



# The Mediating Effect of Financial Motives in the Association between Entrepreneurial Experience and Subjective Well-Being: Evidence from Japan

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## Abstract

This study investigates the relationship between entrepreneurial experience and subjective well-being. Using an original survey on subjective well-being, entrepreneurial experience, level of wealth (inferred from observed variables of income, cash, and assets), and personal attributes of 10,001 individuals in Japan, we examine the factors that mediate the association between entrepreneurial experience and subjective well-being. We measure entrepreneurial experience as an individual's experience in funding, owning, and running a corporation. We consider the mediating effect of the level of wealth on subjective well-being because entrepreneurial well-being is associated with wealth derived from income, cash, and assets. Our results provide no significant evidence that individuals with entrepreneurial experience have higher subjective well-being. However, we find a positive indirect effect of entrepreneurial experience on subjective well-being through wealth and a negative indirect effect through debt. The findings of this study indicate the importance of considering the mediating effect of financial motives in entrepreneurial well-being.

**Keywords** Debt · Entrepreneur · Generalized structural equation modeling · Mediating effect · Subjective well-being · Wealth

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## Introduction

Subjective well-being represents a broad category of phenomena that includes people's emotional responses, domain satisfactions, and global judgements of life satisfaction (Diener et al. 1999: p.277). This has recently come to the forefront in research on entrepreneurship (e.g., Kibler et al. 2019; Wiklund et al. 2019). The extant literature also highlights the relationship between an individual's experience in starting and running a business—that is, entrepreneurial experience—and subjective well-being (e.g., Carree and Verheul 2012; Sherman et al. 2016). Entrepreneurial well-being indicates the experience of satisfaction, positive affect, infrequent negative affect, and psychological functioning in relation to developing, starting, growing, and running an entrepreneurial venture (Wiklund et al. 2019: p.579). Some scholars have argued that entrepreneurial well-being is more relevant for better understanding the behavior and performance of entrepreneurs (e.g., Shepherd et al. 2019; Marshall et al. 2020).

Numerous scholars have examined the factors that affect subjective well-being (e.g., Dolan et al. 2008; Stephan 2018). Indeed, there are various motives for new firm creation (Feldman and Bolino 2000; Carree and Verheul 2012). Several studies have emphasized nonpecuniary motives, such as procedural utility and autonomy (e.g., Benz and Frey 2008a; Block and Koellinger 2009). Meanwhile, whether financial motives (monetary motives), often measured by wealth and income, have a significant effect on subjective well-being—in other words, money buys happiness—has been debated in the literature (e.g., Kahneman and Deaton 2010; Stevenson and Wolfers 2013). In practice, empirical studies have found a positive effect of wealth and income on subjective well-being (e.g., Headey and Wooden 2004; Benz and Frey 2008a; Block and Koellinger 2009). At the same time, some scholars provided evidence that the average income of entrepreneurs is lower than that of employees (e.g., Hamilton 2000; Binder and Coad 2013; Åstebro et al. 2014). These findings force us to question why individuals become entrepreneurs from financial motives, despite the possibility that subjective well-being decreases due to lower incomes. Moreover, the process of achieving entrepreneurial well-being seems complex (Abreu et al. 2019). To resolve such complex relationships, some scholars have shed light on mediating processes in entrepreneurial well-being (e.g., Shir et al. 2019; Nikolaev et al. 2020a, 2020b). However, it remains debatable as to how entrepreneurs acquire subjective well-being via financial motives, including the mediating process. To the best of our knowledge, there is a paucity of research on the mediating role in entrepreneurial well-being, including the indirect effect of entrepreneurial experience on subjective well-being. Understanding this aspect would assist us in improving our understanding of the nature of entrepreneurship.

This study investigates the relationship between entrepreneurial experience and subjective well-being. Using an original survey on subjective well-being, entrepreneurial experience, level of wealth (inferred from observed variables of income, cash, and assets), and personal attributes of 10,000 individuals in Japan, we examine the factors that mediate the association between entrepreneurial experience and subjective well-being. We measure entrepreneurial experience as an individual's experience in funding, owning, and running a corporation. We consider the mediating effect of the level of wealth on subjective well-being because entrepreneurial well-being is associated with wealth derived from income, cash, and assets. By doing so, we identify how subjective

well-being is shaped by entrepreneurial experience. This can help improve our understanding of entrepreneurship in national and regional economies.

Our results provide no significant evidence that individuals with entrepreneurial experience have higher subjective well-being. Rather, entrepreneurial experience has a negative direct effect on subjective well-being when we control for the level of wealth, measured by household income, and individual cash and assets, in addition to personal attributes. We also find a positive indirect effect of entrepreneurial experience on subjective well-being through wealth and a negative indirect effect through debt. The results indicate that individuals with higher household income and individual cash and assets are more likely to have higher subjective well-being. In contrast, individuals with debt burdens are less likely to have higher subjective well-being. The findings suggest that the level of wealth plays a critical role in determining entrepreneurial well-being. Moreover, a debt burden becomes an obstacle to increasing entrepreneurial well-being.

This study contributes to the relevant literature by providing novel findings from an original survey. Although prior research on entrepreneurship has provided evidence on the presence of entrepreneurial well-being, there is still limited knowledge on the mediating effect of financial motives on entrepreneurial well-being. Our results indicate that entrepreneurial well-being does not simply result from starting a business. Even if individuals become entrepreneurs to seek their own interests, they do not necessarily have higher subjective well-being by starting their businesses. Rather, the level of wealth, which consists of financial motives, may enable individuals to secure subjective well-being derived from entrepreneurial experience. Our findings illustrate how entrepreneurs experience and exhibit subjective well-being.

The remainder of this study is organized as follows. The subsequent section explains the research background. Next, we discuss the data and methods used. After that, the estimation results are presented. Finally, we discuss implications and present conclusions of this study.

## Research Background and Theoretical Arguments

### Entrepreneurship and Subjective Well-Being

In recent years, scholars have paid increasing attention to entrepreneurship and subjective well-being (e.g., Uy et al. 2017; Ryff 2019; Shir et al. 2019; Nikolaev et al. 2020a). The subjective approach to well-being, which includes not only pleasure attainment and pain avoidance (hedonic and desire based) but also emphasize vitality, meaning, and self-realization (eudaimonic) of mental wellness, has been prevalent in the literature (e.g., Wills 2009; Wiklund et al. 2019). Most studies examining the relationship between entrepreneurship and well-being have adopted general subjective measures of well-being, such as life satisfaction and positive affect, or focusing on context-specific constructs of business- and work-related satisfaction (e.g., Wiklund et al. 2019). Subjective well-being, such as life satisfaction, happiness, worry, and depression, provides a more holistic view. In contrast, objective measures of well-being, such as income and expenditure, are only partially related to how people experience and evaluate their lives (Bhuiyan and Artjoms 2019).

Essentially, it is thought that individuals' decisions to become entrepreneurs are related to their personal net worth and self-interests (Van de Ven et al. 2007; Lofstrom et al. 2014). In this context, many studies have addressed entrepreneurs' job and life satisfaction (e.g., Binder and Coad 2013; Millán et al. 2013; Lindblom et al. 2020). Empirical evidence indicates that people who are actively starting and running new businesses report significantly higher levels of job and life satisfaction, despite earning lower incomes and working longer hours (Benz and Frey 2008a, 2008b). Meanwhile, some studies emphasize that starting new businesses leads to job stress (Monsen and Boss 2009) and feelings of grief (Jenkins et al. 2014).

To date, numerous scholars have explored the differences in job and life satisfaction between self-employed (i.e., entrepreneurs) and employed individuals (i.e., employees) (e.g., Andersson 2008; Van der Zwan et al. 2018; Kibler et al. 2019). It is plausible that entrepreneurs experience an increase in subjective well-being while enjoying their new businesses. Individuals have less incentive to become entrepreneurs unless they expect higher subjective well-being. Indeed, research on individuals' decisions to become entrepreneurs has established that self-employed individuals have higher job satisfaction than employees (e.g., Blanchflower and Oswald 1998; Blanchflower 2000; Andersson 2008; Benz and Frey 2008b). The findings of these studies indicate a positive relationship between entrepreneurship and subjective well-being. In particular, psychological motives, such as autonomy, competence, and relatedness, are associated with an increase in subjective well-being (Cooper and Peake 2018).<sup>1</sup>

Conversely, Naudé et al. (2014) found a negative relationship across nations using the Global Entrepreneurship Monitor (GEM) data. This relationship partly indicates that necessity entrepreneurship—individuals who are pushed into entrepreneurship because all other options for work are either absent or unsatisfactory—is related to entrepreneurial well-being due to a lack of better alternatives (Block and Koellinger 2009; Kautonen and Palmroos 2010). In other words, some individuals are self-employed because they cannot find any suitable jobs in existing firms. Meanwhile, Tiefenbach and Kohlbacher (2015) found a negative relationship between entrepreneurship and subjective well-being using data on Japanese individuals. It is likely that individuals with entrepreneurial experience have lower subjective well-being, even though the unemployment rate has been low in Japan (Akram 2019). This may suggest that entrepreneurial well-being is possibly determined regardless of a lack of other alternatives.

Essentially, it is conceivable that subjective well-being is associated with business outcomes. Several scholars have addressed the relationship between business outcomes and subjective well-being (e.g., Lyubomirsky et al. 2005; Dijkhuizen et al. 2018). For entrepreneurs, subjective well-being is indeed tied to business outcomes (Sherman et al. 2016). In addition, some studies have examined the relationship between goal attainment and subjective well-being in the literature on psychology (e.g., Sheldon and Houser-Marko 2001; Sheldon et al. 2002). It is thought that individuals who successfully pursue their goals experience a higher level of subjective well-being (Klug and Maier 2015). Moreover, entrepreneurial success is found to be positively associated

<sup>1</sup> Satisfying psychological motives, such as autonomy (experiencing choice), competence (experiencing effectiveness), and relatedness (experiencing connectedness with others), is considered to influence individual motivation (Deci and Ryan 2000).

with life satisfaction (Przepiorka 2017). In this regard, business outcomes, which facilitate goal attainment, are nontrivial in predicting entrepreneurial well-being.

Moreover, nascent entrepreneurs who a priori have less information on business environment cannot perfectly predict business outcomes prior to starting businesses. It is plausible that nascent entrepreneurs recognize real conditions after starting their businesses (Baron and Henry 2010). This notion is derived from the learning process of achieving entrepreneurial well-being, based on the concept of a learning model proposed by Jovanovic (1982). It is conceivable that nascent entrepreneurs are encouraged or discouraged by unexpected outcomes, which will increase or decrease entrepreneurial well-being. A positive gap between expected and real outcomes, which increases wealth more than expected, could explain the positive relationship between entrepreneurship and subjective well-being. In contrast, a negative gap between expected and real outcomes, which decreases wealth less than expected, could explain the negative relationship between entrepreneurship and subjective well-being. More importantly, individuals who become entrepreneurs are more susceptible to certain cognitive biases, and are more likely to be overconfident than others (Forbes 2005; Koellinger et al. 2007). Such entrepreneurs may rather encounter unexpected hardship, including excess working hours, after starting their businesses.

### **Determinants of Entrepreneurial Well-Being and Financial Motives**

There are various motives for new firm creation. Individuals pursue entrepreneurship for personal and idiosyncratic reasons (Feldman and Bolino 2000; Carree and Verheul 2012; Wiklund et al. 2019). Numerous scholars have examined the factors affecting entrepreneurial well-being, in other words, what makes entrepreneurs happy (e.g., Carree and Verheul 2012). As is often argued, entrepreneurial well-being depends on personality traits, such as self-efficacy (Boyd and Vozikis 1994; Bradley and Roberts 2004). In this context, psychological motives have been highlighted in research on entrepreneurship (e.g., Shir et al. 2019; Wiklund et al. 2019). Some studies have emphasized the importance of entrepreneurs' mental and physical health (e.g., Hessels et al. 2018; Stephan 2018; Hatak and Zhou 2021). Entrepreneurial well-being is also derived from independence and creativity (Block and Koellinger 2009). In addition, autonomy and flexibility have a significant impact on entrepreneurial well-being (Parasuraman and Simmers 2001; Tremblay and Genin 2008). More interestingly, entrepreneurs may enjoy procedural utility, which indicates that people value not only outcomes but also the conditions and processes leading to the outcomes (Benz and Frey 2008a). These suggest that nonpecuniary motives influence entrepreneurial well-being. At the same time, there is room for further evidence on how individuals acquire subjective well-being owing to the motives for becoming entrepreneurs.<sup>2</sup>

Financial rewards and consequences are not trivial for entrepreneurship (Carter 2011). Several scholars have addressed the importance of financial satisfaction or subjective well-being (e.g., Van Praag et al. 2003; Brügger et al. 2017). Indeed, many studies have found a positive effect of wealth and income on subjective well-being (e.g., Headey and Wooden 2004; Benz and Frey 2008a; Block and Koellinger 2009).

<sup>2</sup> Cueto and Pruneda (2017) argued that entrepreneurs have higher levels of life satisfaction when they have a preference for self-employment.

While nonpecuniary motives influence entrepreneurial well-being, financial motives must be a major incentive for individuals to engage in entrepreneurial activity (Block and Koellinger 2009). Entrepreneurs prefer to manage their firms for sufficient financial means to live a comfortable life (Carree and Verheul 2012). It is conceivable that entrepreneurs who are satisfied with their standard of living through sufficient income are more likely to have higher subjective well-being. Moreover, many, but not all, individuals expect successful outcomes when starting new businesses. Some of them may seek financial well-being, such as large capital gains and profits through successful outcomes. In particular, individuals who expect profits are more encouraged or discouraged by their income and wealth levels. As entrepreneurs' task is to seek the successful outcomes of start-up firms founded by themselves, entrepreneurial well-being is associated with firm performance. In this respect, entrepreneurial success is considered to be significantly associated with better business outcomes (Dijkhuizen et al. 2018). Given that the level of income partly reflects business outcomes, it is also conceivable that entrepreneurial well-being is associated with the level of income.

Since the seminal work of Easterlin (1974) regarding the association between economic growth and happiness, the relationship between income and subjective well-being has often been highlighted in the literature (e.g., Stevenson and Wolfers 2008; Binder 2013). Previous studies have demonstrated that subjective well-being depends on the level of wealth (e.g., Cummins 2000; Judge et al. 2010). The sense of financial well-being depends on the objective measures of financial situations, such as the level of income (Porter and Garman 1992). Some scholars provided evidence on a positive relationship between income and subjective well-being (e.g., Block and Koellinger 2009; Millán et al. 2013). These results indicate that entrepreneurial well-being is associated with the level of wealth, which can be called financial well-being (Sorgente and Lanz 2017).<sup>3</sup>

In contrast, the level of debt becomes a burden to entrepreneurs and results in a negative effect on entrepreneurial well-being. For instance, Bhuiyan and Artjoms (2019) examined the case of microcredit that has long been hailed as a powerful tool to promote livelihoods and reduce poverty through entrepreneurship in Bangladesh. They found that microcredit borrowing has an indirect negative effect on overall life satisfaction through increased worry. Such financial motives, which are measured by wealth and debt levels in this study, would also play a critical role in determining entrepreneurial well-being.

## The Japanese Context

According to the GEM data, Japan exhibits a lower level entrepreneurship (Honjo 2015; Honjo and Nakamura 2020). The entry rate has been low during a few decades following the collapse of the bubble economy. Moreover, Japan has a lower level of

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<sup>3</sup> Traditionally, previous studies have examined the impact of financial constraints, often measured by inheritances, on business start-ups (e.g., Evans and Jovanovic 1989; Holtz-Eakin et al. 1994a, 1994b). According to the perspective of financial constraints, it is thought that wealthier individuals are more likely to start businesses (Lofstrom et al. 2014). Meanwhile, Hurst and Lusardi (2004) argued that wealth does not matter in starting a business. They also argued that there is a strong and positive relationship between household wealth and business entry only for households at the very top of the wealth distribution. The causal relationship between entrepreneurship and wealth needs to be further clarified in future investigations.

entrepreneurial attitudes, as measured by subjective perceptions, including confidence in one's skills and ability and risk propensity. These findings suggest that the cautious and prudent attitudes of individuals impede entrepreneurial activity in Japan (Honjo 2015). Conversely, it is desirable how policymakers foster entrepreneurship for future economic growth because of a lower level of entrepreneurship. In this respect, much attention should be paid on how entrepreneurs experience subjective well-being in Japan.

According to the 2017 White Paper on Small and Medium Enterprises in Japan, satisfaction with income in the establishment stage after start-up is lower than before start-up, while satisfaction with work (e.g., freedom and discretion, sense of achievement and enthusiasm, and work content) in the establishment stage after start-up is much higher than before start-up (Small and Medium Enterprise Agency 2017: p.184). This suggests that many individuals a priori have insufficient information and the learning process of achieving entrepreneurial well-being is prominent for entrepreneurs in Japan. It is also possible that the gap between expected and real income discourages entrepreneurial well-being. Meanwhile, "hobby entrepreneurs," who start businesses only for their own interests and skills, have recently been highlighted. However, such entrepreneurs do not necessarily have higher subject well-being compared to others (Small and Medium Enterprise Agency 2019). This suggests that it is difficult to maintain entrepreneurial well-being in Japan, only if entrepreneurs pursue their own interests and skills. Subjective well-being may be more susceptible to social evaluation, including economic performance.

As discussed, prior literature has established that self-employed individuals have higher job satisfaction than employees (e.g., Blanchflower and Oswald 1998; Blanchflower 2000; Andersson 2008; Benz and Frey 2008b). However, as already mentioned, Tiefenbach and Kohlbacher (2015) found a negative relationship between entrepreneurship and subjective well-being, using data from the 2011 National Survey on Lifestyle Preference in Japan. Their findings provide inconsistent evidence regarding the positive relationship between entrepreneurship and subjective well-being in Japan (Benz and Frey 2008b). However, other studies did not find significant results for the relationship between entrepreneurship and subjective well-being (e.g., Oshio and Kobayashi 2011).

In Japan, individuals prefer stable working status, based on income and employment security, to the risky and unstable path of entrepreneurs. This suggests that career paths and family plans are more rigid and homogenous than in Western societies (Tiefenbach and Kohlbacher 2015).<sup>4</sup> Japan has a lower level of interest in self-employment, although the ratio of self-employed individuals in Japan is not lower, compared to some developed countries (Blanchflower et al. 2001). In addition, individuals in Japan seem to have more opportunities because the unemployment rate has been low in recent years (Akram 2019). These suggest that some individuals tend to be obliged to choose self-employment in accordance with the succession of businesses and technologies developed by their family members.

Whereas entrepreneurship is directly linked to subjective well-being, it is possible that the indirect effect of entrepreneurial experience on subjective well-being, including

<sup>4</sup> Taniguchi and Potter (2016) emphasized that social relationships, including neighbor relationships, enhance subjective well-being, especially in the Eastern Societies, such as Japan.

mediating factors, is more significant. This may determine subjective well-being. However, to the best of our knowledge, there is a paucity of research on the mediating effect of other factors, which would assist us in having a better understanding of the nature of entrepreneurship in countries with less entrepreneurial well-being, such as Japan.

## Hypotheses Development

### Direct Effect of Entrepreneurial Experience on Subjective Well-Being

As discussed, entrepreneurial well-being depends on various motives. Many entrepreneurs, including the self-employed, may simply consider the achievement of their own personal interests. Essentially, individuals have less incentive to become entrepreneurs unless they expect higher subjective well-being. Indeed, the findings of previous studies indicate a positive relationship between entrepreneurship and subjective well-being (e.g., Blanchflower and Oswald 1998; Blanchflower 2000; Andersson 2008; Benz and Frey 2008b). In this context, a positive relationship between entrepreneurship and subjective well-being is hypothesized.

However, it is not easy for individuals to perfectly predict business outcomes prior to starting businesses. According to the learning process of achieving entrepreneurial well-being, individuals may rather recognize real conditions after starting their businesses. If individuals encounter unexpected hardship, a negative relationship between entrepreneurship and subjective well-being emerges. While some studies provided support for a positive relationship between entrepreneurship and subjective well-being (e.g., Blanchflower and Oswald 1998; Blanchflower 2000; Andersson 2008), mixed results were founded for Japanese self-employed individuals (e.g., Blanchflower et al. 2001; Benz and Frey 2008b; Oshio and Kobayashi 2011; Tiefenbach and Kohlbacher 2015). In addition, others found that self-employed individuals work longer hours than those employed by organizations (e.g., Hyttinen and Ruuskanen 2007). Such working conditions may negatively affect entrepreneurial well-being. In these respects, it is unclear whether entrepreneurs have higher life satisfaction than employees. Thus, we test the following hypotheses:

- **H1a:** Entrepreneurial experience is positively associate with subjective well-being.
- **H1b:** Entrepreneurial experience is negatively associated with subjective well-being.

### Indirect Effect of Entrepreneurial Experience through Wealth

In addition to the relationship between entrepreneurship and subjective well-being, the relationship between entrepreneurship, including self-employed individuals, and income has been debated in the literature (e.g., Hurst and Lusardi 2004; Carter 2011). Some scholars provided evidence that the average income of entrepreneurs is lower than that of employees (e.g., Hamilton 2000; Binder and Coad 2013; Åstebro et al. 2014). These findings do not support the notion that individuals with entrepreneurial



experience have higher income than employees, although these individuals do face more volatile income. Meanwhile, the relationship between individuals' income level and subjective well-being has been debated in the existing literature (e.g., Cummins 2000; Clark et al. 2008). Presumably, several individuals care about aspects other than money when they start businesses. Moreover, nonpecuniary motives play a more critical role in driving entrepreneurial well-being. However, as discussed, financial motives are a major incentive for individuals to engage in entrepreneurial activity (Block and Koellinger 2009). While some individuals possibly seek their own interests, it is unlikely that individuals pay less attention to business outcomes. Furthermore, individuals who are obliged to choose self-employment at that time may have higher subjective well-being by reaching a certain level of wealth. In practice, previous studies have found a positive effect of wealth and income on subjective well-being (e.g., Headey and Wooden 2004; Benz and Frey 2008a; Block and Koellinger 2009).

As already mentioned, the process of achieving entrepreneurial well-being is complex (Abreu et al. 2019). While some individuals have higher subjective well-being through entrepreneurial experience, others may evaluate subjective well-being based on financial motives. Presumably, entrepreneurial experience has direct and indirect effects on subjective well-being. The mediating role in entrepreneurial well-being is critical for business start-ups. In recent years, some scholars have identified this mediating role using a multi-path mediation model with structural equation modelling (SEM) approach (e.g., Nikolaev et al. 2020a; Shir et al. 2019). In particular, Nikolaev et al. (2020b) examined the mediating effect of psychological functioning on subjective well-being. Their results emphasized the importance of the direct and indirect effects of self-employment. While they considered psychological functioning in their analysis, they did not pay attention to the mediating effect of financial motives. It is possible that the mediating effect of financial motives is nontrivial in determining subjective well-being. Furthermore, to the best of our knowledge, the mediating effect of financial motives, such as the level of wealth, on entrepreneurial well-being has been ignored in the existing literature. Distinguishing between the direct and indirect effects, we identify the channels through which entrepreneurial experience is related to subjective well-being. By doing so, we can articulate how entrepreneurial experience is associated with subjective well-being. We test the following hypotheses:

- H2a:** Entrepreneurial experience is positively associated with the level of wealth.
- H2b:** Entrepreneurial experience is negatively associated with the level of wealth.
- H3:** The level of wealth is positively associated with subjective well-being.

### **Indirect Effect of Entrepreneurial Experience through Debt**

Furthermore, some entrepreneurs increase debt because of investment in new businesses. Financial motives related to debt may affect entrepreneurial well-being. Specifically, the debt burden reduces entrepreneurial well-being. We also examine the indirect effects of the level of debt, in addition to the level of wealth, on subjective well-being. Thus, we test the following hypotheses:

- H4:** Entrepreneurial experience is positively associated with the level of debt.

**H5:** The level of debt is negatively associated with subjective well-being.

The mediating effect of financial motives, including the level of debt, is considered significant. It is also plausible that the relationship between entrepreneurship and subjective well-being depends on financial motives. Such investigations on the mediating role in entrepreneurial well-being assist us in gaining a better understanding of how to promote entrepreneurship in the economy.

## Data and Methods

### Data Collection

The data used in this study come from a smartphone and online computer survey, “Internet Survey on the Characteristics and Decision-Making of Potential Entrepreneurs and Angel Investors” from our research project at the Research Institute of Economy, Trade, and Industry (RIETI), Japan. In the survey, we asked individuals their experiences in and attitudes toward business start-ups and investments to identify the proportions of entrepreneurs and angel investors in Japan. We targeted individuals aged 18 to 79, who were assigned according to gender, age, and prefectures in the survey. Rakuten Research, Inc. (currently, Rakuten Insight, Inc.), subcontracted by the RIETI, conducted this survey in May 2018.<sup>5</sup>

In this study, respondents were randomly selected by Rakuten Research. To construct a sample without a bias, Rakuten Research distributed and collected the questionnaires, in proportion to each prefecture’s population by gender and age distribution in Japan. 150,144 individuals were contacted and 13,449 respondents were obtained (response rate: 8.96%). We excluded some respondents due to lack of answers for some questions, leaving us with a final sample size of 10,001 individuals.

### Methods

As discussed, the indirect effect of entrepreneurial experience on subjective well-being is nontrivial, while entrepreneurial experience may be directly related to subjective well-being. Thus, we pay more attention to the indirect effect of entrepreneurial experience, in addition to the direct effect, on subjective well-being to identify entrepreneurial well-being. Following the mediation analysis stated by Baron and Kenny (1986), we examine the relationship between entrepreneurial experience and subjective well-being.

Let  $Y_i^*$  denote the level of individual  $i$ ’s subjective well-being, which is captured by a latent variable. We measure  $Y_i$  instead of  $Y_i^*$  using a five-point ordinal scale. It is assumed that individual  $i$ ’s entrepreneurial experience, denoted by  $X_i$ , is related to their subjective well-being,  $Y_i^*$ . In addition, the mediating effect of entrepreneurial

<sup>5</sup> Rakuten Insight has approximately 2.3 million qualified market research respondents (as of March 2016) in Japan, which are recruited through the users of Rakuten Group services.

For more details, see the website of Rakuten Insight.

<https://insight.rakuten.co.jp/en/> [Accessed on January 11, 2020]

experience on subjective well-being exists in individuals, and the mediation term is denoted by  $Z_i^*$ , which is captured by a latent variable in this study. Based on Baron and Kenny's (1986) framework, we estimate the following equations:

$$Y_i^* = \alpha_0 + \alpha_1 X_i + e_{1i}, \quad (1)$$

$$Z_i^* = \beta_0 + \beta_1 X_i + e_{2i}, \quad (2)$$

$$Y_i^* = \gamma_0 + \gamma_1 X_i + \gamma_2 Z_i^* + e_{3i}, \quad (3)$$

where  $\alpha_0$ ,  $\alpha_1$ ,  $\beta_0$ ,  $\beta_1$ ,  $\gamma_0$ ,  $\gamma_1$ , and  $\gamma_2$  are parameters to be estimated, and  $e_{1i}$ ,  $e_{2i}$ , and  $e_{3i}$  are error terms. In this case, we obtain the following relationship:

$$\alpha_1 = \gamma_1 + \beta_1 \gamma_2. \quad (4)$$

As shown in Eq. (4),  $\alpha_1$  can be divided into two effects: the direct effect,  $\gamma_1$ , and indirect effect,  $\beta_1 \gamma_2$ . To identify the gap between the direct and indirect effects, we calculate the test statistics for  $\beta_1 \gamma_2 / \sigma_{\beta_1 \gamma_2}$  where  $\sigma_{\beta_1 \gamma_2}$  is the squared root of the covariance of  $\beta_1$  and  $\gamma_2$ .

To identify the mediating effect of entrepreneurial experience on subjective well-being, we use the SEM approach. There are some advantages of using SEM in the context of mediation analysis (Gunzler et al. 2013; MacKinnon 2017; Hayes 2018). The SEM approach allows us to incorporate latent variables. This approach simplifies the testing of the mediation hypotheses because it is designed, in part, to test more complicated mediation models in a single analysis. The SEM approach can also be used when it includes multiple independent variables, mediation terms (mediators), and dependent variables (outcomes). Indeed, we develop a multi-path mediation model in which wealth and debt mediate the relationship between entrepreneurial experience and subject well-being, partially through a positive effect of wealth.

More importantly, as the mediation term is captured by the latent variable ( $Z_i^*$ ), we identify whether an indirect effect of entrepreneurial experience on subjective well-being exists in individuals using mediation analysis with generalized structural equation modelling (GSEM). Our model includes dependent variables (response variables) measured by an ordinal scale, such as subjective well-being and annual income. GSEM is applicable when we use SEM with continuous and discrete (e.g., binary and ordinal) variables. Therefore, we employ GSEM in this study to capture the mediation term.

## Variables

Using data on subjective well-being and personal attributes in the sample of individuals, we identify the relationship between entrepreneurial experience and life satisfaction. However, many individuals in the sample have no occupation, and their subjective well-being may be independent of work experience. It is more appropriate to compare individuals with entrepreneurial experience to those with other work experience. When

examining the impact of entrepreneurial experience, we thus use the subsample of individuals with occupations. As a result, the number of observations in the subsample is 6092.

The major dependent variable of subjective well-being is measured by life satisfaction (*SATISF*). We use single-item measurement of life satisfaction, following the previous literature (e.g., Decancq et al. 2015; Kibler et al. 2019). To capture subjective well-being, we asked respondents about life satisfaction, and rated their responses using a five-point scale: (1) “not satisfied,” (2) “not very unsatisfied,” (3) “cannot say either,” (4) “somewhat satisfied,” and (5) “satisfied.”

We define the major independent variable in the estimation model using a binary variable for entrepreneurial experience (*ENTRE*). In this study, entrepreneurial experience is defined as “experience in funding, owing, and running a company that paid salaries and wages to employees and owners, as well as other expenses, for three or more months.” Using this variable, we estimate the relationship between entrepreneurial experience and subjective well-being. We asked individuals about their experiences in business start-ups and angel investments. If an individual has entrepreneurial experience, the variable of entrepreneurial experience (*ENTRE*) equals 1.

To consider the indirect effect of entrepreneurial experience on subjective well-being, we pay attention to wealth, mainly because subjective well-being depends on the level of individual wealth (Cummins 2000; Clark et al. 2008). The level of wealth is often measured by household income and assets (Hurst and Lusardi 2004; Sorgente and Lanz 2017). In this study, we capture wealth (*Z*) using three variables: (i) household income (*HINC*), (ii) individual cash and deposits (*CASH*), and (iii) individual assets other than cash and deposits (*ASSET*). In addition, as aforementioned, it is hypothesized that the level of debt is negative associated with subjective well-being. In this study, we also use the variable of debt (*DEBT*), in addition to these variables for wealth.

Moreover, to construct some controls, we include questions on personal attributes, such as educational background and occupation, in addition to the level of household income, individual cash and assets, and debt. We control for personal attributes because subjective well-being depends on individual-specific characteristics. In this study, we capitalize on personal attributes using the following variables: age (*lnAGE*), gender (*FEMALE*), marriage status (*MARRIED*), and the number of children (*NCHILD*).

Table 1 indicates the definitions of variables used in this study. Table 2 presents the descriptive statistics of the variables in the subsample of individuals with occupation. The mean of subjective well-being (*SATISF*) is slightly over 3, and its median is 3. The mean of entrepreneurial experience (*ENTRE*) is 0.10, indicating that approximately 10% of individuals in the sample have entrepreneurial experience. Figure 1 describes differences in subjective well-being by entrepreneurial experience. While the proportion of (1) “not satisfied” for individuals with entrepreneurial experience (*ENTRE* = 1) is slightly higher than that for individuals without such experience (*ENTRE* = 0), the proportion of (5) “satisfied” for individuals with entrepreneurial experience (*ENTRE* = 1) is higher than that for individuals without such experience (*ENTRE* = 0). Figure 2 depicts the level of wealth by entrepreneurial experience: (a) household income, (b) cash and deposits, and (c) assets other than cash and deposits. Figure 3 depicts the level of debt by entrepreneurial experience. These figures indicate that individuals with entrepreneurial experience are more likely to have higher levels of wealth and debt.

## Estimation Results

Using the subsample of individuals with occupation, we apply GSEM to describe the relationship between entrepreneurial experience and subjective well-being. Table 3 presents the estimation results for subjective well-being using GSEM. Figure 4 depicts the path diagram of the results presented in Table 3.

As Table 3 shows, we do not find evidence on the positive effect of entrepreneurial experience on subjective well-being. This result may rather indicate a direct negative relationship between entrepreneurial experience and subjective well-being. While our findings are not consistent with those of Benz and Frey (2008b), they are consistent with the findings of Tiefenbach and Kohlbacher (2015) regarding Japanese individuals. Our findings suggest that on average, individuals with entrepreneurial experience do not have higher subjective well-being, even though it is possible that only a few entrepreneurs have much higher subjective well-being than others. In addition, the results indicate that entrepreneurial well-being is associated with the level of wealth.

**Table 1** Definitions of variables

Variable	Symbol	Definition
Subjective well-being	<i>SATISF</i>	Five-point scale: (1) not satisfied, (2) not very unsatisfied, (3) cannot say either, (4) somewhat satisfied, and (5) satisfied.
Entrepreneurial experience	<i>ENTRE</i>	(1) if individuals have entrepreneurial experience, and (0) otherwise.*
	<i>(ENTRE_STOP)</i>	(1) if individuals with entrepreneurial experience retired from or closed their businesses, and (0) otherwise.
	<i>(ENTRE_CONTINUE)</i>	(1) if individuals with entrepreneurial experience are currently involved in their business start-up, and (0) otherwise.
Household income	<i>HINC</i>	Seven-point scale: (1) <1 million yen, (2) 1–3 million yen, (3) 3–5 million yen, (4) 5–10 million yen, (5) 10–20 million yen, (6) 20–50 million yen, and (7) 50 million yen+.
Cash and deposits	<i>CASH</i>	Seven-point scale: (1) <1 million yen, (2) 1–3 million yen, (3) 3–5 million yen, (4) 5–10 million yen, (5) 10–20 million yen, (6) 20–50 million yen, and (7) 50 million yen+.
Assets other than cash and deposits	<i>ASSET</i>	Seven-point scale: (1) <1 million yen, (2) 1–3 million yen, (3) 3–5 million yen, (4) 5–10 million yen, (5) 10–20 million yen, (6) 20–50 million yen, and (7) 50 million yen+.
Debt	<i>DEBT</i>	Seven-point scale: (1) <1 million yen, (2) 1–3 million yen, (3) 3–5 million yen, (4) 5–10 million yen, (5) 10–20 million yen, (6) 20–50 million yen, and (7) 50 million yen+.
Gender	<i>FEMALE</i>	(1) if the individual is female, and (0) if the individual is male.
Age	<i>lnAGE</i>	Logarithm of <i>AGE</i> ( <i>AGE</i> is the individual's age).
Married	<i>MARRIED</i>	(1) if the individual is married, and (0) otherwise.
Number of children	<i>NCHILD</i>	Five-point scale: (0) no children, (1) one child, (2) two children, (3) three children, and (4) four or more children.

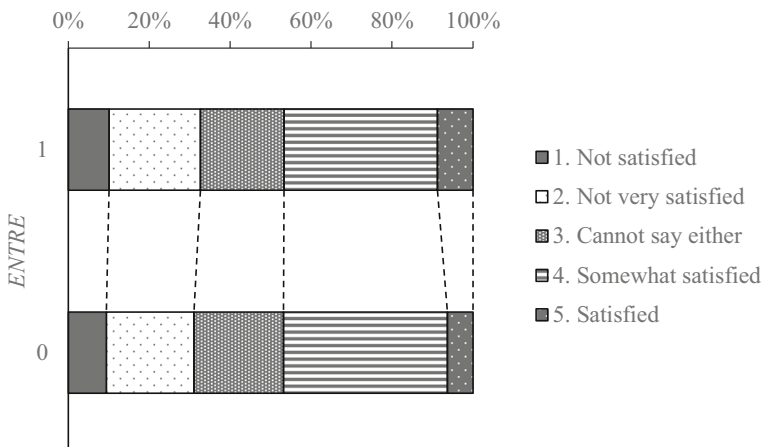
Notes: \* In this study, “entrepreneurial experience” is defined as “experience in founding, owning, and running a corporation that paid salaries and wages to employees and owners, as well as all other expenses, for three or more months.” Individuals with entrepreneurial experience are categorized as *ENTRE\_CONTINUE* if they are currently involved in business start-ups, and are categorized as *ENTRE\_STOP* if they retired or closed their businesses

**Table 2** Descriptive statistics of variables

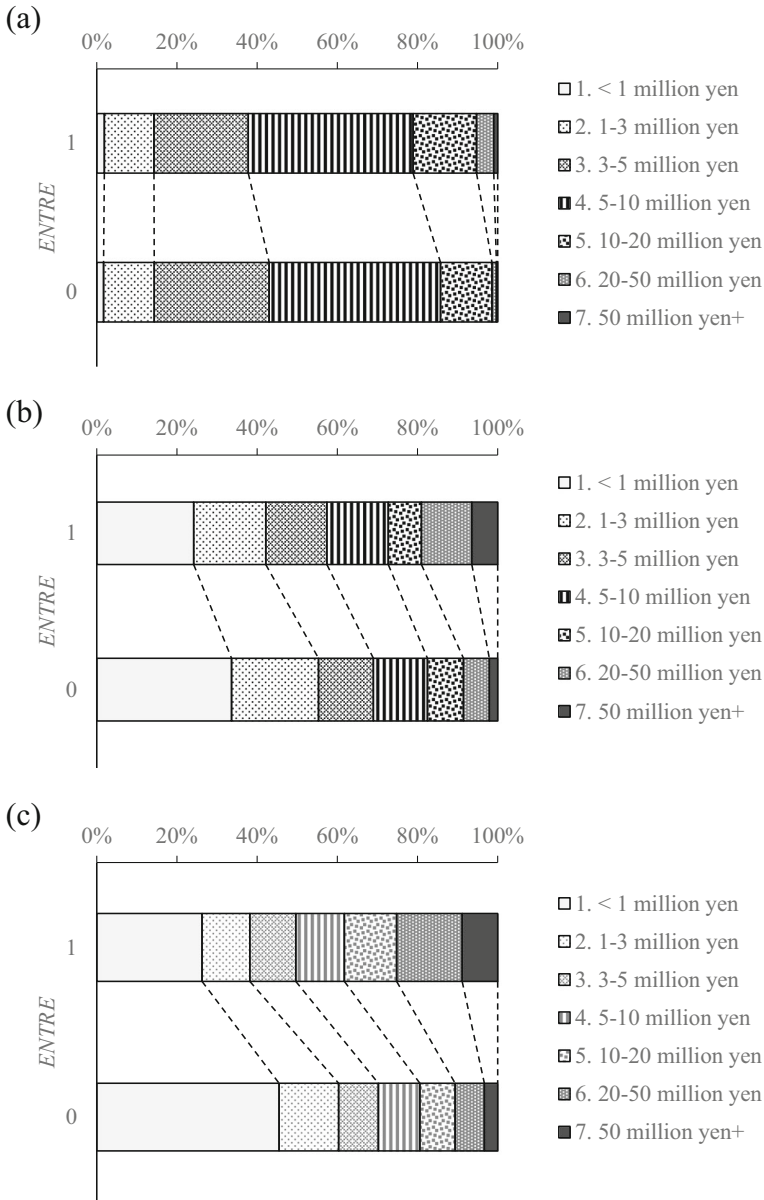
Variables	<i>N</i>	Mean	S.D.	Min.	p25	Median	p75	Max.
<i>SATISF</i>	6092	3.13	1.12	1.00	2.00	3.00	4.00	5.00
<i>ENTRE</i>	6092	0.10	0.30	0.00	0.00	0.00	0.00	1.00
<i>ENTRE_STOP</i>	6092	0.04	0.20	0.00	0.00	0.00	0.00	1.00
<i>ENTRE_CONTINUE</i>	6092	0.06	0.23	0.00	0.00	0.00	0.00	1.00
<i>HINC</i>	5220	3.59	1.00	1.00	3.00	4.00	4.00	7.00
<i>CASH</i>	4789	2.76	1.73	1.00	1.00	2.00	4.00	7.00
<i>ASSET</i>	4222	2.68	1.90	1.00	1.00	2.00	4.00	7.00
<i>DEBT</i>	5145	1.85	1.49	1.00	1.00	1.00	2.00	7.00
<i>FEMALE</i>	6092	0.41	0.49	0.00	0.00	0.00	1.00	1.00
<i>AGE</i>	6092	45.26	13.32	18.00	35.00	45.00	55.00	79.00
<i>MARRIED</i>	6092	0.68	0.47	0.00	0.00	1.00	1.00	1.00
<i>NCHID</i>	6092	1.03	1.11	0.00	0.00	1.00	2.00	4.00

Notes: *N* indicates the number of observations. S.D. indicates standard deviation

One reason is that some entrepreneurs recognize true market conditions, including income, through their business practices after starting businesses, since nascent entrepreneurs have less information on the conditions before it. These entrepreneurs may have lower subjective well-being due to unexpected income, in addition to an increase in debt. Another reason is that while entrepreneurs tend to encounter unstable income, employees in Japan—especially those in established firms—are more likely to be given favorable conditions, such as long-term employment and employee pension. Even though entrepreneurs are more likely to gain freedom, they face pressure in securing not only their own income and pension, but also their employees’ employment and pension. Entrepreneurs may also evaluate subjective well-being based on successful business outcomes. Moreover, some individuals are obliged to become successor entrepreneurs, simply because of the succession of businesses and technologies



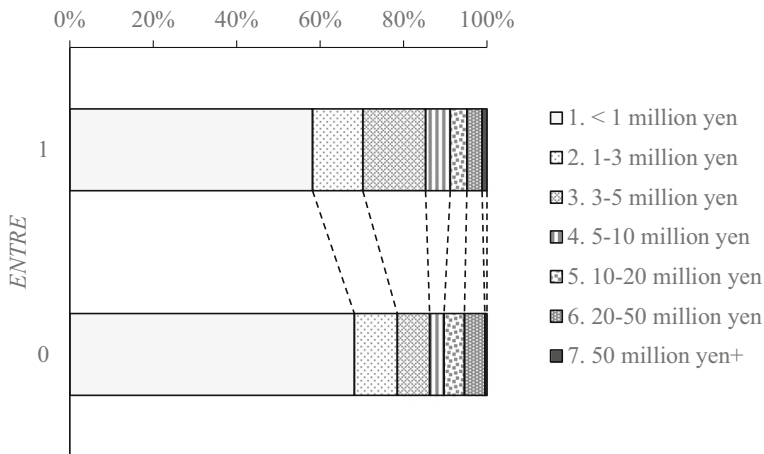
**Fig. 1** Subjective well-being by entrepreneurial experience



**Fig. 2** Wealth by entrepreneurial experience. (a) Household income, (b) Cash and deposits, (c) Assets other than cash and deposits

developed by their family members, and others become entrepreneurs due to the lack of employment opportunities. This may be especially seen in Japan due to aging population. Such entrepreneurs may not have higher subjective well-being without a certain level of wealth.

Regarding the indirect effect of entrepreneurial experience on subjective well-being, we examine whether the level of wealth, measured by household income and individual



**Fig. 3** Debt by entrepreneurial experience

cash and assets, mediates the association between entrepreneurial experience and subjective well-being. In Table 3, the coefficient of entrepreneurial experience is positive and significant for the level of wealth. In addition, the coefficient of the level of wealth is positive and significant for subjective well-being. We find a positive relationship between entrepreneurial experience and wealth and a positive relationship between wealth and subjective well-being. This is consistent with the findings of Block and Koellinger (2009). We provide supportive evidence on the indirect effect of entrepreneurial experience on subjective well-being through wealth. This indicates that individuals with entrepreneurial experience are more likely to have higher subjective well-being as they have higher incomes and assets. Our findings suggest that the level of wealth plays a critical role in determining subjective well-being in individuals, including entrepreneurs.

Moreover, we examine whether the level of debt mediates the association between entrepreneurial experience and subjective well-being. As Table 3 shows, debt has a negative and significant effect on subjective well-being, while entrepreneurial experience has a positive and significant effect on debt. The results reveal that entrepreneurial experience is associated with subjective well-being through debt, as well as wealth, although the relationship is opposite. Our findings suggest that the level of debt also plays a critical role in determining subjective well-being in individuals, including entrepreneurs.

Regarding the impact of personal attributes as control variables, the coefficient of  $\ln AGE$  for subjective well-being is negative and significant, while the coefficient of  $FEMALE$  is less significant. The results indicate that younger individuals are more likely to have higher subjective well-being. The coefficient of  $MARRIED$  for subjective well-being is positive and significant, indicating that married individuals have higher subjective well-being than non-married ones.

In Table 4, we estimate the direct, indirect, and total effects of entrepreneurial experience on subjective well-being. We do not find total effects of entrepreneurial experience on subjective well-being, although its direct effect is negative. More importantly, the indirect effect of entrepreneurial experience through wealth and debt

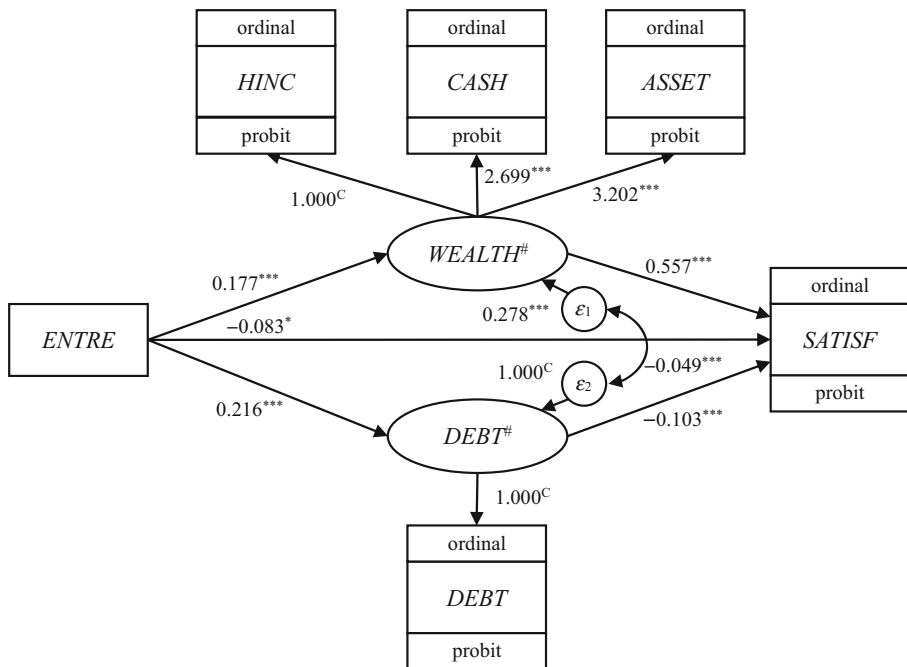


**Table 3** Estimation results for subjective well-being (GSEM)

	<i>SATISF</i>	<i>WEALTH</i> <sup>#</sup>	<i>DEBT</i> <sup>#</sup>	<i>HINC</i>	<i>CASH</i>	<i>ASSET</i>	<i>DEBT</i>
<i>ENTRE</i>	-0.083* (0.049)	0.177*** (0.029)	0.216*** (0.078)				
<i>FEMALE</i>	0.063* (0.038)	-0.184*** (0.019)	-0.851*** (0.053)				
<i>lnAGE</i>	-0.461*** (0.058)	0.551*** (0.035)	-0.701*** (0.089)				
<i>MARRIED</i>	0.399*** (0.048)	0.135*** (0.029)	0.452*** (0.081)				
<i>NCILD (=0)</i>	Omitted	Omitted	Omitted				
<i>NCHILD (=1)</i>	-0.005 (0.053)	-0.034 (0.032)	0.292*** (0.089)				
<i>NCHILD (=2)</i>	0.096** (0.048)	-0.019 (0.029)	0.367*** (0.081)				
<i>NCHILD (=3)</i>	0.146** (0.062)	-0.098*** (0.037)	0.569*** (0.100)				
<i>NCHILD (=4)</i>	0.177 (0.133)	-0.216*** (0.081)	0.477** (0.215)				
<i>WEALTH</i> <sup>#</sup>	0.557*** (0.040)			1 <i>Const.</i>	2.699*** (0.153)	3.202*** (0.216)	
<i>DEBT</i> <sup>#</sup>	-0.103*** (0.027)						1 <i>Const.</i>
cut1	-1.400*** (0.189)			-0.334** (0.130)	4.810*** (0.375)	6.350*** (0.513)	-1.775*** (0.321)
cut2	-0.516*** (0.188)			0.864*** (0.127)	5.812*** (0.393)	7.123*** (0.535)	-1.295*** (0.321)
cut3	0.095 (0.188)			1.864*** (0.128)	6.466*** (0.405)	7.689*** (0.552)	-0.793** (0.321)
cut4	1.613*** (0.189)			3.289*** (0.134)	7.250*** (0.421)	8.365*** (0.574)	-0.502 (0.321)
cut5				4.529*** (0.144)	8.013*** (0.439)	9.142*** (0.600)	0.019 (0.321)
cut6				5.225*** (0.165)	9.306*** (0.472)	10.42*** (0.644)	1.391*** (0.331)
Var(error)		0.278*** (0.021)	1 <i>Const.</i>				
<i>N</i>	6092						

Notes: Standard errors in parentheses. \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. *N* indicates the number of observations. Variables with subscript # are latent variables

is significant. In particular, the positive effect of entrepreneurial experience on subjective well-being through wealth is observed, implying that entrepreneurs cannot achieve higher subjective well-being without a certain level of wealth. Further, the debt burden



**Fig. 4** Path diagram of subjective well-being (GSEM). Notes: The definitions of variables are presented in Table 1. The estimation results are presented in Table 3. Variables with superscript # are latent variables.  $\varepsilon_1$  and  $\varepsilon_2$  are error terms. The estimated coefficients are adjacent to arrows. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . C indicates the coefficient constrained to a fixed value. The numbers outside error terms (circle) indicate the variance of errors. Control variables are also included in the model, but omitted from the figure. The number adjacent to the double-headed arrow indicates covariance

may reduce subjective well-being. The results indicate that the indirect effect of entrepreneurial experience plays a critical role in determining subjective well-being.

## Discussion

This study contributes to the extant literature on entrepreneurial well-being by providing novel findings from an original survey in Japan. Although prior research on entrepreneurship has provided evidence on the presence of entrepreneurial well-being, there is still limited knowledge on the mediating effect of financial motives on entrepreneurial well-being. Our results indicate that entrepreneurial well-being does not simply result from starting a business. Even if individuals become entrepreneurs to seek their own interests, they do not necessarily have higher subjective well-being by starting their businesses. Rather, the level of wealth, which consists of financial motives, may enable individuals to secure subjective well-being derived from entrepreneurial experience. This is because a certain level of wealth is required to achieve subjective well-being through a business start-up, even though entrepreneurs with low income and long working hours have higher psychological motives, such as autonomy, than employees. Indeed, a low level of income reduces subjective well-being. In addition, we find that the level of debt reduces subjective well-being. Given that

**Table 4** Decomposition of the total effects of entrepreneurship experience on subjective well-being

	Coef.	S.E.	z	p
Direct effect	-0.083	0.049	1.710	0.088
Indirect effect	0.069	0.020	3.430	0.001
via <i>WEALTH</i> <sup>#</sup>	0.096	0.017	5.600	0.000
via <i>DEBT</i> <sup>#</sup>	-0.027	0.011	2.480	0.013
Total effects	-0.014	0.048	-0.290	0.773

Notes: S.E. indicates standard error. The number of observations is 6092. Variables with superscript # are latent variables

nascent entrepreneurs do not have an accurate prediction of business outcomes before starting their businesses, unexpected income and debt may reduce entrepreneurial well-being.

Moreover, this study provides new insight into the relationship between the subjective success measures (i.e., subjective well-being) and objective measures, which are captured by financial motives in this study. There are several types of measures to capture entrepreneurship. Both objective and subjective measures are useful for examining an individual's life satisfaction and assessing public support policy in the literature (e.g., Veenhoven 2002; Bhuiyan and Artjoms 2019; Zhao et al. 2021). In this respect, this study contributes to the extant literature by not only identifying the indirect effect of financial motives on subjective well-being, but also by emphasizing the importance of objective measures in the subjective success measure. This would be helpful in filling the gap between subjective and objective measures in research on entrepreneurship.

## Implications

Entrepreneurial well-being allows individuals to create incentives to start businesses. This can lead to sustainable entrepreneurship in the economy. In reality, only few firms achieve high growth in a short period (Haltiwanger et al. 2013, 2017). Such high-growth start-ups substantially contribute to the major part of economic growth (Shane 2008; Storey and Greene 2010).

The findings of this study provide some policy implications with regard to entrepreneurship. While policymakers have paid attention to the promotion of high-growth start-ups that can stimulate a stagnant economy, the level of entrepreneurship is still low in some countries, including Japan. As shown here, entrepreneurs do not necessarily have higher subjective well-being than others, suggesting that some employees have higher subjective well-being in Japan. Meanwhile, our findings suggest that the level of debt prevents individuals from becoming entrepreneurs. This may imply that the reduction of the mental burden associated with debt, including free property under the Bankruptcy Law, is required to promote entrepreneurship in Japan.<sup>6</sup> On average,

<sup>6</sup> According to the Civil Execution Act (Article 131) in Japan, cash in the amount specified by a Cabinet Order based on an average household's necessary living expenses for two months shall not be seized, even when personal bankruptcy occurs. According to the Civil Execution Ordinance, this amount of cash (free property) is 990 thousand yen.

becoming an entrepreneur may not be a better choice in some countries, including Japan. Such recognition prevents individuals from becoming entrepreneurs, which could result in the low entry rate in these countries. While policymakers often encourage entrepreneurship in regions and countries, it is unclear whether becoming an entrepreneur is a better choice for all individuals. It should be emphasized that policymakers should pay more attention to promoting individuals with a better understanding of the current environment for business start-ups, in addition to required entrepreneurial ability to achieve a certain level of income, rather than simply encouraging individuals to become entrepreneurs. Such policy shifts could create sustainable economic growth in an entrepreneurial ecosystem.

### Limitations and Future Research Directions

There are some limitations to this study. First, although we used the smartphone and online computer survey to effectively secure a sufficient sample size, this might cause a selection bias resulting from easy online access. Second, we measured subjective well-being using the single-item measurement of life satisfaction, which could be quite simplistic, following the previous studies (e.g., Decancq et al. 2015; Kibler et al. 2019). We also measured entrepreneurial experience, regardless of an individual's age. Third, we could not identify whether the level of wealth is derived from starting a business. In addition, we could not identify whether subjective well-being is derived mainly from starting a business in the survey. Finally, we could not pay attention to the causal relationship between entrepreneurial experience and wealth, although previous studies have examined the impact of financial constraints, which are associated with wealth, on business start-ups (e.g., Evans and Jovanovic 1989; Holtz-Eakin et al. 1994a, 1994b). Further investigation will be warranted to elucidate the impact of business outcomes on entrepreneurial well-being.

### Conclusions

This study investigated the relationship between entrepreneurial experience and subjective well-being. Using an original survey on subjective well-being, entrepreneurial experience, level of wealth, and personal attributes of 10,001 individuals in Japan, we examined the factors that mediate the association between entrepreneurial experience and subjective well-being. As a result, we found no significant evidence that individuals with entrepreneurial experience have higher subjective well-being. However, we found a positive indirect effect of entrepreneurial experience on subjective well-being through wealth and a negative indirect effect through debt. The findings of this study indicated the importance of considering the mediating effect of financial motives in entrepreneurial well-being.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s11482-021-09947-1>.

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**Code Availability** All data analyses in this study were performed using Stata software (version 16.0). If requested by the reader, our programming code (Stata do file format) used for the analyses can be provided by e-mail.

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**Data Availability** The data used in this study come from a smartphone and online computer survey, “Internet Survey on the Characteristics and Decision-Making of Potential Entrepreneurs and Angel Investors” of the research project of the RIETI. We cannot deposit the data because of the regulations of the RIETI.

## Declarations

**Conflict of Interest/Competing Interests** Not applicable.

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