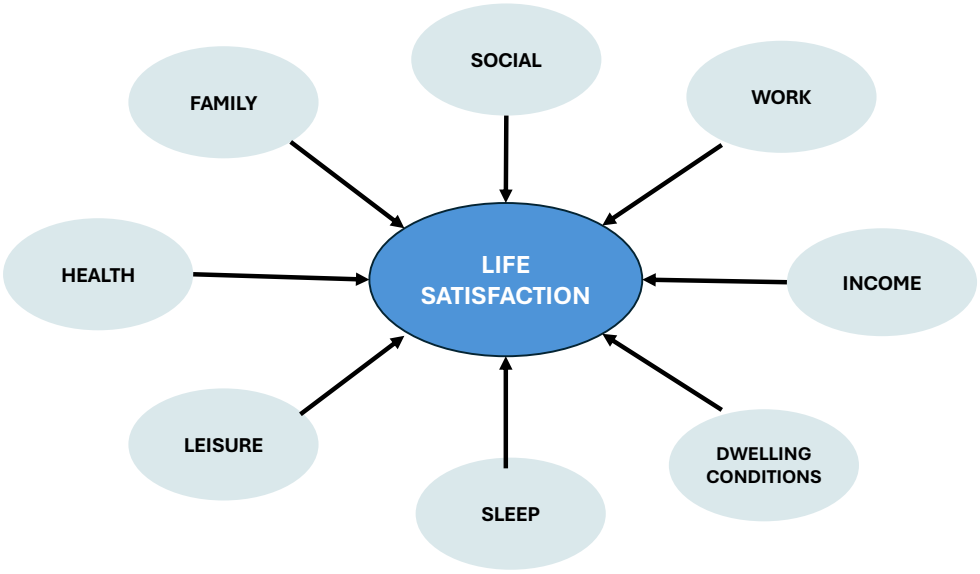
Moreover, this study goes beyond from simply examining the overall trajectory of LS and its domains by addressing an equally important and relatively underexplored question: *what are the key pillars of happiness, and whether they change across different stages of life*.

To frame this question, it is essential to consider how the literature conceptualises the way individuals form overall life evaluations. In the literature on subjective well-being, two main theoretical perspectives have emerged to explain how individuals evaluate their lives: the *top-down* and the *bottom-up* approaches.

The ***top-down* perspective** (Costa & McCrae, 1980; Steel, Schmidt & Shultz, 2008) argues that overall life satisfaction primarily reflects stable personality traits and dispositional tendencies, such as extraversion, neuroticism, or optimism, that influence how individuals interpret and experience events across all life domains. According to this view, life circumstances play only a secondary role: people with similar personalities are expected to report comparable levels of happiness, regardless of differences in their objective living conditions.

In contrast, the ***bottom-up* approach** (Headey et al., 1989; Diener et al., 1999; Ferrer-i-Carbonell & Frijters, 2004) conceives overall life satisfaction as a composite evaluation derived from satisfaction in specific life domains. Each domain represents a distinct source of utility. Individuals aggregate these partial satisfactions, consciously or not, into a global assessment of their quality of life.

Figure 2.1 A visual representation of the bottom-up model



This chapter follows the *bottom-up* perspective. **It assumes that overall life satisfaction can be interpreted as a *weighted average* of domain satisfactions**, where the relative importance of each domain may change over time as people's roles, aspirations, and constraints evolve. The empirical analysis thus aims to uncover the *weights* associated with each life domain and to examine how these weights shift throughout the life course, revealing, in other words, how the architecture of happiness itself transforms as individuals age. This investigation is carried out in the second part of the analysis (*Section 2.3 and 2.4*) through the use of *constrained regression models (CNS)* and *Shapley decompositions*, which jointly allow us to quantify the relative contribution of each domain and its evolution over time.

Taken together, the results emerging from the two approaches offer a coherent and mutually reinforcing picture: ***Health and family satisfaction* consistently emerge as the central pillars of overall well-being**, displaying the largest and most stable contributions across all age groups. ***Income-related domains* follow closely**, reflecting their increasing salience in shaping life evaluation. While these core pillars remain broadly stable over the life course, **their relative importance shifts across different stages of life**, with material conditions gaining weight as individuals age and other domains becoming more or less influential depending on the specific phase of the life cycle.

In light of these dynamics, three interrelated research questions structure the analysis: *How do life satisfaction and the various domain satisfactions evolve over the life span? Which life domains constitute the main pillars that sustain happiness? Do these pillars change in relative importance as individuals age?*

To address these questions, we rely on data from the **German Socio-Economic Panel (SOEP v38)**, a large-scale, nationally representative longitudinal survey that provides harmonised measures of overall life satisfaction and ten domain-specific satisfactions indicators for individuals aged 20 to 80. The richness of the SOEP, both in terms of sample size and temporal depth, makes it particularly well suited for this analysis: its panel structure allows us to disentangle age effects from cohort composition and unobserved heterogeneity, while the simultaneous availability of multiple life domains enables us to examine how the architecture of subjective well-being evolves across the life course.

By integrating three analytical components: *non-parametric age trajectories (Section 2.2)*, *constrained compositional regressions (Section 2.3)* and, *Shapley decompositions (Section 2.4)*, this chapter tries to provide a comprehensive account of how subjective well-being evolves throughout the life course. In doing so, it bridges two strands of research that have often developed in parallel: *the life-cycle analysis of happiness* and *the multidimensional approach to its determinants*.

2.2 Age Profiles of Life and Domain Satisfaction

This section examines how self-reported *Life Satisfaction* and other *Domains Satisfaction* evolves over the life course, distinguishing between *cross-sectional differences* and *within-person changes* over time.

2.2.1 Data and Methods

The analysis builds on a large literature documenting age patterns in subjective well-being. Cross-sectional studies such as Blanchflower and Oswald (2008) typically show a pronounced U-shape, with a midlife low observed in many countries. More recent contributions refine this view: Stone et al. (2010) highlight that different components of well-being follow distinct age profiles, while Schwandt (2016) stresses the role of shifting aspirations and evaluative processes. Taken together, these studies suggest that cross-sectional age gradients may partly reflect psychological mechanisms of adaptation and expectation formation.

Panel-data evidence, however, complicates this interpretation. Frijters and Beatton (2012) show that the U-shaped pattern largely vanishes once individual fixed effects are controlled for, implying that much of the midlife dip reflects unobserved heterogeneity and selective panel attrition rather than genuine within-person ageing. Similarly, Clark (2016) argues that observed cross-sectional age profiles capture stable personality traits and life circumstances as much as biological ageing. This distinction between cross-sectional and within-person evidence is therefore central to interpreting age–well-being patterns.

Building on this debate, this empirical analysis exploits data from the German Socio-Economic Panel (SOEP v38), a long-running household survey covering 1990–2022. The working sample includes all individuals aged 20 to 80 with non-missing information on overall life satisfaction and on ten domain-specific satisfactions items, each measured on a 0–10 scale. The domains considered are:

1. *Health satisfaction*
2. *Sleep satisfaction*
3. *Work satisfaction*

4. *Housework satisfaction*
5. *Household income satisfaction*
6. *Personal income satisfaction*
7. *Dwelling satisfaction*
8. *Leisure satisfaction*
9. *Family satisfaction*
10. *Social satisfaction*

Descriptive statistics are reported in *Table 2.1* (*Appendix A*). Mean life satisfaction is 7.12 points (SD = 1.80), while domain-specific satisfactions range from 6.08 (personal income) to 7.89 (family), indicating substantial heterogeneity across different life dimensions.

To trace the age–well-being profile without imposing functional-form restrictions, age is modelled *non-parametrically* through a full set of annual dummies from age 20 to 80. This flexible specification takes advantage of the large SOEP sample and allows satisfaction to vary freely across ages.

To assess how overall *Life and Domain-specific satisfactions* evolves across the life course, both cross-sectionally and within individuals, two complementary models are estimated and compared.

1. **Pooled Ordinary Least Squares (OLS):**

$$\text{LifeSat}_{it} = \sum_{a=20}^{80} \beta_a D_{a,it} + \varepsilon_{it} \qquad \textbf{1.1}$$

2. **Fixed Effects (FE):**

$$\text{LifeSat}_{it} = \sum_{a=20}^{80} \beta_a^{FE} D_{a,it} + \alpha_i + \varepsilon_{it} \qquad \textbf{2.2}$$

In both specifications, $\textbf{LifeSat}_{\textbf{it}}$, and analogously each *domain-specific satisfaction* measure, denotes the self-reported *life/domain satisfaction* of individual i in year t. The variables $\textbf{D}_{\textbf{a,it}}$ are a full set of age dummies equal to 1 if the respondent is age a in year t and 0 otherwise, so that

the coefficients $\boldsymbol{\beta_a}$ and $\boldsymbol{\beta_a^{FE}}$ trace the non-parametric age profile of life satisfaction in the pooled and within-person estimations, respectively. The term $\boldsymbol{\alpha_i}$ captures time-invariant individual heterogeneity in the FE model, while $\boldsymbol{\varepsilon_{it}}$ is an idiosyncratic error term. Standard errors are clustered at the individual level to account for repeated observations.

Importantly, **no additional control variables are included** in either specification. This choice is deliberate: the goal of the analysis is to isolate the *total association* between age and subjective well-being, rather than partial correlations conditional on life circumstances. Including controls such as income, employment, or marital status would mean to account for variables that are themselves endogenous outcomes of ageing, thereby removing precisely the mechanisms through which age affects *Life Satisfaction*. By estimating unconditional age profiles, we capture the genuine empirical shape of general well-being and domain-specific across the life course, before decomposing its potential drivers in subsequent analyses (*Section 2.3 and 2.4*).

By comparing the two estimated profiles, we can disentangle **cross-sectional age differences** (captured by OLS) from **within-person ageing effects** (captured by FE). The OLS curve reflects how average life satisfaction differs *between individuals* of different ages in the population at a given moment. The FE curve instead tracks how *the* same individual's well-being changes with age, net of all stable personal characteristics. This comparison is crucial because cross-sectional U-shapes may be driven by unobserved cohort or compositional effects. Evidence from Frijters and Beatton (2012), together with the broader discussion in Clark (2016), shows that once such unobserved differences are controlled for, life satisfaction no longer exhibits a pronounced midlife minimum followed by a strong rebound. Instead, the age profile becomes much flatter between early adulthood and late midlife, with only a modest upturn around retirement ages and a marked decline at very old ages.

As such, our approach, based on non-parametric annual age dummies in a large panel, provides a clear and data-driven representation of how life satisfaction evolves both between and within individuals, without relying on restrictive assumptions.

2.2.2 Comparing OLS and Fixed-Effects Age Profiles

Results related to this approach are reported in *Table 2.2 (Appendix A)*, where we present both pooled OLS and individual fixed-effects (FE) estimates with cluster-robust standard errors at the person level. As shown by Frijters and Beatton (2012), and more broadly by Ferrer-i-Carbonell and Frijters (2004), comparing OLS and FE estimates is informative about the extent to which age gradients reflect unobserved heterogeneity, selection, or compositional biases.

Broadly, we find that **FE age profiles are steeper** (in absolute value) **than pooled OLS in domains where ageing plausibly reduces capacities or tightens constraints** (overall *life satisfaction, health, sleep, work, family* and *social relations*). By contrast, **FE profiles are more positive than OLS in domains where ageing tends to increase resources or entitlements, or to lower aspirations** (household and personal income satisfaction, dwelling conditions, and, after midlife, leisure). This pattern is consistent with evidence on life-cycle changes in well-being, adaptation, and expectations/reference points in Stone et al. (2010), Schwandt (2016), and Blanchflower (2020).

These results tell us that **OLS tends to attenuate the overall impact of age on satisfaction across domains,** perhaps because cross-sectional differences capture a mixture of true aging effects and compositional factors that blur the within-person trajectory. In cross-sections, **older individuals are typically a positively selected group**: they tend to be healthier, wealthier, better educated, and more emotionally stable than those who have dropped out of the panel or did not survive to older ages. This **selective survival** and **cohort heterogeneity** bias the observed averages upward, making aging appear less detrimental than it actually is.

Moreover, cross-sectional estimates conflate **cohort effects**, systematic differences in attitudes, expectations, and reference standards between generations, with the genuine effects of aging. For example, younger cohorts often hold higher material aspirations or compare themselves to more ambitious reference groups, which depresses their reported satisfaction relative to **older cohorts**, who **tend to have lower expectations** and **greater adaptation** to their circumstances. As a result, **the OLS pattern may give the illusion of a flatter or even U-shaped trajectory**, when in fact the within-person evolution is monotonic and substantially stronger in magnitude.

Finally, the OLS attenuation may also reflect **reporting heterogeneity**: older respondents may anchor their satisfaction differently, either due to cognitive adaptation or shifts in social comparison norms, leading to smoother cross-sectional age gradients. By contrast, the **fixed-effects** approach removes all time-invariant individual characteristics and thus isolates the **pure aging effect**, showing how the same person's evaluation of each life domain evolves over time, once stable personality traits, upbringing, or long-term optimism are held constant.

The following paragraphs discuss the results for each life domain in detail. *Figures 2.2–2.3a-l* graphically display the estimated age profiles (OLS and FE) reported in *Table 2.2 (Appendix A)*.

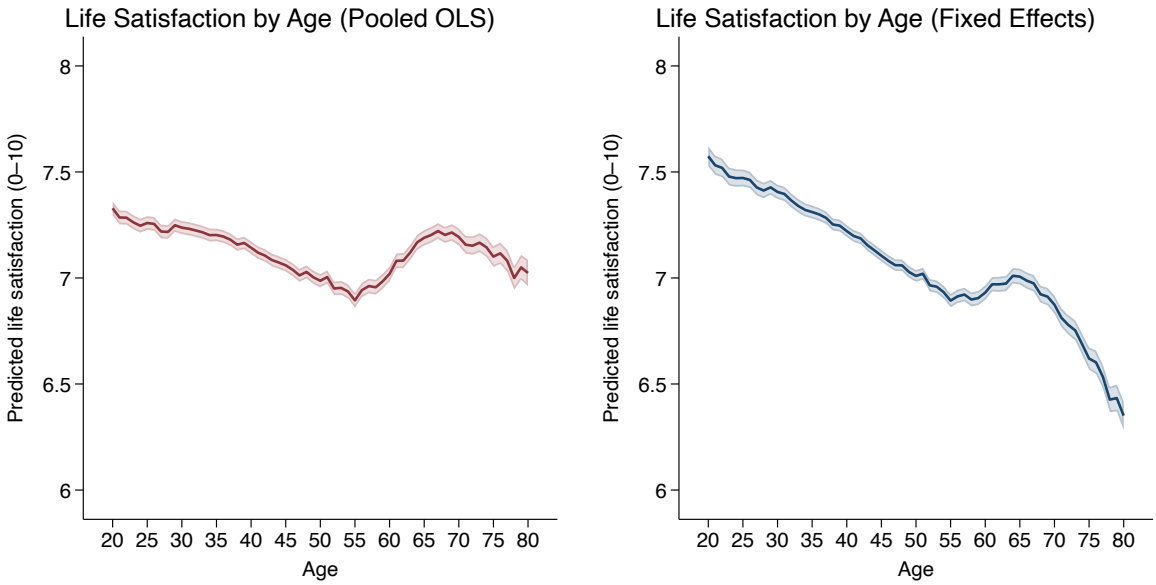
Overall Life Satisfaction and Aging

The evolution of overall life satisfaction (*Figure 2.1*) across the life course displays two distinct patterns, depending on whether cross-sectional or longitudinal variation is considered.

In the **Pooled OLS model**, life satisfaction shows a modest decline from early adulthood to midlife, followed by a mild recovery around the retirement years. Average predicted levels start from approximately 7.3 points in the early twenties, decrease steadily through the working years, and reach their minimum, around 6.9 points, between ages 50 and 55. After this period, the curve slightly rebounds, stabilising around 7.1–7.2 points in the early sixties, and remains relatively flat thereafter. This trajectory reproduces the well-known *U-shape in happiness* often reported in cross-sectional studies (Blanchflower & Oswald, 2008; Clark, 2016; Blanchflower, 2020). According to this literature, the given explanation is that: midlife captures a period of heightened stress and multiple role demands, while the subsequent recovery may reflect adaptation, improved time autonomy, and the transition out of full-time employment.

The **Fixed Effects (FE) model**, however, reveals a very different story. Once time-invariant individual characteristics are controlled for, **life satisfaction declines slowly but steadily across the life course, with only a brief plateau between ages 55 and 65**. Average levels start at around 7.5 points in early adulthood, then gradually fall across the following decades, reaching about 7.0 between ages 55 and 65, a phase where the decline briefly halts. This mild stabilisation likely reflects an adaptive adjustment in expectations: individuals recalibrate their aspirations and experience a temporary improvement in perceived well-being as they retire or reduce their work-related responsibilities. After this *short plateau*, life satisfaction begins to drop again, falling to around 6.5 points by the age of eighty.

Figure 2.2 Life Satisfaction and Age: Pooled vs Fixed Effects



The comparison between the two models is revealing. The flatter OLS profile conceals the genuine within-person decline observed in the FE estimates, suggesting that **cross-sectional composition biases**, such as healthier, wealthier, or more optimistic individuals being overrepresented among older cohorts, mask the true ageing process. This interpretation is consistent with Frijters and Beatton (2012), Clark (2016) and Schwandt (2016).

Overall, *Figure 2.2* suggests that ***life satisfaction*** **follows a monotonic, though gradual, downward path within individuals, with a modest stabilisation in the nearest of the retirement years, before resuming its decline in later life**. *What appears as a midlife dip followed by recovery in cross-sectional data thus represents, to a large extent, a statistical artefact driven by composition rather than a genuine improvement in subjective well-being*. Once we account for individual heterogeneity, the ageing process emerges as a gradual erosion of evaluative well-being, slowed, but not reversed, by temporary phases of adaptation.

Health-Sleep Satisfaction and Aging

Figure 2.3a shows ***health satisfaction*** trend, which exhibits a remarkably similar pattern across both the OLS and Fixed Effects (FE) specifications. In each case, satisfaction with health declines steadily across the life course, starting from high levels in early adulthood and deteriorating continuously thereafter. In the OLS model, average *health satisfaction* stands at approximately 7.9 points at age 20, drops to around 6.5 by the mid-fifties, and reaches about 5.4–5.5 by age 80.

The FE profile follows an almost identical trajectory. This close correspondence confirms that the age-related deterioration in perceived health is not merely compositional, but instead reflects a genuine within-person process of decline.

The near-parallel slopes of the two models imply that both cross-sectional and longitudinal evidence point toward a similar reality: individuals experience a gradual yet inexorable erosion of their perceived health status over time. This pattern is consistent with extensive evidence showing that functional capacity, subjective vitality, and evaluations of personal health tend to deteriorate with age due to cumulative physiological wear, higher chronic morbidity, and more frequent health shocks. These results are coherent with Gerstorf and colleagues (2013) which show that although later-born cohorts enjoy prolonged periods of stable functioning, the eventual downturn in cognitive, physical, and subjective health domains is steep and widespread, reflecting the well-documented terminal decline processes in very old age.

Figure 2.3b shows ***sleep satisfaction*** declines with age, though the pattern differs between FE and OLS.

In the OLS estimates, the decline is moderate and non-linear: satisfaction falls from about 7.4 points at age 20 to around 6.5 by the late fifties, followed by a mild improvement near retirement and a slight drop thereafter. This pattern supports evidence of midlife strain and partial recovery once time pressures ease (Stone et al., 2010).

FE estimates reveal an even more continuous and pronounced within-person decline, starting near 8.3 in early adulthood and falling steadily to around 5.5 by age 80, closely resembling the trajectory observed for health satisfaction. This suggests that ageing itself, rather than cohort composition, drives the deterioration.

These findings align with a broad physiological and psychological literature showing that sleep quality deteriorates with age. Ageing is associated with more frequent nighttime awakenings, reduced sleep continuity, and greater vulnerability to stress, comorbidities, and medication side effects, all of which exacerbate sleep fragmentation (Léger et al., 2008). Consistent with Steptoe et al. (2015), poor sleep both reflects and contributes to declines in physical and emotional well-being in later life, suggesting that the FE pattern captures a process of cumulative biological wear and sleep-related strain.

Figure 2.3a Health Satisfaction and Age: Pooled vs Fixed Effects

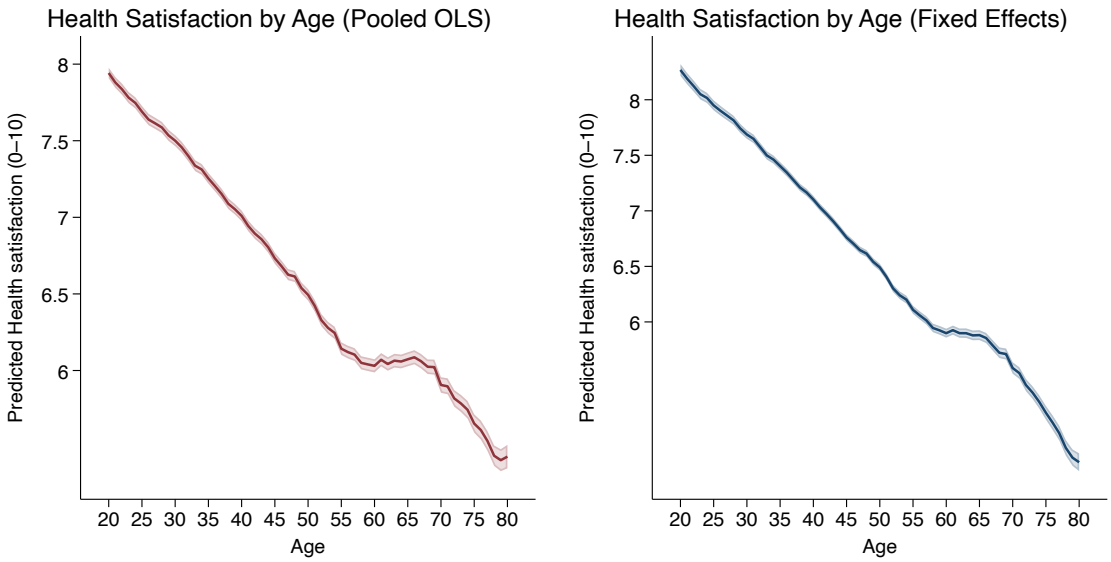
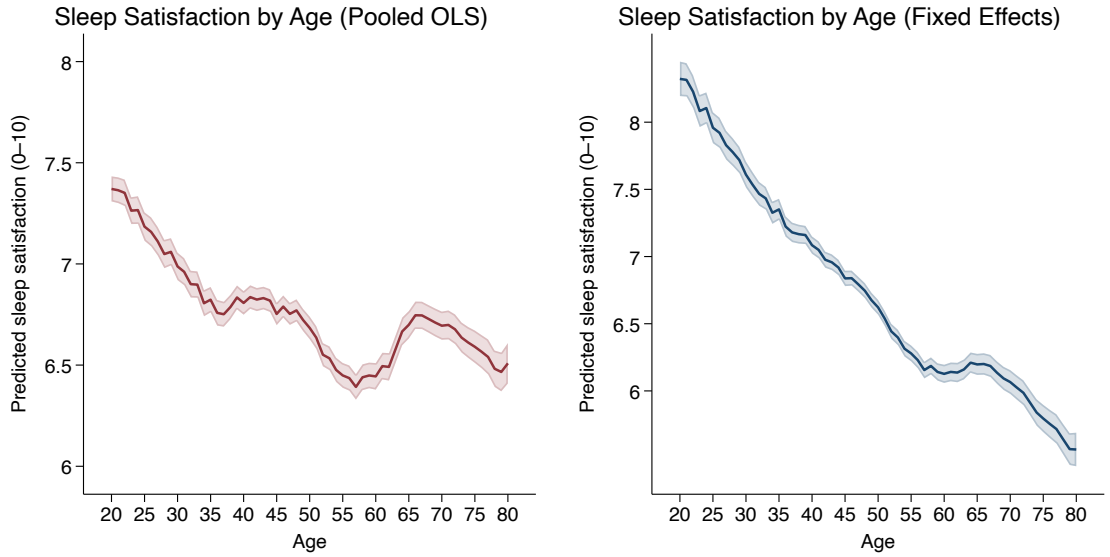


Figure 2.3b Sleep Satisfaction and Age: Pooled vs Fixed Effects

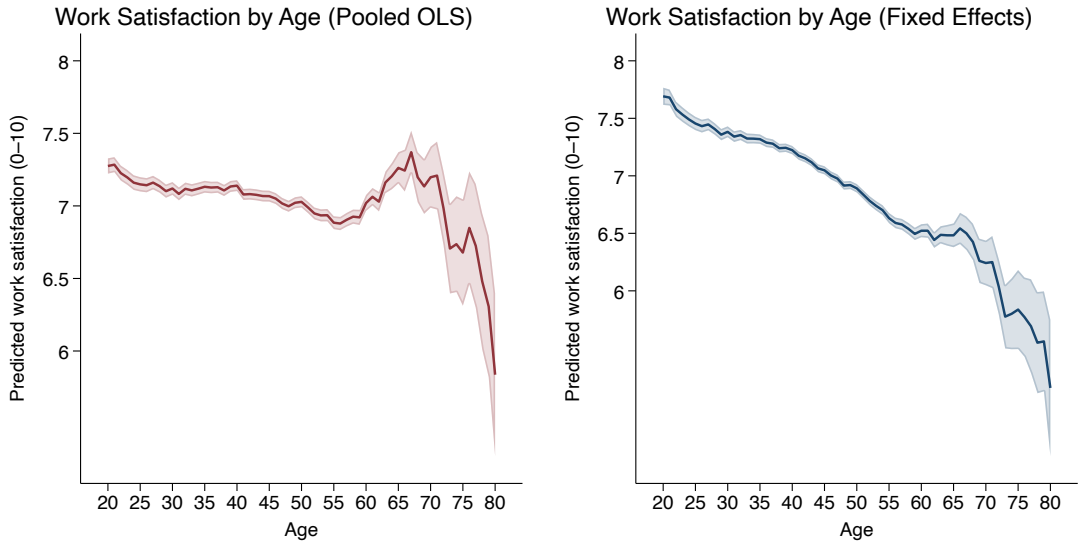


Work Satisfaction and Aging

In line with the patterns observed for sleep and *health satisfaction,* ***work satisfaction*** also declines as individuals age, though at a more gradual pace (*Figure 2.3c*). In the OLS specification, the decline is mild: satisfaction averages around 7.3 points in the twenties and remains relatively stable until the mid-fifties, dipping slightly to about 6.9, before becoming noisier in later life. This stability mainly reflects *compositional selection*, older individuals who remain employed are typically healthier, more experienced, and in more fulfilling positions, which compresses cross-sectional differences across age groups.

As concerns **Fixed-Effects estimates,** they reveal a clearer and more persistent within-person erosion. Work satisfaction starts at roughly 7.7 points in early adulthood, falls to around 6.5 by the mid-fifties, and declines further below 5.2 by age 80. This sustained within-person drop suggests that **ageing in the labour market is accompanied by rising job strain, plateauing career prospects, and declining physical or cognitive stamina**. This evidence aligns with prior findings that ageing workers experience a gradual deterioration in perceived job quality and motivation, consistent with the literature on job strain and ageing (Clark, 1997; Ilmarinen, 2001).

Figure 2.3c Work Satisfaction and Age: Pooled vs Fixed Effects



Economic and Material Satisfaction over the Life Course

A distinct picture emerges when turning to the *economic* and *material dimensions* of well-being. In contrast to the declining patterns observed for health, sleep, or work, the domains related to *household income, personal income, and dwelling* display a clear upward trajectory across the life course, suggesting that **ageing tends to consolidate rather than erode perceived economic security**.

For both ***household income*** (*Figure 2.3d*) and ***dwelling satisfaction*** (*Figure 2.3f*), **the relationship with age follows a *concave U-shape*.** In the OLS estimates, satisfaction dips slightly during early adulthood, around the mid-twenties, before rising steadily throughout midlife and later years. The FE profiles mirror this pattern: starting from approximately 6.3 (*HH income*) and 7.5 (*dwelling conditions*) points in young adulthood, both domains increase slowly, reaching values close to 6.5 (*HH income*) and 8 (*dwelling conditions*) by age 60, and continuing

to climb in later life. This initial trough likely reflects the economic vulnerabilities of early career stages, when individuals face unstable earnings, job uncertainty, and high expenditure related to household formation and mobility. With age, these conditions progressively reverse, leading to higher evaluations of both financial and residential circumstances. The concavity of the two curves shown in *Figures 2.3d and 2.3f* aligns with reference-adaptation theories (Clark et al., 2008; Van Praag & Ferrer-i-Carbonell et al., 2004), which posits that satisfaction depends not only on absolute resources but also on expectations and comparative standards. As individuals age, aspirations tend to stabilise and material goals become easier to attain, so that a given level of objective resources yields higher subjective satisfaction. This pattern is also consistent with the housing-adjustment hypothesis (Glaeser & Gottlieb, 2009), according to which individuals progressively align their residential conditions with their long-term preferences.

The trajectory of ***personal income satisfaction*** differs slightly (*Figure 2.3e*), **exhibiting a nearly linear increase throughout the life span**. In both OLS and FE models, satisfaction rises steadily from early adulthood into retirement, moving from roughly 5.5 to 7 points in OLS, and from 3.7 to more than 8 points in the FE specification. This linear trend underscores the importance of individual financial autonomy as a key driver of subjective well-being. While part of the increase can be attributed to rising earnings and tenure-related gains, psychological mechanisms play an equally central role. With age, people's reference groups narrow, their consumption needs moderate, and their sense of financial adequacy strengthens, even as absolute income growth slows.

Notably, the sustained rise in income satisfaction **beyond retirement** reinforces this interpretation: fixed pension income provides stability and predictability, while diminished social comparison and expenditure needs lead to higher perceived sufficiency. Together, these patterns suggest that ageing is associated with a **recalibration of financial expectations and preferences**, producing sustained gains in economic satisfaction even when objective circumstances plateau.

Overall, the three economic domains (*Figures 2.3d-2.3e-2.3f*) reveal that while **ageing may bring health and social challenges, it simultaneously enhances perceived financial and material security**, partly through adaptation, partly through the accumulation of resources, and partly through a shift in evaluative standards that redefine what it means to be "satisfied" in later life.

Figure 2.3d Household income Satisfaction and Age: Pooled vs FE.

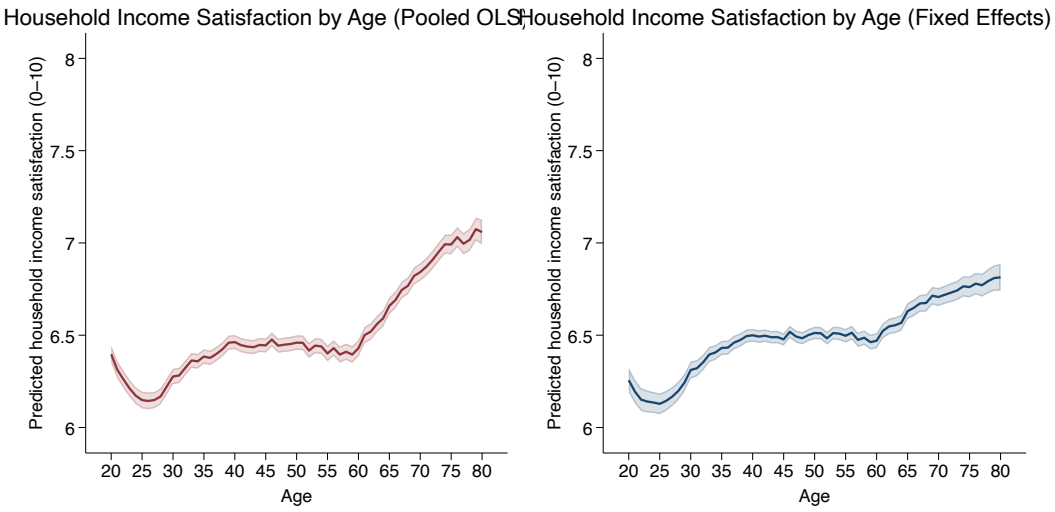


Figure 2.3e Personal income Satisfaction and Age: Pooled vs FE

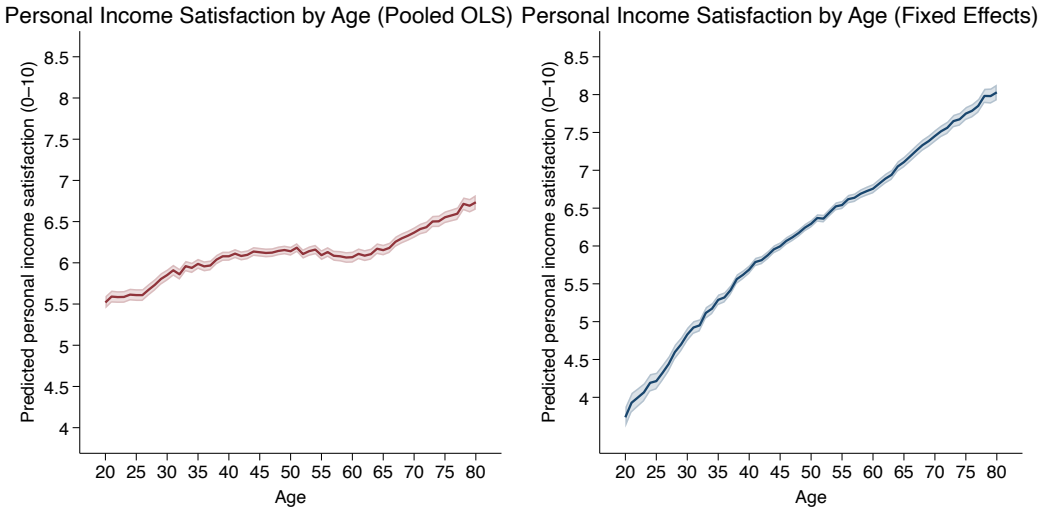
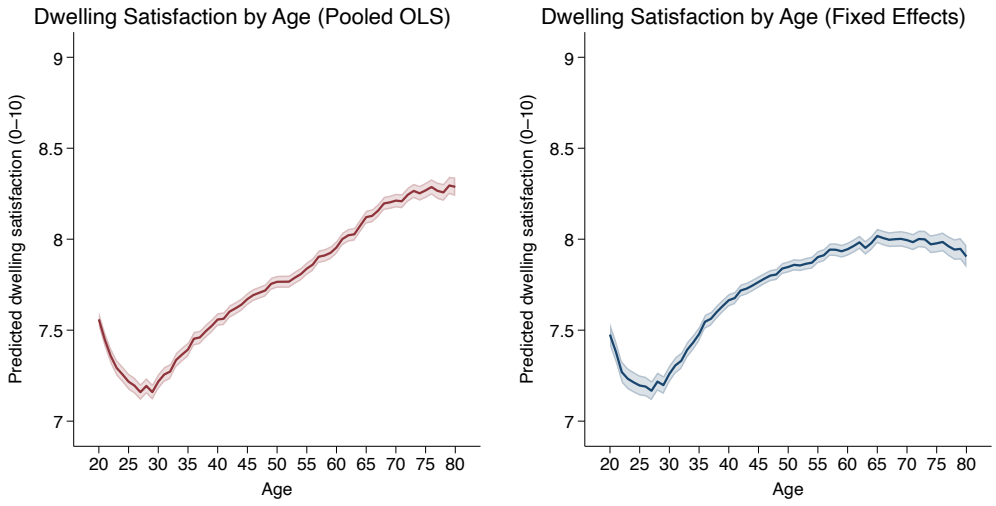


Figure 2.3f Dwelling Conditions Satisfaction and Age: Pooled vs FE



Family and Leisure Satisfaction over the Life Course

Turning to the more relational and time-related domains, ***family*** and ***leisure satisfaction*** provide two complementary perspectives on how individuals' social and affective environment evolves with age. The patterns depicted in *Figures 2.3g and 2.3h* suggest that while ***family satisfaction*** **follows a moderately decline over time with a *plateau* and a slight rebound between 45-70 years**, ***leisure satisfaction*** **displays a clearer U-shape, with a pronounced rebound after retirement and a slight flattening thereafter**.

In the case of ***family satisfaction***, the within-person (FE) trajectory starts at relatively high levels, around 8.5 points in the early twenties, and then declines steadily through the first half of the life course, reaching approximately 7.7 by the mid-forties. This downward trend coincides with the period of maximum role accumulation and conflict: the years when individuals face the simultaneous pressures of partnership maintenance, childrearing, and peak work intensity. These findings resonate with the concept of "role strain," in which competing family and professional responsibilities compress emotional resources and reduce the perceived quality of family interactions (Clark & Georgellis, 2013). From the mid-forties to the late fifties, the trajectory stabilizes, before showing a modest rebound between ages 60 and 70. This improvement likely reflects an adaptive **reprioritization of goals**: as individuals approach retirement, time scarcity eases, intergenerational tensions diminish, and family relationships become increasingly valued for emotional support rather than instrumental coordination. This interpretation aligns closely with *socioemotional selectivity theory* (Carstensen et al., 1999), according to which aging leads individuals to invest more selectively in emotionally meaningful relationships. However, after the age of 70, family satisfaction begins to decline once more, likely reflecting the onset of loss and dependency within the family network, spousal illness, bereavement, or caregiving fatigue. The late-life decrease is thus less a sign of reduced attachment than of changing circumstances that limit the quality or frequency of interaction. The OLS profile, in contrast, remains relatively flat across adulthood and even mildly positive at older ages, illustrating again how cross-sectional averages are smoothed by *compositional effects*. The FE specification corrects for this survivorship bias and thus reveals the genuine intra-personal decline that accompanies aging, consistent with longitudinal evidence on marital satisfaction (VanLaningham, Johnson & Amato, 2001).

The pattern of ***leisure satisfaction*** shown in *Figure 2.3h* is close to the textbook U-shape often associated with overall well-being. Both OLS and FE reveal a substantial midlife trough followed

by a strong increase after the age of 40, which peaks around 70 years old before leveling off and declining slightly thereafter. Both curves capture this dynamic vividly: leisure satisfaction drops from its early-adulthood levels, bottoms out around 40, and then rises sharply once these constraints recede. This steep post-60 rebound reflects the transition into retirement, which redistributes time from market and care activities to discretionary domains. The stabilization after 70 likely signals the point at which the gains from time autonomy are offset by health limitations or social losses that restrict participation in activities.

Figure 2.3g Family Satisfaction and Age: Pooled vs FE

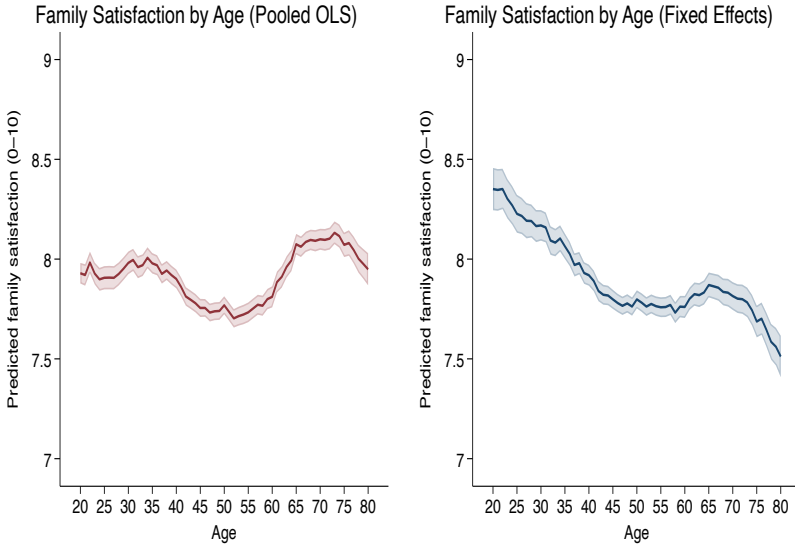


Figure 2.3h Leisure Satisfaction and Age: Pooled vs FE

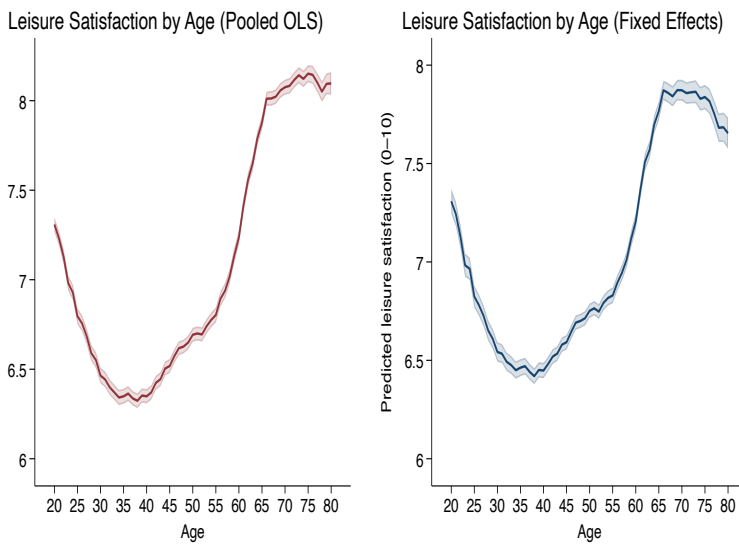


Figure 2.3i Social Satisfaction and Age: Pooled vs FE

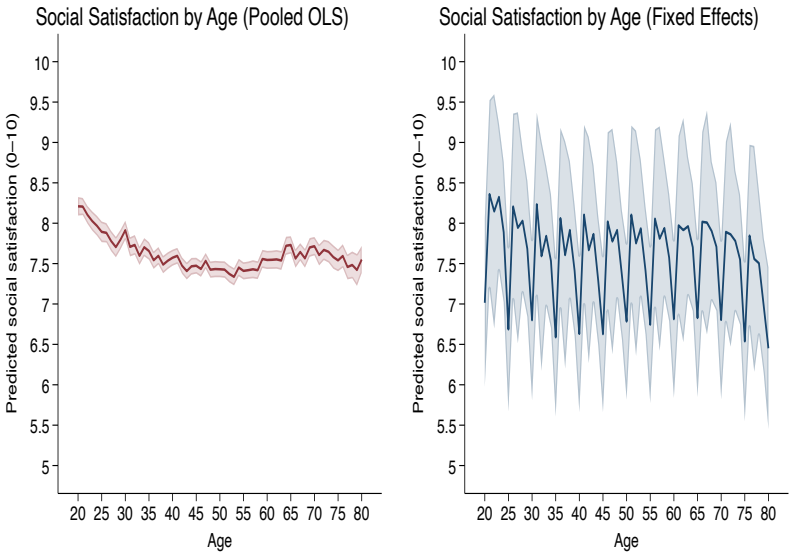
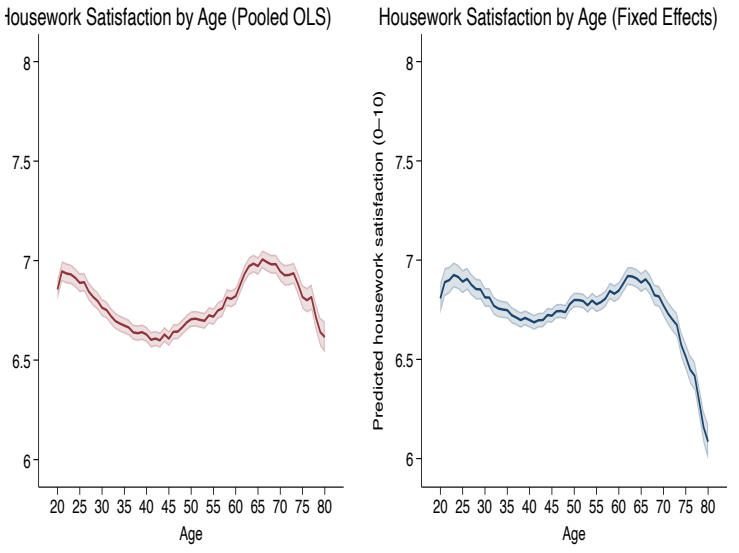


Figure 2.3i Housework Satisfaction and Age: Pooled vs FE



Overall, the trajectories of *family* and *leisure satisfaction* are consistent with the life-course framework, according to which ageing is accompanied by processes of adaptation and socioemotional selectivity, mechanisms that progressively redirect individuals toward emotionally meaningful goals and close social relationships, thereby shaping patterns of subjective well-being across older adulthood (Stone et al., 2010; Carstensen et al., 1999).

The last two domains, *social* and *housework satisfaction*, show comparatively muted age gradients (*Figures 2.3i–2.3l*). Social satisfaction remains largely flat across the life course, with no consistent within-person trend once stable traits are controlled for, suggesting that individuals adapt to network changes by prioritizing fewer but emotionally meaningful ties, as proposed by Carstensen et al. (1999). *Housework satisfaction*, instead, follows a mild U-shape, declining during the high-pressure midlife years, recovering around retirement, and falling vertiginously after 70 as domestic tasks become more physically demanding. These two domains thus capture different facets of aging adaptation: the former reflecting emotional regulation and selectivity, the latter the tangible limits of time and energy that re-emerge in old age.

2.3 Decomposing Happiness: A Life-Cycle Analysis of Domain Contributions

The previous analysis examined how both overall life satisfaction and the satisfaction derived from specific *life domains* change in relation to personal characteristics and age-related life-course dynamics. Here, the objective shifts: we investigate *how overall well-being can be represented as the weighted sum of satisfaction in multiple life domains, and how these relative weights evolve across different stages of life*.

2.3.1 Methodology: The Constrained Nonnegative Sum (CNS)

The analysis builds on the *bottom-up model* of subjective well-being (Diener, 1984), which posits that global life satisfaction reflects an implicit cognitive aggregation of evaluations across life domains such as *health, work, income, family, and leisure*. In line with this conceptual framework, and following the empirical tradition of Ferrer-i-Carbonell and Frijters (2004) and Clark (2016), we model life satisfaction as a convex combination of domain satisfactions, imposing **non-negativity** and **additivity constraints** on the weights **to ensure interpretability as relative contributions to overall happiness**.

Formally, the model can be expressed as:

$$LS_{it} = \sum_{j=1}^{J} w_j \, DS_{jit} + \varepsilon_{it}, \qquad \textbf{2.3}$$

where LS_{it} denotes the reported overall life satisfaction of individual **i** at time **t**, DS_{jit} represents satisfaction with domain **j**, and w_j captures the relative weight of domain j in the composition of overall well-being.

To ensure that the coefficients are interpretable as ***shares of contribution***, two constraints are imposed:

- **Non-negativity** $w_j \geq 0 \quad \text{for all } j,$ **2.4**

- **Additivity** $\sum_{j=1}^{J} w_j = 1.$ **2.5**

These restrictions define what we refer to as a ***Constrained Nonnegative Sum (CNS) model***, in which the estimated coefficients represent the proportion of total *life satisfaction* that can be attributed to each domain. The *non-negativity constraint* prevents the interpretation of any domain as detrimental to happiness, while the *additivity constraint* ensures that the resulting weights are directly comparable and sum to unity.

The *CNS model* has to be interpreted mainly as *descriptive*: it does not seek to isolate marginal causal effects but to recover the internal structure through which different life domains jointly shape subjective well-being. Consequently, **no additional covariates**, such as socio-demographic characteristics or income levels, are included in the estimation. Introducing controls would remove the shared variation between *life satisfaction and the domains themselves*, altering the interpretation of the coefficients from *observed contributions* to *partial effects*. By excluding such controls, the ***CNS approach*** **preserves the meaning of w_j as the unconditional share of each domain in the composition of happiness**.

Similarly, the ***domain variables*** are ***not standardized*** prior to estimation. Since all *domain satisfactions* in the SOEP are measured on an identical 0–10 scale, standardization is neither necessary nor desirable. Standardizing would equalize variances across domains, artificially eliminating differences in dispersion that reflect genuine variation in how each life aspect influences subjective well-being. Retaining the original scale ensures that the estimated weights capture both the average level and the natural variability of each domain, thus reflecting their empirical salience in explaining overall *life satisfaction*.

To explore whether the internal structure of happiness varies across the life course, the model is estimated separately for four age cohorts: **20–30, 31–45, 46–65, and 65+ years**. This partition follows both theoretical and empirical conventions in the literature (Frijters and Beatton, 2012; Blanchflower, 2020), and aligns with distinct life stages marked by transitions in social roles and priorities. The first group 20-30 years, corresponds to early adulthood,

characterized by entry into the labour market and the formation of individual identity; the second group 31-45 years, to the consolidation phase of family and professional life; the third corresponds to late-career and pre-retirement phase; and the fourth to retirement and health adaptation. Estimating the *CNS model* within each cohort allows us to trace how the relative importance of domains, *health, household income, personal income, work, family, leisure, sleep, housework and dwelling conditions*, evolves along the life cycle.

Estimation proceeds by minimizing the sum of squared deviations between observed and predicted life satisfaction under the two linear constraints described above.

Formally, the vector of weights $w = (w_1, \ldots, w_j)'$ is obtained as the solution to:

$$\min_{\mathbf{w}} \sum_{i,t} \left(LS_{it} - \sum_{j=1}^{J} w_j DS_{jit} \right)^2 \quad \text{s.t.} \quad w_j \geq 0, \sum_{j=1}^{J} w_j = 1. \qquad \textbf{2.6}$$

This procedure is conceptually related to *relative importance analysis* and *importance-weighting* approaches (Lindeman, Merenda and Gold, 1980; Johnson and Lebreton, 2004), which aim to partition the explained variance of a dependent variable among correlated predictors. However, unlike those techniques, the *CNS method* imposes *convexity* constraints that allow the estimated coefficients to be interpreted directly as *compositional shares* of overall well-being rather than as partial contributions to variance.

Through this formulation, the *CNS model* provides a parsimonious and interpretable representation of the *multidimensional* architecture of subjective well-being. Whereas traditional regressions would identify *which variables matter* for happiness, the ***CNS* framework identifies how much each domain matters within the subjective construction of well-being**. This approach thus complements causal analyses by revealing the life-cycle dynamics of happiness composition, **showing how individuals progressively reweight the relative importance of material, relational, and affective dimensions as they age**.

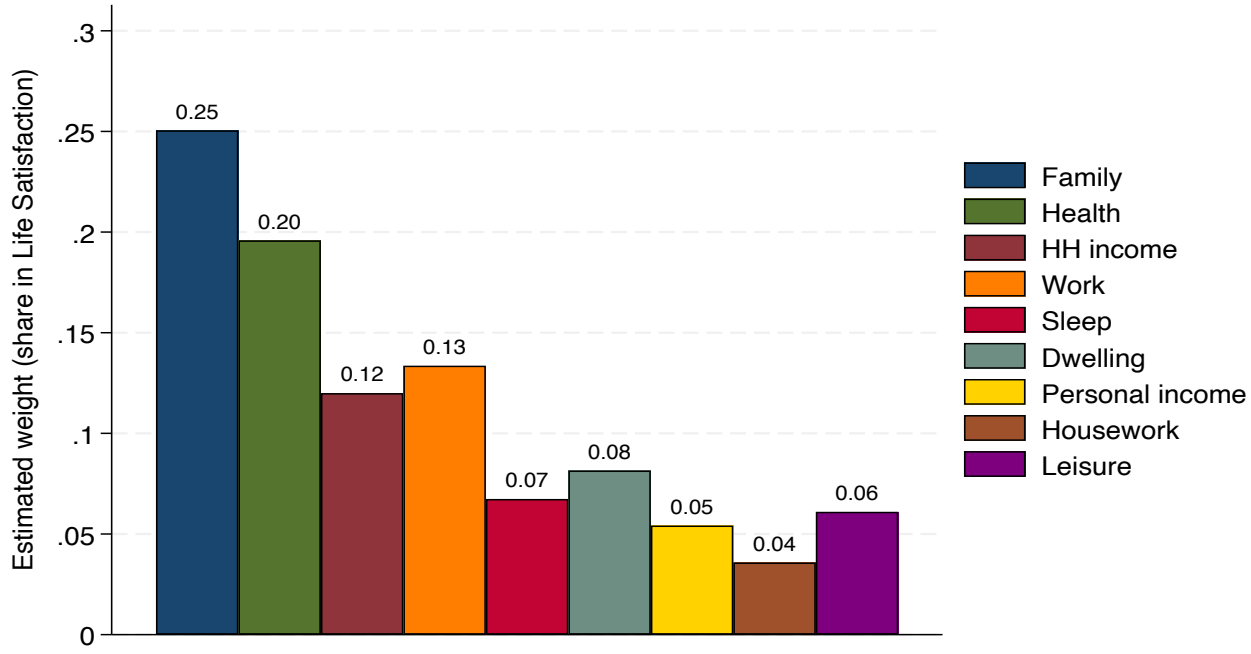
2.3.2 Empirical Results from the CNS Model: Composition of Happiness

This section presents and discusses the results of the *Constrained Nonnegative Sum (CNS) estimation*. The analysis proceeds in two steps. We first examine the estimated compositional weights obtained for the *full sample*, to outline the average structure of happiness in the population. We then assess how this structure varies across the *four age cohorts*, 20–30, 31–45, 46–65, and 66 years and above, thereby exploring whether the relative importance of *life domains* changes systematically over the life course.

Before presenting the results, it should be noted that the *social satisfaction* domain is not included in the analysis, as the number of valid observations for this variable is relatively low and its inclusion would have substantially reduced the sample size. The estimated model therefore comprises **nine domains**, *health, sleep, work, housework, household income, personal income, dwelling, leisure, and family*, each measured on a 0–10 scale. These variables capture the main material, experiential, and relational components of subjective well-being as available in the SOEP.

The first column of *Table 2.3* (*Appendix A*) reports the results of the *CNS regression* for the full sample (**N = 156,961**), while *Figure 2.4* provides a visual representation of the estimated compositional weights. The coefficients are interpreted as *shares of contribution* to overall *life satisfaction*: higher weights indicate domains that contribute more strongly to explaining cross-sectional variation in happiness. All estimated coefficients are positive and highly significant, consistent with the non-negativity constraint, and the set of weights sums to one, as required by the additivity restriction. The overall model fit, summarized by a Root Mean Squared Error (RMSE) of 1.22, can be regarded as an indicator of the model's goodness of fit. This value suggests that the *convex* aggregation of domain satisfactions provides a satisfactory approximation of the observed variation in life satisfaction across individuals. The *CNS* procedure does not report a conventional R^2 statistic, as the estimation is performed under linear constraints and differs from standard ordinary least squares; therefore, the RMSE represents the most informative measure of model accuracy in this context.

Figure2.4 Estimated CNS Coefficients for the full sample



The results reveal a well-defined hierarchy in the composition of happiness. **The largest contribution is associated with *family satisfaction*** (w ≈ 0.25), highlighting the fundamental role of interpersonal relationships and affective ties in shaping overall well-being. This finding echoes extensive evidence showing that *social connectedness and family bonds are among the most powerful correlates of life satisfaction* (Helliwell and Putnam, 2004; Clark et al., 2008).

The second most influential factor is *health satisfaction* (w ≈ 0.20), confirming that perceived health is a cornerstone of subjective well-being and a prerequisite for the enjoyment of other life domains. Together, family and health account for nearly half of total life satisfaction in the pooled sample, representing the emotional and physical pillars of happiness. ***Work satisfaction*** (w ≈ 0.13) and ***household income satisfaction*** (w ≈ 0.12) form the next tier of importance. These domains reflect instrumental aspects of well-being, economic security and job fulfillment, whose contributions are substantial but secondary relative to relational and health dimensions. The magnitudes emphasize that both income and employment quality are key, though not dominant, determinants of life satisfaction in line with prior evidence from Ferrer-i-Carbonell and Frijters (2004) and Clark (2016), which consistently show that economic resources and job-related experiences do matter for subjective well-being, yet their explanatory power remains modest once compared to relational and health dimensions. A moderate share is attributed to ***dwelling satisfaction*** (w ≈ 0.08), indicating that housing conditions and perceived comfort play a meaningful yet limited role in shaping overall well-

being. ***Sleep*** and ***leisure satisfaction*** contribute similarly (w ≈ 0.06–0.07), capturing the experiential and restorative dimensions of life that, while important, exert less influence on overall evaluations than health or family.

Finally, **personal income satisfaction** (w≈0.05) and **housework satisfaction** (w≈0.04) show the smallest but statistically significant contributions. The relatively modest impact of income-related domains, compared to family and health, reinforces a recurrent empirical finding: beyond a certain threshold, financial satisfaction explains only a small fraction of happiness differences (Easterlin, 1995; Kahneman and Deaton, 2010).

However, the role of **income and material conditions should be interpreted in a broader sense**, as these factors collectively shape a common *material well-being dimension*. In fact, both *household* and *personal income satisfaction*, together with elements of *work satisfaction* (reflecting job stability and earning potential) and *dwelling satisfaction* (capturing housing and living conditions), contribute to this macro-area of economic and material security. **When considered jointly, these domains represent a substantial component of overall life satisfaction**, even if their individual coefficients appear modest when viewed in isolation.

Overall, the results illustrate that happiness is a multidimensional construct, with family and health as its core, work and household income as strong instrumental supports, and dwelling, leisure, sleep, personal income, and housework providing complementary variation.

2.3.3 Empirical Results from the CNS Model: How Domains Contribution Evolve Across the Life Course

The next step is to examine **whether and how the estimated weights w_j** vary across the life span. The evolution of these compositional weights across cohorts, reported in *Table 2.3* and illustrated in *Figures 2.5a–2.5d (Appendix A)*, reveal systematic and intuitive changes in the internal structure of happiness over the life course. While all *domains* continue to contribute significantly to overall well-being, their **relative importance shifts in ways that align closely with life-cycle theory and existing evidence on subjective well-being.**

Among **individuals aged 20–30** (*Figure 2.5a in Appendix A*), the composition of happiness reflects the priorities of early adulthood. *Work satisfaction* accounts for about 15% of overall life satisfaction, while *health* (21%) and *family* (22%) are almost equally important, forming

the core of well-being at this stage. The relatively **high contribution of *work satisfaction* highlights the salience of labour-market experiences, career expectations, and identity formation in young adulthood**. Income-related domains contribute moderately: *household income* explains around 8% and p*ersonal income* 6%, confirming that material well-being is perceived as relevant but not yet predominant. *Leisure* (8%) and *sleep* (8%) also play a noticeable role, reflecting the value attached to personal balance and rest during this life phase.

In the **31–45 age group** (*Figure 2.5b in Appendix A*), the structure of happiness changes markedly. ***Family satisfaction*** rises to approximately 27.5%, **emerging as the single largest component of life satisfaction**. This sharp increase likely mirrors the consolidation of family life, the presence of children, and the emotional centrality of close relationships during prime adulthood. The relative importance of *work satisfaction* decreases slightly to 13%, and *sleep satisfaction* declines to 6%, consistent with time constraints and the competing demands of career and family. At the same time, *household income satisfaction* almost doubles compared to the youngest cohort, reaching 13%, underscoring the growing relevance of financial stability and material security as individuals face major economic and caregiving responsibilities. In contrast, *leisure satisfaction* falls to 5%, possibly reflecting reduced discretionary time and the work–family trade-offs typical of this stage.

In the **46–65 age group** (*Figure 2.5c in Appendix A*), **the composition of happiness stabilizes** but reveals some important rebalancing. *Family satisfaction* remains high at around 24%, though slightly lower than in the previous cohort, while *health satisfaction* and *work satisfaction* remain stable if compared to 31-45 cohort. Satisfaction with *dwelling conditions* increases to 9%, suggesting that **housing comfort and stability become more salient as individuals spend more time at home**.

Finally, for **older adults aged 66 and above** (*Figure 2.5d in Appendix A*), **the structure of happiness changes, although not dramatically**. *Health satisfaction* increases further to about 21%, confirming, together with *family satisfaction* (25%), one of the two main pillars of well-being. *Work satisfaction* drops sharply to 8%, consistent with the declining importance of professional identity following retirement. Conversely, *dwelling satisfaction* rises to 11%, indicating that housing and living conditions become particularly central for the elderly, who spend more time at home and rely on domestic environments for comfort and social interaction.

Household income satisfaction remains significant (14%), reflecting the continued relevance of financial stability and pension adequacy in later life.

Figures 2.6a and 2.6b provide an integrated visual summary, displaying the coefficients jointly to facilitate comparison across age groups and to highlight the main patterns of reweighting. Several trends emerge: **some domains remain remarkably stable over time**, such as *personal income satisfaction, housework satisfaction*, and, somewhat unexpectedly, *health satisfaction*, whose relative weight fluctuates only marginally across cohorts, indicating that **feeling healthy constitutes a central and persistent pillar of life satisfaction regardless of age**.

In contrast, *dwelling satisfaction* displays a steady and pronounced increase, almost doubling its relative contribution from early to late adulthood, suggesting that **housing and living conditions become progressively more central for SWB as individuals age**.

Figure 2.6a Estimated CNS coefficients for - health, family, household income, personal income - across the four age cohorts (20–30, 31–45, 46–65, 65+)

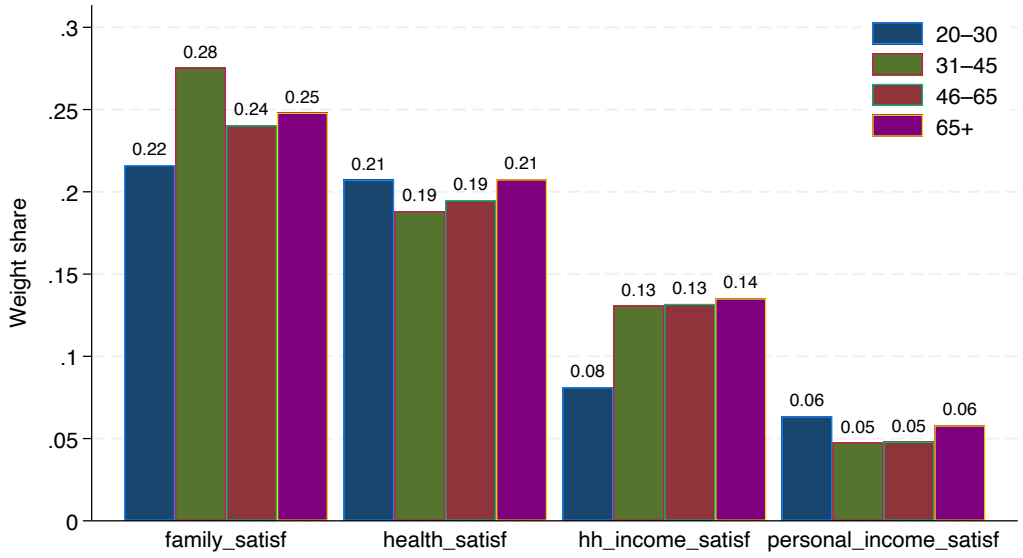
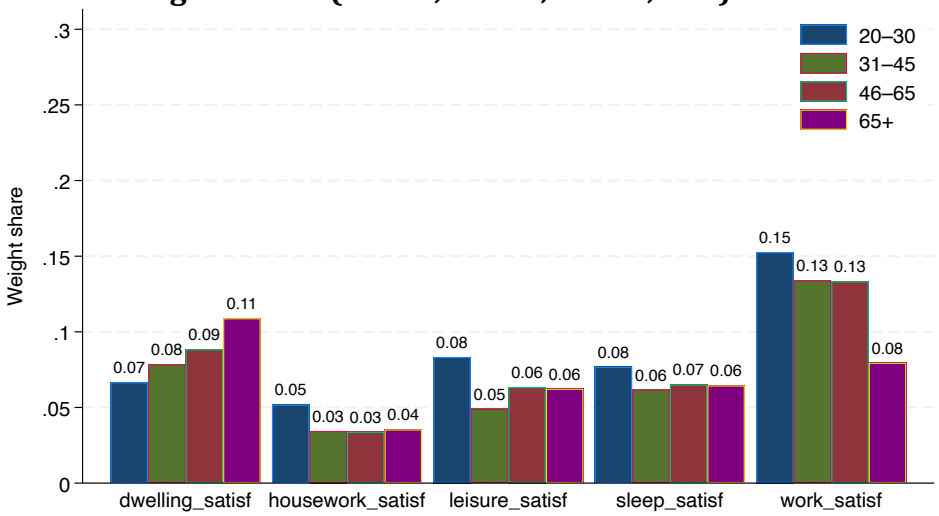


Figure 2.6b Estimated CNS coefficients for - dwelling conditions, housework, sleep, work - across the four age cohorts (20–30, 31–45, 46–65, 65+)



By contrast, ***sleep* and *leisure satisfaction* are relatively more important in early adulthood**, when time flexibility and lifestyle dynamics play a stronger role in shaping daily well-being, but their weights stabilize at lower levels in midlife and later years. ***Family satisfaction* reaches its maximum importance in the 31–45** age range, reflecting the emotional and relational centrality of family life during this stage, **and remains one of the main pillars of happiness thereafter**. ***Household income satisfaction* increases substantially from the youngest to the middle-aged cohorts**, consistent with rising financial responsibilities, but then stabilizes at a comparable level across older groups. Finally, ***work satisfaction* shows a gradual decline throughout the life course** and drops sharply after retirement, as expected given the reduced relevance of employment in later life.

2.4 Robustness Analysis via Shapley Value Decomposition

To validate the compositional patterns obtained with the *Constrained Nonnegative Sum (CNS)* model and assess the robustness of the previous findings, this section introduces a *Shapley value decomposition of explanatory power*. While the *CNS* specification imposes a convexity structure, requiring all domain weights to be non-negative and summing to one, the *Shapley approach* provides a *model-free* assessment of variable importance by quantifying each domain's marginal contribution to the model's goodness of fit, averaged across all possible permutations of regressors (Lindeman, Merenda and Gold, 1980).

The *Shapley decomposition* serves two main purposes. First, it offers an **independent benchmark** to verify whether the domains identified as most influential in the *CNS model* retain their prominence when functional restrictions are removed. Second, because *life domains* are often highly correlated, the Shapley framework provides a principled way to **deal with multicollinearity** by fairly distributing the shared explanatory power among correlated predictors, thus isolating each domain's unique contribution to overall explanatory power.

In this sense, Shapley values constitute a rigorous **robustness check** of the *CNS decomposition*. If both methods deliver similar rankings and magnitudes of importance across domains, confidence in the interpretation of the composition of happiness is strengthened. Conversely, **discrepancies between the two approaches may reveal domains whose apparent relevance in the *CNS model* is driven by its imposed constraints rather than by intrinsic explanatory power**.

2.4.1 Shapley Methodology

This section formalizes the *Shapley methodology* and explains how it decomposes the explained variance of the life satisfaction model.

The method originates from cooperative game theory (Shapley, 1953) and was adapted to regression analysis by Lindeman, Merenda and Gold (1980). Its objective is to apportion the total explained variance among predictors by computing each variable's marginal contribution averaged across all possible inclusion orders.

Let ***LS*** denote *overall life satisfaction* and let ***X={X₁,X₂,...,Xⱼ}*** denote the set of ***J*** *domain satisfactions*. For any subset **S⊆X**, define the *characteristic function* as:

$$v(S) = R^2(S) \tag{2.7}$$

where $\mathbf{R^2}$ measures the explanatory power of the regression including only the variables in ***S***.

For a predictor $\mathbf{X_j}$, its *marginal contribution* to a subset ***S*** is:

$$\Delta_j(S) = v(S \cup \{X_j\}) - v(S) \tag{2.8}$$

The *Shapley value* for domain $\mathbf{X_j}$ is the weighted average of its marginal contributions across all subsets not containing $\mathbf{X_j}$:

$$\phi_j = \sum_{S \subseteq X \setminus \{X_j\}} \frac{|S|!\,(J - |S| - 1)!}{J!} \left[v(S \cup \{X_j\}) - v(S)\right]. \tag{2.9}$$

The term $\frac{|S|!(J-|S|-1)!}{J!}$ corresponds to the probability that subset **S** precedes **Xj** in a random ordering of predictors, ensuring fairness across all permutations.

The Shapley value satisfies **four fundamental axioms** of cooperative game theory (Shapley, 1953), which guarantee a fair and coherent allocation of explanatory power across predictors:

- **Efficiency:** the contributions assigned to all variables sum exactly to the model's total explanatory power.
- **Symmetry:** predictors that contribute equally receive identical Shapley values.

- **Null player:** if a variable adds no explanatory power to any subset, its Shapley value is zero.

- **Additivity:** Shapley values are consistent across combined models, ensuring coherence when aggregating explanatory contributions.

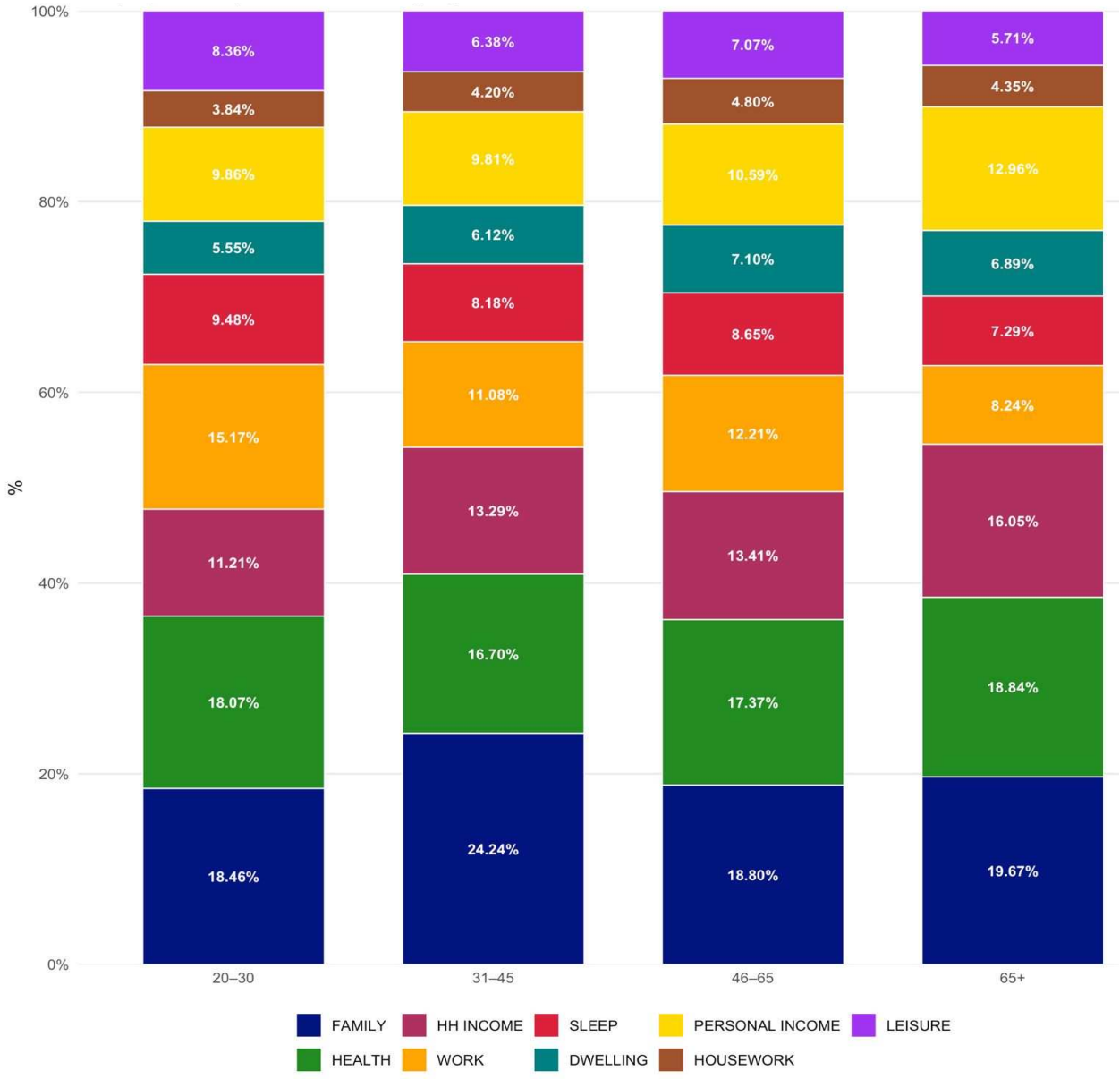
These properties guarantee that Shapley values provide a coherent, permutation-invariant and unbiased measure of variable importance. **They are particularly valuable in the present context because life domains are highly correlated, and the decomposition fairly distributes shared explanatory power induced by multicollinearity**.

The next subsection presents the empirical *Shapley results* for the full sample and each age cohort, and compares them with the *CNS estimates* discussed earlier.

2.4.2 Shapley Results

Table 2.4 (in Appendix A) and Figure 2.7 present the Shapley value decomposition for the *full sample* and the *four age cohorts*, allowing a direct comparison with the *CNS* compositional weights discussed in the previous section. Overall, the **Shapley results strongly confirm** the main conclusions derived from the *CNS model*: ***family satisfaction*** **and health satisfaction consistently emerge as the two dominant pillars of subjective well-being across all ages**.

Figure 2.7 Shapley decomposition by age cohorts (20–30, 31–45, 46–65, 65+)



As reported in *Table 2.4 (in Appendix A)*, ***family satisfaction*** **remains the single most important domain**, with contributions ranging from 18–19% in the youngest and oldest cohorts to a clear peak of 24.25% among individuals aged 31–45. **This pattern precisely mirrors the *CNS* coefficients explained in *section 2.3***, which also identified the mid-life segment as the stage where family acquires maximum importance. The *Shapley results* therefore reinforce the interpretation of family satisfaction as the central relational dimension of well-being, reaching its maximum salience during the years typically characterized by family formation, child-rearing, and dense relational responsibilities.

Similarly, ***health satisfaction*** **remains remarkably stable across the life cycle**, fluctuating within a narrow band (between 16.7% and 18.8%). This confirms the *CNS result* that health is a structural and persistent pillar of well-being, whose relative importance does not follow strong age gradients. One possible explanation, consistent with psychological adaptation mechanisms documented in the health literature, is that **individuals progressively adjust their internal standards and expectations about health as they age**. As shown by Jylhä (2009), subjective assessments of health depend not only on objective conditions but also on age-specific reference frameworks and shifting evaluative standards. Likewise, the response-shift model of Sprangers and Schwartz (1999) suggests that individuals recalibrate what they consider "good" or "acceptable" health when facing changing physical conditions. Taken together, this evidence supports the idea that stable health satisfaction across age groups may reflect adaptive adjustment processes rather than an absence of underlying health deterioration.

A key difference between the *Shapley* and *CNS results* concerns the trajectory of income-related satisfactions. Under the *CNS specification*, *household income* and *personal income* tended to increase between early adulthood and mid-life but remained relatively flat afterwards.

By contrast, **the *Shapley* values reveal a much more pronounced age gradient**:

- ***Household income satisfaction*** rises from **11.21%** (20–30) to **13.29%** (31–45) and **13.41%** (46–65), reaching a markedly higher **16.05%** among those **65+**.
- ***Personal income satisfaction*** follows a similar pattern, increasing steadily from **9.86%** to **12.96%** in the oldest cohort.

This implies that **income and material conditions matter more for the elderly in relative terms** than what the *CNS coefficients* suggested. The divergence stems from the **nature of the Shapley method**, which isolates the unique predictive contribution of *income domains* net of their correlation with work, dwelling, and other material dimensions. Once shared variance is properly partitioned, income re-emerges as a major explanatory factor for older individuals, possibly reflecting heightened financial vulnerability, dependence on pensions, and the stronger role of economic security later in life.

Thus, whereas the *CNS model* indicated a relatively stable importance of **income** after age 30, the **Shapley results show a clear upward trend** culminating in old age.

For the remaining domains, the *Shapley values* replicate closely the life-cycle patterns observed in the *CNS* weights:

- ***Dwelling satisfaction*** increases steadily with age (from 5.55% to 7.10%), just as in the *CNS results* where its coefficient nearly doubled. This confirms that housing conditions become increasingly central in mid-to-late life.
- ***Sleep satisfaction*** and ***leisure satisfaction*** are more important in youth (around 9% and 8%) and then stabilise at lower levels, the same declining pattern found in the *CNS coefficients* for these experiential dimensions.
- ***Work satisfaction*** shows a peak in young adulthood (15.17%), decreases but remains relevant in middle age, and drops sharply to 8.24% among the elderly, again precisely reflecting the *CNS* trajectory, and consistent with the expected detachment from the labour market after retirement.
- ***Housework satisfaction*** remains consistently low and stable, contributing around 4% across all cohorts, exactly as in the *CNS* model.

The *Shapley decomposition* therefore provides a **strong validation** of the *CNS* findings while adding meaningful nuance: **First,** *family* and *health* remain the undisputed structural pillars of subjective well-being, with consistent importance across age groups and perfect alignment between *CNS* and *Shapley*. **Second,** *Experiential domains* (sleep, leisure) and ***work-related satisfaction*** follow life-cycle patterns identical to those found in the *CNS model*, reinforcing the robustness of those dynamics. **Finally**, the major difference lies in the **material well-being dimension**: by removing functional constraints and properly accounting for multicollinearity, the *Shapley* method reveals that **income-related satisfactions gain substantial importance after age 65**, a dynamic that was only partially visible in the *CNS estimates*.

2.5 Conclusions

This chapter set out to examine how subjective well-being evolves over the life course and to identify the internal architecture that underlies individuals' global life evaluations. In doing so, it bridges two major strands of the happiness literature that have often progressed in parallel without fully interacting: the *life cycle analysis of SWB* and *the multidimensional approach to the composition of happiness*. Bringing these literatures together makes it possible to understand not only *whether* happiness changes with age, but also *why*, by identifying which life domains constitute the pillars of well-being and whether these pillars shift as individuals move through different stages of the life cycle.

Three guiding questions structured the analysis: (i) how life satisfaction and domain satisfactions vary with age, (ii) which domains act as the central pillars of overall well being, and (iii) whether these pillars change in relative importance across the life course. To answer these questions, the chapter combined three complementary empirical strategies: non parametric age profiles estimated through pooled OLS and individual fixed effects, a Constrained Non Negative Sum model that recovers compositional weights, and a Shapley value decomposition that provides a model free measure of explanatory power.

A first major contribution of the chapter arises from the comparison between pooled OLS and fixed effects estimates. While cross sectional profiles reproduce the familiar U shaped trajectory of life satisfaction, the longitudinal evidence reveals a very different pattern: once individual heterogeneity is removed, life satisfaction declines slowly but persistently across adulthood, stabilising only briefly near retirement before declining again in old age. This stark divergence shows that the classic U shape is largely driven by cohort composition, selective survival and stable personality traits rather than by within person ageing. By allowing age coefficients to vary freely through annual dummies, the chapter provides one of the clearest demonstrations to date that ageing is associated with a monotonic, rather than U shaped, decline in evaluative well-being.

The analysis of domain specific satisfactions further illustrates the heterogeneous ways in which different aspects of life respond to ageing. Health, sleep and work satisfaction deteriorate

markedly over the life course, while financial and material dimensions such as household income, personal income and dwelling conditions improve steadily as economic stability, housing quality and material expectations adjust. Relational and experiential domains display more complex trajectories: family satisfaction declines during the most demanding years of work and caregiving, stabilises through midlife, and increases around the transition to retirement before declining again in old age; leisure satisfaction exhibits a pronounced U shape, recovering sharply once time constraints ease.

Building on this descriptive evidence, the second part of the chapter sought to identify the **pillars** that support overall life satisfaction. The Constrained Non Negative Sum model showed that family and health satisfaction constitute the two structural foundations of well being, jointly accounting for almost half of its total composition. Work and household income satisfaction form the second tier, reflecting their instrumental but non dominant role. Experiential and material domains such as dwelling, leisure, sleep, personal income and housework provide smaller but meaningful contributions, confirming that happiness is an inherently multidimensional construct.

Importantly, the chapter shows that these pillars evolve across the life cycle, although less than one might expect. Family satisfaction is most influential between ages 31 and 45, the stage in which relational responsibilities, parenting and emotional investment in close ties reach their peak. Health satisfaction remains remarkably stable in relative terms across age groups, a pattern consistent with adaptive adjustments in health expectations as individuals age. Income related domains become more influential from midlife onwards and remain central in later life, while dwelling satisfaction becomes increasingly important among older adults, who spend more time at home.

The Shapley value decomposition confirms these patterns and adds nuance to the interpretation of financial domains. Once shared explanatory power is partitioned across correlated predictors, income related satisfactions become even more prominent for the elderly, revealing an age gradient that the constrained model could only partially uncover. Moreover, when household income and personal income are viewed jointly, their combined contribution closely approaches that of health and family, indicating that the three macro dimensions of relational life, physical functioning and material security become nearly equivalent pillars of happiness, with only moderate reweighting across age groups rather than radical shifts.

Naturally, the analysis faces limitations. The descriptive nature of the methods does not disentangle age, cohort and period effects, and subjective evaluations may shift with adaptation, reframing and changing reference standards. Furthermore, the results are specific to the German institutional and cultural context. Future work could extend the analysis to other countries or integrate causal strategies to investigate specific life course shocks.

Despite these caveats, the chapter provides a comprehensive portraits of how SWB evolves with age and how its multidimensional foundations shift and persist across the life course. By combining longitudinal age profiles with compositional models, it offers a coherent and integrated account of the dynamics of happiness, paving the way for the next chapters, which extend the analysis from individual life cycles to relational and comparative contexts, including migration and the experience of those who remain when family members move abroad.

“Comparison is the thief of joy.”

Theodore Roosevelt

3| RELATIVE INCOME, REFERENCE GROUPS, AND LIFE SATISFACTION AMONG MIGRANTS

This chapter explores how relative income shapes migrants' life satisfaction (LS) through the lenses of social comparison theory, transnationalism, and emotional contagion. While previous research has largely focused on individual-level determinants of well-being, this chapter shifts the attention to **relational well-being**: how people evaluate their lives in relation to others.

To do so, it focuses on **migrants**, a population that offers a unique opportunity to study how **reference groups** evolve across borders, time, and life stages. Drawing on multiple theoretical perspectives and recent empirical findings, this chapter ambitiously aims to analyze how comparative income assessments across different reference groups (country of origin, host-country natives, and co-ethnic migrants) influence life satisfaction trajectories, and how these effects vary with time since migration and age at arrival.

Hypothesis Testing:

i. *With whom do migrants compare themselves when evaluating their life circumstances?*
ii. *Are these reference points static, or do they adjust as migrants spend more time in the host country?*
iii. *How quickly do these reference groups evolve, and does the stage of life at which migration occurs influence the speed or direction of this adjustment?*

Keywords: *Subjective well-being; Life satisfaction; Relative income; Reference groups; Social comparison; Transnational migration; Adaptation; Migrants*

3.1 Introduction

This second empirical chapter adopts a relational perspective on well-being, shifting the focus from the isolated individual to the broader influence of social contexts. As inherently social beings, individuals derive satisfaction not only from their own achievements but also from comparisons with others. Among these, income-based comparisons play a central role in shaping subjective well-being (SWB). While absolute income determines the ability to meet basic needs, relative income reflects **social status** and **perceived success**, especially in high-income societies, where material conditions are generally satisfied and positional concerns become more salient (Clark, Frijters, & Shields, 2008; Ferrer-i-Carbonell, 2005; Layard, 2005).

According to Maslow's hierarchy of needs (1943), the importance of social comparisons emerges only after physiological and safety needs have been met, reinforcing the idea that relative income becomes a key driver of well-being once basic needs are no longer the primary concern.

A critical question, however, is whether the **reference group** used for such comparisons is **static or dynamic**, i.e. evolves over time. Migration provides a **quasi-natural experiment** to explore this issue. Migrants experience a profound shift in their economic and social environments, prompting them to reassess not only their material conditions but also the benchmarks by which they evaluate their relative success and life satisfaction.

Migrants are particularly exposed to multiple and shifting processes of social comparison. After migration, they may evaluate their circumstances in relation to:

a) individuals in their country of origin,

b) the native population in the host country, and

c) co-ethnic peers within transnational networks.

These reference groups may be considered **alternatively or simultaneously**, depending on the migrant's level of integration, identity, and exposure. They shape how individuals interpret

their relative success or failure, and play a crucial role in shaping subjective well-being (Kogan & Shen, 2019).

This leads to some key questions:

With whom do migrants compare themselves when evaluating their life circumstances? Are these reference points static, or do they adjust as migrants spend more time in the host country? How quickly do these reference groups evolve, and does the stage of life at which migration occurs influence the speed or direction of this adjustment?

To try to answer these questions, this chapter takes migrants as a strategic case for examining how individuals recalibrate their evaluative frameworks in response to changing social environments. Migration, by disrupting both absolute and relative positions, makes visible the otherwise implicit processes through which people define success, status, and satisfaction. This analytical focus provides a window into the evolution of reference groups and income comparisons across time and life stages, laying the groundwork for the theoretical perspectives discussed in the next sections.

The chapter is structured as follows. *Section **3.2*** develops the *Theoretical Framework and Conceptual Illustration*, combining insights from **Social Comparison Theory**, **Transnationalism**, and **Emotional Contagion** to explain how migrants form and adjust their reference groups over time. It also provides a formal illustration of how relative income can be conceptualized across different comparison dimensions before and after migration. *Section **3.3*** describes the *Data and Methodology*, detailing the datasets used, the descriptive statistics, and the construction of the **three relative income indices** ($\mathbf{R_1}$–$\mathbf{R_2}$–$\mathbf{R_3}$), before outlining the empirical model adopted for estimation. *Section **3.4*** presents the *Empirical Results*, reporting the sequence of **fixed-effects regressions** that quantify the relationship between migrants' life satisfaction and absolute and relative income, and exploring how these associations vary across reference groups, duration of stay, demographic characteristics, and regions of origin. Finally, *section 3.5* concludes the chapter by summarizing the main findings and discussing their implications.

3.2 Theoretical Framework and Conceptual Illustration

3.2.1 Theoretical Background

This chapter builds on three interrelated theoretical perspectives: **Social Comparison Theory**, **Transnationalism**, and **Emotional Contagion**. Together, they provide the conceptual foundation for analyzing how migrants evaluate well-being across multiple contexts.

The theory of Social Comparison

Social Comparison Theory (Festinger, 1954) posits that individuals evaluate their well-being not in isolation, but relative to others in meaningful social groups. This theoretical lens is foundational to the "economics of happiness" literature, which highlights the importance of *relative* over *absolute* income in explaining life satisfaction (Duesenberry, 1949; Clark & Oswald, 1996). That is, people care not just about what they earn, but how their earnings compare to others'.

In migration contexts, this theory takes on new significance. Migrants do not compare themselves to a single fixed group. Instead, they may evaluate their position relative to:

- **R1 – individuals in the country of origin:** evaluating income relative to peers in the country of origin.
- **R2 – natives in the host society:** comparing to natives in the destination country.
- **R3 – Co-ethnic migrants within the host country**

Empirical studies consistently showed that relative income within these reference groups, more than absolute income, explains variation in LS (Berggren et al., 2020). However, **they rarely interrogate the fluidity of reference groups themselves**. This chapter addresses this gap by asking not only *whether* relative income matters for migrant well-being, but *relative to whom*, and *how the answer evolves over time*.

Transnationalism and Temporal Dynamics

While Social Comparison Theory highlights *how* people evaluate their well-being relative to others, **Transnationalism** gives insights on *where* these relevant others are located. As defined by Levitt and Jaworsky (2007), transnationalism emphasizes the ongoing ties that migrants maintain with their countries of origin through: remittances, emotional bonds, family communication, and media exposure. These enduring cross-border connections suggest that migration does not entail a clean break from the past; instead, many migrants operate within a **dual frame of reference**, simultaneously engaging with both origin and destination contexts.

From a well-being perspective, this implies that **comparative standards may remain anchored in the country of origin**, at least initially. That is, even after relocation, migrants may continue to assess their life satisfaction relative to peers back home (R1), maintaining a **static benchmark** rooted in pre-migration experiences. However, as migrants integrate into the host society, these reference points can shift toward host-country natives (R2) or co-ethnic peers (R3), especially in environments where ethnic networks are strong.

This **tension between persistence and evolution** is shaped by multiple forces. First, **hedonic adaptation** (Kahneman & Deaton, 2010) suggests that initial LS gains from migration may dissipate over time as expectations recalibrate. Second, **identity negotiation,** which is often age-dependent, plays a crucial role: younger migrants tend to adjust more rapidly and adopt host-country standards, while older migrants may retain origin-based norms and comparisons (Clemens & Mendola, 2024).

Empirical findings support these dynamics. For instance, Yaman, Cubi-Molla, and Plagnol (2022) show that although newly arrived immigrants in Germany report higher LS than natives, this advantage erodes over time. Notably, this decline is not driven by falling income but by deteriorating health and shifting expectations. Similarly, Clemens and Mendola (2024) highlight how age at migration and optimism bias influence the extent to which migrants adapt their evaluative benchmarks.

In sum, transnationalism complicates the assumption that reference groups evolve linearly with time since migration. While integration often leads to a reorientation toward host-country norms, strong transnational ties may prolong the relevance of origin-based comparisons.

Whether reference groups are ultimately static or dynamic thus remains an open empirical question which this chapter seeks to explore systematically.

Emotional Contagion

A third central theoretical lens to this chapter is **Emotional Contagion Theory** (Hatfield, Cacioppo, & Rapson, 1993), which posits that emotions are socially transmitted. Individuals absorb and mirror the affective states of those around them via facial expressions, tone of voice, and interactions, creating shared emotional climates that shape perceptions and experiences of well-being. In this framework, subjective well-being (SWB) is not solely an outcome of personal circumstances or cognitive comparisons, but is also embedded in social environments.

This process acquires particular significance in the case of international migration. When individuals move from low- to high-income countries, they are typically exposed to societies with higher average levels of life satisfaction (Hendriks & Burger, 2021). In such contexts, emotional contagion may operate as a **positive spillover**: by interacting with happier populations, migrants may internalize more positive emotional states and, in turn, report higher life satisfaction (LS). However, the realization of this benefit depends on the extent of social integration. As shown by Helliwell and Wang (2011), the affective quality of one's environment (including levels of trust, social capital, and institutional reliability) is a strong predictor of individual well-being, often moderating the negative effects of low relative income or adverse social comparisons.

Yet, the contagion process is not unidirectional nor automatic. Migrants who face discrimination, exclusion, or a lack of interpersonal trust may instead absorb collective frustration or marginalization. Rather than benefitting from the general emotional climate, they may find themselves socially isolated from it, intensifying rather than alleviating feelings of deprivation or failure. Emotional contagion, in this sense, reflects a **double-edged mechanism especially for migrants**: a vehicle of psychological uplift in inclusive contexts, or a source of emotional strain when integration falters.

This is especially relevant within **co-ethnic communities**. In diasporic networks, shared emotions such as nostalgia may shape how migrants interpret their experience. These affective dynamics can reinforce internal group norms regarding what constitutes a "successful" migration, shaping collective expectations and well-being evaluations. Emotional climates,

therefore, interact with the **reference group framework** outlined earlier: migrants' comparisons are not only cognitive assessments of income differences, but also affectively infused judgments shaped by emotional surroundings.

In this way, emotional contagion enriches the concept of relative income by suggesting that **the emotional tone of the reference group** matters as much as its economic profile. For example, being surrounded by visibly happy host-country natives may soften the psychological impact of being relatively poorer if one feels included in their emotional world. Conversely, if migrants perceive themselves as outsiders, the contrast between their own condition and others' joy may heighten dissatisfaction.

Ultimately, the emotional climate (mediated by social trust, inclusion, and group identity) modulates how income comparisons are interpreted and experienced. As Helliwell and Wang (2011) argue, high-trust environments tend to buffer the negative effects of low income or disadvantaged status, while low-trust environments tend to amplify them. Emotional contagion thus operates in conjunction with social comparison and transnationalism, reinforcing the inherently **relational and context-dependent** nature of migrant well-being.

3.2.2 Summary and Research Contribution

This section has outlined how migrants' life satisfaction is shaped by the dynamic interplay of social comparison, transnational ties, and emotional climates. Together, these frameworks highlight that well-being is not merely an individual outcome, but a relational and context-dependent process, particularly in the case of international migration.

Three key insights emerge:

1. **Relative income matters**: Empirical research consistently shows that subjective well-being depends not only on what individuals earn, but on how they perceive their income relative to meaningful reference groups. Yet, for migrants, the question is not whether relative income matters, but **relative to whom**, and **whether that "whom" changes over time**.

2. **Transnationalism complicates adaptation**: Far from severing ties with the past, migration often sustains a dual frame of reference. Long-lasting **connections** to the

country of origin may delay or distort adaptation to host-country norms, making R1 comparisons **particularly persistent,** especially among older or less integrated migrants.

3. **Emotional and social integration mediate comparisons**: The emotional climate of one's environment, whether inclusive or exclusionary, can intensify or buffer the psychological impact of relative disadvantage. Emotional contagion adds an affective layer to economic comparisons: migrants may absorb the optimism of a high-trust host society, or internalize frustration in contexts of social isolation.

Despite these insights, the existing literature leaves **several gaps**. Empirical studies on this theme: analyze reference groups (R1, R2, R3) **in isolation**, rather than comparing them jointly (e.g., Kogan & Shen, 2019); rely on **cross-sectional data**, limiting the ability to trace how reference points evolve with time or life course (e.g., Berggren et al., 2020); often neglect absolute income, even though it interact with relative income in meaningful ways; do not account for age at migration and duration of migration, which may shape both exposure to, and internalization of, new social norms (e.g., Clemens & Mendola, 2024).

This chapter addresses these limitations using **longitudinal data from SOEP (1990–2021)**. It investigates how migrants' life satisfaction responds to relative income within multiple reference groups (origin, host-country natives, co-ethnic peers), and how these effects vary with **time since migration** and **age at arrival**. By integrating social comparison, transnationalism, and emotional contagion into a unified framework, this work contributes to a better understanding of well-being in transnational contexts.

The next section examines how the relationship between migration and life satisfaction can be formally conceptualized from the perspective of the migrant.

3.2.3 Migration and Relative Income: A Theoretical Illustration

As outlined in the previous section, migration provides a valuable natural experiment to examine whether and how individuals shift their reference groups. This section formalizes the process migrants undergo when moving from low- to high-income countries—a transition that often results in significant absolute income gains, but not necessarily in improved relative standing. This tension can be interpreted as a *migration–well-being paradox*: although migration may improve material conditions, it may also result in increased relative deprivation or perceived status loss. This interpretation builds on Stark and Taylor's (1991) relative deprivation model and the broader discussion on the non-pecuniary outcomes of migration.

Figure 3.1 depicts it. Let Y^o (red line) denote the income distribution in the country of origin and Y^d (blue line) the income distribution in the destination country, both expressed in PPP-adjusted terms. A migrant earns $Y_0 \in Y^o$ before migration and $Y_1 \in Y^d$ after migration. Since migration is costly and selective, it is unlikely that individuals originate from the bottom of the income distribution. Indeed, empirical evidence shows that international migrants are typically positively self-selected, often belonging to middle or upper-middle income deciles in their country of origin (Borjas, 1987; Chiquiar & Hanson, 2005; Clemens & Mendola, 2024).

Upon arrival, however, they enter a new income distribution that stochastically dominates the origin distribution:

$$\mathbf{F^d(Y) > F^o(Y)} \qquad \mathbf{3.1}$$

meaning that at every income level, the cumulative distribution in the destination country lies to the right of that of the origin country. This reflects the higher average income and wealth in destination countries.

Despite earning more in absolute terms $Y_1 > Y_0$, the migrant may experience a **drop in relative rank**.

Formally, if $\tilde{r}_d = F^d(Y_1)$ and $\tilde{r}_o$ $F^o(Y_0)$, it is often the case that:

$$\tilde{r}d < \tilde{r}o \qquad 3.2$$

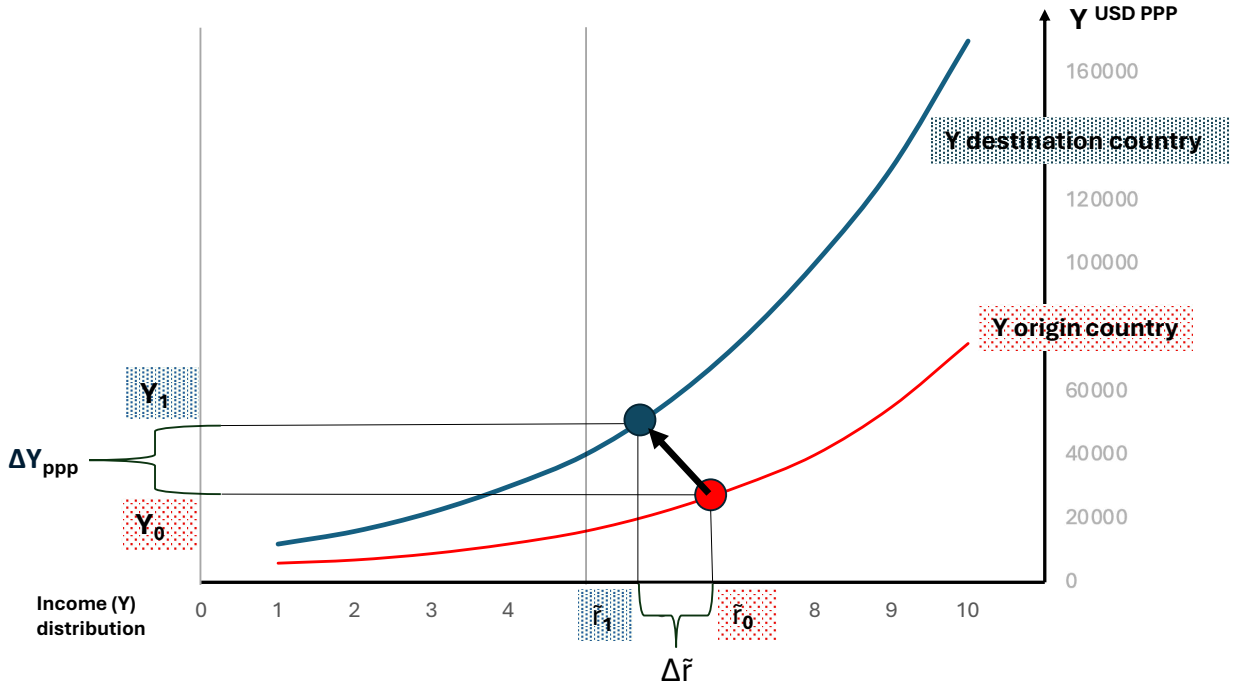
where r̃ denotes the individual's percentile rank in the origin or destination distribution.

This means the individual moved **upward in absolute income** but **downward in their relative position** within the new distribution.

This duality can be summarized as:

- $\Delta Y = Y_1 - Y_0 > 0$ **(absolute gain)** **3.3**
- $\Delta\tilde{r} = \tilde{r}d - \tilde{r}o < 0$ **(relative loss)** **3.4**

Figure 3.1 Theoretical representation of absolute and relative income evolution after migration



This captures the central tension faced by migrants when assessing their well-being. In the short term, they benefit materially, but psychologically, they may experience a decline in status relative to new peers in the host country. The cognitive comparison process underlying life satisfaction depends on the salient reference group. Such dynamics raise the question of which **reference group** the migrant uses to evaluate their well-being. In migration contexts, three main comparisons are possible:

- **Origin-based reference (R1)**: comparison with the income distribution in the home country.
- **Host-country reference (R2)**: comparison with natives in the destination country.
- **Co-ethnic reference (R3)**: comparison with other migrants from the same origin within the destination.

At early stages, we expect, **R1** dominates: newly arrived migrants often experience a subjective boost due to their improved standing compared to the origin context. Over time, however, as social integration advances, migrants should increasingly adopt **R2**, comparing themselves to natives who generally earn more. **R3** may act as a transitional benchmark, particularly salient in tightly knit diaspora communities (Berggren et al., 2020).

To model this trade-off between absolute and relative evaluation, one can express subjective utility or in our case Life Satisfaction as:

$$LS_i = \alpha \ln(Y_i) + (1-\alpha) \ln\left(\frac{Y_i}{\bar{Y}_{R_i}}\right) \quad \textbf{3.5}$$

Where:

- Y_i: migrant's income
- $\bar{Y}R_i$ represents the median income of the reference group R_i
- $\alpha \in [0,1]$ weight given to absolute vs. relative income

The ratio (Y_i / $\bar{Y}R_i$) captures **positional status**. A lower value, typical when comparing to natives, implies lower perceived well-being despite material gains.

While the utility function uses a simple log ratio to express relative income, in this empirical analyses we standardize this measure to account for variation in income dispersion across groups. (this step is analysed more closely in *section 3.3.3*):

$$RI_i^k = \frac{\ln(Y_i) - \ln(\widehat{Y}_{me}^k)}{\sigma^k} \quad \textbf{3.6}$$

Where RI_i^k denotes the relative income of individual *i* in country $k \in \{0, d\}$, indicating origin or destination country, $\hat{Y}^k_{me}$ indicates the median income either in the origin or destination country, and σ^k is the standard deviation of log income within the same reference group.

The change in relative position can thus be expressed as

$$\Delta RI_i = RI_i^d - RI_i^o \quad \textbf{3.7}$$

This difference is often negative, illustrating how **rising income** may still **lower subjective well-being** if relative status declines.

As illustrated in *Figure 3.1*, the migrant moves from a point (Y_0, r_o) on the origin distribution to (Y_1, r_1) on the destination distribution. The vertical shift ΔY measures the absolute income gain, while the horizontal shift $\Delta\tilde{r}$ represents the decline in relative rank.

This framework clarifies that migration simultaneously entails material advancement and relative demotion. Whether migrants' life satisfaction rises or falls depends on how much weight they attach to absolute versus relative income and on which reference group they consider most relevant (Y^o vs Y^d).

Over time, the salience of these comparisons should evolve. The weight attached to each reference group (ωR1, ωR2, ωR3) changes with integration, exposure, and identity adjustment according to the following expected directions:

- ωR1(t) ↓,
- ωR2(t) ↑,
- ωR3(t) ≈ stable or context-dependent.

This dynamic structure aligns with the concept of hedonic adaptation (Kahneman & Deaton, 2010) and identity negotiation (Clemens & Mendola, 2024), whereby initial satisfaction from income gains diminishes as expectations shift and new social standards are internalized.

The theoretical implication is that migrants' subjective well-being trajectories are expected to be path-dependent and sensitive to **time since migration**, as these variables condition measure how quickly reference groups and evaluative standards evolve. The conceptual model thus raises three core questions addressed empirically in this chapter:

1. Which reference group (origin, destination, co-ethnic) exerts the strongest influence on migrants' life satisfaction?
2. How does the relative importance of each group evolve with time since migration?
3. Does the sensitivity to these comparisons differ by age at arrival and country of origin, reflecting distinct adaptive capacities and identity dynamics?

3.3 Data and Methodology

3.3.1 Datasets

The analysis is conducted by combining micro-level panel data on individuals and households residing in Germany with macro-level data on income distributions across countries. Microdata are sourced from the German Socio-Economic Panel (**SOEP**), while cross-country income distributions are drawn from the World Income Inequality Database (**WIID**), curated by UNU-WIDER (2023). These two datasets are harmonized by country and year, enabling a longitudinal micro–macro analytical framework. This structure makes it possible to position migrants simultaneously in relation to their country of origin, their host society, and specific peer groups within the migrant population.

The SOEP Dataset

The German Socio-Economic Panel (SOEP) (Goebel et al., 2019) is a nationally representative longitudinal survey conducted annually since 1984 by the German Institute for Economic Research (DIW Berlin). It collects detailed information on the demographic, socio-economic, and subjective well-being characteristics of individuals living in Germany, including both native-born and foreign-born respondents.

For this study, it is considered the period from 1990 to 2020 , which ensures consistent coverage of the key variables of interest and allows the inclusion of multiple migrant cohorts who arrived in Germany after the fall of the Iron Curtain.

The main outcome variable, *life satisfaction* (LS), is derived from question— *"Wie zufrieden sind Sie gegenwärtig, alles in allem, mit Ihrem Leben?"* — where respondents rate their satisfaction with life on a scale from 0 ("completely dissatisfied") to 10 ("completely satisfied").

Economic conditions are measured through net annual household income, supplemented by official multiple imputations in cases of missing or inconsistent responses. For households with no valid income entries, total income was reconstructed by taking the maximum of positive individual earnings reported within the household.

To ensure comparability, all income variables were winsorised at the 1st and 99th percentiles, converted to 2017 PPP-adjusted euros, and log-transformed. Using the square-root equivalence scale, household income was divided by the square root of household size to produce per-capita equivalised income.

Control variables include age and age squared, education level, employment status, marital status, self-reported health satisfaction, and year fixed effects. Migration-related information is derived from the variable year of arrival in Germany and the derived measure duration = survey year – year of arrival, indicating years since migration.

The analytical sample is restricted to foreign-born individuals with valid and positive observations for both life satisfaction and household income. After data cleaning, the final working sample used in the main analyses comprises approximately **91,000 person-year observations**, corresponding to around **20,700 unique individuals**, observed for an average of **4.5 years** (median = 3). Subsamples with slightly fewer observations are used in models incorporating additional interaction terms or macroeconomic variables (e.g. WIID-based measures), due to missingness in those variables.

The UNU-WIDER dataset

To construct internationally comparable reference income distributions, the SOEP microdata were supplemented with macroeconomic data from the World Income Inequality Database (WIID), compiled by the United Nations University–World Institute for Development Economics Research (UNU-WIDER, 2023). The WIID provides harmonized estimates of household income distributions for over 180 countries, expressed in 2017 international dollars (PPP-adjusted) and disaggregated at the decile level.

For the purposes of this study, average incomes by decile (dy1–dy10) and the median (dy5) were extracted for the period 1990–2019, restricting the sample to entries classified as gross income per person and based on nationally representative household surveys. Missing years were imputed through linear interpolation, resulting in a balanced panel of country–year income distributions.

Since the SOEP reports net disposable income while WIID provides gross pre-tax income, a harmonization procedure was implemented to ensure cross-national comparability.

Specifically, SOEP incomes were first converted to 2017 PPP USD and then rescaled to match the German income distribution reported in WIID for each corresponding year. This anchoring step aligns both datasets in terms of purchasing power and tax treatment, thereby avoiding upward biases in the estimated relative position of migrants with respect to their countries of origin.

Income dispersion within each country was approximated under the assumption of **log-normality**. The standard deviation of log income (σ) was estimated using WIID deciles by regressing the logged mean income of each decile on the corresponding quantiles of a standard normal distribution. This parameter is employed in the construction of the standardized relative income indices presented in *Section 3.3.3*.

The final WIID panel covers 137 countries of origin represented in the SOEP migrant sample, amounting to approximately 820 unique country–year observations. Geographic coverage is particularly dense for Eastern Europe and the MENA region, which together account for the majority of post-1990 migration flows to Germany.

To enhance analytical clarity and ensure sufficient statistical power across subgroups, the 137 origin countries were aggregated into five macro-regions:

1. **Western & Southern Europe** – including migrants from Italy, Spain, Portugal, Greece, France, the Benelux countries, the Nordic states, and other Western European nations;
2. **Eastern Europe, the Balkans & Former Soviet Union (FSU)** – comprising Central and Eastern European countries, the former Yugoslav republics, and the post-Soviet states;
3. **Middle East, North Africa & Turkey (MENA)** – including Turkey and the principal Arab- and Persian-speaking countries in the MENA region;
4. **Sub-Saharan Africa** – covering all major subregions of Africa south of the Sahara;
5. **Asia, Oceania & the Americas** – encompassing migrants from East, South, and Southeast Asia, the Pacific region, and the Americas.

These regional groupings are applied consistently throughout the descriptive and econometric analyses to account for heterogeneity in income trajectories and subjective well-being across migrant populations.

The SOEP and WIID datasets were merged by country and year, enabling each foreign-born respondent in the SOEP to be linked to the income distribution of their country of origin for the corresponding year in the WIID panel. This matching procedure yields, for each migrant, both (i) their PPP-adjusted equivalised household income earned in Germany and (ii) the contemporaneous income distribution of their country of origin.

The resulting dataset allows the construction of relative income indices that reflect comparisons across origin (R1), destination (R2), and co-ethnic peer groups within the host country (R3). The technical specifications and transformations underpinning these indices are detailed in *Section 3.3.3*.

3.3.2 Descriptive Statistics

Tables 3.1a and 3.1b (in Appendix B) summarise the main descriptive statistics for the *SOEP* sample, which encompasses several major migration waves: the early-1990s inflows from Eastern Europe and the Former Soviet Union, the mid-2000s EU enlargements, and the post-2014 humanitarian arrivals from Syria and other MENA countries.

Table 3.1a *and* ***3.1b*** *(in Appendix B)* reports the summary statistics for the core variables included in the regression models (Models M1–M7 discussed in *section 3.4*), covering measures of life satisfaction, income, and key sociodemographic characteristics. On average, migrants report a life satisfaction score of 6.9 (on a 0–10 scale) and an equivalised net household income of € 2,220 per month (≈ € 26,600 per year in 2017 PPP). The corresponding logarithmic income mean is 7.54, with a standard deviation of 0.58, indicating a moderate spread in economic conditions. The average age in the sample is about 41 years (min = 16; max = 99), and migrants have resided in Germany for an average of 17.9 years, reflecting a balanced composition of both recent and long-term residents.

Table 3.2 breaks down the sample by macro-regions of origin, following the classification introduced *in Section 3.3.2.* Migrants from Eastern Europe and the Balkans constitute the largest group (≈ 40 %), followed by those from MENA countries and Turkey (≈ 33 %) and Western and Southern Europe (≈ 16 %). Smaller proportions originate from Asia–Oceania–Americas (≈ 7 %) and Sub-Saharan Africa (≈ 3 %).

Marked regional differences emerge in economic and subjective outcomes. Migrants from Western Europe report the highest average incomes and life satisfaction, reflecting closer economic parity with German natives. By contrast, those from the MENA region and Sub-Saharan Africa exhibit lower household incomes and well-being levels, although life satisfaction differences are narrower than income gaps, suggesting possible effects of adaptation, or differing reference frames. Western European migrants display the longest residence durations (≈ 24 years), while MENA migrants have been in Germany for about **12 years**, consistent with more recent inflows.

Table 3.2 — Mean values by region of origin

Region of origin	Share (%)	years of residence (mean)	ln HH income (mean)	life satisfaction (mean)
Western & Southern Europe	16.33	23.79	7.58	7.23
Eastern Europe & Balkans	40.39	16.87	7.53	7.30
MENA & Turkey	33.20	12.20	7.29	7.00
Sub-Saharan Africa	2.75	8.13	7.01	7.16
Other regions (Asia, Americas, Oceania)	7.17	11.11	7.37	7.46
Not identified	0.16	8.89	7.43	7.13
Total	100	15.40	7.69	7.03

Notes: Mean values are computed over the pooled SOEP sample of migrants. Duration measures years since arrival in Germany. All monetary variables are expressed in log of equivalized household net income (PPP-adjusted).

Life Satisfaction and Duration Since Migration

Figures 3.2a and ***3.2b*** depict the evolution of average life satisfaction as a function of years since migration, using 3-year smoothed means from the SOEP migrant sample.

Figure 3.2a, which shows the overall trend for the full sample of migrants, reveals a non-linear relationship. Life satisfaction peaks shortly after arrival, around 7.5 on the 0–10 scale, and gradually declines during the first 25–30 years of residence in Germany, reaching a minimum near 7.0. After roughly 35 years, a modest upward trend re-emerges, suggesting a late-stage recovery in subjective well-being. This inverted-U trajectory is consistent with hedonic adaptation and shifting reference groups: initial material improvements and optimism typically raise well-being, but satisfaction tends to erode as expectations adjust and migrants

increasingly compare themselves to higher-income host-country peers. The later increase may reflect selective retention of better-integrated individuals or increased emotional and social stability in older age.

It is also plausible that this pattern partly reflects the broader U-shaped trajectory of life satisfaction over the life course, commonly observed in both cross-sectional and longitudinal studies (Blanchflower & Oswald, 2008). However, this interpretation is not straightforward. Even assuming that most migrants arrived in young adulthood e.g., in their early twenties, a duration of 30–35 years implies an average age of 50–55. Therefore, while the upward turn could mirror the typical midlife rebound, it does not eliminate the relevance of migration-specific dynamics. In particular, the fact that satisfaction initially rises and then declines so early suggests that migration itself, and the evolving nature of migrants' reference groups, exert a distinct influence beyond age effects alone.

Figure 3.2b disaggregates the life satisfaction trajectory by region of origin.

Migrants from **Western and Southern Europe** (red line), **Eastern Europe** (blue), and **Other regions** (including Asia, Oceania, and the Americas – grey) display patterns that largely mirror the aggregate trend. In all three groups, life satisfaction peaks within the first decade after migration, followed by a gradual and prolonged decline over the subsequent decades. Around 35–40 years after arrival, a modest upward inflection is observed, suggesting a late-stage recovery in subjective well-being, possibly driven by successful long-term integration or greater emotional stability in later life stages.

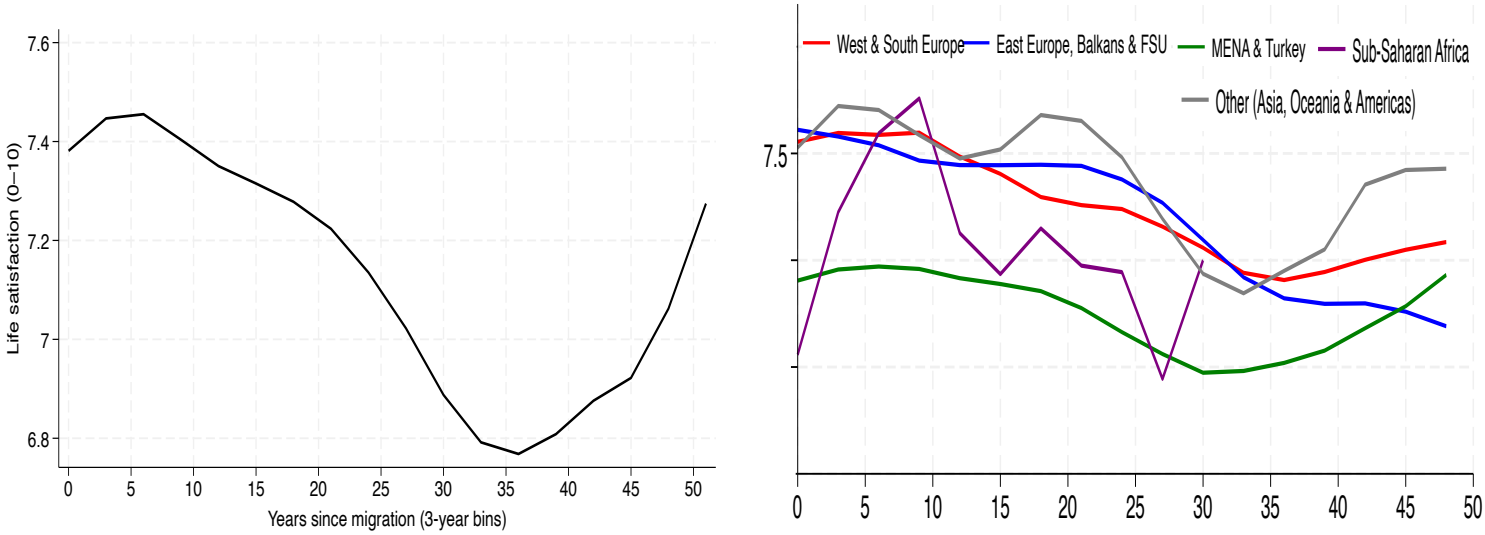
Migrants from the **MENA region and Turkey** (green line) begin with comparatively lower levels of life satisfaction, just above 7.0, and exhibit a steady downward trajectory over time. Life satisfaction plateaus at around 6.5 after three decades, indicating persistent challenges in achieving full integration or the influence of enduring transnational attachments and marginalization.

A distinct trajectory is observed among migrants from **Sub-Saharan Africa** (purple line). Life satisfaction for this group rises sharply in the first 7–8 years after arrival, climbing from roughly 6.3 to nearly 7.5, before undergoing a steep decline to around 6.0. This pronounced volatility may reflect a dual mechanism: on the one hand, the initial improvement could stem from a strong contrast effect, as migrants experience a dramatic shift in living conditions and

opportunities upon entering a high-income country. On the other hand, the subsequent decline might point to unmet expectations, barriers to integration, or growing awareness of structural inequalities. It is also important to consider that the smaller sample size for this subgroup may contribute to greater statistical variability in the estimated trend.

These trajectories resonate with the theoretical perspectives outlined in *Section 3.2*, particularly the role of shifting reference groups, transnational ties, and emotional climates in shaping the subjective well-being of migrant populations.

Figure 3.2a – 3.2b Smoothed trajectories of average life satisfaction by years since migration for the full sample and by gender

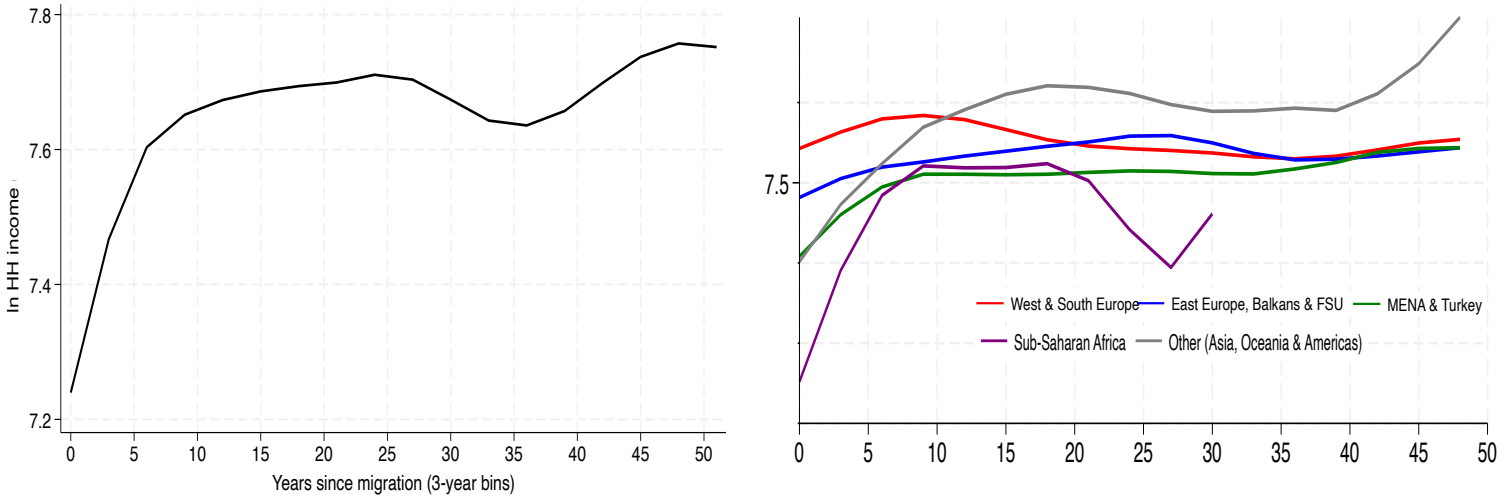


While ***Figures 3.2a*** and ***3.2b*** focus on fluctuations in life satisfaction, a parallel inspection of **income dynamics** — presented in ***Figures 3.3a*** and ***3.3b*** — reveals a markedly different pattern. Household income among migrants exhibits a steadily increasing trend with years of residence in Germany. The monotonic rise implies that, as time since migration lengthens, migrants on average accumulate more economic resources, likely reflecting accumulated human capital, labour market integration, and host-country-specific earnings growth.

The divergence between objective income improvements and stabilising or even declining life satisfaction underscores the complexity of the migrant adaptation process. ***Figure 3.3b*** disaggregates income trajectories by region of origin. Across all macro-areas, household income increases steadily with years since migration, indicating broadly similar patterns of economic assimilation. The upward slope appears remarkably consistent across groups,

suggesting that migrants from diverse backgrounds benefit comparably from prolonged residence in Germany in material terms. The only notable exception is the curve for Sub-Saharan Africa, which displays greater volatility and a less regular trend, likely a consequence of smaller sample sizes at longer durations, making these estimates less stable. Despite these fluctuations, the general trend remains positive, which suggest a positive effect of host-country experience on income acquisition regardless of origin.

Figure 3.3a – 3.3b Smoothed trajectories of migrants' household income by years since migration for the full sample and by gender



From a theoretical standpoint, these stylised facts point to a dual role of time since migration: it enhances economic opportunities (via accumulation of host-country-specific capital, improved language and social networks, and better job matches), yet it may simultaneously erode subjective satisfaction as migrants' reference groups evolve moving: from origin-country peers toward host-society norms, and from co-ethnic enclaves toward broader social strata. Over time, even as absolute income increases, the **relative income position** may improve less or even stagnate, which helps explain why life satisfaction does not ascend in tandem with household income.

Further, the heterogeneity across regions of origin highlighted earlier suggests that these income trajectories are not uniform. The descriptive evidence from ***Figures 3.3a*** and ***3.3b*** thus provides empirical impetus for the econometric strategy outlined in *Section 3.3*, which formalizes how relative income comparisons, rather than absolute income alone, shape migrants' life satisfaction trajectories.

3.3.3 Construction of Relative Income Indices (R_1– R2–R_3)

To operationalize the theoretical framework outlined in *Section 3.2*, three relative income indices—**R_1**, **R_2**, and **R_3**—are constructed to capture social comparisons across distinct reference groups:

i. the income distribution in the **country of origin**,
ii. the income distribution of the **host country**, and
iii. the income distribution of migrants from **the same region of origin** residing in Germany.

These indices translate the principles of social comparison theory (Festinger, 1954; Stark & Taylor, 1991; Falk & Knell, 2004) into empirically tractable measures.

The construction draws on harmonised microdata from the **SOEP** and macro-level distributions from the World Income Inequality Database **(WIID)**. Given structural differences between the two datasets namely, net vs. gross income, and household vs. individual-level reporting a set of harmonization steps was applied.

Firstly, all SOEP household incomes were **winsorised** at the 1st and 99th percentiles to mitigate the influence of extreme values. The resulting figures were equivalised using the square-root equivalence scale, dividing household income by the square root of household size, to produce per-capita income estimates.

Secondly, equivalised net incomes were converted into annual values in **2017 PPP USD** using the appropriate purchasing power parity conversion factor for Germany.

Thirdly, a **rescaling procedure** was applied to align the SOEP income distribution with that of Germany as reported in WIID for the same year. This anchoring ensures compatibility between the net income concept in SOEP and the gross income concept in WIID, avoiding upward bias in migrants' relative positioning.

The **formula 3.8** summarises these steps:

$$y_{it}^{\text{PPP}} = \frac{12 \cdot \text{HH\_income}_{it}}{\sqrt{N_{HH}} \cdot \text{PPP}_{\text{DEU},2017}} \cdot s_t \qquad \textbf{3.8}$$

where:

- $\mathbf{y_{it}^{PPP}}$ denotes the year equivalised net income of individual *i* in year *t*,
- $\mathbf{HH\_income_{it}}$ is the net monthly household income reported in the SOEP,
- $\mathbf{N_{HH}}$ is household size,
- $\mathbf{PPP_{DEU,\,2017}}$ is the purchasing power parity conversion factor 2017 for Germany,
- $\mathbf{S_t}$ is a year-specific scaling factor ensuring alignment with WIID's distribution.

Moreover, in constructing each $\mathbf{R_{\text{-index}}}$, the harmonized income $\mathbf{y_{it}^{PPP}}$ was used to determine the migrant's relative position within the WIID income distribution of the relevant reference group and year. Specifically, **each individual's income was matched to the corresponding decile of the WIID German income distribution for that year**, based on anchored decile thresholds. Once the appropriate decile was identified, the average income associated with that decile – denoted y_{dit}^{PPP} – was retrieved. This decile-specific benchmark served as the reference value against which the individual's income was compared in the computation of the relative income indices.

Hence, for each individual i at time t:

$$y_{it}^{PPP} \longrightarrow y_{d,it}^{PPP} \qquad \textbf{3.9}$$

Once the matched decile in the WIID population is computed $\mathbf{y_{d,it}^{PPP}}$, the three **R-indices** are derived by comparing each migrant's income within the median of the reference distribution $\tilde{\mathbf{y}}$, $_{\mathbf{it}}^{\mathbf{PPP}}$:

- $\mathbf{R_1}$ **(Origin-based Relative Income):** Standardised z-score relative to the contemporaneous income distribution of the migrant's country of origin;

- **R_2 (Destination-based Relative Income):** Standardised z-score relative to the German income distribution, capturing within-country positioning vis-à-vis the host population;
- **R_3 (Peer-based Relative Income):** Standardised z-score within the distribution of co-ethnic migrants from the same macro-region residing in Germany.

Meaning that:

$$R_i = \frac{\ln(y_{d,it}^{PPP}) - \ln(\tilde{y}_R^{PPP})}{\sigma_R} \qquad \textbf{3.10}$$

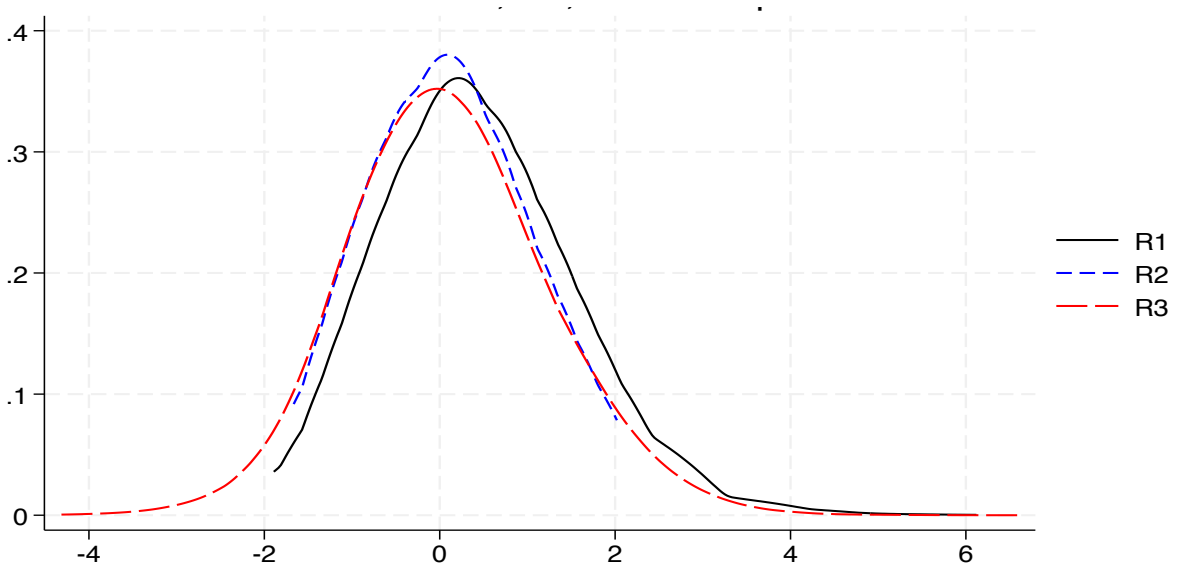
where $\bar{y}_R$ σ_R denote the median and standard deviation of log income in the relevant reference group, i.e. origin population for **R1**, German residents for **R2** and co-ethnic migrant in Germany for **R3**. The standard deviation $\boldsymbol{\sigma_R}$ was estimated under the assumption of lognormality, using WIID decile-level data. Specifically, it corresponds to the slope coefficient from an OLS regression of log decile incomes on the respective quantiles of a standard normal distribution ($z_k \in \{0.05, 0.15, \ldots, 0.95\}$).

Tables 3.3a and **3.*3b*** *(in Appendix B)* and ***Figure 3.4*** summarise the distribution of the three relative income indices. All measures are approximately standardised (mean ≈ 0, sd ≈ 1), but some differences emerge.

R_1 (origin-based) has a higher mean (≈ 0.42), reflecting migrants' generally improved income position compared to their origin countries. **R_2** (Germany-based) and **R_3** (peer-based) are more centred, indicating smaller within-country disparities.

Correlations show that R_2 and R_3 are highly aligned ($\rho \approx 0.91$), while R_1 is more weakly correlated with both, capturing a distinct cross-national comparison. The *Figure 3.4* confirms this with a right-skewed R_1 distribution and more symmetric R_2 and R_3.

Figure 3.4 Distribution of the three relative income indices (R_1, R_2, R_3)



3.3.4 Empirical Model

The empirical analysis aims to estimate how migrants' relative income positions—captured by the indices **R_1, R_2,** and **R_3**—influence their reported life satisfaction (LS) over time. This relationship is difficult to estimate due to several identification challenges, including non-random selection into migration, unobserved heterogeneity, and the dynamic nature of adaptation.

Existing literature highlights four main forms of self-selection in migration studies (Borjas, 1987; Chiswick, 1999; Constant & Zimmermann, 2006):

1. selection into migration,
2. selection into the host country,
3. selection into survey samples, and
4. selective return migration.

Failure to account for these processes can bias both income and well-being estimates.

To mitigate these issues, the analysis relies on a **within-individual fixed effects model**, which leverages the longitudinal structure of the data, covering over 116,000 person-year observations, and controls for all **time-invariant unobserved characteristics**, such as personality traits, cultural background, and pre-migration experiences. This estimation

strategy ensures that the results reflect the **within-person variation** in income and life satisfaction over time, rather than differences across individuals.

The baseline model is specified as follows:

$$LS_{it} = \alpha_i + \lambda_t + \beta_1(R1_{it} \times Duration_{it}) + \beta_2(R2_{it} \times Duration_{it}) + \beta_3(R3_{it} \times Duration_{it}) + \mathbf{X}'_{it}\gamma + \varepsilon_{it} \quad \textbf{3.11}$$

Where:

- $\mathbf{LS_{it}}$ denotes life satisfaction for individual i at time t;
- $\boldsymbol{\alpha_i}$ are individual fixed effects
- $\boldsymbol{\lambda_t}$ are year fixed effects accounting for aggregate shocks
- $\mathbf{X_{it}'}$ is a vector of time-varying controls including age, age squared, marital and employment status, education, self-reported health satisfaction, and crucially, absolute log household income.

The coefficients $\boldsymbol{\beta_1}$, $\boldsymbol{\beta_2}$, and $\boldsymbol{\beta_3}$ capture how the relationship between relative income and life satisfaction varies with **years since migration**, which proxies for adaptation and acculturation.

This fixed effects framework effectively **addresses time-constant self-selection** and individual-level unobservables. Potential concerns may arise from **unobserved time-varying shocks** (e.g., job loss, major life events), but these are unlikely to be systematically correlated with the relative income measures once the rich set of time-varying controls is included.

Moreover, different models are estimated in *section 3.4* considering heterogeneity by origin (Areas), gender and life stage at entry in Germany. This flexible specification allows the **sensitivity of life satisfaction to relative income** to vary across culturally and economically distinct migrant groups, as well as across age cohorts.

Overall, the identification strategy rests on the assumption that, conditional on fixed effects and controls, within-person changes in relative income are exogenous to changes in subjective well-being. This assumption is plausible in the context of a long-running household panel like the SOEP, where stable traits and migration motives are absorbed by the fixed effects structure. As a result, this approach provides a credible framework for isolating the causal effect of changes in relative income on life satisfaction.

3.4 Results

This section presents the empirical evidence on the relationship between migrants' life satisfaction (LS) and income, both in absolute terms and relative to multiple reference groups. Following the theoretical illustration and the empirical strategy detailed in *Sections 3.2* and *3.3*, we estimate a sequence of individual fixed-effects models that progressively incorporate absolute income and relative income measures with respect to the country of origin (R_1), the host-country distribution (R_2), and the co-ethnic population in Germany (R_3). Subsequent specifications add interactions to capture heterogeneity by duration of stay, age at migration, gender, and region of origin. All regressions include year and individual fixed effects and a consistent set of time-varying socio-demographic controls: employment status, marital status, education, health status, and regional dummies.

All models (**M0–M7**) are reported in ***Tables 3.4*** and ***3.5*** *(In Appendix B)* , which present coefficient estimates and robust standard errors.

3.4.1 Baseline Models

In the baseline specification (**M0**), life satisfaction is regressed on the origin-based relative income index (R1) and the set of controls, excluding absolute income. The coefficient of $\mathbf{R_1}$ is positive and highly significant ($\beta = 0.12$, $p < 0.01$), indicating that, within individuals **over time**, a one-standard-deviation increase in the relative position with respect to the income distribution of the country of origin is associated with an **average rise** of about 0.12 points in life satisfaction (on the 0–10 scale). This means that, when migrants increase their own economic position relative to their compatriots back home, they tend to report higher well-being. However, this association likely blends comparative and absolute effects, since income levels in Germany are consistently higher than those in most sending countries. As a result, R_1 may partly capture improvements in living standards rather than purely social-comparison effects.

All **control** variables display **expected and reasonable signs**. Life satisfaction increases with being employed and married, and decreases for those unemployed or separated, confirming the

internal consistency of the estimation. The coefficients for education and self-assessed health are positive and statistically significant, while the regional dummy for East Germany remains insignificant. These patterns closely align with standard findings in SOEP-based analyses (e.g., Clark et al., 2008; Frijters et al., 2004).

When absolute income is included (**M1**), the coefficient of R_1 becomes small and statistically insignificant, while the logarithm of equivalized net household income remains positive and highly significant ($\beta=0.24, p<0.01$). This suggests that the association detected in **M0** was largely driven by **within-person improvements in material conditions**, rather than by changes in social comparison alone. The magnitude of the absolute income coefficient is fully consistent with previous evidence from European panel data, which typically report *within-person elasticities* of life satisfaction with respect to log income around 0.20–0.30 (Ferrer-i-Carbonell, 2005; Clark, Frijters & Shields, 2008). In practical terms, a one-standard-deviation increase in log household income corresponds to roughly a quarter-point rise in life satisfaction. The control variables maintain their expected signs and levels of significance, reinforcing the stability and internal consistency of the specification.

In Model **M2**, both the origin-based (R_1) and host-based (R_2) relative income indices are included alongside absolute income. The results mark a clear turning point: the coefficient of **R_2 is positive and highly significant**, confirming that migrants' life satisfaction increases when their position within the German income distribution improves. In contrast, the coefficient of **R_1 turns negative and significant**, despite being positive in the previous specifications.

This change of sign is arguably the most striking result in the analysis. Indeed, *conditional on a given level of absolute income and on migrants' position within Germany, a higher R_1—that is, a larger income gap with respect to the income distribution of the origin country —is now associated with lower satisfaction in life*. At first glance, this finding may appear counterintuitive, but several complementary mechanisms could rationalize this pattern.

The first and perhaps most intuitive explanation concerns **moral and reputational concerns**. Migrants are typically a highly self-selected and ambitious subset of the population, characterized by strong upward mobility aspirations and a tendency to benchmark themselves against higher standards (Borjas, 1987; Chiswick, 1999; Constant & Zimmermann, 2006). When migrant's home countries experience slower progress, a widening gap between their own income and that of compatriots may generate discomfort rather than pride. A high R_1 could thus

coincide with empathy or concern for relatives left behind and unease about representing a country perceived as economically lagging. Moreover, part of the negative association may also stem from deteriorating economic conditions in the origin country (where relatives may still live) rather than individual improvement. In such cases, a higher **R1** reflects others' worsening circumstances, which may trigger empathy or moral discomfort rather than satisfaction.

A second channel involves **remittances pressure**. Economic success relative to the home population often raises expectations of financial support from family and community members (de Haas, 2007; Carling, 2008). These expectations may translate into moral or financial obligations that increase stress and reduce subjective well-being. Under this interpretation, a higher R_1 would indirectly lower satisfaction even among migrants who are objectively better off.

A third mechanism relates to **social disconnection**. Migrants who internalize host-country norms might perceive their growing economic advantage over the origin population not as progress but as *detachment*: an indicator that they are becoming strangers to the context they once belonged to. In this sense, a large R_1 would reflect emotional distance from the home environment without yet implying full integration into the host society.

Finally, the negative sign may also be amplified by **asymmetric sensitivity to social comparisons**. Psychological and behavioral studies show that individuals respond more strongly to upward than to downward comparisons gains in status bring limited satisfaction, whereas losses or perceived inferiority evoke intense negative emotions (Boyce, Brown & Moore, 2010; Smith et al., 2012; Clark et al., 2008). Migrants' ambition and upward orientation make them particularly susceptible to such asymmetry: outperforming those left behind yields little reward once the benchmark shifts toward German standards, while failing to keep up with natives generates frustration. This dynamic likely reinforces both the disconnection and the reputational unease described above.

In summary, Model M2 provides strong evidence that the relevant frame of reference changes once migrants internalize host-country standards. Economic success relative to the origin population no longer enhances well-being and may even exert a detrimental effect when comparisons with the host-country income distribution are explicitly considered.

Model M3 introduces the co-ethnic relative income index (R_3) alongside R_1, R_2, and absolute income, allowing for a more detailed assessment of how different comparison dimensions jointly influence life satisfaction.

The results reveal a clear hierarchy among reference effects. The coefficient of **R_1 remains negative and statistically significant** ($\beta=-0.076, p<0.05$), implying that, within individuals, an increase in the income gap between their own household and the average income in the country of origin may be a source of decline in life satisfaction. This pattern persists even after controlling for migrants' standing in Germany R_2 and within their co-ethnic community R_3. The coefficient of **R_2 remains positive and robust** ($\beta=0.105, p<0.01$), confirming that an improvement in one's relative position within the German income distribution is associated with higher well-being. The new introduced variable, **R_3**, is **positive and significant** ($\beta=0.052, p<0.05$), suggesting that life satisfaction tends to rise, albeit modestly, when migrants improve their relative position within their co-ethnic group. Absolute income also retains its expected positive sign and magnitude ($\beta=0.147, p<0.001$).

Together, these findings indicate that several reference layers operate simultaneously but with different psychological meanings. The positive host-country effect **(R_2)** remains the dominant force, showing that upward comparisons within the destination society play the central role in shaping well-being. The co-ethnic component **(R_3)** provides a *further sense of validation*, reflecting the importance of local belonging and comparison among peers with similar backgrounds. In contrast, the negative origin-based effect **(R_1)** reinforces the idea that economic distance from home no longer represents achievement but rather detachment with the original social environment, possibly intensified by remittance pressure.

Tests for multicollinearity confirm that these findings are not the product of statistical distortion. Pairwise correlations among R_1, R_2, and R_3 range between 0.25 and 0.88 (between R_2 and R_3), indicating moderate to high but not excessive overlap. The highest variance inflation factor shown in *table 3.6 (in Appendix B)* remains below critical concern thresholds (VIF ≈ 6.96). The stability of signs and magnitudes across specifications supports the robustness of these results and their substantive interpretation.

3.4.2 Duration Effect

To examine how relative income effects evolve with the length of residence, **Model M4** interacts the three relative income indices - R_1, R_2, and R_3 - with three duration classes: 0–5 years (reference group), 6–10 years, and more than 10 years since arrival.

Across all specifications, the pattern that emerges is remarkably consistent. *The negative coefficient of R_1 is concentrated among recent arrivals* ($\beta R_1 \approx -0.21, p<0.01$) and gradually *weakens with longer residence*. The positive and significant interaction terms for migrants with 6–10 years and more than 10 years of stay nearly offset the baseline effect, suggesting that the negative influence of outperforming the origin-country population **vanishes as migrants settle**. This result supports the explanation based on **remittances pressure:** in the first years after arrival, a high R_1 may coincide with stronger expectations of financial support from family members left behind. Newly arrived migrants often experience intense moral and economic obligations to remit, which can turn their relative income advantage into a source of stress rather than satisfaction. As these obligations ease over time, the negative effect of R_1 does not depend by the age of the migrant arrival.

In contrast, R_2 is **strongly positive** for newcomers ($\beta R_2 \approx 0.26, p<0.01$), but its interaction term **for long-term residents is negative and significant** ($\beta R_{2\times11} + \approx -0.20, p<0.01$), indicating that the emotional relevance of comparisons with German natives declines with time. This attenuation may reflect an **adaptation process**: as migrants integrate, they adjust their aspirations to more realistic standards and place less psychological weight on direct comparisons with natives. The coefficient of R_3 remains small and positive, and its interactions with duration are not statistically significant, suggesting that comparisons within the co-ethnic community remain stable throughout the migration trajectory.

On the other hand, **R_3 is positive and significant** ($\beta=0.11$, $p<0.001$) but shows **no significant interaction with duration of residence**, indicating that comparisons within the co-ethnic community remain **stable over time** and are largely unaffected by how long migrants have lived in Germany.

Overall, these dynamics suggest a gradual *reweighting of reference groups* over the course of migration. In the early stages, downward comparisons with the origin population remain emotionally ambivalent: simultaneously a source of pride and concern. As residence in the destination country extends, these transnational references lose salience and may even disappear. Meanwhile, the marginal return to outperforming natives diminishes, a possible explanation is that long-term residents form a **self-selected group**: migrants most dissatisfied with persistent upward comparisons to Germans may have returned home, remaining in the host country only those who no longer define their progress through direct comparison with natives. At the same time R_3 remains stable, suggesting that comparisons within the **co-ethnic community** provide a **consistent psychological anchor** throughout the migration process.

3.4.3 Age and Gender Heterogeneity

Model 5 examines whether the relevance of reference groups varies according to the **age at which individuals migrated**, distinguishing among four age-at-arrival classes: below 20, 21-35, 36–49, and 50 or above. The results show that the coefficient of the origin-based index $\mathbf{R_1}$ **remains negative and significant** ($\beta \approx -0.13, p < 0.05$), but it does **not interact significantly** with age at arrival. Similarly, the host-country comparison $\mathbf{R_2}$ **remains positive and robust across all age groups** ($\beta \approx 0.15, p < 0.05$), suggesting that comparisons with destination residents do not depend by the age of the migrant arrival. The co-ethnic benchmark R3 is **positive but imprecise**, showing no systematic variation by age at migration.

Overall, Model 5 supports the interpretation that **the age at migration does not materially affect the process of reference substitution**. Migrants who arrived young do not differ statistically from those who arrived later in how they compare themselves with the origin population, the host population, or co-ethnic peers.

Model 6 introduces **gender interactions** to explore whether men and women differ in their reference-group structures. The results indicate that the none of the interactions of gender with R_1 and R_2 reach statistical significance. Thus, both men and women seem to exhibit the same pattern of **negative origin-based** and **positive host-based** effects, suggesting that the mechanism operates similarly for both sexes.

The only notable divergence concerns the co-ethnic comparison $\mathbf{R_3}$. The interaction term between $\mathbf{R_3}$ and the female dummy is negative and statistically significant ($\beta \approx -0.06, p \approx 0.02$),

indicating that the positive effect of R3 observed in the pooled sample is **mainly driven by men,** while for women it is almost entirely offset. Female migrants therefore appear less responsive to their relative position within co-ethnic networks, possibly because they identify less strongly with ethnic peer groups and more with the broader host-society environment.

The inclusion of all interaction terms leaves the coefficients for absolute income and other controls stable.

3.4.4 Regional differences

The final empirical step examines whether the relationship between relative income and life satisfaction differs across five macro-regions of origin: Western and Southern Europe, Eastern Europe and the Balkans, MENA and Turkey, Sub-Saharan Africa, and Other countries (including Asia, the Americas, and Oceania). To this end, the same specification used in Model M3 is re-estimated separately for each macro-area. This strategy provides a more detailed depiction of heterogeneity across origins.

For **Western and Southern European** migrants, all three coefficients i.e., R_1, R_2, and R_3, are statistically insignificant. This suggests that, for migrants from Italians, Spaniards, or French migrants, life satisfaction depends primarily on absolute income and individual circumstances rather than on transnational or local income comparisons. The most plausible explanation is that the strong economic and cultural proximity to Germany reduces the importance of reference-group comparisons. Migrants from these countries experience limited social distance, so income gaps across national borders carry little emotional weight.

Migrants from **Eastern Europe and the Balkans** display a similar pattern. Both R_1 and R_2 have the expected signs—negative and positive, respectively—but remain statistically insignificant. The weak relationship between relative income and well-being likely reflects rapid economic convergence with Germany and the relatively short migratory and cultural distance, which make upward and downward comparisons less pronounced. The co-ethnic benchmark R_3 remains positive ($\beta \approx 0.07$), possibly reflecting a modest but consistent sense of *reassurance* from performing well relative to migrants of the same ethnic background.

The picture changes markedly for migrants from **MENA countries and Turkey**, where the model shows a clear and statistically significant asymmetry. The coefficient of R_1 is negative and significant ($\beta \approx -0.13, p \approx 0.10$), while R_2 is positive and significant ($\beta \approx +0.14, p \approx 0.08$). This configuration suggests that this group largely drives the aggregate results observed in the pooled sample. For these migrants, improving one's position within the German income distribution raises life satisfaction, but a simultaneous widening of the income gap with the origin-country population reduces it. Economic advancement may thus evoke mixed emotions

pride in upward mobility (captured by R_2) but also concern or guilt over the stagnation of their home environment, as reflected in the negative R_1 effect.

The pattern for Sub-Saharan African migrants stands in sharp contrast. For this group, the coefficient of R_1 is strongly positive and highly significant ($\beta \approx +0.79, p < 0.05$), while both R_2 and R_3 are statistically insignificant. This implies that Sub-Saharan migrants mainly evaluate their success through comparisons with the origin-country population, rather than within the host society. The most plausible explanation is that the income differential between Germany and most Sub-Saharan countries is so large that it generates a powerful sense of material relief and accomplishment. In this context, R_1 may capture not relative deprivation but the realization of a substantial upward leap in living standards, which dominates other reference effects and translates into genuine satisfaction gains.

Finally, migrants from Asian and other countries display a profile closer to that of MENA and Turkish migrants. The coefficient of R_1 is negative and significant, while R_2 is strongly positive and highly significant ($\beta \approx +0.50, p < 0.01$).

3.5 Conclusions

This chapter advances the literature on the subjective well-being of migrants by integrating insights from Social Comparison Theory, Transnationalism and Emotional Contagion into a unified framework that conceptualises migrant well-being as inherently relational and dynamically embedded in multiple social contexts. While the economics of happiness literature has long established that relative income matters for well-being, existing research typically assumes that individuals compare themselves to a single and stable reference group. This chapter takes a complementary and more dynamic perspective, asking whether and how the reference group itself changes as individuals are exposed to new social, economic and cultural environments. To address this question, the analysis focuses on migrants, who represent a quasi-natural experiment for studying the evolution of reference groups. Migration profoundly alters individuals' comparative landscapes, compelling them to reassess not only their absolute position but also the benchmarks they use to evaluate success, status and life satisfaction. By examining migrants' behaviour and trajectories, the chapter is able to trace how reference groups are formed, adjusted and potentially replaced over time, revealing a far more fluid and adaptive comparative process than typically assumed in the existing literature.

The chapter conceptualises migration as a dual shock: migrants typically experience substantial increases in absolute income but a decline in their relative rank within the richer host-country distribution. This tension makes migrants an ideal population for studying how reference groups are selected, re-weighted and internalised over time. Building on this conceptual foundation, the chapter develops three standardised indices of relative income corresponding to origin (R1), host-country (R2) and co-ethnic reference groups (R3). These measures are combined with a within-person fixed-effects framework that isolates the impact of changes in relative income from time-invariant unobserved characteristics, offering a credible empirical strategy for analysing how subjective well-being responds to shifting social comparisons.

The empirical results reveal a rich and nuanced hierarchy of reference effects. The strongest and most consistent predictor of life satisfaction is relative position within the host-country distribution: improving one's standing in Germany (R2) produces clear and robust gains in well-

being. The co-ethnic comparison (R3) also matters, although to a smaller extent, highlighting the stabilising role of ethnic networks in providing local frames of reference.

The most striking and theoretically consequential finding concerns the origin-based comparison (R1). Once absolute income and R2 are included, the coefficient of R1 becomes negative. This means that outperforming compatriots in the origin country, rather than producing pride, is associated with lower life satisfaction for migrants. This counterintuitive result is anchored in several mechanisms identified and discussed throughout the chapter. One explanation centres on **moral and reputational concerns**: migrants may feel discomfort or unease when their economic gains contrast sharply with the stagnation or difficulties faced by relatives and peers at home. Another explanation is linked to **remittances pressure**: higher relative income may increase expectations of financial support, turning economic success into a source of emotional and financial strain. A further mechanism relates to **social disconnection**. As migrants increasingly internalise host-country standards, the widening gap with their origin population may symbolise detachment rather than achievement, intensifying feelings of distance from their original social environment. Finally, psychological research suggests that individuals are **more sensitive to upward than to downward comparisons**. Once host-country peers become the primary benchmark, outperforming origin-country peers yields little satisfaction because the relevant comparison has shifted upwards. These mechanisms provide a coherent interpretation of the negative sign and position this chapter's contribution at the frontier of research on status, identity and transnational belonging.

The evolution of these effects over time reinforces this interpretation. The negative influence of R1 is concentrated among newcomers and fades with longer residence, consistent with declining remittances obligations and weaker emotional ties to the origin context. The positive effect of R2, while initially strong, gradually attenuates for long-term residents, possibly reflecting adaptation to host-country standards or selective return migration among those who struggle with persistent upward comparisons. In contrast, R3 remains stable over time, confirming that co-ethnic networks provide a persistent and emotionally salient comparison group.

Regional analyses further demonstrate that these mechanisms are not universal. Migrants from MENA and Turkey largely drive the negative R1 and positive R2 effects; migrants from Sub-Saharan Africa show the opposite pattern, suggesting that comparisons with the origin context

remain the predominant source of subjective well-being; migrants from Western and Eastern Europe appear mostly unaffected by relative income comparisons, relying more on absolute income and individual circumstances. These differences underscore the heterogeneity of migrant adaptation processes and highlight the importance of cultural, economic and historical backgrounds in shaping comparative standards.

Although the chapter provides a comprehensive analytical framework, several limitations should be acknowledged. The construction of relative income indices relies on decile-level international data that may not fully capture within-decile variation or non-monetary forms of status. Emotional contagion and identity dynamics, though theoretically grounded, are inferred indirectly rather than measured directly. Selective return migration could still introduce bias in long-term estimates if dissatisfaction drives return decisions. This concern is consistent with evidence from Poland, where Brzozowski and Coniglio (2018) document that the well-being of migrants significantly predicts return decisions. Finally, the analysis is restricted to Germany, a high-trust and high-income society with strong integration policies; the mechanisms identified here may operate differently in more unequal or less inclusive contexts.

Despite these limitations, the chapter makes a substantial contribution to the understanding of subjective well-being in migration contexts. It demonstrates that relative income comparisons operate across multiple social layers, that reference groups evolve with migration trajectories and that the meaning of economic success is mediated by identity, emotional ties and transnational obligations. The unexpected negative effect of outperforming the origin population challenges conventional economic models and invites deeper investigations into the moral, relational and emotional dimensions of migrant well-being.

"Happiness quite unshared can scarcely be called happiness; it has no taste."

Charlotte Brontë

4| INTERNATIONAL MIGRATION AND WELL-BEING OF THE LEFT BEHIND: INTRODUCING THE CONCEPT OF HAPPINESS REMITTANCES

The last empirical chapter deals with the consequences of international migration for the well-being of those who remain in the country of origin. In this context, *the **left behind*** refers to the non-migrating family members who continue living in the household when a relative moves abroad. Despite being an integral component of the migration process, this group remains largely overlooked in economic research. This chapter focuses on the **relational interdependence among family members** by examining how the departure of a family member shapes the subjective well-being of those who stay in Poland, an especially relevant setting given the substantial post-accession emigration flows that followed the country's entry into the European Union in 2004.

Hypothesis Testing:

1. *General effect: What happens to the Well-being when a family member migrates?*
2. *Heterogeneity: Is the relationship characterized by heterogeneity? Does it depend on who the migrant is, who is left behind, and the family type?*
3. *Mechanisms: What are the channels that play a role in this relationship? Is the financial channel preponderant?*

Keywords: International Migration, Subjective Well-Being, Life Satisfaction, Left Behind, Financial Remittances, Happiness Remittances

4.1 Introduction

International migration represents not only a transformative experience for those who leave, but also a ***major life event*** for the family members who remain. Surprisingly, while the economic literature has extensively examined the drivers of migration, far less attention has been devoted to those who do *not* migrate. Yet, when only one member leaves the household, the departure can alter economic conditions, family roles, emotional dynamics, and future expectations for those ***left behind***. *Subjective well-being (SWB)* provides an appropriate framework to evaluate these consequences. It encompasses both affective states and cognitive evaluations of overall life satisfaction, with the latter being more sensitive to long-term changes in household circumstances (Lucas, Diener & Suh, 1996). Given the enduring nature of migration-related adjustments, cognitive measures are particularly suitable for this analysis.

The scale of contemporary migration highlights the relevance of studying its impact on non-migrants. International migrants comprise 3.6% of the global population today, 281 million people, and this figure is expected to rise to 400 million by 2050 (World Migration Report 2020; UN DESA, 2015). Importantly, migrants rarely relocate with their entire family. Young adults often move alone, whereas full-family migration is more common when the migrant is a partner or household head. Nonetheless, institutional, economic and social constraints frequently prevent entire households from moving together, resulting in a sizeable, though hard-to-measure, population of left-behind relatives.

Much of the existing research on the left behind has focused on children. Studies highlight transnational caregiving arrangements in which childrearing is distributed among family members across borders (Levitt, 2001; Mazzucato & Schans, 2011), often reinforcing gendered family roles (Parreñas, 2010). This literature also documents substantial heterogeneity in family migration strategies (Dreby, 2010; González de la Rocha, 1994). In contrast, little is known about how adult family members (partners, parents or adult children) adjust their life satisfaction when a relative migrates abroad.

From a well-being perspective, the departure of a close relative constitutes a ***major life event*** whose consequences may be ambiguous. The *set-point theory* suggested that individuals tend

to return to stable baseline happiness levels after shocks (Brickman & Campbell, 1971; Costa & McCrae, 1980; Headey & Wearing, 1989; Lykken & Tellegen, 1996). However, longitudinal studies have shown that *adaptation* is far from inevitable: major life events including marriage, bereavement, unemployment, or illness, can lead to *persistent changes* in life satisfaction (Stutzer & Frey, 2002; Lucas et al., 2003; Lucas et al., 2006). Migration is particularly interesting because its consequences for those left behind involve both ***potential financial improvements***, such as remittances, and ***psychological costs*** linked to emotional separation. Moreover, additional channels, changes in social networks, time allocation, responsibilities and expectations, further complicate theoretical predictions. Taken together, these opposing forces imply that the net effect of a family member's migration on the well-being of those who remain cannot be determined a priori and must therefore be established empirically.

The majority of quantitative contributions rely on cross-sectional data (Cárdenas et al., 2009; Borraz et al., 2008; Antman, 2013; Böhme, 2015; Hendriks et al., 2021; Ivlevs et al., 2019). However, cross-sectional comparisons between households with migrants and those without are highly vulnerable to selection bias. As noted by Gibson et al. (2011), migration decisions involve multiple dimensions of selectivity, including: who migrates, whether families split, whether migrants return, and when these transitions occur. Only longitudinal data capturing changes in both well-being and migration status over time allow for more credible identification strategies (Nobles et al., 2015; Gibson et al., 2011). The fixed-effects framework adopted in this chapter mitigates concerns related to time-invariant unobserved heterogeneity, reducing one of the major sources of bias in migration analyses.

Poland provides an especially relevant context for studying these dynamics. Its **EU accession in 2004** sharply reduced the economic, administrative and psychological costs of moving abroad. Easier mobility, deeper integration and improved communication technologies may have simultaneously facilitated the **maintenance of transnational ties** and **lowered the emotional burden for the left behind**. These features make Poland an ideal setting in which to study how migration reshapes the *subjective well-being* of non-migrating family members.

By examining an overlooked life event in the happiness literature, namely the departure of a family member, and by focusing on a group often ignored in migration studies, the left behind, this chapter positions itself at the intersection of these two strands of research and develops further the research agenda opened by Brzozowski and Coniglio (2024), who highlighted the

importance of non-monetary transfers and social remittances as key channels through which migration reshapes the lived experiences of family members at origin.

Section 4.2 develops a simple conceptual framework inspired by Becker's theory of social interactions. It highlights three forces that operate in opposite directions: the economic channel, the psychological channel and the time allocation channel. Since these forces may counterbalance each other, the final effect of migration on the well-being of those who remain cannot be determined in theory and must therefore be evaluated empirically.

Section 4.3 presents the empirical strategy, which relies on a rich longitudinal dataset and an individual fixed effects approach. This design allows the analysis to track within-person changes in life satisfaction after a migration event while reducing concerns related to selection and unobserved heterogeneity.

The empirical results, discussed in *Section 4.4*, lead to three main findings. First, when a family member migrates abroad, the life satisfaction of those who remain increases by a sizeable amount. The magnitude is comparable to half of the well-known marriage effect and is robust across all specifications. Second, this improvement is not universal. It is concentrated among partners and adult children living in established family units, while no significant changes are observed for household heads or for individuals in more complex family arrangements. Third, the analysis of the channels shows that financial changes explain only part of the effect. Several relational and emotional domains also respond to migration, and, importantly, the overall increase in life satisfaction persists even when financial satisfaction does not improve.

As a consequence, this study, inspired by the social remittances notion suggested by Brzozowski and Coniglio (2024), introduces a new and suggestive concept in the economics literature: **happiness remittances**. This term refers to the emotional and psychological benefits transmitted from migrants to their relatives at home when the latter perceive the migrant to be happier, more fulfilled or more successful abroad. Such benefits may arise through altruistic preferences, emotional contagion, pride and status related feelings or a sense of parental accomplishment. The concept highlights a non financial pathway through which international migration can enhance well-being at origin, complementing but not replacing traditional monetary remittances.

4.2 Theoretical Mechanisms and Channels

Understanding why the departure of a family member may affect the *subjective well-being (SWB)* of those who remain requires a conceptual framework that integrates economic behaviour, intra-household interactions, and emotional spillovers. Building on Becker's (1974) *theory of social interactions*, according to which individuals derive utility not only from their own consumption but also from the well-being of others they care about, we model the *SWB* of the left behind as a function jointly determined by material, psychological, and time-allocation changes triggered by migration.

Let the utility of the left-behind individual *i* depend on:

i. personal consumption Ci,
ii. available free time Ti, and
iii. the utility of the migrant relative Uj, reflecting altruism and emotional interdependence

A simple representation is:

$$U_i = U_i(C_i, T_i, U_j) \quad \textbf{4.1}$$

With:

$$\frac{\partial U_i}{\partial U_j} > 0 \quad \textbf{4.2}$$

consistent with Becker's formulation of "social income," whereby the well-being of others enters one's own utility function.

In this setting, the migration of *j* affects Ui via multiple channels:

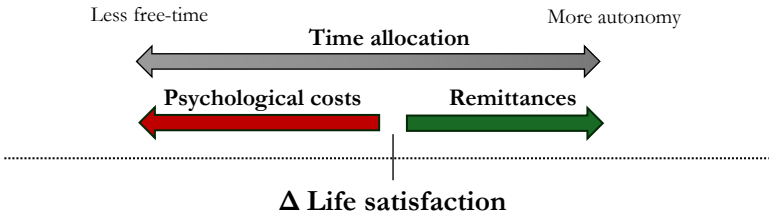
- changes in household consumption possibilities,
- direct emotional costs or benefits,
- changes in time allocation and responsibilities,

This structure generalises the mechanisms outlined by Nobles et al. (2015) and extends them by explicitly embedding *Uj* into *Ui*, allowing both positive and negative spillovers.

Drawing on this framework, the effects of migration on the left behind operate through three broad channels: **Economic**, **Psychological**, and **Time Reallocation**.

Given the coexistence of forces operating in opposite directions, the overall effect of migration on the well-being of the left behind remains theoretically ambiguous and must be assessed empirically. *Figure 4.1* summarises the three channels through which these effects arise and illustrates why no clear prediction can be derived *a priori*.

Figure 4.1 Conceptual framework of migration's on left behind well being



4.2.1 Economic Channel

A migrating relative may alter household resources through *remittances* or *indirect financial relief* (e.g., one fewer dependent member). Remittances may arise for different motives: altruism, exchange, or repayment of migration costs, but regardless of the motive, their effect is to raise disposable income. Taking this perspective, the well-being consequences of a family member's migration are generally expected to operate in a **positive direction** for those who remain. Migration can expand the household's consumption possibilities through monetary remittances, indirect financial relief, and improved income diversification. These additional resources may increase living standards and, in turn, the subjective well-being of the left behind.

This expectation can be formalised by comparing the migrant's net income abroad with the counterfactual income they would have generated at home. Let:

- Y_m denote income earned by the migrant abroad,
- Y_h the income the migrant would have earned in the origin country,
- C_m the additional costs associated with migration (e.g., dual accommodation, travel, installation costs),

- ***R*** the remittances transferred to the origin household,
- ***B*** the reduction in household expenditure resulting from the migrant's financial independence.

Migration produces **net economic gains** for the family when:

$$R + B \geq (Y_h - Y_m) + C_m \quad \textbf{4.3}$$

that is, when the total financial inflow and saved expenses outweigh the opportunity cost of foregone home income and the expenses required to sustain migration. When this condition holds, disposable income for the left behind increases:

$$C_i' = C_i + R + B \quad \textbf{4.4}$$

implying higher potential consumption or savings and, consequently, a theoretical improvement in subjective well-being.

Empirical evidence supports the plausibility of this mechanism. Remittances have been shown to increase household resources across a wide range of contexts (Adams & Page, 2005; Yang, 2008). Importantly, migration may also generate economic benefits through broader household strategies. For instance, Brzozowski and Coniglio (2018), analysing the Polish context, find that migration can enhance the economic prospects of origin households, particularly when the migration experience is successful in terms of earnings and integration abroad. Their findings highlight that the economic gains from migration are far from automatic: they depend critically on the migrant's ability to secure stable and sufficiently high-paid employment in the destination country.

However, the expectation of a positive economic effect rests on several conditions:

1. **Short-run migration costs**: Migration requires substantial upfront investment, potentially leading to borrowing or asset depletion. In the short term, the economic impact may be neutral or even negative (Rose & Shaw, 2008).
2. **Role-specific remittance patterns**: Remittances are systematically higher when the migrant is a parent, while transfers from young adult migrants may be modest or

irregular. In higher-income origin contexts, regular remittance behaviour may also be less pronounced.

3. **Indirect financial benefits**: Even without substantial remittances, households may benefit from the migrant's financial autonomy, which effectively reduces domestic resource demands an "implicit remittance."
4. **Income diversification and risk mitigation**: Migration spatially diversifies income sources, offering a form of insurance against local shocks (Cárdenas et al., 2009).
5. **Changes in household composition**: The departure of a household member may improve per-capita resources (e.g., more living space, lower food expenditure), indirectly enhancing living conditions.

Taken together, these mechanisms justify a **positive theoretical prior** regarding the economic channel. Nonetheless, the magnitude and direction of the effect depend on the migrant's success abroad, the household's pre-existing financial structure, and the time horizon under consideration.

4.2.2 Psychological channel:

Beyond material conditions, a substantial body of research shows that subjective well-being is shaped not only by income but also by a wide range of non-monetary and relational factors (Easterlin, 2009; Ahuvia, 2008). Within this framework, the psychological consequences of migration are generally expected to operate in a **negative direction** for those who remain. Physical separation from a close family member can impose an emotional burden, particularly when the migrant provides daily emotional closeness, companionship, or perceived support. The literature highlights that feelings of loneliness, anxiety, and uncertainty about the migrant's well-being frequently emerge after separation, and official reports submitted to the Global Commission on International Migration (Carballo & Mboup, 2005) document the substantial psychosocial strain experienced by partners and parents. Thus, from a theoretical standpoint, the psychological channel is predominantly associated with emotional costs that are likely to reduce subjective well-being.

Although this negative effect constitutes the most plausible expectation, some contextual elements may attenuate the magnitude of the emotional loss. For example, modern digital communication technologies allow frequent, low-cost interactions, which can partially mitigate

the sense of distance. In addition, in households characterised by pre-existing tension or interpersonal conflict, physical separation may reduce frictions and occasionally improve the emotional climate at home (Echegoyén Nava, 2013).

In summary, while minor mitigating mechanisms exist, the psychological dimension of migration is, in theory, expected to exert a **negative** influence on the well-being of those left behind. Whether this expectation is confirmed or contradicted in practice is ultimately an empirical question that the next sections investigate.

4.2.3 Time Reallocation Channel

The migration of a household member also affects ***the allocation of time*** among those who remain, introducing a set of adjustments whose net impact on *subjective well-being* is **theoretically ambiguous**. When a relative leaves, the distribution of domestic tasks, caregiving responsibilities, and household management often shifts toward the remaining members. This may reduce available leisure time, increase daily workload, and heighten stress, all of which are factors typically associated with lower levels of well-being. From this perspective, a negative effect may arise when the additional responsibilities imposed by migration exceed the coping capacity of the individuals left behind.

At the same time, changes in household composition can also generate **greater autonomy** in the use of time. The absence of the migrant may reduce interpersonal coordination constraints, provide more discretion in daily scheduling, or ease relational pressures within the household. Individuals may gain more freedom to allocate time according to personal preferences, engage in activities previously limited by shared routines, or reorganize their responsibilities in a way that better reflects their priorities. In such cases, the reallocation of time may have a neutral or even positive influence on well-being.

The final effect ultimately depends on several factors, including the identity of the migrant, the degree of task specialisation within the household before departure, the presence of children or dependents, and the socioeconomic status of the family.

Overall, the time reallocation channel does not lend itself to a clear theoretical prediction. It encompasses forces operating in opposite directions, and its influence on well-being is best characterised as *intrinsically ambiguous*.

4.3 Background, Data and Empirical Strategy

4.3.1 Background

Poland, the fifth most populous EU member state, has undergone profound political and economic transformations since the collapse of the Soviet Union in 1989. Democratisation paved the way for EU accession in 2004 and entry into the Schengen Area in 2007, substantially increasing mobility and integration with Western Europe. Over the period 2004–2015, Poland experienced sustained economic growth, with GDP per capita (PPP) rising by roughly 52%. Parallel improvements have been documented in subjective well-being, with studies noting marked increases in life satisfaction during the post-accession period (Bartolini et al., 2017; World Happiness Report, 2019). Recent evidence for Central and Eastern Europe (Brzozowski and Coniglio, 2024) shows similar dynamics, emphasising that migration and well-being trajectories in the region are deeply shaped by post-accession mobility patterns.

These developments coincided with one of the *largest post-enlargement migration waves* in Europe. The number of Poles residing abroad increased from around 1 million in 2004 to 2.3 million in 2007, stabilising at approximately 2.4 million in 2015. The main destinations such as the UK, Germany, and the Netherlands, offered substantially higher income levels and higher average life satisfaction than Poland.

This migration phenomenon is relevant for at least two reasons. First, migration is selective: individuals with lower life satisfaction are more likely to emigrate, even after controlling for socioeconomic factors (Hendriks & Burger, 2021; Migali & Scipioni, 2019; Graham & Nikolova, 2018). This pattern is confirmed by evidence from the same dataset we adopt: using Social Diagnosis, Brzozowski and Coniglio (2021) show that lower pre-migration life satisfaction strongly predicts both migration intentions and actual migration behaviour. Second, and central to this chapter, migration may affect the well-being of the family members who remain behind. These “left-behind effects” are theoretically ambiguous: while remittances may relax financial constraints, separation may impose emotional and organisational costs. Understanding this mechanism is key to assessing whether post-accession migration contributed to Poland’s improvement in subjective well-being or tempered it.

4.3.2 Data

The analysis relies on five waves (2007–2015) of the *Social Diagnosis* (SD), a nationally representative biennial longitudinal survey that documents household composition, employment, income, and multiple well-being indicators. These waves include detailed questions on whether any household member currently lives abroad, making it possible to track migration events between waves.

The dependent variable is the cognitive measure of life satisfaction, recoded so that higher values correspond to greater satisfaction. Following Carbonell and Frijters (2004), the variable is treated as cardinal.

The key explanatory variable is a ***household-level migration indicator*** that takes value 1 when at least one member emigrates between wave t–1 and wave t. ***Return migration*** and ***internal migration*** is coded separately and included as benchmarks.

To isolate the effect of *new* migration events, the analytical sample is restricted to individuals who:

i. never migrated themselves;
ii. had no migrant household members prior to the observation window;
iii. participated in at least two consecutive waves.

The final analytical sample consists of **146,206 individual-year observations**, corresponding to **57,232 unique respondents**, of whom **86,388** provided at least one valid answer to the life-satisfaction question. Within this sample, approximately **1.5%** of individuals experienced the international migration of a household member in the two years preceding the interview. In total, **597 households** were affected by such an event, the vast majority involving the departure of a single member (528 cases), with only a small proportion reporting two or more migrants.

Summary statistics for all variables used in the analysis are reported in *Table 4.1 (Appendix C)*.

A clear pattern emerges when examining who remains in these households. The left-behind population is primarily composed of **partners**, predominantly women, often over the age of fifty, and **adult children**, especially **sons aged 18 to 30**. These figures reflect two dominant

migration configurations within Polish families. The first is characterised by the **male household head migrating abroad**, leaving behind a partner and, frequently, adult children. The second involves the **migration of an adult son**, typically leaving parents and siblings in the household. These demographic patterns align with broader regional trends in Eastern European labour mobility during the post-accession period.

Turning to the characteristics of the migrants themselves, the data indicate a **strong male bias**, with more than **65%** of migrants being men. The migrants are predominantly either **household heads** or **young adults**, which is consistent with the established understanding of migration incentives and household strategies in Central and Eastern Europe.

From a socioeconomic perspective, both migrants and those left behind are relatively evenly distributed across the national income quintiles. This distribution reflects two opposing forces: on the one hand, **higher-income families** are often better positioned to finance the upfront costs of migration; on the other, **lower-income households** may have stronger incentives to send a member abroad but face more severe liquidity constraints (Brzozowski & Coniglio, 2018). As a result, no clear monotonic gradient emerges in the descriptive income data.

A further dimension concerns family structure. For analytical purposes, households are grouped into two broad categories: **Established Family Units** (couples with or without children) and **Contemporary Family Dynamics** (including single-parent households, multi-person non-nuclear arrangements, and multi-family households). Left-behind individuals are markedly more common in the latter group, suggesting that more complex or non-traditional family arrangements may rely disproportionately on staggered migration strategies.

Finally, the descriptive patterns of subjective well-being indicate that the mean level of life satisfaction in the sample is **5.16** on a 1–7 scale. Interestingly, this average is very similar for left-behind individuals and for those who did not experience the migration of a household member. However, clear differences emerge once family structure is taken into account: members of **Established Family Units** report significantly higher life satisfaction (mean **5.31**) compared with those living in **Contemporary Family Dynamics** (mean **5.01**). This gap underscores the relevance of family structure as a potential source of heterogeneity in the relationship between migration and subjective well-being (a theme that is further explored in the next sections).

4.3.3 Methodology and Identification Strategy

To estimate the effect of a family member's migration on the subjective well-being of those who remain, the analysis relies on year and individual fixed-effects model of the form:

$$Happiness_{ijt} = \beta_1 MigrationHH_{jt} + \beta_2 X_{ijt} + \theta_i + \gamma_t + \varepsilon_{ijt} \quad \textbf{4.5}$$

where $\boldsymbol{Happiness_{ijt}}$ denotes the cognitive assessment of overall life satisfaction on a 1–7 scale, recoded such that higher values correspond to higher satisfaction.

The main explanatory variable, $\boldsymbol{MigrationHH_{jt}}$ equals 1 if at least one household member emigrated internationally between wave t−1 and wave t, excluding temporary returnees within the same interval.

Income, social ties, and other potentially migration-induced variables are intentionally excluded from the baseline specification and introduced only in dedicated robustness checks, to avoid conditioning on endogenous mediators i.e. "throwing the baby out with the bathwater" (Hendriks 2015). Hausman tests decisively reject random effects, indicating that unobserved heterogeneity is correlated with the migration variable and confirming FE as the appropriate estimator.

The second research question investigates whether the effect of a family member's migration varies systematically across three dimensions: ***(i) the structure of the family***, ***(ii) the role of the migrating relative,*** and ***(iii) the role of the individual who remains at home***.

To explore these dimensions, separate specifications and interaction models are estimated. Owing to sample-size constraints, it is not feasible to simultaneously interact migrant role and left-behind role, as several cells become sparsely populated. This step allows us to assess whether the positive baseline effect is driven by specific household configurations or relational positions.

The results of these strategies are presented and discussed in *Section 4.4.1* and *4.4.2*

The third research question investigates **the channels through which** the migration of a family member affects the subjective well-being of those who remain. Motivated by the theoretical

discussion in *Section 4.2* : where economic, psychological, and time-allocation mechanisms were outlined, we adopt **two complementary empirical strategies**.

Importantly, because many potential mediators are themselves endogenous to migration, formal causal mediation is infeasible (violating sequential ignorability). Instead, consistent with Nobles (2013; 2015) and Giordano et al. (2011), we interpret attenuation patterns as evidence of plausible channels.

First step: Following the bottom-up model of life satisfaction (Schimmack, Diener & Oishi 2002), we estimate the following model for each of the 16 domain satisfactions recorded in SD:

$$\text{DomainSat}_{ijt}^{(k)} = \alpha_1 \text{MigrationHH}_{jt} + \alpha_2 X_{ijt} + \theta_i + \gamma_t + \varepsilon_{ijt} \qquad \textbf{4.6}$$

By comparing the magnitude and statistical significance of α1 across domains, thereby identifying which aspects of well-being are most affected by a family member's migration, we determine which components of life satisfaction are most responsive to household migration. This approach clarifies which domains plausibly mediate the baseline effect reported in *Equation 4.5*.

Second step: for each domain ***k*** (which has an α1 statistically significant in eq. 4.6), we construct a three-category variable indicating whether satisfaction between waves:

- **decreased** $\Delta\text{Domain}_{ijt}(k) = 0$
- **remained unchanged** $\Delta\text{Domain}_{ijt}(k) = 1$
- **increased** $\Delta\text{Domain}_{ijt}(k) = 2$

This trichotomous structure distinguishes deterioration, stability, and improvement and avoids imposing linearity on domain changes.

We then estimate interaction models of the form:

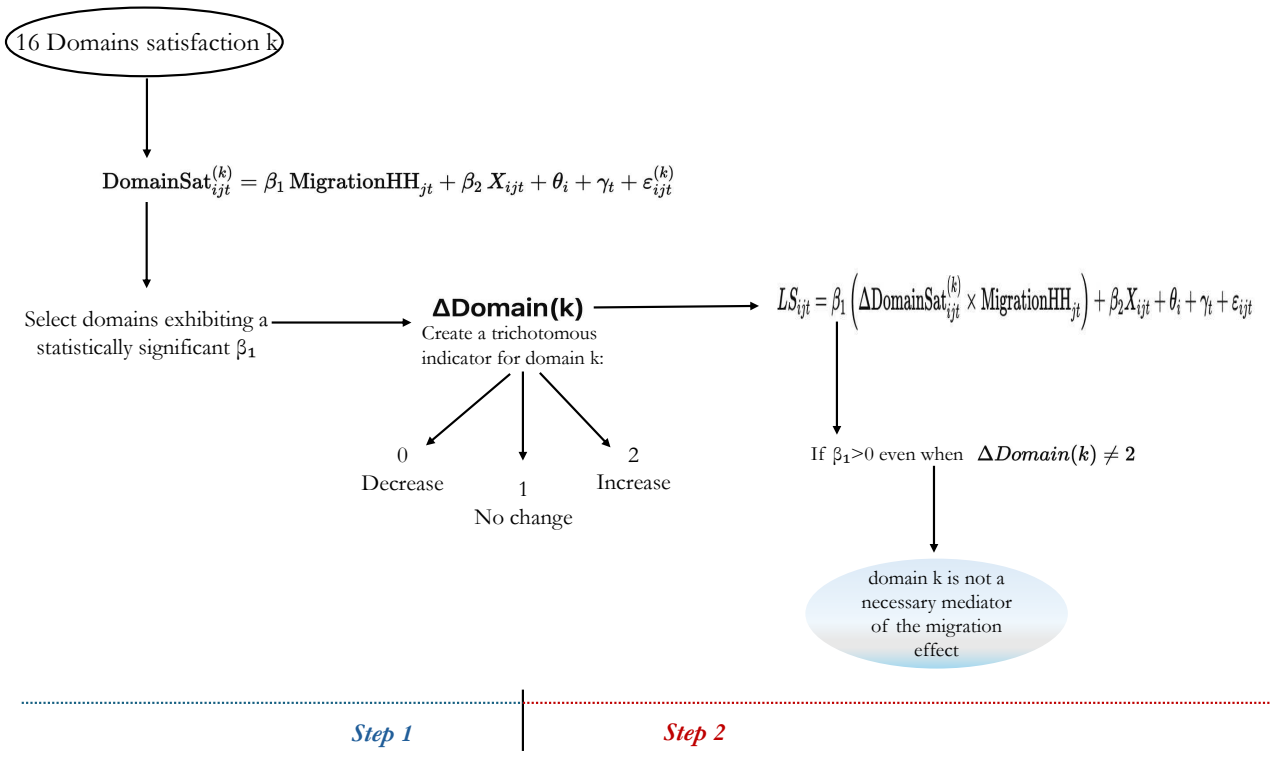
$$LS_{ijt} = \beta_1 \left(\Delta\text{DomainSat}_{ijt}^{(k)} \times \text{MigrationHH}_{jt} \right) + \beta_2 X_{ijt} + \theta_i + \gamma_t + \varepsilon_{ijt} \qquad \textbf{4.7}$$

This specification tests whether the positive effect of migration on overall life satisfaction is ***conditional*** on changes in ***domain k***, or whether migration exerts an ***independent effect*** even when domain satisfaction remains unchanged.

The key interpretative criterion is the following: **A domain mediates the migration effect only if the migration coefficient disappears or reverses when satisfaction in that domain does not change.** Conversely, **if the interaction term corresponding to "no change" remains positive and significant**, then the migration effect operates **independently** of changes in that domain, implying that the domain cannot account for the observed well-being gains.

The results of this two-step approach are presented and discussed in *Section 4.4.3*, while *Figure 4.2* provides a visual summary of the strategy described above.

Figure 4.2 Two step strategy for identifying the channels driving the impact of migration on left behind well-being



4.4 Empirical Analysis

4.4.1 Baseline Effect

Table 4.2 (Appendix C) reports the **baseline estimates of the effect of a family member's migration on the life satisfaction of those who remain**. Across specifications, additional covariates are introduced sequentially—from Model 1 to Model 6—and in every case the Hausman test strongly favours the fixed-effects estimator, indicating correlation between unobserved heterogeneity and migration status.

In *Model 1*, which includes only time-varying controls not directly affected by migration, the migration indicator exhibits a positive and statistically significant association with life satisfaction. The coefficient (+0.085 on a 1–7 scale) represents approximately 8.5% of the overall standard deviation and about 20% of the within-individual standard deviation. To contextualise the magnitude, the effect is roughly half the size of the well-documented positive effect of marriage in the *SWB literature*. Other covariates behave as expected: individuals with primary or lower education report significantly lower well-being, while tertiary education yields a small and statistically insignificant premium; an increase in household size reduces life satisfaction, with an effect similar in magnitude (but opposite in sign) to that of being left behind.

Model 1 also allows a comparison between international migration, internal migration, and return migration. Neither the family members of internal migrants nor those of returnees show statistically detectable changes in life satisfaction, and the coefficients are close to zero. Likewise, we find no significant effect for individuals who migrated and subsequently returned within the same period. These findings confirm that the positive association detected for international migrants' relatives is not driven by generic mobility or by selection into temporary migration.

In *Model 2*, we introduce the logarithm of household income, a potential conduit through which international migration may influence well-being via remittances or indirect financial relief. Household income enters with the expected positive sign and is strongly significant at the 1% level. A 1% increase in household income is associated with an increase of 0.085 points in life

satisfaction (on a 0-7 scale), conditional on other covariates. Notably, including income strengthens, rather than attenuates, the coefficient on *MigrationHH*, both in magnitude and significance. This suggests that **the positive effect of migration of a family is not fully captured by income changes**. The age–life satisfaction profile also aligns with established evidence, displaying a U-shape with a minimum around age 43.

Model 3 adds self-reported financial change over the previous two years. Improvement in financial conditions is strongly associated with higher well-being, with an effect size comparable to the baseline migration coefficient. Yet, the migration effect remains largely unchanged, indicating that subjective financial trajectories do not mediate the full relationship.

Model 4 incorporates social connectedness, approximated by the number of friends and its square. Results display a concave (bell-shaped) relationship, with life satisfaction increasing with social network size up to a relatively high threshold. The inclusion of these variables does not materially alter the migration coefficient, suggesting that migration-induced changes in social networks are unlikely to account for the observed effect.

Models 5 and 6 introduce two further key determinants of well-being: *health and work conditions*. Experiencing a serious illness in the previous year is associated with a substantial decline in life satisfaction (about –0.09), while improvements or even stability, in health needs satisfaction have a significant positive effect. In the labour dimension, experiencing a job downgrade reduces life satisfaction by approximately –0.07. Once again, the migration coefficient remains stable.

A striking result emerges across all models: the estimated coefficient on *MigrationHH* does not decrease when additional controls are introduced. On the contrary, it increases from +0.085 in the baseline to around +0.14 in the fully specified model, retaining statistical significance at the 5% level. ***This pattern indicates that the positive effect of international migration on the well-being of those left behind is not explained away by income, financial perceptions, social ties, health shocks, or labour market events***. Rather, the association becomes stronger once these factors are accounted for.

4.4.2 Heterogeneity

The second step of the analysis examines whether the effect of a family member's migration varies systematically across different household configurations. To do so, we estimate a set of heterogeneous specifications focusing on three dimensions:

i. **family type**,
ii. **the role of the migrant within the household**, and
iii. **the role of the individual who remains at home**.

We additionally explore interactions between family type and each of the two role-based dimensions. Due to data limitations, however, we cannot simultaneously interact migrant role and left-behind role, as this would result in sparse cells and unreliable estimates.

Table 4.3 (in Appendix C) reports the full set of heterogeneous estimates.

Family Structure: *Model 1* distinguishes between *Established Family Units* (couples with or without children) and *Contemporary Family Dynamics* (single-parent households, multi-family households, and other non-nuclear arrangements). The positive migration effect is concentrated almost entirely among *Established Family Units*, with a sizeable coefficient of approximately +0.18 - nearly 50% of the within-individual standard deviation. By contrast, the effect for Contemporary families is close to zero and statistically insignificant.

A plausible interpretation is that traditional family settings may exhibit stronger intra-family ties, allowing both the economic and psychological benefits of migration to translate more sharply into improvements in life satisfaction. This interpretation aligns with existing qualitative evidence on the strong emotional connectedness between Polish migrants and their close family members.

Migrant Role: *Model 2* investigates whether the type of migrant: household head, partner, son/daughter, or other relative, matters for the well-being of those who stay behind. Although coefficients do not reach statistical significance, likely due to small group sizes, the point estimates suggest that migration by a partner (as defined in the SD survey, typically the lower earner in the couple) yields the largest positive effect. This pattern is consistent with the idea

that partners moving abroad may generate financial relief or new income flows, especially when they were previously unemployed or underemployed in Poland.

Role of the Left-Behind Individual: *Model 3* examines heterogeneity according to the position of the left-behind household member. The strongest estimated effect is observed for partners, while sons also appear to benefit, albeit without statistical significance. This aligns with the notion that the emotional and economic repercussions of migration are not uniformly experienced by all family members.

Interactions with Family Type: Models 4–7 examine whether the observed heterogeneity varies across the two family structures.

Among *Contemporary Family Dynamics* (Models 5 and 7), the effect of migration by different types of migrants is not statistically significant. However, in *Model 7*, partners left behind in non-traditional households still exhibit a positive and moderately significant increase in life satisfaction.

Among *Established Family Units* (Models 4 and 6), the patterns become more pronounced. While the type of migrant again does not yield statistically significant differences (Model 4), Model 6 reveals strong heterogeneity by left-behind role. Partners and sons both experience substantial well-being gains, and the effect for sons is particularly large (+0.42), corresponding to nearly an entire within-individual standard deviation.

Overall, *Table 4.3* reveals substantial heterogeneity in how migration affects the well-being of those who stay. **The positive effect observed in the baseline model is far from uniform: it depends on who migrates, who remains, and especially on the structure of the household**.

Two complementary mechanisms may account for this variability:

1. **Heterogeneous benefits:** Certain relational links such as partner–partner or parent–adult son, may generate stronger economic or psychological spillovers, making the benefits of migration more salient.
2. **Heterogeneous costs:** The emotional and organisational costs of separation are likely to differ across family roles and structures. For example, partners may suffer the greatest

emotional loss from separation, but they may also benefit the most from remittances or emotional gains associated with the migrant's success abroad.

4.4.3 Mechanism and Channels

The previous sections established two key empirical facts: (i) the international migration of a household member has a positive and significant effect on the life satisfaction of those who remain, and (ii) this effect is far from uniform, emerging primarily in families characterised by stronger internal bonds. This motivates a deeper investigation of the mechanisms underlying this surprising improvement in *subjective well-being*. As discussed in *Section 4.2*, three channels may be at play: an economic channel driven by remittances and expected to improve household resources, a psychological channel shaped by emotional costs and potential spillovers, and a time-allocation channel linked to the redistribution of responsibilities. Empirically, two broad possibilities arise. Either financial remittances compensate the psychological and organisational costs of separation, or even more unexpectedly the psychological and time-allocation channels may themselves have net-positive effects when the migration involves a close family member.

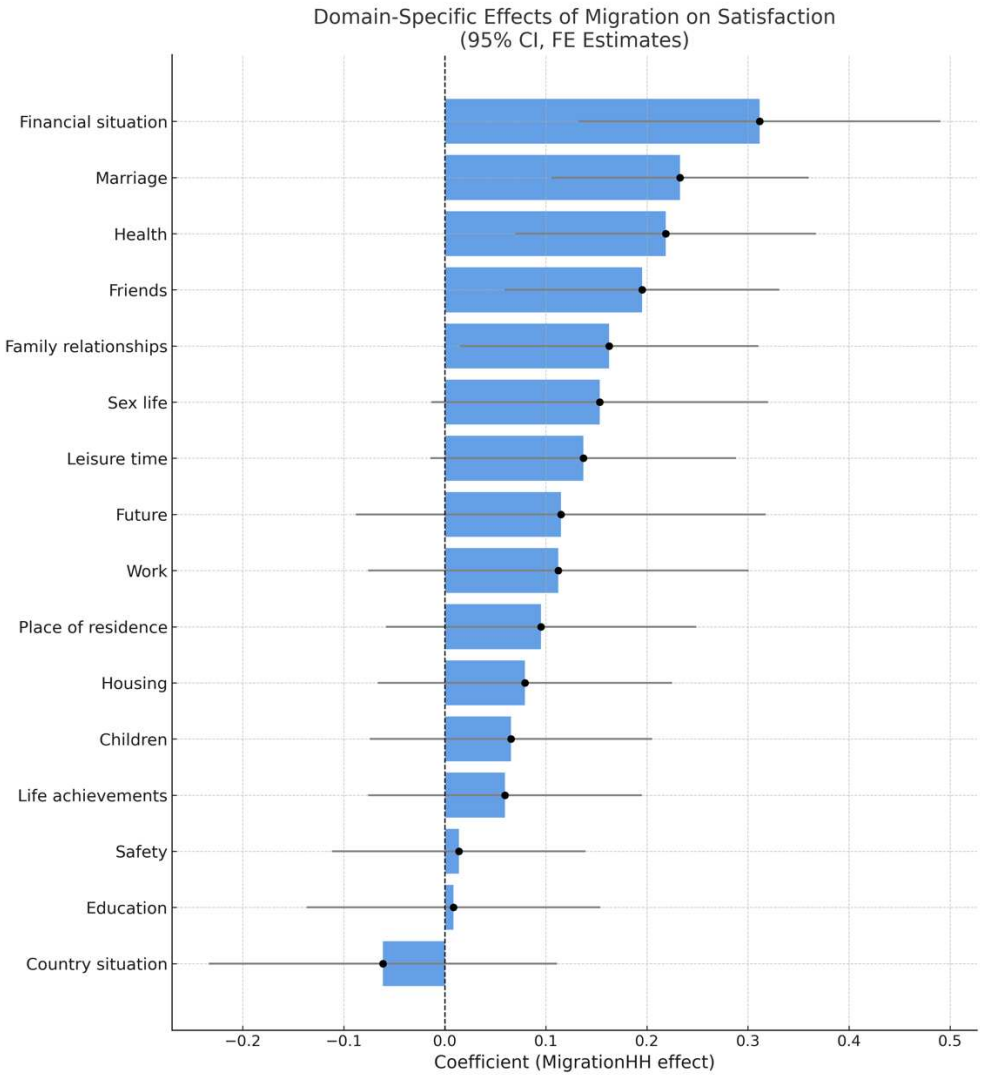
To explore these mechanisms, we adopt the two-step empirical strategy outlined in *Section 4.3.3*. The first step relies on the bottom-up model of life satisfaction (Schimmack, Diener & Oishi, 2002), and separately estimates model (1) in tab 4.2 for each of the sixteen domain satisfactions available in the SD survey. Basically, we estimate the same baseline specification, but replacing overall life satisfaction with each domain-specific satisfaction as the dependent variable. This approach allows us to assess which dimensions of subjective well-being respond most strongly to the migration of a household member, without imposing a priori assumptions about the relevant channels.

The results reported in *Table 4.4A (Appendix C)* and illustrated in *Figure 4.3* show that the migration of a family member is associated with positive and statistically significant improvements in only a subset of the sixteen domains considered; specifically, family financial satisfaction, marital satisfaction, health satisfaction, friendship satisfaction, and family-relationship satisfaction. These results point to multiple avenues: economic, relational, and social, through which migration may shape well-being. The strong effect on financial satisfaction is consistent with a remittance-driven mechanism, while the improvements in

marital and family satisfaction suggest that migration may also have unexpected relational benefits. Notably, these relational improvements do not appear among households experiencing internal migration, suggesting that they are specific to the process of international migration rather than to the mere fact of temporary separation. The improvement in friendship satisfaction is more intuitive, possibly reflecting increased socialisation opportunities for those who remain.

It is important to emphasise, however, that the magnitude of the effect on a given domain does not automatically signal its importance as a mediating mechanism. A domain's contribution to overall life satisfaction depends on both its sensitivity to migration and the subjective weight individuals assign to it. Thus, the finding that the coefficient on financial satisfaction is the largest in *Table 4.4A* does not imply that the economic channel is dominant.

Figure 4.3 Fixes effects estimates of the impact of migration on each of the 16 *DS*



The second step of the analysis evaluates whether changes in specific domains mediate the relationship between migration and overall life satisfaction. For each domain which showed statistically significant coefficient reported in *Table 4.4A (Appendix C)*, we construct a categorical variable indicating whether satisfaction in that domain decreased, remained unchanged, or increased between survey waves. We then estimate the interaction specification described in *Section 4.3.3 (Equation 4.7)*, which allows us to test whether the migration effect persists, disappears, or intensifies depending on domain-specific changes.

The results, reported in *Table 4.4B (Appendix C)*, yield three notable findings. First, decreases in domain satisfaction never produce a positive migration effect, suggesting, as one might expect, that deterioration in key domains cannot explain the well-being gains observed among the left behind. Second, increases in domain satisfaction consistently amplify the effect of migration. Third, and most crucially, the positive effect of migration on overall life satisfaction does not arise only when domain satisfaction improves. For some domains – notably family finances and friendships – the migration coefficient remains positive and statistically significant even when satisfaction in that domain remains unchanged, whereas for marriage, health and family relationships the gains materialise when satisfaction improves. **This pattern suggests that the positive effect of a family member's migration on the well-being of those left behind persists even when the left-behind individual does not report any subjective improvement in their financial situation**.

Taken together, these results provide strong evidence that non-financial and non-material channels play a central role in shaping the well-being of those who remain. The persistence of the migration effect in the absence of domain changes suggests the presence of emotional or **psychological spillovers** that extend beyond household finances and observable life domains. This finding challenges the dominant narrative in the migration literature, which frames remittances as the primary mechanism compensating for the psychological costs of separation.

A more compelling interpretation emerging from our findings is that international migration generates improvements in subjective well-being not only through material channels, but also through non-material emotional spillovers. This pattern partly contradicts the theoretical expectation outlined in *Section 4.2*, where psychological costs were presumed to be negative; instead, our evidence suggests that the psychological channel can itself become a source of positive utility for those left behind. These results lay the groundwork for conceptualising a

novel mechanism: *happiness remittances*, that can be defined as *the non-material psychological gains transmitted from migrants to the relatives who remain at home, arising from the belief that the migrant is better off abroad: financially, socially, or emotionally*.

These gains may stem from several complementary processes:

1. **Altruistic spillovers**: individuals derive utility from the well-being of those they care about. When a migrant relative achieves higher income or improved living conditions, those left behind may experience a direct emotional uplift.

2. **Parental identity fulfilment**: parents may feel a deep sense of accomplishment when a child's migration represents the realisation of aspirations they helped foster. This is consistent with psychological theories that view children as extensions of the self (Aron, 1991; Brummelman, 2015).

3. **Status-related utility**: success abroad often confers social prestige in many communities. Knowing that a family member is studying, working, or "making it" abroad can increase perceived social status, generating pride and status-related satisfaction.

Taken together, these mechanisms transmit **emotional returns** that complement, rather than substitute for, financial remittances. Their relevance is reinforced by a key empirical fact: *these positive spillovers emerge only for international migration, not for internal migration*. This suggests that crossing national borders, often associated with greater opportunities and symbolic upward mobility, plays a crucial role in triggering these emotional benefits.

In this sense, the gains in subjective well-being observed among the left behind cannot be explained solely by financial mechanisms. Instead, the evidence points to a dual pathway in which **migration transmits both monetary and emotional returns**, with the latter playing a surprisingly positive role in shaping well-being.

4.5 Conclusions

This study examines how international migration affects the *subjective well-being (SWB)* of family members who remain in Poland, a country that experienced one of the largest post-accession emigration waves in the European Union. Drawing on the large-scale longitudinal *Social Diagnosis* dataset (over 146,000 individual-year observations across five waves, 2007–2015) and an individual fixed-effects identification strategy, we document a **robust and positive effect of a family member's migration on the life satisfaction of those left behind**. This improvement persists across specifications and survives the sequential introduction of several covariates. Importantly, the effect is not universal: it is concentrated within traditional, two-parent family structures, and it vanishes for household heads and individuals living in more complex or non-nuclear arrangements.

The analysis of mechanisms reveals that the relationship between migration and *SWB* cannot be explained solely by financial improvements. While remittances and indirect financial relief contribute to the economic channel, our results indicate that emotional and psychological processes also play a central role. Migration generates statistically significant improvements in several life domains, especially *family finances, marital relations, health, friendships,* and *overall family relationships*, suggesting a multidimensional pattern of benefits. Notably, the migration of a family member does not produce any statistically significant negative effect on any domain of subjective satisfaction, contradicting the common assumption that emotional costs dominate.

Technological change may partially mitigate the emotional burden of separation by facilitating frequent, low-cost communication across borders; however, this factor does not account for the positive effect observed. Crucially, **the analysis shows that increases in life satisfaction persist even when family financial satisfaction remains unchanged**, indicating that the mechanisms at play extend beyond material improvements.

In light of these findings, we introduce the concept of ***happiness remittances***: *non-material psychological gains transmitted from migrants to their families through perceived improvements in the migrant's living conditions, success, or well-being abroad*. These emotional spillovers, rooted in altruism, parental fulfillment, and status-related utility, represent an alternative and

previously overlooked channel through which migration shapes well-being at origin. While the idea of happiness remittances remains speculative at this stage, and further empirical work is needed to confirm its existence and scope across different settings, the concept offers a promising avenue for future research.

Finally, the external validity of our results is limited by the specific institutional, social, and historical context of Poland in the post-accession period. The combination of large-scale emigration, reduced migration costs, and strong transnational ties may not generalize to other countries or time periods. Replicating this analysis in different cultural, economic, and policy environments is therefore essential to assess the broader applicability of these findings.

Overall, the study calls for a broader understanding of migration's consequences, one that recognizes the interplay between economic and psychological channels. Rather than viewing separation exclusively as a source of hardship, the results highlight the possibility that international migration fosters an emotional narrative of progress and opportunity that enhances the well-being of those who remain.

"Happiness is not something ready-made.

It comes from your own actions."

Dalai Lama

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"The happiness of your life depends on the quality of your thoughts."

Marcus Aurelius

APPENDIX A

Table 2.1 — Descriptive Statistics: SOEP Sample (1990–2022)

Variable	Mean	SD	95% CI	Observations
Life satisfaction	7.122	1.801	[7.11 – 7.13]	658,088
Health satisfaction	6.726	2.246	[6.72 – 6.73]	656,715
Sleep satisfaction	6.750	2.248	[6.74 – 6.76]	277,831
Work satisfaction	7.070	2.112	[7.06 – 7.08]	401,826
Housework satisfaction	6.769	1.994	[6.76 – 6.78]	465,478
Household income satisfaction	6.468	2.284	[6.46 – 6.48]	629,450
Personal income satisfaction	6.080	2.534	[6.07 – 6.09]	365,733
Dwelling satisfaction	7.698	2.022	[7.69 – 7.71]	631,581
Leisure satisfaction	6.954	2.248	[6.94 – 6.96]	603,233
Family satisfaction	7.893	1.910	[7.88 – 7.91]	314,664
Social satisfaction	7.594	1.843	[7.58 – 7.61]	60,647

Source: SOEP v38 (1990–2022).

Table 2.2 – Estimated Age Profiles of Domain and Overall Life Satisfaction (OLS vs Fixed Effects Models)

Life Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.043	-0.043	0.001
25	-0.069	-0.103	-0.033
30	-0.091	-0.168	-0.077
35	-0.126	-0.263	-0.137
40	-0.186	-0.353	-0.167
45	-0.469	-0.469	0.000
50	-0.342	-0.565	-0.223
55	-0.434	-0.681	-0.247
60	-0.309	-0.643	-0.334
65	-0.139	-0.568	-0.429
70	-0.135	-0.700	-0.565
75	-0.228	-0.954	-0.726
80	-0.305	-1.223	-0.919

Health Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.062	-0.078	-0.016
25	-0.252	-0.319	-0.067
30	-0.442	-0.581	-0.140
35	-0.688	-0.865	-0.177
40	-0.932	-1.166	-0.233
45	-1.209	-1.509	-0.299
50	-1.448	-1.777	-0.329
55	-1.799	-2.159	-0.360
60	-1.911	-2.370	-0.458
65	-1.869	-2.387	-0.519
70	-2.036	-2.683	-0.647
75	-2.288	-3.087	-0.799
80	-2.504	-3.532	-1.028

Sleep Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.006	-0.008	-0.001
25	-0.186	-0.364	-0.178
30	-0.383	-0.713	-0.330
35	-0.547	-0.972	-0.424
40	-0.564	-1.238	-0.674
45	-0.618	-1.485	-0.867
50	-0.687	-1.700	-1.013
55	-0.922	-2.043	-1.122
60	-0.926	-2.195	-1.269
65	-0.672	-2.125	-1.453
70	-0.676	-2.256	-1.580
75	-0.780	-2.528	-1.748
80	-0.862	-2.759	-1.897

Work Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE−OLS)
21	0.009	-0.011	-0.020
25	-0.126	-0.236	-0.110
30	-0.155	-0.308	-0.154
35	-0.143	-0.372	-0.229
40	-0.135	-0.468	-0.332
45	-0.208	-0.643	-0.436
50	-0.253	-0.800	-0.546
55	-0.391	-1.059	-0.669
60	-0.255	-1.169	-0.914
65	-0.013	-1.209	-1.196
70	-0.077	-1.449	-1.372
75	-0.597	-1.854	-1.258
80	-1.438	-2.535	-1.097

Housework Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE−OLS)
21	0.091	0.082	-0.009
25	0.033	0.084	0.051
30	-0.092	0.005	0.097
35	-0.181	-0.059	0.122
40	-0.227	-0.109	0.118
45	-0.247	-0.087	0.160
50	-0.149	-0.008	0.141
55	-0.137	-0.029	0.107
60	-0.034	0.039	0.073
65	0.117	0.080	-0.037
70	0.091	-0.035	-0.125
75	-0.038	-0.294	-0.256
80	-0.239	-0.722	-0.483

HH Income Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE−OLS)
21	-0.084	-0.062	0.022
25	-0.248	-0.128	0.120
30	-0.120	0.055	0.176
35	-0.012	0.174	0.187
40	0.066	0.243	0.177
45	0.048	0.221	0.173
50	0.063	0.256	0.193
55	0.004	0.241	0.236
60	0.033	0.213	0.181
65	0.263	0.374	0.112
70	0.445	0.451	0.006
75	0.595	0.505	-0.090
80	0.662	0.557	-0.105

Personal Income Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	0.071	0.192	0.121
25	0.090	0.478	0.389
30	0.332	1.093	0.761
35	0.469	1.552	1.083
40	0.561	1.952	1.390
45	0.610	2.260	1.650
50	0.622	2.557	1.935
55	0.574	2.804	2.231
60	0.550	3.020	2.471
65	0.635	3.372	2.737
70	0.848	3.716	2.869
75	1.034	4.013	2.979
80	1.216	4.294	3.078

Dwelling Conditions Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.111	-0.095	0.016
25	-0.342	-0.280	0.063
30	-0.342	-0.216	0.126
35	-0.166	0.003	0.169
40	-0.001	0.189	0.190
45	0.111	0.289	0.178
50	0.206	0.372	0.165
55	0.279	0.426	0.148
60	0.395	0.469	0.074
65	0.562	0.542	-0.019
70	0.653	0.519	-0.133
75	0.709	0.502	-0.207
80	0.728	0.429	-0.299

Leisure Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.078	-0.065	0.013
25	-0.513	-0.484	0.028
30	-0.844	-0.765	0.079
35	-0.960	-0.846	0.114
40	-0.960	-0.860	0.100
45	-0.791	-0.716	0.074
50	-0.616	-0.556	0.060
55	-0.506	-0.478	0.028
60	-0.071	-0.102	-0.031
65	0.568	0.459	-0.109
70	0.767	0.564	-0.203
75	0.842	0.530	-0.313
80	0.788	0.346	-0.442

Family Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.009	-0.004	0.005
25	-0.023	-0.124	-0.101
30	0.052	-0.182	-0.234
35	0.050	-0.287	-0.337
40	-0.028	-0.432	-0.403
45	-0.174	-0.553	-0.379
50	-0.161	-0.553	-0.392
55	-0.196	-0.592	-0.396
60	-0.118	-0.591	-0.472
65	0.145	-0.481	-0.626
70	0.170	-0.536	-0.706
75	0.142	-0.664	-0.806
80	0.020	-0.839	-0.859

Social Satisfaction

Age	OLS Estimate	FE Estimate	Δ (FE–OLS)
21	-0.003	1.345	1.348
25	-0.316	-0.329	-0.012
30	-0.296	-0.214	0.081
35	-0.553	-0.427	0.126
40	-0.636	-0.385	0.252
45	-0.736	-0.387	0.348
50	-0.779	-0.231	0.548
55	-0.799	-0.270	0.529
60	-0.664	-0.202	0.462
65	-0.478	-0.188	0.290
70	-0.494	-0.212	0.282
75	-0.669	-0.477	0.192
80	-0.659	-0.563	0.095

Notes: All coefficients are statistically significant at the 1% level. FE estimates capture within-person variation, whereas OLS estimates reflect both between- and within-person differences. Δ denotes the difference between FE and OLS coefficients for each age.

Table 2.3 – Estimated CNS Weights by Age Cohort

	Dependent variable: Life satisfaction (0-10)				
Domains satisfaction (0-10)	**Full Sample**	**Age 20–30**	**Age 31–45**	**Age 46–65**	**Age 65+**
Family	0.2505	0.216	0.275	0.240	0.248
	(0.0019)	(0.0050)	(0.0032)	(0.0029)	(0.0084)
Health	0.1959	0.207	0.188	0.195	0.208
	(0.0019)	(0.0051)	(0.0033)	(0.0029)	(0.0077)
Household income	0.1200	0.081	0.131	0.132	0.135
	(0.0025)	(0.0058)	(0.0041)	(0.0040)	(0.0106)
Work	0.1336	0.153	0.134	0.133	0.080
	(0.0017)	(0.0044)	(0.0030)	(0.0027)	(0.0065)
Sleep	0.0674	0.077	0.062	0.065	0.065
	(0.0017)	(0.0048)	(0.0030)	(0.0026)	(0.0071)
Dwelling	0.0815	0.067	0.079	0.088	0.109
	(0.0019)	(0.0046)	(0.0030)	(0.0031)	(0.0082)
Personal income	0.0542	0.064	0.048	0.048	0.058
	(0.0023)	(0.0052)	(0.0039)	(0.0037)	(0.0100)
Housework	0.0358	0.052	0.035	0.034	0.035
	(0.0018)	(0.0046)	(0.0031)	(0.0028)	(0.0074)
Leisure	0.0610	0.083	0.049	0.064	0.062
	(0.0017)	(0.0046)	(0.0028)	(0.0026)	(0.0070)
Root MSE	**1223**	**1.266**	**1.189**	**1.215**	**1.264**
N	**156,961**	**23,941**	**53,360**	**68,946**	**8,204**

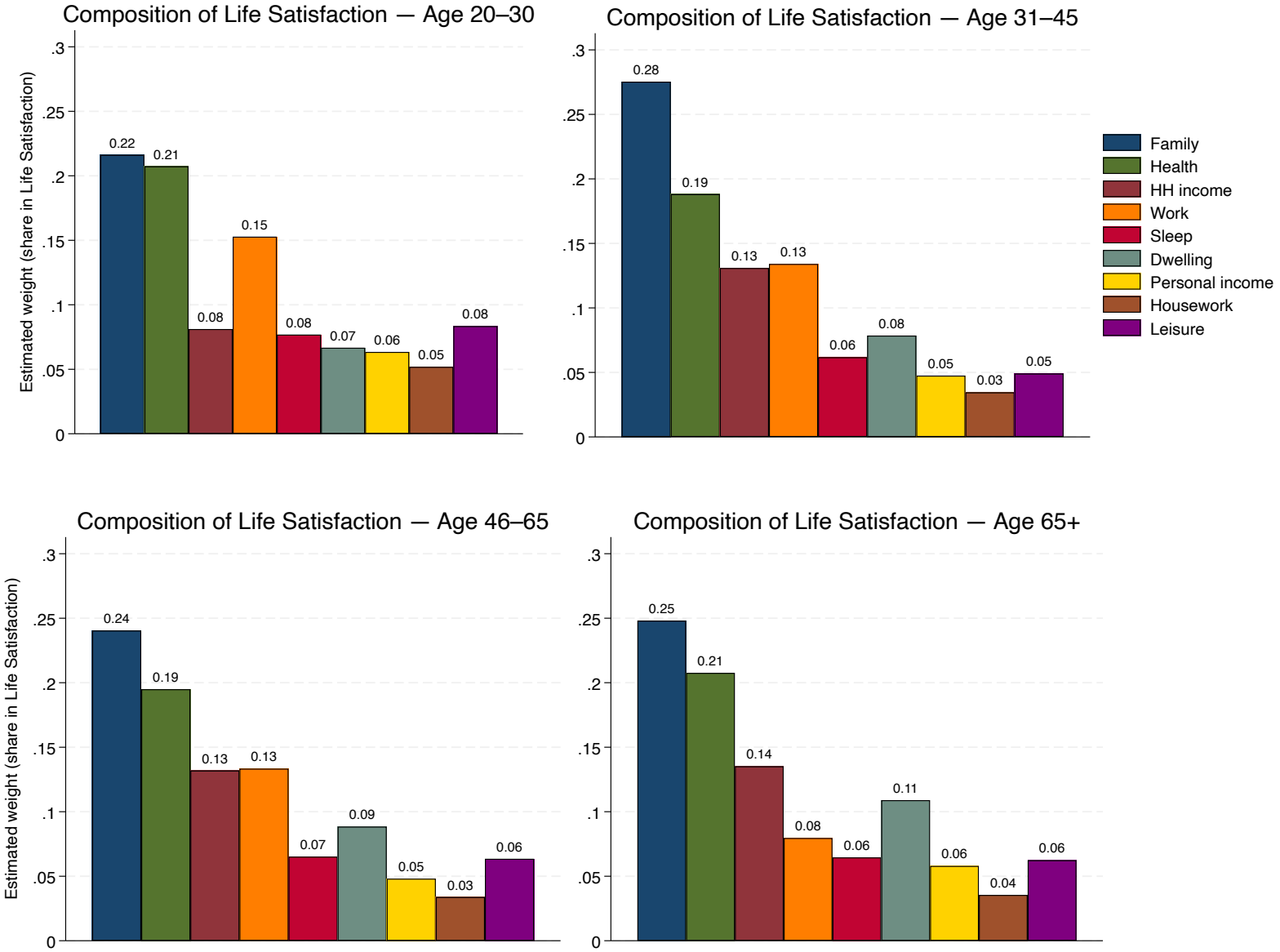
Notes: All coefficients are statistically significant at $\alpha = 0.01$. The table reports estimated compositional weights (wj) from the Constrained Nonnegative Sum model for each age cohort. Standard errors in parentheses.

Table 2.4 – Shapley Value Decomposition by Age Cohort

	Dependent variable: Life satisfaction (0-10)				
Domains	**Full sample**	**Age 20–30**	**Age 31–45**	**Age 46–65**	**Age 65+**
Health	17.87%	18.07%	16.70%	17.37%	18.84%
Sleep	8.84%	9.48%	8.18%	8.65%	7.29%
Work	12.09%	15.17%	11.08%	12.21%	8.24%
Housework	4.39%	3.84%	4.20%	4.80%	4.35%
HH income	12.95%	11.21%	13.29%	13.41%	16.05%
Pers. income	10.08%	9.86%	9.81%	10.59%	12.96%
Dwelling	6.19%	5.55%	6.12%	7.10%	6.89%
Leisure	6.84%	8.36%	6.38%	7.07%	5.71%
Family	20.75%	18.45%	24.25%	18.81%	19.66%
R-squared	**45.65%**	**36.28%**	**44.65%**	**49.76%**	**44.98%**

Notes: Values represent the Shapley decomposition of R^2 (percentage contribution).

Figure 2.5a-d – Estimated CNS coefficients across the four age cohorts (20–30, 31–45, 46–65, 65+)



“Sometimes your joy is the source of your smile,

but sometimes your smile can be the source of your joy.”

Thich Nhat Hanh

APPENDIX B

Table 3.1a — Descriptive statistics (continuous variables)

Variable	Obs.	Mean	Std. Dev.	Min	Max
ln (hh net income)	116,132	7.540	0.579	2.303	11.783
Years of education	116,132	1.130	1.330	0	11
Years Professional education	116,132	10.141	2.244	7	18
self-assessed health	116,132	6.898	2.360	0	10
duration (years since migration)	108,832	17.887	11.993	0	70

Notes: Table 3.1 reports summary statistics for the continuous variables used in the empirical analysis. Values are based on the pooled sample after winsorisation at the 1st and 99th percentiles where applicable.

Table 3.1b — Descriptive statistics (categorical variables)

Employment Status

Category	Frequency	Percent %	Cumulative %
Full-Time Employment	46,458	40.00	40.00
Regular Part-Time Employment	11,203	9.65	49.65
Vocational Training	2,481	2.14	51.79
Part-Time Employment	5,010	4.31	56.10
Not Employed	50,927	43.85	99.95
Sheltered workshop	53	0.05	100.00
Marital Status			
Married	84,926	73.13	73.13
Single	16,513	14.22	87.35
Widowed	3,979	3.43	90.77
Divorced	5,902	5.08	95.86
Separated	4,812	4.14	100.00
Years of residence in Germany			
0–5	20,459	17.62	17.62
6–10	13,600	11.71	29.33
11+	82,073	70.67	100.00
Age			
<35	35,190	30.30	30.30
35–50	45,682	39.34	69.64
51+	35,260	30.36	100.00
Age when arrived in Germany			
<20	35,621	30.67	30.67
20–34	51,885	44.68	75.35
35–49	16,726	14.40	89.75
50+	11,900	10.25	100.00
Gender			
Male	58,191	50.11	50.11
Female	57,941	49.89	100.00
Region of origin			
West-South Europe	22,960	19.77	19.77
East Europe	51,228	44.11	63.88
MENA and Turkey	33,390	28.75	92.63
Sub-Saharan Africa	2,279	1.96	94.60
Other (Asia, Americas, Oceania)	6,122	5.27	99.87
Not identified	153	0.13	100.00

Notes: Table 3.1.b reports the frequency distribution of categorical variables for the pooled sample. Percentages are calculated over 116,132 observations.

Table 3.3a — Descriptive statistics for R_1, R_2, and R_3

Variable	Mean	Std. Dev.	Min	Max	Median (p50)
R_1	0.422	0.996	−3.075	6.120	0.247
R_2	0.104	0.863	−1.665	2.021	0.000
R_3	0.103	1.010	−5.560	6.858	0.000

Notes: Table 3.3.a reports summary statistics for the three relative income indices R_1, R_2, and R_3. All variables are standardized and winsorised at the 1st and 99th percentiles. Observations refer to the pooled SOEP migrant sample.

Table 3.3b — Pairwise correlations among R_1, R_2, and R_3

Variable	R_1	R_2	R_3
R_1	1.000		
R_2	0.330	1.000	
R_3	0.418	0.905	1.000

Notes: Table 3.3b reports the pairwise Pearson correlation coefficients between the three relative-income indices R_1, R_2, and R_3. All indices are standardized and computed over the pooled SOEP migrant sample. The strong correlation between R_2 and R_3 reflects their common reference to the host-country distribution, while the moderate correlation with R_1 suggests that origin-based comparisons capture a distinct transnational dimension of migrants' relative well-being.

Table 3.4 — Fixed-effects estimations (Models M0–M6)

	Dependent variable: Life satisfaction (within-person fixed effects)						
Variable	**M0**	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**
R_1	0.118***	0.025	−0.081**	−0.075**	−0.204***	−0.129**	−0.077*
	(0.015)	(0.020)	(0.031)	(0.031)	(0.045)	(0.054)	(0.046)
R_2	—	—	0.158***	0.105**	0.262***	0.148**	0.066
			(0.032)	(0.037)	(0.062)	(0.061)	(0.052)
R_3	—	—	—	0.052**	0.112***	0.062*	0.094***
				(0.020)	(0.028)	(0.034)	(0.026)
ln HH net income	—	0.244***	0.173***	0.147***	0.149***	0.147***	0.147***
		(0.029)	(0.033)	(0.035)	(0.035)	(0.035)	(0.035)
age²	5.6×10^{-5}	1.15×10^{-4}	1.05×10^{-4}	9.7×10^{-5}	9.7×10^{-5}	7.0×10^{-5}	9.7×10^{-5}
	(7.1×10^{-5})	(7.14×10^{-5})	(7.12×10^{-5})	(7.1×10^{-5})	(7.1×10^{-5})	(7.5×10^{-5})	(7.1×10^{-5})
Employment status (ref. Full time)							
Part-time	−0.110***	−0.092***	−0.085***	−0.083***	−0.137***	−0.084 ***	−0.082 ***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.029)	(0.027)	(0.027)
Vocational Training	−0.079	−0.066	−0.050	−0.045	−0.044	−0.042	−0.084
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
Irregular	−0.200***	−0.171***	−0.160***	−0.159***	−0.159***	−0.160 ***	−0.159 ***
	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
Not Employed	−0.275***	−0.239***	−0.227***	−0.226***	−0.225***	−0.227 ***	−0.227 ***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Sheltered workshop	0.153	0.143	0.162	0.160	0.187	0.145	0.161
	(0.358)	(0.356)	(0.364)	(0.366)	(0.372)	(0.363)	(0.362)
Marital status (Ref. married-engaged)							
Single	−0.181***	−0.179***	−0.179***	−0.177***	−0.172***	−0.175 ***	−0.177 ***
	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
Widowed	−0.587***	−0.500***	−0.555***	−0.569***	−0.568***	−0.587 ***	−0.564 ***
	(0.097)	(0.096)	(0.097)	(0.097)	(0.097)	(0.097)	(0.097)
Divorced	−0.253***	−0.183**	−0.211***	−0.220***	−0.216***	−0.252 ***	−0.223 ***
	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)
Separated	−0.545***	−0.461***	−0.492***	−0.503***	−0.503***	−0.503 ***	−0.508 ***
	(0.061)	(0.061)	(0.061)	(0.062)	(0.062)	(0.062)	(0.062)

Years of education	0.028**	−0.003	0.019	0.0258*	0.028**	0.025	0.026 *
	(0.012)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Years Profess. education	0.020	0.019	0.017	0.016	0.017	0.016	0.016
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
self-assessed health	0.242***	0.241***	0.241***	0.241***	0.241***	0.241 ***	0.241 ***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
East Germany	−0.015	−0.007	−0.002	−0.003	−0.006	-0.040	−0.005
	(0.114)	(0.114)	(0.113)	(0.113)	(0.112)	(0.112)	(0.113)
Time since migration (ref. <5y)							
Migration: 6–10 years		—	—	—	−0.186***	—	—
					(0.060)		
Migration: 11+ years		—	—	—	−0.386***	—	—
					(0.077)		
R1 x time since migration (ref<5y)							
R_1 × years 6–10	—	—	—	—	0.093**	—	—
					(0.035)		
R_1 × years 11+	—	—	—	—	0.160***	—	—
					(0.043)		
R2 x time since migration (ref<5y)						—	
R_2 × duration 6–10		—	—	—	−0.142**		—
					(0.067)		
R_2 × duration 11+		—	—	—	−0.204***	—	—
					(0.064)		
R3 x time since migration (ref<5y)						—	
R_3 × duration 6–10		—	—	—	0.065	—	—
					(0.049)		
R_3 × duration 11+		—	—	—	0.052	—	—
					(0.041)		
R1 x age at migration (ref<20 y)							
R_1 × age class (20–34)		—	—	—	—	0.055	
						(0.067)	
R_1 × age class (35–50)		—	—	—	—	0.135	—
						(0.110)	
R_1 × age class (51+)		—	—	—	—	0.073	—
						(0.093)	
R2 x age at migration (ref<20 y)							

R_2 × age class (20–34)	—	—	—	—	—	−0.071 (0.079)	—
R_2 × age class (35–50)	—	—	—	—	—	−0.050 (0.124)	—
R_2 × age class (51+)	—	—	—	—	—	−0.011 (0.142)	—
R3 x age at migration (ref<20 y)							
R_3 × age class (20–34)	—	—	—	—	—	−0.013 (0.041)	—
R_3 × age class (35–50)	—	—	—	—	—	−0.018 (0.052)	—
R_3 × age class (51+)	—	—	—	—	—	0.066 (0.076)	—
R1 x Female							
R_1 × female	—	—	—	—	—	—	0.0157 (0.0587)
R2 x Female							
R_2 × female	—	—	—	—	—	—	0.0853 (0.0705)
R3 x Female							
R_3 × female	—	—	—	—	—	—	−0.0865 ** (0.0359)
Observations	**91,218**	**91,218**	**91,218**	**91,218**	**91,218**	**91,218**	**91,218**

Notes: Individual and year fixed effects in all models. Robust standard errors clustered at the individual level in parentheses. Controls include employment status, marital status, education (d11107 and pgbilzeit), self-assessed health (plh0171), and East-Germany dummy (l11102). Model M4 adds interactions by duration of stay; M5 by current age class; M6 by gender. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses

Table 3.5 – Heterogeneity by Country of Origin (Model M7 A-E)

Dependent variable: Life satisfaction (within-person fixed effects).

Variable	M3	West & Southern Europe	Eastern Europe & Balkans	MENA & Turkey	Sub-Saharan Africa	Asia, Americas, Oceania
R_1	−0.075**	0.223	−0.052	−0.131 **	0.785 **	−0.314 **
	(0.031)	(0.160)	(0.049)	(0.079)	(0.384)	(0.147)
R_2	0.105**	−0.167	0.071	0.137 **	0.024	0.499 ***
	(0.037)	(0.153)	(0.063)	(0.079)	(0.383)	(0.156)
R_3	0.052**	0.106	0.066	0.033	−0.281	−0.161 **
	(0.020)	(0.069)	(0.043)	(0.075)	(0.246)	(0.076)
ln (household net income)	0.147***	0.119	0.152 **	0.170 ***	0.409	0.220
	(0.035)	(0.081)	(0.060)	(0.065)	(0.310)	(0.149)
age²	9.7×10^{-5}	-7.0×10^{-5}	1.6×10^{-4}	9.0×10^{-5}	9.0×10^{-4}	7.5×10^{-4} **
	(7.1×10^{-5})	(1.4×10^{-4})	(1.0×10^{-4})	(1.6×10^{-4})	(7.5×10^{-4})	(3.8×10^{-4})
Employment status (ref. Full time)						
Part-time	−0.083***	−0.054	−0.032	−0.233 ***	−0.153	−0.104
	(0.027)	(0.063)	(0.037)	(0.069)	(0.441)	(0.096)
Vocational Training	−0.045	0.152	0.021	−0.142	−0.484	−0.116
	(0.052)	(0.156)	(0.065)	(0.111)	(0.408)	(0.206)
Irregular	−0.159***	−0.029	−0.122 **	−0.334 ***	−0.033	−0.077
	(0.034)	(0.083)	(0.048)	(0.075)	(0.355)	(0.121)
Not Employed	−0.226***	−0.149 **	−0.161 ***	−0.413 ***	−0.324	−0.076
	(0.026)	(0.059)	(0.037)	(0.054)	(0.204)	(0.100)
Marital status (Ref. married-engaged)						
Single	−0.177***	−0.098	−0.189 ***	−0.225 *	−0.239	−0.298
	(0.052)	(0.105)	(0.066)	(0.137)	(0.276)	(0.222)
Widowed	−0.569***	−0.610 ***	−0.536 ***	−0.703 **	1.108	−0.491
	(0.097)	(0.218)	(0.116)	(0.292)	(0.718)	(0.856)
Divorced	−0.220***	0.058	−0.231 **	−0.421 ***	−0.571	−0.109
	(0.073)	(0.173)	(0.101)	(0.139)	(0.608)	(0.445)
Separated	−0.503***	−0.317 **	−0.533 ***	−0.567 ***	−0.085	−0.366
	(0.062)	(0.147)	(0.095)	(0.108)	(0.387)	(0.287)
Years of education	0.0258*	0.015	0.024	0.042	0.079	0.085
	(0.014)	(0.030)	(0.034)	(0.056)	(0.120)	(0.063)

Years Professional education	0.016	0.031	0.020	0.010	−0.126 *	0.031
	(0.014)	(0.032)	(0.011)	(0.055)	(0.067)	(0.054)
self-assessed health	0.241***	0.275 ***	0.224 ***	0.251 ***	0.186 ***	0.214 ***
	(0.004)	(0.011)	(0.006)	(0.008)	(0.044)	(0.018)
East Germany	−0.003	−0.220	−0.198	0.534 **	0.050	0.309
	(0.113)	(0.272)	(0.154)	(0.252)	(0.282)	(0.476)
Observations	91.218	91,218	41,630	25,909	1,305	5,453

Notes: Individual and year fixed effects in all models. Robust standard errors clustered at the individual level in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.6 – Multicollinearity diagnostics (Model M3):Variance Inflation Factors (VIF) and tolerance values (1/VIF)

	Dependent variable: Life Satisfaction	
Variable	**VIF**	**1/VIF**
R_1 (origin-based relative income)	1.37	0.7287
R_2 (host-country relative income)	6.96	0.1437
R_3 (co-ethnic relative income)	6.55	0.1528
ln(household net income)	2.91	0.3442
age²	1.87	0.5339
Employment status	1.16	0.8610
Marital status	1.12	0.8956
Years of education	1.10	0.9105
Professional education	1.66	0.6018
Self-assessed health	1.01	0.9922
East Germany dummy	1.48	0.6753
Regional fixed effects	1.17	0.8540
Year fixed effects	1.09	0.9202
Constant	1.08	0.9237
Mean VIF	**2.02**	

"The greatest wealth is to live content with little."

Plato

APPENDIX C

Table 4.1 Descriptive statistics Social Diagnosis Survey

Variable	Mean	SD	Min	Max
Life satisfaction	5.16	0.99	1	7
Migrated HH	0.009	0.09	0	1
Return HH	0.04	0.2	0	1
Internal migrants HH	0.008	0.09	0	1
Left behind head	0.002	0.05	0	1
Left behind partner	0.003	0.05	0	1
Left behind son	0.003	0.05	0	1
Left behind other	0.001	0.03	0	1
HH size	3.68	1.84	1	15
married	0.38	0.49	0	1
age	47.78	18.66	9	105
Edu prim lower	0.13	0.34	0	1
Edu tertiary	0.09	0.29	0	1
Currently employed	0.48	0.50	0	1
Job downgrade last year	0.035	0.18	0	1
ln HH income year	7.93	0.61	1.38	11.00
Financial situation improved	0.14	0.35	0	1
Financial situation unchanged	0.55	0.50	0	1
Serious ill last year	0.1901649	0.3924869	0	1
Health need improved	0.03	0.16	0	1
Health need unchanged	0.72	0.45	0	1
Friends number	6.62	6.67	0	60

Notes: The statistics are calculated on the sample of analysis.

Table 4.2 – The general impact of international migration on family members remained at home

VARIABLES	Dependent variable: Life Satisfaction (0-7)					
Models	(1) Basic	(2) Financial 1	(3) Financial 2	(4) Friends	(5) Health	(6) Job
Migration HH	**0.0842***	**0.101****	**0.0887***	**0.104****	**0.104****	**0.143****
	(0.0482)	(0.0501)	(0.0507)	(0.0520)	(0.0520)	(0.0615)
Internal migrants HH	-0.0265					
	(0.0329)					
Internal migrants	0.112					
	(0.103)					
Return migrants HH	0.0128					
	(0.0204)					
Return migrants	0.0345					
	(0.0274)					
Ln HH income		0.0853***	0.0741***	0.0732***	0.0732***	0.0760***
		(0.0119)	(0.0120)	(0.0123)	(0.0123)	(0.0143)
Financial situation improved (last 2 years)			0.0946***	0.0792***	0.0792***	0.0776***
			(0.0129)	(0.0135)	(0.0135)	(0.0155)
Financial situation unchanged (last 2 years)			0.0584***	0.0447***	0.0447***	0.0392***
			(0.00952)	(0.00987)	(0.00987)	(0.0115)
Number of friends				0.0139***	0.0139***	0.0125***
				(0.00141)	(0.00141)	(0.00156)
Number of friends squared				-0.000164***	-0.000164***	-0.000139***
				(3.09e-05)	(3.09e-05)	(3.29e-05)
Serious illness last year					-0.0944***	-0.0947***
					(0.0123)	(0.0144)
Health need improved (last 2 years)					0.0632**	0.0298
					(0.0272)	(0.0299)
Health need unchanged (last 2 years)					0.0604***	0.0455***
					(0.0105)	(0.0121)
Job downgrade (last year)						).0690***
						).0259)

Household size	-0.0105*	-0.0169**	-0.0162**	-0.0151**	-0.0151**	-0.0259***
	(0.00625)	(0.00661)	(0.00664)	(0.00678)	(0.00678)	(0.00881)
Married	0.189***	0.187***	0.181***	0.179***	0.179***	0.180***
	(0.0246)	(0.0257)	(0.0263)	(0.0271)	(0.0271)	(0.0320)
Age	-0.000405	-0.00889*	-0.00709	-0.00511	-0.00511	-0.0125*
	(0.00499)	(0.00530)	(0.00536)	(0.00546)	(0.00546)	(0.00686)
Age squared	7.23e-05	0.000103**	9.03e-05*	8.14e-05*	8.14e-05*	0.000160**
	(4.46e-05)	(4.64e-05)	(4.70e-05)	(4.80e-05)	(4.80e-05)	(6.28e-05)
Primary or lower educat.	-0.0495*	-0.0515*	-0.0559*	-0.0341	-0.0341	-0.0718*
	(0.0296)	(0.0308)	(0.0312)	(0.0319)	(0.0319)	(0.0368)
Tertiary education	0.00589	-0.00411	-0.00767	-0.00893	-0.00893	-0.00383
	(0.0245)	(0.0261)	(0.0265)	(0.0271)	(0.0271)	(0.0307)
Currently employed	0.0373***	0.0285**	0.0171	0.0138	0.0138	0.0180
	(0.0124)	(0.0131)	(0.0133)	(0.0136)	(0.0136)	(0.0159)
Fixed Effects years	YES	YES	YES	YES	YES	YES
Constant	YES	YES	YES	YES	YES	YES
Observations	85,969	80,512	78,450	75,487	75,487	63,241
R-squared	0.002	0.004	0.006	0.012	0.012	0.012

Notes: Individual and year fixed effects in all models. Robust standard errors clustered at the individual level in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.3 – The impact of international migration on left behind: Heterogeneity by type of family, migrant and left behind

VARIABLES	Dependent variable: Life Satisfaction (0-7)						
	(1) Type of family	(2) Type of migrant	(3) Type of left behind	(4) Type of migrant in Estab. Family units	(5) Type of migrant in non-estab. Fam. unit	(6) Type of left behind in Estab. Family units	(7) Type of left behind in non estab. Family
Migration HH # Estab family units	0.182***						
	(0.0624)						
Migration HH # Non-established family units	0.0184						
	(0.106)						
Migration HH # Migrant is HH head		0.0238		0.165	-0.218		
		(0.103)		(0.126)	(0.198)		
Migration HH # Migrant is partner		0.211		0.264	-0.00486		
		(0.137)		(0.191)	(0.168)		
Migration HH # Migrant is son/daughter		0.0541		0.134	0.0383		
		(0.0676)		(0.0832)	(0.150)		
Migration HH # Migrant is other rel		0.207*		0.244*	0.140		
		(0.111)		(0.144)	(0.211)		
Migration HH # Left-behind is household head			0.0325			0.0807	0.00207
			(0.0805)			(0.109)	(0.139)
Migration HH # Left-behind is partner			0.177**			0.163*	0.479*
			(0.0733)			(0.0835)	(0.274)

Migration HH # Left-behind is son/daughter			0.134			0.416***	-0.109
			(0.0961)			(0.113)	(0.185)
MigrationHH # Left-behind is other relative			0.0253			0.353	-0.115
			(0.190)			(0.347)	(0.252)
Internal migrants HH	0.00340	0.00445	0.00425	0.00947	0.115	0.0107	0.109
	(0.0335)	(0.0335)	(0.0335)	(0.0386)	(0.0864)	(0.0385)	(0.0876)
Return HH	0.0115	0.0108	0.0119	0.00949	0.0567	0.00968	0.0583
	(0.0191)	(0.0192)	(0.0192)	(0.0245)	(0.0393)	(0.0245)	(0.0389)
HH size	-0.0168**	-0.0170**	-0.0170**	-0.00704	-0.0247**	-0.00721	-0.0250**
	(0.00661)	(0.00661)	(0.00661)	(0.00965)	(0.0109)	(0.00966)	(0.0109)
married	0.187***	0.186***	0.187***	0.257***	0.184***	0.257***	0.185***
	(0.0257)	(0.0257)	(0.0257)	(0.0410)	(0.0454)	(0.0410)	(0.0455)
age	-0.00873*	-0.00882*	-0.00889*	-0.00823	-0.00782	-0.00847	-0.00742
	(0.00530)	(0.00530)	(0.00530)	(0.00702)	(0.0108)	(0.00703)	(0.0108)
Age squared	0.000103**	0.000103**	0.000104**	8.10e-05	0.000128	8.43e-05	0.000126
	(4.64e-05)	(4.64e-05)	(4.65e-05)	(6.26e-05)	(9.41e-05)	(6.27e-05)	(9.40e-05)
Primary or< educat	-0.0515*	-0.0511*	-0.0517*	-0.0541	-0.140**	-0.0536	-0.141**
	(0.0308)	(0.0308)	(0.0308)	(0.0392)	(0.0648)	(0.0392)	(0.0648)
Tertiary education	-0.00412	-0.00381	-0.00432	-0.0221	0.00426	-0.0237	0.00315
	(0.0261)	(0.0261)	(0.0261)	(0.0315)	(0.0642)	(0.0315)	(0.0642)
Currently employed	0.0284**	0.0281**	0.0285**	0.0263	0.0467*	0.0260	0.0481*
	(0.0131)	(0.0131)	(0.0131)	(0.0169)	(0.0264)	(0.0169)	(0.0264)
Ln HH income	0.0849***	0.0853***	0.0850***	0.0718***	0.107***	0.0717***	0.106***
	(0.0119)	(0.0119)	(0.0119)	(0.0156)	(0.0247)	(0.0156)	(0.0247)
Fixed Effects years	YES	YES	YES	YES	YES	YES	YES

Constant	4.571***	4.574***	4.575***	4.736***	4.216***	4.740***	4.214***
Observations	80,512	80,512	80,512	44,628	17,509	44,628	17,509
R-squared	0.004	0.004	0.004	0.004	0.009	0.004	0.009

Notes: Individual and year fixed effects in all models. Robust standard errors clustered at the individual level in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01.

Table 4.4a – Effect of Household Migration on Domain-Specific Satisfaction

Domain of Satisfaction	Coefficient *Migration HH*	Standard Error	P-Value
Satisfaction with Financial Family situation	0.3114	0.0914	0.001
Satisfaction with Marriage	0.2326	0.065	0.0
Satisfaction with Health	0.2185	0.0759	0.004
Satisfaction with Friends	0.1951	0.0694	0.005
Satisfaction with Family	0.1627	0.0754	0.031
Satisfaction with Sex Life	0.1532	0.085	0.071
Satisfaction with Leisure Time	0.137	0.0771	0.075
Satisfaction with Future	0.1148	0.1034	0.267
Satisfaction with Work	0.1123	0.0961	0.243
Satisfaction with Place of Residence	0.0952	0.0784	0.225
Satisfaction with Housing Conditions	0.0792	0.0743	0.287
Satisfaction with Children	0.0655	0.0713	0.358
Satisfaction with Life Achievements	0.0594	0.0691	0.391
Satisfaction with Safety	0.0138	0.064	0.829
Satisfaction with Education	0.0085	0.0742	0.908
Satisfaction with Country situation	-0.0614	0.0879	0.485

Notes: Individual and year fixed effects in all models. Robust standard errors clustered at the individual level

Table 4.4b – Interaction between departure of family member and change in satisfaction in other dimensions

VARIABLES	Dependent variable: Life Satisfaction (0-7)				
Models	(1) Basic	(2) Models	(3) Basic	(4) Models	(5) Basic
Migration HH × Worse family-finance satisfaction	-0.0659				
	(0.0977)				
Migration HH × Same family-finance satisfaction	**0.148****				
	(0.0722)				
Migration HH × Improved family-finance satisfaction	0.166**				
	(0.0768)				
Migration HH × Worse marriage satisfaction		0.110			
		(0.103)			
Migration HH × Same marriage satisfaction		0.0641			
		(0.0623)			
Migration HH × Improved marriage satisfaction		0.214*			
		(0.117)			
Migration HH × Worse health satisfaction			0.0527		
			(0.0912)		
Migration HH × Same health satisfaction			0.0502		
			(0.0614)		
Migration HH × Improved health satisfaction			0.214**		
			(0.0957)		
Migration HH × Worse friends satisfaction				-0.0153	
				(0.0916)	
Migration HH × Same friends satisfaction				**0.121***	
				(0.0687)	
Migration HH × Improved friends satisfaction				0.156*	
				(0.0864)	
Migration HH × Worse family-relationship satisfaction					0.0219
					(0.0970)
Migration HH × Same family-relationship satisfaction					0.0784
					(0.0632)

Migration HH × Improved family-relationship satisfaction					0.204**
					(0.0936)
Ln HH income	0.0847***	0.0853***	0.0851***	0.0851***	0.0851***
	(0.0119)	(0.0119)	(0.0119)	(0.0119)	(0.0119)
HH size	-0.0167**	-0.0168**	-0.0169**	-0.0169**	-0.0169**
	(0.00661)	(0.00661)	(0.00661)	(0.00661)	(0.00661)
married	0.187***	0.186***	0.187***	0.187***	0.187***
	(0.0257)	(0.0257)	(0.0257)	(0.0257)	(0.0257)
Age	-0.00883*	-0.00884*	-0.00890*	-0.00889*	-0.00892*
	(0.00530)	(0.00530)	(0.00530)	(0.00530)	(0.00530)
Age squared	0.000103**	0.000102**	0.000103**	0.000103**	0.000104**
	(4.64e-05)	(4.64e-05)	(4.64e-05)	(4.64e-05)	(4.64e-05)
Primary or lower education	-0.0519*	-0.0516*	-0.0516*	-0.0519*	-0.0518*
	(0.0308)	(0.0308)	(0.0308)	(0.0308)	(0.0308)
Tertiary education	-0.00409	-0.00384	-0.00377	-0.00390	-0.00397
	(0.0261)	(0.0261)	(0.0261)	(0.0261)	(0.0261)
Currently employed	0.0284**	0.0285**	0.0284**	0.0284**	0.0286**
	(0.0131)	(0.0131)	(0.0131)	(0.0131)	(0.0131)
Year Fixed Effects	YES	YES	YES	YES	YES
Constant	4.577***	4.574***	4.576***	4.576***	4.576***
	(0.156)	(0.156)	(0.156)	(0.156)	(0.156)
Observations	80,512	80,512	80,512	80,512	80,512
R-squared	0.004	0.004	0.004	0.004	0.004

Notes: Individual and year fixed effects in all models. Robust standard errors clustered at the individual level in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01.

"Happiness is not in the mere possession of money;

it lies in the joy of achievement."

Franklin D. Roosevelt

List of Figures

"The quality of your life is the quality of your relationships."
Tony Robbins

Nomenclature

CNS	Constrained Non-Negative Sum model
CDF	Cumulative Distribution Function
ΔY	Change in absolute income after migration
Δr̃	Change in relative rank after migration
DS	Domain Satisfaction
EU	European Union
FE	Fixed Effects
HH	Household
HR	Happiness Remittances
LB	Left-Behind
LS	Life Satisfaction
MLD	Mean Log Deviation
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
$\tilde{r}^o$, $\tilde{r}^d$	Relative ranks in origin and destination income distributions
R1	Relative income index based on origin country
R2	Relative income index based on host-country distribution
R3	Relative income index based on co-ethnic peers
RMSE	Root Mean Squared Error
SD	Standard Deviation
SOEP	German Socio-Economic Panel
SWB	Subjective Well-Being
WIID	World Income Inequality Database
ωR1, ωR2, ωR3	Weights of R1, R2, R3 in CNS/Shapley decompositions

"Happiness is the settling of the soul into its most appropriate spot."

Aristotle