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► Resilience or need? COVID-19, informality and the probability of being employed

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► Abstract¹

The COVID-19 pandemic affected employment drastically. Using quarterly panel data from Peru for the periods 2019–21, this paper describes how the labour market adjusted in terms of informality and employability. First, it reconfirms that the Peruvian labour market is highly dynamic and that most transitions occur from informal employment to inactivity and vice versa. During the lockdown period, the outflow to inactivity increased, and the inflow from inactivity was severely limited due to the containment restrictions imposed. Second, the paper explores the longer-term effects of the pandemic and finds that it also affected the probability of being employed (a broad measure of employability) and, in particular, being employed formally. While the overall probability of being employed decreased in 2020, it recovered in 2021, but the probability of being employed formally was not fully restored to the pre-pandemic levels at the end of 2021. The effect was especially hard for women, youth, older generations and the less educated. This suggests that the pandemic might have altered the structure of the labour market, in particular its capacity to generate formal jobs. It resulted in a degradation of employment quality that requires additional time to recover.

Keywords: labour market transitions, informality, COVID-19, panel data

JEL: C23, C32, C33, J11, J46, J62

The views expressed in this background paper are those of the authors and do not necessarily represent the views of the organizations where the researchers are based.

¹ This paper updates and extends the results of a presentation on “COVID-19, informality and employability” by Juan Chacaltana, Julio Perez, and Sergio Quispe, presented at the 7th Regulating for Decent Work Conference organized by the ILO, Geneva in July 2021. Helpful comments were received from Sergei Suarez, Guillaume Delautre, Juan Manuel Garcia, Mauricio Dierckxsens, Roxana Maurizio, Johannes Weiss and Miguel Jaramillo. All remaining errors in this paper are those of the authors alone.

1. Introduction

The COVID-19 pandemic affected employment drastically around the world. While trying to contain the spread of the virus, many countries imposed massive restrictions on mobility, especially on mobility related to work, and many jobs and hours of work were lost.

In this paper, we aim to assess the dynamics of the adjustment of the labour market to this crisis, using quarterly panel data from Peru — one of the worst hit countries, both in economic and sanitary terms, for the period of 2019–21². Figure 1 shows the evolution of total employment at the national level in 2019, 2020 and 2021. Before COVID-19, total employment was slightly above 17 million workers. COVID-19 and the severe lockdown measures³ imposed resulted in the decline of employment by some 30 per cent in the second quarter of 2020. Employment started to recover in the third quarter of 2020, and it returned to pre-pandemic levels in the fourth quarter of 2021.

Figure 1. Peru: Evolution of total employment, 2019–21 (millions of persons)



Source: INEI (Instituto Nacional de Estadística e Informática), ENAHO (Encuesta Nacional de Hogares).

However, as in many developing countries, labour markets in Peru typically do not adjust to crisis via unemployment but rather via quality of employment.⁴ For that reason, in our analysis, we pay special attention to the process of adjustment using an informal/formal disaggregation.

² By December 2020, the country had registered one of the highest number of deaths per million inhabitants in the world; with nearly 11 per cent, it had also experienced the worst GDP decline in a hundred years (INEI, 2021).

³ The lockdown period in Peru started on 16 March 2020 and lasted until end of May (DS No. 044-2020-PCM and DS No. 080-2020-PCM).

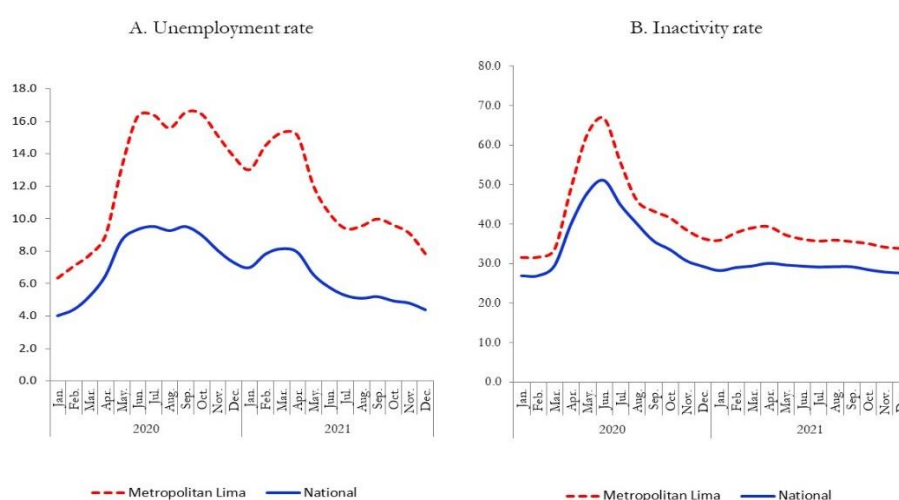
⁴ There have been several studies trying to explain the large impact of COVID-19 on the Peruvian labour market. See, for example, Higa, Morales, and Aragon.(2021); Jaramillo and Campos (2020); Lavado and Crisólogo (2021); and Ministerio de Trabajo y Promoción del Empleo (MTPE, 2021).

2. The evolution of the labour market during the COVID-19 pandemic

In this section, we analyse the evolution of the labour market, using aggregate data from two sources: (a) the National Household Survey on Living Conditions and Poverty (ENAH0), which has a national coverage that includes urban and rural areas; and (b) the Permanent Employment Survey (Encuesta Permanente de Empleo, EPE), with coverage only for Metropolitan Lima. An important difference between both data sets is the little weight given to agriculture in Metropolitan Lima compared to the national data which – as we will see – has important implications for the adjustment process.

As in many countries, the most severe effect of COVID-19 on the labour market occurred during the lockdown period – the second quarter of 2020 in Peru. In this period, due to the imposition of massive restrictions on mobility, the labour participation rate plummeted from over 70 per cent down to 37 per cent, and the unemployment rate increased sharply (see Figure 2). In the third quarter, as restrictions on mobility were gradually lifted, a slow recovery process started. By the fourth quarter of 2020, participation rates still remained 3 per cent lower than in 2019, but by the end of 2021, they had fully recovered. The unemployment rate, however, remained higher than pre-pandemic levels during the rest of 2020, and it only started to decrease in the second half of 2021.

Figure 2. Peru: Unemployment and inactivity by quarter, 2020–21 (%)

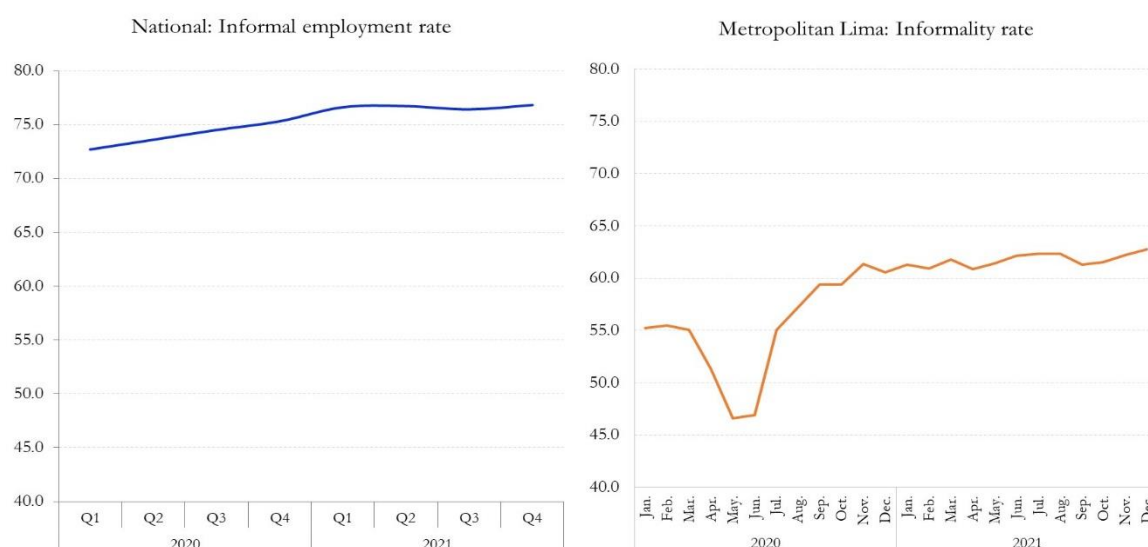


Source: INEI, ENAH0; EPE.

Informality reacted rapidly. As Figure 3 shows, it increased quickly from 72.7 per cent of the national labour force in 2019 to 75.3 per cent in 2020, exceeding 76 per cent in 2021. However, it decreased temporarily in Metropolitan Lima during the lockdown period (Q2 of 2020).⁵

⁵ Note that, for the case of Lima, an “informal” worker is considered a person who is currently working but does not have a contributory health insurance (ESSALUD or private).

Figure 3. Peru: Evolution of informality, 2020–21 (%)



Source: INEI, ENAHO; EPE.

One way to explain this divergence is the fact that the evolution of sectoral employment – both during the lockdown period and the recovery period – was highly uneven among economic sectors. In general, when there is a crisis (typically a demand crisis) and some sectors shrink, the labour market tends to adjust via sectoral recomposition, as workers try to migrate from decreasing sectors to those in which employment grows. During COVID-19, the possibility of this recomposition effect was severely constrained by the lockdown rules. In particular, in the Peruvian case, agriculture was considered an essential activity and was thus authorized to operate normally during the lockdown period, while most of the other sectors were closed.⁶ Moreover, the fact that agricultural employment represents some 31 per cent of total employment at the national level but only around 2 per cent in Metropolitan Lima helps to explain the different processes of adjustment. This can be seen in Tables 1a and 1b, in which we perform a simple shift share analysis of the evolution in the rate of informality by economic sector, comparing national data and those for Metropolitan Lima for the years 2019–20 and 2020–21. In Table 1a, which uses national data, by focusing on Q2-2020 (the lockdown period), we observe that there is an important negative change (reduction) in the “within” effect of -6.9 pp due to reductions of informality in all sectors, except for agriculture. However, this effect was more than offset by a positive change (increase) in the “between” effect of +9.8 pp, which was basically due to the fact that work in the agricultural sector remained authorized, and workers from other sectors were allowed to move there from sectors in which work was prohibited.

⁶ MTPE (2021) highlights the role of “essential” versus “non-essential” sectors: during 2020, job losses amounted to 14.3 per cent in non-essential sectors and only 3.4 per cent in essential sectors.

Table 1a. Peru: Shift share analysis by sector, 2019–21 (per cent)

	Informal employment rate			Employment composition			Decomposition 2020/2019			Decomposition 2021/2019		
	Q2-2019	Q2-2020	Q2-2021	Q2-2019	Q2-2020	Q2-2021	Within	Between	Total	Within	Between	Total
<i>Economic activity</i>												
Agriculture	95.8	97.8	97.4	22.6	44.7	26.8	0.4	21.6	22.1	0.3	4.1	4.4
Fishing	86.8	91.5	83.4	0.6	0.4	0.5	0.0	-0.2	-0.2	0.0	-0.1	-0.1
Mining	35.0	12.1	44.4	1.0	0.7	1.2	-0.2	0.0	-0.3	0.1	0.1	0.2
Manufacture	60.7	56.0	63.5	8.6	6.0	8.0	-0.4	-1.4	-1.8	0.2	-0.4	-0.1
Construction	82.3	79.6	85.2	5.7	2.9	6.7	-0.2	-2.2	-2.4	0.2	0.8	1.0
Commerce	69.0	70.1	76.8	18.2	14.1	19.8	0.2	-2.8	-2.6	1.4	1.3	2.7
Transport & communications	80.0	75.8	79.0	8.4	6.1	7.6	-0.4	-1.7	-2.1	-0.1	-0.6	-0.7
Services	52.5	34.2	53.0	35.0	25.1	29.5	-6.4	-3.4	-9.8	0.1	-2.9	-2.8
<i>Total</i>	70.0	72.9	74.6	100.0	100.0	100.0	-6.9	9.8	2.9	2.3	2.3	4.6
	Q4-2019	Q4-2020	Q4-2021	Q4-2019	Q4-2020	Q4-2021	Within	Between	Total	Within	Between	Total
<i>Economic activity</i>												
Agriculture	95.9	95.6	96.3	23.1	26.2	24.8	-0.1	3.0	2.9	0.1	1.7	1.8
Fishing	86.6	92.4	95.0	0.4	0.5	0.5	0.0	0.1	0.1	0.0	0.1	0.1
Mining	41.5	55.3	44.8	1.2	1.2	1.2	0.2	0.0	0.2	0.0	0.0	0.0
Manufacture	64.5	64.0	62.7	8.9	8.8	8.8	0.0	-0.1	-0.1	-0.2	0.0	-0.2
Construction	78.0	87.3	87.2	6.0	6.6	7.2	0.6	0.5	1.1	0.5	1.0	1.6
Commerce	72.0	75.6	73.4	19.0	19.8	19.0	0.7	0.6	1.3	0.3	0.0	0.2
Transport & communications	80.6	78.1	78.9	8.1	7.0	8.4	-0.2	-0.8	-1.0	-0.1	0.3	0.1
Services	54.0	51.6	53.6	33.5	29.9	30.1	-0.8	-1.8	-2.6	-0.1	-1.8	-1.9
<i>Total</i>	71.6	73.4	73.3	100.0	100.0	100.0	0.3	1.5	1.8	0.6	1.3	1.8

Table 1b. Metropolitan Lima: Shift share analysis by sector 2019–21 (per cent)

	Informal employment rate			Employment composition			Decomposition 2020/2019			Decomposition 2021/2019		
	Q2-2019	Q2-2020	Q2-2021	Q2-2019	Q2-2020	Q2-2021	Within	Between	Total	Within	Between	Total
<i>Economic activity</i>												
Manufacture	54.4	46.4	59.7	13.3	10.6	13.3	-1.1	-1.3	-2.3	0.7	0.0	0.7
Commerce	64.8	63.1	72.0	19.9	23.2	23.7	-0.3	2.1	1.7	1.5	2.8	4.2
Restaurants & hotels	73.4	56.5	77.8	7.8	2.9	7.1	-1.3	-2.8	-4.1	0.3	-0.5	-0.2
Transport and communications	69.9	69.6	78.8	10.7	10.8	9.7	0.0	0.1	0.1	0.9	-0.8	0.2
Services to firms	37.9	32.7	43.0	13.1	14.5	12.6	-0.7	0.5	-0.2	0.7	-0.2	0.5
Other services	49.2	35.5	55.2	35.2	38.0	33.6	-4.8	1.0	-3.8	2.1	-0.9	1.2
<i>Total</i>	55.6	46.9	62.1	100.0	100.0	100.0	-8.3	-0.4	-8.7	6.2	0.3	6.5
	Q4-2019	Q4-2020	Q4-2021	Q4-2019	Q4-2020	Q4-2021	Within	Between	Total	Within	Between	Total
<i>Economic activity</i>												
Manufacture	54.3	60.8	59.4	13.7	14.3	15.2	0.9	0.3	1.2	0.7	0.9	1.5
Commerce	64.4	71.9	70.4	20.2	23.5	23.5	1.5	2.3	3.8	1.2	2.3	3.5
Restaurants & hotels	68.2	80.3	80.5	7.6	6.7	7.9	0.9	-0.7	0.2	0.9	0.2	1.1
Transport and communications	73.2	72.0	72.8	10.6	10.7	10.4	-0.1	0.1	-0.1	0.0	-0.1	-0.2
Services to firms	33.3	42.2	47.0	13.2	13.1	12.8	1.2	0.0	1.2	1.8	-0.2	1.6
Other services	49.4	51.6	57.1	34.7	31.7	30.2	0.8	-1.5	-0.8	2.7	-2.6	0.1

<i>Total</i>	55.0	60.5	62.8	100. 0	100. 0	100. 0	5.1	0.5	5.6	7.3	0.5	7.8
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Note: For Metropolitan Lima, "informal" refers to workers who do not have a contributory health insurance (ESSALUD or private).

Source: Own elaboration based on INEI, ENAHO and EPE.

As a consequence, informal employment increased by +2.9 pp. If we observe the same period in the Lima data (Table 1b), we first notice that agriculture is negligible. In this case, again we observed an even more important negative "within" effect of -8.3 pp, but the recomposition effect ("between") was almost null: -0.4 pp. For that reason, informality decreased sharply: -8.3 pp in Q2-2020. In Q4-2020, once the restrictions were at least partially lifted, the negative "within" effect was reduced, while the positive recomposition effect increased slightly; it turned larger than the "within" effect, thus increasing informality. Observed effects in Q2-2021 and Q4-2021 indicate that informality increased in both quarters (6.5 pp and 7.8 pp, respectively). This was particularly due to larger "within" sectors employment recomposition (high rotations), mainly to commerce and other services.

As the analysis of the national data and those for Metropolitan Lima has shown, during the lockdown period of 2020, there was one sector – agriculture – that could compensate for the loss of employment in other sectors nationwide; in Lima, this effect was very small. Note that in Q4-2020 informality increased both throughout the nation and in Lima due to the recomposition effects being larger than the negative reductions of employment within each sector.

3. Dynamics of the labour market and transition to formality

While the vast majority of studies on informality or formalization take a static approach, the emergence and availability of longitudinal, or panel, data make it possible to provide a dynamic assessment.⁷ In this section, we first analyse dynamic flows into and from the labour market, disaggregating transition matrices by formal and informal employment. We then explore changes in the probability of being employed, offering a broad measure of employability.

3.1 Transitions in labour market status during 2015 and 2019: National data

One way to analyse the dynamism of the labour market is by observing changes in its status (employed, unemployed or inactive). Using information from ENAHO, Table 2 shows annual transition matrices for the Peruvian labour market concerning employment, unemployment and inactivity. Employment is divided into two subgroups: formal and informal employment.

Table 2. Peru: Annual transitions in status in the labour market, including formality and informality, 2015–19 (per cent)

	2015–16	2016–17	2017–18	2018–19
Total (same state + transition)	100.0	100.0	100.0	100.0
Same state	74.5	74.7	73.6	75.6
Formal-formal	14.3	15.1	14.5	16.0

⁷ Some recent studies take this dynamic approach. See, for example, Maurizio and Vasquez (2019) or Soares and Berg (2022).

Informal-informal	39.4	39.6	39.1	41.3
Unemployed-unemployed	0.4	0.2	0.0	0.3
Inactive-inactive	20.4	19.8	19.9	17.9
Transition	25.5	25.3	26.4	24.4
To formality	5.2	4.1	5.7	4.1
Informal to formal	3.6	3.0	4.1	3.0
Inactive to formal	1.1	0.7	1.2	0.9
Unemployed to formal	0.4	0.4	0.5	0.3
To informality	10.6	10.4	10.6	11.5
Formal to informal	2.7	2.8	3.2	3.1
Inactive to informal	7.3	6.8	6.7	7.2
Unemployed to informal	0.5	0.8	0.7	1.2
To inactivity	7.6	9.1	7.6	6.4
Informal to inactive	6.0	6.9	5.9	4.8
Formal to inactive	0.9	1.1	1.0	0.9
Unemployed to inactive	0.7	1.1	0.7	0.7
To unemployment	2.1	1.8	2.4	2.4
Informal to unemployed	1.0	0.5	1.0	0.7
Formal to unemployed	0.2	0.4	0.4	0.2
Inactive to unemployed	0.9	0.8	1.0	1.5

Note: Informal employment is calculated based on the ILO methodology, which includes those workers who work in productive units that do not have a Tax Identification Number (Registro Único de Contribuyente, RUC) registered with the National Superintendence of Customs and Tax Administration (Superintendencia Nacional de Aduanas y de Administración Tributaria, SUNAT) or those wage earners who do not receive any social benefits, such as health insurance paid by the employer.

Source: Quispe, 2020, based on INEI, ENAHO panel.

The first and more general result that arises from this analysis is that, comparing one year to the next, around 1 in 4 persons change their labour market status and 3 out of 4 remain in the same state (Quispe, 2020). This does not mean that they are in the same job,⁸ but that they remain in the same status in the labour market. Second, a related result shows that the proportion of those who remain in the state of “unemployed” is nearly zero, meaning that longer-term unemployment does not seem to be a recurrent phenomenon. In addition, most transitions involving unemployment occur from inactivity to unemployment – mainly among young new entrants – and from unemployment to informality. Third, as expected, among persons who remain in the same state, those in informal employment constitute the largest group (around 40 per cent), followed by those in inactivity (around 20 per cent). Formal-formal status fluctuates around 15 per cent, while both informal-informal and formal-formal statuses increased in the last period of 2018–19, while inactivity decreased.

⁸ Chacaltana (1999), using a quarterly panel for 1996, showed that 26 per cent of individuals were unemployed at least one quarter in that year, and that the average duration of unemployment involved 16 per cent of the annual working time. These are indicators that could complement the traditional measure of open unemployment.

Last but not least, this data confirms that transitions are more frequent between employment and inactivity than between employment and unemployment. In particular, most transitions occur from informality to inactivity. When they do not work, informal workers in Peru typically do not declare themselves as unemployed, since unemployment insurance or other similar benefits do not exist for them.⁹

The transition from informal to formal or formal to informal statuses add up approximately one in four of these transitions. The other transitions are relatively small, in particular those from formal employment to either unemployment or inactivity.¹⁰

3.2 Comparing pre- and post-lockdown: Lima 2020 and 2021

For the analysis of the COVID-19 period, we use quarterly panel data from the Permanent Survey of Employment (Encuesta Permanente de Empleo, EPE) available only for Metropolitan Lima. This is an interannual panel that follows the same individuals in the same quarter of one year with respect to the same quarter of the previous year, but not between the quarters of the same year.

Table 3 shows annual transitions for each quarter of 2020 and 2021, compared to the corresponding quarter in the previous year. In the first quarter of 2020 (pre-COVID-19), 66.9 per cent of the people remained in the same state, similar to those in the third and fourth quarters (66.7 per cent and 65.7 per cent, respectively). Conversely, the proportion of those changing status or “in transition” in the first, third and fourth quarters were around one third of the workforce.

Table 3. Metropolitan Lima: Activity condition transitions by quarter during 2020–21 (per cent)

	2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Total (same state + transition)	100	100	100	100	100	100	100	100
Same state	66.9	53.6	66.7	65.7	63.7	52.8	62.8	69.1
Formal-formal	19.4	13.3	15.8	17.4	16.4	10.7	13.9	16.1
Informal-informal	23.4	10.3	21.9	22.3	21.0	8.3	18.3	26.1
Unemployed-unemployed	1.0	0.6	1.4	1.0	1.7	0.8	1.5	1.3
Inactive-inactive	23.2	29.3	27.7	24.9	24.6	33.0	29.2	25.5
Transition	33.1	46.4	33.3	34.3	36.5	47.3	37.2	30.9
To formality	7.5	2.8	4.1	4.7	4.4	10.7	9.0	7.7
Informal to formal	4.2	1.6	2.6	2.7	2.4	1.5	2.8	3.1
Inactive to formal	2.3	0.8	1.0	1.4	1.4	8.1	4.1	3.0
Unemployed to formal	1.0	0.4	0.5	0.6	0.6	1.1	2.1	1.5

⁹ Chacaltana (1999) also links this process to the existence of groups in the labour force, with different labour attachment (full time, seasonal, etc). In addition, Garavito (2019) highlights the procyclical behaviour of the labour force, in which both employment and unemployment decrease in periods of economic recession, and vice versa.

¹⁰ Similar characteristics were found throughout the entire region. See Maurizio and Monsalvo, 2021; Maurizio, Monsalvo, Catania and Martínez, 2020; Beccaria, Bertranou and Maurizio, 2020. In this period, transitions from informality to formality were more important than transitions from formality to informality, although other combinations (in and out of informality) are even more frequent, depicting an image of great mobility between sectors.

To informality	9.5	3.5	9.1	10.2	9.8	27.6	16.8	12.6
Formal to informal	3.0	2.2	6.1	4.5	3.9	1.6	2.3	2.5
Inactive to informal	4.9	1.0	2.3	4.3	4.5	23.6	10.1	6.9
Unemployed to informal	1.6	0.3	0.7	1.4	1.4	2.4	4.4	3.3
To inactivity	12.0	35.5	12.7	11.8	14.4	3.5	6.0	6.6
Informal to inactive	7.0	21.7	7.4	6.8	7.4	1.7	3.0	3.1
Formal to inactive	3.2	10.5	4.1	3.9	5.1	1.1	1.5	1.5
Unemployed to inactive	1.8	3.3	1.2	1.1	1.9	0.8	1.5	2.0
To unemployment	4.2	4.7	7.4	7.5	7.9	5.5	5.4	4.1
Informal to unemployed	1.2	2.5	3.2	2.8	3.4	0.3	1.2	1.4
Formal to unemployed	1.2	1.1	1.7	2.6	2.1	0.4	0.7	0.6
Inactive to unemployed	1.8	1.1	2.4	2.2	2.4	4.7	3.5	2.1

Note: For Metropolitan Lima, “informal” refers to workers who do not have a contributory health insurance (ESSALUD or private).

Source: INEI. Own elaboration based on a panel from EPE.

In the second quarter of 2020, the “lockdown period”, the proportion that remained in the same state fell to 53.6 per cent, and the share of those “in transition” increased to 46.4 per cent. The main transition occurred from employment to inactivity rather than to unemployment; the most frequent transitions were from informality to inactivity (21.7 per cent) and from formality to inactivity (10.5 per cent). This was consistent with what happened in other countries.¹¹ In the remaining quarters, the transition from informality to inactivity was partially offset by the transition from inactivity to informality, but in the lockdown period, the transition from informality increased to 21.7 per cent and the transition from inactivity to informality fell drastically (1 per cent). In other words, during the lockdown period, while the transitions to inactivity increased, the reverse process was limited or blocked because of the prevailing supply side restrictions.

After the lockdown period, in quarters 3 and 4 of 2020, transitions to unemployment increased from below 5 per cent to above 7 per cent. In addition, for those who returned to work, transits from formality to informality were also higher (3.0 per cent versus 6.1 per cent in Q3 and 4.5 per cent in Q4). At the same time, transitions from informality to formality were lower (4.2 per cent in Q1 versus 2.6 per cent and 2.7 per cent in Q3 and Q4, respectively). This evidence suggests that, as more people returned from inactivity after the lockdown period, they found a labour market characterized by fewer opportunities, higher unemployment and lower capacity to generate formal jobs.

Table 3 also shows the quarterly transitions for the year 2021 with respect to the same quarter of 2020. As we can see, these transitions did not change much, except for the second quarter.¹² A comparison of interannual panels shows that the second quarter of 2021 basically registers the return to the labour market of those who exited it in the second quarter of 2020. For this reason, the share of those in the “same status” decreased again to 52.8 per cent and the proportion of those “in transition” increased to 47.3 per cent. Note that the most important components of those that changed status were persons

¹¹ See, for example, Beccaria, Bertranou and Maurizio (2020) and ILO (2020a, 2020b).

¹² Note that, during February 2021, the Peruvian government established a new national lockdown period in response to the second wave of COVID-19. However, this second lockdown had regional differences, was not implemented nationwide and did not last as long as the first lockdown in 2020.

transiting from inactivity to informality (23.6 per cent) and those in transition from inactivity to formality (8.1 per cent). Both transitions remained high in the third quarter of 2021 and started decreasing only in the fourth quarter.

4. Long-term effects. The probability of being employed

In this section, we analyse the possible longer-term effects of COVID-19 on the individual capacity of being employed. For this, we use a simple measure of the capacity of being employed: the conditional probability of being occupied in period t given the individual and labour market characteristics in both period t and period $t-1$. Given that the Peruvian labour market is highly informal, we also attempt to decompose that measure into its formal and informal components.

Following Chacaltana (et al 2021), we assume that, in time t , an individual can be employed (in formal or informal employment) or not employed (unemployed or inactive), subject to a set of contemporary or lagged observable variables. To estimate the probability of being employed, we use a probit model for each labour market status as follows:

$$P[y_{it} = 1 \mid x_{it}, x_{it-1}, \beta] = \Lambda(X'_{it}\beta)$$

where y_{it} denotes the economic status in time t , which is 1 if occupied and 0 if not occupied. As we are interested in labour market resilience¹³, we want to assess, in particular, the role of individual characteristics vis-à-vis the role of pre-COVID-19 conditions. For this reason, x_{it} is a vector of contemporary individual characteristics, such as age, gender, education level, family status (head of household or not), while x_{it-1} represents the labour market conditions in the previous year. It is assumed that the function (Λ_z) is normally distributed. Moreover, as employment is decomposed into formal and informal employment (i.e., mutually exclusive events), the total probability of being employed is the sum of the probabilities of each event (Newbold, Paul, William L. Carlson, y Thorne, Betty, 2013). This specification allows us to decompose the overall probability of being employed into its formal and informal components, in an additive way:

$$P[y_{it} = 1 \mid x_{it}, x_{it-1}, \beta] = P[formal_{it} = 1 \mid x_{it}, x_{it-1}, \beta] + P[informal_{it} = 1 \mid x_{it}, x_{it-1}, \beta]$$

Our initial and preferred regression uses occupation by economic sector as a proxy of pre-COVID-19 labour market insertion. Results are shown in Tables 4a and 4b for the years 2020 and 2021, respectively. Regarding contemporary individual characteristics, results are consistent for both years. Coefficients are consistently negative for females, indicating that they have a lower probability than men to be employed, both in formal and informal employment. Regarding age, the results indicate that positive and significant coefficients are found in the range of 25–29-year-old youths, mainly driven by significant coefficients for informal work. Elders have negative coefficients in general. They are non-significant for formal work but negative and significant for informal work. Moreover, it is important to highlight that, compared to the other age groups, individuals in the range of 40–49-year-olds are the ones with the highest probability of being occupied. This was the case during most of the quarters in both 2020 and 2021, with significance in

¹³ According to ILO Recommendation 205, “the term ‘resilience’ means the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management”.

the informal sector. In addition, higher levels of education result in higher probabilities of being employed, especially in formal employment, and education at the tertiary level, in particular, reduces the probability of having an informal job. Furthermore, being head of household is associated with a higher probability of being occupied, but to a significant extent only in the informal sector.

Concerning the role of the economic sector, Table 4a indicates that working before COVID-19 in the accommodation and restaurant sector is associated with higher probabilities of being occupied in the current period – although with a higher probability of employment in the informal sector – as compared to the remaining categories. In Q2-2020, those working in the accommodation and restaurant sector faced lower probabilities of being occupied. By comparison, working in the sector of services and administration in 2019 provided higher probabilities in 2020 of being occupied in formal employment, even during Q2 and the rest of the quarters. This result is not surprising, since this sector could easily adapt to the teleworking policy that was implemented during the lockdown period. During 2021, results are similar, which means that workers with previous experience in accommodation and restaurant increased their probability of gaining informal employment, while workers with experience in services and administration had greater chances of working in formal jobs.

As a complementary exercise, we implement two additional regressions, changing the economic sector as a pre-COVID condition for (a) firm size and (b) contract type of the individual during the previous year. The idea is to identify the contribution of these characteristics in the probability of being currently occupied in the formal and informal sector.¹⁴ Regarding firm size (Tables A2a and A2b in the annex), working in larger firms before COVID-19 (more than 50 workers) increases the overall probability of being currently employed during all the quarters (even in Q2-2020), but to a significant extent only in the formal sector. On the contrary, previous work experience in small enterprises (1 to 10 workers), increases significantly only the probability of currently working in the informal sector (for both years), and the majority of workers are employed in smaller firms (1 to 3 workers).

Finally, Tables A3.1a and A3.1b in the annex concerning the occupational status (employee or own account worker) in the previous year, show that, having previously been an employee, increases the probability of being occupied currently, more so than having been an own account worker, as compared to the base category of not having been occupied in the previous year. Former employees are more employable in the formal sector, while own account workers have a better chance of being re-employed in the informal sector. Tables A3.2a and A3.2b extend this analysis and try to identify heterogeneous profiles between these categories. While estimated coefficients show the expected signs for all variables included, the most striking result of this comparison seems to be related to the role of individual versus sectorial variables. While both types of variables show significant coefficients for employees, the role of individual variables – notably that of educational levels – seems to be less significant for own account workers, especially in 2020. In 2021, the significance of both types of variables is reduced.

¹⁴ We ran different regressions instead of a single one, including all these pre-COVID characteristics in order to avoid inconsistent estimators, since those variables have a high degree of correlation.

Table 4a. Metropolitan Lima: Probit model with employment sectors (all quarters in 2020 with respect to same quarter in 2019)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.359*** (0.059)	-0.165*** (0.051)	-0.318*** (0.055)	-0.357*** (0.050)	-0.121** (0.058)	-0.084 (0.059)	-0.068 (0.056)	-0.128** (0.052)	-0.214*** (0.051)	-0.160*** (0.060)	-0.226*** (0.051)	-0.223*** (0.049)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.360*** (0.106)	0.370*** (0.089)	0.365*** (0.094)	0.421*** (0.088)	0.334*** (0.103)	0.302*** (0.117)	0.232** (0.112)	0.306*** (0.098)	0.102 (0.096)	0.256*** (0.097)	0.271*** (0.095)	0.215** (0.088)
30–39 years	0.482*** (0.103)	0.427*** (0.084)	0.693*** (0.080)	0.474*** (0.079)	0.457*** (0.093)	0.370*** (0.105)	0.444*** (0.113)	0.353*** (0.088)	0.091 (0.086)	0.224** (0.097)	0.282*** (0.083)	0.170** (0.081)
40–49 years	0.568*** (0.093)	0.489*** (0.083)	0.561*** (0.083)	0.425*** (0.082)	0.637*** (0.104)	0.485*** (0.109)	0.442*** (0.116)	0.368*** (0.092)	0.001 (0.088)	0.213** (0.098)	0.183** (0.088)	0.118 (0.083)
50–59 years	0.428*** (0.098)	0.428*** (0.086)	0.091 (0.093)	0.294*** (0.083)	0.490*** (0.102)	0.354*** (0.106)	0.429*** (0.120)	0.417*** (0.093)	0.023 (0.092)	0.238** (0.093)	-0.213** (0.094)	-0.009 (0.083)
60 years and older	-0.058 (0.096)	-0.289*** (0.096)	-0.382*** (0.097)	-0.545*** (0.084)	0.589*** (0.105)	0.125 (0.112)	0.311*** (0.115)	0.135 (0.098)	-0.559*** (0.096)	-0.622*** (0.115)	-0.685*** (0.116)	-0.703*** (0.086)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.114 (0.075)	0.036 (0.083)	0.104 (0.078)	0.144** (0.070)	0.319*** (0.088)	0.363*** (0.123)	0.433*** (0.132)	0.405*** (0.103)	-0.150** (0.069)	-0.174** (0.087)	-0.135* (0.078)	-0.056 (0.070)
Tertiary (non-univ.)	0.423*** (0.103)	0.411*** (0.093)	0.353*** (0.098)	0.307*** (0.084)	0.997*** (0.102)	0.891*** (0.134)	0.978*** (0.139)	1.088*** (0.113)	-0.458*** (0.096)	-0.177 (0.108)	-0.332*** (0.108)	-0.445*** (0.085)
Tertiary (univ.)	0.401*** (0.095)	0.732*** (0.093)	0.379*** (0.093)	0.250*** (0.077)	1.166*** (0.095)	1.311*** (0.131)	1.273*** (0.140)	1.245*** (0.106)	-0.687*** (0.096)	-0.286*** (0.105)	-0.624*** (0.095)	-0.671*** (0.085)
Head of household	0.051 (0.071)	0.119** (0.057)	0.191*** (0.064)	0.230*** (0.055)	0.027 (0.063)	-0.076 (0.065)	-0.002 (0.061)	0.001 (0.051)	-0.001 (0.058)	0.230*** (0.063)	0.161** (0.064)	0.179*** (0.050)
Not occupied in 2019 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Commerce in 2019	1.207*** (0.082)	1.199*** (0.084)	1.655*** (0.078)	1.193*** (0.073)	0.847*** (0.081)	0.854*** (0.111)	0.897*** (0.115)	0.724*** (0.086)	0.745*** (0.072)	1.039*** (0.090)	1.392*** (0.084)	0.941*** (0.068)
Manufacture in 2019	1.210*** (0.110)	1.010*** (0.095)	1.544*** (0.090)	1.380*** (0.086)	1.049*** (0.101)	0.981*** (0.114)	1.060*** (0.108)	1.148*** (0.096)	0.525*** (0.093)	0.690*** (0.106)	1.176*** (0.094)	0.674*** (0.089)
Services, admin. in 2019	1.242*** (0.118)	1.569*** (0.098)	1.834*** (0.110)	1.226*** (0.095)	1.256*** (0.111)	1.496*** (0.117)	1.390*** (0.121)	1.261*** (0.105)	0.298** (0.117)	0.823*** (0.121)	1.040*** (0.119)	0.416*** (0.102)
Accommodation, restaurant in 2019	1.403*** (0.111)	0.586*** (0.126)	1.205*** (0.109)	0.994*** (0.103)	0.743*** (0.106)	0.454** (0.196)	0.690*** (0.143)	0.649*** (0.127)	0.961*** (0.102)	0.543*** (0.136)	1.124*** (0.113)	0.788*** (0.105)
Other sectors in 2019	1.219***	1.110***	1.490***	1.165***	0.856***	1.064***	1.102***	0.930***	0.710***	0.718***	1.063***	0.706***

	(0.078)	(0.075)	(0.069)	(0.055)	(0.074)	(0.096)	(0.088)	(0.071)	(0.066)	(0.088)	(0.073)	(0.064)
Constant	-0.789***	-1.821***	-1.333***	-0.843***	-2.250***	-2.695***	-2.723***	-2.418***	-0.455***	-1.604***	-1.008***	-0.622***
	(0.101)	(0.114)	(0.104)	(0.086)	(0.128)	(0.155)	(0.163)	(0.131)	(0.098)	(0.124)	(0.103)	(0.088)
Observations	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871
Pseudo R2	0.251	0.217	0.337	0.266	0.186	0.214	0.201	0.201	0.102	0.119	0.192	0.130

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table 4b. Metropolitan Lima: Probit model with employment sectors (all quarters in 2021 with respect to same quarter in 2020)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.294***	-0.373***	-0.330***	-0.251***	-0.065	-0.063	-0.071	0.030	-0.229***	-0.316***	-0.246***	-0.193***
	(0.051)	(0.049)	(0.052)	(0.052)	(0.052)	(0.054)	(0.058)	(0.051)	(0.049)	(0.049)	(0.051)	(0.050)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.431***	0.601***	0.613***	0.449***	0.143	0.415***	0.494***	0.261**	0.393***	0.385***	0.276***	0.300***
	(0.089)	(0.100)	(0.108)	(0.101)	(0.104)	(0.113)	(0.117)	(0.110)	(0.095)	(0.096)	(0.106)	(0.105)
30–39 years	0.512***	0.750***	0.517***	0.515***	0.237***	0.408***	0.302***	0.463***	0.351***	0.469***	0.326***	0.129
	(0.074)	(0.081)	(0.084)	(0.090)	(0.087)	(0.099)	(0.106)	(0.087)	(0.082)	(0.080)	(0.091)	(0.088)
40–49 years	0.536***	0.576***	0.522***	0.557***	0.479***	0.438***	0.433***	0.602***	0.163**	0.285***	0.231***	0.022
	(0.072)	(0.082)	(0.085)	(0.090)	(0.092)	(0.098)	(0.097)	(0.094)	(0.079)	(0.086)	(0.086)	(0.087)
50–59 years	0.207***	0.402***	0.419***	0.464***	0.349***	0.517***	0.461***	0.498***	-0.006	0.081	0.130	0.074
	(0.078)	(0.080)	(0.087)	(0.089)	(0.097)	(0.099)	(0.103)	(0.097)	(0.079)	(0.091)	(0.089)	(0.091)
60 years and older	-0.489***	-0.436***	-0.367***	-0.289***	0.164*	0.311***	0.363***	0.398***	-0.680***	-0.658***	-0.619***	-0.560***
	(0.082)	(0.085)	(0.085)	(0.085)	(0.099)	(0.090)	(0.102)	(0.094)	(0.088)	(0.095)	(0.093)	(0.091)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.041	0.022	0.072	0.179**	0.225**	0.431***	0.063	0.326***	-0.109	-0.191**	0.011	-0.047
	(0.074)	(0.073)	(0.080)	(0.080)	(0.107)	(0.101)	(0.107)	(0.100)	(0.071)	(0.076)	(0.079)	(0.070)
Tertiary (non-univ)	0.273***	0.162*	0.364***	0.327***	0.794***	1.028***	0.787***	0.907***	-0.312***	-0.500***	-0.293***	-0.391***
	(0.084)	(0.095)	(0.102)	(0.102)	(0.117)	(0.117)	(0.118)	(0.106)	(0.086)	(0.088)	(0.093)	(0.086)
Tertiary (univ.)	0.184**	0.043	0.142	0.196**	1.100***	1.100***	0.897***	1.213***	-0.754***	-0.718***	-0.639***	-0.826***
	(0.082)	(0.091)	(0.094)	(0.092)	(0.113)	(0.112)	(0.112)	(0.107)	(0.089)	(0.090)	(0.096)	(0.088)
Head of household	0.306***	0.450***	0.217***	0.298***	0.088	-0.023	-0.100*	-0.012	0.202***	0.428***	0.260***	0.227***
	(0.055)	(0.063)	(0.060)	(0.059)	(0.059)	(0.064)	(0.057)	(0.063)	(0.053)	(0.057)	(0.056)	(0.054)
Not occupied in 2020 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Commerce in 2020	1.158***	0.855***	1.142***	1.252***	0.875***	0.546***	0.453***	0.480***	0.785***	0.325***	0.763***	0.940***
	(0.072)	(0.107)	(0.086)	(0.081)	(0.093)	(0.116)	(0.087)	(0.088)	(0.075)	(0.101)	(0.076)	(0.074)

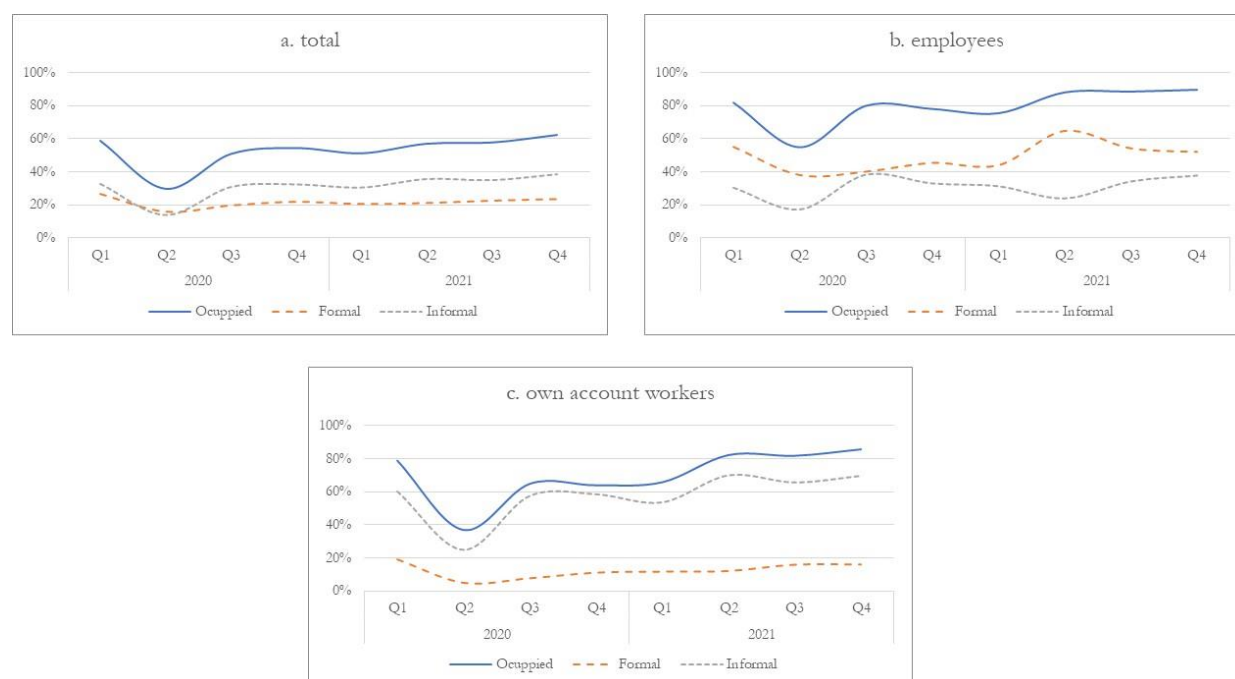
Manufacture in 2020	1.160*** (0.091)	0.806*** (0.162)	1.130*** (0.125)	1.463*** (0.102)	1.100*** (0.103)	0.875*** (0.131)	1.000*** (0.114)	0.901*** (0.100)	0.574*** (0.090)	-0.083 (0.152)	0.220** (0.110)	0.669*** (0.094)
Services, admin. in 2020	1.197*** (0.104)	0.817*** (0.133)	1.343*** (0.133)	1.470*** (0.118)	1.388*** (0.107)	1.039*** (0.115)	1.185*** (0.116)	1.107*** (0.101)	0.299*** (0.109)	-0.248* (0.127)	0.117 (0.109)	0.425*** (0.098)
Accommodation, restaurant in 2020	0.968*** (0.099)	1.061*** (0.332)	0.774*** (0.167)	1.371*** (0.121)	0.665*** (0.124)	0.584** (0.256)	0.286* (0.166)	0.597*** (0.157)	0.757*** (0.098)	0.397* (0.236)	0.630*** (0.154)	0.937*** (0.132)
Other sectors in 2020	1.109*** (0.062)	0.998*** (0.099)	1.045*** (0.074)	1.398*** (0.070)	0.972*** (0.076)	1.017*** (0.079)	0.835*** (0.068)	0.779*** (0.078)	0.632*** (0.069)	-0.160** (0.081)	0.313*** (0.068)	0.736*** (0.062)
Constant	-0.913*** (0.095)	-0.280*** (0.093)	-0.465*** (0.103)	-0.716*** (0.095)	-2.336*** (0.147)	-2.064*** (0.125)	-1.814*** (0.129)	-2.209*** (0.121)	-0.683*** (0.096)	-0.128 (0.093)	-0.439*** (0.100)	-0.445*** (0.086)
Observations	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685
Pseudo R2	0.241	0.191	0.247	0.308	0.192	0.192	0.189	0.182	0.131	0.103	0.119	0.143

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE

Using the estimated coefficients of the previous regression in Figure 4 depicts the estimated probabilities of having a formal or informal job in the period 2020–21, according to the original model (related to Tables 4a and 4b).¹⁵ The probability of being employed was 59 per cent in Q1-2020 and was reduced to 30.0 per cent in Q2-2020, the lockdown period (a fall of almost 50 per cent). In Q3-2020 and Q4-2020, as expected, we observed a recovery with respect to Q2-2020, but it remained still lower than in Q1-2020 (-8 pp and -4 pp, respectively).¹⁶ During 2021, the recovery process continued, and by the end of that year (Q4-2021) it had fully recovered and was even slightly larger than pre-COVID-19.

Figure 4. Metropolitan Lima: Estimated probabilities of being employed by quarter, 2020 and 2021 (Probit models)



Note: Pooled data regression. All probabilities are significant at the 1 per cent level.
Source: INEI, EPE 2020 and 2021.

However, this is basically powered by the informal component, which increased during the whole period, while the probability of having a formal employment did not reach its pre-pandemic level. In general, the overall probability of 59 per cent observed in Q1-2020 includes the probability of 26.9 per cent of being employed formally and the 32.1 per cent probability of being employed informally, showing the higher average probability of finding an informal job. The probability of being employed formally fell in Q2-2020, although less than the probability of being employed informally. It then recovered in Q3-2020 and Q4-2020, although not completely. The probability of informal employment fell sharply in Q2-2020 but bounced back rapidly in Q3-2020 and in Q4-2020 and practically reached the same level as in Q1-2020. This confirms the fact that informality operates an important adjustment mechanism during crisis: it adjusts

¹⁵ The estimated probabilities are presented in the annex in Figure A4a for panel 2019–20 and Figure A4b for panel 2020–21.

¹⁶ A similar trend was found by WIEGO (Women in Informal Employment: Globalizing and Organizing), 2021.

more rapidly downwards and upwards.¹⁷ The concern is that formal employment is recovering at a slower pace.

If we disaggregate the analysis by employment status in 2019 (Tables A3.2a and A3.2b of the annex), we observe, as expected, that for employees the probability of being formally employed is higher than the probability of being in informal employment, and that the opposite is true for own account workers. For employees, the overall probabilities of being employed in Q4-2020 had almost returned to the pre-lockdown level, basically due to the fact that the probabilities of being employed formally had already returned to their pre-lockdown levels. This is not the case for own account workers, for whom the probability of being formally employed did not recover, despite the fact that the probability of being employed informally did recover. This is probably related to the fact that formal employment for employees has greater employment smoothing mechanisms than is the case for own account work.

Tables A4a and A4b of the annex show in greater detail the estimated probabilities for each quarter using the panel 2019–20 information and, at the same time, the disaggregated estimations. The results show that there is a high degree of heterogeneity in these average probabilities. For example, in Q2, the probabilities of being occupied fell more rapidly for men than for women in comparison to Q1. However, they also recovered more rapidly in Q3 and Q4 relative to Q2, with the recovery for women progressing at a slower pace. Regarding age, the youngest (14–24 years old) and the oldest (60+ years old) groups appear to be the most vulnerable. Not only did they have the lowest employability levels before the pandemic, their probabilities of being occupied declined to a particularly large extent in Q2 in comparison to other age groups. Our estimates also indicate that recovery is slower for these groups in Q3 and Q4.

In addition, not only are the less educated less employable, they also lost more relative to the better educated, who were more resilient in keeping their (formal) jobs. People with higher levels of education tend to work in sectors/jobs that allow for teleworking. Our estimates indicate that in Q2, the probabilities of being employed for those with primary or secondary education fell by 54 per cent and 57 per cent, respectively, while these probabilities fell by 33 per cent for those with higher education. In addition, the probabilities of having a formal job fell 42 per cent and 49 per cent for those with primary or secondary education, and 32 per cent for those with higher education.

Employment trends are slightly different for heads and non-heads of households. First of all, heads of households always present larger probabilities of being occupied compared to non-heads of households; it seems to be part of a strategy to stay employed. Second, for heads of households, the conditional probability of being occupied in informal employment is larger than for non-heads, while there are no significant differences regarding formal employment. These two results seem to indicate that, during crisis, heads of households will try to recover their jobs even if this means accepting informal jobs, which appears to be a consequence of need rather than resilience.¹⁸

5. Robustness checks

We tested some additional specifications in order to explore if our results hold. One specification includes having the lagged value of the dependent variable y_{t-1} , as an explanatory variable.

$$P[y_{it} = 1 \mid x_{it}, y_{it-1}, \beta] = \Lambda(X'_{it}\beta)$$

¹⁷ There is a vast literature on the interrelations between the formal and informal sectors. See Tokman (1978), for example, or WIEGO (2021) for a recent discussion.

¹⁸ Interestingly, Calero and Delautre (2023) analyse episodes of recessions and recoveries in seven developing economies and find added worker effects in cases of medium and large output contractions, especially for less educated women. They do not find the same pattern in the case of milder contractions, where female participation is rather pro- or acyclical. In the case of the COVID crisis, they find a clear procyclical behaviour for participation of both men and women.

The results of these checks are shown in table A5a and A5b of the annex. We find that, for those persons who were in formal employment in 2019, the probability of having a formal job decreased in Q2 of 2020 and recovered thereafter, although not to the pre-pandemic levels. However, the probabilities of having an informal job were higher in Q4 of 2020 with respect to Q1. On average, we find that the pandemic increased the overall probabilities of transition to informality from 11.5 per cent to 15.4 per cent – i.e., an increase of 33.9 per cent – and reduced the probabilities of transitions to formality from 12.3 per cent to 8.1 per cent, which corresponds to a reduction of 34.1 per cent.

Note, however, that in this case there is a potential correlation of the initial condition (y_{i0}) of the dependent variable with the unobserved heterogeneity component, affecting the consistency of the estimated parameters. The literature has identified some econometrical approaches to overcome this problem, such as the one suggested by Heckman (1981), who proposes an estimation as a system, using maximum simulated likelihood, or Wooldridge (2005), who suggests a random effects probit. Unfortunately, none of these methods can be implemented correctly in our study, since our panels have only two periods. This constitutes a limitation of our work, which is an improvement area for future research.

We also implement a pooled probit regression using panel information (two observations per individual), as well as a population-averaged panel probit model, which deals with unobserved heterogeneity. Both are used without lagged explanatory variables (only using sex, age, household role and education as independent variables), just to get additional information on relations between variables. The results of both models are similar in general terms, as shown in Tables A6a, A6b, A7a and A7b.

The coefficients of the pool probit model with no lags (Tables A6a and A6b) reflect that females, younger individuals, persons who are less educated and those who are not head of households have a lower probability of being employed, as shown before. Nevertheless, these estimations do not account for unobserved heterogeneity, and estimated coefficients could be biased. For this reason, we also implement a population-averaged panel probit model (Tables A7a and A7b). This methodology takes advantage of the panel data to deal with unobserved heterogeneity and to obtain unbiased estimations. If we compare these results with the pool probit model, we see that the population-averaged model brings slightly lower coefficients in most of the cases, but the signs and significance remain the same, showing that our previous results are robust.

6. Conclusions

The COVID-19 pandemic had a drastic impact on employment around the world. In this paper, using interannual panel data from Peru, we analysed patterns of transitions in the labour market during 2020 and 2021.

The descriptive analysis confirms that, because of the restrictions imposed, the labour market adjusted differently during the temporary lockdown period and the recovery period. During the lockdown period, in the second quarter of 2020, we observed two major restrictions to labour market adjustment. First, the transition from employment to inactivity increased and could not be offset by a similar transition from inactivity to employment because of the restrictions on labour supply. Given that in Peru most of these transitions typically occur from informality to inactivity and vice versa – rather than from employment to unemployment – we observed that informality was affected to a greater extent during the lockdown, but also recovered more quickly afterwards. Second, as some economic sectors were declared as “essential” and remained open while others were considered “non-essential” (and only allowed work online), there was also a restricted intersectoral reallocation of labour. The agricultural sector, in particular, was considered essential. Given that, during lockdown, the movement of workers to this sector was massive, it

had an impact on the levels of activity and informality in the short run, but with consequences for the medium term.

On the other hand, unemployment rates that increased during the lockdown period remained high for the rest of 2020 and started to decrease only in 2021. They will probably continue to decrease in favour of informality. In general, the recovery of employment during the second half of 2020 and all of 2021 was powered by its informal component. Formal employment could not recover during 2020, and even at the end of 2021, it had not yet reached pre-pandemic levels.

Regarding the longer-term effects, we calculated individual probabilities of being employed based on current and lagged individual and labour market characteristics. We observed that, as expected, during 2020, the overall probabilities of transition to informality increased, while the probability of transition to formality decreased and had not fully recovered to pre-pandemic levels in 2021. The fall in the probability of being employed was not homogeneous. It disproportionately affected some groups, such as women, young people (14–24 years), the oldest people (60 years and older), heads of household and the less educated; it was even more fragile for own account workers. These groups had the lowest probabilities of being employed, greater losses in the probability of having a job during 2020 and higher probabilities of returning to informal jobs during the recovery period. Having a higher education was found to be an advantage to being occupied, but only in the formal sector and for workers with experience as employees.

In our analysis, we highlight the role of the economic sectors. However, the labour market structure also plays a major role. We found that those working during 2019 in sectors that require closer contact with the public, such as the accommodation and restaurant sectors, experienced a greater decrease in their probability of being occupied in 2020. This was particularly true for informal workers and their chances of returning to informal employment in 2021. The same applies to those who had worked in the smallest firms and as own account workers before COVID.

In sum, a key to understanding the longer-term potential effects of COVID-19 is to realize that the pandemic has affected the structure of the labour market, in particular its capacity to generate formal jobs in the short and medium term. It results from the fall of economic activity but also from the observed sectoral reallocations of labour, which would take more time to recover. The sectoral reallocations observed during the lockdown period – including massive labour mobility to agricultural activities, especially for low skill workers, and the enhanced reallocations to new digital modalities of work – configure a new labour market scenario with an increased risk of informality.

The most important policy implication of these findings is that, apart from short-term or immediate actions to promote employment recovery, countries should assess the way in which their labour market conditions have changed and promote policies that adapt to this new reality. This could present an opportunity to discuss, in particular, the potential of structural transformation policies, with an emphasis on sectoral policies and their role in formal employment generation. It could also serve as a chance to consider education or training policies that would assist the most adversely impacted groups in adapting to the new, increasingly digitalized context. An updated formalization strategy, including the search of new forms of formality or formalization – including e-formalization – could also play an important role.

Finally, in term of technical issues, it is strongly recommended to implement the analysis using longer panels (at least with three periods) in order to address the potential initial condition problem discussed in this paper.

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Annex

Table A1 – Metropolitan Lima. Descriptive statistics

	2020		2021	
	Mean	Std. dev.	Mean	Std. dev.
Sex				
Male	0.48	0.50	0.48	0.50
Female	0.52	0.50	0.52	0.50
Age group				
14–24 years	0.26	0.44	0.25	0.43
25–29 years	0.11	0.31	0.11	0.31
30–39 years	0.20	0.40	0.19	0.39
40–49 years	0.17	0.37	0.17	0.38
50–59 years	0.11	0.32	0.12	0.33
60 years and older	0.16	0.37	0.16	0.37
Education				
Primary	0.10	0.30	0.11	0.32
Secondary	0.51	0.50	0.52	0.50
Tertiary (non-univ)	0.16	0.36	0.15	0.36
Tertiary (univ)	0.23	0.42	0.21	0.41
Informal				
Formal employment	0.21	0.41	0.22	0.41
Informal employment	0.27	0.45	0.36	0.48
Not occupied	0.52	0.50	0.43	0.49
Household head				
Head	0.32	0.47	0.34	0.47
Firm size				
Not occupied	0.51	0.50	0.42	0.49
1 to 3 workers	0.24	0.42	0.31	0.46
4 to 10 workers	0.06	0.23	0.08	0.27
11 to 50 workers	0.04	0.20	0.05	0.22
More than 50 workers	0.15	0.36	0.15	0.35
Economic sector				
Not occupied	0.51	0.50	0.42	0.49
Commerce	0.12	0.32	0.15	0.36
Manufacture	0.06	0.25	0.08	0.27
Services, admin.	0.06	0.23	0.06	0.23
Accommodation, restaurant	0.03	0.18	0.04	0.20
Other sectors	0.22	0.41	0.25	0.43

Note: All shown categories correspond to dummy variables.
Source: INEI. Own elaboration based on a panel from EPE.

Table A2a – Metropolitan Lima: Probit model with enterprise size (all quarters in 2020 with respect to same quarter in 2019)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.334*** (0.059)	-0.151*** (0.051)	-0.300*** (0.055)	-0.357*** (0.050)	-0.037 (0.062)	-0.056 (0.063)	-0.005 (0.057)	-0.078 (0.056)	-0.282*** (0.053)	-0.164*** (0.058)	-0.263*** (0.050)	-0.283*** (0.049)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.326*** (0.109)	0.364*** (0.090)	0.344*** (0.096)	0.400*** (0.089)	0.218* (0.113)	0.295** (0.128)	0.222* (0.117)	0.213** (0.106)	0.224** (0.097)	0.290*** (0.098)	0.287*** (0.095)	0.326*** (0.091)
30–39 years	0.465*** (0.101)	0.436*** (0.083)	0.665*** (0.080)	0.464*** (0.079)	0.445*** (0.098)	0.431*** (0.108)	0.433*** (0.112)	0.307*** (0.091)	0.130 (0.092)	0.215** (0.097)	0.318*** (0.084)	0.247*** (0.084)
40–49 years	0.544*** (0.093)	0.529*** (0.083)	0.550*** (0.084)	0.420*** (0.082)	0.634*** (0.109)	0.630*** (0.112)	0.489*** (0.114)	0.360*** (0.097)	0.040 (0.089)	0.181* (0.097)	0.182** (0.088)	0.159* (0.085)
50–59 years	0.421*** (0.097)	0.488*** (0.087)	0.117 (0.091)	0.302*** (0.082)	0.556*** (0.101)	0.490*** (0.109)	0.551*** (0.115)	0.485*** (0.096)	-0.004 (0.091)	0.220** (0.093)	-0.252*** (0.094)	-0.022 (0.086)
60 years and older	-0.062 (0.096)	-0.219** (0.098)	-0.361*** (0.097)	-0.528*** (0.084)	0.695*** (0.104)	0.314*** (0.120)	0.435*** (0.113)	0.247** (0.099)	-0.629*** (0.096)	-0.673*** (0.115)	-0.741*** (0.117)	-0.763*** (0.089)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.090 (0.074)	-0.029 (0.082)	0.080 (0.077)	0.138** (0.070)	0.238*** (0.087)	0.194 (0.129)	0.370*** (0.138)	0.337*** (0.103)	-0.103 (0.073)	-0.130 (0.087)	-0.094 (0.080)	-0.024 (0.072)
Tertiary (non-univ)	0.354*** (0.103)	0.247*** (0.095)	0.271*** (0.098)	0.267*** (0.084)	0.757*** (0.105)	0.573*** (0.143)	0.760*** (0.150)	0.838*** (0.113)	-0.253** (0.100)	-0.074 (0.108)	-0.180 (0.110)	-0.257*** (0.085)
Tertiary (univ.)	0.311*** (0.095)	0.514*** (0.094)	0.244** (0.098)	0.188** (0.079)	0.825*** (0.096)	0.912*** (0.138)	0.971*** (0.148)	0.921*** (0.107)	-0.400*** (0.099)	-0.125 (0.105)	-0.426*** (0.098)	-0.435*** (0.086)
Head of household	0.051 (0.071)	0.140** (0.057)	0.196*** (0.064)	0.235*** (0.055)	-0.002 (0.062)	-0.057 (0.072)	0.024 (0.066)	0.017 (0.056)	0.033 (0.060)	0.235*** (0.065)	0.161** (0.066)	0.181*** (0.052)
Not occupied in 2019 (base)	-	-	-	-	-	-	-	-	-	-	-	-
In enterprise of 1–3 workers in 2019	1.162*** (0.062)	0.827*** (0.072)	1.362*** (0.064)	1.101*** (0.055)	0.393*** (0.066)	0.252** (0.105)	0.395*** (0.088)	0.328*** (0.071)	1.027*** (0.057)	0.957*** (0.080)	1.416*** (0.072)	1.070*** (0.059)
In enterprise of 4–10 workers in 2019	1.119*** (0.115)	0.912*** (0.096)	1.447*** (0.094)	1.141*** (0.083)	0.696*** (0.104)	0.668*** (0.133)	0.768*** (0.116)	0.690*** (0.095)	0.745*** (0.096)	0.810*** (0.106)	1.265*** (0.097)	0.853*** (0.087)
In enterprise of 11–50 workers in 2019	1.425*** (0.137)	1.209*** (0.110)	1.580*** (0.120)	1.272*** (0.111)	1.531*** (0.123)	1.178*** (0.134)	1.275*** (0.131)	1.332*** (0.105)	0.113 (0.122)	0.694*** (0.133)	0.918*** (0.118)	0.306*** (0.110)
In enterprise of more than 50 workers in 2019	1.451*** (0.099)	1.651*** (0.078)	1.939*** (0.083)	1.368*** (0.069)	1.720*** (0.090)	1.742*** (0.098)	1.756*** (0.098)	1.643*** (0.078)	-0.191** (0.097)	0.458*** (0.105)	0.642*** (0.092)	-0.025 (0.076)

Constant	-0.754*** (0.100)	-1.734*** (0.113)	-1.282*** (0.103)	-0.822*** (0.086)	-2.142*** (0.129)	-2.505*** (0.159)	-2.623*** (0.169)	-2.280*** (0.129)	-0.524*** (0.102)	-1.664*** (0.124)	-1.062*** (0.104)	-0.678*** (0.089)
Observations	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871
Pseudo R2	0.254	0.240	0.344	0.267	0.272	0.322	0.295	0.288	0.160	0.124	0.217	0.183

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A2b – Metropolitan Lima: Probit model with enterprise size (all quarters in 2021 with respect to same quarter in 2020)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.289*** (0.051)	-0.369*** (0.050)	-0.332*** (0.052)	-0.251*** (0.051)	-0.023 (0.054)	-0.070 (0.055)	-0.106* (0.059)	0.091* (0.054)	-0.279*** (0.051)	-0.317*** (0.051)	-0.248*** (0.051)	-0.263*** (0.051)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.406*** (0.090)	0.596*** (0.100)	0.628*** (0.109)	0.445*** (0.102)	0.055 (0.114)	0.398*** (0.117)	0.531*** (0.127)	0.181 (0.116)	0.461*** (0.098)	0.405*** (0.098)	0.286*** (0.111)	0.399*** (0.105)
30–39 years	0.496*** (0.076)	0.744*** (0.081)	0.520*** (0.084)	0.511*** (0.091)	0.167* (0.093)	0.380*** (0.105)	0.302*** (0.104)	0.454*** (0.095)	0.420*** (0.082)	0.496*** (0.083)	0.344*** (0.090)	0.178* (0.091)
40–49 years	0.519*** (0.073)	0.568*** (0.083)	0.524*** (0.084)	0.560*** (0.090)	0.454*** (0.096)	0.391*** (0.098)	0.499*** (0.099)	0.604*** (0.101)	0.216*** (0.080)	0.315*** (0.086)	0.214** (0.088)	0.070 (0.090)
50–59 years	0.202*** (0.078)	0.390*** (0.080)	0.421*** (0.087)	0.472*** (0.088)	0.404*** (0.101)	0.465*** (0.102)	0.483*** (0.104)	0.553*** (0.099)	-0.035 (0.080)	0.111 (0.093)	0.142 (0.092)	0.069 (0.093)
60 years and older	-0.486*** (0.081)	-0.445*** (0.085)	-0.364*** (0.083)	-0.287*** (0.084)	0.253** (0.101)	0.260*** (0.092)	0.391*** (0.103)	0.463*** (0.095)	-0.740*** (0.091)	-0.646*** (0.095)	-0.658*** (0.095)	-0.626*** (0.091)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.020 (0.073)	0.011 (0.073)	0.062 (0.079)	0.171** (0.079)	0.102 (0.101)	0.358*** (0.099)	-0.007 (0.106)	0.263*** (0.098)	-0.049 (0.074)	-0.159** (0.076)	0.058 (0.080)	-0.001 (0.073)
Tertiary (non-univ)	0.221*** (0.083)	0.139 (0.096)	0.337*** (0.101)	0.297*** (0.102)	0.542*** (0.114)	0.901*** (0.117)	0.633*** (0.116)	0.757*** (0.106)	-0.133 (0.088)	-0.419*** (0.088)	-0.149 (0.097)	-0.257*** (0.090)
Tertiary (univ.)	0.091 (0.083)	0.011 (0.093)	0.076 (0.095)	0.150 (0.093)	0.741*** (0.110)	0.921*** (0.112)	0.636*** (0.111)	0.921*** (0.104)	-0.512*** (0.090)	-0.590*** (0.091)	-0.435*** (0.099)	-0.563*** (0.092)
Head of household	0.309*** (0.055)	0.457*** (0.063)	0.217*** (0.060)	0.303*** (0.058)	0.081 (0.062)	0.021 (0.065)	-0.103* (0.059)	-0.003 (0.064)	0.223*** (0.054)	0.414*** (0.058)	0.265*** (0.059)	0.246*** (0.057)
Not occupied in 2020 (base)	-	-	-	-	-	-	-	-	-	-	-	-
In enterprise of 1–3 workers in 2020	1.003*** (0.057)	0.739*** (0.088)	0.965*** (0.064)	1.273*** (0.055)	0.349*** (0.080)	0.069 (0.095)	0.123* (0.070)	0.130* (0.068)	0.957*** (0.059)	0.615*** (0.081)	0.851*** (0.061)	1.177*** (0.056)

In enterprise of 4–10 workers in 2020	1.064*** (0.093)	0.614*** (0.169)	0.900*** (0.145)	1.484*** (0.111)	0.622*** (0.107)	0.522*** (0.191)	0.424*** (0.124)	0.747*** (0.099)	0.845*** (0.094)	0.145 (0.180)	0.601*** (0.124)	0.762*** (0.095)
In enterprise of 11–50 workers in 2020	1.185*** (0.103)	1.385*** (0.211)	1.437*** (0.197)	1.277*** (0.148)	1.458*** (0.112)	1.194*** (0.170)	1.243*** (0.139)	1.346*** (0.135)	0.150 (0.108)	-0.201 (0.183)	0.011 (0.139)	0.011 (0.141)
In enterprise of more than 50 workers in 2020	1.391*** (0.076)	1.071*** (0.102)	1.371*** (0.099)	1.617*** (0.093)	1.766*** (0.081)	1.493*** (0.080)	1.716*** (0.083)	1.711*** (0.080)	-0.107 (0.081)	-0.709*** (0.102)	-0.587*** (0.096)	-0.259*** (0.080)
Constant	-0.872*** (0.095)	-0.263*** (0.093)	-0.443*** (0.102)	-0.700*** (0.094)	-2.146*** (0.139)	-1.942*** (0.122)	-1.683*** (0.128)	-2.129*** (0.120)	-0.768*** (0.097)	-0.190** (0.094)	-0.512*** (0.103)	-0.495*** (0.089)
Observations	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685
Pseudo R2	0.246	0.193	0.249	0.310	0.297	0.241	0.280	0.287	0.181	0.133	0.175	0.217

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A3.1a – Metropolitan Lima: Probit model with occupational status (all quarters in 2020 with respect to same quarter in 2019)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.342*** (0.064)	-0.164*** (0.054)	-0.292*** (0.058)	-0.375*** (0.052)	-0.069 (0.063)	-0.121* (0.062)	-0.055 (0.061)	-0.105* (0.056)	-0.256*** (0.056)	-0.139** (0.063)	-0.221*** (0.054)	-0.277*** (0.050)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.354*** (0.113)	0.355*** (0.093)	0.305*** (0.097)	0.364*** (0.092)	0.273** (0.111)	0.296** (0.127)	0.230* (0.118)	0.222** (0.105)	0.175* (0.096)	0.245** (0.099)	0.214** (0.099)	0.243*** (0.091)
30–39 years	0.484*** (0.105)	0.436*** (0.087)	0.636*** (0.087)	0.398*** (0.082)	0.515*** (0.100)	0.421*** (0.111)	0.475*** (0.117)	0.326*** (0.096)	0.052 (0.093)	0.193* (0.101)	0.201** (0.086)	0.125 (0.085)
40–49 years	0.526*** (0.099)	0.517*** (0.090)	0.507*** (0.090)	0.352*** (0.086)	0.727*** (0.109)	0.620*** (0.117)	0.499*** (0.117)	0.399*** (0.099)	-0.091 (0.094)	0.116 (0.104)	0.076 (0.095)	0.018 (0.087)
50–59 years	0.434*** (0.101)	0.517*** (0.090)	0.100 (0.099)	0.248*** (0.085)	0.663*** (0.109)	0.598*** (0.115)	0.676*** (0.122)	0.479*** (0.101)	-0.122 (0.097)	0.116 (0.098)	-0.431*** (0.101)	-0.118 (0.089)
60 years and older	-0.065 (0.102)	-0.198** (0.101)	-0.385*** (0.102)	-0.616*** (0.085)	0.714*** (0.110)	0.373*** (0.125)	0.468*** (0.116)	0.238** (0.105)	-0.690*** (0.102)	-0.774*** (0.122)	-0.856*** (0.129)	-0.895*** (0.091)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.078 (0.076)	0.027 (0.084)	0.074 (0.086)	0.144* (0.077)	0.243*** (0.091)	0.330** (0.130)	0.467*** (0.133)	0.451*** (0.115)	-0.129* (0.078)	-0.141 (0.096)	-0.146 (0.091)	-0.066 (0.077)
Tertiary (non-univ)	0.342*** (0.106)	0.353*** (0.099)	0.325*** (0.107)	0.328*** (0.090)	0.835*** (0.106)	0.826*** (0.143)	0.949*** (0.138)	1.107*** (0.126)	-0.377*** (0.104)	-0.152 (0.118)	-0.266** (0.121)	-0.403*** (0.091)
Tertiary (univ.)	0.321*** (0.092)	0.707*** (0.095)	0.325*** (0.103)	0.250*** (0.085)	0.957*** (0.097)	1.241*** (0.138)	1.189*** (0.138)	1.203*** (0.119)	-0.568*** (0.099)	-0.200* (0.114)	-0.544*** (0.109)	-0.595*** (0.094)
Head of household	0.041 (0.079)	0.135** (0.061)	0.217*** (0.070)	0.234*** (0.059)	0.009 (0.067)	-0.047 (0.071)	0.049 (0.066)	0.053 (0.058)	0.012 (0.064)	0.231*** (0.072)	0.151** (0.068)	0.151*** (0.056)
Not occupied in 2019 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Employee in 2019	1.261*** (0.071)	1.319*** (0.069)	1.671*** (0.068)	1.230*** (0.060)	1.273*** (0.074)	1.383*** (0.093)	1.383*** (0.087)	1.271*** (0.071)	0.302*** (0.067)	0.604*** (0.083)	0.922*** (0.074)	0.386*** (0.064)
Own account worker in 2019	1.216*** (0.076)	0.915*** (0.080)	1.398*** (0.077)	1.184*** (0.062)	0.334*** (0.077)	0.228* (0.123)	0.279*** (0.103)	0.329*** (0.080)	1.144*** (0.070)	1.070*** (0.089)	1.545*** (0.081)	1.179*** (0.068)
Constant	-0.740*** (0.103)	-1.812*** (0.118)	-1.275*** (0.109)	-0.786*** (0.091)	-2.214*** (0.134)	-2.721*** (0.163)	-2.777*** (0.161)	-2.469*** (0.145)	-0.428*** (0.106)	-1.581*** (0.133)	-0.934*** (0.112)	-0.531*** (0.093)
Observations	4,119	5,260	5,124	4,450	4,119	5,260	5,124	4,450	4,119	5,260	5,124	4,450
Pseudo R2	0.258	0.237	0.357	0.278	0.237	0.288	0.269	0.261	0.133	0.133	0.210	0.160

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A3.1b – Metropolitan Lima: Probit model with occupational status (all quarters in 2021 with respect to same quarter in 2020)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.249*** (0.051)	-0.370*** (0.050)	-0.308*** (0.052)	-0.272*** (0.053)	0.025 (0.054)	-0.059 (0.056)	-0.064 (0.059)	0.090 (0.056)	-0.267*** (0.052)	-0.328*** (0.051)	-0.256*** (0.052)	-0.263*** (0.053)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.389*** (0.094)	0.595*** (0.101)	0.592*** (0.112)	0.437*** (0.105)	0.070 (0.111)	0.407*** (0.117)	0.476*** (0.124)	0.235** (0.115)	0.420*** (0.102)	0.403*** (0.099)	0.296*** (0.109)	0.354*** (0.108)
30–39 years	0.474*** (0.079)	0.744*** (0.083)	0.493*** (0.085)	0.527*** (0.095)	0.207** (0.094)	0.373*** (0.106)	0.292*** (0.106)	0.457*** (0.094)	0.346*** (0.086)	0.500*** (0.084)	0.325*** (0.090)	0.175* (0.094)
40–49 years	0.523*** (0.078)	0.552*** (0.084)	0.541*** (0.088)	0.569*** (0.094)	0.534*** (0.099)	0.434*** (0.100)	0.476*** (0.101)	0.651*** (0.101)	0.113 (0.086)	0.273*** (0.089)	0.229*** (0.088)	0.017 (0.094)
50–59 years	0.218** (0.085)	0.387*** (0.081)	0.411*** (0.087)	0.505*** (0.092)	0.493*** (0.103)	0.511*** (0.105)	0.486*** (0.105)	0.594*** (0.102)	-0.119 (0.087)	0.073 (0.096)	0.118 (0.091)	0.042 (0.099)
60 years and older	-0.505*** (0.086)	-0.455*** (0.087)	-0.395*** (0.085)	-0.286*** (0.088)	0.313*** (0.108)	0.291*** (0.093)	0.400*** (0.102)	0.511*** (0.099)	-0.841*** (0.095)	-0.681*** (0.097)	-0.695*** (0.095)	-0.675*** (0.101)
Primary (base)												
Secondary	0.074 (0.078)	0.028 (0.075)	0.092 (0.080)	0.172** (0.080)	0.264** (0.118)	0.401*** (0.106)	0.046 (0.109)	0.327*** (0.106)	-0.100 (0.078)	-0.161** (0.079)	0.044 (0.079)	-0.056 (0.075)
Tertiary (non-univ)	0.243*** (0.089)	0.177* (0.096)	0.386*** (0.102)	0.324*** (0.105)	0.785*** (0.128)	0.975*** (0.122)	0.769*** (0.118)	0.883*** (0.112)	-0.314*** (0.093)	-0.421*** (0.091)	-0.237** (0.096)	-0.362*** (0.095)
Tertiary (univ.)	0.155* (0.086)	0.055 (0.094)	0.113 (0.093)	0.211** (0.093)	1.029*** (0.123)	1.030*** (0.117)	0.796*** (0.113)	1.162*** (0.109)	-0.710*** (0.097)	-0.630*** (0.095)	-0.557*** (0.097)	-0.762*** (0.094)
Head of household	0.321*** (0.057)	0.469*** (0.064)	0.223*** (0.061)	0.280*** (0.061)	0.129** (0.063)	0.020 (0.067)	-0.070 (0.060)	0.029 (0.069)	0.184*** (0.058)	0.429*** (0.058)	0.241*** (0.057)	0.191*** (0.059)
Not occupied in 2020 (base)												
Employee in 2020	1.221*** (0.062)	0.999*** (0.085)	1.242*** (0.075)	1.459*** (0.064)	1.363*** (0.076)	1.275*** (0.070)	1.184*** (0.067)	1.190*** (0.072)	0.344*** (0.068)	-0.470*** (0.083)	0.045 (0.067)	0.325*** (0.061)
Own account worker in 2020	1.055*** (0.065)	0.741*** (0.101)	0.941*** (0.074)	1.320*** (0.070)	0.366*** (0.088)	-0.136 (0.113)	0.127 (0.084)	0.174** (0.073)	1.040*** (0.068)	0.746*** (0.090)	0.838*** (0.071)	1.208*** (0.069)
Constant	-0.928*** (0.098)	-0.284*** (0.094)	-0.472*** (0.102)	-0.696*** (0.096)	-2.444*** (0.158)	-2.030*** (0.129)	-1.807*** (0.132)	-2.286*** (0.126)	-0.619*** (0.100)	-0.162* (0.097)	-0.443*** (0.098)	-0.375*** (0.093)
Observations	4,286	4,063	3,940	4,378	4,286	4,063	3,940	4,378	4,286	4,063	3,940	4,378
Pseudo R2	0.255	0.192	0.250	0.317	0.255	0.239	0.232	0.241	0.155	0.128	0.135	0.170

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.
Source: INEI. Own elaboration based on a panel from EPE.

Table A3.2a – Metropolitan Lima: Probit model for occupied with employment sectors (all quarters in 2020 with respect to same quarter in 2019) by employment status in previous year

	Ocupad in previous year				Employee in previous year				Own account worker in previous year			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.442*** (0.088)	-0.135** (0.061)	-0.322*** (0.071)	-0.454*** (0.069)	-0.387*** (0.120)	-0.046 (0.077)	-0.261*** (0.089)	-0.383*** (0.089)	-0.441*** (0.150)	-0.304*** (0.105)	-0.435*** (0.126)	-0.614*** (0.122)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.363** (0.157)	0.335*** (0.112)	0.236* (0.122)	0.405*** (0.119)	0.270 (0.177)	0.288** (0.125)	0.199 (0.137)	0.338** (0.133)	0.677** (0.326)	0.664** (0.263)	0.261 (0.289)	0.803*** (0.266)
30–39 years	0.464*** (0.151)	0.468*** (0.106)	0.712*** (0.113)	0.544*** (0.109)	0.549*** (0.187)	0.588*** (0.115)	0.782*** (0.134)	0.608*** (0.133)	0.297 (0.231)	0.421* (0.256)	0.564** (0.234)	0.505** (0.205)
40–49 years	0.514*** (0.143)	0.558*** (0.106)	0.540*** (0.116)	0.514*** (0.109)	0.507*** (0.193)	0.676*** (0.128)	0.603*** (0.143)	0.625*** (0.136)	0.432* (0.257)	0.600** (0.245)	0.464** (0.226)	0.435** (0.198)
50–59 years	0.571*** (0.145)	0.495*** (0.110)	0.005 (0.120)	0.477*** (0.109)	0.576*** (0.194)	0.661*** (0.136)	0.357** (0.159)	0.618*** (0.152)	0.487** (0.240)	0.576** (0.242)	-0.236 (0.232)	0.404** (0.197)
60 years and older	0.411** (0.161)	-0.192 (0.122)	-0.421*** (0.122)	-0.244** (0.121)	0.529** (0.227)	0.066 (0.166)	-0.263* (0.150)	-0.151 (0.162)	0.330 (0.241)	-0.167 (0.261)	-0.521** (0.243)	-0.336 (0.209)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.162 (0.115)	-0.018 (0.099)	0.073 (0.109)	0.059 (0.111)	-0.147 (0.218)	0.112 (0.179)	0.014 (0.181)	0.483** (0.188)	0.249* (0.147)	-0.181 (0.129)	0.105 (0.136)	-0.144 (0.129)
Tertiary (non-univ)	0.434*** (0.147)	0.421*** (0.116)	0.314** (0.128)	0.156 (0.122)	0.181 (0.237)	0.651*** (0.191)	0.377* (0.200)	0.646*** (0.198)	0.344* (0.192)	-0.056 (0.184)	0.038 (0.177)	-0.227 (0.159)
Tertiary (univ.)	0.501*** (0.149)	0.778*** (0.117)	0.384*** (0.122)	0.079 (0.122)	0.209 (0.229)	0.966*** (0.189)	0.383** (0.192)	0.519*** (0.190)	0.481** (0.209)	0.194 (0.191)	0.040 (0.199)	-0.255 (0.172)
Head of household	-0.008 (0.104)	0.117* (0.066)	0.223*** (0.079)	0.124* (0.072)	0.108 (0.142)	0.189** (0.088)	0.164 (0.102)	0.141 (0.097)	-0.163 (0.131)	0.070 (0.102)	0.262** (0.123)	0.121 (0.107)
Commerce in 2019 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Manufacture in 2019	-0.094 (0.139)	-0.131 (0.100)	-0.135 (0.102)	0.179* (0.105)	0.023 (0.199)	-0.073 (0.136)	-0.276* (0.148)	0.356** (0.144)	-0.296 (0.191)	-0.681*** (0.170)	-0.213 (0.161)	-0.080 (0.159)
Services, admin. in 2019	0.010 (0.132)	0.348*** (0.105)	0.139 (0.118)	0.064 (0.103)	0.249 (0.194)	0.291** (0.136)	0.062 (0.151)	0.148 (0.130)	-0.655*** (0.254)	-0.204 (0.280)	-0.668** (0.280)	-0.095 (0.263)
Accommodation, restaurant in 2019	0.141 (0.150)	-0.616*** (0.133)	-0.463*** (0.123)	-0.151 (0.117)	0.408* (0.219)	-0.652*** (0.185)	-0.785*** (0.178)	0.198 (0.169)	-0.109 (0.193)	-0.663*** (0.204)	-0.182 (0.166)	-0.451*** (0.168)
Other sectors in 2019	-0.079 (0.118)	-0.084 (0.080)	-0.138* (0.083)	-0.014 (0.079)	-0.033 (0.171)	-0.141 (0.115)	-0.289** (0.125)	0.108 (0.113)	-0.143 (0.168)	-0.206* (0.117)	-0.231* (0.123)	-0.212 (0.131)
Constant	0.439*** (0.168)	-0.615*** (0.148)	0.409*** (0.144)	0.457*** (0.159)	0.594** (0.252)	-0.763*** (0.221)	0.562*** (0.212)	-0.142 (0.240)	0.611** (0.290)	-0.420 (0.297)	0.548** (0.265)	0.890*** (0.240)
Observations	2,379	3,153	3,061	2,634	1,420	1,906	1,898	1,616	959	1,247	1,163	1,018
Pseudo R2	0.0455	0.0921	0.0930	0.0705	0.0641	0.107	0.0971	0.0694	0.0526	0.0687	0.107	0.0889

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.
Source: INEI. Own elaboration based on a panel from EPE.

Table A3.2b – Metropolitan Lima: Probit model for occupied with employment sectors (all quarters in 2021 with respect to same quarter in 2020) by employment status in previous year

	Occupied in previous year				Employee in previous year				Own account worker in previous year			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.324*** (0.066)	-0.255** (0.124)	-0.466*** (0.092)	-0.396*** (0.089)	-0.292*** (0.083)	-0.082 (0.149)	-0.078 (0.129)	-0.269** (0.118)	-0.415*** (0.115)	-0.645*** (0.246)	-0.961*** (0.157)	-0.577*** (0.153)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.340*** (0.124)	0.092 (0.229)	0.242 (0.200)	0.227 (0.149)	0.278** (0.141)	-0.061 (0.287)	0.375 (0.238)	0.303* (0.176)	0.415 (0.269)	0.301 (0.406)	-0.251 (0.391)	0.000 (0.276)
30–39 years	0.426*** (0.110)	0.499** (0.216)	0.378** (0.187)	0.579*** (0.150)	0.467*** (0.131)	0.498* (0.290)	0.670*** (0.230)	0.652*** (0.184)	0.309 (0.221)	0.288 (0.338)	-0.151 (0.310)	0.367 (0.257)
40–49 years	0.521*** (0.109)	0.523** (0.207)	0.250 (0.163)	0.600*** (0.136)	0.537*** (0.138)	0.345 (0.273)	0.351* (0.202)	0.771*** (0.189)	0.432** (0.218)	0.778** (0.331)	-0.154 (0.303)	0.306 (0.217)
50–59 years	0.200* (0.117)	0.654*** (0.235)	0.269 (0.193)	0.604*** (0.147)	0.196 (0.154)	0.539* (0.308)	0.571** (0.242)	1.094*** (0.208)	0.167 (0.223)	0.766** (0.360)	-0.269 (0.321)	0.211 (0.247)
60 years and older	-0.366*** (0.129)	-0.220 (0.238)	-0.295 (0.184)	-0.056 (0.141)	-0.246 (0.175)	-0.259 (0.316)	-0.125 (0.235)	0.026 (0.211)	-0.481** (0.225)	-0.145 (0.376)	-0.741** (0.310)	-0.281 (0.248)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.083 (0.104)	0.031 (0.241)	0.246 (0.169)	0.138 (0.151)	0.221 (0.165)	0.350 (0.366)	0.290 (0.257)	0.134 (0.236)	0.003 (0.128)	-0.204 (0.332)	0.061 (0.225)	0.133 (0.197)
Tertiary (non-univ)	0.134 (0.116)	-0.087 (0.251)	0.293 (0.186)	0.110 (0.169)	0.357** (0.173)	0.251 (0.370)	0.352 (0.276)	0.154 (0.261)	-0.121 (0.160)	-0.595 (0.373)	0.005 (0.259)	-0.030 (0.221)
Tertiary (univ.)	0.254** (0.118)	0.254 (0.248)	0.341* (0.186)	0.155 (0.159)	0.423** (0.177)	0.656* (0.371)	0.337 (0.260)	0.229 (0.236)	-0.048 (0.170)	-0.335 (0.350)	-0.041 (0.263)	-0.151 (0.224)
Head of household	0.290*** (0.068)	0.193 (0.142)	0.074 (0.108)	0.236*** (0.090)	0.288*** (0.093)	0.249 (0.179)	0.119 (0.148)	0.282** (0.124)	0.285*** (0.103)	0.169 (0.229)	-0.005 (0.150)	0.201 (0.126)
Commerce in 2020 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Manufacture in 20120	-0.051 (0.104)	-0.104 (0.192)	-0.055 (0.139)	0.295** (0.143)	0.174 (0.140)	-0.065 (0.280)	0.015 (0.214)	0.277 (0.196)	-0.521*** (0.176)	-0.356 (0.323)	-0.412* (0.222)	0.254 (0.245)
Services, admin. in 2020	0.015 (0.114)	-0.142 (0.177)	0.254* (0.151)	0.224 (0.142)	0.163 (0.137)	-0.316 (0.255)	0.160 (0.213)	0.206 (0.189)	-0.529** (0.222)	-0.555 (0.475)	-0.084 (0.265)	-0.001 (0.290)
Accommodation, restaurant in 2020	-0.277** (0.113)	0.059 (0.340)	-0.213 (0.207)	0.027 (0.151)	-0.257 (0.175)	-0.037 (0.579)	-0.384 (0.306)	0.301 (0.264)	-0.295* (0.154)	0.201 (0.412)	-0.093 (0.290)	-0.157 (0.176)
Other sectors in 2020	-0.038 (0.079)	0.046 (0.150)	-0.099 (0.110)	0.131 (0.106)	0.102 (0.112)	-0.143 (0.248)	-0.214 (0.190)	0.126 (0.159)	-0.271** (0.127)	-0.067 (0.229)	-0.263* (0.152)	-0.041 (0.157)
Constant	0.319** (0.151)	0.746*** (0.280)	0.849*** (0.228)	0.700*** (0.195)	0.072 (0.218)	0.613 (0.451)	0.642** (0.308)	0.544** (0.271)	0.638** (0.254)	1.092** (0.432)	1.808*** (0.370)	1.161*** (0.337)
Observations	2,461	997	1,624	2,206	1,521	698	976	1,278	940	299	648	928
Pseudo R2	0.0664	0.0663	0.0536	0.0795	0.0624	0.0631	0.0545	0.0990	0.0824	0.138	0.104	0.0791

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.
Source: INEI. Own elaboration based on a panel from EPE.

Table A4a – Metropolitan Lima: Estimated probabilities of being employed with employment sectors (all quarters in 2020 with respect to same quarter in 2019)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mean	0.596	0.300	0.510	0.546	0.269	0.161	0.199	0.221	0.329	0.138	0.310	0.326
Male	0.652*** (0.014)	0.322*** (0.011)	0.553*** (0.010)	0.601*** (0.010)	0.285*** (0.011)	0.169*** (0.008)	0.207*** (0.010)	0.236*** (0.009)	0.365*** (0.014)	0.154*** (0.010)	0.343*** (0.011)	0.362*** (0.011)
Female	0.548*** (0.013)	0.277*** (0.010)	0.470*** (0.010)	0.498*** (0.009)	0.253*** (0.011)	0.153*** (0.008)	0.192*** (0.009)	0.206*** (0.009)	0.295*** (0.013)	0.122*** (0.008)	0.278*** (0.010)	0.292*** (0.010)
14–24 years	0.517*** (0.022)	0.228*** (0.016)	0.442*** (0.017)	0.504*** (0.019)	0.168*** (0.016)	0.110*** (0.012)	0.133*** (0.016)	0.161*** (0.015)	0.345*** (0.022)	0.120*** (0.014)	0.304*** (0.019)	0.338*** (0.019)
25–29 years	0.629*** (0.029)	0.331*** (0.021)	0.548*** (0.023)	0.636*** (0.022)	0.247*** (0.022)	0.163*** (0.017)	0.178*** (0.017)	0.231*** (0.018)	0.380*** (0.028)	0.173*** (0.019)	0.388*** (0.024)	0.411*** (0.023)
30–39 years	0.664*** (0.024)	0.348*** (0.018)	0.638*** (0.015)	0.651*** (0.016)	0.281*** (0.017)	0.177*** (0.013)	0.227*** (0.016)	0.242*** (0.014)	0.376*** (0.023)	0.166*** (0.015)	0.391*** (0.018)	0.395*** (0.018)
40–49 years	0.689*** (0.021)	0.367*** (0.017)	0.603*** (0.016)	0.637*** (0.017)	0.333*** (0.021)	0.203*** (0.015)	0.227*** (0.016)	0.246*** (0.015)	0.345*** (0.021)	0.163*** (0.014)	0.360*** (0.018)	0.377*** (0.018)
50–59 years	0.649*** (0.021)	0.348*** (0.018)	0.469*** (0.019)	0.597*** (0.017)	0.290*** (0.018)	0.174*** (0.013)	0.224*** (0.018)	0.259*** (0.016)	0.352*** (0.022)	0.169*** (0.014)	0.244*** (0.017)	0.335*** (0.018)
60 years and older	0.498*** (0.019)	0.162*** (0.015)	0.331*** (0.020)	0.331*** (0.016)	0.319*** (0.018)	0.131*** (0.014)	0.196*** (0.017)	0.190*** (0.015)	0.181*** (0.015)	0.040*** (0.007)	0.135*** (0.017)	0.146*** (0.012)
Primary	0.535*** (0.022)	0.231*** (0.020)	0.454*** (0.020)	0.493*** (0.018)	0.123*** (0.015)	0.054*** (0.012)	0.061*** (0.014)	0.073*** (0.013)	0.429*** (0.025)	0.176*** (0.020)	0.396*** (0.023)	0.411*** (0.021)
Secondary	0.569*** (0.015)	0.240*** (0.010)	0.481*** (0.009)	0.535*** (0.009)	0.190*** (0.011)	0.099*** (0.007)	0.123*** (0.009)	0.138*** (0.008)	0.377*** (0.015)	0.139*** (0.008)	0.354*** (0.011)	0.392*** (0.011)
Tertiary (non-univ)	0.656*** (0.019)	0.344*** (0.016)	0.546*** (0.017)	0.582*** (0.016)	0.387*** (0.019)	0.204*** (0.016)	0.247*** (0.016)	0.312*** (0.017)	0.276*** (0.019)	0.139*** (0.014)	0.297*** (0.018)	0.270*** (0.015)
Tertiary (univ.)	0.650*** (0.016)	0.441*** (0.016)	0.553*** (0.014)	0.565*** (0.013)	0.444*** (0.017)	0.321*** (0.017)	0.334*** (0.018)	0.362*** (0.014)	0.211*** (0.016)	0.118*** (0.011)	0.220*** (0.015)	0.208*** (0.014)
Not head of household	0.592*** (0.012)	0.288*** (0.010)	0.494*** (0.008)	0.525*** (0.009)	0.266*** (0.010)	0.166*** (0.008)	0.199*** (0.009)	0.221*** (0.008)	0.329*** (0.012)	0.122*** (0.008)	0.295*** (0.010)	0.307*** (0.009)
Head of household	0.606*** (0.017)	0.321*** (0.013)	0.543*** (0.013)	0.590*** (0.012)	0.274*** (0.013)	0.152*** (0.010)	0.199*** (0.011)	0.222*** (0.010)	0.328*** (0.016)	0.169*** (0.012)	0.342*** (0.015)	0.364*** (0.013)
Not occupied in 2019	0.325*** (0.015)	0.094*** (0.009)	0.177*** (0.013)	0.282*** (0.013)	0.112*** (0.010)	0.042*** (0.007)	0.054*** (0.008)	0.078*** (0.008)	0.188*** (0.012)	0.046*** (0.006)	0.098*** (0.009)	0.177*** (0.011)
Commerce in 2019	0.752*** (0.023)	0.415*** (0.022)	0.719*** (0.018)	0.694*** (0.019)	0.325*** (0.022)	0.168*** (0.016)	0.216*** (0.023)	0.222*** (0.017)	0.431*** (0.025)	0.245*** (0.020)	0.503*** (0.023)	0.480*** (0.020)
Manufacture in 2019	0.753*** (0.030)	0.349*** (0.026)	0.684*** (0.024)	0.751*** (0.021)	0.394*** (0.029)	0.198*** (0.020)	0.261*** (0.023)	0.349*** (0.025)	0.351*** (0.030)	0.153*** (0.019)	0.423*** (0.027)	0.382*** (0.026)
Services, admin. in 2019	0.762*** (0.033)	0.549*** (0.030)	0.771*** (0.026)	0.705*** (0.027)	0.467*** (0.034)	0.349*** (0.028)	0.367*** (0.033)	0.387*** (0.030)	0.274*** (0.035)	0.185*** (0.025)	0.374*** (0.036)	0.295*** (0.029)
Accommodation, restaurant in 2019	0.806*** (0.027)	0.218*** (0.031)	0.568*** (0.035)	0.628*** (0.032)	0.293*** (0.028)	0.094*** (0.026)	0.165*** (0.028)	0.202*** (0.028)	0.513*** (0.036)	0.122*** (0.025)	0.404*** (0.036)	0.423*** (0.035)
Other sectors in 2019	0.756***	0.383***	0.666***	0.685***	0.328***	0.220***	0.274***	0.280***	0.418***	0.160***	0.382***	0.394***

	(0.021)	(0.016)	(0.015)	(0.013)	(0.016)	(0.013)	(0.014)	(0.012)	(0.019)	(0.013)	(0.015)	(0.014)
Observations	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871

Note: Pooled data regression. Standard errors in parentheses. Average estimate of the analysed variables. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A4b – Metropolitan Lima: Estimated probabilities of being employed with employment sectors (all quarters in 2021 with respect to same quarter in 2020)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mean	0.514	0.572	0.579	0.625	0.208	0.214	0.228	0.238	0.307	0.359	0.352	0.388
Male	0.561*** (0.011)	0.634*** (0.012)	0.632*** (0.011)	0.661*** (0.010)	0.215*** (0.009)	0.221*** (0.010)	0.236*** (0.010)	0.234*** (0.009)	0.343*** (0.012)	0.413*** (0.012)	0.393*** (0.013)	0.421*** (0.012)
Female	0.472*** (0.010)	0.515*** (0.011)	0.534*** (0.011)	0.596*** (0.009)	0.200*** (0.009)	0.207*** (0.009)	0.219*** (0.010)	0.242*** (0.010)	0.273*** (0.011)	0.307*** (0.011)	0.312*** (0.012)	0.358*** (0.012)
14–24 years	0.456*** (0.018)	0.484*** (0.019)	0.514*** (0.020)	0.563*** (0.017)	0.156*** (0.014)	0.143*** (0.013)	0.154*** (0.015)	0.151*** (0.015)	0.292*** (0.018)	0.331*** (0.020)	0.335*** (0.021)	0.395*** (0.022)
25–29 years	0.595*** (0.023)	0.687*** (0.029)	0.705*** (0.028)	0.690*** (0.022)	0.186*** (0.018)	0.234*** (0.025)	0.272*** (0.025)	0.207*** (0.019)	0.423*** (0.026)	0.467*** (0.031)	0.431*** (0.032)	0.498*** (0.026)
30–39 years	0.621*** (0.017)	0.732*** (0.019)	0.677*** (0.018)	0.707*** (0.017)	0.208*** (0.014)	0.232*** (0.018)	0.222*** (0.019)	0.259*** (0.016)	0.409*** (0.020)	0.498*** (0.021)	0.449*** (0.024)	0.439*** (0.020)
40–49 years	0.628*** (0.017)	0.679*** (0.019)	0.678*** (0.019)	0.718*** (0.017)	0.269*** (0.016)	0.240*** (0.016)	0.255*** (0.017)	0.298*** (0.018)	0.344*** (0.019)	0.431*** (0.021)	0.415*** (0.021)	0.402*** (0.019)
50–59 years	0.524*** (0.018)	0.622*** (0.019)	0.647*** (0.018)	0.694*** (0.016)	0.235*** (0.015)	0.260*** (0.018)	0.263*** (0.017)	0.269*** (0.018)	0.290*** (0.016)	0.358*** (0.021)	0.379*** (0.020)	0.420*** (0.020)
60 years and older	0.303*** (0.016)	0.339*** (0.017)	0.397*** (0.016)	0.477*** (0.017)	0.191*** (0.015)	0.208*** (0.014)	0.237*** (0.016)	0.242*** (0.016)	0.122*** (0.012)	0.147*** (0.013)	0.160*** (0.014)	0.224*** (0.018)
Primary	0.482*** (0.021)	0.558*** (0.021)	0.543*** (0.023)	0.577*** (0.019)	0.095*** (0.015)	0.081*** (0.013)	0.133*** (0.019)	0.100*** (0.015)	0.394*** (0.023)	0.475*** (0.025)	0.408*** (0.025)	0.474*** (0.021)
Secondary	0.494*** (0.010)	0.565*** (0.011)	0.564*** (0.010)	0.624*** (0.009)	0.134*** (0.008)	0.154*** (0.009)	0.146*** (0.009)	0.162*** (0.009)	0.358*** (0.012)	0.406*** (0.012)	0.412*** (0.013)	0.458*** (0.012)
Tertiary (non-univ)	0.563*** (0.017)	0.608*** (0.020)	0.649*** (0.019)	0.662*** (0.018)	0.270*** (0.017)	0.311*** (0.020)	0.339*** (0.022)	0.320*** (0.019)	0.294*** (0.017)	0.302*** (0.019)	0.310*** (0.020)	0.343*** (0.019)
Tertiary (univ.)	0.537*** (0.014)	0.571*** (0.019)	0.585*** (0.017)	0.629*** (0.015)	0.364*** (0.016)	0.334*** (0.018)	0.375*** (0.017)	0.423*** (0.017)	0.175*** (0.013)	0.236*** (0.017)	0.211*** (0.017)	0.216*** (0.016)
Not head of household	0.483*** (0.010)	0.524*** (0.011)	0.557*** (0.010)	0.600*** (0.009)	0.200*** (0.008)	0.216*** (0.009)	0.239*** (0.010)	0.239*** (0.009)	0.285*** (0.010)	0.307*** (0.011)	0.319*** (0.011)	0.362*** (0.011)
Head of household	0.575*** (0.013)	0.667*** (0.015)	0.620*** (0.014)	0.677*** (0.011)	0.221*** (0.011)	0.211*** (0.012)	0.215*** (0.010)	0.236*** (0.013)	0.348*** (0.014)	0.454*** (0.016)	0.405*** (0.015)	0.436*** (0.014)
Not occupied in 2020	0.267*** (0.014)	0.506*** (0.010)	0.427*** (0.013)	0.389*** (0.012)	0.068*** (0.008)	0.141*** (0.008)	0.128*** (0.008)	0.124*** (0.009)	0.180*** (0.012)	0.361*** (0.010)	0.287*** (0.012)	0.242*** (0.011)
Commerce in 2020	0.669*** (0.019)	0.779*** (0.027)	0.805*** (0.020)	0.808*** (0.018)	0.243*** (0.018)	0.283*** (0.034)	0.235*** (0.022)	0.235*** (0.019)	0.426*** (0.021)	0.475*** (0.034)	0.555*** (0.025)	0.569*** (0.024)
Manufacture in 2020	0.670***	0.766***	0.802***	0.856***	0.311***	0.393***	0.411***	0.365***	0.351***	0.334***	0.360***	0.469***

	(0.027)	(0.043)	(0.030)	(0.021)	(0.025)	(0.045)	(0.036)	(0.030)	(0.026)	(0.048)	(0.036)	(0.031)
Services, admin. in 2020	0.682***	0.769***	0.852***	0.858***	0.409***	0.453***	0.477***	0.437***	0.262***	0.282***	0.325***	0.380***
	(0.030)	(0.035)	(0.027)	(0.024)	(0.030)	(0.041)	(0.039)	(0.032)	(0.028)	(0.037)	(0.034)	(0.031)
Accommodation, restaurant in 2020	0.604***	0.829***	0.700***	0.837***	0.188***	0.295***	0.191***	0.268***	0.416***	0.501***	0.507***	0.568***
	(0.032)	(0.074)	(0.052)	(0.027)	(0.026)	(0.081)	(0.040)	(0.047)	(0.031)	(0.084)	(0.055)	(0.046)
Other sectors in 2020	0.653***	0.814***	0.780***	0.843***	0.271***	0.445***	0.353***	0.325***	0.371***	0.309***	0.392***	0.494***
	(0.015)	(0.022)	(0.018)	(0.014)	(0.014)	(0.025)	(0.018)	(0.018)	(0.017)	(0.023)	(0.020)	(0.019)
Observations	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685

Note: Pooled data regression. Standard errors in parentheses. Average estimate of the analysed variables. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A5a - Metropolitan Lima: Probit model (all quarters in 2020 with respect to same quarter in 2019)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.337*** (0.054)	-0.191*** (0.05)	-0.336*** (0.055)	-0.366*** (0.049)	-0.121 (0.063)	-0.176** (0.066)	-0.149* (0.061)	-0.17** (0.059)	-0.227*** (0.054)	-0.124* (0.058)	-0.219*** (0.052)	-0.253*** (0.050)
14-24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25-29 years	0.332** (0.104)	0.326*** (0.086)	0.302*** (0.093)	0.403*** (0.088)	0.244* (0.120)	0.204 (0.125)	0.177 (0.121)	0.21 (0.107)	0.189 (0.100)	0.312** (0.098)	0.269** (0.097)	0.306*** (0.092)
30-39 years	0.465*** (0.095)	0.344*** (0.083)	0.609*** (0.081)	0.435*** (0.079)	0.411*** (0.093)	0.223 (0.116)	0.371** (0.122)	0.198* (0.094)	0.135 (0.092)	0.271** (0.098)	0.334*** (0.085)	0.286*** (0.085)
40-49 years	0.505*** (0.090)	0.405*** (0.083)	0.478*** (0.085)	0.383*** (0.081)	0.408*** (0.102)	0.357** (0.121)	0.33** (0.121)	0.181 (0.102)	0.177 (0.093)	0.272** (0.095)	0.236** (0.090)	0.249** (0.088)
50-59 years	0.344*** (0.094)	0.371*** (0.086)	0.045 (0.094)	0.257** (0.082)	0.306** (0.103)	0.206 (0.116)	0.383** (0.122)	0.236* (0.101)	0.12 (0.093)	0.314*** (0.091)	-0.219* (0.097)	0.103 (0.086)
60 years and older	-0.196* (0.088)	-0.411*** (0.098)	-0.46*** (0.100)	-0.587*** (0.083)	0.262** (0.098)	-0.217 (0.132)	0.027 (0.121)	-0.205 (0.105)	-0.445*** (0.096)	-0.519*** (0.116)	-0.6*** (0.116)	-0.567*** (0.089)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.138 (0.073)	-0.017 (0.082)	0.08 (0.077)	0.137 (0.070)	0.259** (0.098)	0.099 (0.156)	0.328* (0.135)	0.322** (0.114)	-0.052 (0.073)	-0.077 (0.091)	-0.043 (0.079)	0.036 (0.073)
Tertiary (non-univ)	0.346*** (0.104)	0.291** (0.096)	0.324*** (0.098)	0.281*** (0.084)	0.697*** (0.113)	0.496** (0.165)	0.7*** (0.147)	0.839*** (0.123)	-0.164 (0.102)	0.029 (0.111)	-0.052 (0.108)	-0.18* (0.087)
Tertiary (univ.)	0.297*** (0.089)	0.574*** (0.097)	0.309** (0.098)	0.212** (0.079)	0.817*** (0.101)	0.808*** (0.165)	0.849*** (0.149)	0.856*** (0.118)	-0.361*** (0.094)	0.075 (0.114)	-0.235* (0.098)	-0.299*** (0.089)
Formal in 2019 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Informal in 2019	-0.174* (0.074)	-0.501*** (0.057)	-0.265*** (0.066)	-0.105 (0.057)	-1.667*** (0.072)	-1.541*** (0.077)	-1.506*** (0.082)	-1.586*** (0.069)	1.616*** (0.077)	0.882*** (0.076)	1.056*** (0.066)	1.35*** (0.061)
No occupied in 2019	-1.448*** (0.072)	-1.414*** (0.070)	-1.706*** (0.077)	-1.255*** (0.058)	-1.742*** (0.070)	-1.668*** (0.093)	-1.676*** (0.093)	-1.638*** (0.073)	0.353*** (0.081)	-0.154 (0.096)	-0.471*** (0.080)	0.153* (0.071)
Head of household	0.108 (0.067)	0.144* (0.056)	0.196** (0.064)	0.238*** (0.054)	0.103 (0.072)	-0.022 (0.070)	0.051 (0.066)	0.097 (0.059)	-0.002 (0.062)	0.213*** (0.065)	0.143* (0.065)	0.139** (0.052)
Constant	0.825*** (0.114)	-0.33 (0.171)	0.43*** (0.134)	0.467*** (0.100)	-0.167 (0.124)	-0.609** (0.228)	-0.602*** (0.188)	-0.433** (0.150)	-0.896*** (0.133)	-1.69*** (0.223)	-0.782*** (0.134)	-0.942*** (0.114)
Observations	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871	4,543	5,774	5,646	4,871
Pseudo R ²	0.291	0.2231	0.339	0.266	0.351	0.358	0.343	0.353	0.261	0.164	0.259	0.233

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A5b - Metropolitan Lima: Probit model (all quarters in 2021 with respect to same quarter in 2020)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.307*** (0.050)	-0.371*** (0.049)	-0.336*** (0.052)	-0.261*** (0.051)	-0.109* (0.056)	-0.090 (0.056)	-0.165*** (0.061)	-0.013 (0.056)	-0.263*** (0.050)	-0.317*** (0.051)	-0.221*** (0.051)	-0.223*** (0.052)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.408*** (0.089)	0.596*** (0.099)	0.624*** (0.108)	0.420*** (0.102)	0.091 (0.116)	0.387*** (0.118)	0.600*** (0.129)	0.219* (0.112)	0.416*** (0.100)	0.411*** (0.101)	0.225* (0.116)	0.348*** (0.102)
30–39 years	0.489*** (0.075)	0.739*** (0.081)	0.520*** (0.083)	0.489*** (0.090)	0.069 (0.093)	0.343*** (0.108)	0.265** (0.109)	0.379*** (0.095)	0.465*** (0.084)	0.530*** (0.085)	0.385*** (0.092)	0.238*** (0.091)
40–49 years	0.500*** (0.073)	0.555*** (0.083)	0.510*** (0.084)	0.516*** (0.089)	0.287*** (0.096)	0.306*** (0.103)	0.430*** (0.102)	0.418*** (0.105)	0.310*** (0.080)	0.378*** (0.086)	0.265*** (0.087)	0.214** (0.091)
50–59 years	0.169** (0.078)	0.380*** (0.081)	0.405*** (0.087)	0.441*** (0.088)	0.122 (0.104)	0.395*** (0.104)	0.381*** (0.102)	0.355*** (0.105)	0.104 (0.082)	0.159* (0.094)	0.206** (0.093)	0.211** (0.095)
60 years and older	-0.538*** (0.083)	-0.458*** (0.086)	-0.383*** (0.083)	-0.326*** (0.084)	-0.222** (0.107)	0.147 (0.093)	0.200* (0.106)	0.093 (0.101)	-0.537*** (0.093)	-0.606*** (0.096)	-0.565*** (0.096)	-0.436*** (0.094)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.033 (0.074)	0.007 (0.073)	0.075 (0.079)	0.175** (0.080)	0.070 (0.111)	0.316*** (0.103)	-0.027 (0.104)	0.220** (0.104)	0.009 (0.077)	-0.133* (0.078)	0.087 (0.081)	0.056 (0.077)
Tertiary (non-univ)	0.245*** (0.084)	0.139 (0.096)	0.350*** (0.101)	0.311*** (0.104)	0.476*** (0.120)	0.855*** (0.118)	0.527*** (0.116)	0.682*** (0.111)	-0.028 (0.090)	-0.370*** (0.090)	-0.034 (0.098)	-0.151 (0.093)
Tertiary (univ.)	0.143* (0.084)	0.017 (0.092)	0.098 (0.094)	0.169* (0.094)	0.679*** (0.118)	0.874*** (0.115)	0.527*** (0.111)	0.823*** (0.112)	-0.387*** (0.091)	-0.549*** (0.092)	-0.318*** (0.098)	-0.452*** (0.094)
Formal in 2020 (base)	-	-	-	-	-	-	-	-	-	-	-	-
Informal in 2020	-0.138** (0.060)	-0.290** (0.116)	-0.238** (0.094)	-0.142* (0.084)	-1.611*** (0.067)	-1.782*** (0.111)	-1.797*** (0.078)	-1.971*** (0.080)	1.352*** (0.069)	1.730*** (0.108)	1.672*** (0.091)	1.891*** (0.077)
Not occupied in 2020	-1.210*** (0.062)	-1.065*** (0.096)	-1.240*** (0.081)	-1.482*** (0.076)	-1.713*** (0.074)	-1.663*** (0.077)	-1.695*** (0.072)	-1.812*** (0.072)	0.263*** (0.078)	0.984*** (0.095)	0.682*** (0.089)	0.548*** (0.080)
Head of household	0.307*** (0.055)	0.455*** (0.063)	0.215*** (0.060)	0.298*** (0.059)	0.120* (0.065)	0.033 (0.069)	-0.077 (0.063)	0.048 (0.069)	0.215*** (0.055)	0.421*** (0.060)	0.250*** (0.060)	0.229*** (0.059)
Constant	0.353*** (0.108)	0.811*** (0.138)	0.800*** (0.125)	0.811*** (0.121)	-0.201 (0.144)	-0.183 (0.152)	0.154 (0.144)	-0.066 (0.134)	-1.146*** (0.116)	-1.232*** (0.134)	-1.279*** (0.133)	-1.189*** (0.115)
Observations	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685
Pseudo R2	0.243	0.192	0.246	0.310	0.349	0.279	0.325	0.378	0.231	0.164	0.213	0.291

Note: Pooled data regression. Robust standard errors in parentheses. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: INEI. Own elaboration based on a panel from EPE.

Table A6a – Metropolitan Lima: Pool Probit model with no lags (all quarters in 2020 with respect to same quarter in 2019)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.487*** (0.042)	-0.299*** (0.032)	-0.470*** (0.044)	-0.409*** (0.036)	-0.261*** (0.044)	-0.161*** (0.039)	-0.189*** (0.045)	-0.203*** (0.036)	-0.244*** (0.040)	-0.217*** (0.035)	-0.293*** (0.038)	-0.214*** (0.036)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.856*** (0.080)	0.748*** (0.055)	0.923*** (0.074)	0.939*** (0.061)	0.651*** (0.081)	0.604*** (0.076)	0.657*** (0.076)	0.659*** (0.064)	0.382*** (0.079)	0.464*** (0.061)	0.567*** (0.068)	0.526*** (0.063)
30–39 years	0.915*** (0.065)	0.894*** (0.052)	1.332*** (0.068)	1.095*** (0.058)	0.709*** (0.078)	0.705*** (0.068)	0.884*** (0.078)	0.812*** (0.064)	0.370*** (0.068)	0.519*** (0.055)	0.675*** (0.065)	0.490*** (0.059)
40–49 years	0.990*** (0.065)	0.948*** (0.054)	1.124*** (0.075)	1.111*** (0.060)	0.959*** (0.084)	0.824*** (0.075)	0.857*** (0.084)	0.824*** (0.069)	0.202*** (0.071)	0.482*** (0.061)	0.528*** (0.066)	0.495*** (0.061)
50–59 years	0.796*** (0.073)	0.809*** (0.056)	0.876*** (0.075)	0.901*** (0.058)	0.742*** (0.090)	0.713*** (0.075)	0.775*** (0.091)	0.788*** (0.072)	0.252*** (0.074)	0.423*** (0.060)	0.385*** (0.069)	0.373*** (0.060)
60 years and older	-0.161** (0.073)	0.037 (0.056)	-0.077 (0.081)	-0.152** (0.062)	0.524*** (0.089)	0.346*** (0.072)	0.454*** (0.089)	0.347*** (0.075)	-0.572*** (0.079)	-0.224*** (0.068)	-0.457*** (0.086)	-0.397*** (0.068)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.125** (0.058)	0.113** (0.053)	0.230*** (0.061)	0.253*** (0.058)	0.256*** (0.071)	0.443*** (0.070)	0.523*** (0.086)	0.462*** (0.074)	-0.110* (0.057)	-0.145** (0.057)	-0.086 (0.064)	-0.021 (0.057)
Tertiary (non-univ)	0.458*** (0.081)	0.468*** (0.064)	0.554*** (0.083)	0.555*** (0.068)	0.991*** (0.084)	0.983*** (0.082)	1.119*** (0.094)	1.127*** (0.086)	-0.430*** (0.075)	-0.207*** (0.071)	-0.272*** (0.078)	-0.314*** (0.069)
Tertiary (univ.)	0.355*** (0.068)	0.575*** (0.063)	0.472*** (0.075)	0.438*** (0.063)	1.108*** (0.082)	1.316*** (0.078)	1.365*** (0.093)	1.303*** (0.079)	-0.702*** (0.079)	-0.487*** (0.071)	-0.643*** (0.078)	-0.636*** (0.067)
Head of household	0.352*** (0.049)	0.241*** (0.036)	0.271*** (0.062)	0.353*** (0.043)	0.088* (0.053)	0.044 (0.046)	0.036 (0.054)	0.040 (0.041)	0.213*** (0.045)	0.232*** (0.039)	0.213*** (0.048)	0.257*** (0.041)
Constant	-0.221*** (0.077)	-0.792*** (0.066)	-0.588*** (0.078)	-0.508*** (0.068)	-1.650*** (0.093)	-1.966*** (0.086)	-2.072*** (0.105)	-1.908*** (0.089)	-0.186** (0.079)	-0.716*** (0.074)	-0.409*** (0.076)	-0.426*** (0.068)
Observations	9,344	11,840	11,600	9,941	9,344	11,840	11,600	9,941	9,344	11,840	11,600	9,941
Pseudo R2	0.150	0.115	0.181	0.175	0.130	0.122	0.134	0.139	0.0697	0.0580	0.0958	0.0796

Note: Pooled data regression. Standard errors in parentheses. Average estimate of the analysed variables. Significant *** p<0.001; ** p<0.01; * p<0.05

Source: Own elaboration based on a panel from EPE

Table A6b - Metropolitan Lima: Pool Probit model with no lags (all quarters in 2021 with respect to same quarter in 2020)

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.463*** (0.039)	-0.300*** (0.036)	-0.500*** (0.040)	-0.457*** (0.041)	-0.231*** (0.041)	-0.174*** (0.048)	-0.224*** (0.044)	-0.167*** (0.040)	-0.269*** (0.038)	-0.227*** (0.036)	-0.351*** (0.041)	-0.297*** (0.043)
14–24 years (base)	-	-	-	-	-	-	-	-	-	-	-	-
25–29 years	0.805*** (0.064)	0.686*** (0.064)	0.914*** (0.074)	0.701*** (0.071)	0.558*** (0.079)	0.628*** (0.084)	0.751*** (0.091)	0.462*** (0.085)	0.483*** (0.066)	0.417*** (0.067)	0.519*** (0.081)	0.463*** (0.086)
30–39 years	0.947*** (0.059)	0.765*** (0.058)	0.895*** (0.064)	0.843*** (0.061)	0.697*** (0.070)	0.760*** (0.082)	0.688*** (0.082)	0.690*** (0.072)	0.466*** (0.061)	0.378*** (0.058)	0.534*** (0.074)	0.380*** (0.071)
40–49 years	0.964*** (0.059)	0.719*** (0.056)	0.980*** (0.059)	0.973*** (0.063)	0.860*** (0.073)	0.835*** (0.083)	0.833*** (0.082)	0.866*** (0.074)	0.331*** (0.062)	0.262*** (0.062)	0.480*** (0.068)	0.325*** (0.068)
50–59 years	0.719*** (0.057)	0.602*** (0.059)	0.682*** (0.063)	0.696*** (0.069)	0.787*** (0.072)	0.835*** (0.082)	0.712*** (0.086)	0.702*** (0.080)	0.197*** (0.061)	0.132* (0.068)	0.300*** (0.070)	0.248*** (0.071)
60 years and older	-0.197*** (0.066)	-0.129** (0.063)	-0.176*** (0.065)	-0.209*** (0.072)	0.404*** (0.078)	0.455*** (0.082)	0.435*** (0.083)	0.418*** (0.077)	-0.515*** (0.069)	-0.489*** (0.073)	-0.489*** (0.074)	-0.521*** (0.079)
Primary (base)	-	-	-	-	-	-	-	-	-	-	-	-
Secondary	0.150*** (0.057)	0.143*** (0.053)	0.192*** (0.060)	0.232*** (0.060)	0.347*** (0.076)	0.532*** (0.085)	0.288*** (0.087)	0.420*** (0.079)	-0.095* (0.056)	-0.119** (0.056)	0.012 (0.067)	-0.022 (0.061)
Tertiary (non-univ)	0.420*** (0.067)	0.481*** (0.068)	0.526*** (0.076)	0.506*** (0.072)	0.897*** (0.086)	1.179*** (0.098)	1.001*** (0.094)	1.017*** (0.090)	-0.296*** (0.067)	-0.251*** (0.067)	-0.218*** (0.077)	-0.245*** (0.074)
Tertiary (univ.)	0.290*** (0.066)	0.590*** (0.062)	0.457*** (0.069)	0.442*** (0.071)	1.115*** (0.084)	1.440*** (0.092)	1.194*** (0.091)	1.321*** (0.087)	-0.683*** (0.070)	-0.420*** (0.069)	-0.540*** (0.083)	-0.635*** (0.078)
Head of household	0.370*** (0.043)	0.334*** (0.042)	0.410*** (0.046)	0.343*** (0.049)	0.122*** (0.046)	0.052 (0.056)	0.114** (0.048)	0.040 (0.047)	0.227*** (0.042)	0.346*** (0.040)	0.324*** (0.047)	0.273*** (0.053)
Constant	-0.374*** (0.075)	-0.855*** (0.067)	-0.605*** (0.077)	-0.358*** (0.074)	-1.787*** (0.095)	-2.289*** (0.105)	-1.929*** (0.100)	-1.929*** (0.098)	-0.314*** (0.072)	-0.655*** (0.067)	-0.550*** (0.082)	-0.260*** (0.075)
Observations	9,645	8,479	8,525	9,627	9,645	8,479	8,525	9,627	9,645	8,479	8,525	9,627
Pseudo R2	0.144	0.108	0.161	0.144	0.118	0.138	0.138	0.128	0.0745	0.0594	0.0967	0.0785

Note: Pooled data regression. Standard errors in parentheses. Average estimate of the analysed variables. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: Own elaboration based on a panel from EPE.

Table A7a – Metropolitan Lima: Population-averaged Panel Probit model for 2019–20

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.485*** (0.041)	-0.306*** (0.033)	-0.462*** (0.043)	-0.404*** (0.036)	-0.262*** (0.043)	-0.166*** (0.043)	-0.173*** (0.046)	-0.202*** (0.039)	-0.238*** (0.041)	-0.219*** (0.036)	-0.293*** (0.042)	-0.210*** (0.036)
14–24 years (base)												
25–29 years	0.777*** (0.074)	0.746*** (0.056)	0.786*** (0.071)	0.908*** (0.062)	0.553*** (0.080)	0.501*** (0.076)	0.554*** (0.086)	0.574*** (0.069)	0.341*** (0.076)	0.458*** (0.062)	0.471*** (0.066)	0.505*** (0.065)
30–39 years	0.893*** (0.061)	0.903*** (0.052)	1.266*** (0.063)	1.074*** (0.057)	0.696*** (0.073)	0.668*** (0.067)	0.818*** (0.073)	0.762*** (0.063)	0.342*** (0.063)	0.514*** (0.054)	0.641*** (0.062)	0.478*** (0.057)
40–49 years	0.964*** (0.067)	0.941*** (0.055)	1.081*** (0.072)	1.085*** (0.058)	0.899*** (0.080)	0.774*** (0.071)	0.771*** (0.079)	0.758*** (0.066)	0.202*** (0.065)	0.470*** (0.059)	0.529*** (0.065)	0.492*** (0.058)
50–59 years	0.734*** (0.071)	0.815*** (0.057)	0.799*** (0.067)	0.856*** (0.060)	0.688*** (0.083)	0.666*** (0.073)	0.702*** (0.082)	0.702*** (0.070)	0.198*** (0.070)	0.414*** (0.059)	0.347*** (0.069)	0.361*** (0.061)
60 years and older	-0.167** (0.068)	0.022 (0.057)	-0.148** (0.074)	-0.165*** (0.059)	0.491*** (0.085)	0.284*** (0.075)	0.368*** (0.082)	0.300*** (0.069)	-0.552*** (0.072)	-0.241*** (0.066)	-0.475*** (0.082)	-0.387*** (0.063)
Primary (base)												
Secondary	0.132** (0.063)	0.119** (0.050)	0.197*** (0.059)	0.257*** (0.055)	0.232*** (0.079)	0.397*** (0.069)	0.514*** (0.075)	0.491*** (0.068)	-0.087 (0.058)	-0.132** (0.056)	-0.111* (0.058)	-0.030 (0.054)
Tertiary (non-univ)	0.455*** (0.080)	0.471*** (0.061)	0.461*** (0.080)	0.519*** (0.067)	0.863*** (0.087)	0.883*** (0.077)	0.993*** (0.087)	1.069*** (0.077)	-0.342*** (0.072)	-0.184*** (0.068)	-0.274*** (0.073)	-0.303*** (0.065)
Tertiary (univ.)	0.346*** (0.070)	0.599*** (0.059)	0.419*** (0.068)	0.432*** (0.062)	1.028*** (0.082)	1.245*** (0.073)	1.258*** (0.083)	1.285*** (0.073)	-0.643*** (0.071)	-0.454*** (0.066)	-0.607*** (0.069)	-0.624*** (0.064)
Head of household	0.361*** (0.049)	0.236*** (0.039)	0.260*** (0.059)	0.344*** (0.043)	0.087 (0.055)	0.020 (0.050)	0.041 (0.054)	0.038 (0.046)	0.220*** (0.049)	0.236*** (0.042)	0.199*** (0.052)	0.245*** (0.042)
Constant	-0.207*** (0.076)	-0.778*** (0.062)	-0.482*** (0.074)	-0.477*** (0.066)	-1.561*** (0.094)	-1.848*** (0.083)	-1.962*** (0.097)	-1.851*** (0.081)	-0.218*** (0.073)	-0.715*** (0.068)	-0.365*** (0.070)	-0.417*** (0.066)
Observations	9,086	11,548	11,298	9,742	9,086	11,548	11,298	9,742	9,086	11,548	11,298	9,742
Number of ID	4,543	5,774	5,649	4,871	4,543	5,774	5,649	4,871	4,543	5,774	5,649	4,871

Note: Panel data regression. Standard errors in parentheses. Average estimate of the analysed variables. Significant *** p<0.001; ** p<0.01; * p<0.05.

Source: Own elaboration based on a panel from EPE.

Table A7b – Metropolitan Lima: Population-averaged Panel Probit model for 2020–21

	Status: Occupied				Status: Occupied formal				Status: Occupied informal			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Female	-0.463*** (0.036)	-0.299*** (0.036)	-0.497*** (0.039)	-0.453*** (0.039)	-0.228*** (0.040)	-0.167*** (0.049)	-0.235*** (0.046)	-0.167*** (0.044)	-0.267*** (0.038)	-0.230*** (0.038)	-0.341*** (0.041)	-0.292*** (0.040)
14–24 years (base)												
25–29 years	0.732*** (0.065)	0.676*** (0.067)	0.812*** (0.076)	0.626*** (0.070)	0.501*** (0.073)	0.623*** (0.088)	0.701*** (0.090)	0.430*** (0.079)	0.389*** (0.069)	0.403*** (0.074)	0.439*** (0.083)	0.365*** (0.074)
30–39 years	0.911*** (0.055)	0.765*** (0.057)	0.878*** (0.062)	0.839*** (0.061)	0.647*** (0.064)	0.773*** (0.082)	0.705*** (0.077)	0.650*** (0.073)	0.432*** (0.059)	0.383*** (0.061)	0.503*** (0.065)	0.386*** (0.063)
40–49 years	0.942*** (0.059)	0.724*** (0.058)	0.959*** (0.063)	0.936*** (0.062)	0.793*** (0.068)	0.838*** (0.081)	0.798*** (0.077)	0.845*** (0.073)	0.325*** (0.060)	0.268*** (0.062)	0.471*** (0.066)	0.292*** (0.064)
50–59 years	0.678*** (0.059)	0.620*** (0.061)	0.657*** (0.064)	0.662*** (0.066)	0.724*** (0.071)	0.831*** (0.085)	0.703*** (0.079)	0.653*** (0.076)	0.165*** (0.062)	0.142** (0.066)	0.266*** (0.068)	0.217*** (0.066)
60 years and older	-0.220*** (0.062)	-0.110* (0.063)	-0.194*** (0.068)	-0.189*** (0.065)	0.346*** (0.074)	0.480*** (0.085)	0.416*** (0.081)	0.420*** (0.077)	-0.523*** (0.067)	-0.471*** (0.071)	-0.489*** (0.075)	-0.498*** (0.070)
Primary (base)												
Secondary	0.128** (0.054)	0.128** (0.052)	0.156** (0.061)	0.231*** (0.058)	0.289*** (0.066)	0.512*** (0.083)	0.263*** (0.081)	0.411*** (0.074)	-0.097* (0.055)	-0.137** (0.055)	-0.019 (0.062)	-0.016 (0.058)
Tertiary (non-univ)	0.410*** (0.066)	0.476*** (0.065)	0.469*** (0.073)	0.478*** (0.072)	0.811*** (0.075)	1.138*** (0.092)	0.892*** (0.090)	0.948*** (0.085)	-0.264*** (0.066)	-0.266*** (0.069)	-0.228*** (0.075)	-0.227*** (0.070)
Tertiary (univ.)	0.290*** (0.061)	0.588*** (0.061)	0.431*** (0.068)	0.460*** (0.066)	1.043*** (0.071)	1.411*** (0.088)	1.116*** (0.085)	1.271*** (0.079)	-0.647*** (0.065)	-0.433*** (0.068)	-0.522*** (0.074)	-0.576*** (0.068)
Head of household	0.366*** (0.043)	0.351*** (0.042)	0.417*** (0.046)	0.352*** (0.045)	0.127*** (0.046)	0.061 (0.055)	0.106** (0.052)	0.052 (0.049)	0.223*** (0.043)	0.364*** (0.044)	0.332*** (0.049)	0.278*** (0.045)
Constant	-0.329*** (0.066)	-0.877*** (0.064)	-0.562*** (0.073)	-0.354*** (0.071)	-1.678*** (0.083)	-2.287*** (0.102)	-1.860*** (0.097)	-1.887*** (0.088)	-0.301*** (0.068)	-0.668*** (0.067)	-0.530*** (0.076)	-0.270*** (0.071)
Observations	9,406	8,256	8,234	9,370	9,406	8,256	8,234	9,370	9,406	8,256	8,234	9,370
Number of ID	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685	4,703	4,128	4,117	4,685

Note: Panel data regression. Standard errors in parentheses. Average estimate of the analysed variables. Significant *** p<0.001; ** p<0.01; * p<0.05

Source: Own elaboration based on a panel from EPE

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