How likely was to fall into unemployment during the COVID-19 pandemic crisis in Ecuador?

Grace Carolina Guevara-Rosero

Escuela Politécnica Nacional, Quito, Ecuador, e-mail: carolina.guevara@epn.edu.ec

David Jachero

Escuela Politécnica Nacional, Quito, Ecuador, e-mail: wdjachero@gmail.com

Marcela Guachamín

Escuela Politécnica Nacional, Quito, Ecuador, e-mail: marcela.guachamin@epn.edu.ec

The COVID-19 pandemic did not only impact on the health system but also the economic one, reducing the employment. This research aims to determine the influence of socioeconomic factors on the probability of falling into unemployment in the context of the COVID-19 pandemic. To do so, a survey on the economic and financial situation of people in Ecuador, carried out by the National Polytechnic School in May 2020 is used. The results of the probit model estimation indicate that characteristics of people who were more prone to lose their jobs during the economic crisis derived from the COVID-19 pandemic are: women with no education; people older than 45 years old; people with no insurance; people with no savings, people with informal debts and people working in COVID-19 related high-risk activities. A novel result that adds to the existent literature is that women and men with no education (same condition) are not equally prone to lose their jobs; women with no education are more likely to lose their jobs than men with no education.

Риск безработицы в период пандемии COVID-19 (на примере Эквадора)

Гевара-Росеро Грейс Каролина

Национальная политехническая школа, Кито, Эквадор, e-mail: carolina.guevara@epn.edu.ec

Хачеро Давид

Национальная политехническая школа, Кито, Эквадор, e-mail: wdjachero@gmail.com

Гуачамин Марсела

Национальная политехническая школа, Кито, Эквадор, e-mail: marcela.guachamin@epn.edu.ec

Пандемия COVID-19 повлияла не только на систему здравоохранения, но и на экономику, сократив занятость. Цель данного исследования состоит в том, чтобы определить влияние социально-экономических факторов на вероятность остаться без работы в условиях пандемии COVID-19. Для этого Национальной политехнической школой (г. Кито, Эквадор) в мае 2020 г. проведён опрос по выявлению экономического и финансового положения жителей Эквадора. Оценка пробит-модели позволила выявить характеристики граждан, склонных потерять работу во время экономического кризиса, вызванного пандемией COVID-19. Как правило, это: женщины без образования; люди старше 45 лет; те, у кого отсутствует страховка; люди, не имеющие сбережений; граждане с долгами по неформальным займам; категории занятых, чья деятельность сопряжена с повышенным риском, связанным с COVID-19. Элемент новизны нашего исследования, дополняющий существующую литературу, заключается в выводе, что женщины и мужчины без образования (т.е. в одинаковых условиях) склонны потерять работу в разной степени: женщины без образования теряют работу чаще, чем мужчины без образования.

Ключевые слова: *безработица; рынок труда; COVID; Эквадор; потеря работы; вероятность*

Благодарность: *Авторы выражают признательность исследовательской группе Национальной политехнической школы (г. Кито, Эквадор), которая провела опрос.*

Introduction

Since the declaration of COVID-19 as pandemic, all governments around the world have established stringency measures to reduce the spread of the virus. Such measures ranged from the closure of specific activities that imply face-to-face contact to strict lockdowns. Consequently, the economic activity has been severely affected. The employment contracted on a large scale (Altamirano et al. 2020; International Labour Organization, 2020). The paralysis of economic activities generated liquidity problems for companies and led to their closure. The COVID-19 pandemic altered the development of formal jobs and generated transformations in the way of working (Weller, 2020) such as teleworking. In this sense, those workers in sectors with easy transition to teleworking could be less exposed to unemployment due to lockdowns. In Ecuador, the unemployment reached 13.3% in June 2020 according to the INEC-ENEMDU TELEFÓNICA survey (2020), compared to 4.4% in June

2019, before the pandemic. According to Matamoros et al. (2022), measures to control the COVID-19 pandemic were not effective as unemployment, poverty and extreme poverty increased. A particularity of developing countries that worsen the negative effects of the pandemic in the labor market is the high level of informality. In the Ecuadorian context, the informality rate reached 46.3% in June 2019. Informal workers were severely affected since most of them could not work from home, which made them lose income. In addition, they are not insured, which makes them more vulnerable. The affectation also varies depending on the nature of the economic activity. The risk of unemployment in the wholesale and retail trade sector might be higher than in other sectors because in this sector workers must have direct contact with customers (Papadimitriou and Blaskó, 2020).

Previous literature about the determinants of unemployment in normal times show that women, young people and those with a low level of education (ILO, 2020) are more likely fall into unemployment. In times of crisis, the characteristics or conditions of people that fall into unemployment might differ. In the case of the COVID-19 pandemic, it constitutes an external shock that influences all firms. Even good performer firms were affected, or good workers would be fired. The experience and training had a lower effect on keeping a job.

This study aims to determine a profile of people that are likely to fall into unemployment due to the COVID-19 pandemic. Individual and contextual characteristics of people are analyzed. To do so, data on socioeconomic and financial situation of workers from the survey conducted by the National Polytechnic School in May 2020 was used and the binary logit methodology was employed. This study, contrary to previous literature (Guashca, 2020; Arellano Estrada, 2019; Zurita Loma, 2013), takes into account financial variables such as savings and debts. They are important since they allow detailing more into deep the profile of people more likely to lose their job due to the COVID-19 pandemic-derived lockdowns.

This article is structured as follows. In the next section we analyze the sociodemographic and financial factors that determine an individual's employment in a normal scenario and in crisis. Then we provide detailed information regarding the database used and analyze the data through descriptive statistics. The following section describes data and methodology. After that we present the results obtained and discuss them. The last section concludes.

Literature review

Unemployment has been analyzed from the macroeconomic and microeconomic perspectives. In the macroeconomic case, unemployment tends to increase in the periods of economic downturn, at times of inflation, which decreases the purchasing power, consumption and spending. This reduction in consumption leads to the dismissal of employees in the public and private sector (Sousa, 2009; Jamshaid et al., 2010; Cysne and Turchick, 2012; Erceg and Levin, 2014) and a reduction in the life quality, including affections in the mental health of people (De Miquel et al., 2022) and an increase in wealth inequality (Veric and Islam, 2010). For Ecuador, Jara et al. (2022) indicate that the COVID-19 pandemic led to a rise in income poverty and inequality between December 2019 and June 2020, the period when the economy was most severely impacted. The national poverty rate increased from 25.7% to 58.2%, extreme poverty rose from 9.2% to 38.6%, and the Gini coefficient climbed from 0.461 to 0.592. On average, household disposable income decreased by 41%.

Regarding the microeconomic perspective, factors that are related to unemployment are linked to sociodemographic factors such as age, gender, educational level and urban or rural residence (Sackey and Osei, 2006; Liu and Zeng, 2008; Oye et al., 2011; Anyanwu, 2013). Unemployment at the microeconomic level has been studied in normal and crisis times. At times of crises, Junankar (2015) mentions that the possibility of finding a job depends on age, experience of the worker and the previous laboral position. Unemployed workers in positions of high responsibility are less likely to accept short-term jobs. However, according to Couch and Placzek (2010) unemployed workers with low levels of education could accept short-term jobs with low wages in times of crisis

In the context of the crisis caused by COVID-19, studies such as Houseman (2020) show that the population most affected by unemployment was between 25 and 54 years old, which is the productive age. Generally, in normal times, the age range most affected by unemployment is under 24 years

old. In fact, according to the International Labor Organization (2004), half of the unemployed in the world are less than 24 years old.

As for gender, in a crisis scenario, Böheim and Leoni (2020) show that during the COVID-19 health crisis in some countries such as Austria, men were slightly more affected by the fall in employment than women. Likely, Weller et al. (2020) identify that in Latin American countries such as Chile and Mexico men have been slightly more affected by unemployment. In Chile, the unemployment rate in March 2020 increased by 3.7% while for women it increased by 2.2%. Escribà-Agüir and Fons-Martínez (2014) indicate that in 2009 there was a higher unemployment rate for men than for women in the European Union. For Ecuador, Armijos-Bravo and Camino-Mogro (2023) obtained that the unemployment increases in 15% for women comparing the scenarios before and after the COVID-19 pandemic. Using information on six countries (China, South Korea, Japan, Italy, the United Kingdom and United States), Dang and Nguyen (2021) also obtained that women are 24% more likely to permanently lose their job than men during the outbreak.

According to a report from ECLAC (2020), in Latin American countries, the gender gap between male and female employees has decreased in a normal scenario. Berbel (2014) analyzed the phenomenon known as the glass cliff, which in summary consists of offering top management positions to women, which could reduce the gender gap. However, those management positions generally have a higher risk of failure.

Another important variable to assess the probability of becoming unemployed is the geographic location. In a normal scenario, some studies show that the probability of finding a job is lower in urban areas than in rural areas (Cacuango and Lucero, 2013; Martínez and Solórzano, 2018). In this line, Mora (2021) shows that during the pandemic crises young people residing in the urban Oriente area are 0.36 times less likely to get a job compared to those residing in the rest of the city. By contrast, Campos et al. (2020) concluded that the geographic area is not a determinant of unemployment in the case of Chile.

The level of education is another variable commonly used to estimate the probability of unemployment. During crisis times, Carlson (2002) identified that in Latin American countries, people with more years of schooling have a higher probability of being well paid and a lower probability of being unemployed. In the same line, Weller et al. (2020) obtain that in Latin America, unemployed people with lower educational levels are less likely to find a job during the pandemic. Ferreira et al. (2020) identify that the probability of falling into unemployment during the pandemic crisis increased by 38.3% for those without a higher education degree in Portugal. In a normal scenario, Castillo (2005) obtains that an additional year of education decreases the probability of being unemployed in Cali. On the contrary, a study for Ecuador by Martínez and Solórzano (2018) shows that a higher level of education increases the probability of being unemployed.

While the economic sector is an important factor that explains the probability of falling into unemployment due to industry-specific issues, in the COVID-19 scenario, the economic sector is even more important to explain unemployment as the probability of getting infected increases with face-to-face contact, which some economic activities require. The economic sectors most affected by the COVID-19 pandemic in Latin America were wholesale and retail trade, tourism, manufacturing, business, real estate activities and entertainment (Papadimitriou and Blaskó, 2020).

The financial situation of individuals is also related to unemployment. Tinoco and Ruiz (2002) propose a theory of precautionary savings, which indicates that people save money for difficult times such as unemployment. Indeed, in Spain there was an increase in the savings rate between 2008 and 2009 due to lower expectations about future income since unemployment increases in times of crisis (Sastre and Fernández-Sánchez, 2011).

Ocampo (2021) identified a negative correlation between the household indebtedness variable and unemployment between the 1988 and 2019 for Ecuador. This was also identified by Fuenzalida and Ruiz-Tagle (2009) in their work on household financial risk, showing that the most indebted households are those that have a higher level of income and/or a higher value of assets and are less likely to be unemployed. According to Tinoco and Ruiz (2002), population with savings generally have stable jobs, and, therefore, are less likely to fall into unemployment.

Data and variables

To study the loss of employment due to the COVID-19 pandemic, the survey "Laboral situation of working-aged people during the COVID-19 pandemic" conducted by the Escuela Politécnica Nacional in May, 2020 was used. This survey records information about the economic and financial situation of workers in Ecuador. Due to the lockdown, the survey was online. For this reason, the survey is not representative at the national level but contains important information about 3868 surveyed people. For this analysis, people that were unemployed before the COVID-19 pandemic are not considered (879 observations were eliminated). The information we consider corresponds to surveyed people that lost their jobs due to the COVID-19 pandemic and people that are still working, which results in a database of 2334 observations[1].

Dependent variable

The dependent variable is a binary variable that indicates whether a person lost his/her job during the COVID-19 pandemic. This variable is built using the question: How the COVID-19 pandemic influenced on your laboral status? Six possible answers were: 1) I lost my job, 2) it is possible that I lose my job, 3) I keep my job, 4) extra hours have been eliminated, 5) I work less hours, 6) I did not have a job before the COVID-19 pandemic. People that were unemployed before the COVID-19 pandemic (option 6) were not considered. This variable is recategorized: it takes the value of 1 if a person lost his/her job due to the COVID-19 pandemic (COVID-19 unemployed person) and 0 if the person still works (from option 2 to option 5). A more sophisticated model using the multiple categories of our dependent variable was not applied due to overlapping categories, which might lead to the misinterpretation of results. For instance, a worker who experienced a reduction in working hours could also experience the elimination of extra hours and at the same time feel that it is possible to lose the job. For this reason, the variable is recategorized in a way such that the categories are mutually excluded. As shown in Table 1, 15.30% of people surveyed lost their jobs. As we indicated above, according to national official statistics, unemployment reached 13.3% in May-June 2020. It is worth noting that in our survey, 15.3% of surveyed people declared that they have lost their jobs due to the lockdown derived from the COVID-19 pandemic.

Table 1

Laboral situation due to the COVID-19 pandemic

Laboral situation due to the COVID-19 pandemic	Recategorization	Frequency	Percentage	Cumulative percentage
I lost my job due to the COVID-19 pandemic	COVID-19 unemployed person	357	15.30%	15.30%
It is posible that I lose my job	Occupied	432	18.51%	33.80%
I keep my job		1,006	43.10%	76.91%
Extra hours have been eliminated		76	3.26%	80.16%
My working time has been reduced		463	19.84%	100%
Total		**2,334**	**100%**	

Source: Survey "Laboral situation of working-aged people during the COVID-19 pandemic", Escuela Politecnica Nacional, own elaboration

Independent variables

In Table 2, a description of independent variables is given, together with their expected sign according to the literature.

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[1] After a depuration of the database, outlier observations in the number of members in a household were eliminated (68 obs.). Moreover, there are missing data in some variables, so that the resulting database obtains 2334 observations.

Table 2

Description of independent variables

Variable	Description	Expected sign
Gender	It is a binary variable that takes the value of 1 if the person is woman, and 0, otherwise.	(+) Martínez and Solórzano (2018) Cacuango and Lucero (2013) Cuesta and González (2014) ECLAC (2020) Berbel (2014) Castillo and Salas (2018) Böheim and Leoni (2020) Weller et al. (2020)
Tertiary education	It is a binary variable that takes the value of 1 if the person has tertiary education, and 0 if the person has no education, primary education or secondary education.	(-) Martínez and Solórzano (2018) Cacuango and Lucero (2013) Cuesta and González (2014) Couch and Placzek (2010) Escribà-Agüir and Fons-Martínez (2014) Carlson (2002) Ferreira et al. (2020) Weller et al. (2020) Castillo (2005)
Age	It is a categorical variable with the following categories: • From 18 to 34 years old (Reference category) • From 35 to 44 years old. • More than 44 years old.	Ramírez (2016) Cacuango and Lucero (2013) Cuesta and González (2014) Junankar (2015) Escribà-Agüir and Fons-Martínez (2014) Houseman (2020)
City size	It is a categorical variable with the following categories: • Metropolis (Reference category). • Big city • Medium-sized city • Small city	(+) Ramírez (2016) Cacuango and Lucero (2013) Martínez and Solórzano (2018) Mora (2021) Campos et al. (2020)
Insurance	It is a binary variable that takes the value of 1 if the person accounts for insurance (public, private or both), and 0, if the person does not have any type of health insurance	(-) National Institute of Statistics of Chile (2019)
Savings	It is a binary variable that takes the value of 1 if the person accounts for savings, and 0, otherwise.	(-) Tinoco and Ruiz (2002). Sastre and Fernández-Sánchez (2011)
Debt type	It is a categorical variable with the following categories: • No debt (Reference category) • Formal debt • Informal debt	Ocampo (2021) Fuenzalida and Ruiz-Tagle (2009)
Risk of economic activity	It is a categorical variable with the following categories: • Low risk economic activity (Reference category). This category includes Professional and scientific services, Information and communication technology. • Middle risk economic activity. This category includes Construction, Manufacturing, Transportation or storage, Agriculture, horticulture, forestry or fishing, Accommodation and food services. • High risk economic activity Social and personal services, Wholesale and retail trade, sales, shop work. The risk is defined according to the level of exposure to the virus in economic activities. The methodology to determine these sectors was developed by Papadimitriou and Blaskó, (2020) and has been used by the International Labor Organization (2020)	(+) OIT (2020) (Papadimitriou and Blaskó, 2020). Weller (2020) ILO (2020)

Source: authors

Descriptive statistics of independent variables

Variable	Total number of observations	Number of unemployed people	Employed people (%)	COVID-19 unemployed people (%)
GENDER				
Female	*1161*	*220*	81%	19%
Male	*1173*	*137*	88%	12%
TERTIARY EDUCATION				
No higher education	*479*	*158*	67%	33%
Higher education	*1855*	*199*	89%	11%
AGE				
From 18 to 34 years old	*773*	*125*	85%	15%
From 35 to 44 years old	*749*	*101*	87%	13%
More than 44 years old	*812*	*131*	85%	15%
CITY SIZE				
Metropoli	*1171*	*188*	84%	16%
Big City	*401*	*51*	87%	13%
Medium-sized city	*399*	*60*	85%	15%
Small city	*363*	*58*	84%	16%
INSURANCE				
With insurance (private or public)	1642	97	94%	6%
No insurance	692	260	62%	38%
SAVINGS				
No	*1390*	*283*	80%	20%
Yes	*944*	*74*	92%	8%
DEBT TYPE				
No debt	*380*	*60*	84%	16%
Formal debt	*1824*	*246*	87%	13%
Informal debt	*130*	*51*	61%	39%

Source: authors' computation

According to the descriptive statistics, shown in Table 3, the percentage of women that lost their jobs due to the COVID-19 pandemic was higher (19%) than that of men (12%). People with no higher education fell into unemployment due to the COVID-19 pandemic to a greater extent (33%) than people with higher education (11%). A higher level of education might be related to better jobs, so people with higher education are more likely to have more labor stability. Regarding the age, the most affected workers were those between 18 and 34 and those older than 44 years old with 15% of them that lost their jobs due to the COVID-19 pandemic, meanwhile 13% of workers between 35 and 44 years old, lost their jobs. Workers with no insurance, most likely working in the informal sector, record a 38% of unemployment due to the COVID-19 pandemic, meanwhile workers with insurance report only a rate of 6% of unemployment. Thus, the percentage of unemployment of people with no insurance is 6 times larger than that of people with insurance. Likewise, the percentage of people with no savings that lost their jobs due to the COVID-19 pandemic is higher (20%) than people with savings (8%). Those people with informal credits record a higher percentage of unemployment (39%) than people with formal credits (13%). To sum up, people with pre-existing bad conditions were more affected by the crisis derived from the COVID-19 pandemic. As the economic activities had different degrees of risk related to the COVID-19 pandemic, various percentages of people that lost their jobs are observed in different types of economic activities. From those people who worked in economic activities of low risk such as education and services related to utilities,

7% lost their jobs, meanwhile from those people who worked in economic activities of high risk such as wholesale and retail and manufacturing, 25% fell into unemployment due to the COVID-19 pandemic. Regarding the localization of people, a higher percentage of people living in metropolis (16%) and small cities (16%) lost their jobs with respect to people living in big (13%) and medium-sized cities (15%). It was expected to have a higher incidence of unemployment in big cities because they are more populated and most of the jobs are located there. Employment in the health sector was not very affected because it was needed to assist COVID-19 infected people. In small cities, unemployment was higher because less opportunities to do teleworking were at hand.

Methodology

The dependent variables indicate whether a person lost his/her job due to the COVID-19 pandemic. In this framework, choice models with binary dependent variable can be applied (Greene, 2012). A probit model is then estimated as in Martínez and Solórzano (2018), Castillo (2005), Castellar and Uribe (2017), who analyzed the determinants of unemployment. The probit model can be expressed as follows (Wooldridge, 2010).

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots \beta_k x_k) = G(\beta_0 + X\beta), \tag{1}$$

where G is the standard cumulative distribution function which is expressed as an integral:

$$G(z) = \Phi(z) = \int_{-\infty}^{z} \phi(v)dv, \tag{2}$$

where the standard normal density, $\phi(z)$, is defined by:

$$\phi(z) = 2\pi^{-1/2} exp\left(\frac{-z^2}{2}\right). \tag{3}$$

The specification is the following:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots \beta_k x_{ki} + e_i, \tag{4}$$

where:

$$Y = \begin{cases} 1 \; if \; the \; individual \; lost \; his - her \; job \; due \; the \; COVID - 19 \; pandemic \\ 0 \; otherwise \end{cases}. \tag{5}$$

β_k are the coefficients which are estimated by maximum likelihood, x_{ki} are the independent variables e is the error term which is normally distributed.

Results

Table 4 shows the estimation results of the probability of falling into unemployment due to the COVID-19 pandemic. The percentage of correctly classified observations is 86.46%, which shows an adequate goodness of fit of this model.

Among the explanatory variables, an interaction term between gender and instruction is included. The reference category is men with no education. The results shows that men and women with the same level of education (no tertiary education) do not have the same probability to lose their jobs. Women with no tertiary education are more likely to lose their job due to the lockdown derived from the COVID-19 pandemic than men with no tertiary education. This situation can be explained by gender discrimination in the labor market (Vásconez, 2009). Nevertheless, results in previous studies considering crisis times, men are more likely to lose their jobs than women such as the descriptive analysis conducted by Böheim and Leoni (2020) for Austria. For Ecuador, Armijos-Bravo and Camino-Mogro (2023) demonstrated that unemployment rose by 15% for women. In addition, our results show that men with tertiary education are less likely to lose their jobs than men with no tertiary education, whereas the difference between women with tertiary education and men with no tertiary education is not significant. While the result of a lower probability of losing a job with more education is supported by previous studies such as Weller et al.

(2020) for Latin America during the COVID-19 pandemic and Márquez-Scotti (2015) for the Mexican case in normal times, the non-significant difference in the probability of losing a job between men with no tertiary education and women with tertiary education is a novel result that sums to the existent literature.

Regarding the age range, the probability of losing a job due to the COVID-19 pandemic is higher for people older than 45 years old with respect to people between 18 and 34 years old. The estimate for people between 35 and 45 years old is negative but not significant. This results in a U-shaped relationship between age and the probability of losing a job. In fact, the International Labor Organization (2013) reported that younger people were more affected in terms of losing a job during the world economic crisis in 2012 and 2013 because it is difficult for them to get a decent job. The higher probability of losing a job for people older than 45 years old is explained by two factors. First, older adults were more prone to have severe disease effects. And second, for firms in Ecuador, older adults represent an economic charge since according to the Ecuadorian law, firms have to pay them employer's pension. During the pandemic, firms took the opportunity to fire them and not to pay the employer's pension. Although this situation occurs in normal times, during the COVID-19 pandemic, it was intensified.

Our results also show that the probability of losing a job decreases with the city size. Such probability in small cities was 3 percentage points lower than in Metropolis, in medium-sized cities, it is 2.94 percentage points lower than in metropolis; and in big cities, although not significant, it is 0.3 percentage points lower than in metropolis. Although in bigger cities is expected to have a lower probability of falling into unemployment due to a higher probability of teleworking and better access to internet due to their infrastructure in terms of telecommunications (ECLAC, 2020), in Ecuador, bigger cities were more affected due to the prolonged mandatory lockdown. People in bigger cities were more prone to get infected due to a high population density and therefore more face-to-face contact, so the lockdown was respected. By contrast, since citizens in smaller cities are not very close to each other, the probability to get infected was lower therein, so they did not respect the lockdown, even though it was mandatory. Therefore, economic activities did not stop abruptly and for prolonged times in smaller cities as they were in bigger cities.

Regarding health insurance, people without any type of insurance, either public or private, who are considered informal workers (INE, 2019), are more likely to lose their jobs in 19.22 percentage points than people with insurance. Therefore, people that were vulnerable prior to the COVID-19 pandemic, become more vulnerable after it. This result is in line with Marcillo (2010) who obtained a positive relationship between informality and unemployment duration in Colombia. Our result is also in accordance with the findings of Armijos-Bravo and Camino-Mogro (2023) for Ecuador, who obtained that at the macroeconomic level, social protection was not enough to protect people in the informal sector with little or no social security. People with savings are less likely to fall into unemployment at 7.18 percentage points with respect to people without savings. This relationship can be explained by two reasons. First, people that cannot save money are generally employed in jobs of low quality with low income and low stability, so they are more likely to lose their jobs. Second, people that save money have diversified sources of income. According to the study of individual saving accounts by Gogorza (2016), people with savings are less likely to fall into unemployment and are less vulnerable since they invest in different sectors, diversifying the risk.

Regarding the effect of having a debt, our results show that people with credits/debts from informal sources are more likely to lose their jobs in 8.23 percentage points with respect to people with no debts. This result might be explained by the fact that people that borrow money from informal sources such as friends, family members or "chulqueros", are people with limited access to credits granted by financial institutions as they might not have stable jobs and therefore, stable incomes. Thus, their probability to lose their income source (a collateral required by financial institutions) is higher than people that do have access to formal credits.

An interesting finding drawn from our results is that as the risk related to COVID-19 of an economic activity increases, the probability of falling into unemployment is higher. For instance, people working in COVID-19 medium-risk activities such as wholesale and retail, manufacturing, accommodation and food, are more likely to lose their jobs due to the COVID-19 pandemic in 4.62 percentage points with respect to people working in low-risk activities such as education, health and defense. The probability of losing a job increases in high-risk economic activities such as transport and communication in 5.94 percentage points with respect to low-risk activities. In COVID-19 risky economic activities, people had to have face-to-face contact with other people. Despite of the high-risk position, these activities must continue to attend the basic needs of the whole population (ILO, 2020). Thus, layoffs are numerous and people willing to take the risk will be hired.

Probit estimation results

Variables	Model	Marginal effects
Category of reference: Man without tertiary education		
Man with tertiary education	−0.324*** (0.008)	
Woman without tertiary education	0.365*** (0.006)	
Woman with tertiary education	− 0.100 (0.410)	
Category of reference: Man		
Woman		0.0489*** (0.000)
Category of reference: With no tertiary education		
With tertiary education		−0.0804*** (0.000)
Category of reference: From 18 to 34 years old		
From 35 to 44 years old	−0.108 (0.248)	−0.018 (0.247)
More than 45 years old	0.128* (0.149)	0.024* (0.148)
Category of reference: Metropolis		
Big city	−0.015 (0.885)	−0.003 (0.885)
Medium-sized city	−0.168* (0.106)	−0.029* (0.094)
Small city	−0.169* (0.108)	−0.030* (0.095)
Category of reference: No insurance		
With insurance	1.073*** (0.000)	0.192*** (0.000)
Category of reference: With savings		
No savings	−0.401*** (0.000)	−0.072*** (0.000)
Category of reference: No debt		
Formal debt	−0.131 (0.207)	−0.024 (0.223)
Informal debt	0.374** (0.016)	0.082** (0.021)
Category of reference: Low risk economic activity		
Middle risk economic activity	0.267** (0.012)	0.046** (0.015)
High risk economic activity	0.334*** (0.000)	0.059*** (0.000)
CONSTANT	−1.357*** (0.000)	
Correctly classified	86.46%	
Sensitivity	29.13%	
Specificity	96.81%	
* p<.10, ** p<.05, *** p<.01		

Source: authors' computation

Conclusions

This study identifies the profile of people that are more likely to lose their job during the lockdown derived from the COVID-19 pandemic in Ecuador. Individual and contextual characteristics that define the probability of losing a job were identified. According to our results, the main individual characteristics of people who are more prone to lose their jobs are: women with no education; people older than 45 years old; people with no insurance; people with no savings, people with informal debts. A novel result that adds to the existent literature is that women and men with no education (same condition) are not equally prone to lose their jobs; women with no education are more likely to lose their jobs than men with no education. Therefore, people that were vulnerable prior to the COVID-19 pandemic, become more vulnerable after it. Based on these results, it is recommended to strengthen the formal sector of the economy to incentivize workers operating in the informal sector to formalize. Actions toward the formalization of workers would be beneficial for two reasons: i. workers could have labor market benefits by law such as access to the social security system and ii. more vulnerable workers could improve their resilience in case of economic crisis. Regarding the higher probability to lose the job for women with no education than for men with no education, it is important to establish labor market policies with gender approach. For instance, a suggested reform of the labor market law could be to equalize the paternal leave for both women and men. In the current labor law, women have more time for maternal leave than men, which reduces the incentives for firms to hire women. In the informal labor market, working women with no education might be in charge of household domestic activities, which reduces their participation in the labor market. In this context, it is crucial to promote the equality in household activities between men and women.

The results regarding the financial variables and the interaction between gender and education level are novel in the literature. The contextual characteristics that influence the probability of losing a job are the city where people live and the economic activity. Contrary to expected, there is higher probability of losing a job in metropolitan cities than medium-sized cities and small cities where less chances to transit teleworking exists due to low-quality of internet connection in remote areas. In Ecuador, the probability of losing a job was higher in metropolitan cities due a more strict and more respected lockdown therein. High-risk economic activities increase the probability of losing a job. These economic activities are related to social and personal services, wholesale and retail trade, sales, shop work. To reduce the vulnerability in these activities, it would be useful to implement electronic commerce and delivery services, so firms in these sectors could be more resilient to economic crisis. Moreover, it is important to promote financial policies that encourage financial inclusion, considering the restructuring of debts and the reduction of microcredit interest rates to provide options for the unemployed to generate entrepreneurship.

For further analysis, we recommend looking at the use of credits that workers obtain as it could determine whether they could maintain an economic activity as entrepreneurs. Additionally, the results of this study could be used for comparative analysis with other studies about crisis and identify some patterns and anticipate to possible future crisis.

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