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Gustavo Leyva
Banco de México

Israel Mora
Banco de México

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How High (Low) are the Possibilities of Teleworking in Mexico?*

Gustavo Leyva†
Banco de México

Israel Mora‡
Banco de México

Abstract: We estimate that about 10.6 percent of jobs could be done from home in Mexico, using 468 4-digit SINCO occupations and employment data in 2019. This is roughly half the estimate reported by Dingel and Neiman (2020) using teleworking criteria devised for the U.S. labor market. Owing to the peculiarities of the Mexican labor market, we report results by type of contract (formal and informal), geographical area, and gender. We validate our teleworking measure by exploiting the cross-state variation of real GDP per worker, the share of services in employment, and internet and computer access within the household. We find that the gap in teleworking possibilities favorable to females has its root in the disparate occupation structures across gender. During the pandemic, the decline in the share of non-telework jobs in females has been thrice as much as that in males.

Keywords: COVID-19, teleworking, informality, information and communication technologies, gender, Mexico, states, regions

JEL Classification: J16, J46, J81

Resumen: Se estima que alrededor del 10.6 por ciento de los trabajos podrían realizarse desde casa en México, usando 468 ocupaciones del SINCO a 4 dígitos y empleo en 2019. Esto es aproximadamente la mitad de la estimación de Dingel y Neiman (2020) utilizando criterios de teletrabajo ideados para el mercado laboral de EE.UU. Debido a las peculiaridades del mercado laboral mexicano, se reportan resultados por tipo de contrato (formal e informal), área geográfica y género. Se valida la medida de teletrabajo propuesta explotando la variación entre estados del PIB real por trabajador, la proporción de servicios en el empleo y el acceso a Internet y a computadora dentro del hogar. Se encuentra que la brecha en las posibilidades de teletrabajo favorable a las mujeres tiene su raíz en las diferentes estructuras ocupacionales por género. Durante la pandemia, la caída en el porcentaje de no-teletrabajos en las mujeres ha sido tres veces mayor que la de los hombres.

Palabras Clave: COVID-19, teletrabajo, informalidad, tecnologías de la información y la comunicación, género, México, entidades federativas, regiones

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† Dirección General de Investigación Económica. Email: gleyvaj@banxico.org.mx.

‡ Dirección General de Investigación Económica. Email: ifmora@banxico.org.mx.

1. Introduction

A natural concern that has caught the interest of policymakers in response to social distancing and confinement policies implemented because of the COVID-19 pandemic is how high the possibilities of working from home are. In Mexico, such a question is even more pressing given its large informal sector and slow diffusion within the household of the so-called information and communication technologies (ICT). In 2019, informal work engaged about half of the workforce and a similar fraction of households had an internet connection or a computer.[1]

The goal of this paper is twofold. First, we assess the extent of teleworking possibilities in Mexico. Our aim is not to assess the actual possibilities before the coronavirus outbreak or provide a classification of jobs based on their vulnerability in response to the confinement policies (essential against non-essential activities).[2] Our measure will be better understood as a possibilities frontier. We start by proposing a binary classification of telework occupations using the title and job description as a guide.[3] Next, we use this classification to estimate the share of the workforce occupied in jobs amenable to teleworking. To account for the heterogeneity of jobs by type of contract, gender, and location, we report this share for formal and informal workers, males and females, and by region or state (federal entity) of residence.[4]

Second, we extend our measure to the post-pandemic period, including the initial impact of the pandemic, the incipient recovery, and possibly some setbacks in the light of subsequent

[1] We use the broadest definition of informal work, including employment in unregistered businesses or lacking access to health care through social security, contemplated by INEGI, the national statistical agency.

[2] Banco de México (2020a) and Banco de México (2020b) use administrative data from the Mexican Social Security Administration (IMSS, from Spanish) to suggest that the most significant formal employment losses at the onset of the pandemic were witnessed in the most vulnerable sectors, partly defined by using the Dingel and Neiman (2020)'s telework measure. Centro de Estudios Espinosa Yglesias (2020) uses employment and income survey data together with IMSS data to characterize employment vulnerability at the state level. The richness of administrative data comes at the cost of leaving out an essential fraction of the workforce making a living in the informal sector and lumping together unemployment and inactivity spells.

[3] We use job and occupation interchangeably throughout the paper.

[4] The teleworking concept used throughout this paper refers to the possibility of doing work from home *with* the aid of ICT. The Mexican Department of Labor explicitly recognizes this dimension of teleworking in its "Guidelines to implement teleworking in the workplace within the framework of actions to deal with COVID-19" (our free translation); see STPS (2020) and `https://juntosporeltrabajo.stps.gob.mx/docs/herramientas/`. These guidelines are intended to be framed more formally in a teleworking law (Diario Oficial de la Federación, 2020).

coronavirus waves. For this extension, we focus on the differential impact of teleworking in males and females. Though in 2019 females would have had the best prospects to work from home (15.3 percent versus 7.7 percent for males), we find that during the pandemic, teleworking has discriminated especially against women unable to work from home. The decline in the share of non-telework jobs in females was thrice as much as that in males at the onset of the pandemic.

Assessing these possibilities could be valuable to policymakers in dealing with the severity of the pandemic recession, its duration, and the shape of the ongoing recovery. Interestingly, we still do not know much about what these possibilities look like at the national level, let alone the regional or state level, how they interact with informal labor markets, or how they differ by gender.

Recently, Dingel and Neiman (2020) calculate for the U.S. that 41.6 percent of jobs could be done from home by exploiting the job characteristics from the O*NET questionnaires.[5] They report corresponding shares for a large set of countries, including Mexico, by correlating their U.S. telework classification with 2019 employment data from the International Labor Organization (ILO), classified following the 2-digit International Standard Classification of Occupations of 2008 (ISCO).

For cross-country comparisons, the benefit of such a procedure is evident. Nonetheless, this paper challenges it when applied to an emerging economy with a sizable informal sector and delayed ICT diffusion within the household. Using 2019 employment data from the National Survey of Occupation and Employment (ENOE, from Spanish) and 468 4-digit occupations from the National Classification System of Occupations of 2011 (SINCO, from Spanish), we estimate these possibilities at 10.6 percent of the employed population, about half the share reported by Dingel and Neiman (2020) for Mexico (22.3 percent).

The literature concerned with the economic impact of COVID-19 has partly been focused on the classification of jobs according to their suitability to be done from home, physical contact, and essentialness, as a first step towards capturing the impact of social distancing and confinement policies. On the measurement of the ability to work from home with an

[5] See their section 4 and, in particular, footnote 4.

emphasis on developing countries, Saltiel (2020), Gottlieb et al. (2020), and Gottlieb et al. (2021) stand out. They show that such an ability is even more elusive in countries with a still important fraction of workers engaged in agriculture and self-employment. Our paper complements this literature.[6]

The following section briefly describes the procedure to calculate the percentage of telework jobs in Mexico. Admittedly, our procedure lacks the sophistication of Dingel and Neiman (2020)'s as we do not possess additional information at the occupational level, other than the title and job description. Therefore, we validate our teleworking measure by correlating it with real GDP per worker, employment structure (share of services), and access to ICT within the household, calculated by state and type of employment (formal and informal) when possible. We reserve Section 3 for our downward revision of Dingel and Neiman (2020)'s estimate. We show that we can match their estimate for Mexico almost exactly by developing a mapping between two occupation classification systems and thus learn about differences in the telework classification. We report that only 4 of these occupations account for 52.7 percent of the gap.

Since the start of the pandemic, INEGI, the national statistical agency, has been making efforts to measure the share of telework jobs using direct survey responses. In section 4, we discuss the benefits and drawbacks of four survey-based teleworking measures. We find that our preferred survey-based measure is closer to ours than to Dingel and Neiman (2020)'s, except in Mexico City (and the Central region), hinting at a possible bias in the latter measure. Section 5 looks at the gender gap in the possibilities to work from home and find its root in the disparate occupational structures across gender. We end section 5 by tracking the dynamics of telework employment up to 2021.Q1, with particular emphasis on the gender gap.

[6] For additional telework measures, we refer the reader to Dingel and Neiman (2020) and Gottlieb et al. (2021). Monroy-Gómez-Franco (2021) applies the former classification to Mexico, with similar results to ours at the national level. Relatedly, ILO economists measure the teleworking possibilities for the group of middle-income countries (Mexico included) at 16 percent; see `https://voxeu.org/article/working-home-estimating-worldwide-potential`. IMF (2020), p. 22, Box 3, shows the impact of teleworking on employment outcomes in Mexico in 2020.Q2. Also, Delaporte and Peña (2020) find that 10 percent of employment could be done from home using Saltiel (2020)'s classification, a predecessor of Gottlieb et al. (2021).

2. The Extent of Teleworking Possibilities in Mexico

Our classification relies on 468 4-digit occupations from the SINCO (see INEGI, 2011). In the absence of more information on the job characteristics other than its title and description, we assign the value of one if we consider the occupation could be done remotely and zero otherwise. Our evaluation of the teleworking possibilities is subjective but informed by the description of all these occupations.

Though the job title may already convey an idea of whether the job could be done from home, we complement our assessment by paying attention to the functions of the job and the examples provided therein. This information allows us to distinguish between coordination and supervision tasks, the first being more prone to be done remotely. However, this distinction is weighed differently across sectors, e.g., supervision in personal care services versus supervision of workers who provide and manage information, the second being more amenable to teleworking. Also, we differentiate between jobs where the decision-making is made daily (supervision in manufacturing processes) or in a more scattered fashion (preparation of annual budgets), the second more likely to be done from home with the aid of ICT. Finally, we consider whether the job could be performed interchangeably at the office or home (e.g., survey interviewing, either face-to-face or by telephone).[7] In few cases, the job description leaves room for ambiguities, so we make a decision based on the examples provided therein. One example is real estate rental occupations, not classified as telework jobs even if they may include housing rental through the internet. The description also allows for the rental of offices, buildings, and venues for ceremonies.[8]

The percentage of employment that could be done from home is then calculated as fol-

[7] For instance, the telephone version of the household labor survey, used extensively in this paper and conducted in the second quarter of 2020, is not necessarily comparable to the survey as conducted previously, based on face-to-face interviews. Thus, the products are different and, therefore, the jobs are not comparable. Accordingly, the occupation "survey interviewers" is not classified as a telework job.

[8] Our classification is available in a companion Excel file at https://sites.google.com/site/gustavoleyvajimenez/research.

lows:

$$\tau = \sum_{i=1}^{468} \delta_i \omega_i,$$

where δ_i is equal to 1 is occupation i classifies as telework and ω_i is the employment share in occupation i. Using employment data from the ENOE in 2019, we measure these teleworking possibilities at $\tau = 10.6$ or, equivalently, 6 percent of the working-age population, speaking already to the slim possibilities of working from home in Mexico (see Table 1, panels A and B).[9]

This outlook is more revealing when disaggregated by type of worker and region (see Table 1, columns 2-6). Perhaps not surprisingly, we find acute differences between formal and informal employment, which we further separate into wage-earners and self-employed.[10] The share of telework jobs in formal employment (19.4 percent) is almost twice as much as the share estimated over total employment (panel A, column 1). These possibilities shrink to 4.6 and 1.4 percent for wage-earners and the self-employed in the informal sector, respectively.

When measured over total employment, the Southern region exhibits the lowest possibilities (8.5 percent), contrasting with the Central region (11.6 percent) and even more with Mexico City (CMX), which is a constituent state. These differences widen when the share of telework jobs is calculated over informal employment, in particular, the self-employed.[11]

To put all these numbers in context, we entertain an alternative albeit rough measure of teleworking. We calculate the share of employment in selected services, taken as more amenable to teleworking, including the following: information; finance and insurance; real state and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; educational services; and public administration. Our measure is below this alternative across geographical regions and types of employment (panels C and

[9] In 2019, the national employment to working-age population ratio was 56.9 percent. The ENOE survey is the source of official estimates of labor market variables in Mexico.

[10] Wage-earner (remunerated) workers are those who work for pay and under the supervision of a boss. Self-employed comprises employers and those working on their own account. Our sample excludes non-earner workers, comprising unpaid employees working for a family member or working as part of a college on-the-job training or internship.

[11] The state-composition of the four regions appears in Banco de México (2019), p. 1.

D). At the national level, for instance, the overestimation is almost 40 percent. Interestingly, the alternative measure (14.6 percent) is already lower than the 22.3 percent calculated for Mexico by Dingel and Neiman (2020).

Regional disparities are shown more eloquently by state. In Figure 1 we plot the share of telework jobs against real GDP per worker. The takeaway is clear: greater development is associated with higher teleworking possibilities. The association is more balanced when the share of telework jobs is measured over informal employment. For formal employment, it is somewhat atypical, with Mexico City pulling up the positive correlation. Again, informality tends to stress the differences.[12]

We can extend the association of teleworking and economic development through at least two dimensions. The first is the employment structure. In Mexico, the lackluster economic growth experienced in the recent decades has been accompanied by the rise of the tertiary sector, in consonance with international trends. According to INEGI, the share of services in total value-added went from 39.1 percent in 1990 to 43.9 percent in 2019.[13] Figure B.2 in the appendix suggests that this association could also be appreciated at the state level. The second dimension is the diffusion of ICT within the household. Based on two national (different-in-scope) surveys, we calculate the share of households in each state that have access to the internet or a computer. As shown in Figures B.3-B.6 in the appendix, our measure compares favorably to these two ICT indicators; see also rows E-H in Table 1.[14]

The lagged diffusion of ICT within the household is also captured by a more comprehensive indicator that incorporates years of schooling and enrolment to secondary and tertiary education of users of these technologies (see ITU, 2016, p. 9). The ICT Development Index (IDI) is available at the country level only, but Micheli and Valle (2018) approximate it for the 32 Mexican states. Reassuringly, our teleworking measure correlates well with the IDI

[12] Campeche is excluded because its real GDP depends hugely on oil mining (79 percent in 2019). In the appendix, we report a similar figure excluding oil mining from the GDP of all 32 states.

[13] The share of selected services, calculated with nominal figures, went from 22.6 to 26.4 percent.

[14] We use the National Survey on the Availability and Use of ICT at Home (ENDUTIH, from Spanish) and the National Survey of Household Income and Expenditure (ENIGH, from Spanish), both representative at the state level in 2018. We did not find substantial differences in the use of power (electricity) across states. The standard deviation of the percentage of households with an internet connection and a computer across states is 12.2 and 7.4, while the similar figure for the use of power is 0.4. These latter calculations are based on the ENIGH 2018.

Table 1: The Extent of Teleworking Possibilities in Mexico, in Percent

	National	CMX	North	North-Central	Central	South
	1	2	3	4	5	6
A. Share of telework jobs in each type of employment:						
Overall employment	10.6	19.0	11.4	10.3	11.6	8.5
Formal employment	19.4	30.9	16.0	18.3	21.9	20.6
Informal wage-earners	4.6	8.4	5.2	3.8	4.9	4.4
Informal self-employed	1.4	3.2	1.6	1.4	1.7	0.9
B. Share of telework jobs in the working-age population:						
Overall Employment	6.0	11.1	6.7	6.0	6.5	4.7
Formal employment	5.0	9.4	5.9	5.1	5.4	3.7
Informal wage-earners	0.8	1.4	0.7	0.7	1.0	0.8
Informal self-employed	0.2	0.4	0.1	0.2	0.2	0.2
C. Share of selected services in each type of employment:[a]						
Overall employment	14.6	26.5	13.8	13.7	16.3	13.4
Formal employment	25.7	42.6	18.4	23.6	30.1	31.0
Informal wage-earners	7.5	11.9	8.4	6.0	7.6	8.3
Informal self-employed	2.3	5.5	2.9	2.2	3.0	1.3
D. Share of selected services in the working-age population:						
Overall Employment	8.3	15.5	8.1	8.0	9.2	7.3
Formal employment	6.7	12.9	6.7	6.5	7.4	5.5
Informal wage-earners	1.4	2.0	1.1	1.2	1.5	1.6
Informal self-employed	0.3	0.6	0.3	0.2	0.4	0.2
E. Households with internet, ENDUTIH[b]	52.9	72.3	65.7	53.2	55.7	37.6
F. Households with internet, ENIGH[c]	40.3	62.0	50.7	41.8	42.8	26.0
G. Households with computer, ENDUTIH[d]	44.9	63.4	52.3	45.5	48.4	32.6
H. Households with computer, ENIGH[e]	27.2	47.7	31.3	27.4	30.7	17.9
I. Percentage of real GDP associated with teleworking[f]	7.8 – 10.7					

Notes: Own calculations based on the ENOE 2019 (representative at the national and state level), using individual responses and appropriate survey weights. Mexico City (CMX), a member of the Central region, contributed 18 percent of the national real GDP in 2019. The working-age population is all people aged between 15 and 98.

[a] See the text for a list of these services.

[b] In the ENDUTIH 2018, the question is *Do you have an internet connection available?*

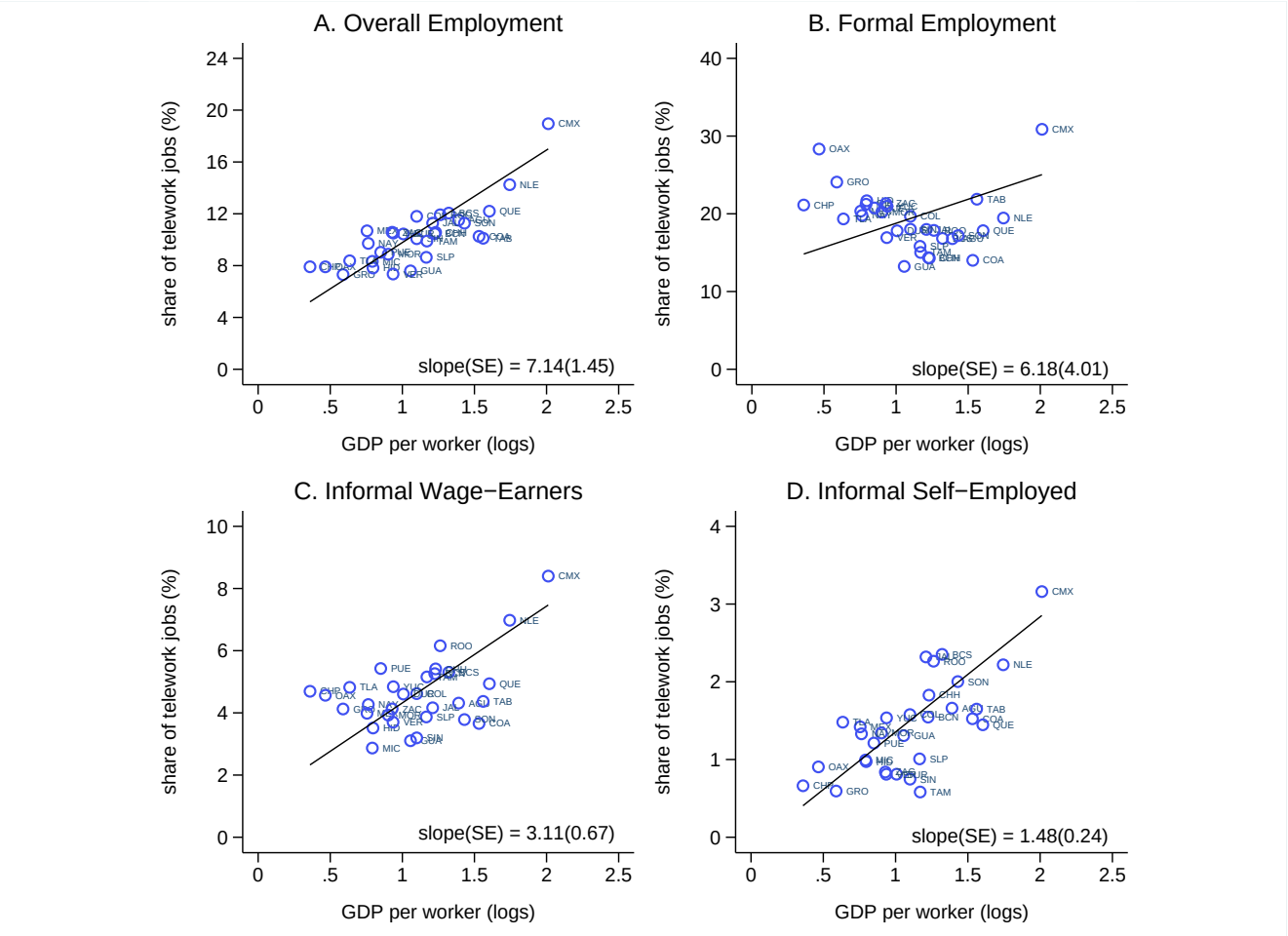
[c] In the ENIGH 2018, the question is *Does this house have internet?* According to the interviewer's manual, the options given to the interviewee are telephone line, prepaid card, or cable.

[d] In the ENDUTIH 2018, the questions are *Do you have a desktop computer? (are keyboard, monitor, and CPU separated)? Do you have a laptop? (are keyboard, monitor, and CPU physically integrated)? Do you have a tablet? (virtual keyboard and pointer in the touch screen)?*

[e] In the ENIGH 2018, the question is *Does this house have a computer?*

[f] For row I, we run the regression $y_t = c + \gamma\ e_t + \eta_t$, where y_t is real GDP (2013 prices) and e_t is the employment to population ratio, with $t = 1, \ldots, 132$ quarters (1987-2019). GDP and the employment rate were smoothed out using centering moving averages (4 observations lost). The regression includes a second-order polynomial on time. The effect reported is a range (twice the standard error) around $\hat{\gamma} \times 6.0$ (panel B). The employment rate across columns is 56.9, 58.6, 59.0, 58.3, 56.4, and 54.5 percent. Due to rounding errors, the sum of formal and informal employment may not add up to total employment in panels B and D.

Figure 1: Correlation between Teleworking and Real GDP per Worker in 31 States



Notes: This figure is inspired by Dingel and Neiman (2020). The state codes correspond to the International Organization for Standardization (ISO); see https://en.wikipedia.org/wiki/ISO_3166-2:MX. The coefficient $\hat{\beta}$ (slope) and its standard error (SE) correspond to the OLS estimation of the following regression: $\tau_s = \alpha + \beta\ y_s + \varepsilon_s$, where τ_s is the share of employment that could be done from home and y_s is real GDP per worker in 2019 (in logs), where $s = 1, \ldots, 31$ states (excluding Campeche). The residuals of the regression are weighted by real GDP in 2019, the latest preliminary data available. Standard errors are clustered by state.

(Figure B.7 in the appendix).[15]

3. Comparison with Dingel and Neiman's results

While Dingel and Neiman (2020) calculate the share of telework jobs in Mexico by classifying 39 2-digit ISCO occupations and using ILO employment data for 2019, we use 468 4-digit SINCO occupations and employment data from the ENOE in 2019, which is the source upon which ILO based its employment estimates. Hence, the difference between their 22.3 percent and our 10.6 percent owes much to differences in the telework classification.[16]

Dingel and Neiman (2020)'s classification has the advantage of exploiting rich information on job characteristics available in two questionnaires from the Occupation Information Network Survey (O*NET). Among other criteria, electronic mail (average response refers to its use at least once a month) acts as a necessary condition for a job to be classified as telework.

We reproduce Dingel and Neiman (2020)'s estimate in Table 2, column 1 and our baseline estimate in column 2, together with regional estimates we presented before in Table 1. Dingel and Neiman (2020)'s estimate is available at the national level only. By establishing a correlation between the ISCO and the SINCO (see Figure B.8 in the appendix) and using ENOE employment data, we replicate Dingel and Neiman (2020)'s estimate to see its implications for the possibilities of teleworking across regions. As shown in column 3, we can match their estimate almost exactly. In all regions and Mexico City, the Dingel and Neiman (2020)'s estimate is above ours (column 2) by roughly a factor of 2 to 1.

We take advantage of the replication exercise to learn about the differences between

[15] Micheli and Valle (2018), Table 5, p. 47 use the ENDUTIH 2015. For their cross-country comparisons, Micheli and Valle (2018) use the ITU report of 2015, Table 2.1, p. 13. We note that the ITU report of 2016 places the U.S. in the 15th position (8.17 points) and Mexico in the 92nd position (4.87 points), from a total of 175 positions (ITU, 2016, p. 12). Later, we will see that these differences in the access and use of ICT between Mexico and the U.S. could help understand the discrepancies between the teleworking measures calculated for Mexico.

[16] Saltiel (2020) constructs an alternative measure of teleworking for a set of developing countries (Mexico excluded), later subsumed in Gottlieb et al. (2021). Using the crosswalk between this and Dingel and Neiman (2020)'s classification (Gottlieb et al., 2021, p. 13, Table A3) and the crosswalk between the latter and ours at the 2-digit level, we find a telework share of 7.5 percent. Since ours is just above this alternative telework measure, this section focuses on the comparison with Dingel and Neiman (2020)'s results.

columns 2 and 1 (or 3). We argue that four 2-digit occupations account for 52.7 percent of the gap (see Table B.3). These occupations were selected because the difference in classification was as large as 0.5 in absolute value.[17,18] We run a counterfactual exercise by using our classification except for those four occupations, for which we use the classification in column 1. In column 4, we see that this classification places the teleworking possibilities much closer to the Dingel and Neiman (2020)'s estimate than to ours, thus closing the gap by 52.7 percent.[19]

4. Teleworking Measures Based on Survey Responses

In April 2020, INEGI conducted the Telephone Survey on COVID-19 and the Labor Market (ECOVID-ML, from Spanish), asking whether the respondent has been working from home. Unlike the ENOE, the ECOVID-ML inquires whether ICTs are available within the household (internet connection, computer, or the equipment necessary to perform the job). By design, however, the ECOVID-ML provides an outlook of the national labor market where the telephone penetration is the highest (INEGI, 2020). Moreover, after the COVID-19 outbreak and the deployment of confinement policies, this survey may already capture the heavier employment loss in occupations less amenable to teleworking, shifting the composition of employment and raising the measure of teleworking artificially.

In the top panel of Table 3, we report national estimates of four survey-based teleworking

[17] Dingel and Neiman (2020)'s classification is continuous between 0 and 1. The telework classification in column 4 is the simple average of the 4-digit classification.

[18] Only afterward, we noted that they accounted for about 9.4 and 12.7 percent of national employment, using ILO and ENOE data, respectively. We could not map any of the ISCO occupations into five SINCO occupations coded "(19) Other directors, officers, managers, coordinators and heads of area, not previously classified", "(29) Other specialists and technicians, not previously classified", "(54) Armed forces", "(69) Other farmers, fishers, hunters, and gatherers, not previously classified", and "(99) non-classified occupations". We classified occupation 19 as telework (coded 1), concerning two thousand workers only, and the rest as non-telework jobs.

[19] The 52.7 percent is obtained by calculating $\left(\frac{17.1-11.2}{22.4-11.2}\right) \times 100$. The 11.2 percent results from our teleworking classification at the 2-digit level, the simple average of our 4-digit classification. We display the differences in classification in these four occupations in Table B.3 in the appendix. For all these occupations, we believe the differences lay in a combination of three factors, namely, the looseness criterion for the use of electronic mail, once per month, as a necessary condition in Dingel and Neiman (2020)'s classification; contrasting perceptions about the use and availability of ICT in the U.S. and Mexico, confirmed by the ITU ranking (see footnote 15); and aggregation bias (use of 2-digit instead of 4-digit occupation classification).

Table 2: Comparison between Two Teleworking Measures for Mexico, 2019, in Percent

	DN	LM Baseline	LM Replication DN	LM Counterfactual
Occupation Classification and Data	ISCO-ILO	SINCO-ENOE	SINCO-ENOE	SINCO-ENOE
No. Occupations	44	468	53	53
No. Digits in Classification	2 digits	4 digits	2 digits	2 digits
Telework Classification	DN	LM	DN	LM but in 4 occupations that use DN
	1	2	3	4
National	22.3	10.6	22.4	17.1
CMX	-	19.0	32.5	25.8
North	-	11.4	24.9	19.8
North-Central	-	10.3	21.5	16.3
Central	-	11.6	23.6	18.1
South	-	8.5	18.9	13.7
Employment (Millions)	54.4	52.5	52.5	52.5

Notes: DN stands for Dingel and Neiman (2020) and LM is this paper. DN do not classify "(63) Subsistence Farmers, Fishers, Hunters and Gatherers" and exclude three Armed Forces occupations and the "not elsewhere classified" category, making an effective number of 39 out of 44 ISCO occupations. The SINCO 2011 has 53 2-digit occupations (all used), including the "non-specified occupations" category, and 468 4-digit occupations (467 effectively used). Non-earner workers are excluded from the sample of 2019, representing 2.5 million. The four occupations classified according to DN in column 4 are shown in Table B.3. These occupations represent 9.4 and 12.7 percent of total employment, using ILO and ENOE data, respectively.

measures, going from the coarser to the finer measure across columns 6-9. In column 6, we report the share of jobs that have been done from home without imposing any additional restrictions. We restrict the sample to those with an internet connection or a computer at home in the remaining columns. Even if these ICT are available at home, the worker may still report that she lacks the proper equipment and tools for the job. In column 7, we further condition the answer to the availability of *all* or *only a few* of those equipment and tools. Column 8 reports an even stringent measure by requiring the availability of *all* of them. Finally, from the sample in column 8, we exclude those who reported not having worked at least one hour during the reference survey week because of a reason related to COVID-19 (column 9; see also notes in Table 3).

The complementary information on ICT availability and the equipment and tools to per-

Table 3: Comparison among Teleworking Measures, including Survey Responses, in Percent

Telework Classification	DN	LM Replication DN		LM	LM	Survey-Response ECOVID-ML			
Sample Period	2019	2019	2020.M4	2019	2020.M4	2020.M4			
	1	2	3	4	5	6	7	8	9
National	22.3	22.4	24.4	10.6	11.3	23.4	19.7	15.5	15.3
CMX	-	32.5	33.6	19.0	17.4	38.2	36.8	31.0	31.0
North	-	24.9	22.3	11.4	11.0	18.4	15.5	12.4	11.7
North-Central	-	21.5	24.0	10.3	12.4	19.4	15.3	13.2	13.1
Central	-	23.6	24.7	11.6	11.2	27.9	24.9	19.6	19.6
South	-	18.9	26.6	8.5	10.3	24.9	19.5	13.8	13.7
National (Women)	-	27.0	29.2	15.3	15.6	34.7	29.0	23.0	22.7
CMX	-	35.3	35.3	23.6	20.9	49.9	47.2	36.2	36.2
North	-	29.2	26.5	16.2	16.6	27.1	21.9	18.1	17.1
North-Central	-	26.5	35.3	14.8	16.3	33.8	28.1	25.1	24.9
Central	-	27.7	29.0	16.5	15.5	37.6	33.0	25.7	25.7
South	-	23.9	26.2	12.7	13.9	38.3	30.2	20.7	20.7

Notes: DN stands for Dingel and Neiman (2020) and LM is this paper. The rest of the columns are our calculations using the Telephone Survey on COVID-19 and the Labor Market (ECOVID-ML, from Spanish), April 2020, based on individual responses (people aged 18 and over) and using appropriate survey weights. Column 6 is based on respondents who reported to have worked from home, not necessarily doing teleworking. Column 7 further restricts the sample to those who reported having access to *all* or *only a few* of the equipment and tools to perform their job/task and to have an internet connection or a computer. Column 8 further restricts the sample to those who reported having access to *all* of the equipment and tools to perform their job/task. From the latter sample, column 9 excludes a subsample of the so-called absent employees, those who reported not having worked for at least one hour during the survey reference week because of a reason related to COVID-19. The questions are the following:
a. Last week, Did you work from home because of the COVID-19 contingency?: Yes (columns 6, 7, 8, and 9), No.
b. At home, Do you have the equipment or tools to perform your job/task?: Yes, all (columns 7, 8, and 9); Yes, only a few (column 7); None.
c. At home, Do you have a computer? (column 7, 8 and 9), *an internet connection?* (columns 7, 8, and 9), *printer machine?*, *fixed telephone?*
d. What is the main reason for not having worked last week?: work or activity closed or suspended because of the coronavirus or COVID-19?, fired because of the coronavirus or COVID-19?, temporary suspension of duties because of the coronavirus or COVID-19?, infected with the coronavirus or COVID-19?, being in contact with or taking care of someone else with the coronavirus or COVID-19?, being in preventive isolation by possible coronavirus or COVID-19 contagion? (excluded from column 9).

form the job make a significant difference. Relative to column 6, the revision in column 8 (or 9) is 65 percent downward.[20] Without this revision, the measure of teleworking based on the

[20] Numbers reported in this table are based on the employed population excluding non-earner workers. The national estimate based on the entire employed population is, from column 6 through column 9, 23.5, 19.8, 15.6, and 15.4 percent, respectively. The total employed population in the ECOVID-ML represents 62 percent of the total employment population in the ENOE 2019 and 76.5 percent of the ETOE, April 2020 (telephone version of the ENOE, also conducted in May and June 2020). Both the ETOE and the ECOVID-ML are

ECOVID-ML would be closer to Dingel and Neiman (2020)'s estimate. Otherwise, notice that the share of telework jobs based on survey responses (column 8) compares favorably to the numbers calculated in this paper, except for the Central region and Mexico City. This suggests that Dingel and Neiman (2020)'s teleworking measure would fit better relatively more developed areas.

Our speculation that the share of telework jobs calculated with data post-COVID-19 may be biased upwards as a reflection of a relatively heavier loss of jobs less amenable to teleworking has some ground. We calculate our measure and the replication of Dingel and Neiman (2020)'s with April 2020 data, consistent with the ECOVID-ML survey. We see that is the case for national estimates in columns 3 and 5, relative to columns 2 and 4, respectively. However, the direction of the bias is less consistent across regions and measures of teleworking, though this could be a manifestation of the slow diffusion of teleworking in the early stages of the pandemic.

5. A Look at the Gender Gap

It is expected that the pandemic might have exerted particular strains on the female population, given the role women typically play within the household. According to the Time Use National Survey (ENUT, from Spanish) of 2019, women spent 32.1 weekly hours in domestic activities, including food preparation, household chores, and obtaining goods and services, while males allocated only 11.9 hours.[21] Among employed workers, the uneven distribution of time remains: women spending 15.4 percent of their weekly time on domestic activities, more than twice the contribution of males (6.2 percent).[22]

In this section, we do two things. First, we explore how the possibilities of working from home would have differed between males and females in 2019. Next, we extend our telework measure to the post-pandemic period to see whether the possibility of working from home

representative at the national but not at the state level.

[21] Child care must have signified an additional pressure on females during the pandemic. In 2019, women spent in child care more than twice the time allocated by males. Child care here means "taking care of household members below 5 and 14 years old" in the ENUT 2019.

[22] These numbers are calculated on a sample of 15 years and older. The questionnaire used to identify employed workers in the survey is similar to that used in the ENOE.

Table 4: National Occupational Structure by Gender in 2019

	Employment Share			Truncated Telework		
Top Occupations	Males %	Females %	Difference % points	Males %	Females %	Difference % points
1	2	3	4	5	6	7
10	36.8	42.8	6.1	0.0	3.0	3.0
25	52.3	63.8	11.6	0.0	6.3	6.3
50	67.2	78.4	11.3	1.8	9.6	7.8
75	76.7	86.3	9.7	3.0	11.9	8.9
100	82.9	90.8	8.0	4.3	13.3	9.0
150	90.1	95.5	5.4	5.6	14.4	8.7
467	100.0	100.0	0.0	7.7	15.3	7.6

Notes: Own calculations based on the ENOE 2019, using individual responses and appropriate survey weights. The effective number of 2011 SINCO occupations in 2019 is 467 out of 468. The contribution to overall employment of the top 10 occupations is calculated as $\sum_{i=1}^{10} \omega_i$, where ω_i is the employment share in total employment of occupation i, while the contribution to the national measure of teleworking (truncated telework) is calculated as $\sum_{i=1}^{10} \delta_i \omega_i$, where δ_i is either 1 or 0. The numbers shown in column 4 (7) may not correspond to the difference between columns 3 and 2 (6 and 5) due to rounding errors.

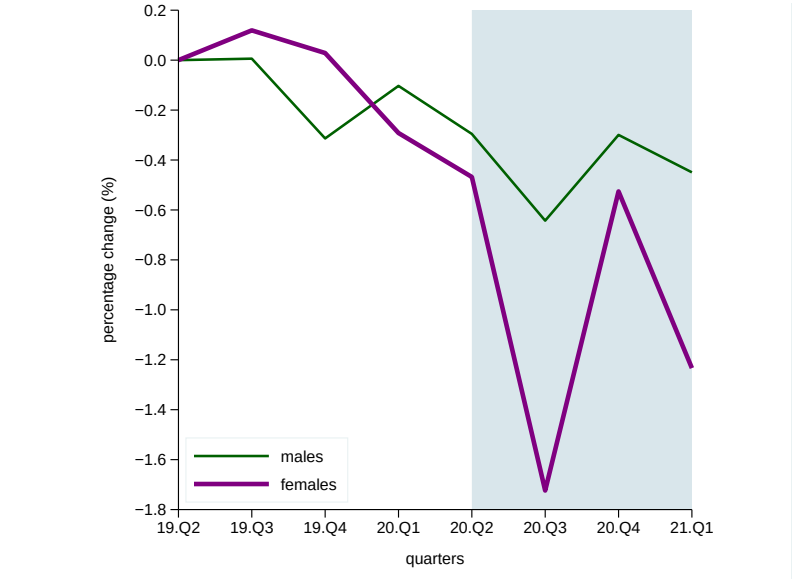
reflected (is reflecting) on employment outcomes.

The bottom panel of Table 3 reports all teleworking measures proposed in this paper, restricted to the female sample. For females, the prospects of working from home, conditional of being employed, look much better than for males, both nationally and regionally. Our teleworking measure with 2019 data places these possibilities at 15.3 percent of the employed female population, almost 50 percent above the national estimate of 10.6 percent. Interestingly, the teleworking measures based on survey responses agree with this gap in the possibilities of working from home.

One straightforward candidate to explain such a wide gap is the disparity in the occupational structure across gender. To see this, consider Table 4, which ranks occupations (column 1) according to the share they claim in male (column 2) and female employment (column 3). For instance, the first 75 out of 467 occupations account for 76.7 and 86.3 percent of male and female employment, respectively, indicating a more concentrated female employment.

Columns 5 and 6 make the connection between occupational structure and the gender gap

Figure 2: Evolution of the Non-Telework Share, Mexico, 2019.Q2-2021.Q1



Notes: Percentage change relative to 2019.Q2. Own calculations using the ENOE, ETOE, ENOE (Nueva Edición). The shaded area corresponds to the pandemic period.

in the teleworking possibilities. They display the contribution of the occupations ranked in column 1 in the national teleworking measure. For instance, the teleworking possibilities are nil for the top 25 male occupations (52.3 percent of male employment). For the top 25 female occupations (almost two-thirds of female employment), the truncated teleworking measure (6.3 percent) is already half the national estimate of 15.3. Thus, just 25 occupations account for roughly 80 percent of the gender gap.[23]

More strikingly, Table B.4 in the appendix illustrates the role of the type of job (physical or menial) and, perhaps, of the rigidity of cultural traits in the specialization of jobs across gender. To gain intuition on the root of the differences shown in Table 4, we truncate the employment distribution at the top 25 male and female occupations (according to the share they claim in total employment by gender) and report the list of occupations shared by both and the jobs exclusive to each gender. The manifest specialization displayed there seems to

[23] This observation may explain why the gender gap is robust when running a regression that controls for age, education, and marital status of the respondent (7.9 compared with the baseline of 7.7).

be sufficiently entrenched to warrant policies to close the gender gap.

In the remainder of this section, we extend our telework measure to the post-pandemic period, covering part of the ongoing recovery. For this, we use ENOE, ETOE, and ENOE (Nueva Edición), the latter intended to be a follow-up of the pre-pandemic ENOE. To control for shocks, other than telework, affecting male and female employment differently, we report non-telework work relative to overall employment. In Figure 2 we display the evolution of the non-telework share by gender.

Qualitatively, the dynamics of the non-telework share for both females and males are similar. Surprisingly, the maximum decline in the non-telework share was reached not in 2020.Q2 but one quarter later. Note that the recovery initiated at the end of 2020 seems to have been halted at the start of 2021, possibly reflecting the second coronavirus wave.

Quantitatively, we see differences across gender. The decline in non-telework employment for males was only 0.6 percentage points above the decrease in overall employment in 2020.Q3. For females, the differential impact against non-telework jobs tripled that number. It appears then that the ability to work from home determined employment outcomes with a particular bias against females.

Why did an apparent advantage ex-ante become a disadvantage ex-post? Though this is not the place to provide a complete answer, we can still sketch one. Males unable to work from home could have decided to work outdoors, possibly in the informal sector. By contrast, females could not have resolved such a dilemma readily because of the closure of schools and the presence of children at home.

6. Conclusions

Only 10.6 percent of jobs could have been done from home in 2019, which is half the percentage reported by Dingel and Neiman (2020) for Mexico. We document considerable differences in these possibilities when assessed by type of contract (formal and informal) and geographical region. We then replicate Dingel and Neiman (2020)'s share for Mexico at the national level and find that their estimate seems to fit in better local labor markets such as Mexico City or the Central region, which we interpret as an indication of an upward bias.

In any case, we report that regardless of the teleworking measure, including survey-based measures, the teleworking possibilities look higher for females than for males. The root of this gender gap lay in the disparate occupation structures that characterize females and males in the Mexican labor market. These better teleworking possibilities have not translated to actual advantages for females when judged by their labor market outcomes post-COVID-19. We leave an explanation for this for future research.

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Appendix

A. Data Sources

Real GDP National: Economic Information Database (BIE), INEGI. Accessed 10 February 2021, https://www.inegi.org.mx/sistemas/bie; by State: INEGI. Accessed 26 January 2021, https://www.inegi.org.mx/programas/pibent/2013/default.html#Tabulados.

Share of telework jobs, number of employed workers, and employment structure: Own calculations based on the ENOE 2019, https://www.inegi.org.mx/programas/enoe/15ymas.

Quarterly employment to population ratio, 1987-2019: See Leyva and Urrutia (2020).

Households with internet and computer: Own calculations based on the ENIGH 2018 and the ENDUTIH 2018.

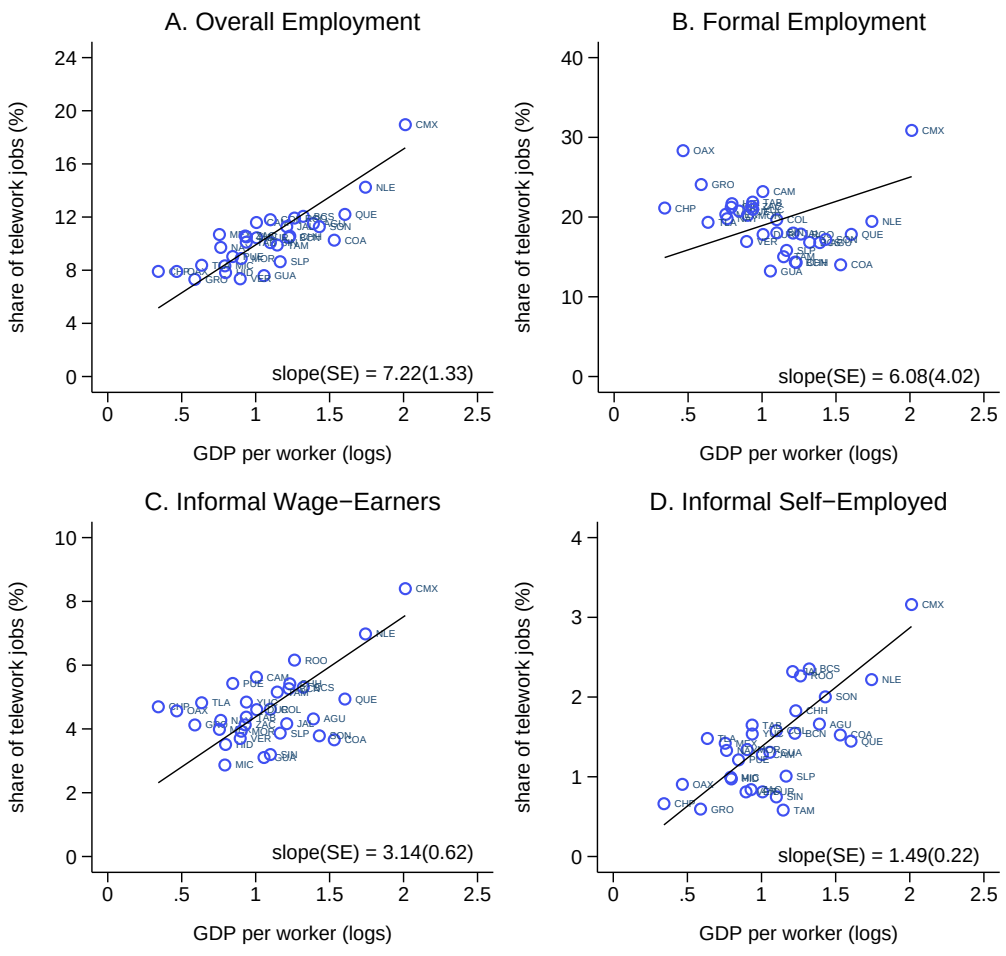
Mexico KLEMS database: INEGI. Base year 2013. Last update 18 December 2020. Accessed 10 February 2021

Public microdata files are available at:

- ENOE and ENOE (Nueva Edición): https://www.inegi.org.mx/programas/enoe/15ymas/.
- ETOE: https://www.inegi.org.mx/investigacion/etoe/.
- ENDUTIH 2018: https://www.inegi.org.mx/programas/dutih/2018/.
- ENIGH 2018: https://www.inegi.org.mx/programas/enigh/nc/2018/.
- ENUT 2019: https://www.inegi.org.mx/programas/enut/2019/.

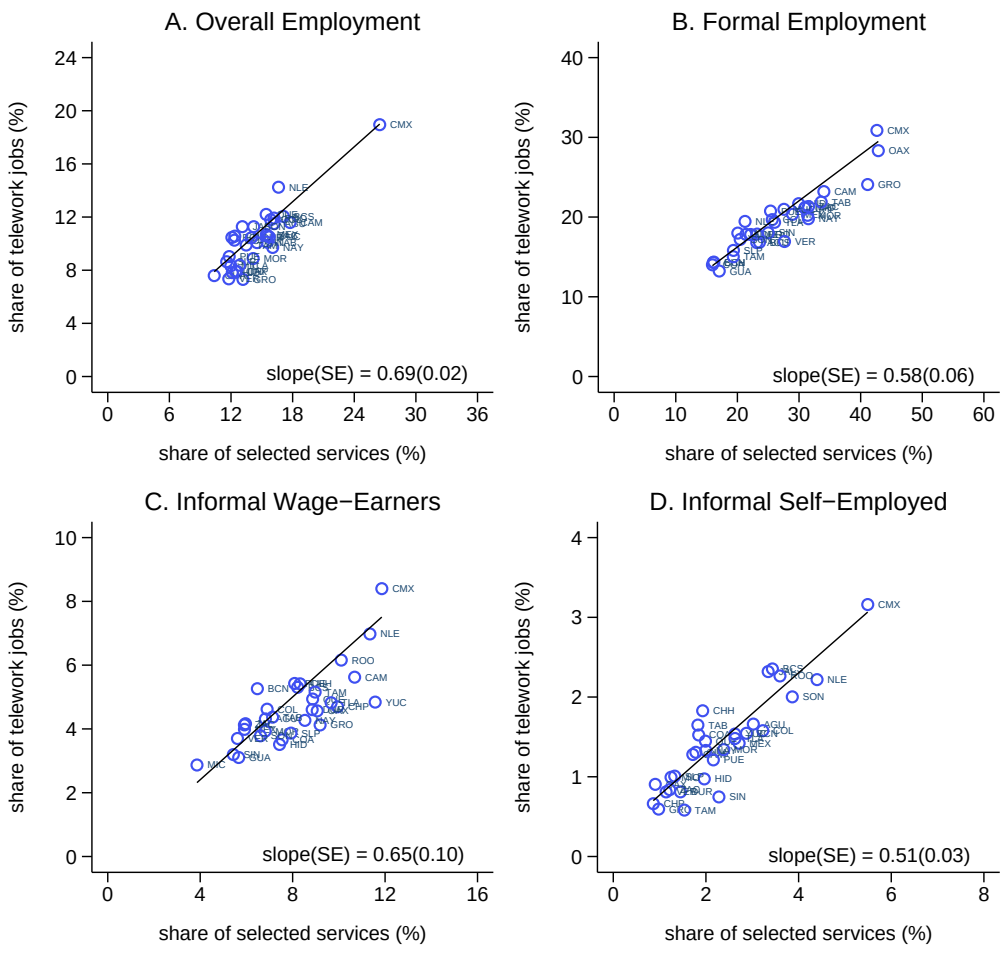
B. Additional Figures and Tables

Figure B.1: Correlation between Teleworking and Real GDP per Worker in 32 States



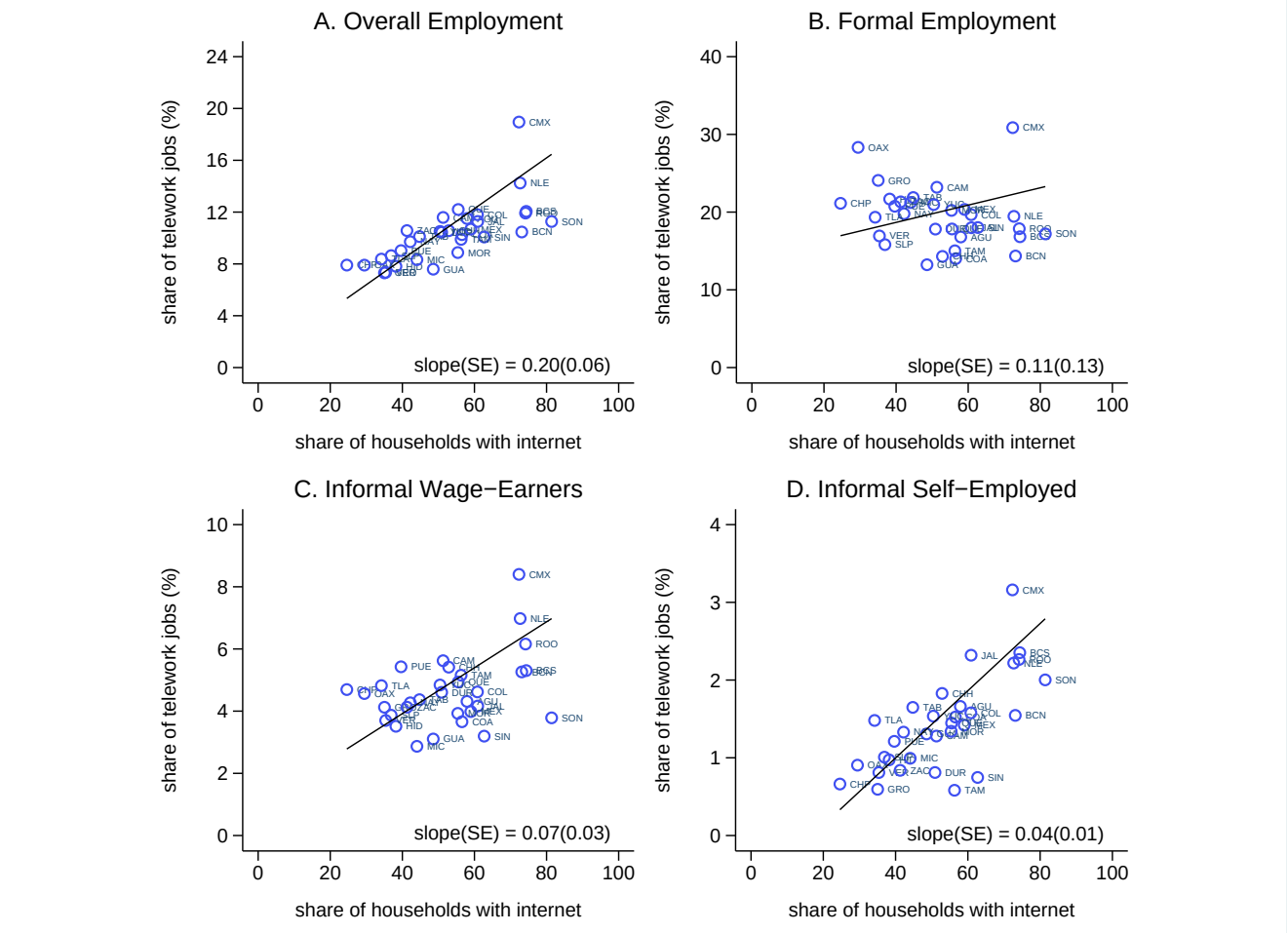
Notes: Own calculations based on the ENOE 2019. GDP per worker is real GDP, excluding oil mining, divided by overall employment. Oil mining includes extraction of oil and gas and drilling of oil and gas wells (INEGI, 2019). Residuals of the linear regression are weighted by GDP, excluding oil mining. Standard errors are clustered at the state level.

Figure B.2: Correlation between Teleworking and Share of Selected Services in 32 States



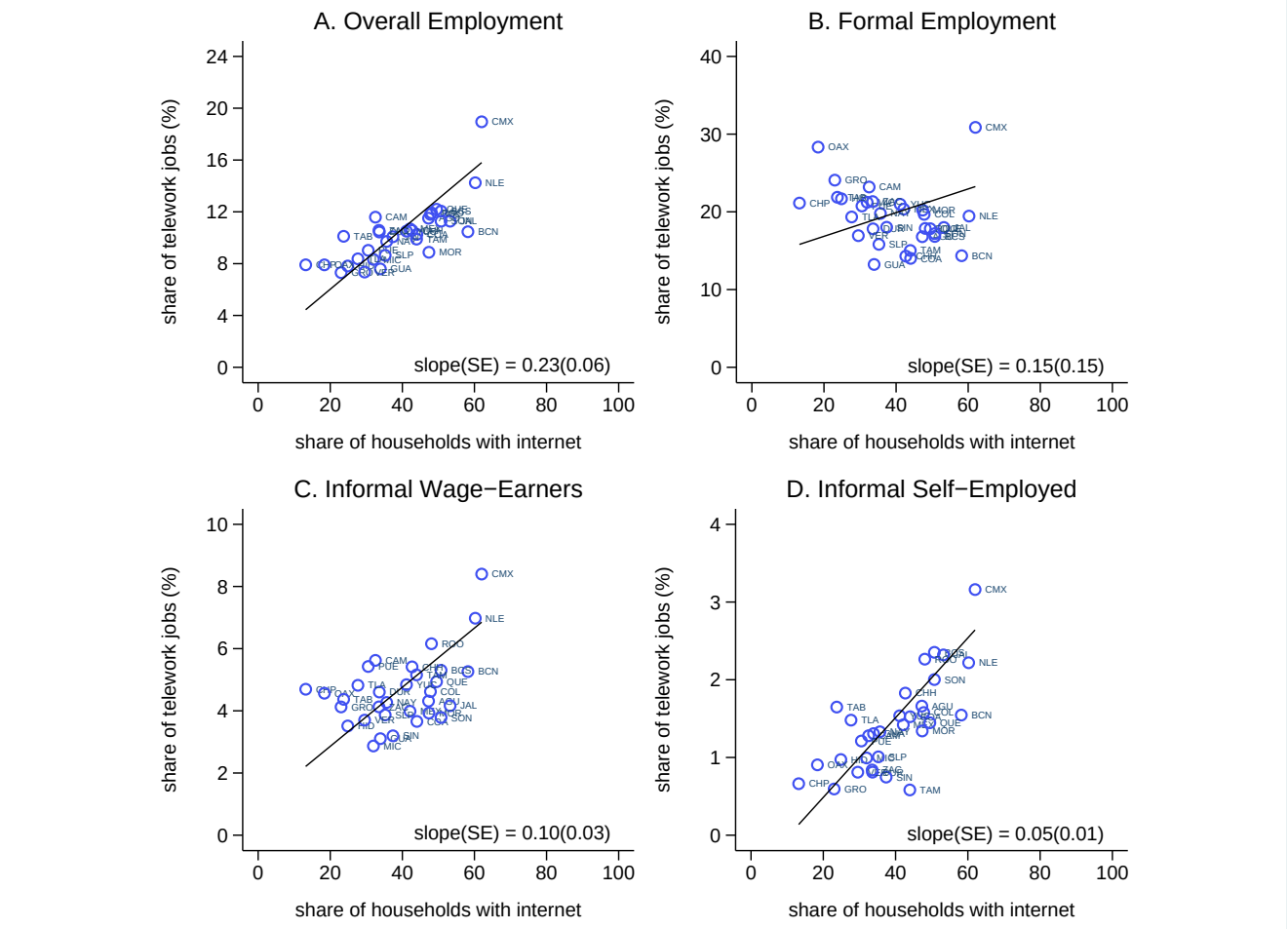
Notes: Own calculations based on the ENOE 2019. Residuals of the linear regression are weighted by GDP. Standard errors are clustered at the state level. Selected services are information; finance and insurance; real state and rental and leasing; professional, scientific, and technical services; management of companies and enterprises; educational services; and public administration.

Figure B.3: Correlation between Teleworking and Access to Internet (ENDUTIH) in 32 States



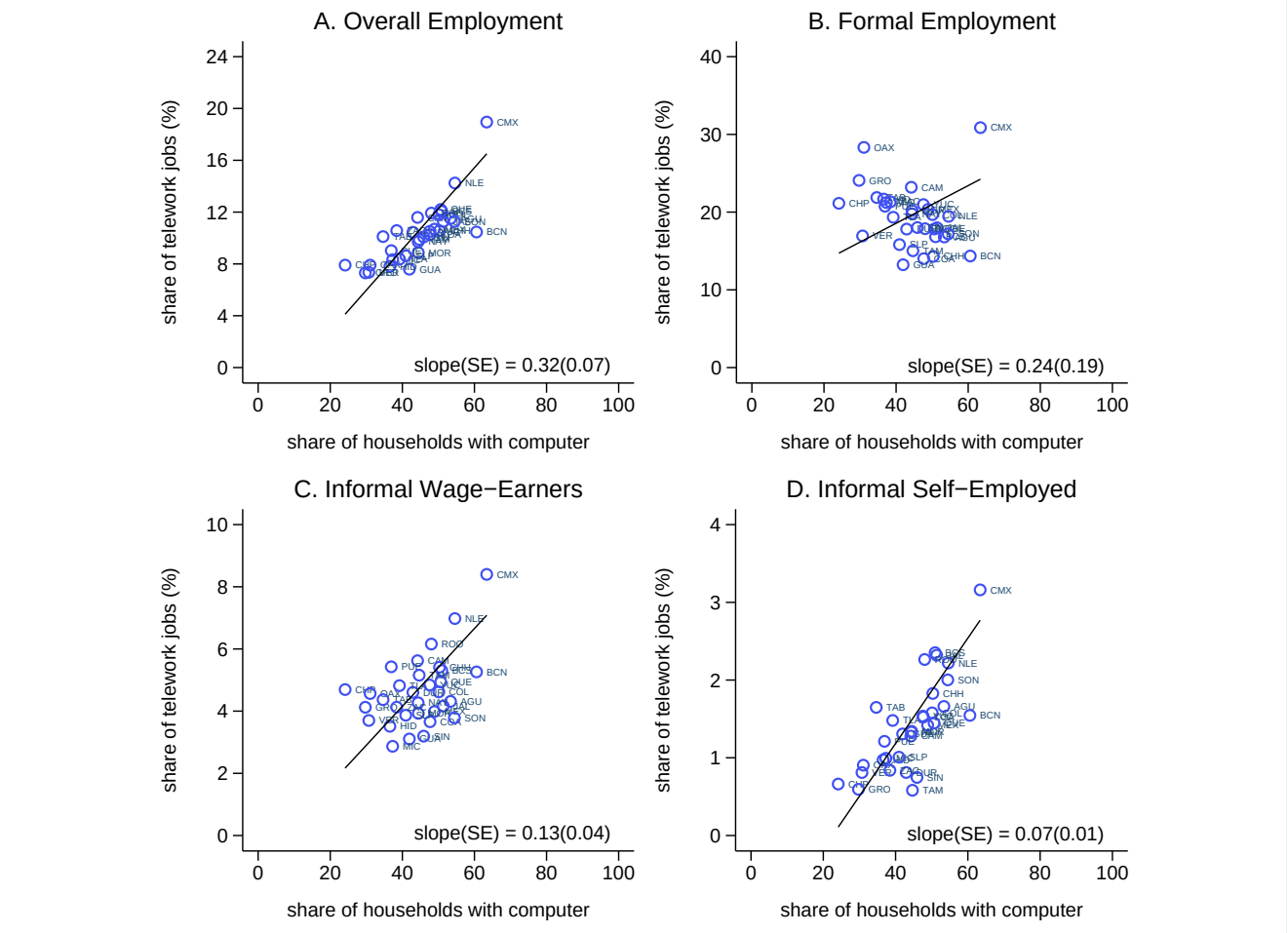
Notes: Own calculations based on the ENDUTIH 2018, using responses at the household level and appropriate survey weights. Residuals of the linear regression are weighted by GDP. Standard errors are clustered at the state level.

Figure B.4: Correlation between Teleworking and Access to Internet (ENIGH) in 32 States



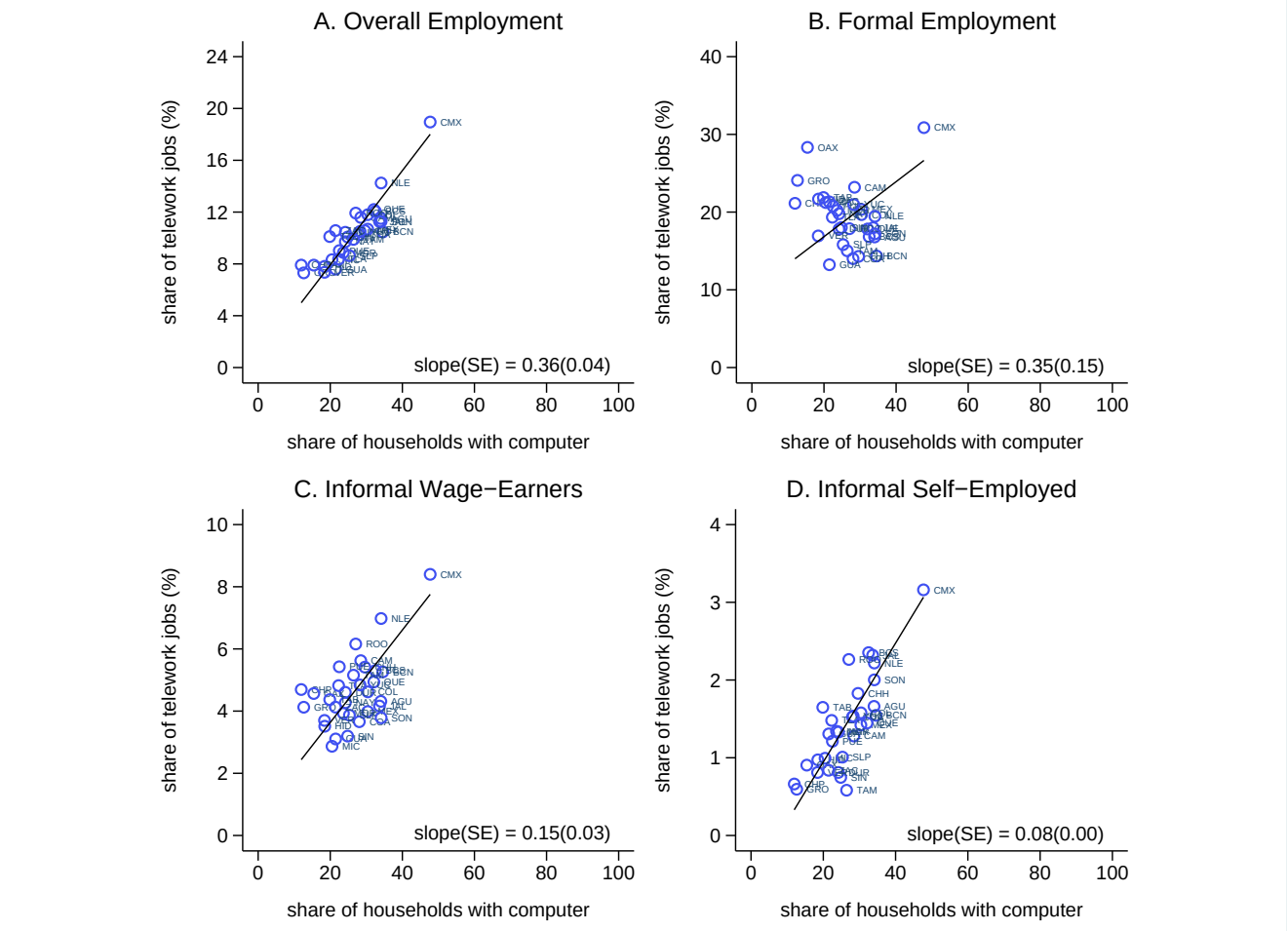
Notes: Own calculations based on the ENIGH 2018, using responses at the household level and appropriate survey weights. Residuals of the linear regression are weighted by GDP. Standard errors are clustered at the state level.

Figure B.5: Correlation between Teleworking and Access to Computer (ENDUTIH) in 32 States



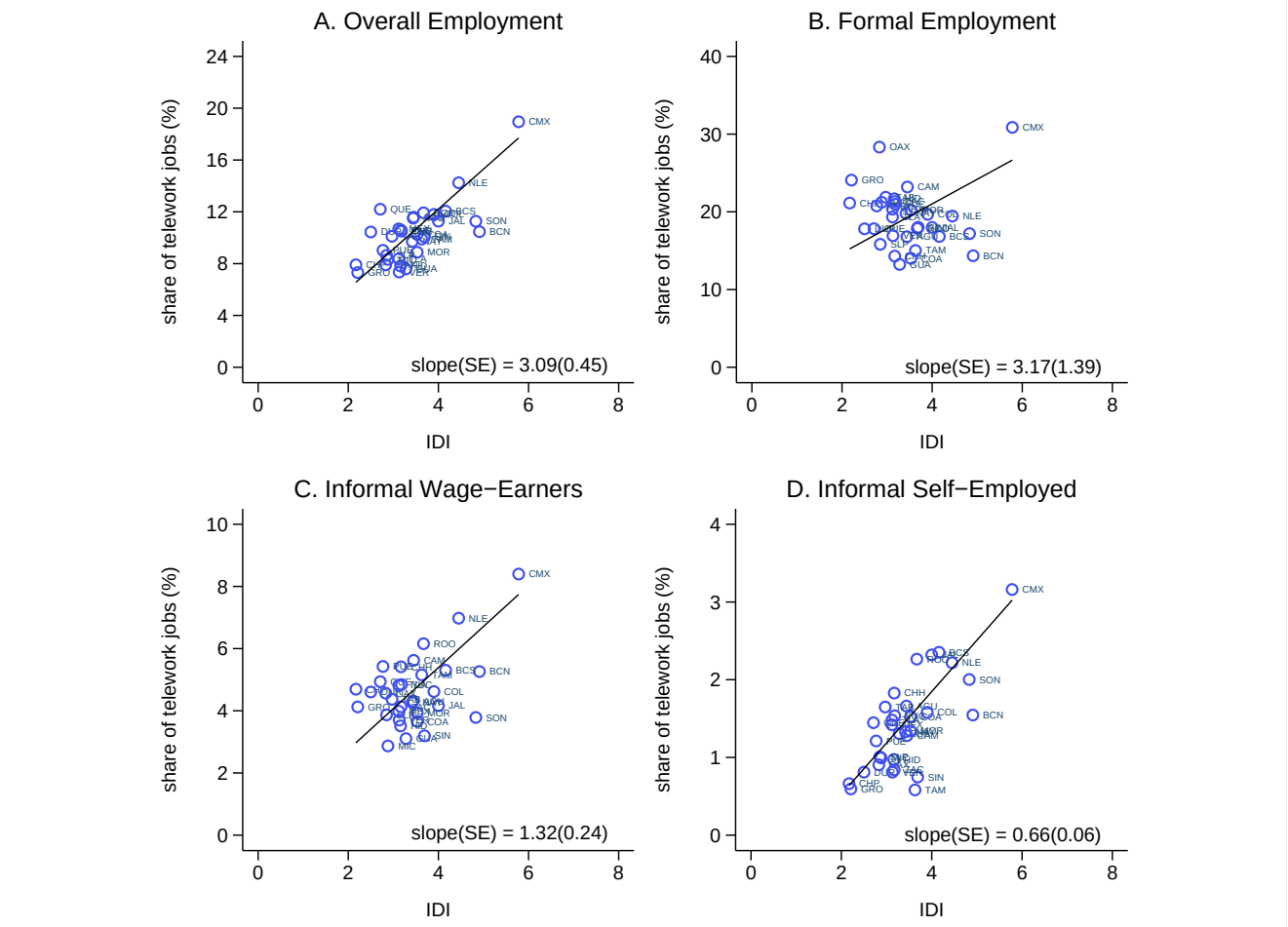
Notes: Own calculations based on the ENDUTIH 2018, using responses at the household level and appropriate survey weights. Residuals of the linear regression are weighted by GDP. Standard errors are clustered at the state level.

Figure B.6: Correlation between Teleworking and Access to Computer (ENIGH) in 32 States



Notes: Own calculations based on the ENIGH 2018, using responses at the household level and appropriate survey weights. Residuals of the linear regression are weighted by GDP. Standard errors are clustered at the state level.

Figure B.7: Correlation between Teleworking and IDI in 32 States



Notes: IDI is the ICT Development Index estimated by Micheli and Valle (2018) and taken from Table 5, p. 47. Residuals of the linear regression are weighted by GDP. Standard errors are clustered at the state level.

Table B.1: The Extent of Teleworking in Mexico by State in 2019, in Percent

	AGU	BCN	BCS	CAM	COA	COL	CHP	CHH	CMX	DUR	GUA	GRO	HID	JAL	MEX	MIC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A. Share of telework jobs in each type of employment:																
Overall employment	11.5	10.5	12.1	11.6	10.3	11.8	7.9	10.6	19.0	10.4	7.6	7.3	7.8	11.3	10.7	8.3
Formal employment	16.8	14.4	16.8	23.2	14.0	19.7	21.1	14.3	30.9	17.8	13.2	24.1	21.7	18.0	20.3	21.2
Informal wage-earners	4.3	5.3	5.3	5.6	3.7	4.6	4.7	5.4	8.4	4.6	3.1	4.1	3.5	4.2	4.0	2.9
Informal self-employed	1.7	1.5	2.4	1.3	1.5	1.6	0.7	1.8	3.2	0.8	1.3	0.6	1.0	2.3	1.4	1.0
B. Share of telework jobs in the working-age population:																
Overall Employment	6.5	6.4	8.0	6.7	5.9	7.5	4.1	6.2	11.1	5.9	4.4	4.0	4.4	6.7	5.9	4.8
Formal employment	5.7	5.5	6.9	5.5	5.4	6.3	3.1	5.4	9.4	5.1	3.6	3.1	3.4	5.7	5.0	3.9
Informal wage-earners	0.7	0.7	0.8	1.1	0.4	1.0	0.8	0.7	1.4	0.8	0.6	0.7	0.9	0.8	0.8	0.7
Informal self-employed	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.1	0.1	0.1	0.2	0.2	0.2	0.1
C. Share of selected services in each type of employment:																
Overall Employment	16.2	12.1	17.1	17.8	12.3	15.9	12.6	12.4	26.5	14.0	10.4	13.2	12.1	13.1	15.4	12.0
Formal employment	23.1	16.2	23.6	34.0	16.0	25.7	30.9	16.1	42.6	22.2	17.1	41.1	29.9	20.1	29.0	31.0
Informal wage-earners	6.8	6.5	8.2	10.7	7.5	6.9	9.9	8.3	11.9	8.8	5.7	9.2	7.4	6.0	5.9	3.9
Informal self-employed	3.0	2.9	3.4	1.7	1.8	3.2	0.9	1.9	5.5	1.5	1.8	1.0	2.0	3.3	2.7	1.2
D. Share of selected services in the working-age population:																
Overall Employment	9.1	7.3	11.3	10.3	7.1	10.1	6.5	7.3	15.5	7.9	5.9	7.2	6.8	7.8	8.6	6.9
Formal employment	7.9	6.2	9.7	8.0	6.1	8.2	4.6	6.0	12.9	6.3	4.7	5.3	4.6	6.4	7.1	5.7
Informal wage-earners	1.0	0.9	1.3	2.0	0.8	1.6	1.7	1.1	2.0	1.4	1.1	1.6	1.9	1.1	1.1	1.0
Informal self-employed	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.6	0.2	0.2	0.2	0.3	0.3	0.3	0.2
E. Households with internet, ENDUTIH	57.9	73.1	74.4	51.3	56.5	60.8	24.6	52.9	72.3	50.9	48.6	35.0	38.2	60.9	59.0	44.0
F. Households with internet, ENIGH	47.3	58.2	50.7	32.5	44.0	47.8	13.2	42.7	62.0	33.6	33.9	23.0	24.9	53.2	42.1	32.0
G. Households with computer, ENDUTIH	53.4	60.6	50.9	44.2	47.7	50.1	24.1	50.3	63.4	42.9	41.9	29.7	36.5	51.4	48.9	37.3
H. Households with computer, ENIGH	34.0	34.6	32.5	28.5	28.1	30.4	12.0	29.6	47.7	24.2	21.5	12.6	18.5	33.7	30.4	20.5

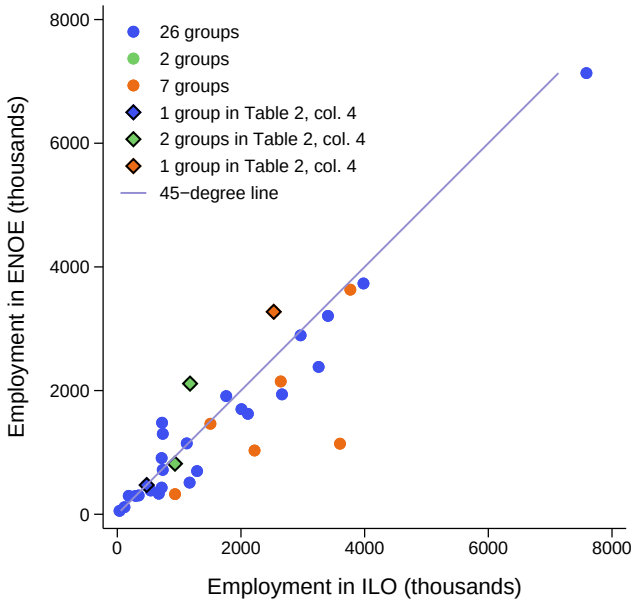
Notes: Aguascalientes (AGU), Baja California (BCN), Baja California Sur (BCS), Campeche (CAM), Coahuila de Zaragoza (COA), Colima (COL), Chiapas (CHP), Chihuahua (CHH), Ciudad de México (CMX), Durango (DUR), Guanajuato (GUA), Guerrero (GRO), Hidalgo (HID), Jalisco (JAL), México (MEX), and Michoacán de Ocampo (MIC).

Table B.2: The Extent of Teleworking in Mexico by State in 2019, in Percent (*Continued*)

	MOR	NAY	NLE	OAX	PUE	QUE	ROO	SLP	SIN	SON	TAB	TAM	TLA	VER	YUC	ZAC
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
A. Share of telework jobs in each type of employment:																
Overall employment	8.9	9.7	14.2	7.9	9.0	12.2	11.9	8.6	10.1	11.3	10.1	9.9	8.4	7.3	10.5	10.6
Formal employment	20.2	19.8	19.5	28.3	20.8	17.8	17.9	15.8	18.0	17.2	21.9	15.0	19.3	16.9	21.0	21.3
Informal wage-earners	3.9	4.3	7.0	4.6	5.4	4.9	6.2	3.9	3.2	3.8	4.4	5.2	4.8	3.7	4.8	4.1
Informal self-employed	1.3	1.3	2.2	0.9	1.2	1.4	2.3	1.0	0.7	2.0	1.6	0.6	1.5	0.8	1.5	0.8
B. Share of telework jobs in the working-age population:																
Overall Employment	4.7	5.9	8.3	4.5	5.2	6.3	7.6	4.8	5.8	6.8	5.4	5.8	4.9	3.8	6.5	5.7
Formal employment	3.7	4.8	7.2	3.4	3.7	5.5	6.2	4.0	5.1	6.0	4.3	5.0	3.4	2.9	5.3	4.8
Informal wage-earners	0.9	0.9	0.8	0.9	1.3	0.7	1.1	0.7	0.6	0.6	0.9	0.8	1.2	0.7	1.0	0.8
Informal self-employed	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1
C. Share of selected services in each type of employment:																
Overall Employment	14.2	16.1	16.6	12.5	11.8	15.4	16.2	11.6	14.5	14.2	15.5	13.5	12.8	11.8	15.7	15.6
Formal employment	31.4	31.5	21.2	42.9	25.4	21.4	23.2	19.4	25.0	20.5	33.6	19.3	26.0	27.6	27.6	31.5
Informal wage-earners	6.8	8.5	11.3	9.1	8.1	8.9	10.1	7.9	5.4	6.6	7.1	9.0	9.7	5.6	11.6	5.9
Informal self-employed	2.4	2.0	4.4	0.9	2.2	2.0	3.6	1.3	2.3	3.9	1.8	1.5	2.6	1.1	2.6	1.2
D. Share of selected services in the working-age population:																
Overall Employment	7.6	9.8	9.6	7.2	6.8	7.9	10.3	6.5	8.4	8.5	8.3	7.9	7.5	6.0	9.8	8.4
Formal employment	5.7	7.6	7.9	5.2	4.5	6.6	8.1	4.9	7.1	7.1	6.6	6.4	4.6	4.7	6.9	7.1
Informal wage-earners	1.6	1.9	1.4	1.7	1.9	1.2	1.8	1.4	1.0	1.1	1.4	1.4	2.5	1.1	2.4	1.2
Informal self-employed	0.3	0.3	0.4	0.2	0.3	0.1	0.4	0.2	0.3	0.3	0.3	0.2	0.4	0.2	0.4	0.1
E. Households with internet, ENDUTIH	55.4	42.2	72.7	29.5	39.6	55.5	74.2	36.9	62.7	81.4	44.8	56.3	34.2	35.4	50.4	41.3
F. Households with internet, ENIGH	47.4	35.7	60.2	18.4	30.5	49.5	48.1	35.2	37.4	50.7	23.7	43.9	27.7	29.5	41.1	33.5
G. Households with computer, ENDUTIH	44.4	44.4	54.6	31.1	36.9	50.6	48.0	40.9	45.9	54.4	34.6	44.7	39.2	30.7	47.6	38.4
H. Households with computer, ENIGH	23.7	24.2	34.1	15.4	22.5	32.1	27.1	25.3	24.8	34.1	19.9	26.4	22.3	18.4	28.3	21.5

Notes: Morelos (MOR), Nayarit (NAY), Nuevo León (NLE), Oaxaca (OAX), Puebla (PUE), Querétaro (QUE), Quintana Roo (ROO), San Luis Potosí (SLP), Sinaloa (SIN), Sonora (SON), Tabasco (TAB), Tamaulipas (TAM), Tlaxcala (TLA), Veracruz de Ignacio de la Llave (VER), Yucatán (YUC), and Zacatecas (ZAC).

Figure B.8: ISCO-SINCO Mapping used in Table 2, Columns 3-4



Notes: This figure depicts the mapping from Dingel and Neiman (2020)'s telework classification using 39 2-digit ISCO occupations into the 2-digit SINCO classification, using the title of the occupation as a guide. The mapping did not always conform to a one-to-one correspondence. As a result, the 39 ISCO occupations were rearranged into 26 single-occupation groups, four occupations into two groups, and seven groups of remaining occupations, in some cases paired with occupations from the first group. The horizontal axis is the (sum of) employment in each of these 35 groups using ILO data, taken directly from Dingel and Neiman (2020)'s replication files. The vertical axis is employment in the same 35 groups using ENOE data. The closer the dots are to the 45-degree line, the better the mapping. Four of these 35 groups are used in a counterfactual exercise in Table 2, column 4.

Table B.3: Comparison between Two Telework Classifications in Four Occupations

ISCO 2008 occupation (2 digits)	telework classification DN	SINCO 2011 occupation (2 digits)	telework classification LM
1	2	3	4
(14) Hospitality, Retail and Other Services Managers	0.4581	(14) Directors and managers in sales, restaurants, hotels, and other establishments	1.0000
		(17) Coordinators and heads of area in sales, restaurants, hotels, and other establishments	0.2000
(21) Science and Engineering Professionals	0.7206	(22) Researchers and professionals in exact sciences, biology, engineering, informatics, and telecommunications	0.2381
(25) Information and Communication Technology Professionals	1.0000		
(31) Science and Engineering Associate Professionals	0.1265	(26) Assistants and technicians in exact sciences, biology, engineering, informatics, and telecommunications	0.0294
(35) Information and Communication Technicians	0.9552		
(41) General and Keyboard Clerks	1.0000	(31) Supervisors of administrative support personnel, secretaries, data-entry assistants, tellers, and file and transport control workers	0.2500
(43) Numerical and Material Recording Clerks	0.5372		

Notes: SINCO 2011 occupation titles are our free translation; see https://www.snieg.mx/DocumentacionPortal/Normatividad/historica/sinco-2012.pdf. Dingel and Neiman (2020)'s replication material is available at https://github.com/jdingel/DingelNeiman-workathome.

Table B.4: Top 25 4-Digit SINCO Occupations by Gender, 2019

Top 25 Occupations by Gender
Eight Jobs in the Top 25 Shared by Males and Females
4111 Merchants in establishments
4211 Sales clerks, dispatchers, and shop assistants
3115 Support workers in various administrative activities
9621 Sweepers and cleaning workers (except in hotels and restaurants)
9521 Street food preparers and vendors
5114 Fast food preparers: tacos, snacks, pizzas, hot dogs, juices, coffee, etc.
9512 Street vendors of sundries (excluding those selling food)
5116 Waiters
Seventeen Jobs in the Top 25 in Male Employment that are not Shared by Females
6111 Workers in the cultivation of corn and/or beans
9111 Support workers in agricultural activities
7121 Masons, bricklayers, and similars
9221 Construction support workers
8342 Drivers of buses, trucks, vans, taxis, and passenger cars
8341 Truck, van, and cargo car drivers
5313 Watchmen and guards in establishments
2632 Mechanics in motor vehicle maintenance, and repair
3132 Managers and workers in warehouse and warehouse control
9231 Support workers in the manufacture, repair and mechanical maintenance of equipment, machinery and metal and precision products
9331 Loaders
7311 Carpenters, cabinet makers and planers in the production of wood products
6112 Workers in the cultivation of vegetables and greens
7221 Blacksmiths and forgers
2642 Electricians and linemen
6121 Workers in cattle farming
6114 Workers in the cultivation of fruit trees
Seventeen Jobs in the Top 25 in Female Employment that are not Shared by Males
9611 Domestic workers
3111 Secretaries
7513 Workers in the production of bread, tortilla, pastries, and other cereal and flour products
4224 Catalog sellers
3121 Cashiers, ticket agents, bookmakers and croupiers
2332 Primary school teachers
7341 Tailors and dressmakers, seamstresses and garment makers
5211 Hairdressers, barbers, stylists and hairdressers
5112 Home eatery food vendors and preparers
2335 Preschool teachers
8212 Assemblers of electrical and electronic parts
9411 Helpers in food preparation
5111 Chefs, cooks
2512 Auxiliaries in accounting, economics, finance, and stockbrokers
5222 Caregivers of children, people with disabilities, and the elderly in private homes
3211 Receptionists and workers who provide information (personally)
2426 Specialist nurses

Notes: This table was constructed by ranking all occupations for males and females separately and then finding the coincidences. The translation from Spanish to English is ours. The 4-digit classification corresponds to the SINCO 2011.