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The occupational structure of Latin American Countries and worker exposure to COVID*

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The COVID has spread in Latin America at a later stage of industrialized countries. Even if such states had a better understanding and more available information on how to face the virus, the sanitary infrastructure was less prepared in comparison to the industrialized countries. Latin American Countries (LAC) have a health system with inadequate coverage and an infrastructure deficit. These facts have made social distancing measures the most effective solution to contain the terrible effects of the pandemic.

Besides, LAC characterizes by having high shares of informality, which makes that such individuals have a hard time accessing social protection schemes, aggravating income shocks product of indirect measures. A large proportion of households are sole dependent on labor income. Social distance measures put under stress such households that happen to be also poor and vulnerable. When looking at the most recent labor market results, we can observe a significant increase in unemployment. Many LAC countries have reached unemployment figures that have not been seen two decades ago.

There is recent evidence that workers' well-being depends on occupation characteristics. These results have been measured for the U.S. (Dingel and Neiman, 2020) and other developing countries (Saltiel, 2020; Delaporte and Peña, 2020). Such calculations rely on household surveys and census information to estimate the impact of different populations based on workers' occupation. Occupational information helps to identify if the worker's job is at risk, and if the job tasks can be performed from home. Occupational information also allows the worker to assess the worker's risk when performing the occupation and if the job is performed at proximity (Leibovici et al., 2020; Mongey et al., 2020).

For the U.S., only 40% of jobs can be done from home (Dingel and Neiman 2020), and it seems that this figure correlates positively to domestic product. There are a couple of studies that assess this figure for LAC. For example, in Colombia, only one-fifth of jobs can be performed from home, but the value for informal workers is much lower (Cardenas and Montana, 2020). Following Delaporte and Peña (2020), the share of workers who can work from home is: in Argentina 31%, in Chile 27%,

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in Colombia 21%, in Mexico 22% and in Peru around 20%. These figures show that a large share of the population is at risk of losing their jobs due to the social distance measures, and the formal status of its job determines the access to government aids and social protection.

The quality of data in developing countries presents many challenges to calculate such figures. Because of the lockdown measures, the national statistical offices have canceled or reduced the geographical coverage of the ongoing surveys. Among other adjusting measures, statistical offices have been forced to implement shorter questionnaires and changed the collection method (by phone mostly) impacting data quality. The implication of such changes has resulted in relying upon small national samples, or missing information on occupational classification. Data quality creates problems when estimating the possible effects of the pandemic on the population since occupational information is the primary input to calculate such figures. To overcome some limitations, and given the lack of available data in the region, we started evaluating alternative sources of information.

To do so, we use posted vacancy data from Argentina, Chile, Colombia, Mexico, and Peru, collected from the largest job boards in each country. We use information collected weekly in the period from January 2018 to June 2020. Such novel data will help us better assess the consequences of the spread of the virus in LAC and assess the different effects in each country's labor markets.

The first thing when constructing the database was to classify each job posting to ISCO-08 four digits code. To do so, we use the title and raw text from the description of the vacancy. We also have access to a hand classified database that we use as training data for the classification. In order to identify the level of requirements for each vacancy, we use the raw text from the description of the posting and using text mining, we classify the skills. We use the classification of skills and qualifications information from ESCO taxonomy to classify the skills. Using ESCO allows us to identify the skill content of each posting from general skills (transectorial) to specialized skills (occupational). We identify the relevant skills for each vacancy in order to characterize the labor market requirements in each of the countries' labor markets. We also extract information on the following vacancy characteristics:

- Full time/part-time
- Wage information (has been standardized to December 2018 USD)
- Education level required
- If the post requires experience
- If gender is specified in the description of the vacancy
- Classified skills based on ESCO (skills classification system developed by the European Union)³.

³ The ESCO classifies skills in four groups: Transversal skills "are relevant to a broad range of occupations and economic sectors. They are often referred to as core skills, basic skills or soft skills, the cornerstone for the personal development of a person". Cross-sector skills "are relevant to occupations across several economic sectors". Sector-specific skills "are specific to one sector, but are relevant for more than one occupation within that sector." Occupation-specific skills "are usually applied only within one occupation and its specialisms" (ESCO, 2020).

Social distance measures are heterogeneous for formal and informal jobs (Cardenas and Montana, 2020; Saltiel, 2020). Nevertheless, there is no information on the post that allows us to identify which employment is offered. Nonetheless, the vacancy data is crucial because it overcomes the occupational availability, allowing to capture high-frequency data, which enables one to compare and see the responses of employers to the cycle and shock. Such a feature will allow us to identify employers' reactions to the social distance measures and the sectoral re-composition due to lockdown.

We present preliminary results of an ongoing project that uses vacancy data to assess the effects of COVID in LAC. As can be seen in the following tables, we compare teleworkable and non-teleworkable occupations, and proximity against non-proximity occupations, and see the characteristics of such jobs. Using the sample from January 2018 to December 2019, we would like to evaluate the occupation composition in the selected LAC. We summarize the principal characteristics of the posted vacancies in each country.

When we compare the difference between teleworkable and not teleworkable occupations, we see that there are differences in earnings that are explained mostly by the educational requirements and skill contents of jobs. Teleworkable jobs require a higher degree of education, while we observe the opposite relationship for non-teleworkable jobs. When we consider experience a larger share of work from home jobs need previous experience in the description of the posting. When analyzing the post's structure, the skill is not explicitly required in one-quarter of work from home postings, while in the case of not work from home, this information is explicit only in three every five job postings. We can identify more general than specific skills both for teleworkable and not teleworkable occupations. The share of observed skills decreases with the degree of specialization.

High proximity occupations have a lower share of full-time jobs. Posted wage is higher in Argentina and Peru only, where the education is also published more in high proximity occupations. The education requirements tend to be less in high proximity education, so the risk for the more vulnerable population is more elevated. Among the postings that require experience, the share of high proximity occupations that require experience is lower. Gender is posted in the job requirements in a smaller percentage in high proximity occupations, and in such cases, females are preferred when compared to non-proximity occupations.

As pointed out by Malcov (2020), workers that were displaced during the pandemic, are searching primarily jobs which can be performed from home, but the differences in the skills contents of such posts are going to make the matching less likely. Table 1-5 shows the difference in work from home and high proximity occupations for each one of the selected countries. As can be seen in the tables the wages, experience, gender and educational requirement varies in each country, and for each kind of jobs (WFH and high proximity).

After a complete characterization of the occupational structure and its characteristics, our next step is to assess the changes in occupational structure due to social distance measures. There is still a lot of insights that can be retrieved from job postings. The ongoing project tries to identify

modifications on requirements and skills due to the economic shock and labor reallocation due to the spread of the virus.

Table 1. Teleworkable and non-teleworkable vacancies - Argentina

	Teleworkable (average)	Teleworkable (St. Dev.)	No Teleworkable (average)	No Teleworkable (St. Dev.)	High proximity occupation (average)	High proximity occupation (St. Dev.)	Low proximity occupation (average)	Low proximity occupation (St. Dev.)
Full-time (%)	85.9	0.35	85.09	0.36	81.38	0.39	85.68	0.35
Wage is published (%)	3.62	0.19	4.06	0.2	3.25	0.18	3.94	0.19
Avg. Wage for full time posts (USD)	290.53	57.75	296.27	55.67	307.48	48.59	293.45	56.82
Education is published (%)	75.2	0.43	70.43	0.46	74.17	0.44	72.15	0.45
Elementary	0.84	0.09	4.53	0.21	4.96	0.22	2.87	0.17
Highschool	37.7	0.48	52.09	0.5	29.74	0.46	47.56	0.5
Technical education	38.35	0.49	36.98	0.48	57.05	0.5	35.96	0.48
Advanced technical education	27.57	0.45	15.1	0.36	28.73	0.45	19.49	0.4
Bachelor degree	34.68	0.48	20.28	0.4	20.12	0.4	26.63	0.44
Post graduate degree	1.01	0.1	0.93	0.1	0.86	0.09	0.97	0.1
Master	0.1	0.03	0.04	0.02	0.02	0.01	0.07	0.03
PhD	0.2	0.04	0.23	0.05	0.08	0.03	0.23	0.05
Experience is published (%)	79.39	0.4	75.14	0.43	66.61	0.47	77.6	0.42
Gender is published (%)	11	0.31	13.45	0.34	9.14	0.29	12.76	0.33
Male	61.1	0.49	66.17	0.47	70.8	0.45	64.06	0.48
Female	42.58	0.49	37.08	0.48	36.08	0.48	39.14	0.49
Skills/competences are published (%)	71.56	0.45	50.86	0.5	42.25	0.49	60.28	0.49
-transversal	27.77	0.45	20.19	0.4	22.1	0.41	23.88	0.43
-transectoral	79.77	0.4	73.7	0.44	68.51	0.46	77.03	0.42
-sectoral	61.34	0.49	52.04	0.5	51.41	0.5	56.74	0.5
-occupational	6.84	0.25	5.24	0.22	5.3	0.22	6.04	0.24

Source: Main job portals in LAC. Own calculations.

Table 2. Teleworkable and non-teleworkable vacancies - Chile

	Teleworkable (average)	Teleworkable (St. Dev.)	No Teleworkable (average)	No Teleworkable (St. Dev.)	High proximity occupation (average)	High proximity occupation (St. Dev.)	Low proximity occupation (average)	Low proximity occupation (St. Dev.)
Full-time (%)	87.78	0.33	82.56	0.38	80.83	0.39	85.25	0.35
Wage is published (%)	13.6	0.34	19.39	0.4	24.21	0.43	16.12	0.37
Avg. Wage for full time posts (USD)	909.91	2841.68	678.74	1505.11	575.51	243.89	789.25	2233.78
Education is published (%)	75.03	0.43	68.27	0.47	65.95	0.47	71.73	0.45
Elementary	0.31	0.06	1.72	0.13	3.7	0.19	0.82	0.09
Highschool	32.02	0.47	52.71	0.5	50.97	0.5	42.63	0.49
Technical education	57.16	0.49	59.87	0.49	60.81	0.49	58.43	0.49
Advanced technical education	4.9	0.22	2.59	0.16	1.73	0.13	3.82	0.19
Bachelor degree	36.74	0.48	20.46	0.4	18.24	0.39	28.75	0.45
Post graduate degree	1.18	0.11	0.73	0.09	0.65	0.08	0.96	0.1
Master	0.44	0.07	0.21	0.05	0.32	0.06	0.31	0.06
PhD	0.25	0.05	0.19	0.04	0.38	0.06	0.2	0.04
Experience is published (%)	73.01	0.44	67.42	0.47	59.92	0.49	70.88	0.45
Gender is published (%)	2.85	0.17	6.45	0.25	10.34	0.3	4.32	0.2
Male	32.2	0.47	62.49	0.48	92.93	0.26	45.05	0.5
Female	79.39	0.4	67.05	0.47	60.86	0.49	72.53	0.45
Skills/competences are published (%)	39.56	0.49	30.61	0.46	23.85	0.43	35.6	0.48
-transversal	12.79	0.33	15.42	0.36	13.82	0.35	14.15	0.35
-transectoral	65.09	0.48	62.65	0.48	60.19	0.49	64.12	0.48
-sectoral	56.14	0.5	51.42	0.5	52.26	0.5	53.85	0.5
-occupational	5.39	0.23	5.08	0.22	5.21	0.22	5.23	0.22

Source: Main job portals in LAC. Own calculations.

Table 3. Teleworkable and non-teleworkable vacancies - Colombia

	Teleworkable (average)	Teleworkable (St. Dev.)	No Teleworkable (average)	No Teleworkable (St. Dev.)	High proximity occupation (average)	High proximity occupation (St. Dev.)	Low proximity occupation (average)	Low proximity occupation (St. Dev.)
Full-time (%)	98.55	0.12	98.59	0.12	96.8	0.18	98.68	0.11
Wage is published (%)	67.6	0.47	70.86	0.45	64.54	0.48	69.69	0.46
Avg. Wage for full time posts (USD)	375.81	224.82	316.83	181.95	338.73	171.58	341.28	204.32
Education is published (%)	80.63	0.4	80.97	0.39	83.63	0.37	80.65	0.4
Elementary	0.86	0.09	2.28	0.15	1.63	0.13	1.65	0.13
Highschool	40.67	0.49	54.29	0.5	38.74	0.49	48.77	0.5
Technical education	40.73	0.49	38.4	0.49	54.04	0.5	38.54	0.49
Advanced technical education	28.47	0.45	18.53	0.39	14.08	0.35	23.53	0.42
Bachelor degree	17.52	0.38	8.56	0.28	10.08	0.3	12.73	0.33
Post graduate degree	3.32	0.18	2.06	0.14	3.22	0.18	2.59	0.16
Master	1.02	0.1	0.29	0.05	0.32	0.06	0.64	0.08
PhD	0.2	0.04	0.07	0.03	0.09	0.03	0.13	0.04
Experience is published (%)	78.51	0.41	76.79	0.42	77.64	0.42	77.56	0.42
Gender is published (%)	10.6	0.31	15.86	0.37	15.35	0.36	13.39	0.34
Male	69.2	0.46	71.29	0.45	72.93	0.44	70.39	0.46
Female	63.85	0.48	51.46	0.5	43.25	0.5	56.68	0.5
Skills/competences are published (%)	51.45	0.5	43.47	0.5	42.16	0.49	47.34	0.5
-transversal	13.28	0.34	10.61	0.31	12.1	0.33	11.92	0.32
-transectoral	70.17	0.46	64.78	0.48	60.45	0.49	67.79	0.47
-sectoral	54.98	0.5	53.65	0.5	55.04	0.5	54.26	0.5
-occupational	4.04	0.2	3.52	0.18	4.89	0.22	3.71	0.19

Source: Main job portals in LAC. Own calculations.

Table 4. Teleworkable and non-teleworkable vacancies - Mexico

	Teleworkable (average)	Teleworkable (St. Dev.)	No Teleworkable (average)	No Teleworkable (St. Dev.)	High proximity occupation (average)	High proximity occupation (St. Dev.)	Low proximity occupation (average)	Low proximity occupation (St. Dev.)
Full-time (%)	92.37	0.27	90.37	0.29	92.81	0.26	91.16	0.28
Wage is published (%)	53.81	0.5	53.42	0.5	52.29	0.5	53.68	0.5
Avg. Wage for full time posts (USD)	548.58	331.87	530.21	17990.92	397.01	664.53	545.73	13809.54
Education is published (%)	99.77	0.05	99.64	0.06	99.68	0.06	99.7	0.05
Elementary	1.12	0.11	6.63	0.25	6.51	0.25	4.11	0.2
Highschool	46.54	0.5	63.14	0.48	64.68	0.48	54.94	0.5
Technical education	27.67	0.45	29.9	0.46	34.69	0.48	28.57	0.45
Advanced technical education	17.84	0.38	11.63	0.32	11.12	0.31	14.7	0.35
Bachelor degree	27.91	0.45	16.71	0.37	14.64	0.35	22.3	0.42
Post graduate degree	0.86	0.09	0.45	0.07	0.46	0.07	0.65	0.08
Master	3.09	0.17	1.27	0.11	1.13	0.11	2.17	0.15
PhD	0.14	0.04	0.05	0.02	0.07	0.03	0.09	0.03
Experience is published (%)	79.56	0.4	72.28	0.45	68.34	0.47	76.32	0.43
Gender is published (%)	12.91	0.34	16.21	0.37	16.57	0.37	14.44	0.35
Male	50.16	0.5	64.16	0.48	72.02	0.45	57.13	0.49
Female	56.89	0.5	41.58	0.49	34.23	0.47	49.21	0.5
Skills/competences are published (%)	75.08	0.43	64.98	0.48	53.4	0.5	70.77	0.45
-transversal	24.66	0.43	18.17	0.39	20.52	0.4	21.69	0.41
-transectoral	78.03	0.41	75.92	0.43	72.54	0.45	77.2	0.42
-sectoral	62.99	0.48	54.9	0.5	53.75	0.5	59.43	0.49
-occupational	5.3	0.22	5.33	0.22	5.38	0.23	5.31	0.22

Source: Main job portals in LAC. Own calculations

Table 5. Teleworkable and non-teleworkable vacancies - Peru

	Teleworkable (average)	Teleworkable (St. Dev.)	No Teleworkable (average)	No Teleworkable (St. Dev.)	High proximity occupation (average)	High proximity occupation (St. Dev.)	Low proximity occupation (average)	Low proximity occupation (St. Dev.)
Full-time (%)	93.8	0.24	94.68	0.22	93.83	0.24	94.4	0.23
Wage is published (%)	17.64	0.38	24.64	0.43	21.57	0.41	21.68	0.41
Avg. Wage for full time posts (USD)	415.36	313.29	374.41	941.42	432.92	1148.15	384.27	776.77
Education is published (%)	69.2	0.46	65.58	0.48	71.92	0.45	66.82	0.47
Elementary	1.06	0.1	0.59	0.08	0.72	0.08	0.8	0.09
Highschool	31.26	0.46	43.3	0.5	33.33	0.47	38.36	0.49
Technical education	59.32	0.49	54.65	0.5	65.84	0.47	56.09	0.5
Advanced technical education	9.87	0.3	6.21	0.24	5.07	0.22	7.98	0.27
Bachelor degree	41.97	0.49	24.14	0.43	20.17	0.4	32.69	0.47
Post graduate degree	5.21	0.22	3.21	0.18	4.05	0.2	4.08	0.2
Master	2.86	0.17	1.92	0.14	1.5	0.12	2.38	0.15
PhD	0.19	0.04	0.09	0.03	0.17	0.04	0.13	0.04
Experience is published (%)	80.13	0.4	79.27	0.41	77.86	0.42	79.74	0.4
Gender is published (%)	4.6	0.21	7.17	0.26	5.36	0.23	6.12	0.24
Male	30.34	0.46	38.89	0.49	53.56	0.5	35.23	0.48
Female	81.1	0.39	74.16	0.44	60.08	0.49	77.25	0.42
Skills/competences are published (%)	75.5	0.43	75.78	0.43	76.18	0.43	75.63	0.43
-transversal	23.52	0.42	23.36	0.42	23.31	0.42	23.44	0.42
-transectoral	84.33	0.36	84.31	0.36	83.69	0.37	84.36	0.36
-sectoral	63.2	0.48	62.94	0.48	63.47	0.48	63.03	0.48
-occupational	10.78	0.31	10.4	0.31	9.92	0.3	10.6	0.31

Source: Main job portals in LAC. Own calculations

Bibliography

- **Cardenas, J., Montana, J. (2020).** Possible effects of Coronavirus in the Colombian labour market.
- **Delaporte, I., & Peña, W. (2020).** Working from home under covid-19: Who is affected? evidence from latin american and caribbean countries. Evidence From Latin American and Caribbean Countries (April 1, 2020). CEPR COVID Economics, 14.
- **Dingel, J. I., & Neiman, B. (2020).** How many jobs can be done at home? (No. w26948). National Bureau of Economic Research.
- **Leibovici, F., Santacreu, A. M., & Famiglietti, M. (2020).** Social distancing and contact-intensive occupations. On the economy, St. Louis FED.
- **Mongey, S., & Weinberg, A. (2020).** Characteristics of workers in low work-from-home and high personal-proximity occupations. Becker Friedman Institute for Economic White Paper.
- **Malkov, E. (2020).** Nature of Work and Distribution of Risk: Evidence from Occupational Sorting, Skills, and Tasks. CEPR Covid Economics: Vetted and Real Time Papers, 34, 15-49.
- **Saltiel, F. (2020).** Who can work from home in developing countries? Covid Economics, 7(2020), 104-118.