Does necessity entrepreneurship pay off?

Over the past decade, economists have expressed increased interest in necessity entrepreneurs; individuals who are pushed into entrepreneurship due to a lack of outside options. Experts, however, mainly focused on empirical research on its impact procedural utility, while the effect on income is understudied. This study examines a Dutch panel dataset to analyze the income effects of necessity entrepreneurship, and compares it to the effect of opportunity entrepreneurs and paid employment for the unemployed. With the use of individual-fixed effects regressions and event studies, I derive that necessity entrepreneurship deteriorates income, while opportunity entrepreneurship improves income. Furthermore, necessity entrepreneurs would have been better of had they been in paid employment. Based on these conclusions, many governments should adjust their reemployment policies.

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Introduction

The number of businesses is growing rapidly in The Netherlands. This January, for the first time, The Netherlands had over two million registered firms (KVK, 2020). This trend is fueled by many individuals starting as a small business owner without employees. Traditionally, entrepreneurship is considered to be positive for the economy, yielding more dynamics, innovation, and growth (Audretsch & Keilbach, 2004). However, the current increase in entrepreneurs without employees is an undesirable trend according to many economists (Larsson & Thulin, 2017) (Stanworth & Stanworth, 1995). These experts express concerns about the decreasing number of people participating in social security due to the increase in business owners without employees, and its negative externalities (Zipconomy, 2020). Furthermore, concerns arise regarding the increasing existence of so-called 'necessity entrepreneurs': individuals who are pushed into self-employment due to a lack of employment opportunities (Larsson & Thulin, 2017).

Traditionally, economists approach labour market decisions from a rational-choice theory perspective. According to this theory, labour market participants rationally decide to become an entrepreneur if this option yields them the highest expected utility. The expected utility is determined based on rational expectations of, among others, probability of success, expected income and expected procedural utility. A lot of entrepreneurial literature is based on this framework, and several pieces of literature offer hypotheses as for why entrepreneurship might offer an increase of well-being. Rosen (1981) and Macdonald (1988) hypothesize that it is the option-value of earning an extremely high income which attracts workers into entrepreneurship, while Hamilton (2000) hypothesizes that it is non-monetary benefits such as autonomy which lures individuals into self-employment. Although empirical evidence indicates that these benefits indeed incentivize opportunity entrepreneurs, this theory might not be valid for necessity entrepreneurs.

Over the past two decades, economists have expressed increasing interest in the presence of necessity entrepreneurship and its welfare implications. Although opportunity entrepreneurs (those who turn into entrepreneurship to seize an opportunity) express higher job-satisfaction levels after turning into entrepreneurship, this is not the case for necessity entrepreneurs (Larsson & Thulin, 2017). For this reason, necessity entrepreneurship is welfare-enhancing if and only if necessity entrepreneurs experience a boost in income after turning to self-employment. However, Hamilton (2000) shows that entrepreneurs experience a lower income compared to wage workers. This, combined with Block and Wagner (2010), who show that necessity entrepreneurs earn less than opportunity entrepreneurs, questions the welfare enhancement of necessity entrepreneurship. This research aims to empirically discover whether necessity entrepreneurship indeed deteriorates

individual well-being, by comparing the income effect of necessity entrepreneurship to opportunity entrepreneurship and paid employment. This leads to the following research question:

What is the impact of moving into necessity entrepreneurship on income?

In order to answer this question, the following sub-questions will be discussed:

- What is the effect on income of moving into entrepreneurship?
- How does this effect depend on necessity and opportunity entrepreneurship?
- How does the impact on income of necessity entrepreneurship relate to that of other previously unemployed workers?

From a scientific perspective, this paper will contribute to the current entrepreneurial literature by further examining the relationship between necessity entrepreneurship and income. Convincing evidence concerning the relationship between life satisfaction and necessity entrepreneurship has been published, but the relationship between income and necessity entrepreneurship is understudied. Although an income comparison between necessity and opportunity entrepreneurs has been conducted by Block and Wagner (2010), these authors failed to compare necessity entrepreneurship to paid employment. By comparing the income effects of necessity entrepreneurship to that of returning to paid employment after unemployment, this research aims to give necessity entrepreneurship more perspective.

This paper potentially has severe policy implications. The Dutch government currently offers great benefits to entrepreneurs starting from unemployment, who are defined as necessity entrepreneurs under the working definition by Fairlie & Fossen (2019)[1]. These benefits, among others, entail maintaining unemployment benefits while starting as an entrepreneur (RVO, 2020). Not only do such benefits work as persuasive incentives, but they also signal that necessity entrepreneurship is a desirable phenomenon. If this paper shows necessity entrepreneurs had been better off in paid employment, it offers valuable implications to subsidy regulation and reemployment projects. Governments would increase well-being by cutting such benefits and reinvesting this money into permanent job creation projects for the unemployed. Moreover, this research might imply the desire for adjustments in the methods of unemployment counselors.

To answer these questions, the LISS panel dataset will be used. This dataset consists of over 4500 households that are being studied over time (centERdata, 2020). The data is assembled by selecting participants on a probability-based basis, which guarantees representability. These participants

[1] Necessity entrepreneurs are individuals who move into self-employment after unemployment according to the operational definition (Fairlie & Fossen, 2019).

complete online questionnaires and are paid for each completed survey. The data contains a wide variety of information such as health, schooling, personality, and economic situation. This research will focus on individuals who, according to the survey, moved into self-employment. For all individuals, historical background information is available.

To set up a valid hypothesis, historical entrepreneurial literature will be discussed first. This literature review will also contain a discussion of the limitations of endogenous choice models. Subsequently, the data used in this paper will be discussed and analyzed. This will be followed by the methodology of this paper and its results. Finally, a conclusion and discussion will be presented.

Theoretical Framework

Research on the (self-)employment decision is generally approached from a rational-choice theory (RCT) framework. This implies that individuals self-select the preferred type of employment based on the expected utility yielded from this activity. Individuals are thus assumed to have rational expectations about (amongst others) their probability of success, as well as income and non-pecuniary benefits which follow from different 'states of the world'. From this theory, it seems that individuals change employment out of a free will and do so if and only if this swap results in them being better off. The discussed research generally focuses on the theoretical and empirical exploration of the attractiveness of entrepreneurship compared to paid employment. This attractiveness might stem from both monetary and non-monetary aspects of self-employment.

Entrepreneurs and Employees

Income differences between entrepreneurs and employees

In early work on entrepreneurship, Taylor (1966) attempts to discover why individuals turn into self-employment. As he hypothesizes the reason for this switch to be monetary, he attempts to estimate the pay-gap between self-employment and paid employment. He first estimates the income of entrepreneurs had they worked as employees with the Heckmann Procedure, while he makes use of data from the British Household Panel Study. Subsequently, he analyzes the effects of personal characteristics on the employment decision with a probit-model. Here, Taylor assumes that individuals have two options: either they work as an employee, or they are self-employed. Taylor's research concludes that entrepreneurs have a higher income as an entrepreneur compared to what they would have earned as an employee. He also finds more-risk averse individuals less likely to turn into self-employment due to the risk of job insecurity. Finally, he shows that employees are more likely to turn into entrepreneurship when unemployment rates are low. He reasons that job insecurity is lower in these periods, therefore more risk-averse workers are willing to take the risk. Taylor highlights the positive income gap as a major attracting factor to become self-employed but also shows selection-effects to be an important factor in self-employment.

However, Rosen (1981) provides a theoretical framework which sheds another light on Taylor's (1966) conclusions. With the so-called 'superstar theory', he hypothesizes that for a few sectors the income distribution is highly skewed to the right since a few successful individuals earn an extremely high income (Rosen, 1981). Although mean income thus might be higher for entrepreneurs compared to wage workers, median income is not. Rosen's theory does not only concern entrepreneurs, as he mentions sportsmen and classical musicians, among others. Rosen does not support his theory with empirical evidence.

Macdonald (1988), builds on Rosen's (1981) paper by hypothesizing that, in equilibrium, only young or successful individuals will continue to be entrepreneurs (Macdonald, 1988). He substantiates this claim with the following hypothesis: first, he states that foregone offers for aspiring entrepreneurs are higher than current entrepreneurial income. Therefore, only young entrepreneurs move, or stay, in entrepreneurship, since they hope to become a 'superstar'. Eventually, young individuals will give up once they learn they are not superstars, or when the option value of becoming a superstar does no longer compensate the income gap. Of course, superstars stay in self-employment, as they earn an extraordinarily high income. According to MacDonald, it is the option value of becoming a superstar that compensates for the negative wage differential of entrepreneurs. From this theory, it can be concluded that, when addressing causal claims, it is important to know how long ago an individual turned into entrepreneurship. Again, Macdonald does not support his theory with empirical evidence.

Evans and Leighton (1990) research the selection process of self-employment. With the help of a longitudinal dataset from the US, they conclude, in contrast to MacDonald's (1988) model, that the self-employment decision is independent of age (Evans & Leighton, 1990). They also find half of all new entrepreneurs return to regular employment within seven years. Finally, they find what they call 'poorer wage workers' to be more likely to turn into self-employment. This is the first literature reference to necessity entrepreneurs since they describe that these individuals are 'pushed' into entrepreneurship. In this research, poorer wage workers are defined as individuals who are unemployed, earn a low wage or have switched jobs multiple times.

On the contrary to Evans and Leighton (1989), Hamilton (2000) finds empirical evidence in favour of the wage differential hypothesized by Rosen (1981) and MacDonald (1988). Based on a US panel dataset, Hamilton (2000) finds that individuals, ten years after becoming entrepreneurs, earn approximately 35% less than they would have, had they worked as wage workers (Hamilton, 2000). Hamilton uses the owner's draw, or the owner's draw plus the yearly increase in equity as a measure of entrepreneurial income. This is because the self-employed tend to underreport net income to tax authorities. A regression is run on the hourly wage gap of self-employed and employed individuals, with indicators such as education and medical status. Based on these results, the author comes to the previously mentioned conclusion. Although robustness checks indicate the existence of selection effects of lower-ability individuals into entrepreneurship, these effects do not threaten the conclusion according to the author. However, since entrepreneurship is an endogenous choice, it is unclear to what extent and through which mechanism unobservable variables influence the decision to become self-employed. It may, therefore, be the case that other self-selection effects are present. Finally, the author argues this research is likely to underestimate the wage gap between wage

workers and employees since this research did not consider non-wage compensations such as health insurance. The explanation Hamilton offers for his findings is that individuals move into entrepreneurship to reap non-pecuniary benefits, rather than a high monetary income. On the other hand, Hamilton admits that these findings also support the superstar theory of Rosen (1981) and MacDonald (1988). At the 75th percentile, Hamilton (2000) finds earnings profiles for the self-employed to be higher compared to employees.

Sorgner, Fritsch & Kritikos (2017) further investigate the income differential between entrepreneurs and employees in a German panel dataset. For their analysis, they include several personal characteristics as control variables, as well as a control for selection bias. To handle the outliers, the authors make use of the quantile regression method. At the 75th percentile, entrepreneurs earn on average 7,5% less than employees, while at the 99th entrepreneurs earn 54% more than employees. Hence, this research provides further evidence in favour of the option-value theory of Macdonald (1988). Afterwards, Sorgner, Fritsch and Kritikos (2017) categorize entrepreneurs as either solo-self employed or self-employed with employees (employers). The authors show solo-self employed individuals to earn less than employees, while employers earn more on average. Moreover, the authors find that firm size has a bigger impact on the wage of the entrepreneurs than on the wage of employees. As both the decision to become an entrepreneur and the choice to hire employees is endogenous, the results of this research, however, are unlikely to be interpretable as causal. Higher-ability individuals are more likely to become an employer compared to their lower-ability counterparts. Therefore, the authors include an interaction effect between the employment status and the education level. Here, the level of education serves as a proxy for ability. They find the entrepreneurial income gap to be most significant for individuals who completed higher education. However, education is also an endogenous decision, thus it is not a good control variable. The authors conclude that the income gap is positive for employers, but negative for solo-self employed individuals. Note that employers are more likely to be superstars, as they often have a longer presence in the market. Finally, the authors find the income gap to be dependent on the industry one is employed in. Again, this is an endogenous decision and the results can therefore not be interpreted causally.

In their research on the Finnish population, Poutvaara and Tuomala (2004) come to similar conclusions. They find that, after controlling for ability, the wage gap between entrepreneurs and employees is negative for all education levels. Moreover, they present evidence that highly educated individuals more often switch from entrepreneurship to regular employment. No significant relationship between education levels and turning into self-employment is depicted in the results of the authors.

Carter (2010) offers an opposing view to the hypothesis that the attractiveness of self-employment is due to non-pecuniary benefits. Carter argues that low-median incomes are a result of inaccurate measurement of the financial benefits in historical research. She claims that, for tax purposes, entrepreneurs often underreport net income, and try to minimize drawings, a point which was already discussed as a limitation by Hamilton (2000). Empirical evidence shows underreporting to be as big as 28-40% of net income (Cagetti & De Nardi, 2006). The income measure for entrepreneurs is therefore unreliable (Carter, 2010). Moreover, the living standards of entrepreneurs are similar to that of employees, due to the private use of business-related goods (which lowers net income even further). These facilities would increase private consumption by approximately 34% (Bradbury, 1996). According to Carter (2010), the underreporting and private consumption of company goods explain the negative wage differential, rather than non-pecuniary benefits. Carter stresses that further research should shy away from the narrow definition of entrepreneurial income, to better capture the complete mechanism of the entrepreneurial wage differential.

Differences in non-pecuniary benefits between entrepreneurs and employees

Benz (2006) concludes that entrepreneurship is a non-profit seeking activity based on the empirical evidence provided by, among others, Hamilton (2000). This evidence has proven the existence of a negative wage gap between entrepreneurs and employees. Benz (2006) uses the research of Vivarelli (1991) to support his hypothesis. In his research, Viviarelli shows that for less than half of the aspiring entrepreneurs, 'aspiration to a higher income' is their driving motivation. Rather than seeking high income, almost eighty% of new entrepreneurs report the desire to be independent as an important motivation (Benz, 2006). Based on his literature study, Benz concludes individuals turn into entrepreneurs because of non-monetary benefits such as autonomy.

This is not the only difference between employees and entrepreneurs, according to Cramer, Hartog, Jonker and Van Praag (2002). In their research, the authors make use of a survey designed to examine differences in risk-aversion amongst the two groups. The attitude towards risk is measured by demanding the certainty equivalent for a lottery. Participants are also asked whether they have been employed, self-employed or a mixture of both during their professional career. With the use of a probit-model, the authors find a strong correlation between self-employment and lower levels of risk-aversion, controlling for several observable characteristics. However, it is hard to interpret these coefficients as causal since the risk-aversion proxy was measured at the end of the professional career of the individual. Therefore, this research set-up is vulnerable to reversed causality.

Hyyttinen and Ruuskanen (2007) further investigate the non-pecuniary benefits of self-employment. This research is focused on whether differences in flexibility between entrepreneurs and wage

workers translate into greater independence and flexibility concerning the use of time for the former. Participants are asked to report their behaviour twice for 24 hours in ten-minute blocks. After a simple OLS regression which compares the self-employed to the employed, this research shows that entrepreneurs not only work longer hours but are also more likely to work evenings and weekends. Furthermore, entrepreneurs have significantly less leisure-time. Although entrepreneurs experience flexibility as a benefit, this research shows no single dimension of flexibility in which entrepreneurs are better off than wage workers. Even though self-selection and endogeneity negatively impact the extent to which causal interpretations can be drawn from this research, Hyytinen and Ruuskanen offer an insight into the autonomy and flexibility of entrepreneurs. Since entrepreneurs work longer hours and have a significantly lower income, other aspects of entrepreneurship must offer significant non-monetary benefits (Hamilton, 2000). Although the conclusion of Hyyttinen and Ruuskanen (2007) is similar to that of Benz (2006), neither find direct empirical evidence to defend their hypothesis (Hyytinen & Ruuskanen, 2007).

Bradley and Roberts (2019) do provide evidence in favour of the non-pecuniary benefits of self-employment theory. The authors hypothesize self-employed individuals to have higher job satisfaction, a view previously offered Benz (2006) and Hyytinen and Ruuskanen (2007). The difference in job satisfaction would need to make up for the negative wage differential between entrepreneurs and wage workers, as proven by Hamilton (2000). In a longitudinal dataset, Bradley and Roberts (2019) compare reported job satisfaction rates for entrepreneurs and wage workers. According to this research, self-employed individuals indeed report a higher job satisfaction rate, which could compensate for the lost wage differential. Moreover, Bradley and Roberts find empirical proof which links this satisfaction gap to lower depression and higher self-efficacy rates among entrepreneurs. In this research, Bradley and Roberts do not distinguish between necessity and opportunity entrepreneurs.

Necessity and Opportunity Entrepreneurs

Definition of Necessity Entrepreneurship

Evans and Leighton (1990) were the first to indicate the existence of a group of workers who were ‘pushed into entrepreneurship’ in their empirical study on the income of young American males. This group included previously unemployed individuals, as well as low-educated workers and workers who often changed jobs. They empirically proved this group to be more likely to step into entrepreneurship at least once. Evans and Leighton did, however, not formally define this group as necessity entrepreneurs yet.

To set out the differences between necessity and opportunity entrepreneurship, one first needs to formally define what opportunity and necessity entrepreneurs are. Fairlie and Fossen (2019) provide an objective, operational definition for empirical purposes. The authors argue that the distinction between opportunity and necessity entrepreneurship is most clearly presented by the Global Entrepreneurship Monitor (GEM, 2020). In accordance with this definition, opportunity entrepreneurs start a business to take advantage of a business opportunity, while necessity entrepreneurs do not have other options. Fairlie and Fossen (2019) claim that, although this definition makes a clear-cut distinction, it is not available in other datasets besides the datasets of the GEM. Furthermore, this categorization is quite subjective. This also applies to the German SOEP dataset, which makes this categorization based on the motives of the entrepreneur. With the use of German and American panel datasets, the authors compare data of various proposed definitions to data of the GEM definition. From this research, they conclude that necessity entrepreneurs are best defined as entrepreneurs who were unemployed before initiating self-employment, while opportunity entrepreneurs were already employed. The authors offer theoretical justification for this definition by linking unemployment to a lack of outside options. Since listing as unemployed entails one is looking for a job, it must be the case that the unemployed do not have other employment opportunities. The authors find, following economic theory, opportunity entrepreneurship to be pro-cyclical, while necessity entrepreneurship is counter-cyclical. The definition provided by the authors allows researchers to investigate necessity and opportunity entrepreneurship without the obligation to use GEM data.

Income Differences Between Necessity and Opportunity Entrepreneurs

Block and Wagner (2010) formally research income differences between opportunity and necessity entrepreneurs using data on the German working population. They define opportunity entrepreneurs as those who deliberately move into entrepreneurship from employment, while necessity entrepreneurs move into entrepreneurship from unemployment or after an involuntary job loss. The authors first analyze a German panel dataset on differences in socioeconomic factors between the two types. Afterwards, they conduct a random-effects OLS regression, of which the results show opportunity entrepreneurs to have a significantly higher income than necessity entrepreneurs. The authors also find different determinants of success for both categories. The variable *Educated in his profession* only has a significant impact on the income of necessity entrepreneurs. On the other hand, the coefficients of education and labour market experience are only significant for opportunity entrepreneurs. Based on these results, the authors argue that opportunity entrepreneurs are better at acquiring the necessary social and human capital to fully grasp a profitable business opportunity. For instance, opportunity entrepreneurs have more time to gain specific working experience before

starting their business. This is called 'planning advantage'. This, combined with the fact that necessity entrepreneurs have lower opportunity costs and therefore are willing to seize less profitable opportunities, explains why opportunity entrepreneurs experience higher earnings.

Fossen and Büttner (2013) express their concerns regarding ability differences between necessity and opportunity entrepreneurs, which might explain part of the income differential in the research of Block and Wagner (2010). Fossen and Büttner (2013) therefore investigate returns to education rather than income, as they believe this measure better controls for ability. However, note that education and ability are imperfectly correlated since education is an endogenous decision rather than an exogenous attribute of an individual. This research makes use of a panel dataset which is representative of the German population that has been conducted over a period of twelve years. The categorization of necessity and opportunity entrepreneurs is based on the prior employment situation. The authors estimate the effects of education, opportunity and necessity entrepreneurship and their interactions while controlling for individual fixed effects and time effects. Afterwards, the father's education is used as an instrumental variable to estimate the returns to education for these groups. Father's education, however, is likely to be correlated with income directly through, for instance, social networks and up-bringing. Hence, this IV is likely to be unreliable. The results show the returns of education to be similar for opportunity entrepreneurs and paid employees, although opportunity entrepreneurs' returns are slightly higher. The returns to education are significantly lower for necessity entrepreneurs compared to both groups. The authors hypothesize that this is the case due to the limited ability of necessity entrepreneurs to select employment which optimally exploits their human capital. Note however that both education and employment are endogenous decisions, which negatively impacts the quality of these results.

Non-pecuniary differences among necessity and opportunity entrepreneurs

According to Larsson and Thulin (2017), not all self-employed individuals experience higher job satisfaction, as claimed by Bradley and Roberts (2019). Larsson and Thulin (2017) make use of the Global Entrepreneurship Monitor (GEM) to investigate the relationship between subjective well-being and opportunity or necessity entrepreneurship. For this research, individuals indicate whether they are opportunity or necessity entrepreneurs. Here, a necessity entrepreneur is defined as someone who is 'pushed' into business, while opportunity entrepreneurs are 'pulled' into self-employment. After controlling for education, income and country, Larsson and Thulin find significant proof that entrepreneurs on average report higher well-being than employees. However, this difference is entirely caused by opportunity entrepreneurs. After differentiating between opportunity and necessity entrepreneurs, the former report significantly higher well-being, while the

latter report significantly lower well-being. Note that it is questionable whether individuals can objectively determine to what category of entrepreneurship they belong. Moreover, since this research is based on a cross-sectional dataset instead of a panel dataset, this analysis does not account for time-fixed unobservable characteristics.

Binder and Coad (2013) come to similar conclusions in their research on the relationship between job satisfaction and opportunity or necessity entrepreneurship. Nascent entrepreneurs are matched to a 'regular' employee by Nearest Neighbor Matching and Propensity Score Matching. In this research, individuals are categorized as opportunity entrepreneurs if they used to be employed, and necessity entrepreneurs if they previously were unemployed. Two years after turning to entrepreneurship, opportunity entrepreneurs have experienced a significant increase in life satisfaction, while the opposite holds for necessity entrepreneurs. However, the estimation method assumes that the matched counterfactual is (on average) identical to the monitored entrepreneur. Although the individuals are matched on observables, individuals likely differ in unobservable characteristics which correlate with the endogenous decision to become self-employed.

Block and Koellinger (2009) survey entrepreneurs to study satisfaction with their start-up. To determine whether someone is an opportunity or necessity entrepreneur, the authors asked whether someone moved into entrepreneurship to seize an opportunity, or because they did not have better options. After controlling for socio-demographic factors, self-reported personality characteristics and weekly hours worked, Block and Koellinger find necessity entrepreneurs to experience significantly lower satisfaction with their enterprise than opportunity entrepreneurs. Based on the results of this survey, the authors conclude necessity entrepreneurs to have lower procedural utility. Moreover, the Block and Koellinger find satisfaction to be strongly correlated with creativity and independence. Therefore, entrepreneurs might indeed seek the non-monetary benefits in self-employment. However, personality traits might be influenced by whether someone is a necessity entrepreneur or not. It is also doubtful that an individuals 'satisfaction regarding the venture' reflects procedural utility. Finally, by controlling for income, the authors have included a mechanism in this regression, which means that a causal relationship cannot be interpreted from the results. This is because whether someone is an opportunity or necessity entrepreneur is expected to have a significant impact on the earnings.

Another limitation of the research of Block and Koellinger (2009), but also of the research of Larsson and Thulin (2017) and Binder and Coad (2013), is pointed out by Clark, Frijters and Shields (2008), who claim that life or job satisfaction is likely to be inaccurately measured. The authors show subjective income to be a strong determinant of subjective well-being, rather than absolute income.

The experienced utility can reflect both external and internal income comparisons. Moreover, research into happiness economics has proven happiness to be an imperfect measure of utility. This is because the timing of surveys with respect to income differences is usually quite imperfect. It is also hard for researchers to extract the pool to which individuals compare themselves. Finally, income is an imperfect measure of consumption, although consumption determines utility and happiness. The literature on the relationship between utility and entrepreneurship is therefore likely to be flawed.

Furthermore, Loewenstein and Ubel (2008) show that happiness economics is inevitably flawed due to people's tendency to 'regress to the mean'. In their literature review, the authors show the analysis of policy intervention to be difficult due to 'Hedonic adaption'. To explain this phenomenon, Loewenstein and Ubel refer to the research of Brickman, Coates and Janof-Bulman (1978), who showed that lottery winners were not significantly happier than the control group. Moreover, people with chronic health conditions not only reported to have a similar level of happiness, but they also reported they would have been much happier had they been in the condition of the former group. Based on their research, Loewenstein and Ubel (2008) conclude happiness economics in its current form to be unsuitable to analyze policy implications. From their research, the conclusion can be drawn that the methods used in happiness economics are satisfactory only to a limited extent to analyze the impact of becoming an entrepreneur.

Block, Kohn and Miller (2014) study the entrepreneurial strategy of start-ups. In their research, the authors investigate differences in strategy between necessity and opportunity entrepreneurs. Specifically, Block, Kohn and Miller focus on the two most common start-up strategies: cost leadership and differentiation. In their research, which makes use of a yearly survey among entrepreneurs, they focus on nascent entrepreneurs. The distinction between opportunity and necessity entrepreneurship is similar to that of Block and Wagner (2010) (Block, Kohn & Miller, 2014). With a probit-model, controlling for observable characteristics, the authors estimate the probability of an individual pursuing cost leadership or a differentiation strategy. The authors find opportunity entrepreneurs more likely to follow a differentiation strategy, while necessity entrepreneurs are more likely to pursue cost leadership. However, a decomposition shows the pursued strategy of necessity entrepreneurs is to a large extent explainable by differences in endowment, such as labour market positions.

Methodological Literature

To estimate the effect of (necessity) entrepreneurship on income, this research will make use of a panel dataset and several econometrical methods. However, with the use of panel data and these methods, some complications arise.

Devine (1995) addresses several issues regarding the analysis of entrepreneurial income in survey data. The author warns for differences in the definition, and therefore interpretation, of income between incorporated and unincorporated ventures due to tax legislation differences between the two. The same applies to intertemporal variation in income definition, for instance, due to changes in tax legislation. Moreover, the author argues that economists are interested in hourly income, rather than total income. However, this is often inaccurately determined for the self-employed, as their total hours worked is unclear. Furthermore, Devine finds significant evidence for self-selection effects in response to income questions. Not only are entrepreneurs less likely to respond to this question, but unincorporated self-employed individuals with characteristics correlated with low-income groups are also less likely to respond, while the opposite is the case for the incorporated self-employed. Imputing an estimate for this missing value based on individuals with similar characteristics is likely to lead to an inaccurate estimate. Finally, the unincorporated self-employed might also report negative net income. How this problem should be handled is arbitrary, but all methods lead to an overestimation of income for this group.

Furthermore, a small number of observations per individual (T) pose limitations to the fixed-effects method (Chamberlain, 1984). Under a large T, the variance approximates a normal distribution. However, under a small T, the degrees of freedom are inconsistent with the distribution.

Angrist and Krueger (1999) present various limitations regarding the omission of unobserved bias with fixed-effects estimators in the context of the labour market. First, a possible pitfall for this research is an overestimation of the causal effect due to the endogenous nature of labour market decisions. Although training programs are the main example of this issue, its logic also applies to necessity entrepreneurship. Angrist and Krueger point out that the decision to uptake training tends to follow from a negative shock in earnings. The employment decision and the regression-to-the-mean of income might therefore coincide and lead to spurious effects in the estimator. Second, because of the differencing method, fixed effects regressions are more vulnerable to measurement errors. Finally, the core assumption of fixed effects regressions, namely that unobserved characteristics are constant over time and can thus be captured in the fixed effects estimator, is questioned. According to Angrist and Krueger, neither economic theory nor historical data predict

such a phenomenon. On the other hand, this assumption is intuitive and likely to hold at least partially. The authors do not provide clear-cut solutions to these issues.

Hypotheses

In conclusion, early entrepreneurial research indicates the existence of a negative wage gap between employees and entrepreneurs (Hamilton, 2000). However, based on this literature review, I believe that the variety within entrepreneurs is too big to characterize this differential as causal. These differences have been discussed in the section '*Non-pecuniary differences among necessity and opportunity entrepreneurs'.* Based on the discussed differences, I believe opportunity and necessity entrepreneurship should be separated to make an accurate causal claim of entrepreneurship on income.

Block and Wagner (2010) have already proven that opportunity entrepreneurs have a significantly higher income than necessity entrepreneurs. Later, Fossen and Büttner (2013) show the returns to education of employees to be (insignificantly) lower than that of opportunity entrepreneurs, but significantly higher than that of necessity entrepreneurs. Based on this research, I believe opportunity entrepreneurs experience an income boost after moving onto entrepreneurship. This boost can be explained by their high opportunity costs, and the planning advantage (Block & Wagner, 2010). This leads to the first hypothesis:

H1: Moving into opportunity entrepreneurship causes an increase in income.

Block and Wagner (2010) show that necessity entrepreneurs have a lower wage than opportunity entrepreneurs. Due to their low opportunity costs, which stem from the belief that they do not have other outside options, necessity entrepreneurs are willing to seize almost every available opportunity for entrepreneurship. These unfortunate circumstances lead to unprofitable moves into self-employment. This, combined with the results of Hamilton (2000), who shows that entrepreneurs earn less than employees on average, is captured in the second hypothesis:

H2: Moving into necessity entrepreneurship does not increase income

Fossen and Büttner (2013) have proven that necessity entrepreneurs have a significantly lower return to education than both opportunity entrepreneurs and wage workers. Therefore, I hypothesize an augmented version of the wage differential between entrepreneurs and employees (Hamilton, 2000).

H3: Unemployed individuals experience higher income returning to wage work than moving into entrepreneurship.

Data

Data resource

The data needed to perform this research is obtained from the Longitudinal Internet Studies for the Social sciences (LISS) panel (CentER Data, 2020). This survey is conducted every year, for as long as the participants are willing to cooperate. Participants are selected on a probability-based basis, with the help of Statistics Netherlands. This guarantees the dataset is representative of the Dutch population.

Every year, this survey is conducted among approximately 5000 households. The timespan of this dataset reaches from 2007 until 2020. Participants receive a monetary reward after the completion of every questionnaire. Although this dataset contains information on a wide variety of subjects such as health, schooling, personality and economic situation, this research only makes use of the *background variables* section. In this way, the number of observations is maximized, as the background variables section is mandatory for all active participants.

A total of 100.551 data points are included in the dataset. Since some individuals drop out over time while others enroll, 18.939 unique individuals are observed over time. Therefore, the average time observed per individual is 5,31 years. For this research, only adults are included in the dataset. Individuals who did not report an income are excluded. For everyone, socio-economic indicators such as gender, age and employment status are available.

Definitions and Specifications

To answer the research question, individuals need to be categorized with respect to the occupation. This research specifically separates (necessity) entrepreneurs, employees, and unemployed individuals. The categorization will be based on the reported primary occupation. First, the variable *entrepreneur* is generated. This dummy variable equals one if an individual reported being an autonomous professional, freelancer, or self-employed. Moreover, the dummy *unemployed* is created. This variable is only equal to one if the individual reported either to be a job seeker, to perform unpaid work while he or she retains unemployment benefits, or to be exempt from job-seeking because of a job loss. Hence, individuals who indicate they take care of housekeeping are not included in this dummy.

To make a distinction between necessity and opportunity entrepreneurs, the variable *necessity_entrepreneur* is created. The abbreviation *necessity* will be used throughout this research. In accordance with historical literature, a necessity entrepreneur is defined as an individual who used to be unemployed before turning into entrepreneurship (Fairlie & Fossen, 2019). Necessity

entrepreneurs will be labeled according to the time they stay in entrepreneurship. Moreover, to generate a fair comparison between wage workers and necessity entrepreneurs, a comparison between necessity entrepreneurs and employees who previously were unemployed is essential. Therefore, the variable *previously unemployed (prev_unemployed)* is created. This variable takes the value one if an individual used to be unemployed but is currently active in any type of employment. Note that the definitions of *necessity_entrepreneur* and *prev_unemployed* compel the existence of information about the previous employment status. Therefore, these variables require a previous observation. The definitions cannot be determined in the first observations, as historical employment status before entering the panel is not provided in the LISS data.

Besides these key variables, several controls are included in the data. These variables were already provided by the LISS panel. An overview of all variables is provided in table 1:

Table 1: Variable Names and descriptions

Variable	**Description**
Male	Takes a 1 if individual is a male, 0 if not
Age	The age of an individual (in years)
Single	Takes a 1 if an individual is single, 0 if not
Children	Takes a value 1 if individual has children, 0 if not
High_Education	Takes a 1 if individual has completed higher education (defined as HBO or university), 0 if not
Labour_force	Takes a 1 if individual is employed, entrepreneur or unemployed, 0 if not
Net_Income	Personal net monthly income in euros
Entrepreneur	Takes a 1 if individual reports to be an autonomous professional, freelancer of self-employed, 0 if not
Unemployed	Takes a 1 if individual reports either to be a job seeker, to be retaining unemployment benefits while being exempt from job seeking or to perform unpaid work, 0 if not
Necessity_Entrepreneur	Takes a 1 if an individual is currently an *entrepreneur,* while he or she was *unemployed* in the previous period. Remains a 1 for as long as the individual is an entrepreneur, 0 if not
Necessity2	Takes a 1 if an individual has been unemployed in any period before entrepreneurship, 0 if not
Necessity3	Takes a 1 if an individual is an entrepreneur and low-educated.
Prev_Unemployed	Takes a 1 if an individual who was *unemployed* in the previous period but either employed or an entrepreneur in the current period. Remains a 1 for as long as the individual is employed or entrepreneur, 0 if not.

Descriptive Statistics

To generate a comprehensive overview of the data, the descriptive statistics are supplied in table 2. The descriptive statistics include the number of observations, the mean, the standard deviation, as well as the minimum and maximum.

The dependent variable in this research, net income, has a mean of 1.586,07 euros per month. Net income exhibits a great variety across individuals, as the standard deviation is 4109,28. The median of net income is 1400 euros, which suggests the income distribution is skewed to the right. This is a common aspect of income distributions. This suspicion is confirmed by the kernel density graph of the working force depicted in figure 1. For interpretation, individuals with an income higher than 15000 euros per month are excluded in the kernel density graph. This is because the few (92) observations with an income higher than this number negatively impacted the clarity of this graph. The Kernel density functions for entrepreneurs and necessity entrepreneurs in figure 1 and 2 respectively in the appendix present a similar skewness as that of the general population. But figure 2 in the appendix depicts that the distribution of necessity entrepreneurs does not have an outlier with an income higher than 5000 euros per month. Besides the empirical evidence that necessity entrepreneurs earn less, this lack of outliers is also caused by the fact that necessity entrepreneurs are hardly observed three years after turning into entrepreneurship in this dataset (Block & Wagner, 2010). Therefore, even successful necessity entrepreneurs did not yet have the time to become a 'superstar'.

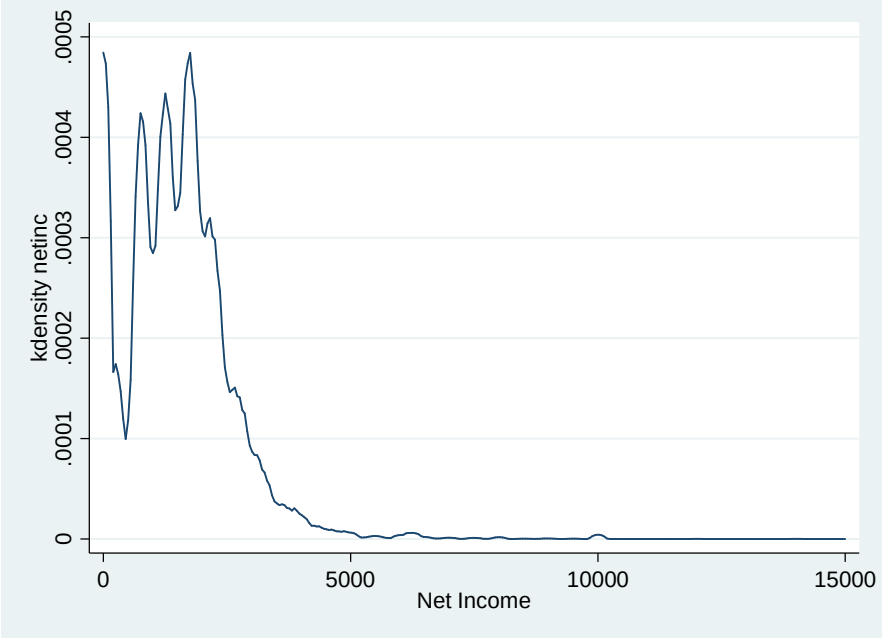

Figure 1: Kernel density graph for the net income of the working force

Figure 2 shows the trend of net income over time. After the great recession, net income significantly decreases. More recently, income started to increase again. From figure 2 it can be deduced that net income exhibits a pro-cyclical trend. Figure 2 highlights the necessity of including time-effects dummies for all upcoming regressions. Figure 3 and 4 in the appendix depict the net income trends for entrepreneurs and necessity entrepreneurs, respectively. These graphs show that the income of entrepreneurs exhibit a similar trend to that of the entire population, although average income is higher for entrepreneurs. The trend of necessity entrepreneurs is quite similar as well, but this graph is less obvious. This is the case due to the small number of observations.

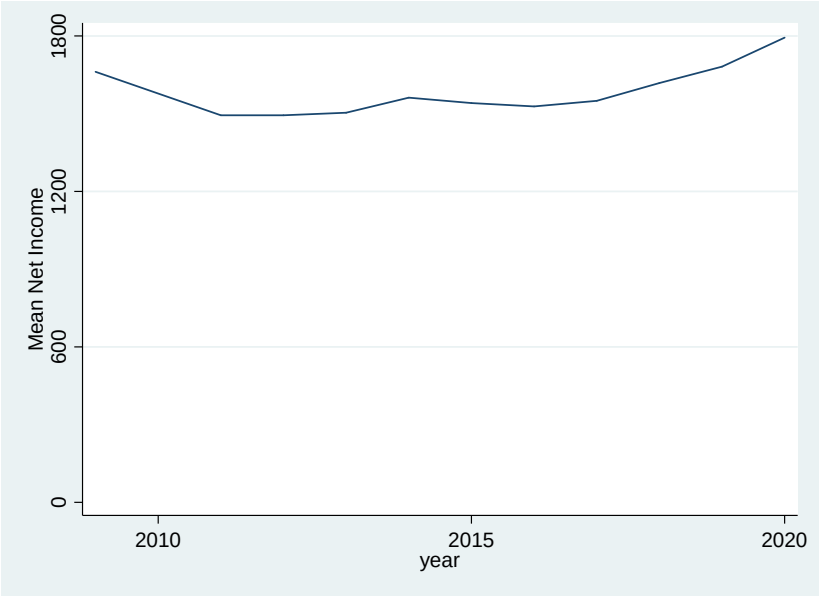

Figure 2: average income over time

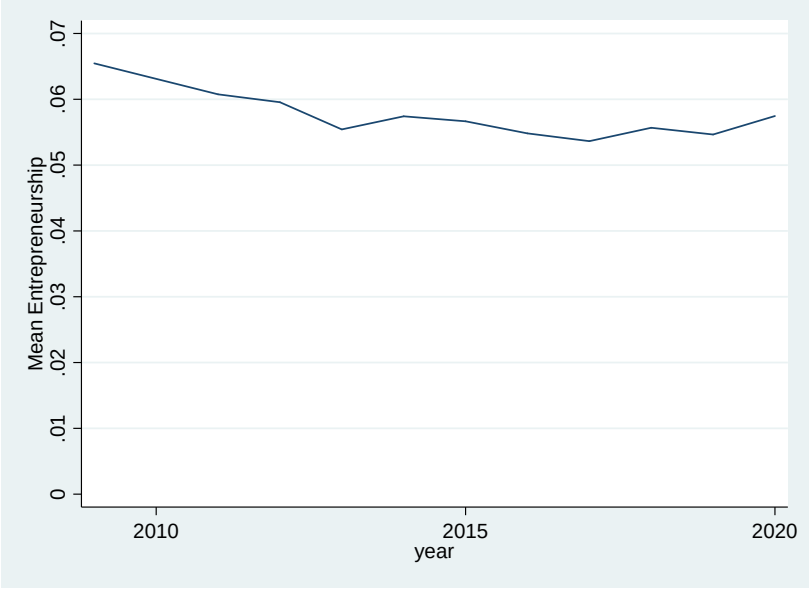

Figure 3: The average entrepreneurship level over time

Table 2: Descriptive statistics of the Dataset

Variable	Observations	Mean	Std. Deviation	Min	Max
Male	100.551	0,486	0,500	0	1
Age	100.551	48,3	17,6	18	120
Single	100.551	0,247	0,431	0	1
Children	100.551	0,457	0,498	0	1
Higher Education	100.551	0,326	0,469	0	1
Labour force	100.551	0,648	0,477	0	1
Net income	100.551	1.586,07	4.109,28	0	298.535
Entrepreneur	100.551	0,058	0,234	0	1
Unemployed	100.551	0,031	0,173	0	1
Necessity	81.268	0,004	0,058	0	1
Necessity (2)	81.268	0,005	0,069	0	1
Necessity (3)	81.268	0,030	0,170	0	1
Previously Unemployed	81.268	0,031	0,173	0	1

In 5,8% of all unique data points the surveyed individual was an entrepreneur. This is the result of 1580 individuals who reported to be self-employed at least once over the time of the questionnaire. From figure 3, it can be deduced that entrepreneurial activity is non-constant over time. Entrepreneurial activity diminished during the great recession. However, in recent years it is on the rise again. Hence, entrepreneurial activity is pro-cyclical. Figure 5 in the appendix shows that new entrepreneurial activity exhibits a similar trend compared to average entrepreneurial activity. Therefore, there is no need to separate the change in entrepreneurial activity into new entrepreneurial activity and entrepreneurs who 'give up'.

Necessity entrepreneurship, logically, makes up a much smaller part of the dataset. Only 0,5% of all data points represent a necessity entrepreneur. In total, 282 data points can be classified as necessity entrepreneurship, which is divided across 88 unique individuals. Figure 4 presents the trend of new necessity entrepreneurship over time. New necessity entrepreneurship only includes individuals that are still within their first year of entrepreneurship since unemployment. This measure is depicted to draw a fair comparison, as it is unclear whether individuals that already were entrepreneurs are necessity or opportunity entrepreneurs, due to a lack of historical employment data. New necessity

entrepreneurship exhibits an anti-cyclical trend with respect to the business cycle, as opposed to total entrepreneurship. This supports the chosen definition of necessity entrepreneurship in this research to be accurate since business cycle downturns are accompanied by decreased employment opportunities (Fairlie & Fossen, 2019). Other, looser definitions are also included in the methodology and results sections as robustness checks. The variable *necessity2*[2] provides 390 observations, while the even looser definition of necessity entrepreneurship is adopted for the variable *necessity3*[3], resulting in 2418 observations.

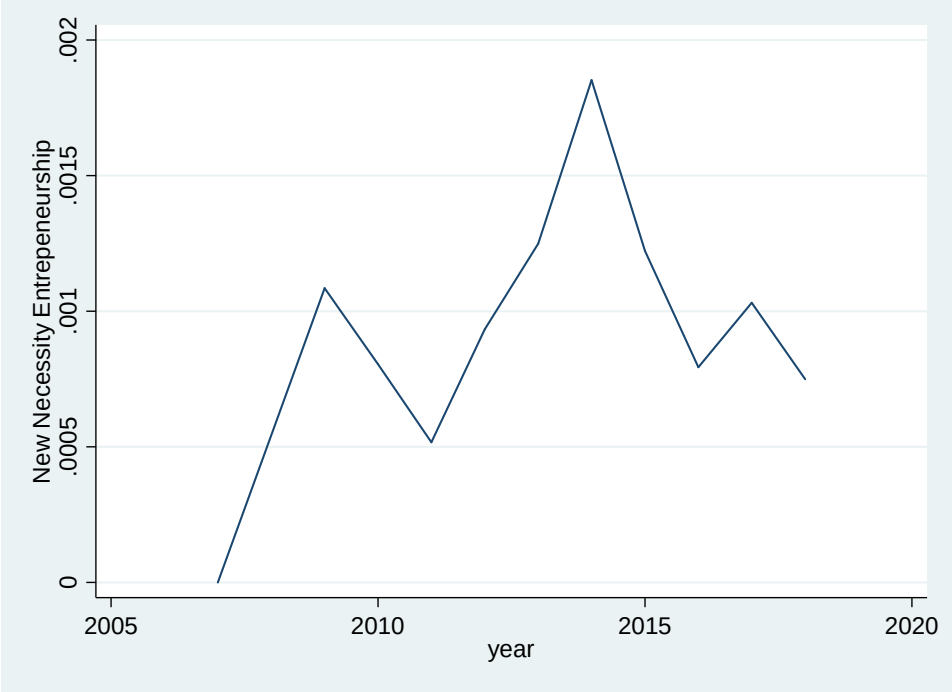

Figure 4: The average of new necessity entrepreneurs over time

The variable *unemployed* has a mean of 0,031. Hence 3,1% of all data points are unemployed. Although this seems rather low, this is the percentage of the entire dataset. If one compares this number to the number of observations in the labour force, the unemployment rate equals 5,3%. This percentage is in line with historical trends (Trading Economics, 2020).

The variable *previously_unemployed* has a mean of 0,024. Hence, 2,4% of the data points represent individuals who are currently employed but used to be unemployed. As can be expected, this variable also exhibits an anti-cyclical trend. This can be deducted from figure 6 in the appendix. For reasons similar to new necessity entrepreneurship, this graph presents the new cases, rather than the total cases.

[2] *Necessity2:* A Necessity entrepreneur is defined as an individual who has been unemployed in any period before turning into entrepreneurship.
[3] *Necessity3:* A necessity entrepreneur is defined as an entrepreneur who is low educated

Moreover, the descriptive statistics of control variables are included in Table 2. The table depicts that 48,6% of all data points represent males. The average age is 48,3 years, with a standard deviation of 17,6 years. This age rises slightly over time, which is quite usual in a panel dataset. In 24,7% of the data points individuals report being single, while 45,7% of the individuals have children and 32,6% is highly educated. Moreover, 64,8% of the data points represent participants in the labour force. Finally, in 3,1% of all data points the individuals report being unemployed. At its peak in 2014, this was nearly five percent.

Table 3: Descriptive statistics of the Entrepreneurs and Necessity entrepreneurs

	Entrepreneur					**Necessity Entrepreneur**				
Variable	Observations	Mean	Std. Dev.	Min	Max	Observations	Mean	Std. Dev.	Min	Max
Male	5.833	0,636	0,481	0	1	282	0,600	0,490	0	1
Age	5.833	48,000	11,981	18	96	282	47,344	12,159	22	77
Single	5.833	0,193	.3943171	0	1	282	0,291	0,455	0	1
Children	5.833	0,542	0,498	0	1	282	0,497	0,500	0	1
Higher Education	5.833	0,481	0,500	0	1	282	0,486	0,500	0	1
Net Income	5.833	2.172,25	1.776,44	0	44826	282	1.438,82	1087,22	0	4750

Table 3 presents the descriptive statistics for entrepreneurs and necessity entrepreneurs. Males are overrepresented in both the category of the entrepreneur and the necessity entrepreneur, compared to the total population, which might be the case due to a larger presence of males in the working population. The average ages of both groups align with the average pf the entire population. Although singles are more present compared to the total population for necessity entrepreneurs, the opposite applies to entrepreneurs in total. This might be evidence that necessity entrepreneurs possess certain negative characteristics, although the labour market is quite different from the partner market. The percentage of the population that has children is slightly higher for both groups compared to the total population. Moreover, entrepreneurs and necessity entrepreneurs have more often completed higher education. The relatively high number of highly educated individuals amongst necessity entrepreneurs, compared to the entire population, is remarkable (49,7% compared to 32,6%). This is because of the vulnerable position in the labour market of necessity entrepreneurs is often linked to lower education. There is no first-hand explanation as for why this percentage is this high. Possibly, the highly educated unemployed are more confident they can succeed as an entrepreneur compared the lower-educated unemployed. Consequently, the latter might wait for paid employment opportunities, while the former becomes a necessity entrepreneur. Finally, the net income of entrepreneurs is significantly higher than that of the total population, while

the net income of necessity entrepreneurs is lower. Within the category of entrepreneurs in general, income is also more widely spread than for necessity entrepreneurs.

Table 1 in the appendix also presents the descriptive statistics of previously unemployed workers and necessity entrepreneurs. The average previously unemployed worker appears to be a bit younger and less likely to be male compared to necessity entrepreneurs, but these differences are not extreme. Moreover, previously unemployed wage workers are less likely to have completed higher education compared to necessity entrepreneurs. This explains the relatively high presence of high-educated necessity entrepreneurs. Apparently, highly educated unemployed individuals are more likely to start a business than low-educated unemployed individuals. Previously unemployed workers do, on average, have a higher income than necessity entrepreneurs.

The fact that necessity entrepreneurs exhibit characteristics similar to the pool of entrepreneurs is comforting. Of course, selection effect cannot be ruled out and both groups might differ significantly in unobservable characteristics. Moreover, although necessity entrepreneurs differ slightly from the total group of previously unemployed workers, these differences are not of great magnitude. The descriptive statistics indicate that one would want to control characteristics such as education, age, and gender. Based on these results, selection effects cannot be ruled out, but are certainly not proven.

Methodology

To get an insight into income differences between opportunity and necessity entrepreneurs, regression 1 is run. This regression essentially estimates the relative difference in income of necessity and opportunity entrepreneurs compared to the residual population. To account for the skewness in the distribution of income, the natural logarithm of income will be the dependent variable, rather than regular income, for all models. This is in line with what is common in economic literature. Note that model 1 suffers from selection bias and is not to be interpreted causally.

Regression 1*:* $ln(Income_{it}) = \beta_1 Entrepreneur_{it} + Necessity\_Entrepreneur_{it} + \varepsilon_{it}$

Then, to estimate the effect of moving into entrepreneurship, a regression of income on entrepreneurship will be run. The regression will include year dummies, to account for temporary shocks. Individual fixed-effects dummies will be included, to account for individual-specific time-invariant omitted variables, such as gender, race, or education level. Because of the use of a fixed-effects regression, the effect on income of one of these variables cannot be isolated. However, as these are not at interest, this is not a concern. The control variable age is included, as it probably correlates with both income and moving into entrepreneurship. The second regression will thus take the following functional form:

Regression 2*:* $ln(Income_{it}) = \alpha_i + \beta_1 Entrepreneur_{it} + \beta_2 Age_{it} + \Upsilon_t + \varepsilon_{it}$

As discussed, the effect of entrepreneurship is likely to be dependent on whether this individual is a necessity or opportunity entrepreneur. Two different approaches will be used to determine the impact of necessity entrepreneurship on income.

In the first approach, the variable *Necessity* is added to regression 2, to determine how the effect of income differs between necessity and opportunity entrepreneurs. Note that in all models, necessity entrepreneurs are also entrepreneurs. The variable *Entrepreneur* thus represents all opportunity entrepreneurs.

Regression 3*:* $ln(Income_{it}) = \alpha_i + \beta_1 Entrepreneur_{it} + \beta_2\ Necessityr_{it} + \beta_3 Age_{it} + \Upsilon_t + \varepsilon_{it}$

Regression 3, however, might be flawed. This is because necessity entrepreneurs might be less-able individuals. The earning potential of these individuals is therefore not only lower than that of 'regular' entrepreneurs, but also lower than the potential earnings of the 'average' wage worker. To account for this issue, the variable *Prev_Unempoyed* is included as a control. The inclusion of this dummy allows for a comparison between paid employment and self-employment for previously unemployed individuals. Note that, since all necessity entrepreneurs were previously unemployed,

necessity entrepreneurs are included in this dummy. Regression 4 takes the following functional form:

Regression 4*: ln(Income$_{it}$) = α_i + β_1 Entrepreneur$_{it}$ + β_2 Necessity$_{it}$ + β_3 Prev_Unemployed$_{it}$ + β_4 Age$_{it}$ + γ_t + ε_{it}*

Finally, highly educated individuals have more employment options compared to their lower-educated counterparts. Therefore, the impact of necessity entrepreneurship is likely to differ across education levels. The control *High_Education* is introduced in regression 5, as an interaction term with necessity entrepreneurship, to determine how this effect differs across education levels. However, due to the small sample size of highly schooled necessity entrepreneurs and the endogeneity of education, caution is needed when interpreting this coefficient.

Regression 5*: ln(Income$_{it}$) = α_i + β_1 Entrepreneur$_{it}$ + β_2 Necessity$_{it}$ + β_3 Prev_Unemployed$_{it}$ + β_4 Necessityr$_{it}$ *High_Education + β_5 Entrepreneur$_{it}$ *High_Education + β_4 Prev_Unemployed$_{it}$ *High_Education + β_7 Age$_{it}$ + γ_t + ε_{it}*

As a second method, event studies will be used to complement the individual fixed-effects regressions. With the use of this method, one can observe how income varies before, during and after turning to (necessity) entrepreneurship. First, necessity entrepreneurship will be compared to opportunity entrepreneurship. In this regression, the controls *gender, age,* and *education* are included. These variables are likely to affect both the decision to become an entrepreneur, as well as income. Moreover, time dummies will be included.

Regression 6: ln(Income$_{it}$) = α + $\sum_{t=-2}^{3}$ (β_t entrepreneur$_{it}$)+ $\sum_{t=-2}^{3}$ β_{t+6} nec_entrepreneur$_{it}$ + β_{13} Age$_{it}$ + β_{14} Gender$_i$ + β_{15} High_Education$_{it}$ + γ_t + ε_{it}

To properly examine the effects of necessity entrepreneurship, an event study which compares necessity entrepreneurs to other previously unemployed workers should be conducted. This event study thus only includes previously unemployed, but currently (self-)employed individuals. In this regression, the effect of becoming an entrepreneur can fairly be compared to that of returning to paid employment. Similar to regression 6, the control variables *gender, age,* and *education* are included. This leads to regression 7:

Regression 7: ln(Income$_{it}$) = α + $\sum_{t=-2}^{3}$ (β_t prev_unemployed$_{it}$)+ $\sum_{t=-2}^{3}$ β_{t+6} nec_entrepreneur$_{it}$ + β_{13} Age$_{it}$ + β_{14} Gender$_i$ + β_{15} High_Education$_{it}$ + γ_t + ε_{it}

However, under the current definition of necessity entrepreneurship, the number of necessity entrepreneurs in the dataset is very limited. Since this poses limitations on the reliability of this

research, several regressions will also be run with other definitions of necessity entrepreneurship. These regressions will contribute to this research as robustness checks.

Firstly, necessity entrepreneurship will be defined as every entrepreneur who has been unemployed previously in this dataset. Although these individuals need not necessarily to be desperate anymore, this group is likely to have fewer employment opportunities. Since the average number of observations per individuals is just over five, an individual needs to be unemployed in recent history to be defined as a necessity entrepreneur. This increases the validity of this definition.

Second, several regressions will be run in which a necessity entrepreneur is defined as a low-educated entrepreneur. Although it is not necessarily true that low-educated individuals have worse employment opportunities, and the data shows that almost half of the necessity entrepreneurs are highly educated, this definition is justifiable. One characteristic of necessity entrepreneurship is that it is anti-cyclical (Fairlie & Fossen, 2019). In the past two decades, the low-educated workers were hit hardest during a downturn, which is highlighted by the recent downturn; 40% of low-income workers lost their job in March in the USA due to the consequences of the coronavirus (Luhby, 2020). Moreover, the fact that quite some necessity entrepreneurs are high-skilled under the original definition does not imply low-skilled entrepreneurs cannot be necessity entrepreneurs. However, as this definition includes an endogenous variable, namely education, one needs to be conservative with the interpretation of the regression results. Furthermore, the spread in ability is likely to be large for low-educated workers. This further diminishes the quality of this definition.

Results

Table 4 depicts the regression results from regressions 1 to 5, as discussed in the methodology section. From the results shown in model 1, one can deduct that that opportunity entrepreneurs earn on average about 15,5% more than the average of the rest of the population. On the other hand, necessity entrepreneurs earn on average 11,1% less (0,155-0,266) compared to the residual population. Both coefficients are significant at the 1%-level. Thus, opportunity entrepreneurs earn a significantly higher wage compared to necessity entrepreneurs. Despite the simple set-up, this model explains 0,8% of all variation in income. Model 1 is not to be interpreted causally since it suffers, among other things, from selection bias.

Individual Fixed-Effects Models

Models 2 to 5 control for individual fixed effects, such as gender and ability, as well as for age, and year. The results of model 2 show that an individual that switches to entrepreneurship earns 5,6% more as an entrepreneur compared to his years of not being an entrepreneur. This opposes the empirical findings of Hamilton (2000). However, the coefficient of *entrepreneur* is insignificant. Therefore, statistically, entrepreneurship does not influence income. In general, this model explains 3,8% of the variation in income. Note that the individual fixed-effects regressions include many non-entrepreneurial data points. Since the models focus on examining the impact of (opportunity) entrepreneurship, the R-squared of these regressions will thus be low.

Note that the R-squared for the individual-fixed effects models will be quite low, as many non-entrepreneurial data points are taken into account for these regressions, while the models focus on examining the effects of (necessity) entrepreneurship

Regression 3 separates entrepreneurs into opportunity and necessity entrepreneurs for reasons previously discussed. As shown in Table 4, both coefficients are significant at the 1%-level. In total, the model explains 2,9% of the variation in income. Following the results, opportunity entrepreneurs earn almost 10% more after the switch than they did when they were not self-employed. On the other hand, necessity entrepreneurs earn 17% less after switching into entrepreneurship, compared to not being an entrepreneur. Despite the inclusion of individual-fixed effects, opportunity and necessity entrepreneurs are likely to differ in unobservable characteristics. Hence, this model cannot be interpreted as causal. To gain better insight into what the effect of necessity entrepreneurship is, the dummy *previously unemployed* is included in regression 4, which serves as a control group for necessity entrepreneurs.

Table 4: Regression Results of model 1-5

	Model 1	Model 2	Model 3	Model 4	Model 5
	Ln(Net Income)	Ln(Net Income)	Ln(Net Income)	Ln(Net Income)	Ln(Net Income)
Entrepreneur	0,155***	0,056*	0,099***	0,100***	0,016
	(0,027)	(0,031)	(0,035)	(0,035)	(0,137)
Necessity Entrepreneur	-0,266***		-0,269***	-0,475***	-0,317**
	(0,096)		(0,010)	(0,103)	(0,130)
Previously Unemployed				0,226***	0,106***
				(0,031)	(0,029)
Age		0,011	0,004	0,004	0,004
		(0,010)	(0,004)	(0,004)	(0,004)
Entrepreneur*High Education					0,071
					(0,065)
Necessity*High Education					-0,355*
					(0,203)
Prev_Unemployed*High Education					0,138**
					(0,038)
Constant	7,202***	6,617***	6,973***	6,973***	6,973***
	(0,006)	(0,434)	(0,192)	(0,188)	(0,192)
R-Squared	0,008	0,038	0,029	0,024	0,031
Individual Fixed effects	No	Yes	Yes	Yes	Yes
Time fixed Effects	No	Yes	Yes	Yes	Yes
observations	72.211	80.071	63.685	63.685	63.685

*p<0,10 **p<0,05 ***p<0,01; Standard Errors presented between brackets

As table 4 depicts, the coefficients *previously employed, entrepreneur and necessity entrepreneur* are all significant at the 1%-level in model 4. The coefficient for opportunity entrepreneurs is similar to that of model 3; this group earns 10% more after they turn into entrepreneurship compared to the years they were not self-employed. On the other hand, necessity entrepreneurs earn almost 15% less (0,100-0,475+0,226) compared to the years in which they were not self-employed. This result is especially striking when this coefficient is compared to that of previously unemployed wage workers. For the latter, income namely increases with 22,6% compared to not being a wage worker. This

difference indicates that previously unemployed individuals are better off in paid employment than as an entrepreneur. The R-squared of model 4 is fairly low: 0,024 and thus only 2,4% of the variation in income is explained by this regression. This model, again, is likely to suffer from endogeneity and selection bias.

In regression 5, an interaction effect between the type of employment and education is introduced. The estimate of *entrepreneur* depicts that low-educated opportunity entrepreneurs experience a 1,6% increase in income after turning into self-employment compared to their years not being self-employed. On the other hand, highly educated opportunity entrepreneurs earn 8,7% (0,016+0,071) more after this switch. Note that both coefficients are insignificant and individuals who enter the field of opportunity entrepreneurship do thus not experience a significant income growth, regardless of the education level. Low-educated previously unemployed individuals who turn into paid employment earn 10,6% more than they did in their years not being employed. This boost is of even higher magnitude for highly educated individuals, as they earn 24.4% more being employed than they did not being employed. Both the coefficient *prev_unemployed* and the interaction effect are significant at 5%-level. For the evaluation of necessity entrepreneurship, all four previous coefficients, the coefficient of *necessity* and the coefficient of the interaction term between *necessity* and *high_education* need to be considered. Low-educated necessity entrepreneurs earn a wage 19,5% lower than they did not being an entrepreneur, which is statistically significant. If the interaction term would be interpreted, one would conclude that income drops with 34,1% compared to their years not being self-employed. This would imply that high-educated necessity entrepreneurs are more severely affected by turning into necessity entrepreneurship that low-educated necessity entrepreneurs. But, this coefficient is insignificant. That this is the case, despite the high magnitude of the coefficient, is due to the small number of observations available for high-educated necessity entrepreneurs.

Although the results of model 5 are interesting, they are not to be interpreted causally. Although education is a reasonable estimation for intelligence, it is also highly endogenous. Moreover, the small number of observations for necessity entrepreneurs are even further separated in model 5, which causes the estimates to be inaccurate. Therefore, model 4 provides the closest estimate to causal inference. Hence, the individual fixed-effects models show that both opportunity entrepreneurs and previously unemployed wage workers are better off than necessity entrepreneurs. Moreover, necessity entrepreneurs experience a decline in income after the switch.

Event Study Models

Now, event studies will be conducted to evaluate dynamic treatment effects and anticipation effects. Due to the limited number of observations, the analysis will evaluate income up to two years before becoming an entrepreneur and three years after the change. Figure 5 depicts an event study without any controls, which compares the effect of self-employment on income for necessity and opportunity entrepreneurs. Although two years before the employment change both groups earn a similar income, the income of necessity entrepreneurs deteriorates considerably in the year before becoming an entrepreneur. This is the result of the definition of necessity entrepreneurs: they are unemployed before turning to self-employment. Afterwards, necessity entrepreneurs do not manage to return to their initial wage within three years after becoming self-employed. On the other hand, turning to self-employment pays off for opportunity entrepreneurs, as this group experiences significant income growth after turning to self-employment, compared to the two years before turning to entrepreneurship. Although this growth is biggest in the first year after the employment change, growth is still positive for the second and third year.

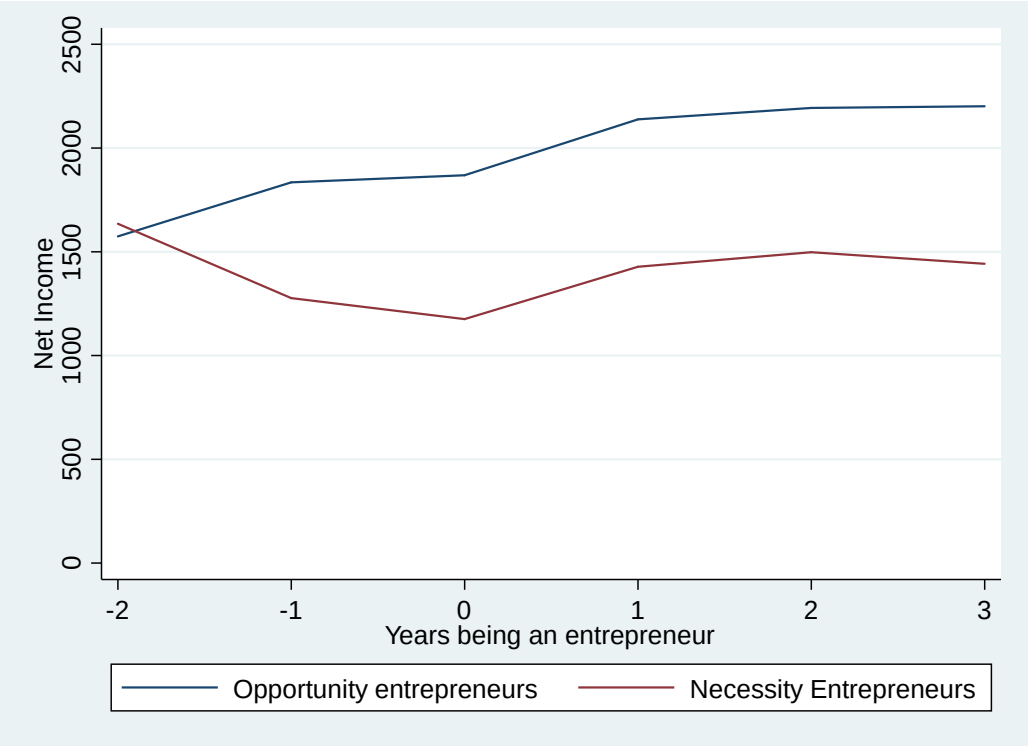

Figure 5: Preliminary event study of being an entrepreneur on income

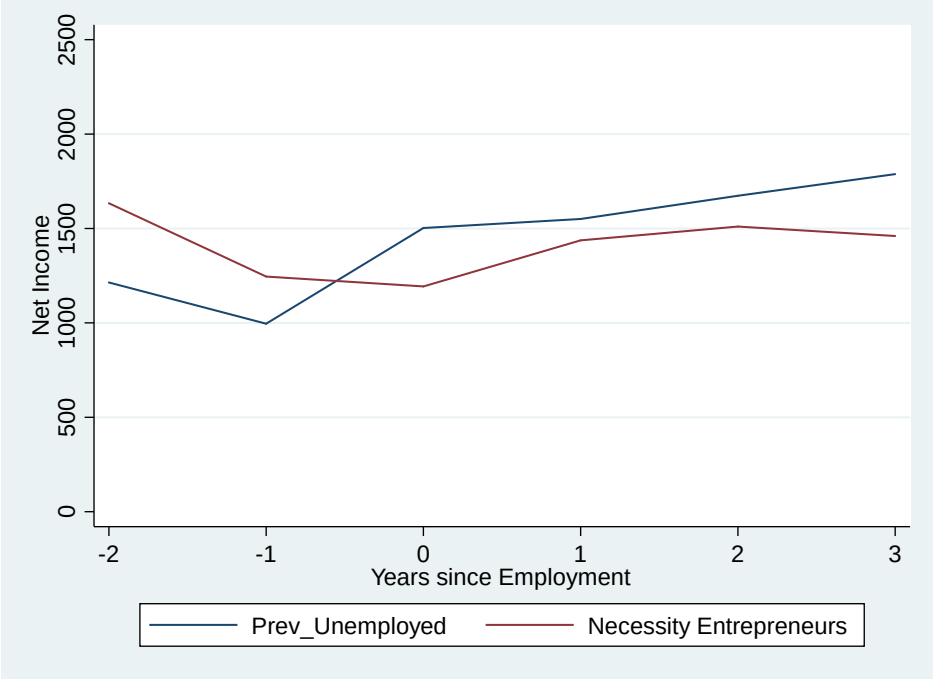

Figure 6: Preliminary event study of being employed or self-employed after unemployment

Figure 6 presents an event study of the effect of (self-)employment on income for the previously unemployed. Again, controls are not included, and the effects are evaluated from two years before the switch until three years after. On average, necessity entrepreneurs have a higher income than wage workers two years before making the switch. Both experience a powerful drop in income in the year before the change, because of the definition of both groups. However, the unemployed who turn to paid employment experience an increase in the year turning to employment, while necessity entrepreneurs experience a slight reduction. This is probably because entrepreneurs invest quite heavily in the first year, with lagged rewards. In the three years after, the employed experience a steady rise in income. Moreover, the income of the employed is higher than that of the self-employed in every year after the switch. Similar to figure 5, necessity entrepreneurs experience some income growth after turning to self-employment, but do not return to the income level two years prior to unemployment. However, these event studies do not control for the economic conditions, nor does it account for personal characteristics. The discussed results can therefore not be interpreted as causal.

Therefore, OLS event study regressions will be conducted to further examine the income effects of necessity entrepreneurship. The first event study is presented in table 5 and compares the income of necessity entrepreneurs to that of opportunity entrepreneurs. Afterwards, an event study will compare the income of necessity entrepreneurs to that of the previously unemployed employed, of which the results are presented in Table 6.

Thus, model 6 in Table 5 presents the event study which estimates income differences between opportunity and necessity entrepreneurs. First, the results indicate that income respectively two and one years prior to turning to self-employment is 14.5% and 9.9% lower than the income of this group in the year they become an entrepreneur. Hence, opportunity entrepreneurs experience a slight income growth in the year before self-employment and an even bigger boost after this switch. Both estimates are statistically significant at the 5%-level. One year after this employment switch, income further increases 9% compared to the year before, again significant at the 5%-level. Two and three years after turning to self-employment, income is respectively 10.7 and 9.7% higher than in the base year. However, these two estimates are statistically insignificant. Income two and three years after turning to self-employment is thus statistically indifferent from income in the year opportunity entrepreneurs make the switch. Despite the insignificance of these coefficients, the presented results show opportunity entrepreneurs to benefit from their employment change. This is because income in the two years prior to self-employment is significantly lower compared to the years after the change in employment status. This model explains 23,3% of the variation in income.

The pattern for necessity entrepreneurs is quite different. Two years before turning to self-employment, soon-to-be necessity entrepreneurs earn 8,2% less (-0,145+0,063) than opportunity entrepreneurs the base year (0). The interaction effect is positive, but insignificant, which indicates that opportunity and necessity entrepreneurs have a similar income two years prior to their decision to become self-employed. Due to the operational definition, necessity entrepreneurs experience an income drop one year later, to 25,6% less than the income of opportunity entrepreneurs in year 0. This income is 15,7% lower than that of opportunity entrepreneurs at this point, significant at the 5%-level. In the year individuals become an entrepreneur, necessity entrepreneurs experience a further decrease in income, to 35,5% lower than opportunity entrepreneurs at this point. This estimate is statistically significant. Therefore, this result shows that opportunity entrepreneurs are more able to generate income directly after turning to self-employment. Afterwards, income slightly increases to 27,1% less than opportunity entrepreneurs in the base year, which is statistically significant. One year later, income has diminished significantly to 34,2% less than opportunity entrepreneurs earn in year 0. Three years after the switch, income is 28% less than opportunity entrepreneurs in the year this group becomes self-employed. Although this estimate indicates that necessity entrepreneurs are worse off three years after necessity entrepreneurship compared to two years before, the estimate is insignificant and results from it can therefore not be drawn with certainty.

Table 5: The OLS results of event study regressions between necessity and opportunity entrepreneurs

		Model 6 Ln(income)	Model 10 Ln(income)	Model 11 Ln(income)
Regressor:		*Necessity*	*Necessity2*	*Necessity3*
Years since entrepreneurship	-2	-0,145***	-0,141***	-0,035
		(0,046)	(0,048)	(0,064)
	-1	-0,099**	-0,101**	-0,056
		(0,038)	(0,041)	(0,051)
	1	0,090**	0,111**	0,0364
		(0,042)	(0,04)	(0,048)
	2	0.109*	0,112	0,035
		(0,062)	(0,064)	(0,079)
	3	0,097	0,0112	0,008
		(0,073)	(0,074)	(0,095)
Years since necessity entrepreneurship	-2	0,063	0.023	0.347
		(0,083)	(0,076)	(0,247)
	-1	-0,157**	-0,010	0,390
		(0,071)	(0,066)	(0,242)
	0	-0,355***	-0,286***	-0,324
		(0,093)	(0,085)	(0,250)
	1	-0,361***	-0,381***	0,389
		(0,119)	(0,108)	(0,255)
	2	-0,451***	-0,393***	0,436
		(0,157)	(0,143)	(0,272)
	3	-0,377*	-0,387**	0,497
		(0,199)	(0,182)	(0,273)
Age		0,008***	0,008***	0,006**
		(0,003)	(0,003)	(0,003)
Male		0,577***	0,587***	0,579***
		(0,003)	(0,037)	(0,068)
High_Education		0,458***	0,485***	0,859***
		(0,063)	(0,035)	(0,237)
Constant		6,73***	6,826***	6,367***
		(0,145)	(0,152)	(0,296)
R-squared		0,223	0,251	0,230
Observations		1736	1832	1637

*p<0,10 **p<0,05 ***p<0,01; Standard Errors presented between brackets

Since opportunity and necessity entrepreneurs might differ in observable characteristics, which potentially causes the latter to be less successful as entrepreneurs, model 7 in table 6 depicts an event study of the previously unemployed (self-) employed. In this event study, the unemployed

returning to employment are compared to necessity entrepreneurs, to obtain a better insight into the consequences of necessity entrepreneurship.

Model 7 shows that individuals who return into paid employment earn 8,9% less than they do in the year they return into employment. Afterwards, due to unemployment, their income drops to 24,6% lower than income in the base year. One year after becoming a wage worker, these individuals already experience an income growth of 3,5% compared to the year before. Income further increases to 7 and 11,6% higher than the base in respectively two and three years after the employment change. All coefficients are significant at the 1%-level. The unemployed returning to paid employment thus experience a steady income growth after they become employed.

Now, necessity entrepreneurs are compared to this group. Two years before self-employment, necessity entrepreneurs earn 1.3% less than previously unemployed wage workers did in the base year. The insignificance of the interaction term, despite the large magnitude, is likely to be caused by the small number of observations for necessity entrepreneurs. Although this term is statistically no different than that of previously unemployed wage workers, necessity entrepreneurs likely earn a higher income two years before self-employment than the control group. If this is the case, necessity entrepreneurs thus do have the potential to earn more than previously unemployed wage workers. Afterwards, necessity entrepreneurs experience a significant income reduction; they earn 29,7% less than wage workers do in the base year. Both groups are statistically similarly disadvantaged by unemployment since the interaction term is again insignificant. This is again likely to be caused by a small number of observations, and if one were to interpret the coefficient, one would conclude that necessity entrepreneurs are impacted more severely. In the year individuals become entrepreneur, they earn 30,3% less than previously unemployed wage workers do, which is statistically significant. Although the self-employed need some time to invest in their enterprise before they can reap the benefits of self-employment, this effect of a very high magnitude. Afterwards, entrepreneurs experience a slight income boost since income increase to 27,8% less than wage workers at year 0. This is still 25,5% less than their paid employment counterparts at this point. These coefficients are significant at the 5%-level. Afterwards, the income gap further increases to 34,8 and 37,7% respectively, two and three years after the switch. Both coefficients are significant at the 1%-level. This brings the income of necessity entrepreneurs to respectively 27,8 and 26,1% lower than the base level two and three years after the employment switch. The wage gap between previously unemployed wage workers and necessity entrepreneurs thus grows dramatically from almost non-existent when both parties become unemployed to 37,7%. After unemployment, it appears to be beneficial to return to paid employment, rather than turning to self-employment.

Table 6: The OLS results of event study regressions for the previously unemployed (self-)employed

		Model 7 Ln(income)
Regressor:		*(Necessity)*
Years since (self-) employment	-2	-0,089***
		(0,032)
	-1	-0,246***
		(0,025)
	1	0,035**
		(0,018)
	2	0.070***
		(0,026)
	3	0,116***
		(0,030)
Years since entrepreneurship	-2	0,076
		(0,080)
	-1	-0,051
		(0,070)
	0	-0,303***
		(0,084)
	1	-0,255**
		(0,108)
	2	-0,348***
		(0,141)
	3	-0,377**
		(0,174)
Age		0,010***
		(0,001)
Male		0,281***
		(0,036)
High_Education		0,312***
		(0,035)
Constant		6,73***
		(0,145)
R-squared		0,223
Observations		2911

*p<0,10 **p<0,05 ***p<0,01; Standard Errors presented between brackets

Hence, the event studies indicate that necessity entrepreneurs earn a similar income compared to opportunity entrepreneurs, and maybe an even higher income than previously unemployed wage workers two years before the switch. This indicates that necessity entrepreneurs can earn a wage similar to that of both groups. Although three years after the change, necessity entrepreneurs earn more than they did being unemployed, they do not return to their earnings potential in model 7. Moreover, necessity entrepreneurs are statistically worse off than their paid employment counterparts in terms of income. A possible interpretation of these results is that necessity

entrepreneurship negatively impacts earnings. Alternatively, necessity entrepreneurs differ from previously unemployed wage workers, which causes them both not to be rehired and to earn less compared to this group. This research cannot disentangle these two explanations, but a mixture of both explanations is most likely to be valid.

Robustness checks

This paper adopts a narrow operating definition of necessity entrepreneurship. Consequently, a small number of observations for necessity entrepreneurs are available in the data and relatively wide confidence intervals are applied. Therefore, robustness checks will be executed with alternative definitions of necessity entrepreneurship. First, a necessity entrepreneur will be defined as an entrepreneur who has previously been unemployed. This definition will be named *necessity2* from now onwards. The difference with the first definition is that this definition does not require individuals to be unemployed directly before turning into self-employment. For *necessity3,* a necessity entrepreneur will be defined as a low-educated entrepreneur.

Even though model three is less likely to approach causal estimation than model 4 is, model 3 will be used in the individual fixed-effects robustness checks. This is because, under the definitions of *necessity2* and *necessity3,* it is unclear whether the dummy variable *previously unemployed* takes a 1 or a 0 for necessity entrepreneurs. Afterwards, the event study which compares necessity to opportunity entrepreneurs will be conducted while the alternative definitions are adopted. The event study which compares necessity entrepreneurs to the previously unemployed paid employed workers will not be conducted. This is because, as the individual fixed-effects regression, it is unclear whether necessity entrepreneurs were previously unemployed under the definition of *necessity2* and *necessity3*. Therefore, variations of model 7 with different definitions would sketch an inaccurate comparison.

The results of the individual fixed-effects robustness checks are presented in table 7, together with the original coefficients of model 3. In model 8, the effect of becoming an opportunity entrepreneur is quite similar to that in model 3. Opportunity entrepreneurs have an income 10,6% after becoming self-employed compared to not being self-employed. Necessity entrepreneurs earn 20,1% less as an entrepreneur compared to the years not being self-employed. Model 8 thus supports the previous results.

This is not the case for model 9. Although the results indicate a positive coefficient for opportunity entrepreneurship and a negative one for necessity entrepreneurship, these coefficients are

insignificantly different from 0. Therefore, the effect of (opportunity) entrepreneurship is statistically null according to model 9.

Table 7: Results Fixed-Effects OLS regression robustness tests

	Model 3 Ln(net income)	Model 8 Ln(net income)	Model 9 Ln(net income)
Entrepreneur	0,100*** (0,035)	0,106*** (0,037)	0,077 (0,051)
Necessity Entrepreneur	-0,269*** (0,010)		
Necessity Entrepreneur (2)		-0,201*** (0,081)	
Necessity Entrepreneur (3)			-0,050 (0,065)
Age	0,004 (0,004)	0,004 (0,004)	
Constant	6,973*** (0,192)	6,970*** (0,192)	6,974*** (0,192)
R-squared	0,029	0,029	0,027
observations	63.685	63.685	63.685

*p<0,10 **p<0,05 ***p<0,01; Standard Errors presented between brackets

The results of models 10 and 11, which involve the use of the definitions *necessity2* and *necessity3* for event studies, are depicted in table 6. The results of model 10 (*necessity2)* draw a picture similar to the results of model 8. Opportunity entrepreneurs experience a slight decrease in income right before turning to entrepreneurship, while their income increases afterwards. However, only the first two years are statistically significant and negative. This shows opportunity entrepreneurs experience higher income after the employment change, which is the same conclusion as drawn in model 8. The model thus does not support statistical income growth after becoming opportunity entrepreneur, but neither did model 6.

Necessity entrepreneurs earn an income statistically similar to that of opportunity entrepreneurs before turning to self-employment. However, after the switch, necessity entrepreneurs experience an income drop. From this moment onwards, the income gap grows to close to forty% between necessity and opportunity entrepreneurs. Three years after the turn to self-employment, necessity entrepreneurs earn 27,5% less than opportunity entrepreneurs earn in the year they move into entrepreneurship. Although most results are like that of model 6, for model 7 the estimates of the interaction effects between years 1, 2 and 3 and necessity entrepreneurship are negative and significant. Hence, the results of this model prove that individuals are worse off three years after necessity entrepreneurship than they were two years before this switch.

Model 11 does not present any significant variable of interest. Therefore, according to this model, neither opportunity nor necessity entrepreneurs experience income effects after their turn into self-employment. These results lead to results similar to those of model 9. The insignificance in both models is likely to be caused by the extreme variety in ability, which is a result of the definition. Moreover, the demand for some low-educated professions, such as plumbers, is fairly constant over the business cycle. Such low-educated professionals are thus unlikely to be necessity entrepreneurs. Hence, due to an expansion in the definition of necessity entrepreneurship, more workers who are not truly necessity entrepreneurs are included, which negatively affects the quality of the estimates.

Conclusion

This paper offers a broader and deeper perspective into necessity entrepreneurship and its consequences on income. Not only is the income effect of necessity entrepreneurship compared to that of opportunity entrepreneurship, but also to the impact of returning to paid employment after unemployment. The comparison between necessity entrepreneurship and the latter is one that has been overlooked in research on necessity entrepreneurship and its impact on income, until now.

In line with the research of Block and Koellinger (2009), the results show that opportunity entrepreneurs earn a higher income than necessity entrepreneurs. Moreover, opportunity entrepreneurs experience an income increase after moving into entrepreneurship. Since opportunity entrepreneurs also experience an increase in non-pecuniary benefits from entrepreneurship, opportunity entrepreneurship is a welfare-enhancing activity (Larsson & Thulin, 2017). This is suggesting that people move into entrepreneurship if it makes them better off, hence rational-choice theory is valid for opportunity entrepreneurs.

On the other hand, necessity entrepreneurs experience an income drop after moving into entrepreneurship. This is confirmed in both the individual-fixed effects regression and the event studies. As this decline is not compensated by an increase in procedural utility, turning to entrepreneurship deteriorates individual welfare (Larsson & Thulin, 2017). The robustness checks indicate that low-educated entrepreneurs do not necessarily classify as necessity entrepreneurs and that this group does not experience a decline in income when moving into self-employment. The rational-choice theory does breaks down for necessity entrepreneurs, due to a lack of outside options.

Necessity entrepreneurs step into self-employment as it is their only option to earn income. This proves the contrast between necessity entrepreneurs and previously unemployed wage workers to be even more poignant. The results indicate that the latter not only earn a higher income compared to the former, but reemployment also appears to cause an income improvement after moving into employment. Therefore, the unemployed are better off returning to paid employment rather than turning to self-employment.

This conclusion has strong policy implications. Governments have developed a supportive attitude towards necessity entrepreneurship. The Dutch government, for instance, allows previously unemployed entrepreneurs to maintain a large part of their unemployment while setting up a start-up (UWV, 2020). Following the results of this paper one can conclude that the Dutch government would increase well-being by adjusting (reemployment) policies. First, if the regulator wants to promote entrepreneurship, based on its job generating capacities and externalities, it should focus

on boosting opportunity entrepreneurship. Concerning reemployment policy, creating social workplaces, or subsidizing companies to hire the unemployed will increase social welfare, compared to offering benefits to nascent necessity entrepreneurs. Even if the unemployed believe self-employment will offer them non-monetary benefits such as autonomy, the research of Larsson and Thulin (2007) indicates this cannot compensate for the negative wage differential between necessity entrepreneurs and previously unemployed wage workers. Since such ambitions are likely to be based on wrong beliefs, unemployment counselors should create awareness about the consequences of necessity entrepreneurship. Alternatively, counselors might want to use nudges to convince the unemployed to go into paid employment, if their beliefs are prone to heuristic biases that cannot be overcome by rational persuasion.

This paper also sheds light on scientifically relevant matters. Firstly, this research indicates that rational-choice theory represents reality only to a limited extent. In this case, necessity entrepreneurs do not self-select into self-employment to be better off, but due to a lack of outside options. Researchers should pay attention to the outside options of individuals if they apply rational-choice theory since a lack of outside options fiercely deteriorates the applicability of this theory. For further research in this field, the selection effects between previously unemployed wage workers and necessity entrepreneurs could be studied, in a set-up similar to that of Evans and Leighton (1990), who only study selection effects between 'regular' entrepreneurship and employment. Such research would fill a gap in the current field of literature on necessity entrepreneurship. Finally, to overcome limitations such as the discussed selection effects, an experiment similar to that of Van den Berg and Van der Klaauw (2006) should be set up. In their research, the unemployed are randomly allocated to a treatment group via their obligated unemployment counseling. If an experiment with an encouragement design for necessity entrepreneurship and paid employment would be set up, endogeneity and selection bias issues could be overcome. This experiment is likely to approach a causal estimation of the impact necessity entrepreneurship and employment have on the income of the unemployed.

Discussion

This research is not without limitations. Firstly, turning to entrepreneurship is an endogenous choice. Although the individual fixed-effects model controls for (un)observable time-invariant characteristics, as well as age, this does not imply that the results of this model can be interpreted as causal. One would have to assume that unobservable time-variant variables are inexistent. As Angrist and Krueger (1999) already pointed out, labour market decisions are often correlated with unobservable characteristics. In this particular case, self-employment is likely to correlate, among other things with the number of outside options. Therefore, causality might not be inferred from individual-fixed effects models.

Moreover, selection-effects are existent. It could be the case that the more attractive unemployed workers find an employment opportunity, while the less attractive unemployed workers are pushed into entrepreneurship. This cannot be tested and should be kept in mind. Although the descriptive statistics did not indicate significant differences, one cannot exclude that groups are different in unobservable characteristics. Moreover, model 7 indicates that necessity entrepreneurs have a higher income than previously unemployed employees. If income has any explanatory power over attractiveness, which is likely to be true to some extent, then both groups are of similar attractiveness and quality.

Furthermore, this research uses net income as a dependent variable. Although gross income would not necessarily have been a more accurate measure, due to differences in tax regulation between the self-employed and the employed, the use of net income restrains the causal interpretation of this research. Entrepreneurs also have an incentive to underestimate their income for tax purposes (Carter, 2010). Therefore, this research might underestimate the true income of entrepreneurs. Moreover, the previously discussed tax benefits for previously unemployed entrepreneurs in The Netherlands imposes a limitation on this research (RVO, 2020). The government allows the unemployed to maintain an almost complete unemployment benefit in their first six months as a nascent entrepreneur. This might lead to an overestimation of the income boost in event studies. However, this regulation would not significantly alter the estimations in the individual fixed-effects regression. Since both estimation methods provide similar results, this is not a major concern.

Finally, the small sample size imposes limitations on this research. Due to the small number (88) of necessity entrepreneurs, the law of large numbers does not apply. The estimates for necessity entrepreneurs might, therefore, be slightly inaccurate.

Appendix

Table 1: Descriptive statistics of the necessity entrepreneurs and previously unemployed (self-) employed

	Previously unemployed					**Necessity Entrepreneur**				
Variable	Observations	Mean	Std. Dev.	Min	Max	Observations	Mean	Std. Dev.	Min	Max
Male	2521	0,529	0,500	0	1	282	0,600	0,490	0	1
Age	2521	42,272	12,137	18	77	282	47,344	12,159	22	77
Single	2521	0,266	0,442	0	1	282	0,291	0,455	0	1
Children	2521	0,519	0,500	0	1	282	0,497	0,500	0	1
Higher Education	2521	0,389	0,488	0	1	282	0,486	0,500	0	1
Net Income	2521	1603,07	832,08	0	10.000	282	1.438,82	1087,22	0	4750

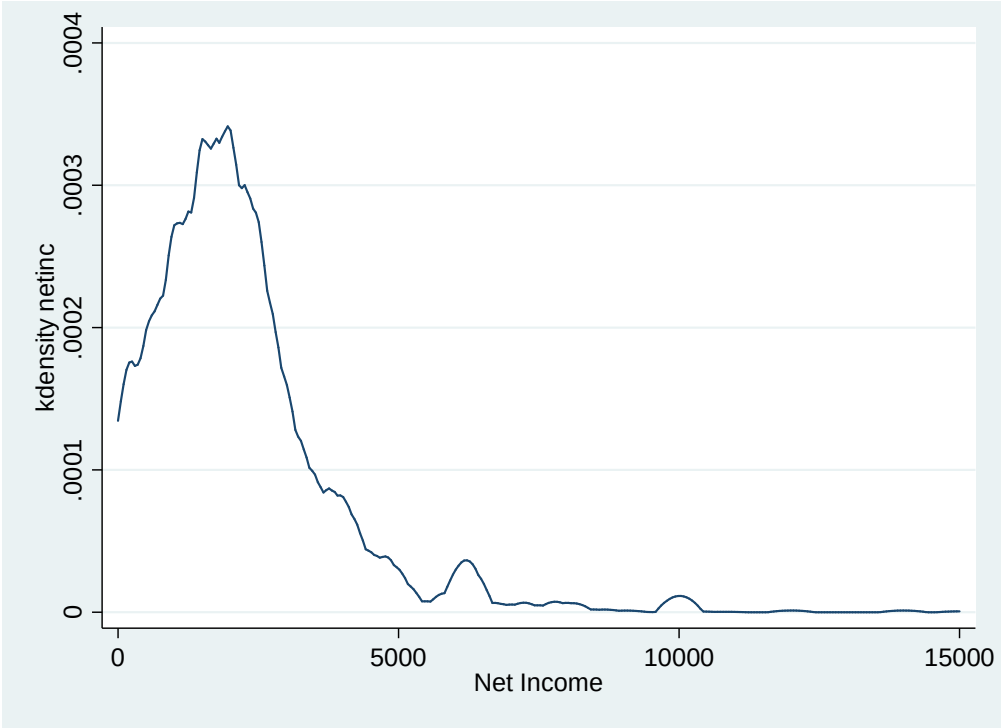

Figure 1: Kernel Density graph for income of entrepreneurs

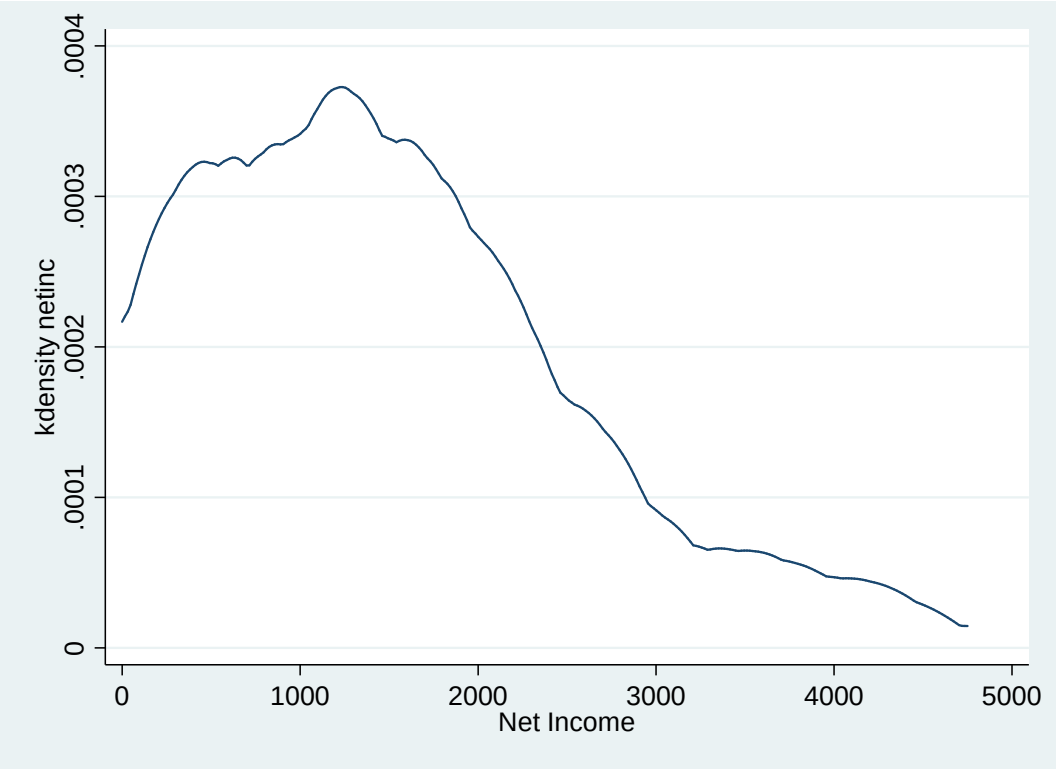

Figure 2: Kernel Density graph for income of necessity entrepreneurs

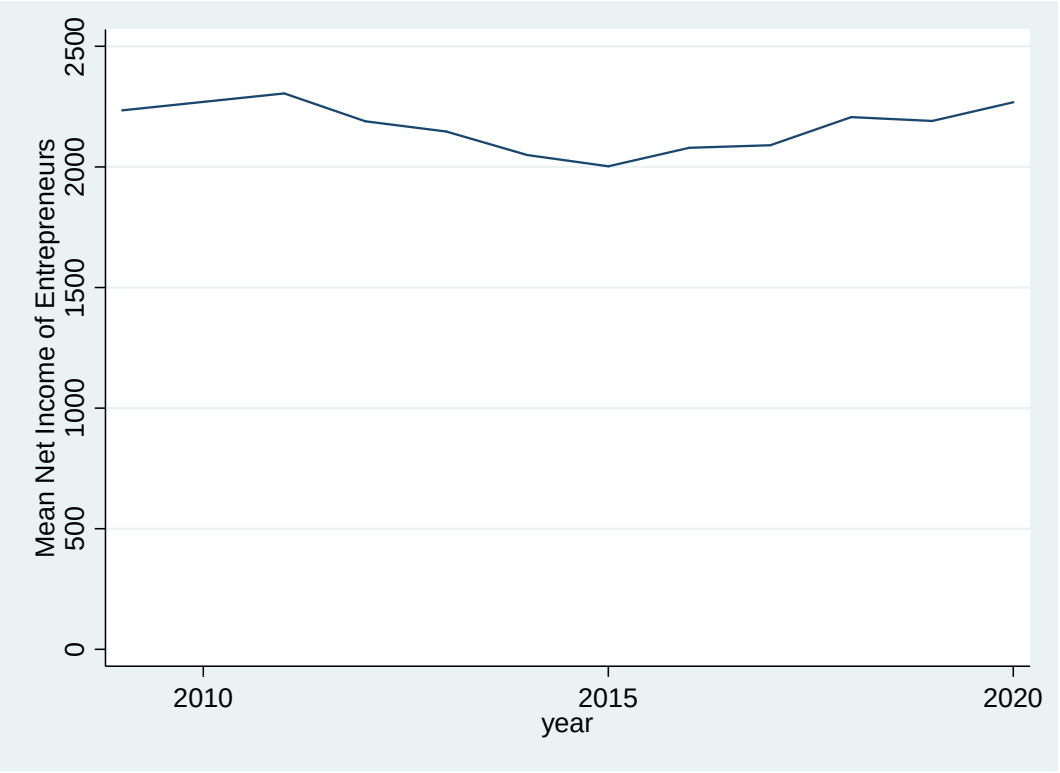

Figure 3: Mean net income of entrepreneurs over time

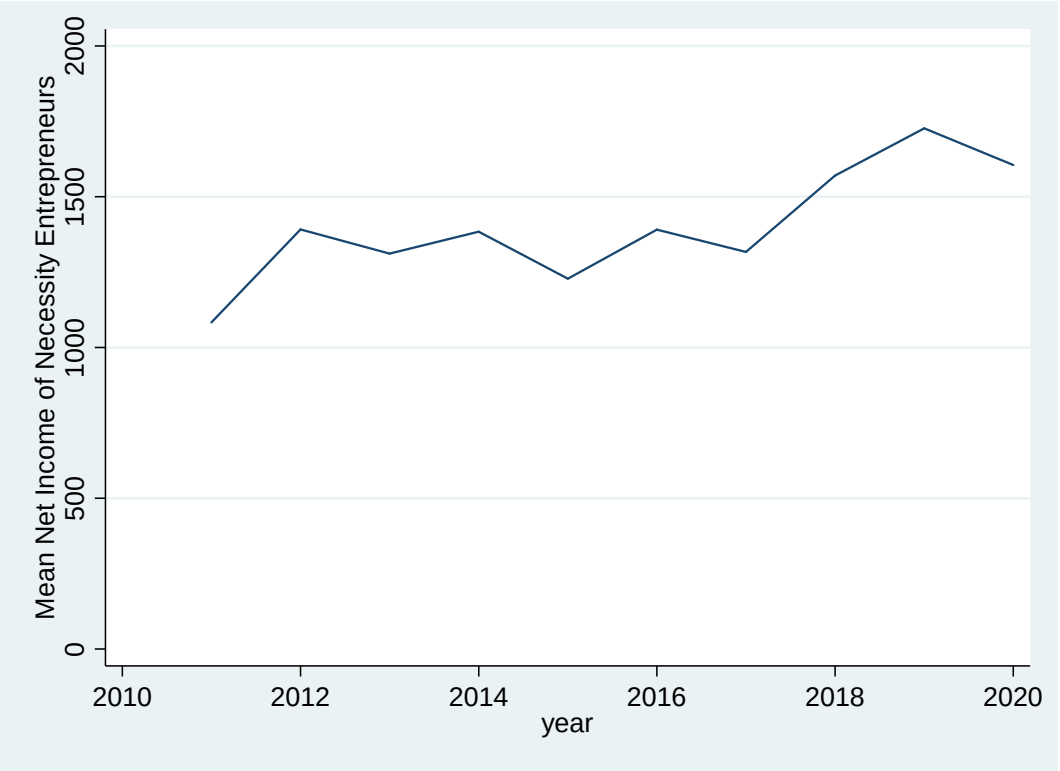

Figure 4: Mean net income of necessity entrepreneurs over time

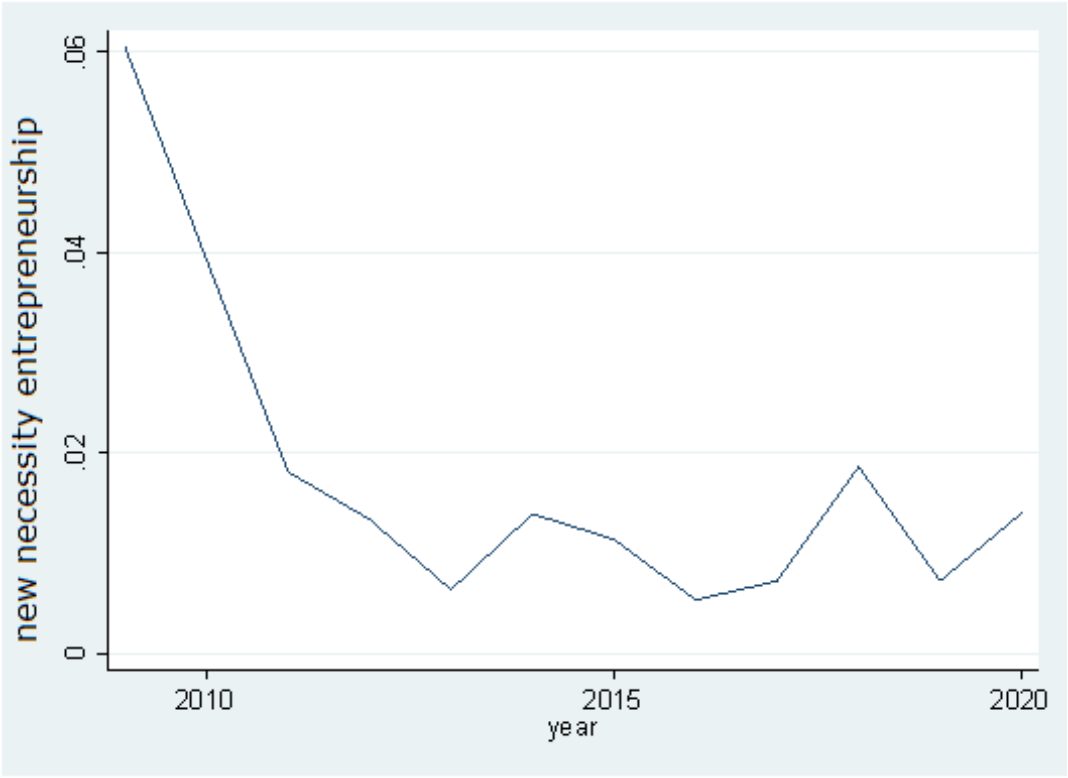

Figure 5: The average of new entrepreneurial activity over time

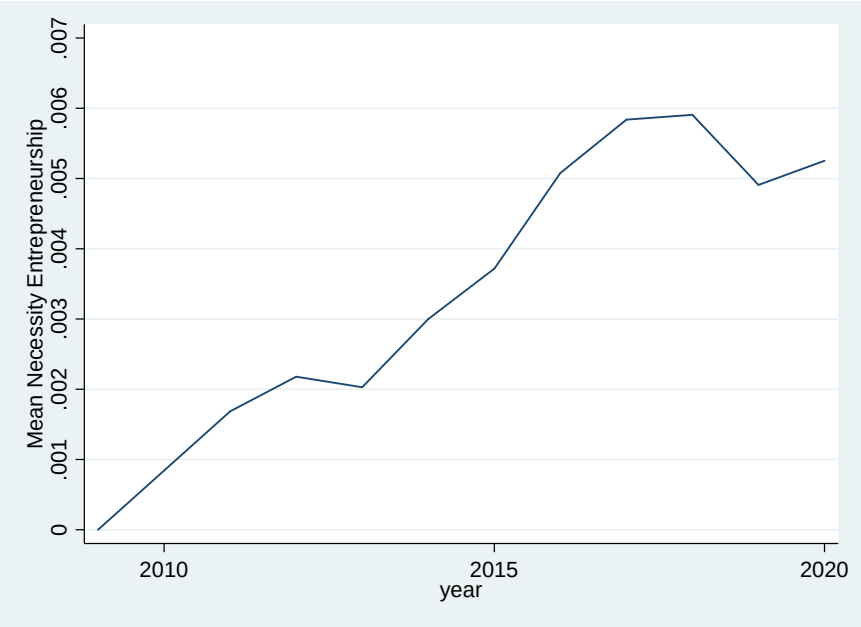

Figure 6: The average of new previously unemployed (self-) employed individuals over time

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