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Gender Gaps: Back and Here to Stay? Evidence from Skilled Ugandan Workers during COVID-19

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Keywords: Female Employment, Gender Gap, COVID-19, Sub-Saharan Africa, Shecession

JEL Codes: J13, J16, J21, J24, O12

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1 Introduction

To curb the spread of COVID-19, governments implemented unprecedented measures to restrict economic activity and individual mobility. Evidence from the early stage of the pandemic shows that, all over the world, these restrictions disproportionately affected female paid workers, who lost their jobs at a greater rate than male ones, and female entrepreneurs, whose businesses saw a disproportionate decline in revenues and workforce.¹ While in the Global North these gendered effects have largely dissipated following the easing of the restrictions (Bluedorn et al. 2020; Lee et al. 2021), it is unclear whether the same holds true in the Global South. As the integration of female talent in the labor force is a key determinant of GDP growth (Papageorgiou et al. 2018; Hsieh et al. 2019), evaluating how skilled female workers and entrepreneurs in low-income economies have been affected by COVID-19 is crucial for understanding how productivity will fare in these regions once the pandemic subsides.

To make progress on this question, we investigate gender disparities in the effects of two nationwide lockdowns implemented in Uganda on the labor market outcomes of a sample of 714 young, urban, and highly skilled workers who, pre-pandemic, received post-secondary vocational education and were employed in a wide range of manufacturing and services sectors. Relying on a unique high-frequency panel dataset spanning from January 2020 to September 2021 we track these workers' labor market outcomes before, during and after the two lockdowns and evaluate gender differences in both the early responses to the two lockdowns and in the recovery patterns. The richness of our survey data further allows for the investigation of the root causes of the trends we document.

We find strong evidence that women were disproportionately affected by COVID-19 restrictions despite the absence of gender differences in pre-pandemic employment rate and job security. The first lockdown reduced the employment rate by 53 p.p. (69% over the baseline level) among female workers and by 35 p.p. (45%) among male workers, generating a gender gap in employment of 20 p.p. Once the restrictions were lifted, employment grew for all workers, pushed by previously employed workers re-entering the labor market and younger cohorts joining the labor market for the first time. While the entry of new cohorts was symmetrical by gender, the re-entry was not. Most men reported being employed throughout the eighteen months following the first lockdown. In six months, male employment was back to its pre-pandemic level. Conversely, as 10% of the previously employed women definitively separated from the labor force and 35% became occasionally employed, female overall employment remained below its pre-pandemic projections. The employment gender gap, further amplified by the second lockdown that once again disproportionately reduced female employment, persisted eighteen months after the onset of the pandemic. Along the intensive margin, the lockdowns permanently displaced women from the sectors in which they received vocational training; relocated women into agriculture and other unskilled

¹Adams-Prassl et al. 2020; Amuedo-Dorantes et al. 2020; Deshpande 2020; Farré et al. 2020; Kristal et al. 2020; Andrew et al. 2021; Casale et al. 2021; Caselli et al. 2021; Dang et al. 2021; Kikuchi et al. 2021; Landivar et al. 2020; Reichelt et al. 2021; Kugler et al. 2021; and Alon et al. 2022 find disproportionate effects of the economic restrictions on female workers. Torres et al. 2021; Gulesci et al. 2021; and Alfonsi et al. 2021 focus on entrepreneurs.

sectors; and widened the earnings gender gap. The sectorial misallocation of productive skills is likely to induce a disproportionate depreciation of female workers' human capital from not working in the sector in which they would be most able to effectively leverage their expertise and experience. This is especially worrisome when considering the monetary and time investment in vocational education made by these workers.

We investigate two possible determinants of these dynamics identified by the rising literature: female workers' concentration in economic sectors deemed as non-essential and with higher risk of infection (Alon et al. 2020; Couch 2020) and the extraordinary childcare responsibilities generated by school closures (Del Boca et al. 2020; Farré et al. 2020; Hupkau et al. 2020; Andrew et al. 2021; Orefice et al. 2021; Sevilla et al. 2020; Couch 2020; Alon et al. 2022). Pre-pandemic, the female workers in our sample were over-represented in the sectors of the economy which were subject to the strongest restrictions. Initial closures in these sectors explain 52% of the gender gap in employment during the first lockdown, but their share gradually declines to 13% after the restrictions are lifted. Moreover, we find that in periods of schools' closure employment declines with the number of school-age children in the household for women but not for men. Childcare responsibilities explain only 5% of the gender gap in the early stage of the pandemic and about 20% of the gender employment gap in the late stages of the pandemic, following the prolonged school closure. Although sectorial concentration and childcare responsibilities contribute to explaining the gendered impacts and recovery, a considerable share of the gender gap in employment remains unexplained by these two factors alone, similarly to what was observed in other high- and low- income settings (Adams-Prassl et al. 2020; Montenegro et al. 2020; Furman et al. 2021; Kugler et al. 2021).

The gender gap in the job loss rate of 20 p.p. we observe is considerably larger than the 2.5-9 p.p. gap documented in both higher and lower income countries for more representative populations than our sample (Stantcheva 2022; Kugler et al. 2021; Alon et al. 2022). We identify three key drivers of such large and persistent effects. First, our respondents were hit by the pandemic in the earliest, most vulnerable stage of their careers. Several studies consistently finding larger job losses (Montenegro et al. 2020; Kikuchi et al. 2021; Lee et al. 2021; Kugler et al. 2021) and gender differentials (Kristal et al. 2020) among the youth. Second, our respondents were mostly unable to work from home, given the hands-on nature of their jobs. Third, they could not rely on publicly financed retention schemes, which supported about 50 million jobs across the OECD (OECD 2020).

We contribute to the literature on the gendered effects of COVID-19 in three ways. First, we give new insights about the effects of the pandemic in low-income countries by identifying large and persistent effects in the emerging class of skilled urban workers, characterized by above-average employment and earnings, and arguably representing one of the most productive segments of the labor market in many low-income countries. Second, we contrast between the effects of the pandemic between the Global North and the Global South. While in the North highly educated women were the least affected (Adams-Prassl et al. 2020, Foucault et al. 2020, Lee et al. 2021), in the South the gendered effects of the pandemic are magnified and persistent for some highly educated groups,

and short lived in the general population largely employed in the relatively more resilient agricultural sector or in non-farm subsistence activities (Alon et al. 2022). Third, while most studies use single or repeated cross-sections and short panels, we leverage one of the longest panel datasets spanning the pandemic in a low-income country. The panel structure of our data, the extended time span it covers, and the availability of pre-pandemic information allow us to monitor labor market trajectories in and out of employment and across sectors; test the persistence of the initial shock for eighteen months; and isolate the specific effects of COVID-19 containment measures from pre-trends.

The findings of this paper indicate that the labor market trajectories of economically empowered young women in low-income countries are highly vulnerable to temporary economic shocks. If not pressingly tackled, the labor market disconnection and sectorial misallocation of young and skilled female workers induced by the COVID-19 pandemic may result in additional barriers to economic growth. Policymakers should prioritize supporting enterprises in female dominated sectors and women seeking stable employment. Closing the gender gap will additionally require identifying the forces behind its unexplained portion, such as employer discrimination or social norms.

2 Context

With 78% of its population aged below 30 (International Youth Foundation 2011), Uganda struggles to absorb all the youths in its labor market: in 2015, the youth (age 15-29) underutilization rate was 68%, driven by employment in vulnerable occupations (49%), unemployment (15%) and inactivity (4%) (ILO 2017). Possible explanations for the scarcity of high value-added jobs include prevailing skills mismatches and workers' underqualification. To enhance the country's productivity, in 2012 the Ugandan government implemented a decennial strategic plan aimed at reinforcing its vocational education system (EPRC 2021)². Currently representing 4% of the youths, post-secondary vocational graduates have above mean employment rates and earnings (authors' elaboration of the latest Uganda National Household Survey from 2016/2017 [UNHS].) This highly skilled segment of the population was projected to grow as further educational and labor market opportunities emerged with the sustained economic growth that characterized the country in the last decade (EPRC 2021).

The positive economic outlook was, however, undermined by the COVID-19 shock, which contracted the economy to its slowest pace in three decades (World Bank 2021). To curb the spread of the virus, the government implemented one of Africa's strictest sets of containment measures. It closed schools on March 18, 2020, and non-essential businesses during a first national lockdown implemented between March 31 and June 2, 2020. The government also imposed travel bans for private and public vehicles and a dusk-to-dawn curfew. While most

²Alfonsi et al. 2020 shows that vocational training programs are effective at generating productive human capital in this setting.

restrictions for economic activity were lifted in June 2020, schools remained closed until February 10, 2021 when, except for pre-primary schools, they gradually reopened.³ Amid the fear of a second wave of cases, the government imposed a second, milder lockdown between June 19 and July 31, 2021. Although most businesses were not shut down, travel limits, a stringent curfew and the suspension of public transportation once more paused an already fragile economic recovery. Uganda’s schools were closed once again, and only reopened to students in January 2022, ending the world’s longest school disruption due to COVID-19. Despite being extreme, the Ugandan scenario provides a stable context in which analyzing the effects of prolonged school closures on employment.

3 Data and sample

3.1 The panel dataset

Our sample consists of 714 graduates of five vocational training institutes (VTIs) located in the Central and Eastern regions of Uganda. Like most Ugandan VTIs, none of these five tracked their graduates’ career developments nor kept their updated contact information. We therefore collected and digitized schools’ hard copies of registries containing contacts for the cohorts of alumni graduating in 2014-19.^{4, 5}

As shown in Figure A.2, we interviewed our respondents in January, July and December 2020 and in September 2021. In each survey round, we collected detailed current and retrospective information, allowing us to measure labor market outcomes before, during, and after the two lockdowns. The data is unique for providing an otherwise unavailable look at how skilled workers in low-income countries fared throughout the pandemic. With it we can evaluate both early responses to the two lockdowns and the persistence of the effects eighteen months from the onset of the crisis.

As our respondents had spread across the country following graduation, we conducted all surveys, including the pre-pandemic one, by phone. Once COVID -19 hit the world and phone interviews became the widespread tool to collect time-sensitive information, we avoided disruptions in our data collection process. We successfully interviewed 714 workers in January 2020, 615 in July 2020, 561 in December 2020 and 561 in September 2021. The attrition rates are 14%, 21%, and 21% respectively.⁶ Attritors are 9.3 p.p. more likely to be female, but do not significantly differ from non-attritors otherwise (Table A.1). This difference is driven by female workers being 6.2 p.p. less likely to be interviewed in the last survey round (Table A.3), while there are no significant differences in the first three rounds. Reassuringly, there are no differences in baseline characteristics between female attritors and non-attritors (Table A.2), suggesting that our findings are unlikely to be attributable to differential attrition

³Exceptionally, schools reopened in October 2020 for students enrolled in the last year of their education cycle.

⁴Figure A.1 shows one example of the digitized material.

⁵This work is a spin-off study of the Meet Your Future Project (Alfonsi et al. 2022). For both projects we partnered with BRAC Uganda.

⁶Our attrition rates are aligned with the literature: 15% on average in a review of 91 RCTs published in top economics journals (Ghanem et al. 2019) and 18% in studies surveying youth (Bandiera et al. 2020).

and compositional changes by gender.

3.2 The study population

We study young and highly skilled Ugandan workers who graduated from the National Certificate, a two-year post-secondary education vocational program providing trainees with a nationally accredited skills certificate. These workers received training in thirteen sectors: electrical wiring (23%), motor mechanics (19%), food and hospitality (15%), plumbing (12%), tailoring (8%), secretarial and accounting studies (7%), construction (5%), early childhood development (5%), and hairdressing (3%). Minorities trained in agriculture, welding, carpentry, and machining and fitting.

Table 1 reports the workers' baseline characteristics: they are on average 25 years old, they come from all over the country, 36% are married, and 47% have children. Pre-pandemic, 56% of them were paid employees, 21% owned a business, 13% were without an occupation,⁷ and minorities were enrolled in educational programs or engaged in casual occupations.

Women represent 41% of the sample. Table 1 shows that although these women are on average two years younger than men, they are as likely to be married, and live with more school-age children. Crucially, pre-pandemic female workers are as likely as male ones to be employed and to hold secure jobs, as indicated by the absence of gender differences in labor market experience, self-employment rate, and the probability to work in, or own, a registered firm. Women are also significantly more likely to have a permanent job and less likely to be engaged in precarious casual occupations. These statistics suggest that the female workers in this study are among the most economically empowered in the country.

The uniqueness of our sample clearly emerges when comparing it to the population of young Ugandan adults in the UNHS.⁸ With 15+ completed years of education, our workers belong to the top 3% of the education distribution for Ugandan youths (Figure A.3). Their employment rate in non-agricultural occupations and earnings are 27 p.p. (56%) and \$33 (47%) respectively higher than average (Table A.4). In stark contrast with the average Ugandan youth, largely employed in agriculture or unskilled occupations, 85% of the employed workers were working in skilled, non-agricultural jobs (Table A.5). Our sample arguably represents one of the most productive segments of the Ugandan labor market.

Although our findings will not automatically extend to the average Ugandan youths, they likely apply to other young, urban, and skilled workers in Sub-Saharan Africa. When we compare our sample to post-secondary VTI graduates from the UNHS, we find smaller differences in socio-economic and labor market characteristics

⁷We cannot distinguish between unemployed and discouraged workers in our data.

⁸We restrict the UNHS sample to individuals aged 18-39 and we reweight it so that the distributions of age and gender in the UNHS sample match those in the study sample.

Table 1: Baseline Summary Statistics and Balance Table

	<i>All</i>		<i>Female</i>		<i>Male</i>		
	Mean	SD	Obs	Mean	Obs	Mean	P-value
<i>Panel A: Socio-economic characteristics</i>							
Female	0.41	0.49	295	1.00	419	0.00	.
Age	25.01	3.22	291	24.11	418	25.63	0.00
Married	0.36	0.48	171	0.35	232	0.37	0.68
Has children	0.47	0.50	218	0.51	338	0.44	0.13
Number of school-age children in the household	0.87	1.26	215	1.22	338	0.64	0.00
Traditional religious denomination	0.75	0.43	289	0.71	414	0.77	0.07
Ethnic minority	0.44	0.50	289	0.42	414	0.45	0.48
House of origin: rural	0.51	0.50	230	0.48	332	0.53	0.27
Region of origin: central	0.37	0.48	290	0.41	415	0.34	0.05
Region of origin: eastern	0.43	0.50	290	0.40	415	0.45	0.21
Region of origin: northern	0.12	0.32	290	0.11	415	0.12	0.61
Region of origin: western	0.08	0.27	290	0.07	415	0.09	0.49
Caretaker's years of education	10.17	5.18	190	10.63	272	9.85	0.11
Agricultural household of origin	0.19	0.39	286	0.20	411	0.18	0.60
Household of origin asset index	0.00	4.95	291	0.02	414	-0.02	0.91
<i>Panel B: Labor market characteristics</i>							
Years in labor market	2.74	2.20	225	2.59	324	2.84	0.18
Wage employed	0.56	0.50	282	0.53	409	0.57	0.30
Self employed	0.21	0.41	282	0.23	409	0.20	0.40
Has permanent job	0.79	0.41	147	0.86	224	0.74	0.00
Works in / owns registered firm	0.46	0.50	203	0.48	302	0.45	0.54
Enrolled in further education	0.05	0.22	282	0.05	409	0.05	0.80
Involved in casual occupations	0.05	0.22	282	0.03	409	0.07	0.05
Other not wage- and self-employed	0.13	0.34	282	0.16	409	0.11	0.09

Notes: The table reports summary statistics and tests gender differences for a set of socio-economic and labor market characteristics measured at baseline, in January 2020. There are few exceptions: the indicator for whether the respondent has children is measured in July 2020; the indicator for whether the respondent is married is measured in December 2020; the variable for number of school-age children in the household is measured in September 2021. School-age children are children aged three or more. The ethnic minority indicator takes value one for the respondents who do not belong to the Muganda or Musoga tribes but to one of 35 other tribes. The traditional religious denominations indicator takes value one for respondents belonging to the Anglican, Muslim or Catholic faith. The caretaker education level is calculated as the highest educational level among the two main caretakers the respondent had while growing up. The respondent's household of origin is considered as "agricultural" if its main source of income is subsistence or commercial agriculture. Only work experience accumulated post vocational training counts towards the years active in the labor market. We classified as casual the following occupations: street vending, agricultural day labor; (un)loading trucks; transporting goods on bicycle; fetching water; land fencing; slashing someone's compound; and all occupations in which neither principal nor agent had an active working relationship, neither held any contractual obligations toward the other, and the principal requested agent on a need-based basis.

(Table A.4) and a much higher sectorial overlap (Table A.5).⁹ Additionally, Figure A.4 shows that there are no heterogeneous effects of the two lockdowns on the employment rate of respondents with different socio-economic characteristics,¹⁰ which points towards a broader generalizability of our findings.

4 Results

4.1 The Ugandan *shecession*

Figure 1 illustrates the impacts of the two lockdowns by gender in our sample.¹¹ Panel (a) shows how the average share of employed female and male workers evolved over the course of 2020 and 2021. Prior to the onset of the pandemic, female and male employment levels were nearly identical and constant at around 77%. Consistent with a high fear of infection and the severe restrictions imposed on economic activity, during the first lockdown employment fell by 53 p.p. (69%) for females and 35 p.p. (45%) for males, generating a gender gap in employment of 20 p.p. Once the restrictions were lifted, male employment recovered faster than female employment, and by December 2020 was back to its pre-pandemic level. At that time, female employment was still 8 p.p. (11%) lower than its baseline level. Figure A.5 shows that the post-lockdown increase in employment was driven by both previously employed workers re-entering the labor market after the shock and new entrants from younger cohorts joining the labor market for the first time. While the entry of new cohorts was symmetrical by gender,¹² the re-entry was not: while most previously employed men returned to employment after the shock, in each point of the pandemic time more than 20% of the previously employed women were unemployed. Figure A.6 reveals that 80% of the men were employed in two-thirds of the periods or more, and 40% of them remained employed throughout. Conversely, 10% of the women were definitively disconnected from the labor market, and another 35% reported being employed in half, when not less, of the pandemic periods. For this reason, the gender gap in employment persisted until May 2020, widened to 24 p.p. during the second nationwide lockdown, as female workers once again experienced a relatively larger drop in employment, and persisted through September 2021, despite employment levels beginning to recover following the easing of restrictions. The sharp decline in female labor force participation during both lockdowns, paired with the strong attachment to employment that our women signaled through VTI enrollment, suggest we would almost certainly have not observed these dynamics in the absence of the pandemic.

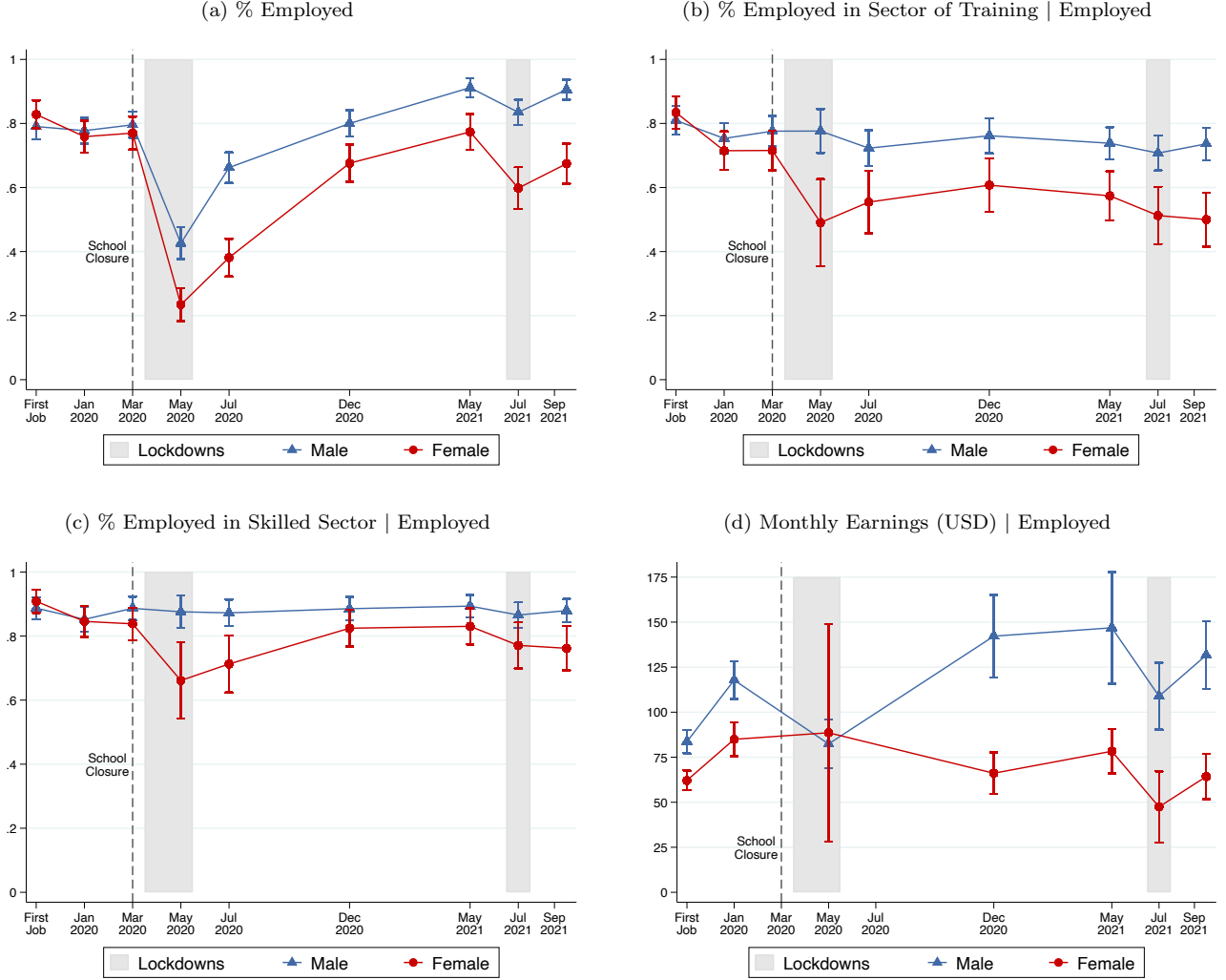
⁹ Although all differences shrink, they remain significant. The positive selection of our sample with respect to the population of Ugandan VTI graduates is plausibly driven by the quality of the VTIs from which our workers graduated (which were pre-selected by BRAC Uganda based on their reputation, infrastructure and equipment, teachers' educational attainment and teacher-student ratio) and by the fact that most of our graduates live and work in the two richest urban areas of the country.

¹⁰ We compare the evolution of employment over time for respondents aged below and above the sample median; single and married; with and without children; belonging or not to the main religious and ethnic groups; rural and urban; with caretakers educated below and above the sample median; with own and household of origin's asset indexes above and below the sample medians.

¹¹ Outcome levels by gender and over time and the magnitudes of the observed gaps are reported in Table A.6.

¹² This dynamic is consistent with the positive association between employment and age found for both genders in the UNHS sample of post-secondary vocational graduates (panel [a] of Figure A.7).

Figure 1: The Emergence and Persistence of Gender Disparities After the Lockdowns



Notes: The figure illustrates average employment rates (panel [a]), employment rates in the sector of training conditional on employment (panel [b]), employment rates in a skilled sector conditional on employment (panel [c]), and monthly earnings conditional on employment (panel [d]), over time and by gender. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. In panels (b), (c), and (d), the outcome is missing for non-employed respondents, and the average outcome in each point of time is calculated over all the respondents that are employed in that point of time. The first data point refers to the respondents' first job after completing vocational education. It may coincide with the job in January 2020 and its start and end date may be different for each respondent. The data point referring to the first job in panel [a] can be interpreted as an indicator for individuals who ever worked after completing vocational education. Skilled occupations include motor-mechanics, plumbing, hospitality, hairdressing, construction, electrical work, welding, carpentry, teaching, secretary and accounting, machining and fitting, and a residual skilled category. Earnings data were not collected in March and July 2020. In January 2020 and May 2020 respondents placed their earnings in a 15 USD bracket. We use the range midpoint. From December 2020 onwards earnings were asked as a continuous variable. For self-employed workers, the variable measures monthly profits, collected following the same procedure. 95% robust confidence intervals are reported.

In panels (a) and (b) of Figure A.8 we decompose the effect on overall employment rate into the effects on wage- and self-employment. The figure reveals that the drop in wage-employment is the main driver of the overall effect. One plausible reason is the higher level of compliance to government rules among larger and established firms employing wage labor. Moreover, the figure indicates that some wage-employed workers gradually responded to the layoffs by setting up their own activity. This seems especially true among women, who suffered the largest drop in wage-employment. Following job losses, our respondents did not resume education (panel [c]) nor engage in low-skill and precarious casual occupations to make ends meet (panel [d]).

Additionally, the first lockdown disproportionately displaced female workers from the sector in which they received training. Panel (b) of Figure 1 shows that the average share of workers employed in their training sector conditional on being employed was similar across genders before the pandemic but fell by 22 p.p. (31%) only for women during the first lockdown and remained persistently below its-pre pandemic level. Furthermore, panel (c) shows that female employment in skilled sectors conditional on being employed declined by 33 p.p. (39%) during the first lockdown and remained depressed for eighteen months. Figure A.9 illustrates that this effect is driven by female workers pivoting towards agriculture and non-agricultural unskilled occupations, where female employment increased by 2 p.p. and 15 p.p. (200%) respectively. While the former slowly converged to its original level, the latter grew again during the second lockdown. The shift towards sectors in which women cannot leverage their comparative advantage may bring to a disproportionate depreciation of their human capital and skills accumulated during vocational education.

Lastly, we investigate the existence of an earnings gender gap conditional on employment in panel (d) of Figure 1. During the first lockdown (May 2020), the few workers active in the labor market had similar average earnings (suggesting that the few women still employed were positively selected), but the standard errors of the data points are too large to make any claims on the earnings gender gap. By December 2020, the earnings gap had widened to \$76 (+130% over the baseline level of \$33) and remained stable in the following months. Such widening is driven by both higher earnings among men and lower earnings among women. The former may result from career advancements: panel (b) of Figure A.7 shows that for vocational graduates in the UNHS sample each additional year of age is associated to a \$7 increase in monthly earnings; the \$25 increase observed in this sample may be driven by the VTI positive selection discussed in footnote 9. Figure A.7 also suggests female earnings should have grown too in absence of the pandemic. The observed stagnation may originate from the prolonged inactivity during the lockdown, the shift to a different sector from that of their trainings, the shift to agriculture and other unskilled sectors, and the shift out of wage-employment into self-employment, but we are not powered enough to draw definitive conclusions.

As reported in Table A.7, we find no gendered effects in working hours and in the probability to sell assets as a coping strategy; however, self-employed women report making use of borrowing to face the second lockdown

significantly more than self-employed men. Last, women are more likely than men to report being anxious because of the pandemic: *fear of infection* and *fear of losing employment* are the two main sources of their worsening mental health.

We test the stability of these findings in several ways. Figure A.10 illustrates the unconditional version of employment in the training sector, employment in a skilled sector, and earnings. Figure A.11 shows that employment patterns remain similar when we remove one training area at a time, suggesting that our findings are not driven by any sector-specific shock, and in the balanced panel of respondents, suggesting that differential attrition by gender is irrelevant. Table A.8 shows that the gender gaps are robust to controlling for unbalanced baseline covariates from Table 1, except for the gap in skilled employment that remains larger than baseline but becomes insignificant in December 2020, and May and September 2021. Last, Table A.9 reports several bounds to our estimated employment gender gap to investigate the sensitivity of our results to different assumptions about the employment status of attritors, following Horowitz et al. 2006 and Kling et al. 2007. Our results remain consistent except for the unlikely scenario in which all the female attritors and none of the male attritors are employed.

To sum up, the economic crisis caused by the COVID-19 pandemic had long-lasting gendered consequences on the employment, sector distribution and earnings of these economically empowered women.

4.2 Where is the new and persistent employment gap coming from?

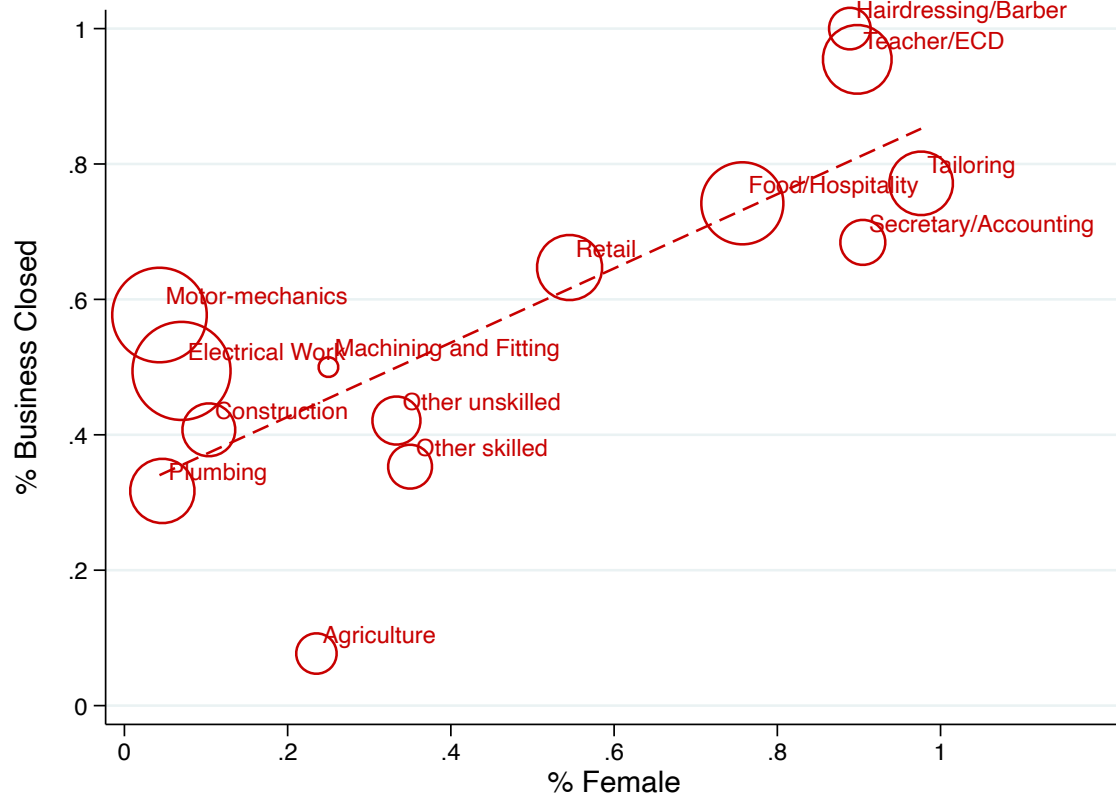
4.2.1 The role of sectors of employment

During the first lockdown, the government suspended economic activity in all sectors either deemed non-essential or that involved close interactions with clients. We test the hypothesis that the pre-pandemic sorting of women in these sectors contributed to the emergence and persistence of the observed employment gender gap.

In Figure 2 we plot the sectors in which our workers were employed pre-pandemic along two dimensions: (i) the share of female workers in each sector and (ii) the share of wage- and self-employed workers whose business were closed during the first lockdown. The figure shows that these economic sectors are highly segregated by gender: sectors such as tailoring, teaching, hairdressing and secretary employ almost only female workers; sectors like motor-mechanics, plumbing, electrical work, and construction remain traditionally male-concentrated sectors. This is not only true in our sample, but in the Ugandan labor market as well (columns 2 and 3, Table A.5). Consistent with women pre-pandemic sorting in the sectors subject to the strongest restrictions, we observe a strong positive relationship between the share of businesses closed during the first lockdown and the share of female workers in each sector.

We turn to investigating whether economic sectors contribute to the persistence of the employment gap. Figure A.12 shows that the relationship between the share of business closed and female employment was still positive in

Figure 2: Female Concentration in Economic Sectors Severely Impacted by the First Lockdown



Notes: The figure displays the economic sectors in which our respondents were employed pre-pandemic by the share of female workers hosted before the pandemic and the share of businesses that were closed in May 2020, during the first lockdown. Markers are proportional to the number of workers employed in each sector before the pandemic. The category “other unskilled” includes the following occupations: boda boda/taxi driver, street vendor, street food maker, market vendor, gate keeper/guard, factory work, cleaner/housemaid, transport, printing, driver. The category “other skilled” includes the following occupations: painting (walls, buildings), sales and marketing, office work for the government, a company, or a NGO, other business work, IT technician, medical doctor, nurse, police and army, photographer, gardner, banking, veterinary, journalist. The slope of the fitted line is 0.548 (standard error: 0.122).

July 2020, despite all restrictions had been lifted. By May 2021 the curve had almost flattened, only to tilt again during the second lockdown in July 2021, even though businesses were not directly prevented from operating. A smaller rebound of labor demand and supply in female dominated sectors may explain these dynamics. Fear of infection may have pushed customers to postpone the consumption of non-essential services or to shift to home production. The lower purchasing power registered among the (mostly) female clients of firms in female-dominated sectors, documented in our study by the lower female earnings as well as in other contexts (Dang et al. 2021, Martinez-Bravo et al. 2021, Hill et al. 2021), may have further depressed the demand of female products and services. Moreover, female workers may have decided not to go back to work when presented with the possibility, due to the higher frequency of close interactions with clients in female-dominated sectors, paired with their overall higher fear for the virus, still circulating after the end of the lockdowns.

To rigorously assess the role of economic sectors over time, we reweight the female sample so that the distribution of female workers across sectors that were severely and mildly hit by initial closures matches that of male workers.¹³ Since women were over-represented in severely hit sectors, this procedure assigns large weights to those women that pre-pandemic were employed in mildly affected economic sectors.¹⁴ Panel (a) of Figure 4 compares actual female and male employment with sector-reweighted female employment. The latter can be interpreted as the female employment we would observe if pre-pandemic women were distributed across severely and mildly hit sectors as men. Average employment rate for sector-reweighted female workers is substantially higher than actual female employment rate during the first lockdown. The distance between them declines over time but remains positive throughout the period. Table A.10 quantifies the portion of the gender gap in employment explained by economic sectors, calculated as the ratio of the gap between sector-reweighted female employment and female employment and the gap between male and female employment. Initial closures in economic sectors explain 52% of the gap during the first lockdown; 20% during the second lockdown; and 13% in the period between the two lockdown and in September of 2021. Table A.10 shows that this procedure is almost equivalent to calculating the portion of the gender gap explained by different endowments using the standard decomposition proposed by Oaxaca 1973 and Blinder 1973 and the distribution of workers in severely and mildly hit sectors as explanatory variable.

Because these economic sectors in Uganda are highly segregated by gender, there may be other unobserved sectorial characteristics, such as differences in the reopening times or in the rebound of labor demand, that account for the residual part of the gap but are inseparable from gender. To test this hypothesis, we plot in Figure A.14 average employment for male and female workers working in single-gender or mixed-gender sectors.

¹³Specifically, we reweight the female sample so that the average of the variable Hit Sector_i matches the male sample average. Hit Sector_i is an indicator variable equal to one for respondents that pre-pandemic were wage- or self- employed (or trained, if unemployed) in a sector in which more than 50% of the businesses in which our workers were wage- or self-employed pre-pandemic were closed during the first lockdown.

¹⁴Weights are equal to one for male workers.

Male and female workers have the same average employment regardless of sector, which is evidence against the existence of unobserved sectorial characteristics explaining the gender gap.

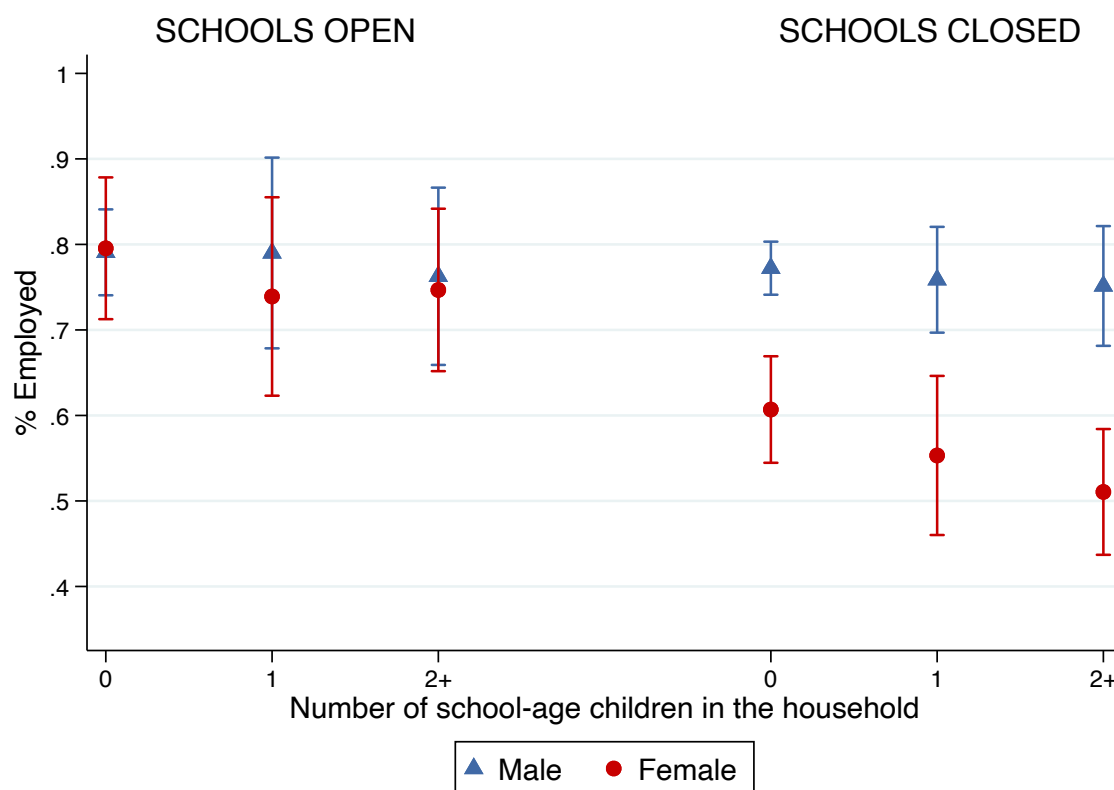
4.2.2 The role of childcare responsibilities

That the availability and cost of childcare affect adult labor supply and business profitability for women is widely documented (Heath 2017; Delecourt et al. 2021). We therefore investigate the contribution of childcare responsibilities, magnified by the prolonged closure of schools, to the emergence and persistence of the employment gender gap. 43% of our respondents live with school-age children.¹⁵ As our sample is relatively young, the suspension of pre-primary schooling throughout the study period was especially salient. Figure 3 shows that female and male average employment rates changed differentially with the number of school-age children in the household in periods in which schools were open (pre-pandemic) and closed (post-pandemic). The figure suggests that female employment declines with the number of school-age children in the household, but only during schools' closure: the presence of one child reduces female employment by 5 p.p.; additional children further reduce it by 5 p.p. Conversely, male employment does not change with the number of school-age children they live with neither when schools are open nor when they are closed. This evidence suggests that the closure of schools has limited women's ability to work due to the magnified childcare duties it generated. Our findings remain consistent in Figure A.13, where we plot average female and male employment by bins of the ratio of the number of school-age children to the number of adults in the household (the larger the ratio, the larger the childcare responsibilities of our respondent). By incorporating the presence of other adults in the household with whom the respondent may share childcare responsibilities, this alternative measure accounts for the fact that a given number of children may reflect different household compositions. Overall, the evidence is consistent with the concerns expressed by the women in our sample, who declare that childcare responsibilities have interfered with their ability to work more than men (shown in Table A.7).

To quantify the contribution of childcare responsibilities to the emergence and the persistence of the gender gap in employment, we reweight the female sample so that the proportions of respondents with zero, one, and more than one school-age children in the household match those in the male sample. Panel (b) of Figure 4 compares female and male employment with children-reweighted female employment. The latter represents the female employment we would observe if women lived with the same number of school-age children as men. The figure shows that children-reweighted female employment is similar to actual female employment in the early stage of the pandemic but becomes higher as time progresses. Table A.11 shows that differences in childcare responsibilities explain only 5% of the gender gap in employment during the first lockdown and around 20% from December 2020 onwards. In summary, the evidence points towards initial job losses being mostly unrelated to schools' closure, which instead

¹⁵In this context it is common for children to live with the mother but not with the father. We follow Casale et al. 2021 and Alon et al. 2022 and use the number of children in the household as a proxy for a respondent's childcare responsibilities.

Figure 3: Gender Gap in Impact of Schools' Closure on Employment



Notes: The figure displays the average employment rate for female and male respondents with zero, one, and two or more school-age children in the household in periods in which schools were open (January and March 2020) and periods in which schools were closed (May, July and December 2020, May, July and September 2021). School-age children are children aged 3 or more. 95% robust confidence intervals are reported.

partly limited females' labor force participation in the longer run.

Consistent with findings from Hansen et al. 2022 in the US and Biscaye et al. 2022 in Kenya, we expect some improvement in female labor market participation following the recent reopening of schools in January 2022. However, the fact that part of the Kenyan labor supply response to reopening was driven by the fall in agricultural child labor (Biscaye et al. 2022), coupled with the small portion of the gap explained by childcare responsibilities and the 15-p.p. gap among respondents with no school-age children (Figure 3), suggest that in our urban context the employment gap will not close following the reopening.

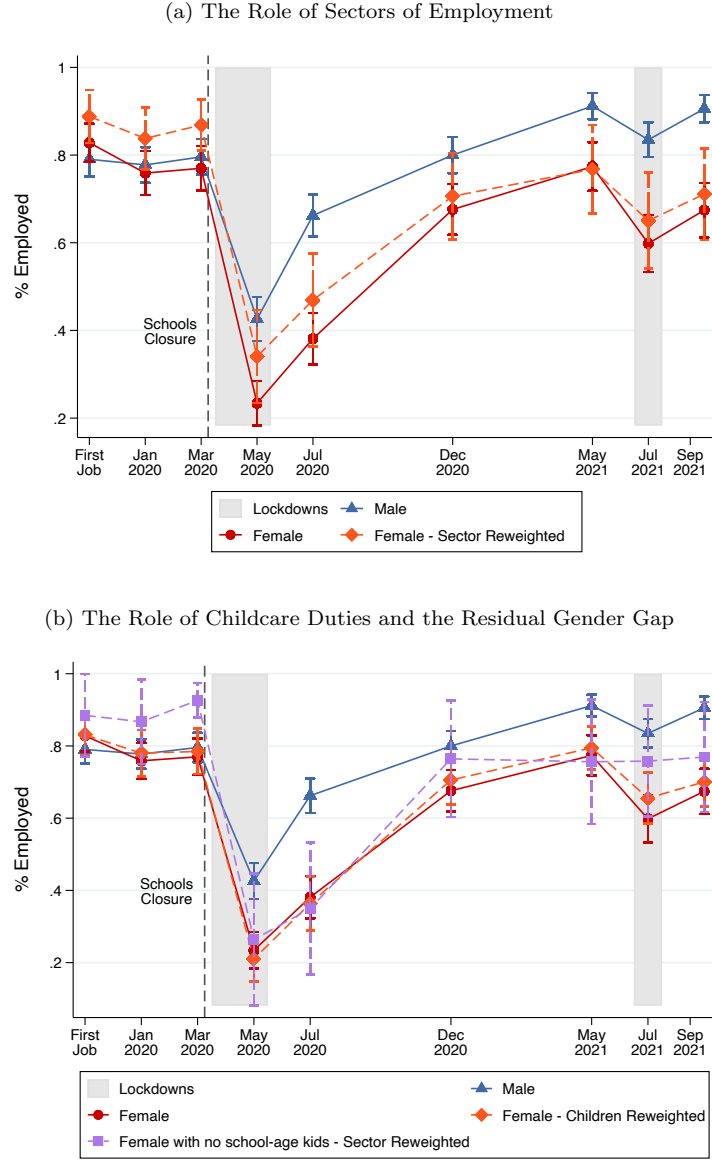
4.2.3 The residual gender gap

Economic sectors and childcare responsibilities seem to explain up to 57% of the employment gender gap in the early stage of the pandemic and 33% in the later phase. Consistent with the existence of a residual gender gap in employment, unexplained by these two factors alone, panel (b) of Figure 4 shows that the sector-reweighted employment rate of female workers with no school-age children remains persistently below male employment, even though we are not powered enough to reject that the two estimates are the same.

To identify additional contributors to the residual gender gap, we investigate in Figure A.15 the existence of heterogeneities in the effects of the pandemic by a set of baseline socio-economic and labor market characteristics.¹⁶ Results show no evidence of differential effects. The absence of heterogeneities in asset ownership suggests that the decline in female labor force participation is not driven by women who could not afford childcare or women earning less than their partners. Additionally, a higher fear of infection with COVID-19 slows down the recovery for workers of both gender. Alternative explanations, then, include women complying more with COVID-19 restrictions (Galasso et al. 2020, Orefice et al. 2021), employers' discrimination in layoffs and hirings, and social norms reducing female attachment to the labor market (Jayachandran 2020). Understanding the residual forces behind the rise and the persistence of the employment gender gap will be essential in designing effective countermeasures.

¹⁶We replicate the analysis detailed in Footnote 10 further refining by gender.

Figure 4: Decomposing the Gender Gap in Employment



Notes: Panel (a) illustrates average employment rates over time for male respondents, female respondents, and sector-reweighted female respondents. Sector-reweighted female employment rate is equal to female employment rate when weighting the female sample so that the first moment of $Hit\ Sector_i$, an indicator for whether pre-pandemic the respondent was employed in a severely hit sector (i.e., a sector in which more than 50% of the businesses in which our workers were wage- or self-employed pre-pandemic were closed during the first lockdown in May 2020), matches that in the male sample. Panel (b) illustrates average employment rates over time for male respondents, female respondents, children-reweighted female respondents, and sector-reweighted female respondents with no school-age children. Children-reweighted female employment rate is equal to female employment rate when weighting the female sample so that the proportions of respondent with zero, one, or more than one school-age children in the household match those in the male sample. Sector-reweighted employment rate for women with no children is equal to the employment rate of women with no school-age children when weighting the sample of women with no school-age children so that the first moment of $Hit\ Sector_i$ matches that in the sample of men with no children. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. The first data point refers to the respondents' first job after completing vocational education. It may coincide with the job in January 2020 and its start and end date may be different for each respondent. The data point referring to the first job can be interpreted as an indicator for individuals who ever worked after completing vocational education. 95% robust confidence intervals are reported.

5 Conclusions

We analyze the gendered labor market effects of the COVID-19 induced restrictions on a sample of young and skilled Ugandan paid workers and entrepreneurs working in a wide range of vocational industries. We rely on a unique high-frequency panel dataset spanning the course of the pandemic, with which we are able to identify both short- and long- term responses to the two lockdowns implemented in Uganda. These restrictions reduced female employment disproportionately more than male employment, shifted female workers into sectors misaligned with their skill sets, and widened the gender pay gap. While men quickly went back to their pre-pandemic labor market trajectories, women found more precarious occupations or were definitively detached from the labor market. To explain the uneven impacts and recovery, we formally decomposed gender differences in employment levels to quantify the role that pre-epidemic sorting in highly hit sectors and increased childcare responsibilities due to prolonged schools' closure played in Uganda. We find that these factors explain up to 57% of the employment gap, part of which remains unexplained. Taken together, these findings indicate that hard-earned progress towards women's employment and earnings parity can be set back by temporary shocks.

Our sample represents a small yet growing share of the Ugandan population. Given the importance of this population for the country's transition into a middle-income economy, the persistence of employment and wage gaps eighteen months from the onset of the pandemic in Uganda should be of great concern to policymakers. The decline in skilled female labor force participation and the sectorial misallocation induced by the pandemic may slow the growth of salaried workers and larger businesses than the prevailing micro-enterprises. Given the precarious nature of economic development, Ugandan stakeholders should prioritize policies supporting women seeking to reenter, preserving employment linkages, and directing targeted support for enterprises in economic sectors with higher female representation.

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Declaration of Interests

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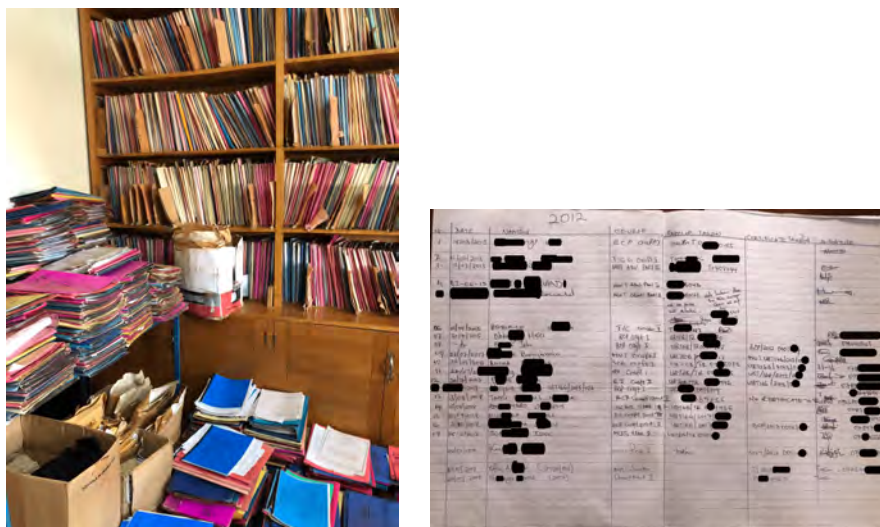
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Appendix

Figure A.1: Sample Construction - Records Digitization



Notes: Of the 1,368 alumni for whom we found a registry entry, we successfully contacted 714. We consider the tracking rate of 51% a success: the quality of the contact information collected by the VTIs is generally poor and outdated. Additionally, due to the written nature and manual entry of the records, the digitization process was prone to error.

Figure A.2: Project Timeline

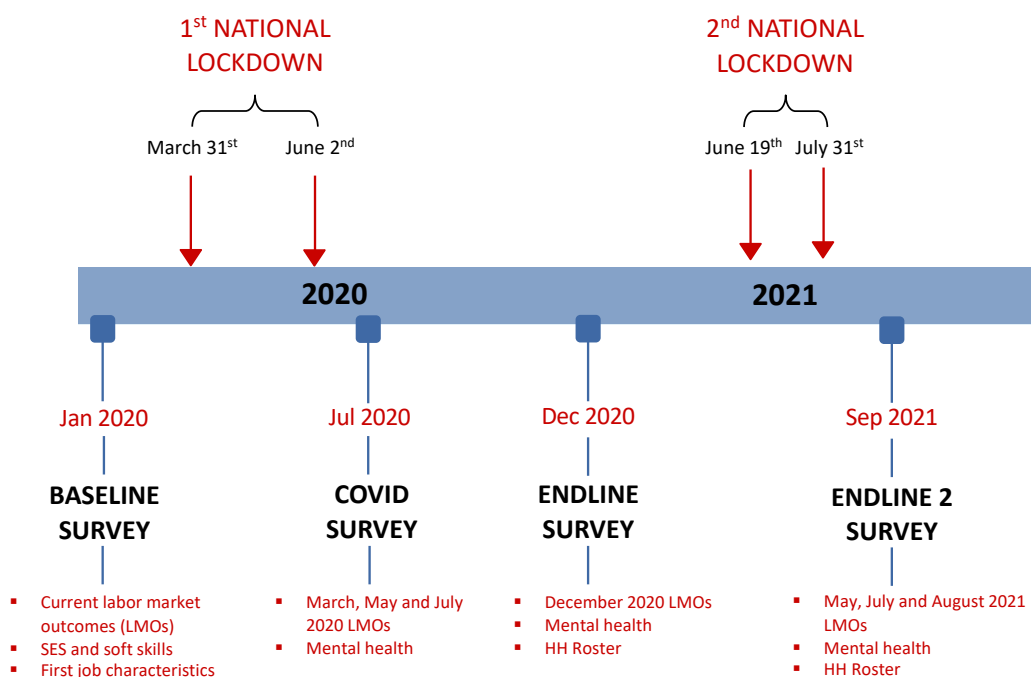


Table A.1: Attritors and Non-Attritors' Characteristics: Summary Statistics and Balance Tests

Variable	(1)		(2)		T-test
	Non-Attritors N	Mean/SE	Attritors N	Mean/SE	Difference (1)-(2)
<i>Panel A: Socio-economic characteristics</i>					
Female	456	0.379 (0.023)	258	0.473 (0.031)	-0.093**
Age	456	25.022 (0.150)	253	24.984 (0.205)	0.038
Married	316	0.361 (0.027)	87	0.368 (0.052)	-0.007
Has children	454	0.460 (0.023)	102	0.510 (0.050)	-0.049
Number of school-age children in the household	453	0.872 (0.060)	100	0.840 (0.120)	0.032
Traditional religious denomination	456	0.761 (0.020)	247	0.725 (0.028)	0.036
Ethnic minority	456	0.465 (0.023)	247	0.389 (0.031)	0.076*
House of origin: rural	456	0.518 (0.023)	106	0.481 (0.049)	0.036
Region of origin: central	452	0.341 (0.022)	253	0.423 (0.031)	-0.082**
Region of origin: eastern	452	0.440 (0.023)	253	0.415 (0.031)	0.025
Region of origin: northern	452	0.142 (0.016)	253	0.075 (0.017)	0.066***
Region of origin: western	452	0.077 (0.013)	253	0.087 (0.018)	-0.010
Caretaker's years of education	301	10.402 (0.293)	161	9.739 (0.421)	0.663
Agricultural household of origin	454	0.176 (0.018)	243	0.206 (0.026)	-0.030
Household of origin assets index	456	-0.160 (0.260)	249	0.293 (0.227)	-0.452
<i>Panel B: Labor market characteristics</i>					
Years in labor market	453	2.756 (0.105)	96	2.652 (0.215)	0.105
Wage employed	448	0.565 (0.023)	243	0.539 (0.032)	0.026
Self employed	448	0.194 (0.019)	243	0.243 (0.028)	-0.049
Permanent job	245	0.747 (0.028)	126	0.865 (0.031)	-0.118***
Formal firm	325	0.440 (0.028)	180	0.500 (0.037)	-0.060
Enrolled in further education	448	0.060 (0.011)	243	0.033 (0.011)	0.027
Involved in casual occupation	448	0.060 (0.011)	243	0.037 (0.012)	0.023
Other not wage and self employed	448	0.121 (0.015)	243	0.148 (0.023)	-0.028

Notes: The table reports summary statistics for a set of baseline socio-economic and labor market characteristics separately for non-attritors (i.e., respondents found in all the four survey rounds) and attritors (i.e., respondents found in fewer than four survey rounds). The table also tests for difference in means between the two groups of respondents. The indicator for whether the respondent has children is measured in July 2020 and the variable for number of school-age children in the household is measured in September 2021. The ethnic minority indicator takes value one for the respondents who do not belong to the Muganda or Musoga tribes but to one of 35 other tribes. The traditional religious denominations indicator takes value one for respondents belonging to the Anglican, Muslim or Catholic faith. The caretaker education level is calculated as the highest educational level among the two main caretakers the respondent had while growing up. The respondent's household of origin is considered as "agricultural" if its main source of income is subsistence or commercial agriculture. Only work experience accumulated post vocational training counts towards the years active in the labor market.

Table A.2: Female Attritors and Non-Attritors' Characteristics: Summary Statistics and Balance Tests

Variable	(1)		(2)		T-test Difference (1)-(2)
	Female N	Non-Attritors Mean/SE	Female N	Attritors Mean/SE	
<i>Panel A: Socio-economic characteristics</i>					
Age	173	24.150 (0.221)	118	24.059 (0.275)	0.091
Married	125	0.368 (0.043)	46	0.304 (0.069)	0.064
Has children	172	0.500 (0.038)	46	0.543 (0.074)	-0.043
Number of school-age children in the household	171	1.199 (0.102)	44	1.295 (0.194)	-0.097
Traditional religious denomination	173	0.746 (0.033)	116	0.664 (0.044)	0.082
Ethnic minority	173	0.474 (0.038)	116	0.345 (0.044)	0.129**
House of origin: rural	173	0.503 (0.038)	57	0.421 (0.066)	0.082
Region of origin: central	171	0.409 (0.038)	119	0.420 (0.045)	-0.011
Region of origin: eastern	171	0.368 (0.037)	119	0.454 (0.046)	-0.085
Region of origin: northern	171	0.146 (0.027)	119	0.059 (0.022)	0.087**
Region of origin: western	171	0.076 (0.020)	119	0.067 (0.023)	0.009
Caretaker's years of education	111	10.658 (0.478)	79	10.595 (0.559)	0.063
Agricultural household of origin	172	0.203 (0.031)	114	0.184 (0.036)	0.019
Household of origin assets index	173	-0.063 (0.418)	118	0.151 (0.364)	-0.213
<i>Panel B: Labor market characteristics</i>					
Years in labor market	173	2.654 (0.174)	52	2.367 (0.296)	0.287
Wage employed	170	0.559 (0.038)	112	0.491 (0.047)	0.068
Self employed	170	0.206 (0.031)	112	0.259 (0.042)	-0.053
Permanent job	94	0.851 (0.037)	53	0.887 (0.044)	-0.036
Formal firm	123	0.455 (0.045)	80	0.512 (0.056)	-0.057
Enrolled in further education	170	0.065 (0.019)	112	0.036 (0.018)	0.029
Involved in casual occupations	170	0.041 (0.015)	112	0.018 (0.013)	0.023
Other not wage and self employed	170	0.129 (0.026)	112	0.196 (0.038)	-0.067

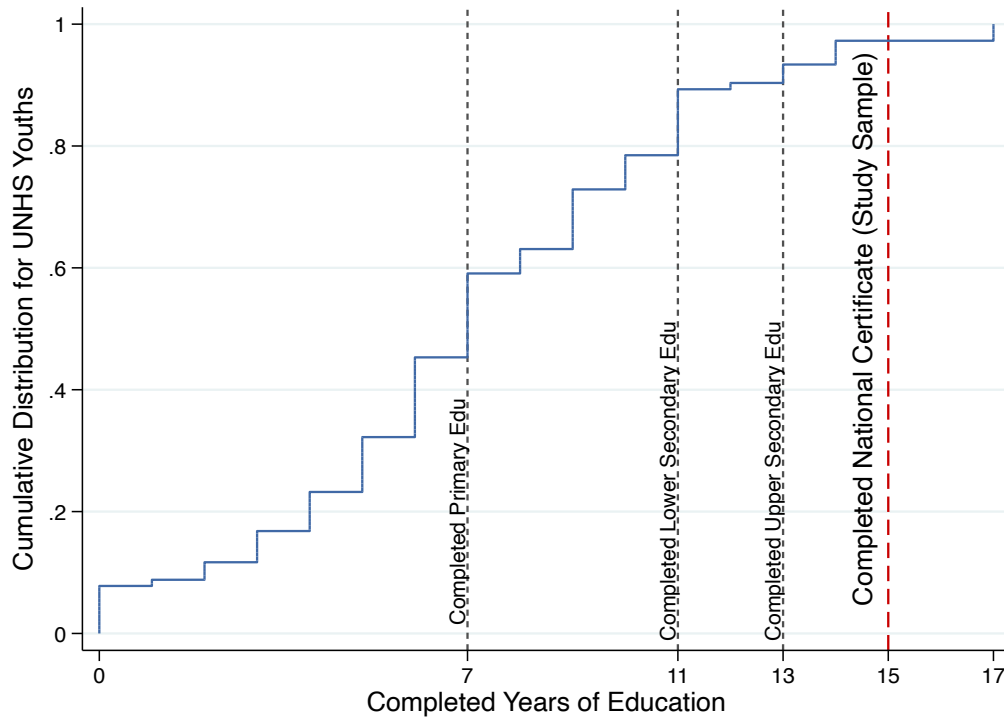
Notes: The table reports summary statistics for a set of baseline socio-economic and labor market characteristics separately for female non-attritors (i.e., respondents found in all the four survey rounds) and female attritors (i.e., respondents found in fewer than four survey rounds). The table also tests for difference in means between the two groups of respondents. The indicator for whether the respondent has children is measured in July 2020 and the variable for number of children in the household is measured in September 2021. The ethnic minority indicator takes value one for the respondents who do not belong to the Muganda or Musoga tribes but to one of 35 other tribes. The traditional religious denominations indicator takes value one for respondents belonging to the Anglican, Muslim or Catholic faith. The caretaker education level is calculated as the highest educational level among the two main caretakers the respondent had while growing up. The respondent's household of origin is considered as "agricultural" if its main source of income is subsistence or commercial agriculture. Only work experience accumulated post vocational training counts towards the years active in the labor market.

Table A.3: Attrition Magnitude and Timing by Gender

Variable	N	(1) Male	N	(2) Female	T-test Difference (1)-(2)
		Mean/SE		Mean/SE	
Found in Jan 2020	419	0.995 (0.003)	295	0.983 (0.008)	0.012
Found in Jul 2020	419	0.869 (0.017)	295	0.851 (0.021)	0.018
Found in Dec 2020	419	0.792 (0.020)	295	0.776 (0.024)	0.016
Found in Sep 2021	419	0.811 (0.019)	295	0.749 (0.025)	0.062**

Notes: The table reports summary statistics and tests for gender differences in means for four indicators summarizing the presence of the respondent in each of the four survey rounds.

Figure A.3: Educational Attainment of Ugandan Youths from UNHS and Study Sample



Notes: This figure shows the cumulative distribution function of years of education for the population of Ugandan adults aged 18–39 from the Uganda National Household Survey 2016/2017 (UNHS). The UNHS samples of young adults is reweighted so that its age and gender distributions matches that of the study sample. The four dashed lines indicate the number of years of education corresponding to completing primary education (7), completing lower secondary education (11), completing upper secondary education (13) and completing the National Certificate program at a Vocational Training Institute (15). The latter corresponds to the minimum education level attained by the respondents in our sample.

Table A.4: External Validity: Socio-economic and Labor Market Characteristics

	(1) Mean Young Adults UNHS	(2) Mean VTI Graduates UNHS	(3) Mean Study Sample	(4) Difference (3)-(1)	(5) P-value (3)-(1)	(5) Difference (3)-(2)	(6) P-value (3)-(2)
<i>Full sample</i>							
Female	0.410	0.410	0.413	0.000	0.999	0.000	0.998
Age	25.021	25.014	25.008	-0.013	0.918	-0.006	0.976
Married	0.595	0.468	0.362	-0.229***	0.000	-0.102***	0.003
Completed primary school	0.620	1.000	1.000	0.380***	0.000	-0.000	1.000
Completed secondary school	0.182	1.000	1.000	0.818***	0.000	-0.000	1.000
Completed vocational training	0.051	1.000	1.000	0.949***	0.000	-0.000	1.000
Any work in last 7 days - no Ag	0.476	0.690	0.742	0.265***	0.000	0.052**	0.075
Any work in last 7 days - Ag included	0.782	0.797	0.767	-0.016	0.335	-0.030	0.251
Monthly earnings (USD) - wage employed	71.174	89.940	104.518	33.377***	0.000	14.611**	0.024
<i>Female sample</i>							
Age	24.113	24.115	24.113	-0.000	1.000	-0.001	0.997
Married	0.671	0.561	0.351	-0.314***	0.000	-0.204***	0.000
Completed primary school	0.587	1.000	1.000	0.413***	0.000	-0.000	1.000
Completed secondary school	0.142	1.000	1.000	0.858***	0.000	-0.000	1.000
Completed vocational training	0.046	1.000	1.000	0.954***	0.000	-0.000	1.000
Any work in last 7 days - no Ag	0.328	0.617	0.745	0.415***	0.000	0.126***	0.004
Any work in last 7 days - Ag included	0.692	0.704	0.759	0.066**	0.013	0.054	0.204
Monthly earnings (USD) - wage employed	55.318	77.090	84.948	29.532***	0.000	7.760	0.534
<i>Male sample</i>							
Age	25.632	25.632	25.632	-0.000	0.999	-0.000	0.999
Married	0.563	0.418	0.371	-0.190***	0.000	-0.046	0.319
Completed primary school	0.652	1.000	1.000	0.348***	0.000	0.000	1.000
Completed secondary school	0.212	1.000	1.000	0.788***	0.000	0.000	1.000
Completed vocational training	0.056	1.000	1.000	0.944***	0.000	0.000	1.000
Any work in last 7 days - no Ag	0.585	0.746	0.741	0.155***	0.000	-0.005	0.900
Any work in last 7 days - Ag included	0.847	0.863	0.773	-0.075***	0.000	-0.091***	0.005
Monthly earnings (USD) - wage employed	77.622	97.513	117.807	40.185***	0.000	20.294***	0.008

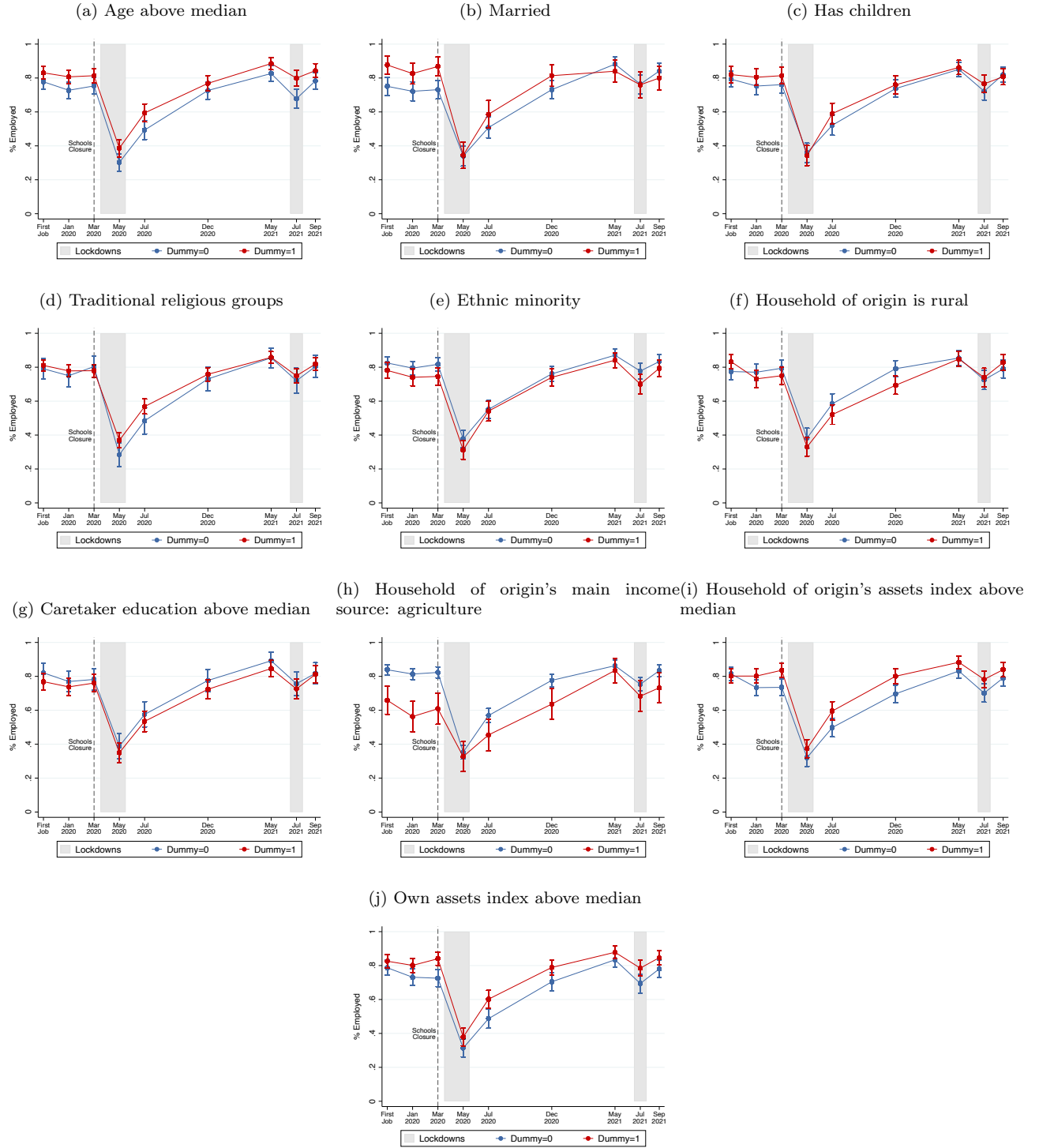
Notes: The table compares our sample with the population of Ugandan adults aged 18–39 and the subpopulation that completed post-secondary vocational education from the Uganda National Household Survey 2016/2017 (UNHS). The table reports sample means for a set of socio-economic and labor market characteristics, differences in means across the samples, and p-values for the test that the differences are statistically different from zero. The UNHS samples of young adults and VTI graduates are reweighted so that their age and gender distribution matches that of the study sample. The variable “Any work in the last seven days” refers to individuals who worked for pay, run a business, helped out in business or were apprentices in the previous week. Average monthly earnings are available only for wage employed respondents.

Table A.5: External Validity: Sector Relevance and Gender Composition Nationwide

	(1) Young Adults UNHS % All	(2) % Female	(3) % Male	(4) VTI Graduates UNHS % All	(5) % Female	(6) % Male	(7) Study Sample % All	(8) % Female	(9) % Male
Food and hospitality	0.044	0.524	0.476	0.049	0.349	0.651	0.122	0.757	0.243
Tailoring	0.006	0.600	0.400	0.006	0.794	0.206	0.073	0.976	0.024
Electrical work	0.001	0.115	0.885	0.006	0.218	0.782	0.174	0.070	0.930
Motor-mechanics	0.011	0.072	0.928	0.016	0.041	0.959	0.162	0.043	0.957
Construction	0.037	0.004	0.996	0.035	0.016	0.984	0.051	0.103	0.897
Plumbing	0.001	0.000	1.000	0.003	0.000	1.000	0.075	0.047	0.953
Retail	0.137	0.441	0.559	0.133	0.637	0.363	0.077	0.545	0.455
Secretary and accounting	0.006	0.408	0.592	0.011	0.591	0.409	0.037	0.905	0.095
Teaching (pre-primary and primary)	0.024	0.470	0.530	0.171	0.495	0.505	0.085	0.898	0.102
Hairdressing	0.013	0.425	0.575	0.019	0.593	0.407	0.031	0.889	0.111
Agriculture	0.528	0.444	0.556	0.158	0.320	0.680	0.030	0.235	0.765
Machining and fitting	0.006	0.034	0.966	0.012	0.000	1.000	0.007	0.250	0.750
Other unskilled	0.099	0.153	0.847	0.141	0.204	0.796	0.042	0.333	0.667
Other skilled	0.086	0.270	0.730	0.240	0.380	0.620	0.035	0.350	0.650

Notes: The table compares our sample (columns 7, 8 and 9) with the population of Ugandan adults aged 18–39 (columns 1, 2 and 3) and the subgroup that completed post-secondary vocational education (columns 4, 5 and 6) from the Uganda National Household Survey 2016/2017 (UNHS). Columns 1, 4 and 7 show the percentage of the considered population employed in each sector of the economy. Columns 2, 5 and 8 and 3, 6 and 9 show the gender composition of the considered population in each sector. The UNHS samples of young adults and VTI graduates are reweighted so that their age and gender distribution matches that of the study sample.

Figure A.4: Heterogeneities in Effect of Lockdowns on Employment by Socio-Demographics



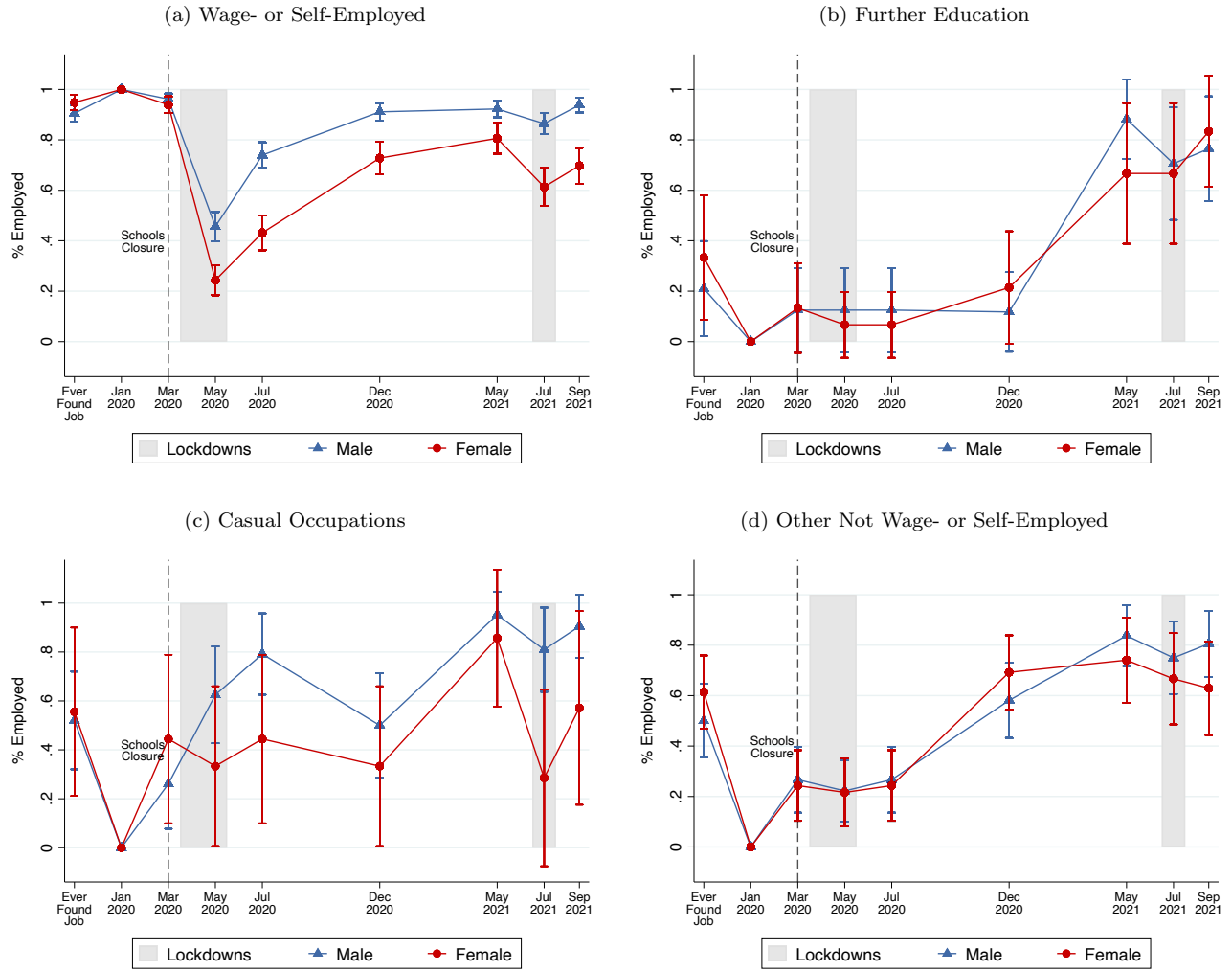
Notes: The figure illustrates average employment rates for respondents with different socio-economic characteristics over time. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. The first data point refers to the respondents' first job after completing vocational education. It may coincide with the job in January 2020 and its start and end date may be different for each respondent. The data point referring to the first job can be interpreted as an indicator for individuals who ever worked after completing vocational education. 95% robust confidence intervals are reported.

Table A.6: The Emergence and Persistence of Gender Disparities After the Lockdowns–Magnitudes

Variable	(1) Female		(2) Male		T-test Difference (1)–(2)
	N	Mean/SE	N	Mean/SE	
First Job	291	0.828 (0.022)	415	0.790 (0.020)	0.038
Employed, Jan20	282	0.759 (0.026)	409	0.773 (0.021)	-0.014
Employed, Mar20	265	0.770 (0.026)	377	0.796 (0.021)	-0.026
Employed, May20	265	0.234 (0.026)	378	0.426 (0.025)	-0.192***
Employed, Jul20	265	0.381 (0.030)	379	0.662 (0.024)	-0.281***
Employed, Dec20	253	0.676 (0.029)	360	0.800 (0.021)	-0.124***
Employed, May21	221	0.774 (0.028)	340	0.912 (0.015)	-0.138***
Employed, Jul21	219	0.598 (0.033)	339	0.835 (0.020)	-0.237***
Employed, Aug21	218	0.674 (0.032)	339	0.906 (0.016)	-0.231***
Employed in Sector of Training Employed, First Job	211	0.834 (0.026)	299	0.809 (0.023)	0.025
Employed in Sector of Training Employed, Jan20	214	0.715 (0.031)	316	0.753 (0.024)	-0.038
Employed in Sector of Training Employed, Mar20	204	0.716 (0.032)	299	0.776 (0.024)	-0.060
Employed in Sector of Training Employed, May20	53	0.491 (0.069)	143	0.776 (0.035)	-0.286***
Employed in Sector of Training Employed, Jul20	101	0.554 (0.050)	249	0.723 (0.028)	-0.168***
Employed in Sector of Training Employed, Dec20	135	0.607 (0.042)	235	0.762 (0.028)	-0.154***
Employed in Sector of Training Employed, May21	162	0.574 (0.039)	298	0.738 (0.026)	-0.164***
Employed in Sector of Training Employed, Jul21	121	0.512 (0.046)	270	0.707 (0.028)	-0.195***
Employed in Sector of Training Employed, Aug21	136	0.500 (0.043)	292	0.736 (0.026)	-0.236***
Employed in Skilled Sector Employed, First Job	241	0.784 (0.027)	328	0.799 (0.022)	-0.015
Employed in Skilled Sector Employed, Jan20	214	0.846 (0.025)	316	0.851 (0.020)	-0.005
Employed in Skilled Sector Employed, Mar20	204	0.838 (0.026)	300	0.883 (0.019)	-0.045
Employed in Skilled Sector Employed, May20	62	0.516 (0.064)	161	0.764 (0.034)	-0.248***
Employed in Skilled Sector Employed, Jul20	101	0.713 (0.045)	251	0.865 (0.022)	-0.152***
Employed in Skilled Sector Employed, Dec20	171	0.614 (0.037)	288	0.701 (0.027)	-0.087*
Employed in Skilled Sector Employed, May21	171	0.778 (0.032)	310	0.855 (0.020)	-0.077**
Employed in Skilled Sector Employed, Jul21	131	0.695 (0.040)	283	0.820 (0.023)	-0.125***
Employed in Skilled Sector Employed, Aug21	147	0.687 (0.038)	307	0.831 (0.021)	-0.144***
Earnings (USD) Employed, First Job	234	62.118 (2.795)	316	83.610 (3.311)	-21.492***
Earnings (USD) Employed, Jan20	110	84.948 (4.798)	162	117.807 (5.397)	-32.859***
Earnings (USD) Employed, May20	46	88.590 (30.846)	101	82.380 (6.847)	6.210
Earnings (USD) Employed, Dec20	145	66.122 (5.863)	255	142.201 (11.683)	-76.079***
Earnings (USD) Employed, May21	152	78.316 (6.303)	286	146.863 (15.797)	-68.546***
Earnings (USD) Employed, Jul21	111	47.428 (10.055)	258	108.886 (9.462)	-61.458***
Earnings (USD) Employed, Aug21	122	64.278 (6.377)	277	131.662 (9.639)	-67.384***

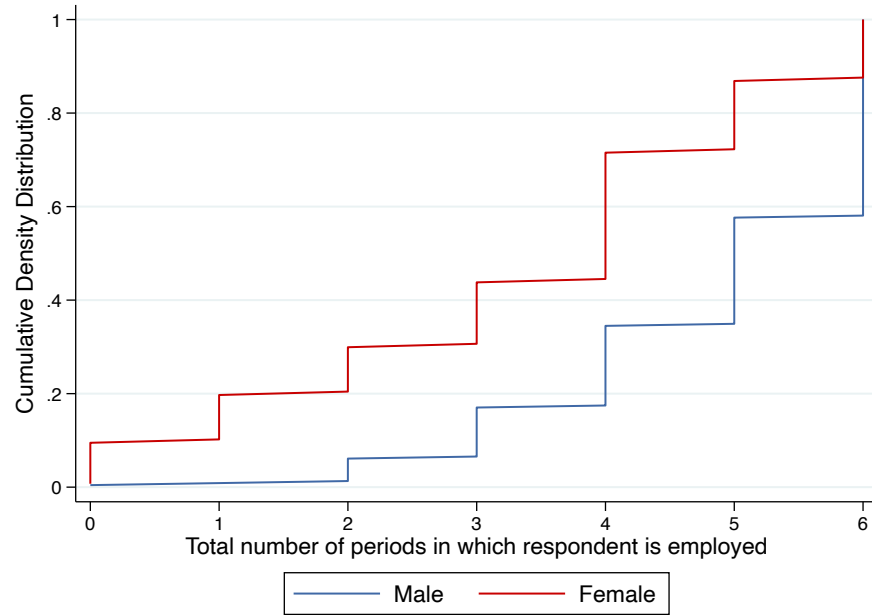
Notes: The table reports summary statistics and tests for gender differences in each point of time for our main outcomes: employment, employment in the sector of training conditional on employment, employment in a skilled sector conditional on employment, and monthly earnings conditional on employment.

Figure A.5: The Evolution of Employment Rate by Baseline Occupation Type



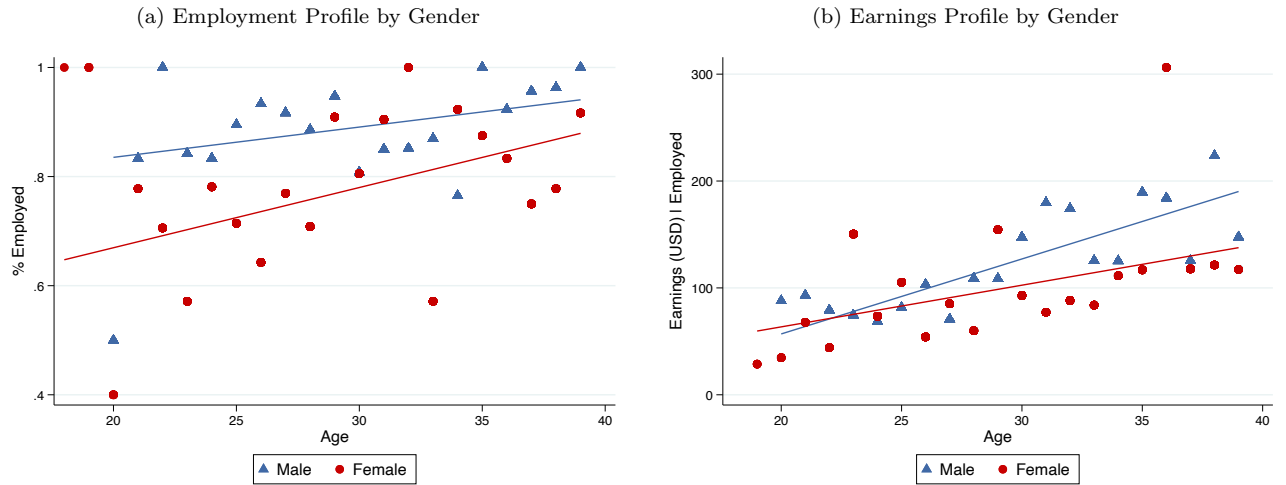
Notes: The figure illustrates the average share of employed respondents that at baseline (in January 2020) were wage- or self-employed (panel [a]), were enrolled in educational programs, (panel [b]), were engaged in casual occupations (panel [c]), and had none of these occupations (panel [d]), over time and by gender. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. The first data point refers to the respondents' first activity after completing vocational education. It may coincide with the activity in January 2020 and its start and end date may be different for each respondent. 95% robust confidence intervals are reported.

Figure A.6: Employment Frequency During the COVID-19 Pandemic (May 2020-Sep 2021)



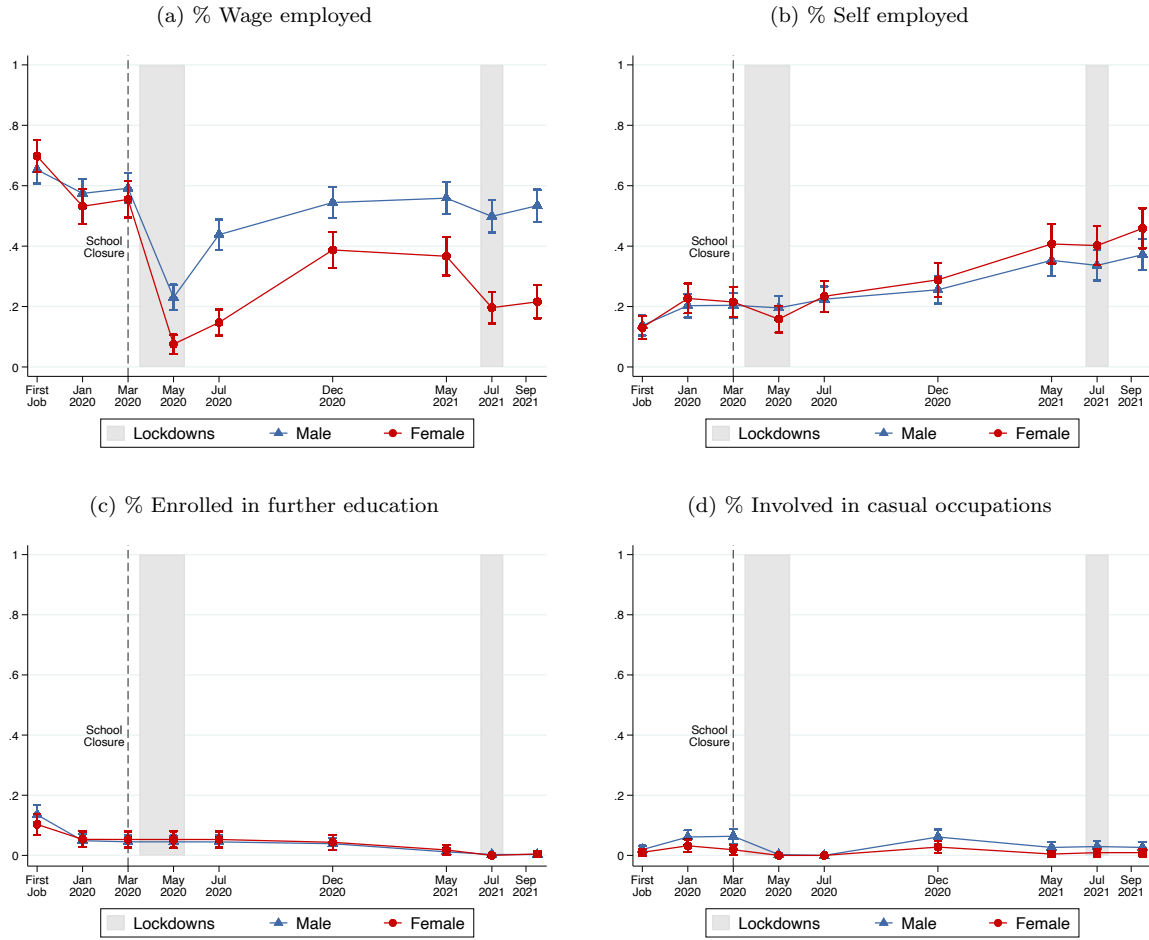
Notes: The figure illustrates the cumulative density function of the total number of periods in which a respondent was employed between May 2020 and September 2021. The sample is restricted to non-attriters, i.e., respondents we found in all survey rounds.

Figure A.7: Vocational Graduates' Careers in the UNHS



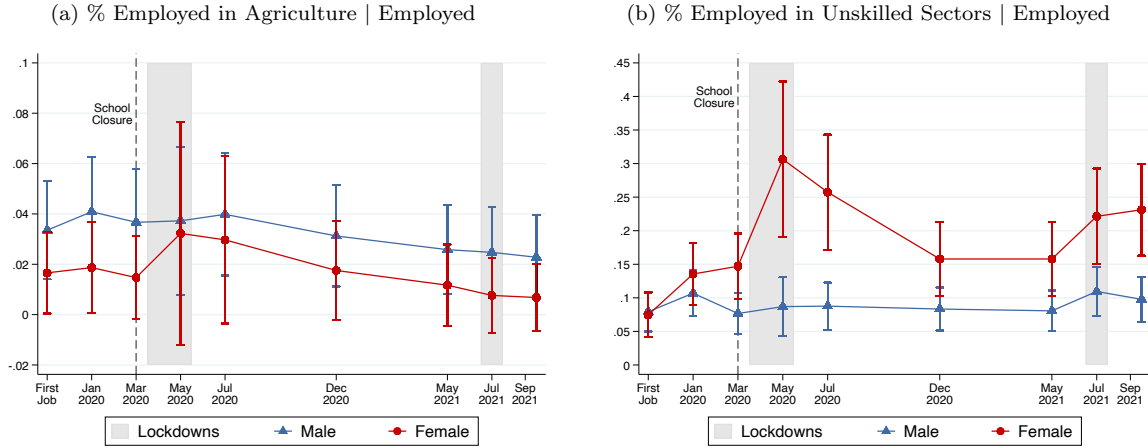
Notes: This figure shows average employment (panel [a]) and monthly earnings (panel [b]) by age, and a fitted line, for female and male respondents that completed post-secondary vocational education from the Uganda National Household Survey 2016/2017 (UNHS). The UNHS samples of VTI graduates is reweighted so that its age and gender distribution matches that of the study sample.

Figure A.8: The Emergence and Persistence of Gender Disparities After the Lockdowns by Type of Activity



Notes: The figure illustrates the average share of wage employed respondents (panel [a]), self-employed respondents (panel [b]), respondents enrolled in educational programs (panel [c]) and respondents engaged in casual occupations (panel [d]) over time and by gender. The first data point refers to the respondents' first activity after completing vocational education. It may coincide with the activity in January 2020 and its start and end date may be different for each respondent. 95% robust confidence intervals are reported.

Figure A.9: The Emergence of Gender Disparities in Skilled Employment After the Lockdowns



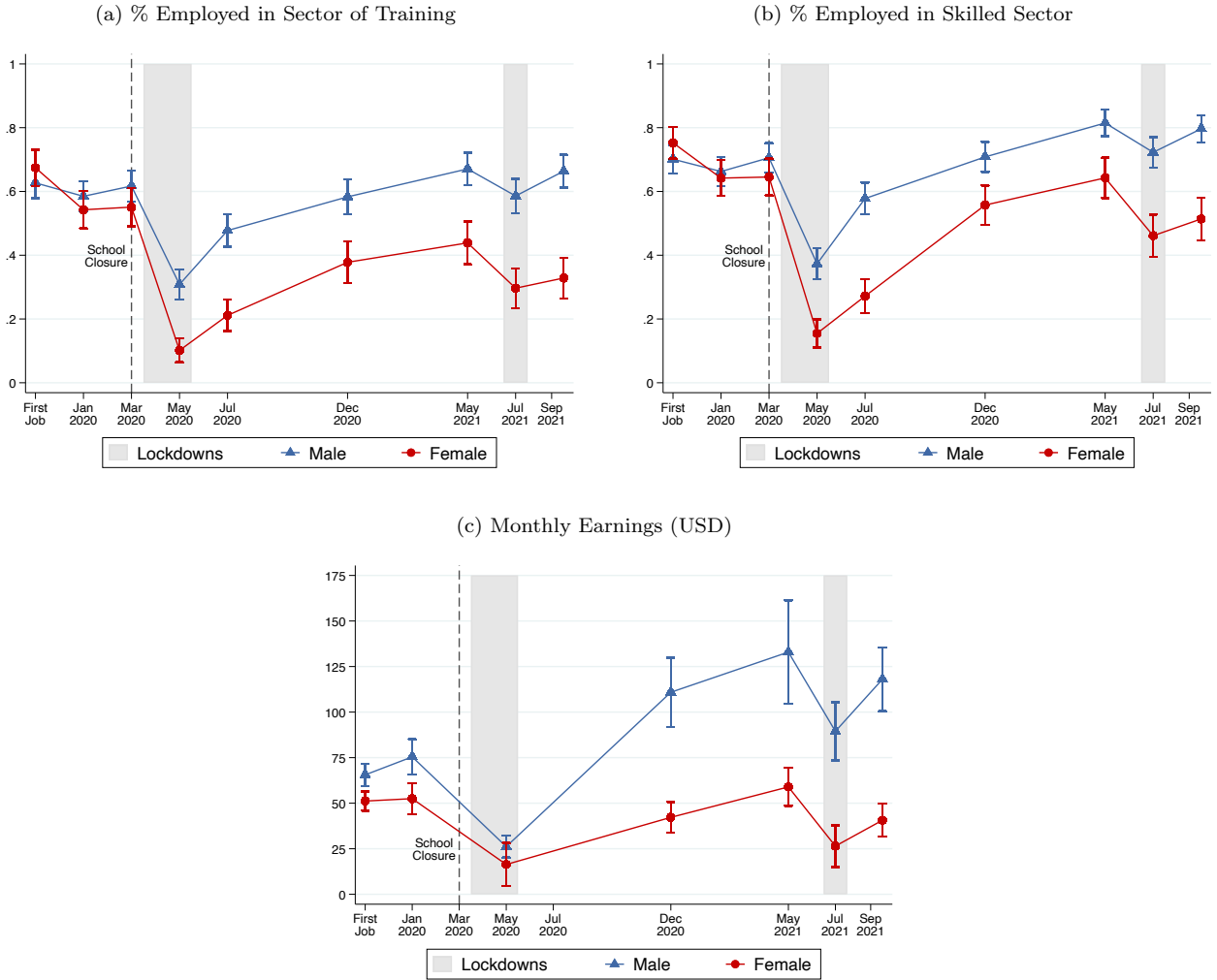
Notes: The figure illustrates the average share of respondents employed in agriculture (panel [a]) and in non-agricultural unskilled sectors (panel [b]) conditional on being employed over time and by gender. The first data point refers to the respondents' first activity after completing vocational education. It may coincide with the activity in January 2020 and its start and end date may be different for each respondent. 95% robust confidence intervals are reported.

Table A.7: The Effects of Lockdowns on Hours Worked, Borrowing, Selling Assets, Mental Health, Ability to Work

Variable	(1) Male		(2) Female		T-test Difference (1)-(2)
	N	Mean/SE	N	Mean/SE	
Business reduced hours of operation (Jul20)	160	0.812 (0.031)	77	0.818 (0.044)	-0.006
Self-employed: reduced working hours (Jul20)	21	0.476 (0.112)	12	0.583 (0.149)	-0.107
Wage-employed: reduced working hours (Jul20)	32	0.344 (0.085)	24	0.458 (0.104)	-0.115
Hours worked (May21)	310	9.681 (0.113)	170	9.753 (0.178)	-0.072
Hours worked (Jul21)	283	8.830 (0.147)	131	8.435 (0.213)	0.395
Hours worked (December 2021)	307	9.684 (0.118)	147	9.320 (0.209)	0.364
Since lockdown borrowed money to cover living expenses (Jul20)	309	0.184 (0.022)	200	0.145 (0.025)	0.039
In the next two weeks will money to cover living expenses (Jul20)	309	0.107 (0.018)	200	0.090 (0.020)	0.017
In the last four months borrowed money to cover living expenses (Dec20)	326	0.261 (0.024)	226	0.230 (0.028)	0.031
Borrowed money to cope with second lockdown (Sept21)	108	0.102 (0.029)	80	0.200 (0.045)	-0.098*
Sold assets as result to COVID-19 (Jul20)	376	0.152 (0.019)	265	0.132 (0.021)	0.020
Self-employed: sold assets to cope with second lockdown (Sept21)	108	0.019 (0.013)	80	0.000 (0.000)	0.019
Wage-employed: sold assets to cope with second lockdown (Sept21)	189	0.026 (0.012)	80	0.013 (0.013)	0.014
Anxious due to COVID-19 outbreak (Jul20)	364	0.764 (0.022)	252	0.849 (0.023)	-0.085***
Anxious due to COVID-19 outbreak (Dec20)	326	0.653 (0.026)	226	0.743 (0.029)	-0.090**
Anxious due to COVID-19 outbreak (Sept21)	339	0.732 (0.024)	217	0.797 (0.027)	-0.066*
Schools closure affected ability to work through childcare, scale 0-10 (Sept21)	338	0.964 (0.127)	217	2.336 (0.215)	-1.372***

Notes: The table reports summary statistics by gender and tests gender differences for a set of outcomes. The survey round in which the outcomes are measured is reported in parenthesis.

Figure A.10: The Emergence and Persistence of Gender Disparities After the Lockdowns (Unconditional Outcomes)



Notes: The figure illustrates average unconditional employment rate in the sector of training conditional on employment (panel [a]); unconditional employment rate in a skilled sector (panel [b]); and unconditional monthly earnings (panel [c]); over time and by gender. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. The outcome variables are coded as zero for non-employed respondents, and the average outcome in each point of time is calculated over all the respondents. The first data point refers to the respondents' first job after completing vocational education. It may coincide with the job in January 2020 and its start and end date may be different for each respondent. Skilled occupations include motor-mechanics, plumbing, hospitality, hairdressing, construction, electrical work, welding, carpentry, teaching, secretary and accounting, machining and fitting, and a residual skilled category. Earnings data were not collected in March and July 2020. In January 2020 and May 2020 respondents placed their earnings in a 15 USD bracket. We use the range midpoint. From December 2020 onwards earnings were asked as a continuous variable. For self-employed workers, the variable measures monthly profits, collected following the same procedure. 95% robust confidence intervals are reported.

Figure A.11: Gendered Effect of Lockdowns on Employment, Leaving Out one Training Area at a Time and in the Balanced Panel

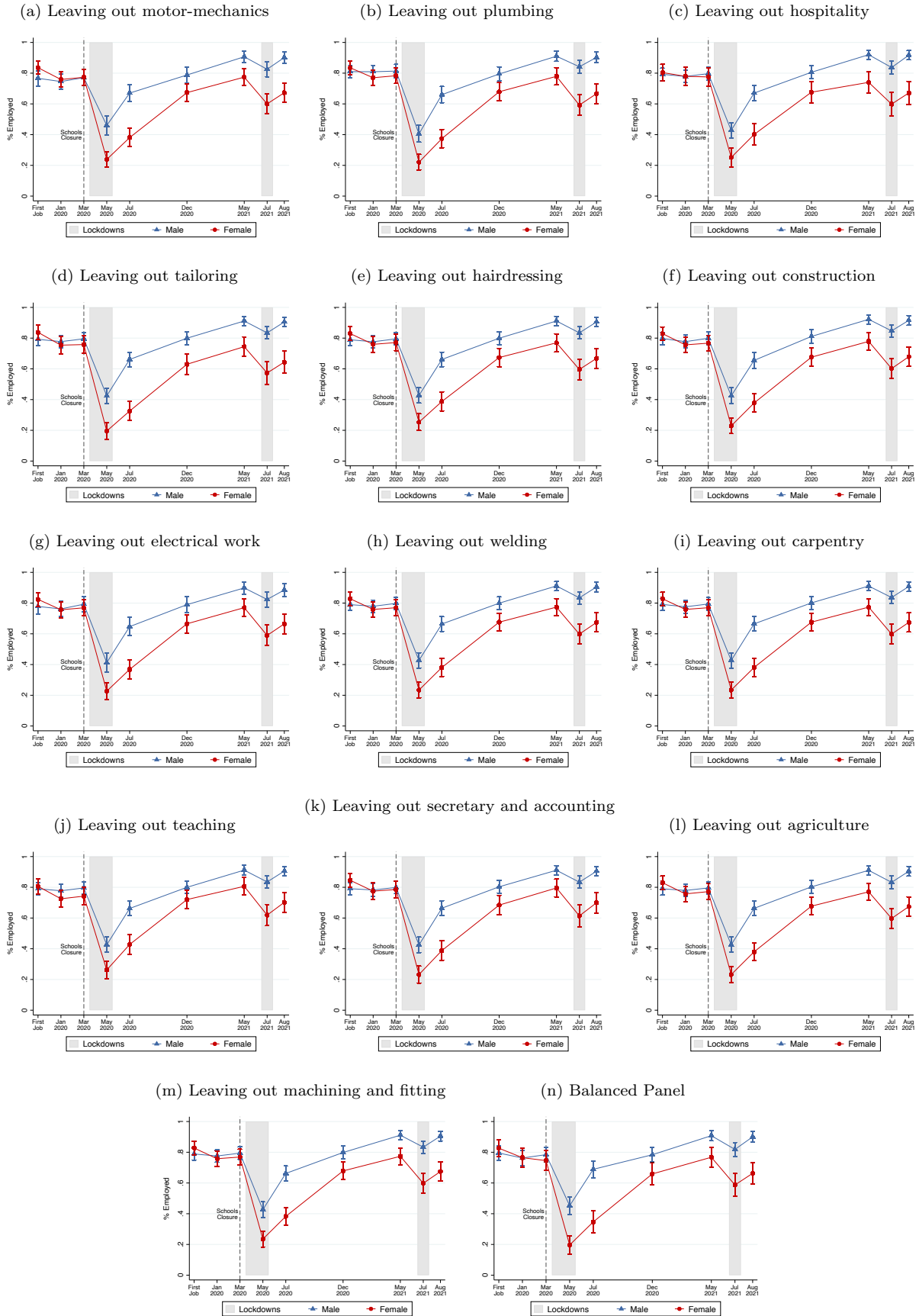


Table A.8: The Emergence and Persistence of Gender Disparities After the Lockdowns—Magnitudes After Controlling for Unbalanced Baseline Variables

Variable	(1) Female		(2) Male		T-test Difference (1)-(2)
	N	Mean/SE	N	Mean/SE	
Ever Found Job	291	0.828 (0.022)	415	0.790 (0.020)	0.038
Employed, Jan20	282	0.759 (0.026)	409	0.773 (0.021)	-0.014
Employed, Mar20	265	0.770 (0.026)	377	0.796 (0.021)	-0.026
Employed, May20	265	0.234 (0.026)	378	0.426 (0.025)	-0.192***
Employed, Jul20	265	0.381 (0.030)	379	0.662 (0.024)	-0.281***
Employed, Dec20	253	0.676 (0.029)	360	0.800 (0.021)	-0.124***
Employed, May21	221	0.774 (0.028)	340	0.912 (0.015)	-0.138***
Employed, Jul21	219	0.598 (0.033)	339	0.835 (0.020)	-0.237***
Employed, Sep21	218	0.674 (0.032)	339	0.906 (0.016)	-0.231***
Employed in Sector of Training Employed, First Job	211	0.834 (0.026)	299	0.809 (0.023)	0.025
Employed in Sector of Training Employed, Jan20	214	0.715 (0.031)	316	0.753 (0.024)	-0.038
Employed in Sector of Training Employed, Mar20	204	0.716 (0.032)	299	0.776 (0.024)	-0.060
Employed in Sector of Training Employed, May20	53	0.491 (0.069)	143	0.776 (0.035)	-0.286***
Employed in Sector of Training Employed, Jul20	101	0.554 (0.050)	249	0.723 (0.028)	-0.168*
Employed in Sector of Training Employed, Dec20	135	0.607 (0.042)	235	0.762 (0.028)	-0.154
Employed in Sector of Training Employed, May21	162	0.574 (0.039)	298	0.738 (0.026)	-0.164**
Employed in Sector of Training Employed, Jul21	121	0.512 (0.046)	270	0.707 (0.028)	-0.195*
Employed in Sector of Training Employed, Sep21	136	0.500 (0.043)	292	0.736 (0.026)	-0.236**
Employed in Skilled Sector Employed, First Job	241	0.784 (0.027)	328	0.799 (0.022)	-0.015
Employed in Skilled Sector Employed, Jan20	214	0.846 (0.025)	316	0.851 (0.020)	-0.005
Employed in Skilled Sector Employed, Mar20	204	0.838 (0.026)	300	0.883 (0.019)	-0.045
Employed in Skilled Sector Employed, May20	62	0.516 (0.064)	161	0.764 (0.034)	-0.248***
Employed in Skilled Sector Employed, Jul20	101	0.713 (0.045)	251	0.865 (0.022)	-0.152*
Employed in Skilled Sector Employed, Dec20	171	0.614 (0.037)	288	0.701 (0.027)	-0.087
Employed in Skilled Sector Employed, May21	171	0.778 (0.032)	310	0.855 (0.020)	-0.077
Employed in Skilled Sector Employed, Jul21	131	0.695 (0.040)	283	0.820 (0.023)	-0.125*
Employed in Skilled Sector Employed, Sep21	147	0.687 (0.038)	307	0.831 (0.021)	-0.144
Earnings (USD) Employed, First Job	234	62.118 (2.795)	316	83.610 (3.311)	-21.492***
Earnings (USD) Employed, Jan20	110	84.948 (4.798)	162	117.807 (5.397)	-32.859***
Earnings (USD) Employed, May20	46	88.590 (30.846)	101	82.380 (6.847)	6.210
Earnings (USD) Employed, Dec20	145	66.122 (5.863)	255	142.201 (11.683)	-76.079***
Earnings (USD) Employed, May21	152	78.316 (6.303)	286	146.863 (15.797)	-68.546***
Earnings (USD) Employed, Jul21	111	47.428 (10.055)	258	108.886 (9.462)	-61.458*
Earnings (USD) Employed, Sep21	122	64.278 (6.377)	277	131.662 (9.639)	-67.384***

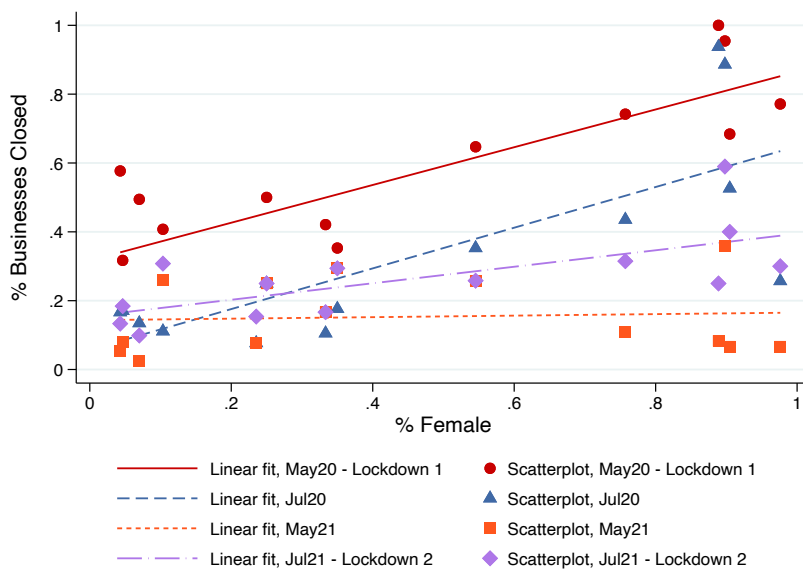
Notes: The table reports summary statistics and tests for gender differences in each point of time for our main outcomes: employment, employment in the sector of training conditional on employment, employment in a skilled sector conditional on employment, monthly earnings conditional on employment. We control for the following baseline variables that at baseline are unbalanced between genders: age, and indicator variables for respondents with Central region of origin, employed in permanent position, engaged in casual occupations, neither wage- nor self-employed.

Table A.9: The Gender Gap in Employment Under Different Assumptions on Attritors' Behavior

Gender Gap under Scenario:	May20	Jul20	Dec20	May21	Jul21	Sep21
Extreme High	-0.272*** (0.034)	-0.352*** (0.036)	-0.249*** (0.034)	-0.345*** (0.031)	-0.422 (0.033)	-0.425 (0.032)
Extreme Low	-0.072** (0.036)	-0.155*** (0.038)	0.035 (0.035)	0.087*** (0.031)	0.026 (0.035)	0.027 (0.033)
0.25 Std. Dev.	-0.163*** (0.033)	-0.240*** (0.035)	-0.112*** (0.031)	-0.112*** (0.025)	-0.170*** (0.030)	-0.165*** (0.027)
0.1 Std. Dev.	-0.158*** (0.033)	-0.233*** (0.035)	-0.099*** (0.031)	-0.096*** (0.025)	-0.153*** (0.030)	-0.149*** (0.027)

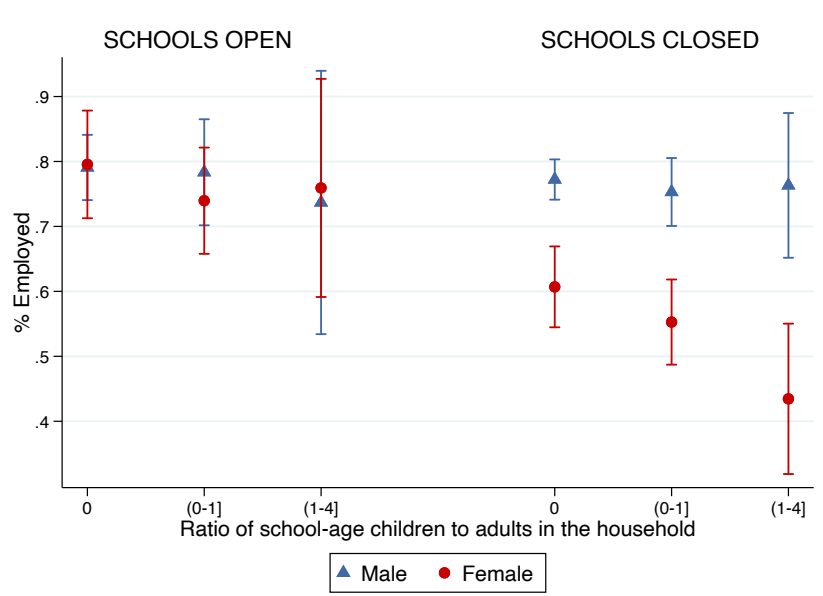
Notes: The table reports the estimated gender gap in employment in May, July, and December 2020, and May, July, and September 2021 in four scenarios about the behavior of attritors, following Horowitz et al. 2006 and Kling et al. 2007. In the *Extreme High* scenario, we assume all female attritors are unemployed and all male attritors are employed. In the *Extreme Low* scenario, we assume all female attritors are employed and all male attritors are unemployed. In the *0.25 Std. Dev.* scenario, we assume female (male) attritors are 0.25 standard deviations below (above) the mean of male (female) non-attritors. In the *0.1 Std. Dev.* scenario, we assume female (male) attritors are 0.1 standard deviations below (above) the mean of male (female) non-attritors.

Figure A.12: Female Concentration in Severely Hit Economic Sectors Over Time



Notes: The figure displays the economic sectors in which our workers were employed pre-pandemic by the share of female workers hosted before the pandemic and the share of businesses that were closed in May 2020, July 2020, May 2021, and July 2021. A linear fit was added for each period. In May and July 2021 the share of business closed is approximated by the share of non-employed respondents. This measure has been validated by comparing the share of business closed and the share of unemployed workers in previous periods, when both variables are available. The slope and standard errors (in parenthesis) of the fitted lines are: 0.55 (0.12) in May 2020; 0.59 (0.19) in July 2020; 0.02 (0.09) in May 2021; and 0.24 (0.09) in July 2021.

Figure A.13: Gender Gap in Impact of School Closure on Employment and Household Childcare Support



Notes: The figure displays the average employment rate for female and male respondents with different ratios of school-age children to adults in the households in periods in which schools were open (January and March 2020) and periods in which schools were closed (May, July and December 2020, May, July and September 2021). The higher the ratio, the heavier are childcare responsibilities. Respondents with a ratio equal to zero have no school-age children in the household. Respondents with a ratio between zero and one have more adults than school-age children in the household. Respondent with a ratio greater than one have multiple school-age children per adult in the household. School-age children are children aged 3 or more. 95% robust confidence intervals are reported.

Table A.10: Decomposing the Gender Gap in Employment: The Role of Different Sectors of Employment

	FirstJob	Jan20	Mar20	May20	Jul20	Dec20	May21	Jul21	Sep21
<i>Panel A: Raw Means and Difference</i>									
Average Male Employment	0.858	0.888	0.912	0.447	0.715	0.864	0.918	0.850	0.918
Average Female Employment	0.869	0.805	0.806	0.233	0.387	0.682	0.783	0.606	0.683
Gender Gap	-0.012	0.083	0.106	0.214	0.328	0.182	0.136	0.244	0.235
<i>Panel B: Portion of the Gap due to Different Sectors of Employment</i>									
Method: Reweighting	0.019	0.033	0.062	0.107	0.082	0.024	-0.016	0.044	0.028
Method: Oaxaca-Blinder	0.019	0.034	0.065	0.112	0.085	0.026	-0.017	0.048	0.030
Explained % Gender Gap	1.589	0.411	0.614	0.523	0.259	0.144	0.128	0.197	0.127

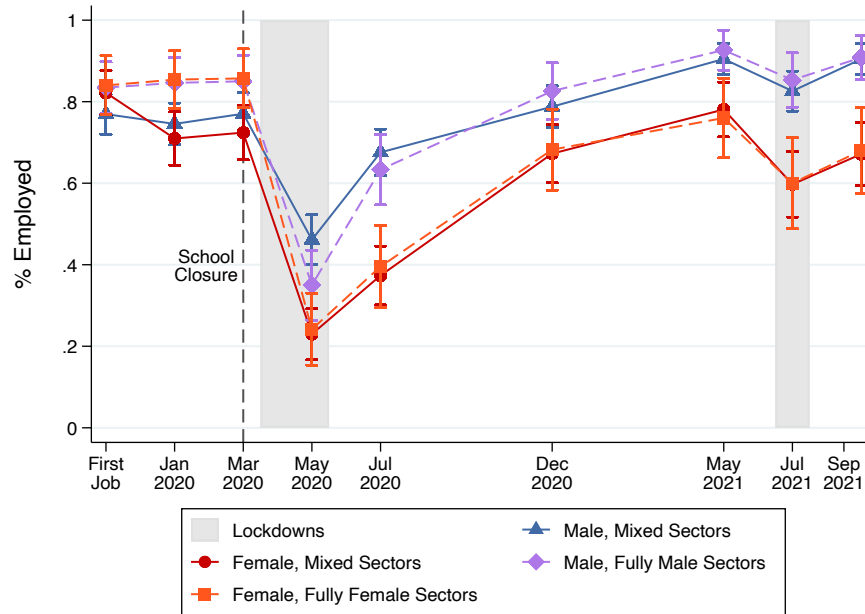
Notes: The table quantifies the part of the gender gap in employment rate explained by different sectors of employment. Panel (A) reports average employment rate by gender over time and the difference between female and male respondents. Employment rate and the gap are calculated for all respondents with non-missing pre-pandemic sector of employment (i.e., respondents that were employed either in January 2020 or March 2020 or in both). Panel (B) reports the part of the gender gap explained by different sectors of employment in absolute value and as a share of the overall gender gap. The explanatory variable is $Hit\ Sector_i$, an indicator for whether pre-pandemic the respondent was employed in a severely hit sector (i.e., a sector in which more than 50% of the businesses in which our workers were wage- or self-employed pre-pandemic were closed during the first lockdown in May 2020). We calculate the explained part of the gap in two ways. First, as the difference between average sector-reweighted female employment rate and average female employment rate in each point of time. Sector-reweighted female employment rate is equal to female employment rate when weighting the female sample so that the first moment of $Hit\ Sector_i$ matches that in the male sample. Second, using the Oaxaca-Blinder decomposition in each point of time and reporting the part of the gap due to different endowments.

Table A.11: Decomposing the Gender Gap in Employment: The Role of Different Childcare Responsibilities

	FirstJob	Jan20	Mar20	May20	Jul20	Dec20	May21	Jul21	Sep21
<i>Panel A: Raw Means and Difference</i>									
Average Male Employment	0.796	0.770	0.798	0.437	0.674	0.798	0.911	0.834	0.905
Average Female Employment	0.819	0.776	0.765	0.221	0.368	0.678	0.772	0.605	0.674
Gender Gap	-0.023	-0.005	0.033	0.217	0.306	0.120	0.139	0.229	0.231
<i>Panel B: Portion of the Gap due to Different Childcare Responsibilities</i>									
Method: Reweighting	0.012	0.004	0.020	-0.010	-0.004	0.028	0.023	0.051	0.026
Method: Oaxaca-Blinder	0.012	0.005	0.020	-0.011	-0.004	0.028	0.023	0.051	0.026
Explained % Gender Gap	0.531	0.898	0.606	0.051	0.012	0.233	0.164	0.222	0.113

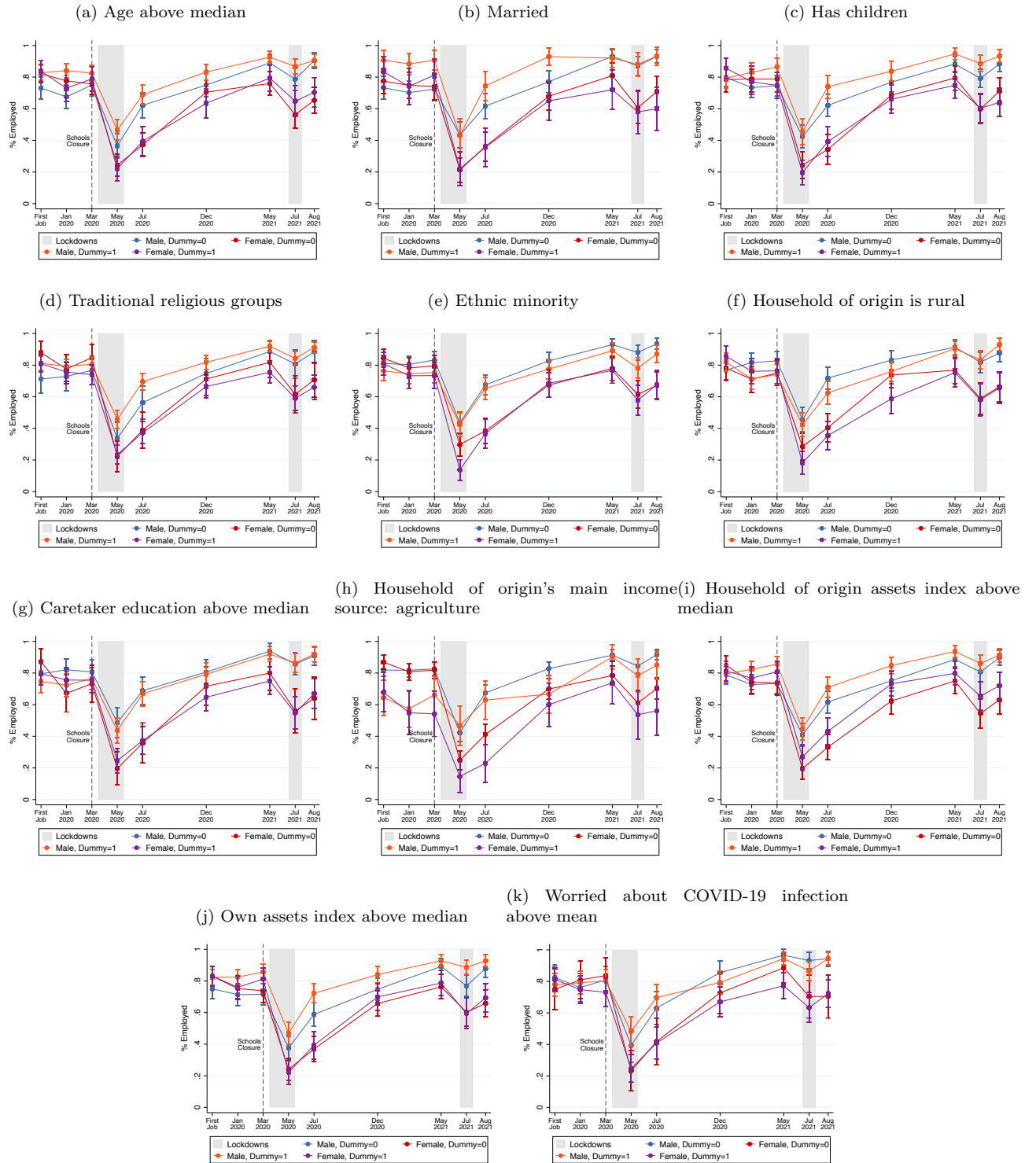
Notes: The table quantifies the part of the gender gap in employment rate explained by different childcare responsibilities. Panel (A) reports average employment rate by gender over time and the difference between female and male respondents. Employment rate and the gap are calculated for all respondents with non-missing information on the number of school-age children in the household. Panel (B) reports the part of the gender gap explained by different childcare responsibilities in absolute value and as a share of the overall gender gap. The explanatory variables are indicators for whether the respondent has zero, one, or more than one school-age children in the household. We calculate the explained part of the gap in two ways. First, as the difference between average children-reweighted female employment rate and average female employment rate in each point of time. Children-reweighted female employment rate is equal to female employment rate when weighting the female sample so that the first moments of the explanatory variables match those in the male sample. Second, using the Oaxaca-Blinder decomposition in each point of time and reporting the part of the gap due to different endowments.

Figure A.14: The Emergence and Persistence of a Gender Gap in Employment for Respondents in Mixed and Single-Gender Sectors



Notes: The figure illustrates average employment rates, separately for male and female respondents who received training in mixed or single-gender sectors over the course of 2020 and 2021. Single-gender sectors are sectors in which more than 95% of the trainees have the same gender, as measured in our sample. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. The first data point refers to the respondents' first job after completing vocational education. It may coincide with the job in January 2020 and its start and end date may be different for each respondent. It can be interpreted as an indicator for individuals who ever worked after completing vocational education. 95% robust confidence intervals are reported.

Figure A.15: Heterogeneities in Gendered Effect of Lockdowns on Employment by Socio-Economic Characteristics



Notes: The figure illustrates average employment rates for respondents with different socio-economic characteristics and gender over time. At each point in time, a respondent is coded as employed if her main activity is either wage-employment or self-employment. The first data point refers to the respondents' first job after completing vocational education. It may coincide with the job in January 2020 and its start and end date may be different for each respondent. The data point referring to the first job can be interpreted as an indicator for individuals who ever worked after completing vocational education. 95% robust confidence intervals are reported.