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Macroeconomic Contractions during Impressionable Years and Entrepreneurship in Later Adulthood

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Abstract

We argue that past events experienced during the critical ages of 18-25 can influence an individual's future entrepreneurship based on the "*impressionable years hypothesis*". Accordingly, we empirically investigate the relationship between bad economic conditions during youth and later-life entrepreneurship using Gallup from 2009 to 2014. The identification is achieved through variations across 77 countries and age cohorts born between 1954 and 1989. Our findings indicate that bad economic conditions when young can significantly predict higher entrepreneurship in later life. For example, experiencing at least one economic contraction during youth increases future self-employment/business ownership propensities by about 6/10% at the outcome means. Graduating from college and entering the job market in a bad economy cannot explain our results. Findings are robust to numerous methods of measuring economic contractions and controlling for behavioural measures as well as economic shocks experienced before and after the impressionable years.

Keywords: Impressionable Years Hypothesis, Entrepreneurship, Self-employment, Business Ownership, Economic Contractions, Gallup Data.

JEL Codes: L26, E32, E60

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1 Introduction

Entrepreneurship has received much attention in the recent literature with many experts characterising it as a vital element of every well-functioning economy (Block and Koellinger, 2009). The human capital of entrepreneurs is a key marker of cross-country differences in economic growth and firm-level productivity (Murphy et al., 1991; Gennaioli et al., 2013), and there is also a significant positive relationship between entrepreneurship and economic growth (Stel et al., 2005; Michelacci, 2002). Thus, uncovering the causal determinants of entrepreneurship has great importance.

Previous research shows that early life experiences could predict entrepreneurial activity and that the environment in which an individual grows impacts incentives to start a business (Schoon and Duckworth, 2012). For instance, exposure to a family business from a young age or experiencing a difficult childhood can trigger the decision to become an entrepreneur later in life (Cheng et al., 2021; Churchill et al., 2021; Drennan et al., 2005). There is also evidence that the promotion of entrepreneurial intents during late adolescence and early adulthood is positively associated with the number of people starting their own business (Geldhof et al., 2014) and that high school entrepreneurship education programs can increase the probability of starting a business in the long-run (Elert et al., 2015). Thus, early life experiences could influence feelings towards entrepreneurship. However, more research is needed to understand the relative importance of childhood factors and stages of early life for adult entrepreneurship.

The business cycle or the unemployment rate also affect the number of start-ups in a country (Parker, 2009). Specifically, economic contractions can create incentives towards entrepreneurship and lead to an increased number of new firms in a country[1]. Production,

[1] Another part of the literature argues that during periods of economic prosperity a country may realise an

labour, and capital as well as entry costs are lower during economic downturns. Thus, it becomes more appealing to invest in new firms during busts than booms (Lewis, 2009; Glaeser et al., 2010). Koellinger and Thurik (2012) also argue that investments which include a large amount of risk and uncertainty are more likely to happen during economic downturns. In addition, high unemployment rates may push individuals to start a business since accessible work openings are scarcer (Thurik et al., 2008). Alternatively, the number of new firms may be relatively low during periods of low unemployment because it is easier to find a job as a wage earner due to increased job opportunities.

In the light of these discussions, we examine the causal effects of past economic shocks on later life entrepreneurial decisions. We hypothesise that past events experienced during youth can influence individuals' future attitudes towards entrepreneurship. We focus on the impressionable years hypothesis from social psychology which suggests that majority of core individual economic attitudes are shaped between 18 and 25 years of age (Krosnick and Alwin, 1989)[2]. This implies that individuals are most responsive to attitude changes during late adolescence and early adulthood and that responsiveness drops afterwards and remains low through the rest of their lives. Therefore, we examine whether economic contractions

increased number of start-ups (Rampini, 2004; Clementi and Palazzo, 2016). Yet, empirical studies on this topic report mixed results (Llopis et al., 2015), while the most recent ones report a positive relationship between macroeconomic shocks and the creation of new firms. For example, Konon et al. (2018) find counter-cyclical effects of the business cycle on start-ups using data from Germany. Other empirical studies, such as Tervo (2006) in Finland, Fairlie (2013) in the US, Fritsch et al. (2015) in Germany and Georgellis and Wall (2000) in Great Britain also find that macroeconomic contractions can spur entrepreneurial activity.

[2] Krosnick and Alwin (1989) test this hypothesis using individual panel data on political behaviour and economic views and find that individual views and beliefs change during 18-25 but remain stable thereafter. Several other studies such as (Cutler, 1974; Sears, 1981, 1983) support the view that the experiences during impressionable years form the majority of the core attitudes and values. The increasing persistence hypothesis also suggests that the majority of attitudes and beliefs are formed when young, but they fade with age (Glenn, 1980). Findings from neuroscience literature show structural differences between the adolescence and the adult brain providing further support to this hypothesis (Spear, 2000). Furthermore, many researchers in economics have discussed the effects of past macroeconomic shocks on individual attitudes. Experiencing a downturn during impressionable years can permanently change individuals' preferences for redistribution and political views (Giuliano and Spilimbergo, 2014), and politicians hold more conservative positions towards redistribution (Carreri and Teso, 2021). Economic shocks experienced in early-life can also alter people's beliefs towards luck versus effort as determinants of success (Piketty, 1995).

experienced during impressionable ages (18-25) have an impact on individuals' decisions to become self-employed/business owner rather than a salaried employee later in life.

We propose two potential mechanisms describing how past macroeconomic disasters can sway people's attitudes by making them more favourable towards entrepreneurship[3]. As mentioned above, countries may experience an increase in the number of start-ups during economic downturns. Thus, observing people who escaped long-term unemployment by starting their own business with good financial well-being during bad economic conditions could influence feelings towards entrepreneurship among impressionable young minds and these beliefs could be carried on later in life. On the other hand, personal experiences such as being unemployed for a long time and spending time in "bad matches" in the labour market[4] or a reduction in the salary during impressionable years, a period of "mental plasticity" as frequently described by the literature, could also influence people's attitudes towards entrepreneurship because starting your own business and being your own boss may seem much more appealing than working for someone else. In line with these ideas, we argue that past economic contractions during impressionable years can affect individuals' decision to transit into self-employment or business ownership later in life.

This article contributes to the existing literature by establishing a relationship between economic downturns during youth and future entrepreneurship at the individual level. We provide further arguments on how past macroeconomic shocks could have an impact on people's future labour market choices. Moreover, we investigate the type of attitudes towards entrepreneurship that can explain transitions into business ownership. Our study also has important implications regarding future entrepreneurship in countries that have experienced

[3] We do not investigate the relative importance of these two channels in this paper however it will be an interesting venue for future research using longitudinal data covering several decades.

[4] Previous research finds that the quality and availability of jobs tend to decrease during economic downturns (McLaughlin and Bils, 2001). Thus, the matching process for people who got unemployed during an economic contraction may last longer.

economic downturns and high unemployment rates.

We use data from the Gallup World Poll (GWP), a repeated cross-sectional dataset, from 2009 to 2014. Our baseline regression sample comprises around 172000 individuals from 77 countries surveyed throughout 2009-2014 (from 2011 to 2014 for business ownership) who are between 25 and 55 years of age and are born in the country of residence. These 77 countries have non-missing information on GDP per capita for the entire time series while they account for more than 80% of the world's total GDP. We also carry out some robustness checks using the full set of countries that includes around 284000 individuals from 134 countries and show below that our results remain similar with this alternative sample. Importantly, the GWP contains detailed information regarding entrepreneurship which allows us to distinguish between self-employment and business ownership. The dataset also includes information on full-time and part-time status, ownership structure, the size and the formality of business and the reasons why respondents decided to start a business. Information on business starting age is also available for a small number of people. Demographic information such as gender, income, education, religion, and marital status are also available along with behavioural indicators measuring optimism, locus of control and risk-taking.

We estimate current entrepreneurship as a function of past economic shocks experienced between 18 and 25 years of age for individuals who were born in their country of residence. Thus, our identification strategy relies on variations across countries and age cohorts. In our baseline specifications, we measure past economic shocks using sudden declines in GDP per capita during youth. Thus, our main independent variable of interest is defined as a dummy variable that takes the value one if the individual experienced at least one such economic contraction during impressionable years and 0 otherwise. We estimate Probit models controlling for fixed effects for age, country, survey year and country-specific age trends along with economic conditions before the survey year and a set of demographic characteristics.

Information on around 6000 people from 72 countries reveals that more than 80 percent of the individuals start their business after the age of 25 and the median age at first business is around 32. Regression analysis finds that individuals who experienced economic downturns when young are around 1.3% to 1.6% (or 4% to 6% at the mean level) more likely to become self-employed or business owners later in life. We also find that economic shocks increase the future likelihood of business ownership for people who started a business because they couldn't find a suitable job, wanted to be their own boss and had a great idea for a business while past shocks do not have any impact on those who started a business because they were afraid of losing their job and saw an opportunity to make money.

We address alternative theories and investigate potential explanations for our findings. First, we examine whether experiences of macro shocks at different ages have an impact on entrepreneurship. We do so by controlling for the role of shocks experienced before (between 10 and 17 years of age) and after impressionable years (between 26 and 33 or between 34 and 41 years of age). We find that the effects of economic shocks between 18 and 25 remain similar while experiencing an economic shock during non-impressionable years does not affect future entrepreneurship. Second, we investigate whether our results could be related to the literature which examines the long-term effects of past economic experiences on later life expectations and labour market choices. Previous research shows that graduating from college and entering the labour market in a bad economy can affect future income and careers (Kahn, 2010; Oreopoulos et al., 2012). We address this alternative explanation by restricting our sample to people who do not have a college degree; hence they were in the labour market before they experienced a macroeconomic shock and by controlling for education, income and occupation fixed effects. Third, recent studies report that decline in economic activity could be linked to future changes in risk-taking (Malmendier and Nagel, 2011). Risk-taking is also known to be positively correlated with self-employment (Ekelund et al., 2005) along with measures of locus

of control (Baum and Locke, 2004; Puri and Robinson, 2007). Thus, it is possible that past economic shocks could be linked to future entrepreneurship through these personality indicators. Therefore, we estimate regressions first using these variables as the outcome variables and find that past economic shocks experienced between 18 and 25 years of age do not significantly predict subjective personality indicators. Next, we estimate entrepreneurship regressions where we include these indicators as control variables one by one in the regressions. We observe that the inclusion of these variables does not make any change in the estimate for our main independent variable. Fourth, our dependent variables are defined as binary indicators equal to one if the respondent is self-employed/business owner and zero if the individual is a salaried employee. Therefore, we examine the bias due to the exclusion of those unemployed and not in the labour force from our analysis. We estimate models of being in the labour force and being unemployed as a function of past macroeconomic shocks and the results are only significant for the unemployed. We also re-define the dependent variables, including unemployed and out of the workforce individuals in the sample, and we still find significant effects. Thus, our results are not biased due to sample selection.

We also restrict the sample to those who started a business after the age of 25 and the effect of past economic downturns on future business ownership becomes larger with this specification. Controlling for selection on unobservables using a novel method, developed by Oster (2016), shows that our results are downward biased and underestimates the true effects of past economic shocks. Past economic shocks increase the probability of full-time self-employment and business ownership by 1% to 1.5% (or 6% to 7% of the mean level) while they do not influence part-time business ownership. The estimates are slightly lower for sole business ownership while the effects are much larger for micro-business ownership than small business ownership. Past economic shocks significantly increase the likelihood of both registered and unregistered business ownership while the effects are larger for the former.

Sub-sample analysis reveals that the effect of experiencing macroeconomic disasters during youth on future entrepreneurship is stronger in countries with a larger shadow economy, higher levels of financial development and higher ease of doing business ranking. We also find that negative shocks experienced at the age of 21 and 24 have the largest influence on future entrepreneurship while results are robust to controlling for religion fixed effects, cohort fixed effects and country-specific time trends. Importantly, we test numerous ways of measuring economic contractions during impressionable years. Regressions including different definitions of economic downturns using GDP per capita and unemployment rate again confirm our hypothesis.

The rest of the paper is organised as follows. Section 2 describes the data and the definition of the variables, Section 3 motivates the empirical strategy, Section 4 presents the empirical findings and Section 5 concludes.

2 Data

The data for this paper come from the Gallup World Poll (GWP), an annual survey conducted in more than 150 countries globally, representing more than 99% of the world's adult population. The GWP uses a set of core questions surveying approximately 1000 individuals in each country (one individual per household) either over the phone or by using face-to-face interviews. The sample is nationally representative and has been randomly selected. Since 2009, the survey has provided information on the employment status of the respondents by developing a series of questions measuring key employment metrics. Respondents are classified into six categories of employment, including self-employed, salaried employees, unemployed and out of the workforce. The GWP also contains a separate set of questions regarding business ownership.

Our main outcome variables are dummy variables, defined in line with previous literature (Levine and Rubinstein, 2017), indicating whether an individual is self-employed or business

owner (either full-time or part-time) relative to being a salaried employee working for someone else. We differentiate between self-employment and business ownership similar to recent literature studying entrepreneurship (Light and Munk, 2018) and consider them as two different outcome variables. In our sample, the number of respondents categorized as self-employed is 1.8 times larger than the number of the respondents categorized as business owners, 7% of the self-employed are not identified as business owners and 0.32% of the business owners are not classified as self-employed. Light and Munk (2018) also point out that self-employed, who are not classified as business owners, are usually people involved in contract or home-based work such as sales, acting or even babysitting, and that entrepreneurship, as theoretically defined by the literature (Schumpeter, 1934; Lazear, 2005), is more likely to be found among business owners than self-employed in the surveys[5]. Thus, it is important to include these two variables as different outcomes in our models. Information on whether the business owners are the sole owners or have partners, the number of employees a firm has and whether the business is registered or not are also available in the data. We follow OECD's 2019 classification and define firms as micro and small-sized enterprises. The GWP also asks respondents the reasons they started a business with the following options: they could not find a suitable job, they saw an opportunity to make more money, they were afraid of losing their job, they wanted to be their own boss, and they had a great idea for a business. We coded these variables equal to one if the individual falls into one of these categories and zero if he/she is a salaried employee.

The GWP also provides data for the year the respondents started their business. This variable is only available for 5839 individuals from 72 countries in the 2013 round of the data. Despite the small number of observations for each country, this information appears to be in line with other studies. For instance, the average business starting age in our data for the US is 40 for people aged between 26 and 80, which is the exact number provided by Jones et al.

[5] Levine and Rubinstein (2017) argue that incorporated self-employment is a better proxy for entrepreneurship. Unfortunately, similar differentiation among self-employed is not present in our data.

(2018) for the USA. In any event, more than 80% of the individuals opened their business after the age of 25 in our sample, while only a small proportion started a firm between 18 and 25 years of age.

Previous literature finds that risk-taking, optimism and locus of control could be linked to entrepreneurial activity. Risk aversion is known to be negatively correlated with entrepreneurship (Ekelund et al., 2005), while self-employed individuals are more optimistic than employees (Puri and Robinson, 2007). Traits such as setting goals and working hard are also correlated with entrepreneurial activity and firm-level growth (Baum and Locke, 2004). Therefore, we include these indicators in our analysis in order to investigate whether the impact of economic contractions during impressionable years could work through these personality indicators. We code variables such as risk-taking, optimism, reaching goals and working hard equal to one if the respondent answered positively to these survey questions and zero otherwise. Our data also include demographic characteristics such as gender, marital status, education, location of the household and income. Education, location of the household and income are defined using variables constructed in the GWP, making them comparable across countries. Education is coded as primary school degree, secondary and high school degree and college degree or higher. Household income is coded into five categories from the lowest to the highest. Marital status is equal to one if the respondent is married and zero otherwise. When control variables are missing, we use the observations and code for the missing information.

2.1 Measurement of Economic Contractions during Impressionable Years

There are numerous ways of measuring macroeconomic conditions at youth. We first make use of GDP per capita to measure economic conditions because it is available for the entire time series for our selected 77 countries. We then use unemployment rate in our robustness checks because it is available for a smaller number of countries and time periods. In any event though, we expect that severe declines in GDP per capita could potentially capture major

unemployment periods which can influence future entrepreneurship behaviour. Different countries seem to use different definitions of economic downturns. However, considering the large number of countries in our data, it may be more accurate to define a sudden economic decline or a macroeconomic shock relative to each country's own growth rate because some countries experience more volatility in their overall growth than others (Nunn et al., 2018). Therefore, a severe economic decline or contraction is defined as the national GDP per capita growth being less than a country's own 5th percentile growth rate using the 2018 version of the Maddison Project.

We also employ alternative definitions of macroeconomic shocks during impressionable years in the Appendix to investigate whether the results are sensitive to different measures of economic contraction. We, for example, first consider using the number of years a person experienced economic downturn during impressionable years as a continuous variable rather than a binary indicator based on the same definition of an economic contraction as this approach could potentially better capture the exposure intensity. We then use the binary indicator of exposure, again, by replacing the 5th lowest percentile growth rate with a 10th lowest percentile growth rate in the definition of an economic downturn which measures mild economic contractions. Moreover, we also use the binary exposure measure taking the value 1 when a country experiences a negative annual economic growth rate, a negative annual economic growth rate being greater than 2% and/or 5%. Finally, in terms of capturing the macroeconomic shock intensity experienced during impressionable years by an individual, we also use the maximum annual unemployment rate (in percentage terms) of a given country defined over the individual's impressionable years as an additional measure of exposure. As we will explain in the robustness checks section later on, the positive relationship between economic downturns during youth and adult self-employment/business ownership remains statistically significant with the use of these alternative measures of macroeconomic shocks

experienced during the critical ages of 18-25.

2.2 Summary Statistics and Figures

Table 1 presents the summary statistics of the variables for the baseline sample. 19% of the full sample experienced at least one macroeconomic contraction, given our definition as explained in the previous section, during impressionable years while the rate is higher for self-employed and business owners rather than for salaried employees. Similar differences in the means are observed for all the contraction variables with two exceptions, the macroeconomic shocks experienced between 34 and 41 years of age and the ones in the year before the Gallup survey. For example, approximately 14% of the salaried employees have experienced at least one economic shock between 34 and 41 years of age while the percentage is lower and around 12 for the self-employed/business owners and 13 for the full sample. 47% of the sample is female, while 72% is married with the percentages being higher for entrepreneurs. The average age is 40 and quite similar across all samples. Only 24% of the sample has a college degree while the rate is much lower and around 13% for the self-employed and 16% for the business owners. 46% of individuals report to be risk-loving, 77% are optimistic, and 80% believe working hard would bring success and reaching goals is important while we observe sharp differences in these rates between entrepreneurs and waged workers. For example, 85% of the business owners believe that working hard brings success, while the percentage drops to 78 for the salaried workers. Similarly, 55% of the business owners are more willing to take risks while only 42% of the waged employees seem to be more risk-loving. Overall, these personality traits seem to be found mostly among entrepreneurs, a finding which has already been established in the literature and our data appear to be in line with these studies (Baum and Locke, 2004; Ekelund et al., 2005; Puri and Robinson, 2007). In addition, we include a more detailed summary statistics table in the Appendix. Figure 1 presents the distribution of business starting age for people between 25 and 55 years of age in our sample. It is evident that most people

start businesses after the age of 25 and the average age of starting business is around 32.

3 Empirical Framework

We estimate the relationship between macroeconomic shocks experienced during impressionable years and future entrepreneurship. We use binary indicators for self-employment and business ownership as dependent variables and estimate Probit regressions while we report average marginal effects. Standard errors are clustered at the country level and are robust for heteroscedasticity. The baseline specification is presented below:

$$S_{ict} = \beta_0 + \beta_1 economic\ contraction_{c,imp.yrs} + \beta_2 X_i + \rho_\alpha + \theta_c + \gamma_t + \theta_c * age + \varepsilon_{ict}$$

where S_{ict} is an outcome variable such as self-employment or business ownership for individual *i*, in country *c* at time *t*. The main variable of interest, $economic\ contraction_{c,imp.yrs}$, is a binary indicator for whether the individual has experienced at least one year of a macroeconomic shock during impressionable years. X_i includes control variables such as gender, marital status, and education while ρ_α, θ_c and γ_t are age, country, and survey year fixed effects[6], respectively. Country fixed-effects control for time-invariant variation in the outcome variable caused by factors that vary cross-nationally such as business-entry regulations (Branstetter et al., 2013) and taxation system (Gersbach et al., 2018) and age fixed-effects control for the variation in the outcome variable caused by factors that are heterogeneous across (but homogenous within) age groups. Survey year fixed-effects, on the other hand, capture the impact of global shocks that affect all countries simultaneously in terms of the outcome variable. Country-specific age trends represented by $\theta_c * age$ are also included in the regression to address the possibility that the interaction of age and individual behaviours may differ across countries. Moreover, we control for the economic shocks experienced in the year before survey. This method has been used in previous literature

[6] Unreported findings are similar once we replicate our baseline regression model for each survey round. For example, regressions in Table 10 are estimated only using 2013 survey round which provide similar results.

to avoid potential endogeneity because the Gallup surveys are mostly carried out at the beginning of the year thus using lagged values will ensure that they will not be affected by business ownership in the survey year. We additionally control for birth-year fixed effects in the Appendix and show that our results remain similar. Unfortunately, we do not have data on parental characteristics and other background information. However, we control for potential omitted variables in the robustness section of this paper.

Our analysis closely follows recent studies using a similar identification strategy in the context of the impressionable years hypothesis (Giuliano and Spilimbergo, 2014; Aksoy et al., 2020; Eichengreen et al., 2021; Carreri and Teso, 2021; Cotofan et al., 2021). As in these studies, the identification is made possible with the fact that the main variable of interest, exposure to an economic shock during impressionable years, exhibits cross-country variation as well as variation between age cohorts because different countries experienced economic shocks in different years. This means, for instance, that a 50-year-old person in survey year 2013 in country X could have experienced a macroeconomic shock during his/her impressionable years while another 50-year-old person in survey year 2013 in country Y did not have such an experience. It is also particularly important to note that variation across cohorts in our case is not just limited to a 6-year period of the survey data, i.e., 2009-2014. Because our regression sample includes individuals aged 25-55 in each year of our data, the definition of our economic downturn exposure variable utilizes all macroeconomic shocks occurred since 1972 (= 2009-55+18) up until 2014 covering a period of 42 years in which some individual countries have experienced multiple economic downturn periods. Hence, our key variable is not perfectly collinear with other control variables in terms of fixed effects at the levels of country, survey year, and age as well as country-specific age trends.

4 Empirical Results

Table 2 investigates whether macroeconomic shocks in terms of GDP growth rates during

impressionable years are correlated with potential independent variables used in our analysis. We present the results in four different specifications (Columns (1)-(4)). The outcome variables are the control variables we will use in this study while the independent variable is a dummy variable that equals to 1 if the respondent experienced at least one economic contraction during impressionable years and 0 otherwise. We control only for country fixed effects in specification (1) while we add survey year fixed effects in specification (2), country-specific age trends in specification (3) and age fixed effects in specification (4). We find that experiencing a macroeconomic shock before the age of 18 (between 10-17 years of age) or after the age of 25 (between 26-33 years of age) is negatively correlated with economic contractions during impressionable years. Moreover, there is a positive correlation between economic stagnations during the critical years and downturns between 34 and 41 years of age while no correlation is found with the shocks before the Gallup survey year. Gender[7], marital status, and elementary education are not significantly associated with past economic shocks while secondary education is positively correlated with the economic contraction variable. College education along with rural residence are negatively linked to economic shocks during early adulthood. We also examine whether risk-taking, optimism, reaching goals and working hard are associated with macroeconomic contractions during youth and find no significant relationship. Lastly, household income is not significantly correlated with economic contractions during impressionable years.

Table 3 examines the effects of macroeconomic contractions at youth on future self-employment and business ownership estimating Equation (1). We present the effects of macroeconomic shocks on self-employment in Panel A and business ownership in Panel B. For each outcome variable, we present (9) specifications. In specification (1), we do not include any fixed effects or control variables. We include country fixed effects in specification (2), add

[7] We also checked interaction effects between economic downturns and gender in unreported regressions across all countries, developing and developed countries and find insignificant interactions.

survey year fixed effects in specification (3) while we add country times age interactions in specification (4). Specification (5) includes age fixed effects and specifications (6) to (9) add demographic control variables one-by-one in each regression. In the rest of the tables presented below, we report the specification which includes all the fixed effects and controls. Past economic contractions during impressionable years are positively and significantly associated with entrepreneurship in all specifications. Importantly, the estimated coefficients decrease in magnitude following a similar pattern when controlling one by one for fixed effects but remain similar with the inclusion of demographic controls in columns (5)-(9). This indicates that the effect of past shocks is fairly exogenous to observable demographic characteristics. Specifically, individuals who experienced at least one economic contraction during their impressionable years are 1.59% (or 4% of the mean) more likely to become self-employed and 1.31% (or 6% of the mean) more likely to become business owners as adults (Column (9)). Economic declines in GDP growth before the survey year have a significant effect only on business ownership. Overall, we find that past economic disasters increase future entrepreneurship around the world. The estimates also indicate that women are less likely to become business owners while married individuals and the ones who live in a rural area are more likely to start a business. These findings are in line with Cotofan et al. (2021) who reports that economic conditions during impressionable years, measured through GDP per capita in the state of residence during youth, can significantly predict individual self-reported job preferences using the General Social Survey in the US.

Next, we investigate specific attitudes which could be formed at youth and are cited as the reasons to become business owners by the respondents in the Gallup survey. Table 4 studies the effects of past economic shocks on different reasons to become a business owner. Mean values show that most people became business owners because they had a great idea for a business. Being your own boss and not being able to find a suitable job are reported to be other

important causes of business ownership. We find that economic contractions experienced between 18 and 25 years of age increase the probability of business ownership for owners who couldn't find a suitable job, wanted to be their own boss and had a great idea for a business by 0.7% to 1.1% which is approximately 8% to 12% relative to the mean. However, economic contractions experienced during impressionable years do not explain business ownership due to being afraid of job loss or having an opportunity to make money. Economic shocks before the survey year do not have a significant effect on any of the outcome variables. Finding a positive relationship between economic contractions during youth and business owners who started their business because they wanted to be their own boss confirms our initial hypothesis and potential mechanisms described in the introduction of this study. Moreover, we know from previous literature that "bad moods may foster creativity" (George and Zhou, 2002). During downturns, people may also experience negative feelings like stress or fear about their financial situation (Greenglass et al., 2013) which can lead to "having a bad mood". Thus, a possible explanation for our findings is that people came up with great business plans during the economic downturns, but they implement their ideas later in life when, for example, they were in a better financial state. Furthermore, for the business owners who started their business because they couldn't find a suitable job, we hypothesize that the economic shock experience possibly made people feel that working as a salaried employee does not "suit" them and that's why they chose to transit into business ownership.

4.1 Ruling Out Alternative Hypothesis

4.1.1 Effects of Shocks Experienced Before and After Impressionable Years

As explained all along, in this study we investigate whether experiencing a macroeconomic shock during youth could affect future entrepreneurship focusing on the impressionable years hypothesis. However, the lifelong openness hypothesis suggests that individuals alter their attitudes constantly throughout their lives responding to the changing environment around

them (Brim and Kagan, 1980). Therefore, we test whether economic shocks experienced before the age of 18 or after the age of 25 affect future self-employment and business ownership in Table 5. The outcome variable for columns (1) to (4) is self-employment, whereas for columns (5) to (8) is business ownership. We start by presenting the results estimating the baseline specification (Columns (1) and (5)) and then controlling for shocks experienced between 10-17, 26-33 and 34-41 years of age one by one in the regressions. It is evident that experiencing a macro shock during non-impressionable years does not have any impact on entrepreneurship. Experiencing an economic downturn between 10 and 17 years of age seems to have a slightly negative impact on business ownership. However, this effect is barely significant, while the effect from impressionable years is always significant and persistent. These findings confirm our initial hypothesis indicating that such attitudes are determined during these critical years (18-25).

4.1.2 Can Graduating from College During Impressionable Years Explain Our Results?

An important literature examines the long-lasting effects of economic downturns on workers and find that graduating from college during economic contractions could be linked to future labour market outcomes (Kahn, 2010; Oreopoulos et al., 2012). Specifically, entering the labour market during an economic downturn has a negative effect on future income and occupational attainment. In addition, the probability of becoming self-employed at adulthood increases when liquidity constraints are removed (Lindh and Ohlsson, 1996). Moreover, economic conditions when managers enter the labor market have long-run effects on their career paths and managerial styles (Schoar and Zuo, 2017), while economic conditions when graduates enter the labour market can influence subsequent employment, earnings (Genda et al., 2010; Yagan, 2019) and job match quality (Hagedorn and Manovskii, 2013; Liu et al., 2016) in their careers.

Because we are investigating macroeconomic shocks experienced between 18 to 25

years of age, there is a possibility of the entrepreneurship effect we find to be an indirect by-product of these types of influences. We examine this potential explanation in Table 6. Only 24 percent of the regression sample has a college degree while this percentage is much smaller for self-employed and business owners. Nevertheless, we run sub-sample regressions by education levels and present the results in Table 6, Panel A. In any event, we create a sample where the majority of the individuals did not enter the labour market during an economic downturn (i.e. they were in the labour market before) and the results are positive and significant for both self-employment and business ownership (Columns (1) and (2)). The results for the sample of college graduates are similar to those with less than college degree (Columns (3) and (4)).

Next, we control for education (Columns (2) and (5)) and subsequent income (Columns (3) and (6)) and present the results in Table 6, Panel B. It is clear that the inclusion of these variables in our models barely changes the magnitude of the economic contraction coefficients for both self-employment and business ownership. Moreover, we control for occupation choices and present the results in Table 6, Panel C. One important caveat in these regressions is that we end up with a much smaller number of observations than the baseline regressions because occupation information is not available for everyone in the sample. Nevertheless, we start by repeating the baseline specification for the respondents we have information on their occupation (Columns (1) and (5) in Panel C) and control for education (Columns (2) and (6) in Panel C), income dummies (Columns (3) and (7) in Panel C) and occupation dummies (Columns (4) and (8) in Panel C) one by one in the regressions. We find that the effect of economic contractions during impressionable years on self-employment and business ownership remains positive and significant in all these scenarios. Overall, we show that our results remain robust after controlling for education, income, and occupation fixed effects and when we limit our sample to individuals who did not graduate from college during an economic

downturn.

4.1.3 Do Negative Economic Shocks Work Through Personality Indicators?

Previous research shows that certain personality traits, such as risk-taking, optimism and locus of control are mostly found among self-employed individuals (Baum and Locke, 2004; Ekelund et al., 2005; Puri and Robinson, 2007). We also know that macroeconomic contractions could be linked to changes in risk-taking (Malmendier and Nagel, 2011) and that risk-taking is also known to be positively correlated with self-employment along with optimism and locus of control. Moreover, Shigeoka (2019) shows that individuals who experienced economic shocks during impressionable years become more risk averse in Japan. Therefore, it is essential to examine whether economic conditions during youth are associated with future entrepreneurship through personality traits. First, we estimate these variables as a function of past shocks and find that there is no statistically significant effect (Table 2, Rows (12) to (15)) of past economic shocks at youth on these behavioural indicators. In other words, our results suggest that subjective indicators such as risk-taking, optimism and locus of control are not significantly associated with economic contractions during youth. Second, we estimate entrepreneurship regressions including these variables one by one and present the results in Table 7. We start by repeating the baseline specification in column (1) for self-employment and column (6) for business ownership and control for these personality indicators in the rest of the columns. It is clear that the effect of past economic shocks on entrepreneurship barely changes with the inclusion of these variables which suggests that downturns during impressionable years do not work through these personality indicators. Information regarding the personality indicators is not available for the full sample. Therefore, we coded for the missing values for our regressions to be comparable.

4.1.4 Potential Sample Selection Bias

Our regression sample excludes unemployed and out of the workforce individuals. Hence, we examine the bias due to the exclusion of these people in Table 8. We generate two new outcome variables; a binary indicator equal to 1 if the respondent is in labour force and 0 if not and similarly another binary indicator equal to 1 if the respondent is unemployed and 0 otherwise. We estimate these variables as a function of past economic shocks and present the results in Table 8, Panel A. We find no significant association between economic contractions during impressionable years and being in the labour force while there is a significant effect for those being unemployed. Next, we re-define our main outcome variables including unemployed individuals in the sample. Table 8, Panel B shows that the inclusion of these people did not change our results. Furthermore, we include both unemployed and out of the workforce individuals in our regression sample and we still find significant results in Table 8, Panel C. Therefore, our results are not biased due to sample selection because in any scenario, macroeconomic shocks during early adulthood are significantly and positively associated with future entrepreneurship.

4.2 Robustness Checks

Our data do not include information on parental indicators or other background information such as race. Thus, it is likely that our results could be biased due to selection on such unobservable characteristics. We examine this issue of selection on unobservable characteristics in our models using a novel estimation method which was first introduced by (Altonji et al., 2005) and developed further by (Oster, 2016). This method suggests that the amount of selection on unobservable characteristics is a proportion of the amount of selection on observables. Specifically, the ratio of unobservables to the selection on observables can point out the degree of transition into entrepreneurship. We present the results in Table 9 and show that controlling for potential selection on unobserved characteristics increases the coefficients. Thus, our results seem to be biased downwards and the true effects are probably

larger.

We also want to examine whether the individuals opened their business when they experienced an economic shock (i.e., when they were between 18 and 25 years old) or afterwards. To do so, we re-define the business ownership variable as follows. It is equal to 1 if the individual is a business owner who has non-missing information for business staring age, which is more than 25 and less than 55 and 0 if the individual is an employee. Indeed, we have 22120 business owners in the full sample while we have information on business starting ages only for 20 percent of them in 72 countries in the 2013 round of the data. In any event, we create a sample where none of the individuals started their business during their impressionable years. The results are presented in Table 10 and without any controls show a 5 percent increase in business ownership due to impressionable years economic contraction experience while this number becomes approximately 2 percent including all fixed effects and demographic controls. This result is similar to our findings for the full sample of business owners.

The GWP also provides information on whether people are working full-time or part-time. We use this information and define our main outcome variables accordingly. Table 11, Panel A shows that past economic disasters increase the probability of full-time self-employment and business ownership by 1 to 1.5 percent (6 to 7 percent of the mean) while they do not influence part-time business ownership. We do not report coefficients on control variables for brevity, but it is important to mention that being female is positively associated with part-time self-employment and business ownership but is negatively associated with full-time entrepreneurship. In Table 11, Panel B, we examine the effects of economic shocks on business ownership by ownership structure, size and the formality of business. Our dependent variables are binary indicators for sole, micro, small, registered and unregistered business ownership. Sole business owners are the persons who have no partners. The estimates on past economic shocks for sole business ownership is slightly smaller than the value estimated for

the overall business ownership. Economic disasters at youth appear to have a greater influence on micro-business ownership than on small-business ownership. For instance, the coefficient on economic contraction dummy is five times larger for the former. Our results align with previous studies suggesting that micro-type enterprises are mostly affected by GDP changes in a country (Konon et al., 2018). The effects of past shocks are slightly stronger on registered business ownership than unregistered business ownership. Unreported coefficients also show that higher educated people are more likely to own larger and formal businesses, a finding similar to the previous literature (La Porta and Shleifer, 2014).

Moreover, there is evidence that the self-employed are really a minority in advanced economies while people prefer to work as self-employed due to the freedom it offers in the developing countries[8]. Therefore, it is important to investigate the effects of past macroeconomic shocks for different sets of countries. There is a great deal of variation in terms of country-level shadow economies, financial development, and ease of doing business in our regression sample. Thus, we utilize such differences across countries and estimate sub-sample regressions. The data on shadow economy estimates are gathered from Schneider et al. (2011) while data on financial development and ease of doing business indexes are provided by the World Bank. Regression coefficient estimates are presented in Figures 2, 3 and 4. The findings show that macroeconomic shock experiences at youth have stronger effects on future self-employment and business ownership in countries with lower levels of shadow economy, higher financial development and with higher ease of doing business ranking. We also report detailed estimation results in the Appendix. Overall, these results may suggest that in countries with more stable markets, people are less accustomed to economic shocks and uncertainty therefore bad economic experiences at youth could have more lasting impacts than in less developed and more informal economies.

[8] For further information see https://www.brookings.edu/blog/future-development/2017/09/29/are-theself-employed-happy-entrepreneurs.

4.2.1 Additional Robustness Checks

We check the sensitivity of our findings to a battery of robustness tests and present these analyses in the Appendix. It can be argued that persistency in the labour market could explain our results. For instance, our regressions may simply capture the pattern of people who did not find a salaried job when they first went to the job market, stayed in non-salaried sector, and started their careers as business owners. We partially tackled this hypothesis in the previous section when we ruled out the possibility that our results could be driven by individuals graduating during bad economic conditions. Nevertheless, we further restrict our sample to people who have completed up to secondary education, are more than 30 years old and opened their business after the age of 30. As a result, we create a sample in which there is a gap of approximately 10 years from when people graduated (i.e., entered the labour market) until the time they opened their firms. Since we are talking about a large period of time, it is very likely that the entrepreneurs in our sample were working before they started their own business. In any event, Appendix Table 1 shows that deep economic contractions during youth still have a significant effect in this specification while the coefficients are similar in magnitude compared to the baseline specifications.

We control for religion fixed effects, cohort fixed effects, country-survey year specific trends and the average GDP per capita growth during impressionable years and find similar results to the baseline specification in Appendix Table 2. Religion can be linked to entrepreneurial decisions because religious people may decide according to their religious beliefs (Dodd and Gotsis, 2007) while in a repeated cross-sectional dataset age and survey year dummies may not capture all cohort effects, so we include birth-year fixed effects (Giuliano and Spilimbergo, 2014). Country times survey year interactions control for all possible country and time-varying trends. Including the average GDP Growth during impressionable years

shows that deep economic contractions still have an effect while controlling for potential expansions during that period.

As mentioned in the data section, we use alternative definitions of macroeconomic shock exposure during impressionable years in order to examine whether our results are robust to different measurements of economic contractions and present our findings in Appendix Table 3. In Panel A, we present the results when the number of contraction years exposed during impressionable years used as a continuous variable rather than the binary indicator used in our baseline specification. The significant relationship is confirmed with this method. Panel B uses the binary indicator of macroeconomic shock exposure as in the baseline specification but replace the 5th lowest percentile growth rate with a 10th lowest percentile growth rate in the definition of an economic contraction. This definition allows us to include more countries in our estimates that were dropped before because it also captures milder economic downturns. Appendix Table 3 Panel B shows that the estimates are still statistically significant in this specification, but they are smaller in magnitude suggesting that the probability of becoming an entrepreneur is more sensitive to severe economic shocks than mild shocks experienced during impressionable years. In Panel C, we present the results of our estimation when an economic contraction is defined based on a country's negative annual economic growth rate. This definition does not provide much variation in our key variable since 70% of the individuals in our sample would have experienced at least one such event during their impressionable years. Nevertheless, our findings are still robust to this test while the coefficients are much smaller in magnitude because this definition includes even the very minor economic shocks. Next, Panels D and E define contractions when the negative annual economic growth rates are greater than 2% and/or 5%, respectively. Our results are again robust to these checks. Finally, in Panel F, we present the results using the maximum annual unemployment rate (in percentage terms) of a given country defined over an individual's impressionable years as the measure of economic

contraction and find that our results are robust to this specification as well. Importantly, this method does not exclude any countries from our analysis. Overall, our results are robust to different methods of measuring economic contractions while the probability of becoming an entrepreneur in later life is more sensitive to severe economic shocks than mild economic shocks experienced during the ages of 18-25[9].

Moreover, we examine the impact of macroeconomic downturns at each age during impressionable years on entrepreneurship and present the results. We find larger effects from the economic contractions experienced at the ages of 21 and 24. Furthermore, information on self-employment and business ownership are available for 134 countries in the Gallup survey while we do not have full information on economic contraction experiences of all cohorts in these countries based on our baseline definition. Nevertheless, we find similar results using this full sample of 134 countries with an alternative definition of an economic contraction implying that economic shocks experienced during youth again significantly increase the likelihood of self-employment and business ownership in later adulthood. In addition, positive effects of past negative shocks on the probability of micro business ownership and reasons for becoming a business owner remain similar using the full set of countries.

We observe that a few countries did not experience any economic contraction based on our baseline definition of economic contraction which measures severe downturns. These observations do not contribute to our identification strategy when we include country fixed effects in our models. Indeed, we have already tested above using, for example, the maximum unemployment rate during impressionable years where all observations contribute to our identification. In any event, the estimated coefficients remain similar when we drop these

[9] We also examined the effects of economic shocks during impressionable years by cause/result in the unreported regressions. That is, we divided the economic contraction dummy into several categories based on whether a country experienced another crisis in the same year of contraction or not. We find that currency crisis/external debt crisis and banking crisis significantly increase future self-employment while banking crisis increase future business ownership. Details are available upon request from authors.

observations from our sample and replicate the baseline specification.

Also, it is possible that economic downturns in a particular country could coincide with other dramatic events taking place in the same country. For example, individuals born from 1966 to 1973 in a country that was part of the Soviet Union, such as Poland, were all at impressionable age when the Soviet Union collapsed in 1991. In addition, individuals born from 1965 to 1973 in Poland experienced at least one macroeconomic contraction when they were between 18 and 25 years of age. In order to examine whether our estimates are driven by major historical events, we generate a binary indicator that equals to 1 if an individual experienced such an event in his/her country of residence during impressionable years and 0 otherwise and control for this variable in our baseline specification[10]. We find that controlling for such events during impressionable years do not change our main results as our key estimates on economic downturn exposure during the critical ages of 18-25 remain significant and similar in magnitude compared to the baseline estimates. Furthermore, we explore whether our results are sensitive to population weights. We replicate the baseline regressions including population weights and the results, again, remain significant and similar in magnitude.

Next, we estimate models including several economic outcomes, such as job satisfaction, ideal job, productivity in job and income, as a function of entrepreneurship. We find that business owners, full-time owners in particular, are more likely to be satisfied with their jobs in line with findings by Nikolova (2019). On the contrary, self-employment is negatively correlated with job satisfaction. The same pattern is observed when the outcome variable is "Ideal Job". Similarly, full-time business owners are more likely to believe that their jobs are ideal for them compared to the self-employed. Business ownership is also positively correlated with productivity in a job. Lastly, business owners appear to earn more than the self-employed with one exception; part-time business ownership is negatively correlated with

[10] See the Appendix for the definition of this variable.

income.

5 Conclusion

Impressionable years hypothesis suggests that economic contraction experiences between 18 and 25 years of age can strongly influence attitudes towards entrepreneurship. Accordingly, we study the effects of macroeconomic shocks experienced during 18-25 years of age on later adulthood entrepreneurship for individuals who were born between 1954 and 1989 in 77 countries around the world. People who grew up during an economic contraction period are 1-2% more likely to become self-employed or business owners later in life. These are large effects given that 32% of our sample are self-employed and 22% are business owners. More than 80% of people start their business after the age of 25 while median age at first business is 32. Macroeconomic shocks during impressionable years are more influential on business starting decisions of entrepreneurs who opened a business because they couldn't find a job, they wanted to be their own boss, or they had a great idea for a business. However, past macroeconomic experiences cannot explain business openings for those who became an entrepreneur because they were afraid of losing their job or saw an opportunity to make money.

Findings are robust to numerous methods of measuring economic contractions and controlling for economic shocks experienced before and after the impressionable years. Graduating from college and entering the job market in a bad economy during impressionable years cannot explain our results. These findings are also robust to controlling for behavioural variables because macroeconomic shocks experienced at youth are not associated with subjective measures of risk-taking, optimism and locus of control. Our results are also robust to selection bias due to excluding people who are not working. The effects of past economic downturns become larger when we restrict the sample to those who started a business after the age of 25 and control for selection on unobservables.

We also find that the economic shocks experienced at the age of 21 and 24 have the

largest influence of future entrepreneurship. The estimates are slightly lower for sole business ownership while the effects are much larger for micro-business ownership than small business ownership. Past economic shocks significantly increase the likelihood of both registered and unregistered business ownership while the effects are slightly larger for the former. Subsample analysis reveals that the effect of experiencing macroeconomic disasters during youth on future entrepreneurship is stronger in countries with a larger shadow economy, higher levels of financial development and higher levels of ease of doing business. Overall, our study has important policy implications regarding future entrepreneurship in countries that experience economic downturns or high unemployment rates.

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Table 1: Descriptive Statistics

	(1)	(2)	(3)	(4)	(5)
		Self-Employment Sample		Business Ownership Sample	
	Full Sample	Self-Employed	Salaried	Business Owner	Salaried
Panel A: Means of Economic Shocks					
Economic Contraction$_{imp.yrs}$	0.186	0.215	0.173***	0.232	0.178***
	(0.389)	(0.410)	(0.378)	(0.422)	(0.382)
Economic Contraction$_{10-17}$	0.202	0.224	0.191***	0.237	0.199***
	(0.401)	(0.417)	(0.393)	(0.425)	(0.399)
Economic Contraction$_{26-33}$	0.163	0.162	0.164	0.166	0.159*
	(0.370)	(0.368)	(0.370)	(0.372)	(0.366)
Economic Contraction$_{34-41}$	0.133	0.119	0.140***	0.124	0.133***
	(0.340)	(0.324)	(0.347)	(0.329)	(0.340)
Economic Contraction$_{t-1}$	0.118	0.0903	0.131***	0.0384	0.0328***
	(0.322)	(0.286)	(0.338)	(0.192)	(0.178)
Panel B: Means of Demographic Characteristics					
Age	39.849	40.503	39.533***	40.66	39.563***
	(8.688)	(8.611)	(8.707)	(8.485)	(8.740)
Female	0.464	0.464	0.463	0.452	0.482***
	(0.498)	(0.498)	(0.498)	(0.497)	(0.499)
Married	0.712	0.756	0.690***	0.749	0.682***
	(0.452)	(0.428)	(0.462)	(0.433)	(0.465)
Elementary Education	0.222	0.38	0.146***	0.307	0.172***
	(0.416)	(0.485)	(0.353)	(0.461)	(0.377)
Secondary Education	0.532	0.483	0.556***	0.524	0.545***
	(0.498)	(0.499)	(0.496)	(0.499)	(0.497)
College Degree	0.244	0.136	0.297***	0.167	0.281***
	(0.430)	(0.342)	(0.457)	(0.373)	(0.449)
Rural Residence	0.524	0.614	0.48***	0.556	0.502***
	(0.499)	(0.486)	(0.499)	(0.496)	(0.499)
Panel C: Means of Personality Indicators					
Willingness to Take Risks	0.466	0.488	0.457***	0.552	0.428***
	(0.498)	(0.499)	(0.498)	(0.497)	(0.494)
Optimism	0.769	0.773	0.767	0.818	0.762***
	(0.421)	(0.418)	(0.422)	(0.385)	(0.425)
Reaching Goals	0.803	0.811	0.799***	0.867	0.803***
	(0.397)	(0.391)	(0.400)	(0.339)	(0.397)
Working Hard	0.799	0.839	0.780***	0.858	0.784***
	(0.400)	(0.367)	(0.414)	(0.348)	(0.411)
Panel D: Means of Country Level Indicators					
Financial Development Index	0.396	0.332	0.427***	0.335	0.416***
	(0.193)	(0.170)	(0.197)	(0.180)	(0.191)
Shadow Economy Index	28.419	31.584	26.888***	33.527	27.513***
	(14.005)	(15.542)	(12.919)	(15.528)	(13.092)
Ease of Doing Business Index	63.853	75.655	58.136***	79.273	59.613***
	(44.136)	(44.477)	(42.823)	(48.683)	(42.199)

Notes: Standard deviations are in parentheses. Significance stars denote the results from two sample mean comparison t-tests;
*, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. Elementary Education: Completed elementary education or less (up to eight years of basic education); Secondary Education: Completed some secondary education up to three years tertiary education (nine to 15 years of education); College Degree: Completed four years of education beyond “high school” and/or received a four-year college degree.

Table 2: Potential Correlates of Economic Contractions during Impressionable Years

	(1)	(2)	(3)	(4)
Independent Variable →	At Least One Eonomic Contraction during Impressionable Years			
Outcome Variables ↓				
(1) Economic Contraction$_{10\text{-}17}$	-0.196***	-0.196***	-0.403***	-0.410***
	(3.61)	(3.61)	(8.67)	(8.93)
(2) Economic Contraction$_{26\text{-}33}$	-0.209***	-0.209***	-0.430***	-0.428***
	(3.57)	(3.58)	(9.77)	(9.91)
(3) Economic Contraction$_{34\text{-}41}$	-0.0230	-0.0230	0.110**	0.109**
	(0.41)	(0.41)	(2.05)	(2.03)
(4) Economic Contraction$_{t\text{-}1}$	-0.00603	-0.00447	-0.00600	-0.00593
	(1.21)	(1.09)	(1.19)	(1.19)
(5) Female	-0.00565	-0.00566	0.00250	0.00182
	(1.11)	(1.11)	(0.55)	(0.45)
(6) Married	0.0277*	0.0277*	0.00867	0.00746
	(1.70)	(1.70)	(0.64)	(1.38)
(7) Elementary Education	0.0264*	0.0262*	-0.00220	-0.00152
	(1.81)	(1.80)	(0.61)	(0.42)
(8) Secondary Education	-0.0115	-0.0115	0.0115**	0.00874*
	(1.01)	(1.01)	(2.21)	(1.81)
(9) College Education	-0.0149*	-0.0147*	-0.00927**	-0.00722*
	(1.94)	(1.93)	(2.20)	(1.85)
(10) Rural Residence	-0.00973**	-0.00933**	-0.00869**	-0.0100**
	(2.17)	(2.05)	(2.06)	(2.61)
(11) White Collar Occupation	-0.00651	-0.00634	0.00112	0.00199
	(0.89)	(0.87)	(0.19)	(0.34)
(12) Willingness to Take Risks	-0.000928	-0.000503	-0.00705	-0.00521
	(0.07)	(0.04)	(0.50)	(0.36)
(13) Optimism	-0.00818	-0.00795	-0.00336	-0.0034
	(1.58)	(1.55)	(0.52)	(0.51)
(14) Reaching Goals	-0.00756	-0.00608	-0.00886	-0.00864
	(1.49)	(1.19)	(1.55)	(1.51)
(15) Working Hard	-0.00099	-0.000674	0.00105	0.0014
	(0.26)	(0.17)	(0.27)	(0.38)
(16) Household Income	-0.00563	-0.00516	-0.00278	0.00193
	(0.29)	(0.27)	(0.19)	(0.13)
Country Fixed Effects	Yes	Yes	Yes	Yes
Survey Year Fixed Effects	No	Yes	Yes	Yes
Country*Age Interactions	No	No	Yes	Yes
Age Fixed Effects	No	No	No	Yes

Notes: Each cell represents a different regression of the corresponding outcome variables in that row on economic contraction during impressionable years dummy controlling for the corresponding fixed effects in that column using Ordinary Least Squares. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. We define the White Collar Occupation as a dummy equal to 1 if the respondent falls into one of these occupation categories: managerial, professional, associate professional, technical, sales, clerical and secretarial occupations and zero if he falls into the following categories: personal services, craft and related, plant and machine operatives, and other unskilled occupations. Household income is coded into six categories from the lowest to the highest.

Table 3: Effects of Negative Economic Shocks During Impressionable Years on Future Self-Employment and Business Ownership. The Role of Demographic Characteristics.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Outcome: Self-Employed *[Mean: 0.325]*									
Economic Contraction$_{imp.yrs}$	0.0592*	0.0259***	0.0261***	0.0151***	0.0151***	0.0151***	0.0151***	0.0150***	0.0159***
	(1.83)	(3.21)	(3.21)	(3.90)	(3.91)	(3.93)	(3.93)	(3.90)	(4.09)
Economic Contraction$_{t-1}$						0.0143	0.0142	0.0143	0.0144
						(1.44)	(1.42)	(1.43)	(1.45)
Female							0.00538	0.00586	0.00698
							(0.49)	(0.54)	(0.64)
Married								0.0180***	0.0116***
								(3.14)	(2.92)
Rural Residence									0.0890***
									(3.79)
Number of Observations	171738	171738	171738	171738	171738	171738	171738	171738	171738
Number of Countries	77	77	77	77	77	77	77	77	77
Number of Survey Years	6	6	6	6	6	6	6	6	6
Pseudo R^2	0.002	0.125	0.126	0.135	0.135	0.135	0.135	0.136	0.143
Panel B: Outcome: Business Owner *[Mean: 0.221]*									
Economic Contraction$_{imp.yrs}$	0.0587***	0.0262***	0.0263***	0.0132***	0.0130***	0.0131***	0.0132***	0.0129***	0.0131***
	(2.89)	(3.83)	(3.82)	(3.47)	(3.50)	(3.52)	(3.52)	(3.43)	(3.46)
Economic Contraction$_{t-1}$						0.0317***	0.0318***	0.0312***	0.0304***
						(3.33)	(3.30)	(3.19)	(3.00)
Female							-0.0187*	-0.0177*	-0.0175*
							(1.83)	(1.72)	(1.69)
Married								0.0309***	0.0290***
								(6.54)	(6.53)
Rural Residence									0.0291***
Number of Observations	99728	99728	99728	99728	99728	99728	99728	99728	99728
Number of Countries	77	77	77	77	77	77	77	77	77
Number of Survey Years	4	4	4	4	4	4	4	4	4
Pseudo R^2	0.003	0.0979	0.0986	0.107	0.108	0.108	0.109	0.11	0.111
Country Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Year Fixed Effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country*Age Interactions	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Age Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes	Yes

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively.

Table 4: The Effect of Negative Economic Shocks during Impressionable Years on Different Reasons to Become a Business Owner

Outcome →	(1) **Couldn't Find a Suitable Job** *[Mean: 0.089]*	(2) **Opportunity to Make Money** *[Mean: 0.078]*	(3) **Afraid of Job Loss** *[Mean: 0.020]*	(4) **To Be Own Boss** *[Mean: 0.089]*	(5) **Great Idea for a Business** *[Mean: 0.129]*
Economic Contraction$_{imp.yrs}$	0.0116***	0.00597	0.000589	0.00741*	0.0113***
	(4.45)	(1.46)	(0.34)	(1.88)	(3.61)
Economic Contraction$_{t-1}$	0.00551	-0.0121	-0.00897	-0.0185	0.0195
	(0.25)	(0.56)	(1.42)	(0.75)	(1.00)
Controls in Table 3 Column 9	Yes	Yes	Yes	Yes	Yes
Number of Observations	85217	43072	37572	44374	89122
Number of Countries	77	67	63	68	77
Number of Survey Years	4	2	2	2	4
Pseudo R^2	0.178	0.271	0.274	0.264	0.159

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. The outcome variables here are binary indicators equal to one if the respondent became a business owner due to the reasons mentioned above and zero if the respondent is a salaried employee. All specifications include Country, Survey Year, Age Fixed Effects, Country*Age Interactions and Education dummies. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Table 5: The Role of Shocks Experienced Before and After Impressionable Years

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Outcome →	**Self-Employed** *[Mean: 0.325]*				**Business Owner** *[Mean: 0.221]*			
Economic Contraction$_{imp.yrs}$	0.0159***	0.0133***	0.0190***	0.0160***	0.0131***	0.00956**	0.0150***	0.0112**
	(4.09)	(2.79)	(4.16)	(3.35)	(3.46)	(2.56)	(3.23)	(2.06)
Economic Contraction$_{10-17}$		-0.00636				-0.00776*		
		(1.40)				(1.74)		
Economic Contraction$_{26-33}$			0.00762				0.00429	
			(1.40)				(0.89)	
Economic Contraction$_{34-41}$				-0.000694				0.00272
				(0.13)				(0.42)
Controls in Table 3 Column 9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	171738	171738	171738	141708	99728	99728	99728	79300
Number of Countries	77	77	77	77	77	77	77	77
Number of Survey Years	6	6	6	6	4	4	4	4
Pseudo R^2	0.143	0.143	0.143	0.147	0.111	0.111	0.111	0.108

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Country, Survey Year, Age Fixed Effects and Country*Age Interactions. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Table 6: Can Graduating from College During Impressionable Years Explain Our Results?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Subsample Estimates by Education Level								
	Sample: Less than College Education		Sample: College and Above Education					
Outcome →	**Self-Employed**	**Business Owner**	**Self-Employed**	**Business Owner**				
Economic Contraction$_{imp,yrs}$	0.0161***	0.0140***	0.0139**	0.0115*				
	(3.81)	(3.32)	(2.28)	(1.69)				
Number of Observations	128222	73616	41597	25408				
Pseudo R^2	0.152	0.116	0.0675	0.0877				
Panel B: Controlling for Education and Subsequent Income								
Outcome →	**Self-Employed**			**Business Owner**				
Economic Contraction$_{imp,yrs}$	0.0159***	0.0155***	0.0155***	0.0131***	0.0131***	0.0130***		
	(4.09)	(4.12)	(4.19)	(3.46)	(3.46)	(3.43)		
Secondary Education		-0.0972***	-0.0800***		-0.0154	-0.0188**		
		(5.31)	(5.06)		(1.63)	(2.06)		
College Education		-0.170***	-0.144***		-0.0581***	-0.0673***		
		(8.29)	(8.40)		(4.63)	(5.38)		
Education Dummies	No	Yes	Yes	No	Yes	Yes		
Income Dummies	No	No	Yes	No	No	Yes		
Number of Observations	171738	171738	171738	99728	99728	99728		
Pseudo R^2	0.143	0.154	0.159	0.111	0.113	0.114		
Panel C: Controlling for Education, Subsequent Income and Occupation. Sample with Non-Missing Occupation Information								
Outcome →	**Self-Employed**				**Business Owner**			
Economic Contraction$_{imp,yrs}$	0.0106**	0.00996**	0.00929**	0.00890***	0.00692*	0.00692*	0.00679*	0.00697*
	(2.43)	(2.43)	(2.26)	(2.64)	(1.72)	(1.73)	(1.69)	(1.80)
Secondary Education		-0.107***	-0.0837***	-0.0187***		-0.0221***	-0.0208***	0.00246
		(6.69)	(6.52)	(3.49)		(4.39)	(4.33)	(0.54)
College Education		-0.154***	-0.116***	-0.0360***		-0.0316***	-0.0313***	-0.00610
		(8.36)	(8.12)	(4.10)		(4.69)	(4.59)	(0.88)
Education Dummies	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Income Dummies	No	No	Yes	Yes	No	No	Yes	Yes
Occupation Dummies	No	No	No	Yes	No	No	No	Yes
Number of Observations	116668	116668	116668	116668	62752	62752	62752	62752
Pseudo R^2	0.165	0.181	0.192	0.277	0.118	0.12	0.121	0.175

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include the same controls as in Table 3, Column 9. Occupation dummies include Managers, Office Workers, Sales Workers, Service Workers, Construction Workers, Manufacturing Workers, Transportation Workers, Repair Workers, Farming/Fishing or Forestry Workers and other Occupations, the excluded group is Professional Workers. Household income is coded into six dummies from the lowest to the highest, the sixth dummy accounts for the missing observations. All specifications include Country, Survey Year, Age Fixed Effects and Country*Age Interactions. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Table 7: Do Negative Shocks Work through Personality Indicators?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Outcome →	**Self-Employed** *[Mean: 0.325]*					**Business Owner [Mean: 0.221]**				
Economic Contraction$_{imp.yrs}$	0.0159***	0.0159***	0.0159***	0.0159***	0.0158***	0.0131***	0.0133***	0.0133***	0.0134***	0.0134***
	(4.09)	(4.06)	(4.07)	(4.07)	(4.07)	(3.46)	(3.48)	(3.47)	(3.48)	(3.53)
Willingness to Take Risks		0.0584***	0.0583***	0.0574***	0.0573***		0.0976***	0.0959***	0.0932***	0.0932***
		(5.83)	(5.77)	(5.72)	(5.70)		(8.19)	(8.02)	(7.81)	(7.72)
Optimism			0.00124	-0.00179	-0.00264			0.0258***	0.0171**	0.0153*
			(0.13)	(0.18)	(0.26)			(3.18)	(2.12)	(1.85)
Reaching Goals				0.0111**	0.0103**				0.0363***	0.0350***
				(2.24)	(2.08)				(4.43)	(4.21)
Working Hard					0.0148***					0.0258***
					(2.82)					(5.32)
Controls in Table 3 Column 9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	171738	171738	171738	171738	171738	99728	99728	99728	99728	99728
Pseudo R^2	0.143	0.143	0.143	0.143	0.143	0.111	0.112	0.113	0.113	0.114

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. All specifications include Country, Survey Year, Age Fixed Effects and Country*Age Interactions. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Table 8: Addressing Potential Selection Bias in Our Estimates

	(1)	(2)
Panel A: Is There any Sample Selection?		
Outcome →	**Being in the Labour Force** *[Mean: 0.750]*	**Being Unemployed** *[Mean: 0.0797]*
Economic Contraction$_{imp.yrs}$	-0.00326	0.00500**
	(1.09)	(2.09)
Controls in Table 3 Column 9	Yes	Yes
Number of Observations	248957	186800
Pseudo R^2	0.172	0.108
Panel B: Including Unemployed Individuals		
Outcome →	**Self-Employed** *[Mean: 0.299]*	**Business Owner** *[Mean: 0.200]*
Economic Contraction$_{imp.yrs}$	0.0122***	0.0105***
	(3.49)	(3.01)
Controls in Table 3 Column 9	Yes	Yes
Number of Observations	186553	110393
Pseudo R^2	0.118	0.0984
Panel C: Including Unemployed and Out of the Labor Force Individuals		
	Self-Employed *[Mean: 0.225]*	**Business Owner** *[Mean: 0.147]*
Economic Contraction$_{imp.yrs}$	0.00790**	0.00668***
	(2.57)	(2.59)
Controls in Table 3 Column 9	Yes	Yes
Number of Observations	248355	150217
Pseudo R^2	0.144	0.108

Notes: The reported coefficients are the marginal effects using Probit models. In Panel B, the outcome variables are binary indicators equal to 1 if the respondent is self-employed or business owner and zero if he is a salaried employee and/or unemployed. Similarly, in Panel C, the outcome variables are equal to 1 if the respondent is self-employed or business owner and zero if he/she is a salaried employee, unemployed and/or out of the labour force. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Country, Survey Year, Age Fixed Effects, Country*Age Interactions and education dummies. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Table 9: Controlling for Unobserved Variables using Oster (2016) Method

	(1) **Self-Employed**	(2) **Business Owner**
1) Selection in Unobservables is equal to selection on observables (Delta=1)	0.0935	0.0435
2) Selection in Unobservables is smaller than selection on observables (Delta=0.5)	0.0547	0.0286
3) Selection in Unobservables is much smaller selection on observables (Delta=0.1)	0.0238	0.0171

Notes: The coefficients are calculated using the *psacalc* command in STATA.

Table 10: Regressions for Entrepreneurs Who Started their Business After the Age of 25 in the 2013 Survey Round

Outcome: Business Owner	(1)	(2)	(3)	(4)	(5)
Economic Contraction$_{imp.yrs}$	0.0519**	0.0423***	0.0181*	0.0190**	0.0185**
	(2.43)	(3.89)	(1.71)	(2.13)	(2.08)
Country Fixed Effects	No	Yes	Yes	Yes	Yes
Country*Age Interactions	No	No	Yes	Yes	Yes
Age Fixed Effects	No	No	No	Yes	Yes
Controls in Table 3 Column 9	No	No	No	No	Yes
Number of Observations	20885	20481	20481	20481	20481
Pseudo R^2	0.0035	0.117	0.142	0.151	0.153

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. The number of observations slightly drops once we include country fixed effects because the Probit model perfectly predicts the outcome for a few observations, since the number of individuals who opened a business after the age of 25 is zero in two countries (Singapore and Ecuador) in our sample. Information for the year the respondents started their business is only available in the 2013 round of the data. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Table 11: Subsample Regressions by Full-Time and Part-Time Status, Business Ownership Structure, Size and Formality of Business

	(1)	(2)	(3)	(4)	(5)
Panel A: Outcome →	**Full Time Self-Employed**	**Part Time Self-Employed**	**Full Time Business Owner**	**Part Time Business Owner**	
Economic Contraction$_{imp.yrs}$	0.0153***	0.00503**	0.0119***	0.00385	
	(4.26)	(2.01)	(3.27)	(1.45)	
Controls in Table 3 Column 9	Yes	Yes	Yes	Yes	
Mean of the Dependent Variable	0.246	0.135	0.173	0.069	
Number of Observations	153599	133943	93949	83387	
Number of Countries	77	77	77	77	
Number of Survey Years	6	6	4	4	
Pseudo R^2	0.17	0.134	0.121	0.108	
Panel B: Outcome →	**Sole Business Owner**	**Micro Business Owner**	**Small Business Owner**	**Registered Business Owner**	**Unregistered Business Owner**
Economic Contraction$_{imp.yrs}$	0.00777**	0.0116***	0.00209	0.00873***	0.00560**
	(2.39)	(3.37)	(1.36)	(2.58)	(2.03)
Controls in Table 3 Column 9	Yes	Yes	Yes	Yes	Yes
Mean of the Dependent Variable	0.112	0.196	0.0112	0.13	0.104
Number of Observations	66324	96616	77966	89264	85686
Number of Countries	74	77	76	77	76
Number of Survey Years	3	4	4	4	4
Pseudo R^2	0.231	0.123	0.107	0.0715	0.246

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute t statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Country, Survey Year, Age Fixed Effects, Country*Age Interactions and control for gender, marital status, location of the household and education. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix for

Macroeconomic Contractions during Impressionable Years and Entrepreneurship in Later Adulthood

June 2, 2021

1 Introduction

This appendix accompanies the study "Macroeconomic Contractions during Impressionable Years and Entrepreneurship in Later Adulthood". Section 2 provides further description of the definitions of the variables used in the paper. Section 3 presents additional tables we discussed in the paper.

2 Additional Details on the Dataset

In this section, we provide a more detailed description of the dataset and the variables we used that is not mentioned in the main body of this study. We use data from the Gallup World Poll (GWP), an annual survey conducted in more than 150 countries globally. The GWP surveys approximately 1000 individuals in each country, while in some cases, the GWP collects data from at least 2000 respondents in large countries such as China or India whereas, in smaller countries such as Haiti, the number of the respondents rarely falls between 500 and 1000. Since 2009, the survey provides information on the employment status of the respondents while it contains a separate set of questions regarding business ownership. In detail, respondents are identified as employed full-time for an employer, employed full-time for self, employed part-time for an employer or for self but want to work full-time, employed part-time for an employer or for self but do not want to work full-time, unemployed, and out of the workforce. There is a possibility some respondents may not fall into any of these categories. Moreover, data for the employment status are available from 2009, whereas data regarding business ownership are available from 2011. We use this information and differentiate entrepreneurs into self-employed and business owners following the previous literature. For instance, Light and Munk (2018) report that the number of the respondents classified as self-employed is 2.3 times larger than the number of the

business owners, 16% of the business owners are not identified as self-employed, and 68% of the self-employed are not categorized as business owners in the 1979 National Longitudinal Survey of Youth. We report similar findings using data from the GWP.

Additional regressions estimating outcome variables such as income and productivity as a function of self-employment and business ownership confirms that these variables are different from each other. These variables are all binary indicators except for income. Job satisfaction is equal to 1 if the respondent answered that he is satisfied with his job and zero otherwise. Ideal job is equal to 1 if the respondent feels that his occupation is the ideal for him and zero otherwise. Productivity in job is equal to 1 if the individual feels productive in his work and zero otherwise, while income is the natural logarithm of income for households with only one occupant (personal income). Furthermore, our data contains information on whether the business owners are the sole owners or have partners, the number of employees a firm has and whether the business is registered or not. We follow OECD's 2019 classification and define firms as micro and small-sized enterprises. More specifically, firms with less than 10 employees are identified as micro-businesses, firms with less than 49 employees but more than 10 are categorized as small-businesses, medium-sized enterprises are the ones who have more than 50 but less than 249 employed people and large-sized enterprises are the ones who employ more than 250 people. Given the fact that 98.5% of our sample has a number of employees less than 50, we cannot investigate the effects of macroeconomic contractions on medium or large-sized enterprises but only on the micro and small-sized ones. We investigate whether the relationship between economic shocks experienced at youth and entrepreneurship depends on ownership structure, size, and the formality of the business, since Konon et al. (2018) study businesses across industries suggesting that the industry context is quite important in entrepreneurship research. We also include behavioural variables in our analysis measuring risk-taking, optimism and locus of control

since previous literature finds these variables linked to entrepreneurial activity (Baum and Locke, 2004; Ekelund et al., 2005; Puri and Robinson, 2007). Risk taking is a binary indicator that equals to one if the respondent answered "yes" to the question "Would you say that you are always willing to take risks to get what you want, or you tend to avoid risks if there is a chance of failure?" and zero otherwise. Optimism equals to one if the respondent answered "yes" to the question "Even when things go wrong, do you feel very optimistic?" and zero otherwise. "Reaching Goals" equals to one if the respondent answered, "I agree" to the statement "You will never give up until you reach your goals no matter what" and zero otherwise. "Working Hard" equals to one if the respondent answered "yes" to the question "Can people of this country get ahead by working hard or not?" and zero otherwise.

To measure major historical event experiences, we generate a binary indicator that equals to 1 if an individual experienced a historical event in his/her country of residence during impressionable years and 0 otherwise. We consider major historical events such as the fall of the Soviet Union and (civil) wars when generating this variable. The countries which were affected by the fall of the Soviet Union in 1991, in our sample, are Poland, Hungary, Bulgaria, and Macedonia (former Yugoslavia). Furthermore, Albania experienced a civil war in 1997, Serbia was involved in the Yugoslavian wars in Croatia and Bosnia from 1991 to 1995 and in Kosovo from 1998 to 1999. Croatia was involved in the same wars from 1991 to 1995. Vietnam experienced wars from 1956 to 1975 and from 1977 to 1991. Algeria similarly experienced wars from 1954 to 1962 and from 1991 to 2002 while El Salvador was involved in a civil war from 1980 to 1991.

Our baseline regression sample includes 171,000 individuals from 77 countries surveyed throughout 2009-2014. These 77 countries are: United States, Egypt, Morocco, Jordan, Turkey, Pakistan, Indonesia, United Kingdom, France, Germany, Netherlands, Belgium, Spain, Italy,

Poland, Hungary, Romania, Sweden, Greece, Denmark, Iran, Singapore, Japan, China, Venezuela, Brazil, Mexico, Israel, South Africa, Canada, Australia, Philippines, Sri Lanka, Vietnam, Thailand, Myanmar, New Zealand, South Korea, Taiwan, Costa Rica, Albania, Algeria, Argentina, Austria, Bolivia, Bulgaria, Chile, Colombia, Croatia, Cyprus, Dominican Republic, Ecuador, El Salvador, Finland, Honduras, Iceland, Ireland, Jamaica, Kuwait, Luxembourg, Macedonia, Malaysia, Malta, Mauritius, Nicaragua, Norway, Panama, Paraguay, Peru, Portugal, Serbia, Slovenia, Sudan, Switzerland, Trinidad & Tobago, Tunisia, and Uruguay.

We also carry out robustness checks using a sample that includes around 284,000 individuals from the entire 134 countries. These 134 countries are: United States, Egypt, Morocco, Lebanon, Saudi Arabia, Jordan, Syria, Turkey, Pakistan, Indonesia, Bangladesh, United Kingdom, France, Germany, Netherlands, Belgium, Spain, Italy, Poland, Hungary, Romania, Sweden, Greece, Denmark, Iran, Singapore, Japan, China, India, Venezuela, Brazil, Mexico, Nigeria, Kenya, Tanzania, Israel, Ghana, Uganda, Benin, Madagascar, Malawi, South Africa, Canada, Australia, Philippines, Sri Lanka, Vietnam, Thailand, Cambodia, Laos, Myanmar, New Zealand, Angola, Botswana, Ethiopia, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Zambia, South Korea, Taiwan, Afghanistan, Burkina Faso, Cameroon, Sierra Leone, Zimbabwe, Costa Rica, Albania, Algeria, Argentina, Austria, Bahrain, Bolivia, Bosnia and Herzegovina, Bulgaria, Burundi, Central African Republic, Chad, Chile, Colombia, Comoros, Congo (Kinshasa), Congo Brazzaville, Croatia, Cyprus, Djibouti, Dominican Republic, Ecuador, El Salvador, Finland, Gabon, Guatemala, Guinea, Haiti, Honduras, Iceland, Iraq, Ireland, Ivory Coast, Jamaica, Kuwait, Lesotho, Liberia, Luxembourg, Macedonia, Malaysia, Malta, Mauritius, Mongolia, Montenegro, Namibia, Nepal, Nicaragua, Norway, Oman, Panama, Paraguay, Peru, Portugal, Qatar, Serbia, Slovenia, Sudan, Swaziland, Switzerland, Togo, Trinidad & Tobago, Tunisia, United Arab Emirates, Uruguay, and Yemen.

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3 Appendix Tables

Appendix Table 1: Can Persistency in the Labour Market Explain our Results?

	(1)	(2)	(3)
Outcome →	**Self-Employed**	**Business Owner**	**Became Business Owner after the Age of 30**
Economic Contraction$_{imp.yrs}$	0.0154***	0.0138***	0.0198*
	(3.23)	(2.63)	(1.75)
Controls in Table 3 Column 9	Yes	Yes	Yes
Number of Observations	109944	63138	11669
Pseudo R^2	0.156	0.115	0.173

Notes: The reported coefficients are the marginal effects using Probit models. The sample in these regressions consists of individuals who are between 30 and 55 years of age and have completed up to secondary education. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. All specifications include Age, Country and Survey Year Fixed Effects, Country*Age Interactions, and the same set of control variables. Specification (3) does not include Survey Year fixed effects because there is only one Survey Year. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 2: Controlling for Religion, Birth-Year Fixed Effects, Country-Survey Year Interactions and Average GDP Growth

	(1)	(2)
Outcome →	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0164***	0.0113***
	(4.04)	(2.58)
Average GDP Growth$_{imp.yrs}$	0.000415	-0.000592
	(0.44)	(0.63)
Controls in Table 3 Column 9	Yes	Yes
Religion Dummies	Yes	Yes
Country Fixed Effects	Yes	Yes
Survey Year Fixed Effects	Yes	Yes
Age Fixed Effects	Yes	Yes
Birth-Year Fixed Effects	Yes	Yes
Country*Age Interactions	Yes	Yes
Country*Survey Year Interactions	Yes	Yes
Number of Observations	171738	99728
Pseudo R^2	0.146	0.115

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 3: Alternative Definitions of Economic Contractions

	(1) **Self-Employed**	(2) **Full Time Self-Employed**	(3) **Part Time Self-Employed**	(4) **Business Owner**	(5) **Full Time Business Owner**	(6) **Part Time Business Owner**
Panel A:						
Number of Economic Contractions	0.00875***	0.00890***	0.00281	0.00806***	0.00739**	0.00256
	(2.72)	(3.14)	(1.32)	(2.70)	(2.50)	(1.46)
Number of Observations	171738	153599	133943	99728	93949	83387
Pseudo R^2	0.143	0.159	0.122	0.111	0.119	0.107
Panel B:						
Economic Contraction defined by the	0.0115***	0.0113***	0.00369	0.00746**	0.00795**	0.000372
10^{th} lowest percentile of GDP	(3.95)	(4.18)	(1.51)	(2.29)	(2.31)	(0.16)
Number of Observations	171738	153599	133943	99728	93949	83387
Pseudo R^2	0.143	0.159	0.122	0.111	0.119	0.107
Panel C:						
Economic Contraction defined by	0.00629**	0.00487	0.00256	0.00560*	0.00488*	0.00136
Negative Economic Growth	(1.98)	(1.61)	(1.01)	(1.65)	(1.75)	(0.52)
Number of Observations	171738	153599	133943	99728	93949	83387
Pseudo R^2	0.143	0.159	0.122	0.111	0.119	0.107
Panel D:						
Economic Contraction defined by	0.0109***	0.0110***	0.00340	0.00665**	0.00665**	0.00114
Negative Economic Growth$\leq -2\%$	(3.37)	(3.52)	(1.47)	(2.09)	(2.20)	(0.56)
Number of Observations	171738	153599	133943	99728	93949	83387
Pseudo R^2	0.143	0.159	0.122	0.111	0.119	0.107
Panel E:						
Economic Contraction defined by	0.0130***	0.0124***	0.00494*	0.00866**	0.00851**	0.00174
Negative Economic Growth$\leq -5\%$	(3.24)	(3.41)	(1.81)	(2.21)	(2.07)	(0.60)
Number of Observations	171738	153599	133943	99728	93949	83387
Pseudo R^2	0.143	0.159	0.122	0.111	0.119	0.107
Panel F:						
Economic Contraction defined by the	0.00155***	0.00116**	0.00116**	0.00109**	0.00116**	0.000253
Maximum Unemployment Rate	(2.62)	(2.14)	(2.46)	(2.40)	(2.54)	(0.74)
Number of Observations	162385	145499	127338	94915	89506	79599
Pseudo R^2	0.139	0.155	0.120	0.104	0.111	0.102

Notes: The coefficients reported are the marginal effects of the estimated probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Age, Country and Survey Year Fixed Effects, Country*Age Interactions, and the same set of control variables. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 4: Effect of Shocks at Each Impressionable Age

	(1) **Self-Employed**	(2) **Business Owner**
Economic Contraction*at age* 18	0.00610	0.00517
	(0.97)	(0.77)
Economic Contraction*at age* 19	0.00251	0.00321
	(0.39)	(0.48)
Economic Contraction*at age* 20	0.00675	0.0111
	(1.12)	(1.42)
Economic Contraction*at age* 21	0.0124*	0.0153**
	(1.95)	(2.44)
Economic Contraction*at age* 22	0.00726	0.00147
	(1.05)	(0.24)
Economic Contraction*at age* 23	0.0125*	0.00936
	(1.65)	(1.18)
Economic Contraction*at age* 24	0.0149**	0.0165**
	(2.42)	(2.40)
Economic Contraction*at age* 25	0.00800	0.000821
	(1.21)	(0.11)
Number of Observations	171738	99728
Pseudo R^2	0.15	0.11

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Age, Country and Survey Year Fixed Effects, Country*Age Interactions, and the same set of control variables. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 5: Estimates for Full Set of 134 Countries

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Outcome →	**Self-Employed**	**Full Time Self-Employed**	**Part Time Self-Employed**	**Business Owner**	**Full Time Business Owner**	**Part Time Business Owner**
Economic Contraction$_{imp.yrs}$	0.00717**	0.00951***	0.000142	0.00739**	0.00824**	0.00144
	(2.20)	(2.84)	(0.06)	(2.05)	(2.43)	(0.55)
Mean of Dependent Variable	0.427	0.321	0.213	0.285	0.216	0.109
Number of Observations	284361	239995	207150	165210	150708	132821
Number of Countries	134	134	134	133	133	133
Number of Survey Years	6	6	6	4	4	4
Pseudo R^2	0.179	0.182	0.193	0.118	0.120	0.132
Panel B: Outcome →	**Sole Business Owner**	**Micro Business Owner**	**Small Business Owner**	**Registered Business Owner**	**Unregistered Business Owner**	
Economic Contraction$_{imp.yrs}$	0.00455	0.00706**	0.000710	0.00281	0.00476	
	(1.42)	(2.05)	(0.60)	(0.97)	(1.54)	
Mean of Dependent Variable	0.130	0.259	0.013	0.135	0.177	
Number of Observations	107627	159458	118048	136593	143053	
Number of Countries	125	133	128	133	132	
Number of Survey Years	3	5	5	5	5	
Pseudo R^2	0.224	0.133	0.111	0.0681	0.222	
Panel C: Outcome →	**Couldn't Find a Suitable Job**	**Opportunity to Make Money**	**Afraid of Job Loss**	**Be Own Boss**	**Great Idea for a Business**	
Economic Contraction$_{imp.yrs}$	0.00855***	0.00463	0.00191	0.00786**	0.00811***	
	(3.03)	(1.41)	(1.04)	(2.43)	(2.59)	
Mean of Dependent Variable	0.135	0.061	0.013	0.065	0.169	
Number of Observations	136665	68376	57654	69624	142076	
Number of Countries	132	115	110	116	132	
Number of Survey Years	4	2	2	2	4	
Pseudo R^2	0.178	0.290	0.261	0.280	0.160	

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Age, Country and Survey Year Fixed Effects, Country*Age Interactions, and the same set of control variables as in Table 3 Column 9. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 6: Estimates by Country Level Shadow Economy Index, Financial Development Index and Ease of Doing Business Index

	(1)	(2)	(3)	(4)
Panel A: Regressions by Shadow Economy Index				
	Sample of Countries Above Median		Sample of Countries Below Median	
Outcome →	**Self-Employed**	**Business Owner**	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0172***	0.00981*	0.0171***	0.0207***
	(3.37)	(1.86)	(2.62)	(4.44)
Number of Observations	86869	51972	84869	47756
Pseudo R^2	0.0906	0.109	0.190	0.0915
Panel B: Regressions by Financial Development Index				
	Sample of Countries Above Median		Sample of Countries Below Median	
Outcome →	**Self-Employed**	**Business Owner**	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0194***	0.0187***	0.0157***	0.0103**
	(2.84)	(3.19)	(3.14)	(2.10)
Number of Observations	88820	52170	82918	47558
Pseudo R^2	0.0906	0.109	0.190	0.0915
Panel C: Regressions by Ease of Doing Business Index				
	Sample of Countries Above Median		Sample of Countries Below Median	
Outcome →	**Self-Employed**	**Business Owner**	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0223***	0.0166***	0.00764	0.00710
	(4.28)	(3.05)	(1.25)	(1.37)
Number of Observations	86947	50827	84791	48901
Pseudo R^2	0.161	0.0880	0.0982	0.109

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. All specifications include Country, Survey Year, Age Fixed Effects, Country*Age Interactions, and control for the same variables as in Table 3 Column 9. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 7: Subsample Regressions excluding Countries with No Economic Contractions Experienced During Impressionable Years

	(1)	(2)
Outcome →	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0161***	0.0132***
	(4.11)	(3.45)
Controls in Table 3 Column 9	Yes	Yes
Country Fixed Effects	Yes	Yes
Survey Year Fixed Effects	Yes	Yes
Age Fixed Effects	Yes	Yes
Country*Age Interactions	Yes	Yes
Number of Observations	115845	67936
Pseudo R^2	0.143	0.131

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 8: Differences between Self-Employment and Business Ownership: Economic Outcomes as a Function of Self-Employment and Business Ownership

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Outcome →	**Job Satisfaction**		**Ideal Job**		**Productivity in Job**		**Income**	
Panel A:								
Self-Employed	-0.0159*		0.00955		-0.0487*		-0.264***	
	(1.87)		(0.88)		(1.79)		(5.66)	
Business Owner		0.0601***		0.0949***		0.0166		0.0767**
		(6.51)		(12.73)		(0.92)		(2.37)
Number of Observations	114719	53801	115132	73407	23008	17376	17822	10738
Adjusted R^2	0.053	0.056	0.054	0.059	0.089	0.072	0.457	0.447
Panel B:								
Full Time Self-Employed	0.00876		0.0342***		-0.0323		-0.123**	
	(0.94)		(2.65)		(1.14)		(2.05)	
Full Time Business Owner		0.0715***		0.107***		0.0314		0.168***
		(7.45)		(13.53)		(1.64)		(4.60)
Number of Observations	103128	50932	103394	69189	20141	16236	15979	10187
Adjusted R^2	0.051	0.057	0.054	0.060	0.086	0.074	0.468	0.452
Panel C:								
Part Time Self-Employed	-0.0693***		-0.0441***		-0.0958***		-0.501***	
	(6.70)		(3.90)		(3.01)		(8.82)	
Part Time Business Owner		0.0289**		0.0603***		-0.0196		-0.151***
		(2.33)		(5.82)		(0.72)		(2.83)
Number of Observations	90091	45417	90393	61450	14667	13174	14737	9395
Adjusted R^2	0.057	0.059	0.053	0.056	0.086	0.074	0.465	0.449

Notes: The table presents OLS estimates. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level respectively. All specifications include Age, Country, Survey Year Fixed Effects, and we have controlled for gender, marital status, and location of the household. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 9: Controlling for Major Historical Events

	(1)	(2)
Outcome →	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0144***	0.0119***
	(3.95)	(3.10)
Major Events$_{imp.yrs}$	0.0127	0.0131
	(1.19)	(1.43)
Controls in Table 3 Column 9	Yes	Yes
Country Fixed Effects	Yes	Yes
Survey Year Fixed Effects	Yes	Yes
Age Fixed Effects	Yes	Yes
Country*Age Interactions	Yes	Yes
Number of Observations	171738	99728
Pseudo R^2	0.143	0.111

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 10: Regressions Using Population Weights

	(1)	(2)
Outcome →	**Self-Employed**	**Business Owner**
Economic Contraction$_{imp.yrs}$	0.0144***	0.0122***
	(2.97)	(2.67)
Controls in Table 3 Column 9	Yes	Yes
Country Fixed Effects	Yes	Yes
Survey Year Fixed Effects	Yes	Yes
Age Fixed Effects	Yes	Yes
Country*Age Interactions	Yes	Yes
Number of Observations	171738	99728
Pseudo R^2	0.146	0.109

Notes: The reported coefficients are the marginal effects using Probit models. Robust standard errors are clustered at the country level. Absolute *t* statistics are presented in parentheses; *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively. For brevity, we do not report the coefficients of the control variables, but the results are available upon request.

Appendix Table 11: Summary Statistics

	Mean	Standard Deviation	Minimum	Maximum	Non-missing Observations
Self-Employed	0.33	0.47	0.00	1.00	171738
Business Owner	0.22	0.42	0.00	1.00	99728
Business Owner$_{\text{Couldn't Find a Suitable Job}}$	0.09	0.29	0.00	1.00	85217
Business Owner$_{\text{Opportunity to Make Money}}$	0.08	0.27	0.00	1.00	43072
Business Owner$_{\text{Afraid of Job Loss}}$	0.02	0.14	0.00	1.00	37572
Business Owner$_{\text{To Be Own Boss}}$	0.09	0.29	0.00	1.00	44374
Business Owner$_{\text{Great Idea for a Business}}$	0.13	0.34	0.00	1.00	89122
Economic Contraction$_{\text{imp.yrs}}$	0.19	0.39	0.00	1.00	171905
Economic Contraction$_{10\text{-}17}$	0.20	0.40	0.00	1.00	171905
Economic Contraction$_{26\text{-}33}$	0.16	0.37	0.00	1.00	171905
Economic Contraction$_{34\text{-}41}$	0.13	0.34	0.00	1.00	141839
Economic Contraction$_{t\text{-}1}$	0.12	0.32	0.00	1.00	171905
Economic Contraction$_{\text{imp.yrs 10th Lowest percentile}}$	0.34	0.47	0.00	1.00	171905
Economic Contraction$_{\text{Neg. Growth}}$	0.69	0.46	0.00	1.00	171905
Economic Contraction$_{\text{Neg. Growth<-2\%}}$	0.41	0.49	0.00	1.00	171905
Economic Contraction$_{\text{Neg. Growth<-5\%}}$	0.22	0.41	0.00	1.00	171905
Max Unemployment Rate$_{\text{imp.yrs}}$	10.00	6.03	0.03	52.00	162548
Age	39.85	8.69	25.00	55.00	171905
Female	0.46	0.50	0.00	1.00	171905
Married	0.71	0.45	0.00	1.00	171905
Elementary Education	0.22	0.42	0.00	1.00	169984
Secondary Education	0.53	0.50	0.00	1.00	169984
College Degree	0.24	0.43	0.00	1.00	169984
Rural Residence	0.52	0.50	0.00	1.00	165581
Willingness to Take Risks	0.47	0.50	0.00	1.00	13860
Optimism	0.77	0.42	0.00	1.00	38329
Reaching Goals	0.80	0.40	0.00	1.00	59152
Working Hard	0.80	0.40	0.00	1.00	146693
Financial Development Index	0.40	0.19	0.07	0.82	169946
Shadow Economy Index	28.42	14.01	8.70	68.10	170048
Ease of Doing Business Index	63.85	44.14	1.00	188.00	171905

Notes: Economic Contraction$_{\text{imp.yers 10th lowest percentile}}$ is defined by a country's 10th lowest percentile of GDP. Economic Contraction$_{\text{Neg.Growth}}$ is based on the negative economic growth. Economic Contraction$_{\text{Neg.Growth<-2\%}}$ is based on the negative economic growth greater than 2%. Economic Contraction$_{\text{Neg.Growth<-5\%}}$ is based on the negative economic growth rate greater than 5%. All these four measures are binary indicators.