The effect of depression on entrepreneurial exit intentions in Latin America

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Abstract

Mental health is of the utmost importance for entrepreneurs. A mental disorder, such as depression, compromises the venture performance and may affect the decision of continuing in the entrepreneurial career. Literature regarding the effects of mental illnesses on the entrepreneurial decision-making process is scarce, despite the relevance of this issue. The objective of this research is to study the effect of depression on entrepreneurial exit intentions. Acknowledging the possible endogeneity problem, the instrumental variables method is implemented on a sample of the main cities of 10 countries in Latin America. The evidence presented in this document indicates a significant and positive effect of depression on entrepreneurial exit intentions, suggesting that mental health should have an important position in the discussions of public policy on entrepreneurship.

Keywords: *Entrepreneurship, Exit intentions, Depression, Instrumental variables.*

Resumen

La salud mental es de suma importancia para los emprendedores. Un trastorno mental, como la depresión, compromete el desempeño de la empresa y puede afectar la decisión de continuar en la carrera empresarial. La literatura sobre los efectos de las enfermedades mentales en el proceso de toma de decisiones empresariales es escasa, a pesar de la relevancia de este tema. El objetivo de esta investigación es estudiar el efecto de la depresión en la intención de *exit* empresarial. Reconociendo el posible problema de endogeneidad, el método de variables instrumentales es implementado en una muestra de las principales ciudades de 10 países de América Latina. La evidencia presentada en este documento indica un efecto significativo y positivo de la depresión en la intención de *exit* empresarial, lo que sugiere que la salud mental debería tener una posición importante en las discusiones de política pública sobre emprendimiento.

Keywords: *Emprendimiento, Intenciones de abandonar el emprendimiento, Depresión, Variables instrumentales.*

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1 Introduction

Since Schumpeter seminal work in 1949, many authors have provided evidence of the importance of entrepreneurship for economic growth in terms of employment, new companies creation and, innovation (Van Praag and Versloot, 2008). The favorable impact of entrepreneurship has a remarkable importance in Latin America and the Caribbean considering this region has the highest TEA[1] for the age groups of: 18-24 (16.5%), 35-44 (20.6%) and 45-54 years (17.9%) (GERA, 2017).

In this region, entrepreneurship is considered a way of boosting upward social mobility and reducing poverty and unemployment (Lora and Castellani, 2013). Because of this reason, governments and institutions have tried to foster a favorable environment for entrepreneurship by promoting the creation and expansion of start-ups (America, 2016). However, one year after the creation of the venture, survival rates are below 50% (Exporter Dynamics Database, World Bank). According to GERA (2017), behind the lack of profitability, the second reason for business discontinuance in this region corresponds to personal reasons (26.1%) that may involve health problems (Hessels, Rietveld, Thurik, and Van der Zwan, 2018).

The owner's health has been considered to be the most important intangible capital of a small business. The smaller the company, the greater the impact of a health problem, whether physical or mental, on the different business outcomes, including venture's performance (Torrès and Thurik, 2019). The study of health as a determining factor of business exit is, therefore, an important but understudied topic in the entrepreneurship literature. Specifically, the study of the effect of mental diseases, such as depression, is scarce.

Among the wide range of mental illnesses, depression is one of the most prevalent ones. Depressive disorders have remained for over three decades among the leading causes of non-fatal health loss, being the third leading cause in terms of years lived with a disability during the 2017 (James et al., 2018). Regarding the employed population, entrepreneurs have

[1] Total early-stage entrepreneurial activity

been found to be more likely to report having a mental health condition (49%), with depression being the most self-reported disease (30%) (Freeman, Staudenmaier, Zisser, and Andresen, 2019).

Moreover, depression can be a difficult disease to cope with, particularly for venture owners. First, entrepreneurs suffer from isolation. They usually work alone or with a small group of people, which means that social support may be limited for them. However, the effect of depression is weaker among individuals with high levels of social support (Pollack, Vanepps, and Hayes, 2012). Second, entrepreneurs face uncertainty in almost every decision they made. This means they lack control over business-decision outcomes involving risk-taking. Third, entrepreneurship is a psychologically demanding job. Entrepreneurs must work long hours, invest physical and emotional energy, and develop multiple roles within their company to meet the objective of managing a successful business (Sardeshmukh, Goldsby, and Smith, 2018). This does not mean that other occupations are not demanding, but what sets entrepreneurs apart is the high costs they face in the event of a mistake, leading them to experience high responsibility pressure. According to the job strain model occupations with these characteristics, i.e, psychologically demanding jobs, with lack of control over the outcomes and with an unsupportive environment, may worsen symptoms and disability resulting from depression, which in turn generates an impaired occupational functioning for entrepreneurs with this mental disorder.

Depression interferes with daily life and normal functioning. In the individual's work sphere, depression is related to poor performance at work, premature retirement, job absences, and lower earnings compared to non-depressed workers. People with depression are more likely to find it more difficult to perform tasks and cope with the challenges associated with entrepreneurship than for those without this condition. For example, depression has negative influences on planning capacity, problem-solving skills, as well as in the decision-making ability and affects various aspects related to memory (Hessels et al., 2018). Under a depressive episode, decisions are distorted by the negative affect and by the altered negative cognition (Cáceda, Nemeroff, and Harvey, 2014). Moreover, depression can negatively influence

the adaptive response capacity needed when facing challenging situations. The feelings of hopelessness that come with depressive episodes can make people, like entrepreneurs, to believe that adverse situations are likely and that they might be incapable of changing the probability of these outcomes (Alloy and Ahrens, 1987). In summary, the alteration in the cognitive, physical, and social functioning that results from depression can negatively affect the performance of entrepreneurs coping with this disorder and eventually induce them to quit from entrepreneurship (Hessels et al., 2018).

On the other hand, much of the research that has studied entrepreneurship has focused on looking for the characteristics that drive individuals towards becoming an entrepreneur, paying less attention to the study of the factors that make owners persist in or exit from their venture. Indeed, *"the comprehension of the entrepreneurial process is incomplete without understanding the importance of entrepreneurial exit"* (DeTienne, 2010). The entrepreneurial exit is defined as the process by which the founders of privately held firms leave the firm they helped to create (DeTienne, 2010). Following this definition, Hessels et al. (2018) are the first one to study the effect of depression on entrepreneurial exit.

However, the performance of an action has a precedent in terms of the intention to perform that particular action. Entrepreneurship is an occupation that is predominantly based on intentional planned behaviors and intentions are *"the single best predictor of planned behavior"* (DeTienne and Cardon, 2012). This is supported by the theory of planned behavior developed by Ajzen et al. (1991), who asserts that behavior is best predicted by intentions since they capture the motivational factors that originate the behavior. In the context of entrepreneurial exit, the intention to exit is the willingness to exert the effort of withdrawing from the venture once created, a precursor of the observed entrepreneurial exit.

Authors like DeTienne and Cardon (2012) have insisted on the importance of studying not only entrepreneurial exit but entrepreneurial exit intentions. Studying the intention to exit, rather than the effective entrepreneurial exit, is important because intentions that occur early in the life of ventures may guide future strategic actions that entrepreneurs are likely to develop.

Likewise, empirical evidence in entrepreneurship has shown the strong relationship between previous intentions and later outcomes (Wennberg and DeTienne, 2014). Then, studying the intention to exit provides valuable insight into the entrepreneurial exit, even without observing an actual exit from entrepreneurship.

The main objective of this document is to study the effect of depression on entrepreneurial exit intentions in Latin America. Specifically, we aim to test if higher levels of depression symptoms cause greater odds of exit intentions. By doing so, we make a contribution to entrepreneurship literature by understanding an important yet understudied area in entrepreneurs' exit intentions research. Since entrepreneurial exit is an event with important consequences to the entrepreneur, the firm, the industry, and the economy as a whole (DeTienne, 2010), a better understanding of entrepreneurial exit intentions in Latin America is required because it could contribute to the design of public policy seeking to improve mental health among entrepreneurs. Also, understanding entrepreneurial exit intentions will lead us to a bigger picture of the entrepreneurial process. Entrepreneurship literature has focused mainly on the intentions to become an entrepreneur, leaving aside other intentions that may be present in the business life cycle such as exit (DeTienne and Cardon, 2012).

Using data from the main cities of 10 countries in Latin America, collected during 2016 by the Development Bank of Latin America (CAF, by its Spanish acronym), we estimate the effect of depression on entrepreneurial exit intentions using the instrumental variables method to correct for potential endogeneity. To the best of our knowledge, this is an empirical strategy that has not been used in this context. The main findings of this document suggest that depression has a significant and positive effect on entrepreneurial exit intentions in Latin America and this effect remains robust after including different covariates and when estimating the model for a different subgroup of entrepreneurs.

The remainder of this document is organized as follows. The next section discusses the related literature. Section 3 presents the chosen method, while the data used in this study and the description of the variables included are presented in section 4. Results are discussed in

section 5. Finally, the conclusions and future research directions are addressed in section 6.

2 Related literature

2.1 Entrepreneurial exit and exit intentions

In general, entrepreneurship literature has paid a lot of attention to the reasons that lead people to create their own business. However, since the exit is a natural and relevant stage in the entrepreneurial process, researchers have recently stressed the importance of entrepreneurial exit as a crucial field in entrepreneurial research.

The growing body of literature studying entrepreneurial exit has primarily focused on its determinants at the company level. Investigators have continuously found that age and firm size are positively associated with firm survival, concluding that small firms face a greater risk of exit (Situm, 2014). Nevertheless, firm-based studies tend to justify exit using performance metrics, considering entrepreneurial exit uniquely as a synonym of business closure (Cefis and Marsili, 2005). While this is an integral factor, attention must also be paid to the individual characteristics of entrepreneurs, who can play a significant role in explaining entrepreneurial exit (Hessels et al., 2018).

Concerning individuals' characteristics, previous studies have found that past experience in entrepreneurship is associated with lower exit rates in a new self-employment or business creation attempt, while mixed results have been found regarding the effect of educational attainment on entrepreneurial exit (Parker, 2004). For example, a study of Finnish entrepreneurs develop by Kangasharju and Pekkala (2002) finds that higher educated entrepreneurs have lower probabilities of withdrawing from entrepreneurship during economic recessions, but a bigger probability during economic upturns. This, because better-educated entrepreneurs have alternatives to self-employment, and times of economic growth may result in a better

wage-job opportunity for business owners (Kangasharju and Pekkala, 2002). To a lesser extent, personality traits as a determinant factor of entrepreneurial exit, have also been addressed. For example, Caliendo, Fossen, and Kritikos (2014) finds that the higher the agreeableness of individuals, the greater their probability of exit, while higher levels of risk tolerance reduce this probability.

On the other hand, there is the exit intentions' literature. Most of the research on entrepreneurial exit intentions has relied on the theory of planned behavior (Ajzen et al., 1991). This theory asserts that *"because most human behavior is under the control of the actor; behavior can be accurately predicted by understanding an individual's intentions to perform the behavior"* (DeTienne and Cardon, 2012). For example, DeTienne and Cardon (2012) build upon this theory to explore the effect of entrepreneurial experience, industry experience, age, and education level on the entrepreneur's intention to exit their business through one of six exit strategies. Their main results suggest a negative effect of age on choosing a family succession exit path, while a greater entrepreneurial experience positively affects the intention to exit the business through an Initial Public Offering (IPO) strategy.

Likewise, the articles of Battisti and Okamuro (2010) and Hsu, Wiklund, Anderson, and Coffey (2016) study the entrepreneurial exit intentions. The first one focuses on the effect of family involvement, business size, and firm performance on the intention to exit from entrepreneurship, finding that these variables significantly affect the intention to liquidate the venture. The second one uses the work-family interface theory to examine how the work and family domains interact with each other and affect entrepreneurs' exit intentions. They find that experiencing interference between the business and family sphere leads to a stronger exit intention in female entrepreneurs compared to male ones.

Even though these articles show the recent interest in understanding the entrepreneurship process further by taking into consideration entrepreneurial exit, yet the amount of research remains narrow within the broader entrepreneurial literature (Blackburn, De Clercq, and Heinonen, 2017). The extant work shows there is still a need for a wider understanding of

entrepreneurial withdrawal. In fact, both on actual entrepreneurial exit as on entrepreneurial exit intentions literature, the relationship between mental disorders like depression and exit is an understudied area of research.

To the best of our knowledge, only two articles have addressed a research question related to depression and entrepreneurial exit. In the first place, Pollack et al. (2012) investigates the role play by business-related social ties on the relationship between the depressed affect and the withdrawal intentions from entrepreneurship. Using an Ordinary Least Square regression model and path analysis on a sample of 262 entrepreneurs, the authors find that greater social ties result in a reduction of the effect of economic stress on depression symptoms, which in turn reduce entrepreneurial exit intentions.

On the other hand, Hessels et al. (2018) study the depressive disorder as a determinant of the decision to exit from entrepreneurship, and the mediating role of self-efficacy, defined as *"the belief that one can effectively handle changing and challenging situations"*. They identify an exit each time an entrepreneur reports to have switched to salaried work, unemployment, a position outside the workforce, or to another self-employment type of job. They use the Australian panel (HILDA), which has the following variables included in their econometric model: physical health, unhealthy habits like smoking and alcohol intake, and demographic variables such as age, gender, educational attainment, marital status, and income. Using binomial and multinomial logistic regression models, they find that an increase of one unit in the depression scale, measured between 0 and 10, is associated with an increment in the odds of entrepreneurial exit by 1.1 percentage points, being of 17% the probability of experiencing an exit (Hessels et al., 2018). It is worth mentioning that neither the study of Pollack et al. (2012) nor that of Hessels et al. (2018) aims to find a causal effect.

2.2 Effects of depression on entrepreneurs' performance

Depression is a major, if not the major cause of disability around the world, with a prevalence of about 264.456 thousand people around the world during 2017 (James et al., 2018). Symptoms of this mental disorder include: lethargy, a loss of interest in the activities once enjoyed; a decreased ability to concentrate as well as persistent feelings of sadness and pessimism. These symptoms inhibit normal daily functioning, also affecting the sphere of work of the person suffering from it. Depression is associated with poor performance at work, premature retirement, job absences, and lower earnings in comparison to non-depressed people. Additionally, it has a negative influence on planning ability, in problem-solving skills and may also produce problems related to memory (Hessels et al., 2018).

Empirical evidence suggests that some occupations are more likely to be affected by the impact of depression on work outcomes than others. Entrepreneurship is one occupational choice that makes workers particularly susceptible to this type of illness. This view is built on the job strain model, which asserts that "high-strain" jobs are closely related to the presence of work stressors that may exacerbate symptoms and disability resulting from depression (Lerner et al., 2010). Compare to non-depressed workers, those coping with depression are impaired in their occupational functioning, and this disability is continuously worsened by the exposure to different work stressors, such as high psychological demands; limited control, and unsupportive environments (Lerner et al., 2010). Entrepreneurship is one of the occupations that bring along this type of work stressors. This makes entrepreneurs highly vulnerable to depression's symptoms. Depression, in turn, may adversely affect their entrepreneurial performance through one or more of the following channels.

First of all, entrepreneurs usually work alone or, at best with a very small group of employees; social interaction and support may be limited for them as a consequence. Moreover, the wish to run a successful business typically requires a notable time and emotional investment. Entrepreneurs epitomize this culture and often do so at the detriment of leisure and their family and social circles (Buttner, 1992). The literature on this topic has given attention to the

”stress-buffering hypothesis”, which holds that the effect of depression is weaker among people with higher levels of social support (Pollack et al., 2012). Then, with a lack of social support, entrepreneurs are more exposed to the effects of depression

Second, entrepreneurs work under conditions of uncertainty and risk. This means that long hours of work are needed in order to face all the challenges and adversities associated with the business process (Sardeshmukh et al., 2018). However, the fatigue experienced by depressed individuals, coupled with a reduced ability to concentrate, can make depressed entrepreneurs less mentally prepared to cope with uncertainty. This point is more prominent considering that individuals with severe symptoms of depression tend to exhibit higher levels of aversion towards uncertainty when compared to individuals without severe symptoms (Huang, Yu, Carleton, and Beshai, 2019). As a consequence, depression can make an already challenging job even more challenging.

Third, entrepreneurs are individuals *"who specialize in taking judgmental decisions about the coordination of scarce resources"* (Acs and Audretsch, 2006). Therefore, mental health is of paramount importance for entrepreneurs to take difficult and risky decisions where the result can have a significant impact on the success of the business. Indeed, the cost of mistakes may be higher for entrepreneurs. They are not only psychologically attached to their venture, but they have also financed it through a combination of their capital, capital from friends and family, and loans from banks. However, a generally known element of all mental illnesses is the prevalent making of bad decisions. Under a depressive episode, entrepreneurs' decisions will be distorted by the negative affect and by the altered negative cognition (Cáceda et al., 2014).

Finally, mental disorders can affect the adaptive response needed when facing adverse situations. For example, depression brings along feelings of hopelessness, namely, the belief that adverse situations are very probable and that one is incapable of changing the probability of these outcomes (Alloy and Ahrens, 1987). With this in mind, when entrepreneurs coping with depression affront a risky situation that may put in danger the performance of their

company, the voluntary exit may eventually become the only feasible reality.

3 Empirical Strategy

Existing literature has used cross-sectional and longitudinal data to find statistical associations between variables measuring depressive disorder and the decision to withdraw from entrepreneurship (see Pollack et al., 2012 and Hessels et al., 2018). Despite the use of longitudinal data allows addressing the confounding problem that arises from the omission of time-invariant variables that can affect both explanatory variables and outcome (Denny, 2011), it does not solve the potential endogeneity problem that may exist between variables in non-experimental data. With this in mind, as a future research suggestion, Hessels et al. (2018) mentioned the possible endogeneity problem that arises when analyzing the effect of depression on entrepreneurial exit.

We believe that endogeneity is a problem that may also be present when studying the effect of depression on withdrawal intentions. The relationship between depression and exit intentions could be biased due to the presence of unmeasured confounding. For example not including into the model variables related to personality traits could generate a positive bias in the estimates since personality traits can affect not only the onset and course of depression (Klein, Kotov, and Bufferd, 2011) but also entrepreneurs' exit intentions (Caliendo et al., 2014). Likewise, the fact that the business is at risk of bankruptcy, in such a way that withdrawing from entrepreneurship is the only possible way out, can generate stress and depression in the entrepreneur. This reverse path can also be mediated by unobservables qualities like entrepreneurs' resilience. The above reasons imply that causation conclusions may not be reliable unless the correct method of estimation is used. To the best of our knowledge, this issue has not been addressed before.

To correct for endogeneity we use instrumental variable estimation. The application of this method depends on the availability of one or more instruments that satisfies 3 conditions.

Valid instruments are variables that: **i)** are correlate with the endogenous explanatory variable (relevance assumption), **ii)** are not correlated with the error term in the equation that explains the outcome or variable of interest (exclusion assumption) and **iii)** a given change in the value of the instrument cannot have opposite effects on different individuals (monotonicity assumption) (Angrist and Imbens, 1995).

With a binary outcome, a linear probability model (LPM) can be used to estimate the result of interest. LPM has several well-known disadvantages. First, it produces estimates for the probability of occurrence of the outcome outside the 0-1 range. Second, since the error term of a binary variable has a Bernoulli structure, estimating the model through a LPM will generate a heteroskedasticity problem. Finally, the LPM impose linearity in the relationship between the outcome and the variables on the right side of the equation (Wooldridge, 2002).

Despite these disadvantages, researches like Angrist (2001), Angrist and Krueger (2001), Wooldridge (2002), Angrist (2006), Angrist and Pischke (2008) and Chesher and Rosen (2013) have justified the use of the Two-Stage Least Squares (2SLS) to estimate a LPM with a binary outcome. They have argued that the 2SLS method has a robust causal interpretation regardless of the non-linearity produced by a binary dependent variable and the consistency of the estimator is unaffected in case of a nonlinear conditional expectation function in the first stage (Angrist, 2001, 2006).

When the effects of the endogenous variable, namely the treatment, are heterogeneous among individuals, the estimation using the instrumental variable method in a linear model may capture an average effect analogous to the local average treatment effect (LATE). LATE is the average treatment effect for individuals whose treatment status is affected by changes in the instrumental variable. Angrist, Imbens, and Rubin (1996) named those people ”compliers”. Concerning an instrumental variable taking over two values or more, the LATE captures the average treatment effect for compliers with a change in the instrument from z to z' (Cornelissen, Dustmann, Raute, and Schönberg, 2016).

However, the principal difficulty of interpreting IV results as LATE is that the conclusions and policy implications based on the results may be limited since it is not formally possible to identify the group of compliers to characterize them. This becomes one of the main limitations of using the instrumental variables method (Becker, 2016). To overcome this, experimental research usually assumes homogeneous treatment effects, i.e, it is supposed that the effect of the independent endogenous variable is constant among the entire population (Box-Steffensmeier, Brady, and Collier, 2008).

2SLS estimation occurs in two stages. In the first one, the fitted values of the endogenous variable are calculated from the regression of the endogenous explanatory variable (D_i) on the instrument (Z_i) and another set of exogenous variables (x_i). In the second stage, these fitted values are used along with other covariates to estimate the outcome or variable of interest (y_i). An illustrative model of this method can be represented as follows:

$$D_i = \Pi_1 x_i + \Pi_2 z_i + \upsilon_i \tag{1}$$

$$y_i = \beta_1 D_i + \beta_2 x_i + e_i \tag{2}$$

Where y_i is a dummy dependent variable for the ith observation; D_i represents the endogenous explanatory variable, that in our study is depression scale; x_i are included exogenous regressors; z_i are excluded exogenous regressors, i.e. excluded instrumental variables; and υ_i and e_i are the error terms. For the estimations of this model we used Stata software package *ivregress* and further developed package *ivreg2*.

4 Data and descriptive statistics

We use data from the 2016 edition of the Development Bank of Latin America (CAF) survey. Since 2008, the CAF survey provides information on demographics, household characteristics, educational attainment, and employment status of individuals from several countries in Latin America. The 2016 edition also included information related to neighborhood characteristics and a module on health, where they applied the CES-D depression scale to all the interviewees in the sample.

For the 2016, the questionnaire was administered to 12.905 individuals located in 11 cities of Latin America: Buenos Aires (Argentina), La Paz, (Bolivia), San Pablo (Brazil), Fortaleza (Brazil), Bogotá (Colombia), Quito (Ecuador), Lima (Perú), Montevideo (Uruguay), Carácas (Venezuela), Panamá (Panamá) and finally Mexico City (Mexico).

To classify respondents as entrepreneurs, the survey provides a module on occupation where they ask about current employment status. Interviewees with more than one job were instructed to answer concerning the occupation in which they spend most of their time. Following the work of Hamilton (2000), Fossen (2012), Caliendo, Fossen, Kritikos, and Wetter (2015), Hsu et al. (2016) and Hessels et al. (2018), entrepreneurship is often operationalized in terms of self-employment. With this definition, we identified entrepreneurs as both self-employers and venture owners with at least one employee. For the 2016 CAF survey, 4107 individuals fit into this definition.

Since it could be highly associated with exit intentions, an important covariate in our analysis is the entrepreneur's income. CAF survey reports income in two ways. First, respondents were asked to specify the monthly income they earned from the work in their main occupation. Second, the interviewees that refused to give precise information about their income, were requested to choose between income ranges. About 80% of entrepreneurs chose the income ranges option to answer this question. Consequently, to avoid loss of observations, we used the grouped version of the income variable. It is classified into 4 groups expressed in

US dollars: lower than 500 USD; between 500 and 1000 USD; between 1001 and 1500 USD and income greater than 1500 USD.

As additional covariates, we include a set of sociodemographic variables that have been studied to be important factors that determine entrepreneurial exit. These variables are the gender, age, education, and the entrepreneurial experience of the venture owner (Hessels et al., 2018; Parker, 2004). Finally, we include a dummy variable indicating if the entrepreneur has employees and dummy variables for the individual's country of residence in order to account for unobservables characteristics of the country affecting the entrepreneurial process.

Table 1 provides information about the definition of the whole group of independent variables used in this study. Table 2, on the other hand, reports the main descriptive statistics of these variables. About 13% of entrepreneurs are considering exiting from their business. They have on average a higher score in the CES-D scale, compared to those who do not intend to leave their venture, which means that on average they have a higher presence of depression symptoms. This difference is statistically significant at the 1% level. These individuals also have on average less age, a lower monthly income, and fewer years of experience in entrepreneurship. Finally, entrepreneurs with exit intentions have on average, a worst residential environment measured by the amount of negative factors happening near their household, compared to individuals that do not have plans of withdrawing from entrepreneurship.

Table 1: Variables' definition

Independent Variables	
Depression	Individual's score in the CES-D-10 depression scale
Female	Dummy=1 if the individual is female and 0 otherwise
Age	Individual's age in years
Higher education	Dummy=1 if the individual has technical education or higher and 0 otherwise
Experience	Individual's work experience in years
Employer	Dummy=1 if individual has at least one employee and 0 otherwise
Argentina	Dummy=1 if individual live in Argentina
Bolivia	Dummy=1 if individual live in Bolivia
Brazil	Dummy=1 if individual live in Brazil
Colombia	Dummy=1 if individual live in Colombia
Ecuador	Dummy=1 if individual live in Ecuador
Mexico	Dummy=1 if individual live in Mexico
Panamá	Dummy=1 if individual live in Panamá
Perú	Dummy=1 if individual live in Perú
Uruguay	Dummy=1 if individual live in Uruguay
Venezuela	Dummy=1 if individual live in Venezuela
Income1	Dummy=1 if individual's income is lower than 500 USD
Income2	Dummy=1 if individual's income is between 500 and 1000 USD
Income3	Dummy=1 if individual's income is between 1001 and 1500 USD
Income4	Dummy=1 if individual's income is greater than 1500 USD
Dependent variable	
Exit intentions	Dummy=1 if individual has entrepreneurial exit intentions and 0 otherwise
Instrument	
Neighborhood environment	Variable = 0,1,2,3,4 or 5. Constructed as the sum of five variables= 1 if there are: i) abandoned buildings; ii) buildings, houses or lots took illegally or invaded; iii) garbage dumps; iv) poorly lit streets and v) sale or consumption of drugs near individual's household and 0 otherwise.

Table 2: Main descriptive statistics by entrepreneurial intention

	Exit intentions "yes"		**Exit intentions "No"**		**t-test**
Variable	Mean	Std Dev	Mean	Std Dev	p-value
Depression	10.399	6.376	8.463	6.135	0.000***
Female	0.413	0.493	0.405	0.491	0.732
Age	36.255	10.981	39.621	10.998	0.000***
Higher education	0.277	0.448	0.247	0.432	0.138
Experience	6.527	8.520	9.181	9.284	0.000***
Employer	0.432	0.022	0.476	0.009	0.059*
Income1	0.800	0.401	0.621	0.485	0.000***
Income2	0.130	0.336	0.209	0.407	0.000***
Income3	0.014	0.117	0.052	0.222	0.000***
Income4	0.057	0.232	0.118	0.322	0.000***
Neighborhood environment	2.119	1.485	1.792	1.465	0.000***
Observations	530		3,577		

Level of significance: (*) is p<0.1, (**) is p<0.05 and (***) is p<0.01

4.1 Dependent Variable

As described in previous sections, the objective of this research is to determine the effect of depression on entrepreneurial exit intentions. Typically, literature related to exit intentions has measured the intention by asking people about the probability of leaving their job within a specific period. The question must specify both a time frame and an effort made to adequately represent the intention of performing the action (Hsu et al., 2016). According to this, the 2016 CAF survey asked the following question: "In the last 4 weeks, have you been trying to change your main occupation?". Although this question applies to all respondents and not only to entrepreneurs, we consider it a good proxy variable to measure entrepreneurs' exit intentions from their current venture.

4.2 Main independent variable

Our main explanatory variable is the entrepreneur's severity of depression symptoms. The 2016 edition of the CAF survey provided a depression scale applied to all respondents. Particularly they used the 10-item Centre for Epidemiological Studies Depression Scale (CES-D-10). Initially, the Centre for Epidemiological Studies developed a 20-item screening tool to measure the current level of depression symptomatology in general populations, with an emphasis on depressed mood (Radloff, 1977).

Afterward, shorter versions of the scale were developed like Andresen's 10-item version (CES-D-10). Several studies have concluded the good psychometric properties of the CES-10-D scale in healthy populations, psychiatric ones, adolescents and elderly populations to identify risk of depression (Irwin, Artin, and Oxman, 1999; Chen and Mui, 2014; Baron, Davies, and Lund, 2017; González et al., 2017; Mohebbi et al., 2018). For example, Irwin et al. (1999) found a positive predictive value [2] of 85% when they applied the scale to a sample of depressed middle-aged patients. Additionally, the CES-10 scale has shown a good internal consistency determined by the Cronbach's alpha (0.7 to 0.9 depending on the studied population), which makes it a reliable tool for measuring depression (Chapela and de Snyder, 2009; Andresen, Byers, Friary, Kosloski, and Montgomery, 2013 and González et al., 2017).

CES-10 scale was constructed through an "item-total correlation" strategy with the 20 items of the original scale (Baron et al., 2017). It is a 10-item Likert scale questionnaire [3] evaluating depression symptoms during the past week. Options for each item range from "less than a day" (score of 0) to "5 to 7 days" (score of 3) where a higher score in a range of 0 to 30 indicates more intensity in the symptoms of depression. Scores were reversed for items 5 and 8 since these items are related to positive affect while the other items are expressed in terms of depressive affect (3 items) and somatic symptoms (5 items).

[2] Positive predictive value is the probability that subjects with a positive screening test truly have the disease.
[3] The complete questionnaire for the CES-D-10 scale is provided in the appendix 6.1

4.3 Instrumental variable

As mentioned in previous sections, we use the instrumental variables method. Housing module of 2016 CAF's survey asked individuals if, at a distance of 3 or fewer blocks from their household, one of the following situations can be observed: i) abandoned buildings, houses or lots; ii) buildings, houses or lots that have been taken illegally or invaded; iii) garbage dumps; iv) poorly lit streets and v) sale or consumption of drugs. Since the answer to each one of these five questions can be affirmative or negative, we encode the answers such that each variable takes the value of 1 when the answer is "yes" and 0 otherwise. Then, the instrumental variable is constructed as the sum of affirmative answers to these questions, being defined as the number of factors of a negative nature in the entrepreneur's neighborhood.

Empirical evidence suggests that neighborhoods with negative conditions such as poor-quality housing and unsafe conditions inflict stress that can eventually lead to depression (Cutrona, Wallace, and Wesner, 2006). For example, after studying the mental health of patients in different hospitals in Chicago, Faris and Dunham (1939) conclude in their seminal work, that residents of underprivileged communities were more likely to develop mental disorders due to the difficulty of maintaining positive affiliations with family members, neighbors, and local institutions. This difficulty leads to "social isolation" which influences depression symptoms. Faris and Dunham (1939) pioneering work starts the theorization of the widely used "social stress model", which asserts that situations or difficulties that generate psychological stress can contribute to the emergence of mental health problems.

Using this theoretical framework, Cutrona et al. (2006) study the process through which stress acts as a link between a person's neighborhood and depression. Their work establishes several important conclusions. In the first place, they assert that certain neighborhoods' characteristics can influence their inhabitants' daily stress levels. These characteristics include physical ones such as poor access to amenities or an unpleasant environment (poor lighting, garbage in the streets, abandoned houses) and social characteristics (conflicting neighbors, noise, homeless). Second, neighborhood attributes can also influence the emergence of

depression by interfering in the formation of supportive bonds between neighbors or family members.

Similarly, other authors have found evidence on the effect of residential environment on depression symptomatology after controlling by individual-level variables like income, education, age, and gender. The neighborhood characteristics studied in the different articles can be classified into two big groups: structural characteristics and indicators of social process (Mair, Roux, and Galea, 2008). Structural characteristics include green space proximity (Reklaitiene et al., 2014), areas characterized by properties with deck access (Weich et al., 2002), residential proximity to industrial activity, among others (Downey and Van Willigen, 2005). Measures of social process, on the other hand, include perceived violence, disorder, residential stability, and social cohesion (Mair, Roux, and Morenoff, 2010).

Although the previous statements show that there may be a statistical association between depression and a negative residential environment, instrument relevance is an assumption that should be formally proven. We estimated the F value for the instrument in the first stage. An F value above 10, with a single endogenous regressor, suffices to conclude that the instrument is relevant, so that we are not dealing with a weak instrument problem (Bound, Jaeger, and Baker, 1995; Staiger and Stock, 1997). On the other hand, the exclusion restriction of the instrument is an assumption that cannot be formally tested.

We consider that our instrument, conditional on the controls included in the regression, does not has an effect on entrepreneurial exit intentions other than through the depression symptoms experienced by entrepreneurs. The major concern with this exclusion restriction is the correlation that may exist between negative residential environments and individuals' income. One possible path is that the entrepreneurs are thinking of withdrawing from entrepreneurship because the venture is under risk of bankruptcy. Business failure implies that income level is low which in turn might affect living conditions and, as a result, entrepreneurs' presence of depression symptoms. The causal graph in figure 1 represents this possible situation, with W being the normal monthly income of the individual, Z our instrumental

variable (number of negative events in the residential environment), D our main independent variable (depression scale), EI our outcome variable (exit intentions) and U unobservables that in our study may include variables related to personality traits as well as physical health, that affect individuals' persistence in entrepreneurship and that are correlated with depression, causing endogeneity.

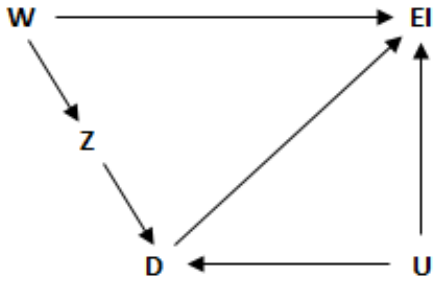

Figure 1

For us to "block" the path between the instrument and the outcome variable so that the exclusion assumption is satisfied, we must control for confounder variables in any path connecting both variables (Pearl and Mackenzie, 2018). A confounder is a variable that affects both outcome and one or more independent variables ($Z \leftarrow W \rightarrow EI$), producing confounding bias unless confounders are included as additional regressors in the model. Under this scenario, income is opening a path between the instrumental variable and exit intentions variable, violating the exclusion restriction. However, once we control for income, this need not be a reason for concern.

Another possibility is that a negative environment near the household has a direct effect on entrepreneurial exit intentions. This could be a reason for concern if entrepreneurs run their business from their home. Then, some adverse characteristics of the residential environment could have a negative effect on the individual's decision to continue in self-employment. If this effect is through individuals' income, then once again, controlling for the income would be enough to inactivate the path between the instrument and the dependent variable. However, if this is not the case, we investigate whether depression has an equivalent effect on exit

intentions once we control for some potential confounder variables between the instrument and the outcome. We check if the addition of these variables affects our estimations in section 5.1.

5 Results and discussion

The main results are presented in Table 3. The dependent variable is a dummy variable indicating entrepreneurial exit intentions in Latin America. The second and the third column show the Probit and OLS regressions on the CES-D-10 depression scale and the different covariates included. Considering the marginal effects estimates for the Probit model, the positive and statistically significant coefficient indicates that an increase of one unit is the depression scale (measured between 0 and 30) is associated to a greater probability, in 0.48 percentage points, of having the intention to withdraw from entrepreneurship. Note that the results for the Probit model, are very similar to those obtained using the linear specification reported in the third column. Because of this, and as mentioned in section 3, we will focus our analysis on linear models.

To account for the potential endogeneity problem, we used the 2SLS method and a measure of the negative situations occurring in the residential environment as the instrumental variable. The results are presented in the fourth and fifth columns of Table 3. The first stage results show a statistically significant association between the instrumental variable and the depression scale. Moreover, the F-statistic for the instrument is about 29, being above the threshold of 10 established by Bound et al. (1995). This suggests that the relevance assumption is met for this instrument so that we are not dealing with a weak instrumental variable problem. The exclusion assumption was previously discussed in section 4.

The point estimates for the second stage results in the 2SLS model imply that one unit increase in the depression scale, i.e., an increase in the severity of depression symptoms, increment the probability of planning withdrawing from entrepreneurship in about 3.1 percentage

Table 3: Depression and entrepreneurial exit intentions

	(1) Probit	**(2) OLS**	**(3) 2SLS**	
	Exit intentions	Exit intentions	Depression	Exit intentions
Depression	0.0048***	0.0052***		0.0314***
	(0.0012)	(0.0014)		(0.0119)
Female	-0.0046	-0.0019	1.2970***	-0.036
	(0.0166)	(0.0183)	(0.3127)	(0.0255)
Age	-0.0015*	-0.0017**	0.0215	-0.0022**
	(0.0008)	(0.0008)	(0.0151)	(0.001)
High education	0.0343	0.0315	-0.9982***	0.0622**
	(0.0209)	(0.0222)	(0.3525)	(0.0278)
Income2	-0.0705***	-0.0723***	-1.0219***	-0.0413
	(0.020)	(0.021)	(0.3694)	(0.0265)
Income3	-0.097***	-0.102***	0.7067	-0.1142***
	(0.0310)	(0.0321)	(0.6403)	(0.0373)
Income4	-0.0995***	-0.0985***	-0.7913	-0.0709*
	(0.028)	(0.031)	(0.6863)	(0.038)
Experience	-0.003***	-0.0026***	-0.0074	-0.0024**
	(0.001)	(0.001)	(0.0187)	(0.0011)
Employees	-0.023	-0.021	0.5726*	-0.0348*
	(0.016)	(0.017)	(0.2984)	(0.0199)
Neighborhood environment			0.5313***	
			(0.0994)	
Country variables	yes	yes	yes	yes
F-Statistic Instrument			28.56	
Observations	1795	1795	1795	

Note – Country-specific dummy variables listed on table 1 are included in all specifications.

Robust standard errors are in parenthesis. Level of significance:* p<0.1; **p<0.05;*** p<0.01.

Marginal effects at the means are reported for Probit model.

points, being statistically significant at the 1% level. Considering a mean of 0.13 for the exit intentions' variable, this is a sizeable effect.

This estimate is considerably higher compared to OLS's results. One of the main reasons why this occur in many empirical investigations, even if the omitted variable bias is expected to be positive, is because the IV method estimates the Local Average treatment effect while OLS estimates the treatment effect among the entire population (Becker, 2016). In other words, the estimated coefficient in the OLS model indicates the average increase in the probability of having an exit intention for those entrepreneurs whose depression scale score differs by one unit, while the IV model, on the other hand, estimates the same effect but only for the population whose score in the depression scale is being influenced by the negative residential environment. For this subgroup of entrepreneurs, the effects of depression may be greater than for the average entrepreneur, since living in not so favorable conditions reduce, from the outset, individuals' resources to cope with depression and to face the entrepreneurship challenges.

Despite the benefits of the IV approach to solve endogeneity, this method brings with it a great cost in terms of efficiency. This can be seen in a much higher estimation for the standard error in the IV model compared to OLS. To justify the use of the instrumental variables method, we used the endogeneity test that allows robust standard errors proposed by Wooldridge (1995). With the null hypothesis that variables treated as endogenous can be treated as exogenous, we reject the null hypothesis at a 99% of confidence level, showing that, regardless of the loss of efficiency, the use of IV method is correct because it leads to a consistent estimation of the coefficients compared to OLS.

Worth mentioning that the coefficients' signs for the other covariates included are in line with the results found by different researches made in both the entrepreneurial exit intentions literature as well in the observed entrepreneurial exit literature. For example, greater entrepreneurial experience, measured in years of work in this occupation, is associated with a lower probability of an entrepreneurial exit intention. Entrepreneurial experience

has been considered one of the most important human capital factors to guarantee business success. This because more experienced entrepreneurs have both the ability and the desire to build value compare to less experienced ones, leading them to persist rather than exit from entrepreneurship (Parker, 2004).

Likewise, the age of the business owner is negatively associated with entrepreneurial exit intentions. This is in line with the empirical evidence suggesting that the business owner's age is one of the major determinants of firm survival (Parker, 2009). As stated by Wennberg, Wiklund, DeTienne, and Cardon (2010), the fact that younger entrepreneurs are likely to find better opportunities outside of self-employment compared to older entrepreneurs can explain this result.

A similar logic can be used in relation to entrepreneurs' education. It is expected that entrepreneurs with a higher level of education will find better job opportunities outside entrepreneurship compared to less educated ones. This explains the positive sign of the estimated coefficient for the variable of education, meaning that individuals with high education, i.e., those who have a complete technical education or higher, are more likely to be considering withdrawing from entrepreneurship compared to individuals with secondary or lower education.

The employer variable is negatively associated with exit intentions, however, it is only statistically significant at the 10% level. The negative sign implies that entrepreneurs with at least one employee are less likely to be thinking of withdrawing from entrepreneurship, compared to entrepreneurs working alone. The number of employees as a proxy for firm size has been linked to less financial distress and a lower probability of bankruptcy. The above because firm size is highly correlated with the age of the business, and long-established enterprises count with the ability to adapt to changing circumstances (Situm, 2014).

Finally, income is a factor expected to have a significant effect on the intention to withdraw from the venture. Owners with a low income for a long period are likely to fall into financial

distress and eventually exit or intend to exit from entrepreneurship. Our 2SLS's model results show a negative and statically significant relationship for the third category of income. This means that having a monthly income between 1001 and 1500 dollars reduce the probability of an exit intention in 11.4 percentage points compared to entrepreneurs with a monthly income lower than 500 dollars. The effect for the fourth category of income (income greater than 1500 USD) has a point estimate of -7 percentage points, however, it is only significant at the 10% level.

5.1 Robustness checks

In this section, we explore potential violations to the goodness of our instrument in terms of exogeneity. As mentioned in section 3, the validity of the results presented in Table 3, depends on the assumption that the neighborhood environment has no direct effect on entrepreneurs' exit intentions. We consider other variables that are correlated with living in a negative residential environment and may have a direct effect on entrepreneurs' exit intentions. In what follow we only focused on the results for the second stage of IV estimates, however it worth mentioning that with the inclusion of these additional covariates the F value for the instrumental variable is still above the threshold of 10 as shown in table 4.

Matti and Ross (2016) studied the effect crime has on entrepreneurs' decision of the location for their business. These authors assert that crime incidence in the place where the enterprise is located, indirectly increases the costs of the business due to a greater risk of facing theft of merchandise, on one hand, and because the higher level of perceived risk by consumers results in a reduction of the customer base. If the increased costs diminish entrepreneurship attractiveness, then withdrawing from entrepreneurship might be likely to happen or at least the intention to do it.

The survey used in this document asked respondents if in the last 12 months they had been a victim of theft or some other crime event such as kidnapping, extortion and physical

assault in the neighborhood in which they live. Because crime is a variable that can be highly correlated with our instrumental variable if there is some path by which crime can affect an individual's decision to persevere in their venture, the estimates presented above will be invalid unless that variable is included in the regression model. We present results for the addition of this covariate in the second column of table 4.

Alike crime, the utilities quality is another variable that is correlated with an unfavorable environment and that can influence the intention to withdraw from the venture. This is primarily true for self-employed people running their entrepreneurial initiative from their home since this type of entrepreneurs depends directly on good access to utilities such as the internet and the electricity. The CAF survey for 2016 asked individuals if in the last 6 months they had experienced interruptions for over 24 hours in the electric energy service and/or in the water service. We consider that this variable is adequate to determine good access to utilities by entrepreneurs.

In section 4 it was discussed how controlling for the level of income allows us to block the causal path connecting entrepreneurial exit intentions, income, and residential environment. However, another possibility is that it is not the level of income per se but the reduction in income, originated from the bad performance of the business, which is affecting the residential environment. If this is the case, we can control by the number of years the individual has been living in the same neighborhood in order to capture changes in the living conditions that might be associated with venture performance. The results for the addition of this covariate are presented in the fourth column of table 4.

Finally, the fifth column of table 4 presents regression model results for the sample of entrepreneurs who carry out their work outside their home. It is expected that work performance for entrepreneurs who run their business in their own homes will be more affected by their living conditions. Neighborhoods with negative conditions may isolate their inhabitants from resources and networks needed for them to reach their potential in different spheres, including the work sphere. Therefore, it can exist the concern that for this group of

Table 4: Depression and entrepreneurial exit intentions: additional checks

	2SLS			
	(1)	(2)	(3)	(4)
Depression	0.0356**	0.0358**	0.0312***	0.0289**
	(0.0144)	(0.0146)	(0.0119)	(0.0146)
Female	-0.0424	-0.041	-0.0361	-0.0422
	(0.0283)	(0.0282)	(0.0255)	(0.0323)
Age	-0.0022**	-0.0022**	-0.0021**	-0.002*
	(0.001)	(0.001)	(0.001)	(0.0011)
High education	0.0687**	0.0672**	0.0623**	0.0485
	(0.0299)	(0.0291)	(0.0278)	(0.0312)
Income2	-0.0366	-0.0387	-0.0421	-0.0458
	(0.0283)	(0.0287)	(0.0266)	(0.0304)
Income3	-0.117***	-0.1208***	-0.1152***	-0.119***
	(0.0399)	(0.0392)	(0.0372)	(0.039)
Income4	-0.0643	-0.0741*	-0.0701*	-0.0561
	(0.0405)	(0.0393)	(0.0382)	(0.0461)
Experience	-0.0026**	-0.0023**	-0.0024**	-0.0028**
	(0.0011)	(0.0011)	(0.0011)	(0.0012)
Employees	-0.0379*	-0.0398*	-0.0347*	-0.0392*
	(0.0211)	(0.0214)	(0.0199)	(0.0233)
Victim of crime	-0.0394			
	(0.0362)			
Utilities quality		-0.0396		
		(0.0323)		
Year in same neighborhood			-0.0003	
			(0.0007)	
Country variables	yes	yes	yes	yes
F-Statistic Instrument	19.86	20.79	28.38	17.26
Observations	1791	1789	1794	1338

Note – Country-specific dummy variables listed on table 1 are included in all specifications. Robust standard errors are in parenthesis. Level of significance: * p<0.1; **p<0.05;*** p<0.01

entrepreneurs, living conditions can affect directly entrepreneurial intentions and decisions such as exit. We evaluate how the results change by eliminating this group of entrepreneurs from the sample.

Overall, we find that none of the additional covariates invalidate our results. Estimates

change considerably little with the inclusion of crime and utilities quality variables, reported in the second and third columns of table 4. Both coefficients are positive with a point estimate of about 0.036 and statistically significant at a level of 5%. It is worth mentioning that neither the variable of crime nor that related to the utilities quality turns out to be statistically significant, meaning that there is not enough statistical evidence supporting that these variables have an effect on exit intentions.

On the other hand, the model that includes the variable related to the number of years in individuals' current neighborhood, estimates an effect of 3.12 percentage points of the depression on the probability of intending to withdraw from the venture. Compared to a coefficient of 3.14 percentage points for the base model, this is a nearly identical and statistically significant effect at a level of 1%. For this model, the variable related to the number of years in the neighborhood does not turn out to be statistically significant either.

Finally, the model that only includes entrepreneurs who work outside their home, is estimated for a total of 1338 observations (457 entrepreneurs work in their home). The effect of depression on entrepreneurial exit intentions for this group of entrepreneurs is only slightly smaller compared to the result for the base sample (0.029 versus 0.031) and statistically significant at a level of 5%.

6 Conclusions and implications

This study contributes to the literature on entrepreneurial exit intentions in several ways. First, it identifies the effect of depression on Latin American entrepreneurs exit intentions. To the best of our knowledge, this is the first article that addresses this relevant issue and does so for a region in which entrepreneurship is an important career choice and source of income. Second, by using the instrumental variables method, the results can be interpreted as an approximation to the estimation of the causal effect. This study is characterized by studying how depression symptoms can affect the business decision-making process. Particularly our interest lies in the

study of the intention to withdraw from entrepreneurship, a precursor of entrepreneurial exit studied by Hessels et al. (2018). The results presented are in line with those of Hessels et al. (2018), in how both studies suggest a positive relationship between depression symptoms and exit process from entrepreneurship.

Entrepreneurship is frequently presented as a desirable career choice because of the opportunities it has in terms of job flexibility, autonomy, and control over the functions performed. However, since it is a demanding occupation both in physical and mental resources, health is of utmost importance for entrepreneurs to succeed in every stage of the entrepreneurial process. The negative effects of mental illness on entrepreneurs' performance could be significant. Yet, the body of literature investigating the effect of mental disorders, like depression, on the entrepreneurial process remain undeveloped. Therefore, this study represents progress in the extensive task of understanding the consequences of mental health problems on entrepreneurs.

The business exit is an important stage in the entrepreneurial life-cycle through which every entrepreneur must at some point go through. Suffering from depression affects the decision-making process and, consequently, can influence the decision of the "when" and "how" to exit from the venture. It is expected that depressive entrepreneurs will have difficulties in selecting the exit mode that allows them to harvest the fruits of their investment. Likewise, suffering from depression can also affect entrepreneurs' re-entry into the labor market after they have effectively withdrawn from entrepreneurship.

The evidence presented in this research suggests that mental health should have an important position in the discussions of public policy on entrepreneurship. Since entrepreneurs are a small and heterogeneous segment of the population, public policy that seeks to promote entrepreneurship as a way to foster upward social mobility and boost productive transformation (Lora and Castellani, 2013), has overlooked entrepreneurs' mental health and well-being. However, if small and medium ventures are to function well, policymakers must address the interaction between mental health and business ownership.

Furthermore, protecting and promoting mental health at the workspace has positive implications for health systems. This because the formulation of strategies seeking to prevent the progression of mental illness among entrepreneurs could reduce private or publicly financed healthcare expenses in the long term. Out-of-pocket might be particularly high in this group of the population. In fact, previous studies have found that over half of all entrepreneurs pay for health insurance out of pocket compared to 6% of salaried-employed with coverage (Hamilton, 2000). Despite there are no comparable studies for Latin American countries, this is an issue worth considering given that this region has both high levels of out-of-pocket spending [4] and high rates of necessity-driven entrepreneurs (27% of total entrepreneurs), a group likely to lack health insurance (Lora and Castellani, 2013).

As suggested in the Canadian Mental Health Association (2019) report, public policy in this subject should focus on prevention and early action. First, entrepreneurs must have a basic understanding of mental health conditions and their symptoms, so they can detect the signs on time and look for help to avoid the development of diseases like depression. This means that business organizations, universities, accelerators, and incubators have the responsibility of including mental health in business education so that entrepreneurs learn how to protect it. Second, the creation and strengthening of entrepreneurial networks should be encouraged. Support networks play a fundamental role for entrepreneurs to share their experience and knowledge with other entrepreneurs in similar situations. This becomes an important source of business and emotional support, to such an extent, that networks have been proven to increase the probabilities of firm survival (Brüderl and Preisendörfer, 1998). Third, stakeholders in the entrepreneurship ecosystem must collaborate in the creation of strategies and tools that support entrepreneurs in maintaining a balance between their personal and work life. Entrepreneurs usually sacrificed a lot of their time in order to meet the high demands of running a business. However, work-life balance is an important contributor to entrepreneurs' well-being and mental health (Canadian Mental Health Association, 2019).

[4] Latin America and the Caribbean was the second region with the highest out-of-pocket spending per total health spending (39.5%) in 2016 (Chang et al., 2019)

In addition to the aforementioned strategies, resilience has been studied to be a protective factor for clinical outcomes. Since resilience is *"the ability to adapt when facing stress and adversity"* (Konradt et al., 2018), It is expected that resilient individuals exposed to stressful life events or working in a stressful occupation do not develop psychiatric disorders like depression or become more capable of managing the symptoms through time. As a result, clinical interventions for entrepreneurs should reinforce their resilience through activities such as psychological treatments.

However, the absence of widespread knowledge about the importance of entrepreneurs' mental health can represent an obstacle for these strategies to be effectively implemented. This has several implications. First, since Schumpeter, entrepreneurs have been conceptualized as visionaries and innovators with no room left to face vulnerabilities like mental diseases. This predominant vision must be changed towards a more realistic one where their different needs are considered and not only in the financial aspect. Second, the lack of data taking into account entrepreneurs' well-being and health in Latin America, points out the importance of the development of screening tools and surveys that, together with the data about the business environment and venture performance, include variables related to the entrepreneurs' physical and mental health.

6.1 Future research

With homogeneous treatment effects, the regression model presented in this study identifies the average treatment effect or the average causal response, when the endogenous variable is continuous (Angrist and Pischke, 2008). This is the ideal scenario. Nevertheless, as empirical problems have shown, this is not always a reasonable assumption since treatment effects are likely to be heterogeneous. As mentioned in previous sections, when treatment effects are heterogeneous, the IV method estimates an average causal effect just for the population of compliers. Compliers, in this research, are entrepreneurs whose depression symptoms are influenced by the negative characteristics of their residential environment. Therefore, they

are entrepreneurs with unfavorable living conditions. With this in mind, future research can explore the possibility of heterogeneous treatment effects in this context.

Moreover, future research could investigate whether entrepreneurial exit intentions, linked to a cognitive process influenced by depression, are maintained over time and lead to an effective exit from entrepreneurship. This is important, because it would reinforce conclusions about the role of mental health as a factor with a significant effect on entrepreneurial planned-behavior. Finally, future research should also dig into the understanding of the mechanisms through which entrepreneurial role can lead to the emergence of depression. Entrepreneurship is an occupation with high job demands associated with high levels of stress. Work stressors, in turn, have been proven to trigger depression symptoms among people working in an adverse psycho-social environment (Iacovides, Fountoulakis, Kaprinis, and Kaprinis, 2003). Consequently, depression, as a trigger of exit intentions due to different reasons than business failure, can be determined by the same characteristics of entrepreneurship. We believe that going as back as possible in understanding the entrepreneurial exit linked to mental diseases is important to close the gaps in this still nascent academic field.

Appendices

10-item Centre for Epidemiological Studies Depression Scale (CES-D-10)

Table 5: CES-D-10 questionnaire

	Less than 1 day	1-2 days	3-4 days	5-7 days
1. "I was bothered by things that usually don't bother me"	☐	☐	☐	☐
2. I had trouble keeping my mind on what I was doing	☐	☐	☐	☐
3. I felt depressed.	☐	☐	☐	☐
4. I felt that everything I did was an effort.	☐	☐	☐	☐
5. I felt hopeful about the future.	☐	☐	☐	☐
6. I felt fearful.	☐	☐	☐	☐
7. My sleep was restless.	☐	☐	☐	☐
8. I was happy.	☐	☐	☐	☐
9. I felt lonely	☐	☐	☐	☐
10. I could not "get going."	☐	☐	☐	☐

Source: CAF survey 2016 questionnaire.

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