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# The Perceived Well-being and Health Costs of Exiting Self-Employment

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## The Perceived Well-being and Health Costs of Exiting Self-Employment

We explore how involuntary and voluntary exits from self-employment affect life and health satisfaction. To that end, we use rich longitudinal data from the German Socio-Economic Panel from 1985 to 2017 and a difference-in-differences estimation. Our findings suggest that while transitioning from self-employment to salaried employment (i.e., a voluntary self-employment exit) brings small improvements in health and life satisfaction, the negative psychological costs of business failure (i.e., switching from self-employment to unemployment) are substantial and exceed the costs of involuntarily losing a salaried job (i.e., switching from salaried employment to unemployment). Meanwhile, leaving self-employment has no consequences for self-reported physical health and behaviors such as smoking and drinking, implying that the costs of losing self-employment are largely psychological. Moreover, former business owners fail to adapt to an involuntary self-employment exit even two or more years after this traumatic event. Our findings imply that policies encouraging entrepreneurship should also carefully consider the costs of business failure.

**Keywords:** entrepreneurship, self-employment, health, well-being, unemployment, job switches

**JEL Codes:** E24, I10, I31, J28, L26

## 1. Introduction

Starting and running a new business venture can be a great source of personal fulfillment and satisfaction (Benz & Frey, 2008b; Binder & Coad, 2013; Cardon, Foo, Shepherd, & Wiklund, 2012; Shir, Nikolaev, & Wincent, 2019; Stephan & Roesler, 2010). Unlike most traditional occupations, entrepreneurs typically enjoy freedom and control enabling them to derive more meaning from their work, effectively cope with stress, and utilize their innate talents and skills (Shir et al., 2019; Stephan, 2018; Wiklund, Nikolaev, Shir, Foo, & Bradley, 2019; Wolfe & Patel, 2019). Consequently, entrepreneurship is often viewed as a highly advantageous career, with over two-thirds of people reporting the desire to work for themselves (Parker, 2019).

However, the process of starting and running a new business venture is rarely easy and straightforward. Many people who launch new companies terminate their efforts in less than a year (Katz & Gartner, 1988; Reynolds, Carter, Gartner, & Greene, 2004; Shane, 2008). Only a third of all new ventures have positive cash flow after seven years (Shane, 2008), and two-thirds of all start-ups fail within the first ten years (Parker, 2019). Business failure is pervasive and can lead not only to financial losses, but also evoke emotions, such as grief, shame, and self-blame, and damage one's self-esteem (Parker, 2019; Shepherd, 2003; Ucbasaran, Shepherd, Lockett, & Lyon, 2013). These adverse outcomes can be particularly traumatic for entrepreneurs who often have their identity tied to their ventures (Rouse, 2016).

This paper investigates the perceived life and health satisfaction costs of exiting self-employment.<sup>1</sup> A large body of literature has documented a wide range of non-monetary rewards of being self-employed, such as job and life satisfaction (Benz & Frey, 2008a, 2008b; Hessels, Arampatzi, van der Zwan, & Burger, 2018), lower stress (Hessels, Rietveld, & van der Zwan, 2017), health (Nikolova, 2019), and eudaimonic well-being (Nikolaev, Boudreaux, & Wood, 2020; Shir et al., 2019). These non-monetary benefits of self-employment are often attributed to having higher levels of job control, autonomy, and utility from purposeful and self-directed work (Hundley, 2001; Nikolaev et al., 2019; Shir et al., 2019). Consequently, the public policy recommendations of scientific papers often tout entrepreneurship as a means of enhancing both personal and social welfare. However, this paints a somewhat idealistic picture of the realities that many people who start new ventures go through.

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<sup>1</sup> We compare four labor market transitions: (1) self-employment to unemployment (i.e., involuntary business exits), (2) salaried employment to unemployment due to plant closures (i.e., involuntary job loss), (3) self-employment to salaried employment (i.e., voluntary self-employment exits), and (4) salaried employment to salaried employment (voluntary job changes).

Therefore, to provide a counterbalance to the well-being literature in entrepreneurship and help examine the potential trade-offs associated with starting and running a business, we pose the following questions: (1) What is the impact of exiting self-employment on perceived health and subjective well-being? (2) How do the perceived health and life satisfaction effects of exiting self-employment compare to losing a salaried job? (3) And, is the negative impact of exiting self-employment persistent, or do people quickly adapt to this adverse event?

To answer these questions, we use rich longitudinal data from the German Socio-Economic Panel (SOEP), allowing us to track self-employed and salaried workers over time. Our findings suggest that losing self-employment and becoming unemployed leads to a decline in psychological well-being. In subsequent analyses, we also show that this drop in life satisfaction is far more severe than losing a salaried job (i.e., switching from salaried employment to unemployment). At the same time, transitioning from self-employment to salaried employment can even be beneficial to life and health satisfaction. Finally, our results suggest that health and life satisfaction declines associated with business failure persist for two or more years after losing self-employment.

Our paper makes three contributions to the small business economics literature. First, unlike previous studies, which mostly focus on the positive effects of self-employment, we examine changes in both life and health satisfaction as a consequence of self-employment exits. As such, we build on and extend from the only contribution on the psychological costs of losing self-employment in the economics literature to date, which shows that losing self-employment can lead to larger declines in life satisfaction than unemployment due to plant closings (Hetschko, 2016). We also compare and contrast the self-reported health and life satisfaction changes of those who involuntarily lose self-employment with those who involuntarily lose a salaried job.

Second, not all business exits are created equal. While some businesses may end up in bankruptcy, others may be liquidated because the founder had better job opportunities elsewhere. Even if the business fails, finding salaried employment can significantly alleviate the negative effects of exiting self-employment by reducing the financial stress associated with unemployment and fulfilling basic psychological needs for structure, shared goals, social contact, status, and activity. Thus, transitioning from self-employment to salaried employment can significantly speed up the recovery process following after exiting self-employment, and, in some cases, even improve psychological well-being, which is a possibility we explore.

Finally, several studies document that people are remarkably adaptable, and life satisfaction typically stabilizes after most life events and shocks (Graham, 2011). We contribute to this line of research by studying if the negative psychological well-being effects of losing self-employment are likely to persist or dissipate over time. In addition, we complement our analysis by exploring additional health and behavioral outcomes (e.g., sleep satisfaction, BMI, smoking, and drinking) that are relevant to the relationships we study.

## **2. Previous literature, theory, and hypotheses**

A large body of literature suggests that job loss can lead to declines in both psychological well-being and physical health (Wanberg, 2012). Specifically, being unemployed is linked with a range of stress-related outcomes, including depression, anxiety, low self-esteem, and physical ailments, such as pain and headaches, that can stifle people's ability to function in their daily lives and even lead to suicide. The negative well-being effects of an unemployment spell can be felt years later, long after workers are reemployed (Clark, Georgellis, & Sanfey, 2001; Wanberg, 2012).

Several theories have been proposed to explain the mechanisms behind the negative consequences of unemployment (Bartrum & Creed, 2006). The most prominent theoretical perspective is Jahoda's (1982, 1987) *latent deprivation model*. According to this perspective, employment is a social institution providing both income-related *manifest benefits* and *latent benefits* related to fulfilling basic psychological needs. While people mostly work to obtain manifest benefits, work also fulfills five basic psychological needs—time structure, social contact, shared common goals, status, and activity—that are key for psychological well-being. Unemployment deprives people of both the manifest and latent benefits of work. However, it is mostly the loss of latent benefits that leads to lower psychological well-being. An extensive empirical literature supports, at least partially, Jahoda's model (Creed & Bartrum, 2006).

Other theoretical perspectives such as the CoPES (Coping, Psychological, and Employment Status) model (Waters, 2000), have identified a wide range of stressors related to job search, job rejection, financial strain, relationship problems, and boredom that can further exacerbate the negative relationship between unemployment and psychological well-being. For example, Price, Choi, and Vinokur (2002) argue that the severe financial strain associated with unemployment ultimately leads to feelings of helplessness, lack of control, and depression, which, in turn, contributes to poor mental health over time.

Previous meta-analyses (McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Paul & Moser, 2009) suggest that the negative effect of unemployment on psychological well-being is non-negligible (Cohen, 1992; Wanberg, 2012). The proportion of clinically depressed people, for example, is twice as high among the unemployed compared to those who have full employment (Paul & Moser, 2009). Of course, reverse causality and selection effects are important empirical challenges with such studies. Specifically, individuals with poor psychological well-being may also be more likely to lose their jobs. However, a number of longitudinal studies using data on company closures—an involuntary job loss proxy—show that unemployment is *causally* related to poor psychological well-being outcomes (Kassenboehmer & Haisken-DeNew, 2009; Nikolova & Ayhan, 2019; Paul & Moser, 2009).

Similarly, many studies suggest that unemployment can negatively impact physical health, measured by self-reported health, health-symptoms checklists, and biochemical markers (Korpi, 2001; Maier et al., 2006; Strully, 2009). Unemployment can also lead to unhealthy behaviors such as smoking, drinking, as well as weight gain (Deb, Gallo, Ayyagari, Fletcher, & Sindelar, 2011; Marcus, 2014). Theoretically, the stress associated with unemployment can directly translate into physical symptoms (Wanberg, 2012), increase the probability of mortality, and even lead to suicide (Platt & Hawton, 2000). Unemployed people may also be unable to afford healthy food and quality health care so that any health conditions can go untreated for a long time.

Nevertheless, people with poor physical or mental health may be more likely to lose their jobs, which again points to reverse causality issues. Indeed, using U.S. panel data, Strully (2009) finds a significant positive correlation between poor health and subsequently being fired or leaving a job voluntarily. Yet, the study also suggests that unemployment is related to the deterioration of mental health beyond these selection effects. Compared to a reference group of people who had stable employment, for example, those who lost their jobs due to company closures were more likely to report poor physical health and an increase in the number of health conditions, such as hypertension, arthritis, or diabetes. Other studies support similar conclusions with respect to symptoms, including chest pain, stomach aches, and backaches that were aggregated in a health-symptoms index (e.g., Korpi, 2001). Previous unemployment spells have also been correlated with higher levels of the stress hormone cortisol (Maier et al., 2006) and the c-reactive protein (CRP), a marker of inflammation, even five to eight years after the unemployment spelled occurred (Janicki-Deverts et al., 2008). Therefore, we expect that:

***H1a:*** *An involuntary exit from self-employment to unemployment is associated with lower life and health satisfaction compared to staying self-employed.*

***H1b:*** *An involuntary exit from salaried employment to unemployment is associated with lower life and health satisfaction compared to staying employed in a salaried job.*

The psychological well-being and health consequences of unemployment we discussed above are largely aggregated across individuals. Many previous studies suggest, however, that not everyone experiences unemployment in the same way (Gielen & Van Ours, 2014; Wanberg, 2012). In this section, we argue that the negative well-being effects of unemployment are stronger for those who transition from self-employment to unemployment compared to those who transition from salaried employment to unemployment.

Several risk factors and processes predict psychological well-being during unemployment (McKee-Ryan et al., 2005). Specifically, work centrality (i.e., how important is the work to the individual), cognitive appraisal (i.e., how individuals interpret the job loss), coping resources (i.e., the individual's financial resources and social support), and coping strategies (i.e., the cognitive and behavioral strategies related to dealing with demands during unemployment) moderate the relationship between unemployment and psychological well-being. In this respect, individuals who have a higher sense of self-worth, perceived control, experience less financial strain, and don't identify as strongly with their work are more likely to fare better during the unemployment spell and recover faster from the adverse experience (McKee-Ryan et al., 2005; Wanberg, 2012).

From this perspective, the unemployment experience after a business exit (i.e., switching from self-employment to unemployment) can be especially damaging to psychological well-being relative to the experience of unemployment due to a loss of salaried employment (i.e., switching from salaried employment to unemployment). First, there is a strong emotional connection between entrepreneurs and their businesses. Most entrepreneurs see their work as being central to their lives and future aspirations, as well as their personal growth and development. In fact, many entrepreneurs are passionate about their ventures beyond the mere potential for financial gain (Cardon et al., 2012). For example, entrepreneurs often view their ventures as their "baby" (Wasserman, 2008). Therefore, the potential loss of something so central to one's life can be particularly damaging to one's psychological well-being. Furthermore, research indicates that founders often form deep identity connections with



the ventures they start as they pour time, energy, passion, hopes, and resources to nurture the future growth of their organizations (Cardon et al., 2012; Rouse, 2016). These deep connections make it especially difficult to psychologically disengage during exit events, which can significantly destabilize the founder's identity (Rouse, 2016; Cardon et al., 2012; Cardon et al., 2009). Losing self-employment, for example, has been found to be more strongly correlated with feelings of personal failure and deviation of one's ideal self, compared to losing salaried employment (Hetschko et al., 2014).

Appraising the situation as a personal rather than a professional loss may also lead to greater feelings of grief, shame, humiliation, guilt, self-blame, distress, and severe anxiety compared to those who lose their salaried employment (Shepherd, 2003; Shepherd, Covin, & Kuratko, 2009; Shepherd, Wiklund, & Haynie, 2009). This negative emotional response can significantly hinder people's ability to learn from failure and harm their perceptions of self-efficacy, self-worth, and perceived life control (Shepherd, 2003). Thus, because it is more difficult to separate professional from personal failure, as the identity of the entrepreneur is often closely tied to his/her business, people who enter unemployment after a business loss may be more likely to fare less well psychologically compared to their counterparts who transition to unemployment from salaried employment. The magnitude of the drop in psychological well-being following a self-employment exit may be greater than that of losing a salaried job, even if both groups end up at the same level of well-being as unemployed (Hetschko, 2016). This is because the self-employed have higher ex-ante well-being levels compared to salaried workers (Benz & Frey, 2008a).

Finally, business failure can lead to large financial losses that exceed the declines in income associated with losing a salaried job. Self-employed people are more likely to run into debt and are less likely to receive unemployment insurance benefits compared to their counterparts in salaried employment (Hetschko, 2016; Parker, 2019). In addition, the most common source of start-up capital is the entrepreneur's own savings (Parker, 2019; Shane, 2008). Losing these savings as a result of business failure can deprive entrepreneurs and their families of essential financial resources during the unemployment spell and increase financial strain and feelings of insecurity, further exacerbating the psychological damage of unemployment, and making coping with the adverse situation more difficult and prolonged.

In some countries, failed entrepreneurs can also face significant social stigma for many years, which can further prolong the recovery process (Armour & Cumming, 2008; Simmons,

Wiklund, & Levie, 2014). Consequently, a longer recovery period may be necessary for failed entrepreneurs to bounce back (adaptation to the adverse situation) relative to people losing salaried jobs.

Therefore, we expect that:

***H2a:*** *The negative life and health satisfaction impacts associated with unemployment are stronger for people who transition from self-employment compared to those who transition from salaried employment.*

***H2b:*** *Adaptation to unemployment (the recovery process) is longer for self-employed people compared to their salaried counterparts.*

As we argued above, involuntary business exits can have a pervasive and long-lasting negative effect on the psychological well-being and physical health of the founder. However, not all self-employment exits are involuntary. Businesses can be liquidated as a result of a successful acquisition, desired career change, retirement, or some other life event such as relocation (Coad, 2014; Jenkins & McKelvie, 2017). Therefore, not all self-employment exits will be appraised as stressful events and lead to negative emotional and health responses (Byrne & Shepherd, 2015; Jenkins & McKelvie, 2017; Jenkins, Wiklund, & Brundin, 2014). Just like people in salaried employment can change jobs and careers to pursue better opportunities for personal growth and development, self-employed people may also voluntarily seek alternative forms of employment to improve their lifestyles and well-being. Specifically, voluntary salaried job changes can improve psychological well-being, at least in the short run (Chadi & Hetschko, 2018). Studies in organizational psychology, for example, theorize and find evidence for the so-called honeymoon-hangover effect, whereby job satisfaction is higher for individuals who transition from one salaried employment to another within the last year (the honeymoon effect), but this positive effect disappears in subsequent years (the hangover effect) (Boswell, Boudreau, & Tichy, 2005). In turn, higher levels of job satisfaction can positively spill over to physical and mental health (Faragher, Cass, & Cooper, 2005), and overall life satisfaction (Judge, Locke, Durham, & Kluger, 1998; Judge & Watanabe, 1993).

As Bates (2005, p.345) explains, “departure requires only that a superior alternative has become available to the entrepreneur.” In that case, it may be reasonable to expect that self-employed people, especially those with high human capital, may voluntarily enter salaried

employment if the opportunity cost of keeping the business in operation is too high (Coad, 2014; Grilli, 2011).

Since entrepreneurs often face high uncertainty, long working hours, time pressure, role conflicts, and ambiguity, starting and running a business can be a major source of stress (Patzelt & Shepherd, 2011; Wincent & Örtqvist, 2011). In fact, the idea that entrepreneurship is one of the most stressful occupational choices is “ubiquitous” (Uy, Foo, & Song, 2013). While other occupations can certainly be stressful as well, entrepreneurs “lack resources, often work alone, lack support from colleagues, and must bear the cost of their mistakes while fulfilling lots of diverse roles such as recruiter, spokesperson, salesman, and boss” (Cardon & Patel, 2015). Thus, voluntary transitions from self-employment to salaried employment can, in some cases, lead to improved psychological well-being and health outcomes, especially for those who may find it difficult to cope with the increased demands and stress of being your own boss.

Transitioning from self-employment to salaried employment can significantly alleviate the financial strain and psychological distress that immediately follow the business exit by providing founders with a new source of income and fulfilling basic psychological needs for time structure, social contact, shared common goals, status, and activity. For example, in a sample of 256 entrepreneurs who filed for bankruptcy, Jenkins and McKelvie (2017) found that while about 80 percent of entrepreneurs reported being considerably or somewhat worse after transitioning to unemployment, close to 40 percent of self-employed people who transitioned to salaried employment reported being considerably better off, somewhat better off, or neither better nor worse off.

However, self-employment transitions, even when voluntary (i.e., switches from self-employment to salaried employment), may have negative well-being consequences for the reasons we outlined earlier. For instance, founders may have a difficult time letting go of their business even when the exit is a result of a successful acquisition (Rouse, 2016). Similarly, Ronstadt (1986) found that most founders who either sold or liquidated their business described their self-employment careers as “financially disappointing” (p. 335).

Taken together, the evidence above leads to our last hypothesis:

***H3: Voluntary transitions from one salaried job in the private sector to another one result in higher positive psychological well-being and perceived health benefits relative to transitions from self-employment to salaried employment.***

### **3. Data**

#### **3.1. Dataset**

We rely on longitudinal data from the German Socio-Economic Panel (SOEP), version 34 (Goebel et al., 2019; Wagner, Frick, & Schupp, 2007). The SOEP is a nationally representative household panel of individuals aged 18 and older that has been available since 1984, with East Germany added in 1990. The dataset provides detailed information on well-being, health, labor market history, and household and socio-demographic characteristics. Since 2002, the SOEP has included a Health Module available every two years. To ensure sufficient statistical power for our analyses and to prevent a loss of observations due to the less frequent nature of the Health Module compared to the rest of the SOEP dataset, we primarily rely on information from the regular SOEP longitudinal module. The data in our main analysis sample span 1985-2017.<sup>2</sup> In robustness checks, we include information from the Health Module.<sup>3</sup>

#### **3.2. Sample restrictions, treatment, and comparison groups**

We restrict the analysis sample to adults aged 18 to 60 to avoid health-induced self-employment exits among older workers. Our definition of salaried workers includes only private sector employees and excludes any civil servants and government workers.<sup>4</sup> Both salaried employees working in the private-sector and the self-employed are working full-time. The self-employed may or may not employ others, and we include self-employed farmers and helpers in the family business.

Unemployed individuals are those who are currently registered with the German Employment Office (*Arbeitsamt*). Salaried workers who lose their job are asked for the reason for the termination of their last job, which allows us to identify those who become jobless due to plant closures. This “company closure” or “plant closure” variable is often considered a proxy involuntary job loss because typically individual salaried employees cannot influence whether the firm will remain in business or not (Haisken-DeNew & Kassenboemer, 2009;

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<sup>2</sup> Our dataset excludes the direct analysis of data from 1984 because the construction of our self-employment exit and job switch indicators require information on the labor force and occupation status of the individual in the previous year. Therefore, the earliest year in our analysis is 1985.

<sup>3</sup> Specifically, in Table A7, we use as dependent variables the Mental Component Scale, the Physical Component Scale, and the Body Mass Index available in the Health Module.

<sup>4</sup> Civil servants in Germany have different working conditions, including job security, pension contributions, retirement age, and benefits compared to the self-employed and salaried workers in the private sector.

Nikolova & Ayhan, 2019). Plant closure information is available in the SOEP since 1991, with the exception of 1999 and 2000.

Testing this paper's hypotheses requires the creation of four different treatment and comparison groups. Our *first treated group* captures involuntary business exits by those who switch from self-employment to unemployment. Respondents in this treated group were full-time self-employed in the previous survey wave, but are registered unemployed in the consecutive one. The matching comparison group consists of individuals who remain continuously self-employed in both survey years. The *second treated group* reflects the involuntary loss of salaried employment. Individuals in this group were salaried employees in the previous wave, but in the current survey are registered unemployed due to company closure. The matching control group consists of individuals who remain continuously employed in both survey periods. Our *third treated group* includes respondents who voluntarily exit self-employment to become salaried workers. This treated group is based on individuals who in the previous wave reported being self-employed but in the current wave work in the private sector as salaried employees. The comparison group is based on respondents who remained continuously self-employed in both surveys. Finally, our *fourth treated group* reflects voluntary job changes from one private-sector job to another one. The treated individuals are those who switch salaried jobs between two survey waves. The comparison group comprises interviewees that report that they remained in the same salaried employment position in both interviews.

### 3.3. Variables

Our outcome variables are based on self-reported information on self-reported health and well-being (Table A1). Specifically, we consider both life and health satisfaction, both of which are measured on a scale of 0 (completely dissatisfied) to 10 (completely satisfied). Table A2 demonstrates the pre- and post-period summary statistics information for these variables for all analysis samples.

Like Nikolova (2019), we rely on a large number of conditioning variables, detailed in Table A1, which include socio-demographic and labor market characteristics such as age, sex, marital status, real disposable household income, household size, tenure, working hours, type of health insurance, and initial health and well-being status. We include a health insurance control (i.e., government, private, or no insurance) because the self-employed in Germany are privately insured, but may become uninsured if they lose their business, despite the country's

universal healthcare system. All conditioning variables are lagged one time period and capture the initial conditions right before experiencing the switch in the labor market state.

## **4. Empirical Strategy**

### **4.1. Entropy balancing and difference-in-differences**

Entering and leaving self-employment or salaried employment may be correlated with one's pre-existing health and well-being levels, which poses a major threat to causality. For example, those who are dissatisfied with their health or have poor psychological well-being may selectively enter self-employment to manage their conditions or exit to salaried employment if their health and well-being improve. Alternatively, individuals who start and run new business ventures may be more likely to become unemployed if their psychological well-being or health worsens. A second empirical challenge arises because the decision to exit or enter self-employment inherently depends on people's unobservable and unmeasurable traits, which are correlated with both employment decisions and health and well-being outcomes. Such traits may include, for example, unobserved ability or entrepreneurial aptitude.

We deal with these issues by following a methodology that utilizes a difference-in-differences estimator applied after a non-parametric matching procedure called entropy balancing (Hainmueller, 2012; Hainmueller & Xu, 2013).<sup>5</sup> Our methodology includes two steps: (i) a data pre-processing using entropy balancing to create comparable groups of individuals who are statistically identical except that the treated group experiences a change in their labor market status between two survey waves while the comparison group does not; and (ii) estimating a weighted regression of the treatment (change in labor market status) on the change in perceived life and health satisfaction status based on weights obtained in step 1. This empirical strategy allows us to eliminate selection based on the observables in step 1, and net out time-invariant unobservables that influence both changes in employment status and well-being through the difference-in-differences (DID) in step 2.<sup>6</sup>

The entropy balancing is a pre-processing step ensuring the similarity of treatment and control groups based on observable characteristics. With traditional propensity score matching

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<sup>5</sup> Examples of other recent studies following this strategy include Chadi & Hetschko (2018), de Bruin, Heijink, Lemmens, Struijs, & Baan (2011), Kunze & Suppa (2020), Marcus (2013), Nikolova (2019).

<sup>6</sup> Examples of observable characteristics include variables such as age, education, and work experience, while time-invariant unobservables may include factors such as individual idiosyncrasies, dispositional personality traits, and unobserved ability.

methods falling out of favor in the scientific community (King & Nielsen, 2019), entropy balancing has emerged as a viable alternative. Its advantages over propensity score matching methods include efficiency, improving covariate balance, and eliminating researcher discretion regarding the choice of tolerance levels and the covariates (Hainmuller, 2012). Instead of generating propensity scores, entropy balancing “matches” individuals in the treatment and control groups by generating weights, which allow achieving balance in terms of the mean and variance of the covariate distributions of both the treated and comparison groups.

The DID estimators assume that in the absence of treatment, the overall life and health satisfaction outcomes of the treated and comparison groups would follow the same trajectories (i.e., the parallel trends assumption). Nevertheless, this assumption is unlikely to hold in our setting due to selection into self-employment based on health (Rietveld, van Kippersluis, & Thurik, 2015). One common solution is controlling for the values of the pre-treatment health and well-being outcomes to ensure that both the treated and control groups have the same starting point (O’Neill, Kreif, Grieve, Sutton, & Sekhon, 2016; Ryan, Kontopantelis, Linden, & Burgess, 2019). Furthermore, we include the pre-treatment values of health and psychological well-being as part of the matching covariates, and the DID regression because healthier or happier individuals may choose to leave self-employment or change jobs. This ensures that pre-existing psychological or physical health conditions cannot influence the decision to exit self-employment or change salaried jobs in the private sector—i.e., individuals in both the treatment and comparison groups have the same baseline health and psychological well-being levels.

Using entropy balancing, we create four matched analysis samples to compare switches from i) self-employment to registered full-time unemployment, ii) salaried employment to unemployment due to a company closure; iii) self-employment to salaried employment; iv) one salaried job in the private sector to another one (job switches). Each of the four treated groups comprises respondents switching from the original labor market state (self-employment or salaried employment) between two consecutive survey periods. The comparison group always includes individuals who remain in the original labor market for both survey periods. For example, when examining switches from self-employment to salaried employment, individuals in the treated group exit self-employment and enter salaried employment in the private sector between two survey periods, while individuals in the control group remain self-employed in both time periods. As explained, we ensure that treated and comparison individuals are statistically indistinguishable from one another based on their pre-treatment

characteristics, including health status, labor market experience, and household and socio-demographic features. The balancing tests are available in Tables A3-A6.

We estimate the average treatment effect (ATT) based on a specification that models the changes in psychological well-being or health status of individual (WH)  $i$  as a result of changes in employment status (ES).<sup>7</sup>

$$\Delta WH_i = \alpha + \beta ES_i + X_i' \Omega + \varepsilon_i \quad (1)$$

We include pre-treatment (i.e., lagged one time period) values of the conditioning variables  $X_i$ . These variables include age, education, height, migration background, marital status number of children, household size, income and wealth, unemployment experience, disability status, health insurance, state of residence, and others (see Table A1). While the treatment effects are already mean-independent due to the entropy balancing, including the pre-treatment covariates reduces the unexplained variance in changes in life and health satisfaction and improves the precision.

#### 4.2. Anticipation and adaptation effects

The effects we identify using equation (1) are short-run only. To furnish a complete picture and test Hypothesis 2b, we also explore whether individuals expect and adapt to losing self-employment. Specifically, following Clark and Georgelis (2013) and Nikolova and Ayhan (2019), the life satisfaction or health satisfaction  $WH$  of each individual  $i$  at time  $t$  is given by:

$$WH_{it} = \alpha + \beta_{-3} U_{-3,it} + \beta_{-2} U_{-2,it} + \beta_{-1} U_{-1,it} + \beta_0 U_{0,it} + \beta_1 U_{1,it} + \beta_2 U_{2,it} + X'_{it} \Omega + \pi_i + \tau_t + \varepsilon_{it} \quad (2)$$

whereas in equation (1),  $X$  is a vector of covariates,<sup>8</sup> and  $\pi$  and  $\tau$  are individual and year fixed effects. We estimate equation (2) for two analysis samples: (1) individuals who involuntarily transition from self-employment to unemployment and (2) individuals who involuntarily become jobless after losing salaried work due to company closure. The leads of the indicator for involuntary self-employment or salaried employment exists ( $U_{-1}$ ,  $U_{-2}$ , and  $U_{-3}$ ) capture anticipation effects by counting down the time to future unemployment entry. The dummy variables  $U_{-1}$ ,  $U_{-2}$ , and  $U_{-3}$  are coded as 1 if the individual will lose self-employment (salaried

<sup>7</sup> The identifying assumption for the DID matching estimator is that the matching covariates include all influences that simultaneously affect the changes in life and health satisfaction and changes in employment status.

<sup>8</sup> Age, age squared, homeownership, house size, marital status, children in the household, real disposable household income, unemployment experience, education, health insurance, disability status, year dummies, and state dummies.



employment) in the next 1-2 years, 2-3 years, and 3 years or more years, respectively, and 0 otherwise. Similarly,  $U_0$  denotes the first year of unemployment after losing self-employment (employment) and the binary indicators  $U_1$  and  $U_2$  capture *adaptation* to losing self-employment (employment), taking the value of 1 if the respondent has been unemployed after losing self-employment (employment) for 1-2 years and 2 or more years, respectively and 0 otherwise. Given that the binary indicators  $U_1$ ,  $U_2$ ,  $U_0$ ,  $U_{-1}$ ,  $U_{-2}$ , and  $U_{-3}$  are mutually exclusive, any individual is observed in only one of the six groups in any given year. Therefore, when estimating equation (2), we use  $U_{-3}$  as the reference (i.e., omitted) category. As we estimate (2) using fixed-effects models, the comparison is within-individual and with respect to the omitted category  $U_{-3}$ . For example, the coefficient estimate of  $U_1$  denotes the change in life (or health) satisfaction for respondents who have been unemployed for 1-2 years compared to the life or health satisfaction scores of the same individuals 3 (or more) years before losing self-employment or salaried employment.

## 5. Results

### 5.1. Involuntary employment changes

Table 1 documents the life and health satisfaction effects of involuntary job changes, i.e., switches from self-employment to unemployment (Panel A) and salaried employment to unemployment (Panel B). Switching from self-employment to unemployment significantly reduces life satisfaction and slightly damages health satisfaction (Panel A), which provides support for H1a. Specifically, losing self-employment decreases life satisfaction by 1.4 points and health satisfaction by about 0.3 points. While both the treatment and control groups start at average life satisfaction levels of 6.2 (by construction), the life satisfaction of those who experience business failure drops to 5.0 following the loss of self-employment, while the life satisfaction of those who remain continuously self-employed increases very lightly to 6.4 (See Table A2). The health satisfaction declines induced by losing self-employment are smaller in magnitude compared to the dramatic life satisfaction drop. Health satisfaction falls from 6.6 to 6.3 points for those experiencing a business exit to unemployment while it remains stable for those who are continuously self-employed (the comparison group). These results are likely due to the fact that involuntary self-employment exits are seen as life failures, which are damaging the psychological well-being of the former owner. At the same time, the psychological costs only partially spill over to the perceived health aspects of life.

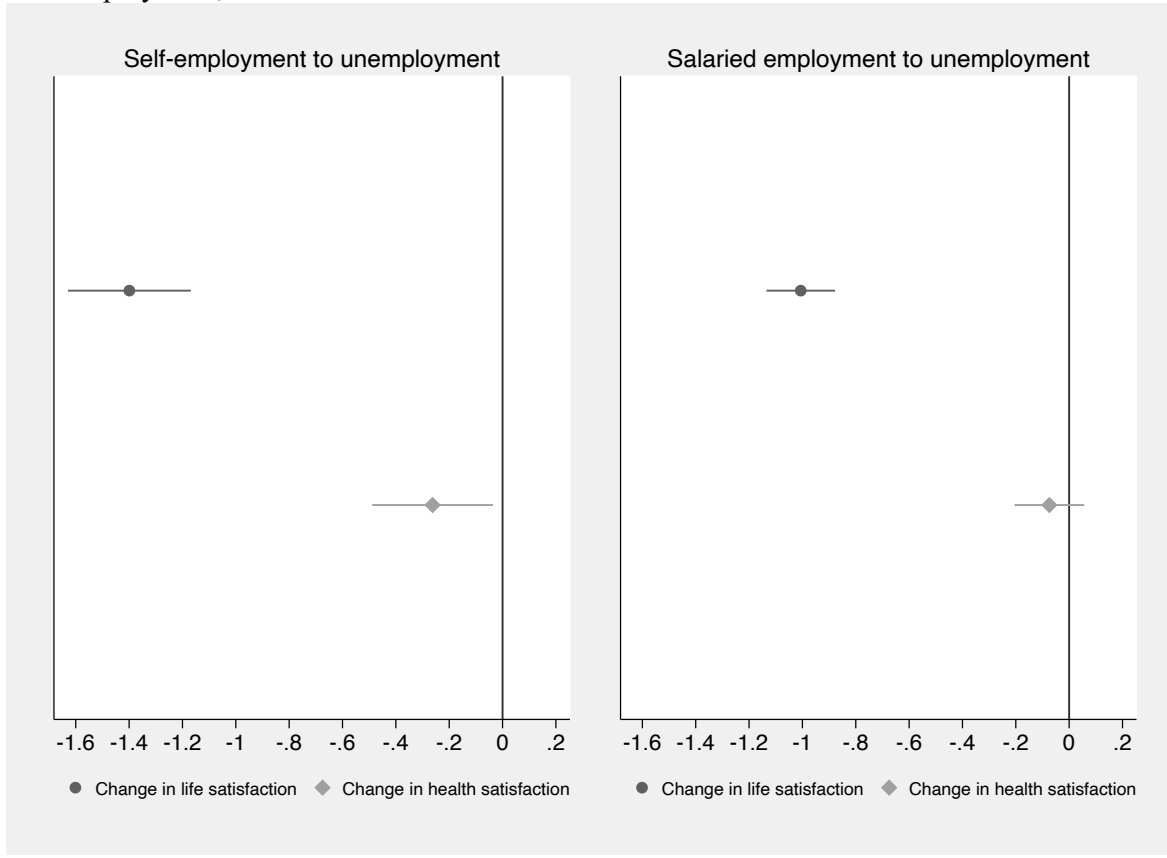
Table 1: Entropy balancing DID results, involuntary self-employment exit vs. involuntary loss of salaried employment

Panel A: switches from self-employment to unemployment		
	(1)	(2)
	$\Delta$ Life satisfaction	$\Delta$ Health satisfaction
Self-employment to unemployment	-1.399*** (0.117)	-0.262** (0.116)
Pre-treatment covariates	Yes	Yes
Treatment group (N)	240	243
Comparison group (N)	18,056	18,078
R <sup>2</sup>	0.410	0.369
Panel B: switches from salaried employment to unemployment due to plant closure		
	(1)	(2)
	$\Delta$ Life satisfaction	$\Delta$ Health satisfaction
Private employment to unemployment	-1.006*** (0.066)	-0.074 (0.067)
Pre-treatment covariates	Yes	Yes
Treatment group (N)	645	645
Comparison group (N)	138,761	138,470
R <sup>2</sup>	0.337	0.322

Source: Authors' calculations based on SOEP v.34

Notes: Robust standard errors in parentheses: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All regressions include the lagged pre-treatment characteristics (see Tables A1 for a list of the covariates, and Tables A3-A4 for balancing tests). The key independent variable in Panel A is coded as 1 for those switching from self-employment to unemployment between two survey waves and 0 for those who remain continuously self-employed. The key independent variable in Panel B is coded as 1 for those switching from salaried employment in the private sector to unemployment due to company closure between two survey waves and 0 for those who remain continuously self-employed. See Table A1 for detailed variable definitions.

Figure 1: Life satisfaction and health satisfaction changes due to switching from self-employment to unemployment, with 95% confidence intervals



Source: Authors' calculations based on SOEP v.34

Notes: Difference-in-Difference estimates based on Table 1, Panel A, Models (1)-(2) in the left hand-side and Panel B, Models (1)-(2) in the right hand-side.

We compare the magnitudes of the changes in life satisfaction and health satisfaction induced by losing self-employment (Panel A in Table 1) to those resulting from losing salaried employment (Panel B in Table 1), also depicted in Figure 1. Involuntary job loss due to plant closings decreases life satisfaction by about 1 point on a 0-10 scale, which is similar to the magnitude reported in previous studies (Kassenboehmer & Haisken-DeNew, 2009; Nikolova & Ayhan, 2019). Meanwhile, according to the results in Panel B, health satisfaction is unaffected by involuntarily losing salaried employment, which is in line with Schmitz (2011). Therefore, the evidence supports H1 and partially H1b and suggests that involuntary unemployment following both self-employment and salaried employment worsens life satisfaction. Some of these

psychological costs are also reflected in the lower health satisfaction, but only for former business owners who involuntarily gave up their ventures.

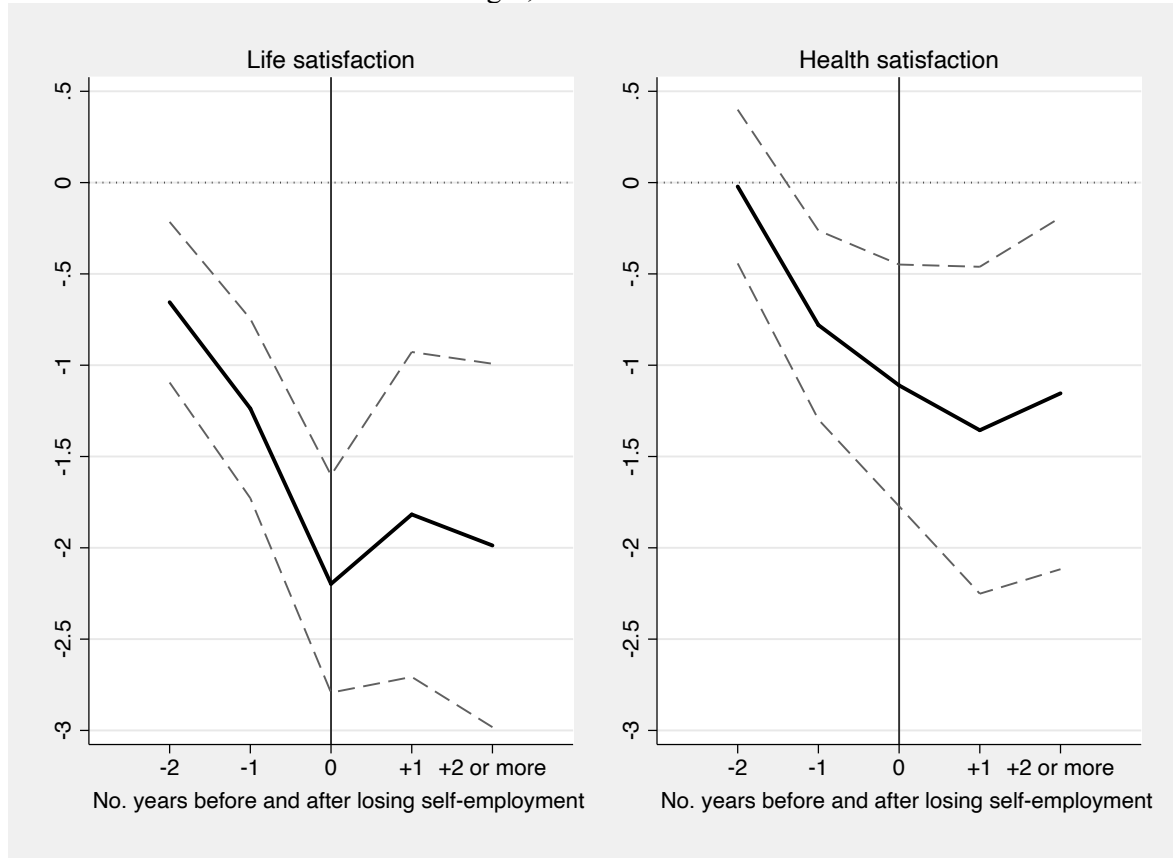
Comparing the results in Panel A and Panel B of Table 1 also provides partial support for hypothesis H2a. Specifically, involuntarily losing self-employment is more harmful to psychological well-being than the involuntary loss of a salaried job. Specifically following Paternoster, Brame, Mazerolle, and Piquero (1998), we tested for the equality of coefficients across the models assuming the samples are independent. The resulting z-statistic of 2.9 leads to the conclusion that the life satisfaction drop following losing self-employment is greater than that following company closures. The differences are not statistically different between Panels A and B of Table 1 for the health satisfaction outcome ( $z=1.4$ ).

## **5.2. Anticipation, adaptation and involuntary job changes**

We test H2b by analyzing whether individuals can anticipate and/or adapt to the involuntary loss of self-employment and salaried work. The anticipation and adaptation effects to life events such as poverty, unemployment, and even self-employment are well-documented (Clark, 2016; Clark, D'Ambrosio, & Ghislandi, 2016; Clark & Georgellis, 2013; Georgellis & Yusuf, 2016; Hanglberger & Merz, 2015; Nikolova & Ayhan, 2019; Qari, 2014; Zimmermann & Easterlin, 2006). Nevertheless, to our knowledge, we are the first to explore the anticipation and adaptation consequences of *losing* self-employment and becoming unemployed in terms of both life and health satisfaction.

Figure 2 demonstrates the results concerning switches from self-employment to unemployment, and Figure 3 depicts changes from salaried employment to unemployment due to company closure. Both figures demonstrate within-person changes, whereby the left panel in each figure shows the findings for life satisfaction, while the right panel presents the results for health satisfaction. Figure 2 indicates that life satisfaction starts falling more than two years before losing self-employment while health satisfaction begins declining one to two years before involuntarily losing self-employment. Importantly, the life and health satisfaction scores of entrepreneurs whose businesses fail do return to the baseline even two or more years after this traumatic event.

Figure 2: Anticipation and adaptation of switching from self-employment to unemployment, life satisfaction and health satisfaction changes, with 95% confidence intervals

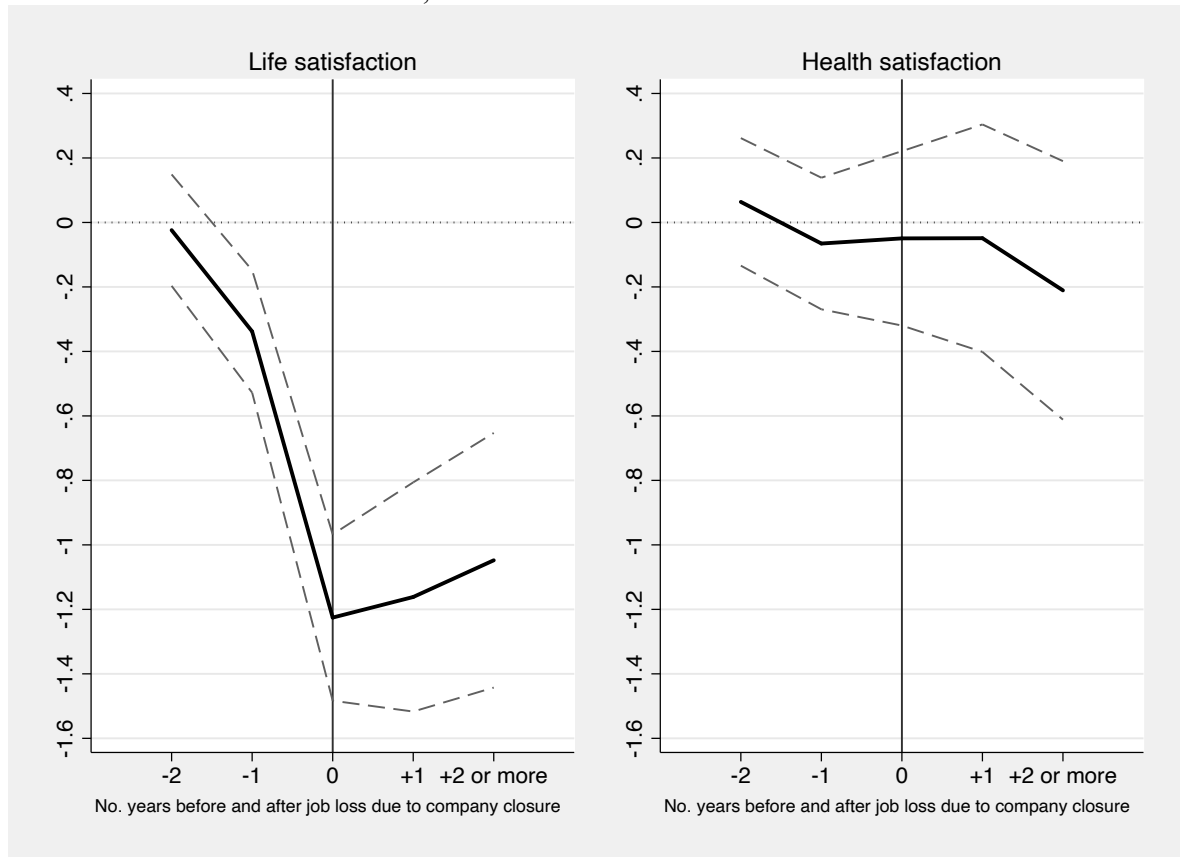


Source: Authors' calculations based on SOEP v.34

Notes: The figure shows the coefficient estimates of the lead and lagged unemployment dummies from the fixed effects estimation of Equation (2). The left panel depicts changes in life and the right panel illustrates the results for health satisfaction. While the dashed lines represent the 95% confidence interval, the solid line denotes the coefficient estimates of  $\{U_{-2}^S, U_{-1}^S, U_0^S, U_1^S, U_2^S\}$  from Equation (2). The x-axis denotes the number of years before and after losing self-employment. The y-axis designates the change in standardized satisfaction outcome. The reference category is  $U_{-3}^S$ , i.e., three or more years before losing self-employment. The coefficient estimates should be interpreted as the within-person change in life or health satisfaction with respect to the score three (or more) years before that person loses self-employment and becomes unemployed.

Individuals who lose salaried employment due to a company closure do not experience changes in health satisfaction (Figure 3). Nevertheless, life satisfaction starts falling already one to two years before the involuntary job exit and does not return to its previous level even two or more years after this event.

Figure 3: Anticipation and adaptation of becoming unemployed due to a company closure, life satisfaction and health satisfaction, with 95% confidence intervals



Source: Authors' calculations based on SOEP v.34

Note: See notes to figure 2.

Comparing the results from Figures 2 and 3, we conclude that losing self-employment has much more severe and long-lasting effects on psychological well-being than involuntarily losing a salaried job. The adverse effects of losing self-employment are reflected in both the steeper health and life satisfaction decreases following business failure and the longer adaptation periods.

### 5.3. Voluntary employment changes

Next, we also analyze the physical health and psychological well-being consequences of voluntary switches from i) self-employment to salaried employment (Panel A of Table 2) and ii) between salaried jobs in the private sector (Panel B of Table 2, respectively). The results in Table 2 provide a direct test of H3. Specifically, they suggest that individuals who voluntarily switch from self-employment to salaried employment enjoy modest increases in life and health

satisfaction compared to individuals who stay continuously self-employed (Panel A) and to those who remain in their private-sector salaried jobs (Panel B). In both cases of voluntary employment switches, the gain in life satisfaction is at most 0.1 points, which is relatively small. These results suggest that voluntarily switches to a salaried job (either from self- or salaried employment) can lead to an improvement in well-being (and are not at all costly compared to exits due to unemployment). In addition, the life and health satisfaction increases for both groups are very similar in terms of magnitude, suggesting that job switches to salaried employment are equally beneficial across the board. Yet, the so-called “honeymoon” effect associated with switching from one salaried job to another one is relatively modest in terms of magnitude, at least in the context of German labor markets. Our findings also imply that finding alternative employment can be a great way to cushion the negative well-being effects associated with business failure. All in all, our results do not provide support for H3.

Table 2: Entropy balancing DID results, voluntary self-employment exit vs. voluntary changes from one salaried job to another

Panel A: switches from self-employment to private employment		
	(1) $\Delta$ Life satisfaction	(2) $\Delta$ Health satisfaction
Self-employment to private employment	0.080* (0.045)	0.103** (0.048)
Pre-treatment covariates	Yes	Yes
Treatment group (N)	1,182	1,180
Comparison group (N)	18,056	18,078
R <sup>2</sup>	0.307	0.284
Panel B: switches from salaried employment to salaried employment (job changes)		
	(1) $\Delta$ Life satisfaction	(2) $\Delta$ Health satisfaction
Private employment to private employment	0.079*** (0.016)	0.110*** (0.018)
Pre-treatment covariates	Yes	Yes
Treatment group (N)	13,852	13,726
Comparison group (N)	144,909	144,764
R <sup>2</sup>	0.296	0.287

Source: Authors' calculations based on SOEP v.34

Notes: Robust standard errors in parentheses: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All regressions include the lagged pre-treatment characteristics (see Table A1 for the list of the covariates, and Tables A5-A6 for balancing tests). The key independent variable in Panel A is coded as 1 for those switching from self-employment to salaried employment between two survey waves and 0 for those who remain continuously self-employed. The key independent variable in Panel B is coded as 1 for those switching from one salaried job in the private sector to another salaried job in the private sector between two survey waves and 0 for those who remain continuously in their current job. See Table A1 for detailed variable definitions.

#### 5.4. Other dependent variables

We also analyze whether voluntary and involuntary exits from self-employment affect specific mental and physical health outcomes and behaviors. The results, which are based on fixed-effects regressions, are shown in Table A7 and demonstrate that involuntary exits from self-employment to unemployment lead to a substantial decrease in mental health (on average, about 78 percent of a standard deviation). Nikolova (2019) shows that switching from unemployment to



self-employment increases mental health by about 38 percent of a standard deviation. Taken together with Nikolova (2019), our findings imply that the mental health costs of business failure by far outweigh the gains of escaping unemployment and becoming self-employed. Meanwhile, physical health indicators, including the Physical Component Scale, sleep satisfaction, body mass index, and engaging in risky behaviors, are unaffected by involuntary exits from self-employment to unemployment. Therefore, changes in life and health satisfaction that follow after exiting from self-employment to unemployment are likely due to worsening mental health. Meanwhile, Table A7 also demonstrates that voluntary switches from self-employment to salaried employment do not affect mental or physical health markers.

## **6. Discussion and conclusion**

The entrepreneurship literature has so far mainly focused on the well-being benefits of starting and running new business ventures. A growing body of work suggests that self-employed people enjoy several advantages, such as autonomy, competence, and meaning that can lead to higher levels of job satisfaction. However, the implications of these findings may paint an overly optimistic picture of what it means to be “your own boss.” After all, the vast majority of new businesses fail, implying that business exits are a common experience.

Our paper contributes to the literature on entrepreneurial well-being by focusing on the underwhelming, but widespread experience of business failure. We utilize rich longitudinal data tracking the careers and well-being of individuals over time. Specifically, we study the life and health satisfaction associated with business exits. We not only study involuntary self-employment exits (i.e., transitions from self-employment to unemployment) but also consider how psychological well-being and health satisfaction change after voluntarily transitioning to salaried employment following a business exit. Finally, we compare the well-being consequences of exiting self-employment to similar transitions from salaried employment. Such insights are equally important when assessing the potential returns from starting a new business and can be particularly relevant for public policy, especially that small business activity is highly valued and supported by governments around the world.

Our findings suggest that the life and health satisfaction of the self-employed decrease drastically if the business exit is followed by an unemployment spell. Compared to previous studies documenting mental and sometimes physical health gains of switching to self-employment

(Nikolova, 2019), our results indicate that the potential well-being costs of business failure can be much larger than the potential gains from starting a new business venture. For many people, fear of failure is a major obstacle to starting a business (Cacciotti, Hayton, Mitchell, & Giazitzoglu, 2016). This fear of failure may, in part, be informed by the high rates of business exits and the negative emotions they trigger. This can explain why despite the fact that many people prefer working for themselves, only a small fraction of people actually take a leap in starting new ventures, especially in the developed world where salaried employment presents a viable alternative (Parker, 2019).

Our results also suggest that the psychological costs of business failure significantly exceed the costs of involuntary loss of a salaried job, implying that the unemployment experience is particularly psychologically damaging for those losing self-employment. Even more importantly, the well-being costs of business failure can be long-lasting and scarring. Specifically, we find that life satisfaction does not recover even two or more years after a business exit that leads to unemployment. Meanwhile, transitioning to private sector employment brings mild improvements in psychological well-being and health satisfaction, both for those voluntarily leaving self-employment and for those switching from one private-sector job to another one. This implies that finding alternative salaried employment can cushion the psychological costs of business failure. In this respect, public programs directed at helping failed entrepreneurs integrate quickly into the labor market can lead to significant welfare gains.

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**Electronic supplementary material**

**“The Perceived Well-being and Health Costs of Exiting Self-Employment”**

Table A1: Definitions of variables used in the analyses

Variable	Definition
<b>Dependent variables</b>	
Life satisfaction	Overall life satisfaction on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied.
Health satisfaction	Satisfaction with health on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied.
<b>Control variables</b>	
Age	Age in years
Home ownership	1=owner of dwelling, 0=not owner of dwelling (or no information). The "no information" category was combined with 0 due to the small number of cases
Size of housing unit	Size of the housing unit in square meters. We created size tertiles and treat the variable as categorical with missing observations being the fourth category
Number of children in the household	Number of children in the household. Childless households are coded as 0
Household size	Number of residents in household, coded as a categorical variable where 1=1, 2=2, 3=3, 4=4, 5=5, 6=6, 7=7, 8=8, 9=9, 10=10 or more, 11=no information
Real household disposable income	Household post-government income (CPI-adjusted). We created income tertiles and treat the variable as categorical with missing observations being the fourth category
Unemployment experience	Unemployment experience in years. We created unemployment experience tertiles and treat the variable as categorical with missing observations being the fourth category
Educational attainment	1 = Less than high school, 2 = High school, 3 = More than high school, 4 = Missing information
Years of education	Number of years of education. We created education year tertiles and treat the variable as categorical with missing observations being the fourth category
Marital Status	1 = married, 2= single, 3 = divorced/separated/widowed, 4 = Missing information
Health insurance	1=State-provided, 2=Private, 3=No health insurance
Disability status	1=not disabled, 2=disabled, 3= Missing information
Firm size	1=less than 20, 2= between 20 and 200, 3=between 201 and 2000, 4=more than 2000, 5=Missing information
Tenure	Length of time with firm in years and months. We created tenure tertiles and treat the variable as categorical with missing observations being the fourth category
Annual working hours	Number of hours worked per year

Industry	1-Digit industry code of individual, 1=Agriculture, mining, and energy, 2 = Manufacturing, 3= Construction, 4=Trade, 5=Transport, 6=Banking and Insurance, 7=Services, 8= Missing information. Due to small number of observations, mining and energy were combined with agriculture
Height	Height in centimeters. We created height tertiles and treat the variable as categorical with missing observations being the fourth category.
Male	Respondent's gender, 1=Male, 0=Female.
Migration background	1=direct or indirect migration background; 0=no migration background
Health and well-being variables	Life satisfaction and health satisfaction
Health worries	1=big worries, 2=some worries, 3=no worries, 4= Missing information
Doctor visits	Number of annual doctor visits
Hospitalizations	Number of in-patient hospitalizations in the previous year
State of residence dummies	Dummy variables for 14 federal states (combined Bremen with Lower Saxony and Hamburg with Schleswig-Holstein due to low number of observations)
Year dummies	Dummy variables designating the year of survey (1985-2017)

Source: Authors based on SOEP Codebooks and paneldata.org

Notes: In the entropy balancing and Tables 1-2, all matching covariates are lagged one time period.

Table A2: Summary statistics, dependent variables

<b>Switches from self-employment to unemployment, analysis in Table 1, Panel A</b>									
	Treated before			Treated after			Comparison before		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Life satisfaction	18,056	6.232	1.907	18,056	6.422	1.915	240	6.208	1.949
Health satisfaction	18,078	6.593	2.250	18,078	6.593	2.250	243	6.588	2.268
<b>Switches from salaried employment to unemployment due to plant closure, analysis in Table 1, Panel B</b>									
	Treated before			Treated after			Comparison before		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Life satisfaction	138,761	6.383	1.904	138,761	6.518	1.813	645	6.366	1.946
Health satisfaction	138,470	6.558	2.242	138,470	6.521	2.154	645	6.567	2.248
<b>Switches from self-employment to salaried employment, analysis in Table 2, Panel A</b>									
	Treated before			Treated after			Comparison before		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Life satisfaction	18,056	7.060	1.839	18,056	7.004	1.798	1,182	7.046	1.882
Health satisfaction	18,078	7.189	2.0511	18,078	7.063	2.054	1,180	7.191	2.047
<b>Switches from salaried employment to salaried employment (job changes), analysis in Table 2, Panel B</b>									
	Treated before			Treated after			Comparison before		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Life satisfaction	144,909	7.058	1.721	144,909	7.075	1.665	13,852	7.048	1.746
Health satisfaction	144,764	7.263	2.003	144,764	7.145	2.005	13,726	7.263	2.004

Source: Authors' calculations based on SOEP v.34

Notes: See Table A1 for detailed variable definitions.

Table A3: Pre-treatment covariates, selected variables, before and after matching, involuntary self-employment exits (switching from self-employment to unemployment)

	Treated		Comparison Unmatched		Comparison Matched		Standardized Bias %	
	mean	variance	mean	variance	mean	variance	unmatched	matched
Age	41.118	92.276	44.015	74.217	41.051	92.123	-0.302	0.007
Migration background	0.297	0.210	0.137	0.118	0.296	0.209	0.349	0.001
Not disabled	0.951	0.047	0.979	0.020	0.951	0.047	-0.130	0.001
Male	0.687	0.216	0.743	0.191	0.686	0.215	-0.120	0.002
Home owner	0.321	0.219	0.608	0.238	0.321	0.218	-0.612	0.001
Children in the household	0.992	1.575	0.871	1.099	0.990	1.573	0.096	0.001
Household disposable income tertile 1	0.333	0.223	0.138	0.119	0.333	0.222	0.413	0.001
Household disposable income tertile 2	0.309	0.214	0.246	0.186	0.309	0.213	0.136	0.001
Household disposable income tertile 3	0.333	0.223	0.608	0.238	0.333	0.222	-0.581	0.001
Less than high school	0.130	0.114	0.071	0.066	0.130	0.113	0.174	0.000
High school	0.618	0.237	0.574	0.244	0.617	0.236	0.089	0.002
More than high school	0.232	0.179	0.345	0.226	0.232	0.178	-0.268	0.000
Married	0.585	0.244	0.691	0.214	0.584	0.243	-0.214	0.002

Source: Authors' calculations based on SOEP v.34

Notes: N=246 (treated group pool) and N=18,225 (comparison group pool). The treated group comprises individuals who lose self-employment and become unemployed between two survey periods. The comparison group is based on individuals who remain continuously self-employed between two survey periods. The last two columns display the percent standardized bias, which is a measure of matching quality. It is calculated as the difference of the sample means in the treatment and the Comparison as a square root of the average of the sample variance in both groups. See Table A1 for detailed variable definitions.

Table A4: Pre-treatment covariates, selected variables, before and after matching, involuntary job loss (salaried employment to unemployment due to plant closure)

	Treated		Comparison Unmatched		Comparison Matched		Standardized Bias %	
	mean	variance	mean	variance	mean	variance	unmatched	matched
Age	42.644	103.282	40.285	103.543	42.610	103.228	0.232	0.003
Migration background	0.227	0.176	0.229	0.177	0.228	0.176	-0.004	-0.001
Not disabled	0.949	0.048	0.955	0.043	0.949	0.048	-0.028	0.000
Male	0.633	0.233	0.682	0.217	0.632	0.232	-0.101	0.001
Home owner	0.648	0.228	0.563	0.246	0.648	0.228	0.178	0.001
Children in the household	0.734	0.943	0.783	1.065	0.734	0.943	-0.051	0.000
Household disposable income tertile 1	0.355	0.229	0.383	0.236	0.355	0.229	-0.060	0.000
Household disposable income tertile 2	0.221	0.173	0.369	0.233	0.221	0.172	-0.357	0.000
Household disposable income tertile 3	0.157	0.132	0.022	0.021	0.156	0.132	0.371	0.001
Less than high school	0.186	0.152	0.139	0.120	0.186	0.151	0.121	-0.001
High school	0.665	0.223	0.640	0.230	0.664	0.223	0.053	0.001
More than high school	0.131	0.114	0.213	0.167	0.130	0.113	-0.244	0.000
Married	0.670	0.222	0.639	0.231	0.669	0.221	0.065	0.001

Source: Authors' calculations based on SOEP v.34

Notes: N=651 (treated group pool) and N= 160,384 (comparison group pool). The treated group comprises individuals who lose their salaried employment and become unemployed due to company closure between two survey periods. The comparison group is based on individuals who remain salaried employees between two survey periods. The last two columns display the percent standardized bias, which is a measure of matching quality. It is calculated as the difference of the sample means in the treatment and the Comparison as a square root of the average of the sample variance in both groups. See Table A1 for detailed variable definitions.

Table A5: Pre-treatment covariates, selected variables, before and after matching, voluntary self-employment exits (self-employment to salaried employment)

	Treated		Comparison Unmatched		Comparison Matched		Standardized Bias %	
	mean	variance	mean	variance	mean	variance	unmatched	matched
Age	40.666	89.933	44.015	74.217	40.654	89.908	-0.353	0.001
Migration background	0.180	0.148	0.137	0.118	0.180	0.148	0.112	0.000
Not disabled	0.974	0.025	0.979	0.020	0.974	0.025	-0.033	0.000
Male	0.736	0.195	0.743	0.191	0.735	0.195	-0.016	0.000
Home owner	0.504	0.250	0.608	0.238	0.504	0.250	-0.208	0.000
Children in the household	0.910	1.157	0.871	1.099	0.910	1.157	0.037	0.000
Household disposable income tertile 1	0.168	0.140	0.138	0.119	0.168	0.140	0.080	0.000
Household disposable income tertile 2	0.259	0.192	0.246	0.186	0.259	0.192	0.029	0.000
Household disposable income tertile 3	0.542	0.248	0.608	0.238	0.542	0.248	-0.131	0.000
Less than high school	0.095	0.086	0.071	0.066	0.095	0.086	0.082	0.000
High school	0.598	0.241	0.574	0.244	0.598	0.240	0.049	0.000
More than high school	0.298	0.209	0.345	0.226	0.298	0.209	-0.103	0.000
Married	0.642	0.230	0.691	0.214	0.642	0.230	-0.102	0.000

Source: Authors' calculations based on SOEP v.34

Notes: N=1,195 (treated group pool) and N=18,225 (comparison group pool). The treated group comprises individuals who lose their salaried employment and become unemployed due to company closure between two survey periods. The comparison group is based on individuals who remain salaried employees between two survey periods. The last two columns display the percent standardized bias, which is a measure of matching quality. It is calculated as the difference of the sample means in the treatment and the Comparison as a square root of the average of the sample variance in both groups. See Table A1 for detailed variable definitions.

Table A6: Pre-treatment covariates, selected variables, before and after matching, voluntary salaried employment to salaried employment switches (job changes)

	Treated		Comparison Unmatched		Comparison Matched		Standardized Bias %	
	mean	variance	mean	variance	mean	variance	unmatched	matched
Age	35.388	94.762	40.758	101.868	35.387	94.759	-0.552	0.000
Migration background	0.261	0.193	0.226	0.175	0.261	0.193	0.081	0.000
Not disabled	0.972	0.027	0.954	0.044	0.972	0.027	0.113	0.000
Male	0.692	0.213	0.681	0.217	0.692	0.213	0.023	0.000
Home owner	0.660	0.225	0.554	0.247	0.660	0.224	0.223	0.000
Children in the household	0.791	1.023	0.782	1.069	0.791	1.023	0.008	0.000
Household disposable income tertile 1	0.283	0.203	0.220	0.172	0.283	0.203	0.140	0.000
Household disposable income tertile 2	0.349	0.227	0.387	0.237	0.349	0.227	-0.079	0.000
Household disposable income tertile 3	0.307	0.213	0.375	0.235	0.307	0.213	-0.150	0.000
Less than high school	0.624	0.235	0.642	0.230	0.624	0.235	-0.038	0.000
High school	0.239	0.182	0.210	0.166	0.239	0.182	0.067	0.000
More than high school	0.009	0.009	0.008	0.008	0.009	0.009	0.012	0.000
Married	0.540	0.248	0.649	0.228	0.540	0.248	-0.218	0.000

Source: Authors' calculations based on SOEP v.34

Notes: N=13,947 (treated group pool) and N=146,087 (comparison group). The treated group comprises individuals who switch between one salaried job to another between two survey periods. The comparison group is based on individuals who remain salaried employees in the same job between two survey periods. The last two columns display the percent standardized bias, which is a measure of matching quality. It is calculated as the difference of the sample means in the treatment and the Comparison as a square root of the average of the sample variance in both groups. See Table A1 for detailed variable definitions.



Table A7: The relationship between exiting self-employment and health and well-being, additional outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mental component scale	Physical component scale	Sleep satisfaction	Sleep hours per night weekday	Sleep hours per night weekend	BMI	Smoker	Drinker
<i>Reference group: Continuously self-employed (SE)</i>								
Exited SE and working as a salaried employee	-0.343 (0.723)	-0.268 (0.635)	0.034 (0.118)	0.101 (0.078)	-0.030 (0.081)	0.037 (0.146)	0.004 (0.032)	0.051 (0.040)
Exited SE and registered unemployed	-7.803*** (2.846)	-2.959 (2.350)	-0.495 (0.485)	0.372* (0.214)	0.450 (0.277)	0.506 (0.309)	-0.029 (0.030)	0.006 (0.014)
Individual Comparison (incl. income)	Y	Y	Y	Y	Y	Y	Y	Y
Individual fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
State and year fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Mean dependent variable	50.886	52.812	7.234	6.831	7.761	26.098	0.356	0.933
Number of observations	5,879	5,879	7,359	6,110	6,084	5,946	5,367	2,898
Number of individuals	2,392	2,392	2,130	2,050	2,050	2,396	2,305	1,651
Adj. R <sup>2</sup>	0.518	0.532	0.540	0.555	0.576	0.913	0.769	0.641

Source: Authors' calculations based on SOEP v.34

Notes: Robust standard errors in parentheses, clustered at the individual level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All regressions include the following individual-level control variables: age, age squared, home ownership, house size, marital status, children in the household, real disposable household income, unemployment experience, education, health insurance, disability status, year dummies, and state dummies. All regressions include individual fixed effects. The dependent variables in Models (7) and (8) are binary. The Mental Component Scale is a weighted combination of mental health, role emotional, vitality, and social functioning (0-100 score) and is computed via exploratory factor analysis and standardized to have a mean of 50 and a standard deviation of 10. Higher values correspond to better mental health. The Physical Component Scale is a weighted combination of physical functioning, general health, bodily pain, and role physical (0-100 score) and is computed via exploratory factor analysis and standardized to have a mean of 50 and a standard deviation of 10. Higher values correspond to better physical health. Sleep satisfaction is measured on a 11-point scale: [0] Completely dissatisfied- [10] Completely satisfied. BMI= Body Mass Index.