CHAPTER 12

The COVID-19 pandemic and academic research enterprise

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LOST RESEARCH

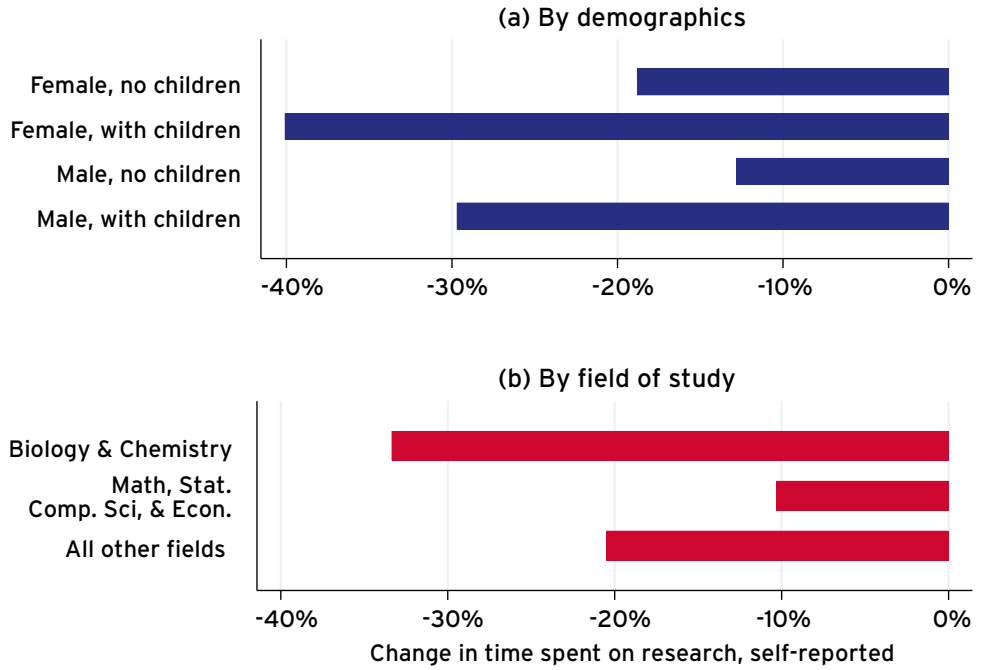
While the COVID-19 pandemic drew immense attention from certain slices of the scientific community, most academic researchers did not apply their skills to the pandemic.[1] Instead, they attempted to continue their research projects amidst a complicated and evolving set of challenges both at work and at home.

Surveys of faculty at institutions across the US and Europe indicated that their total time spent on work declined roughly 10% on average (Myers et al. 2020a). Importantly, the demands for administrative work and teaching did not change much, or often increased (e.g. the need to learn new skills during the transition to online teaching). Thus, the category of work that suffered the most was research, declining by roughly 22% on average. Notably, there were no major differences between US and European researchers despite the large differences in cultural norms and social support structures. This decline in research time amidst a sharp increase in journal submissions (Else 2020) suggests that there was also a shift in the type of research work conducted towards, for example, writing papers. Findings from Gao et al. (2021), discussed later in the chapter, suggest this shift came at the expense of work on new projects and collaborations.

This loss of research time was not felt equally across academics. Figure 1 illustrates the average reported losses in researcher time for different demographic groups (panel a) and different disciplines (panel b). Female researchers and those with young children at home reported the largest declines of any demographic group evaluated. Women reported declines in time spent on research that were roughly 5–10 percentage points larger than men, and those with young children at home reported declines roughly 15–20 percentage points larger than others. These differentials clearly raise concerns for equality and equity, which will be discussed further below in light of institutions' responses.

1 Estimates from Hill et al. (2021) suggest that roughly 6% of active researchers published a journal article related to COVID-19 during the pandemic. Survey evidence from Gao et al. (2020) suggests a larger fraction (roughly one-third) of researchers directed some attention to COVID-19. Besides sampling differences, the discrepancy between these two estimates would be consistent with a large portion of researchers who pivoted their work towards the pandemic either (a) being unsuccessful in producing a research paper, or (b) focusing on 'research' activities where a peer-reviewed journal article was not the object of interest.

FIGURE 1 LOST RESEARCH TIME IN 2020



Note: Displays group-level averages of the percent change in self-reported time spent on research comparing 2019 to 2020. Based on 4,535 full-time academic faculty surveyed in April 2020; see Myers et al. (2020a) for more on the underlying data and additional analyses.

In addition to concerns about equality, the differential impact on women may have important downstream effects on the supply of scientists given evidence that role models play an important part in female students' career decisions (Bettinger and Long 2005, Porter and Sera 2020) and how gender influences the topics scientists pursue (Koning et al. 2021, Truffa and Wong 2022). The differential impact on parents of young children is important because these are typically younger researchers (on average, ten years younger) and, amongst those in tenure-track positions, they are also more likely to be pre-tenure (roughly 10% more likely). Thus, the large degree of disruptions focused within this set of researchers may have important implications for the transfer of knowledge across generations of researchers.

Panel b of Figure 1 illustrates another important dimension of heterogeneity in lost research time across disciplines. Mathematicians, statisticians, computer scientists, and economists – researchers with relatively low equipment, capital, and travel requirements – all reported much smaller declines than the average. It is commonplace for the work in these fields to not involve more than a personal computer, perhaps even just a pen and paper, which likely permitted a much smoother transition to the work-from-home lifestyle that became pervasive. The 'bench sciences' of biology and chemistry, however, clearly suffered the most, reporting declines on the order of 33%. This likely reflected the fact that 'research' for these individuals typically involves working in on-campus, capital-

intensive laboratories and facilities that were almost entirely closed at the onset of the pandemic in 2020. The large losses experienced by these specific researchers may prove more than transitory given recent evidence that shocks to capital-intensive research can persist for many years (Baruffaldi and Gaessler 2021).

INSTITUTIONAL RESPONSES

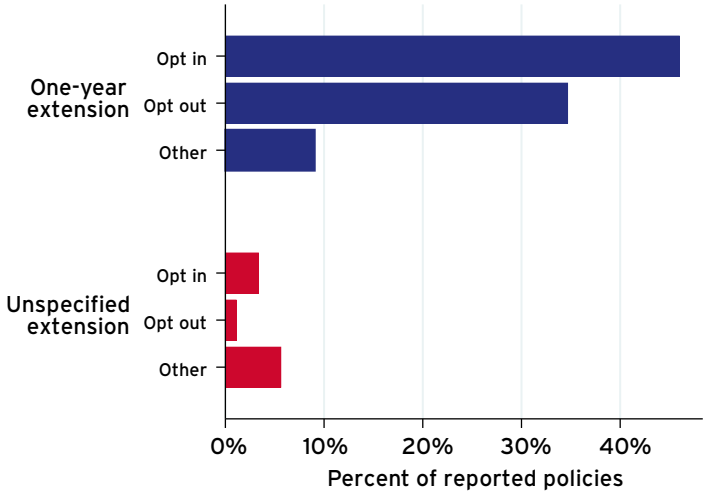
Tenure extensions

Institutions of higher education were relatively quick to respond to the pandemic. By April 2020, nearly all institutions (91%) had closed their doors to most students and staff (Myers et al. 2020a).

Besides these closures, one of the most common policy responses from US-based institutions was to grant pre-tenure tenure-track faculty members an extension on their tenure clock. The specifics of these policies likely varied in many ways, but one of the most important dimensions was whether the extension was granted to all faculty by default (an 'opt-out' policy) or whether faculty were required to apply (an 'opt-in' policy).

Thanks to a decentralised effort to collect data on such policies across roughly 250 US institutions, Figure 2 illustrates the distribution of these policies along dimensions of whether the extension was for one year or not, or whether it was opt-in or opt-out. Interestingly, roughly 90% of policies provided one-year extensions. This homogeneity stands in stark contrast to the heterogeneity displayed in Figure 1.[2]

FIGURE 2 TYPES OF TENURE EXTENSION POLICIES ENACTED ACROSS INSTITUTIONS



Note: Displays the distribution of tenure extension policies based on a publicly available, but unofficial, compilation of policies at roughly 250 US-based colleges and universities, which is available here. 92% of reported policies were enacted in either March or April of 2020.

2 As reported above, the mean decline in research time in Myers et al. (2020a) was roughly 22%, but the standard deviation in the sample was 50%, suggesting a wide range of different experiences across faculty.

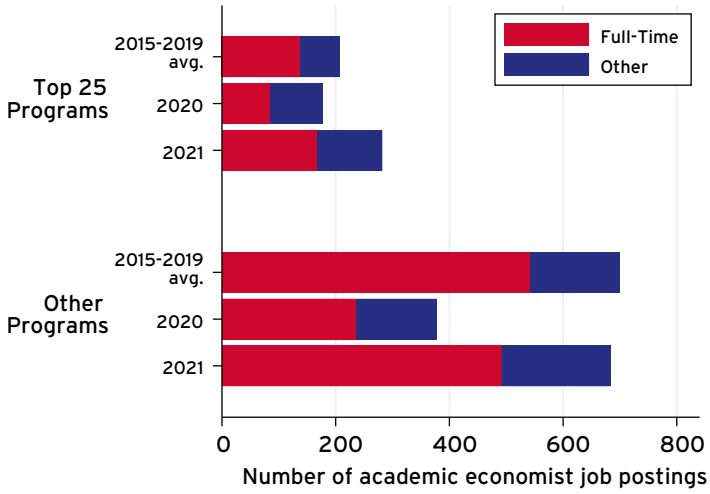
Antecol et al. (2018) provide a clear example of how equality in policy design can lead to inequities by studying the spread of gender-neutral family policies amongst tenure-track faculty. The authors' empirical analyses find that these policies actually increased male tenure rates while decreasing female tenure rates – these equal policies do not account for the unequal productivity losses they are attempting to address.[3] These findings suggest that the homogeneity in policy responses indicated by Figure 2, combined with the fact that at least one-third of extensions were awarded by default, should raise some concern that inequities amongst academic researchers may arise in the future.

Reduced recruiting

Another major response of many academic institutions was to reduce recruiting efforts. Anecdotes abound, but data on these reductions has only begun to be compiled so it remains unclear just how large these reductions may be.

The field of economics operates an organised job market, the data for which provide some initial views on how the pandemic altered the supply of, and demand for, new jobs amongst academic researchers. Figure 3 illustrates data on academic jobs from the American Economic Association's online job forum (Job Openings for Economists), separating openings based on the year they were posted, whether they are at schools with one of the top-25 economics programmes or not, and whether the position is full-time tenure-track or not.

FIGURE 3 TRENDS IN ACADEMIC JOB RECRUITING AMONG ECONOMISTS, 2015-2021



Note: Displays the average or actual number of job postings by year(s), based on whether the posting is for a full-time tenure-track position or not (e.g., part-time, adjunct) as well as whether the recruiting institution was ranked among the top 25 economics departments per the 2017 U.S. News & World Report rankings, which are listed here. Data are sourced from the American Economic Association JOE Listings, which is available here.

3 Notably, Antecol et al. (2018) also find no evidence that female-specific family policies have any effect on female tenure rates, suggesting it is difficult for such extensions (as currently designed) to have meaningful effects.

The data tell two different stories. First, among top-ranked schools, there was a modest decline in postings in 2020 compared to prior years (-15%), which was comprised of a relative decrease in full-time positions (-45%) amidst an increase in other positions including part-time, temporary, or adjunct faculty (+25%). By 2021, these schools had rebounded to roughly 30% above 2015–2019 levels, but now with a larger share of non-full-time positions being posted.

Outside of the top 25, there was a much larger relative (and absolute) decline in job postings in 2020 compared to prior years (-60%), with both full-time and other positions seeing large relative declines (-80% and -10%, respectively). By 2021, these schools had rebounded to 2015–2019 levels. And as in the case of top-25 programmes, the share of non-full-time faculty has increased too.

Overall, the total number of job openings has returned to relatively normal levels (2021 totals were 5% above 2015–2019 averages), which may suggest some optimism. However, two other patterns may be worthy of continued attention. First, the rebounds in hiring seen in 2021 were not large enough to offset the declines observed in 2020. This suggests that there are still some 'missing' academics at these institutions. The extent to which these missing individuals will lead to more responsibilities (e.g. teaching, administration) for existing academics will depend largely on the degree to which enrolment has changed. Early data suggest that enrolment at US universities and colleges in 2020 and 2021 was somewhere near 5% below pre-pandemic levels.[4] If the data from economics are indicative of most disciplines, then it appears there are many more missing faculty than there are missing students. Whether faculty can reallocate their time as needed without sacrificing their productivity remains to be seen.[5]

The second pattern of interest is the growth in non-full-time positions. Recent research has shown evidence that monopsony power among higher education institutions[6] could be a significant force driving a long-run trend towards more non-tenure-track positions (Gooslbee and Syverson 2019). The implications of this trend have been discussed at lengths elsewhere (e.g. Ehrenberg 2012, AAUP 2014), and the early data illustrated in Figure 3 suggest the pandemic may have sped up this shift.[7] The empirical evidence as to the effect of shifts in the composition of faculty types on student outcomes has been mixed (see Ehrenberg 2012 for a review). On an optimistic note, there is some evidence that non-tenure track faculty provide a higher value-add to their students (Figlio et al. 2015).

4 See National Student Clearinghouse (2022) for more.

5 For reference, Deming and Walters (2017) show that shifts in spending at postsecondary institutions has an important effect on degree completion, suggesting that the reduced spending implied by the hiring reductions of 2020 may have important consequences for graduation rates soon.

6 Here, 'monopsony power' refers to the fact that there are relatively few faculty positions in higher education institutions relative to the number of potential faculty members, which, combined with other features of this market, can allow institutions to offer compensation packages that are less attractive than they would be in a fully competitive market for faculty.

7 Additionally, the pattern that top-25 schools appeared more able to shift recruiting towards non-full-time positions (see Figure 3) is consistent with Goolsbee and Syverson's (2019) result that monopsony power is highest among top-tier research institutions.

LOOKING FORWARD

It is still too early to evaluate the full spectrum of effects of the pandemic on academic researchers. There are causes for concern, with initial data suggesting there has been a marked decline in new collaborations and new research projects (Gao et al. 2021). Whether the surge in new policies, arrangements and technologies can address these disruptions is still unclear. For example, consider the growth in virtual technologies across academia (e.g. courses, seminars, or conferences conducted via streaming video or other interactive tools). On one hand, there is good evidence that physical interactions play an important role in shaping the direction of research (Catalini 2018), so perhaps some important lines of research have been lost. On the other hand, these technologies introduce a significant amount of flexibility into many previously rigid systems (e.g. by not requiring travel for in-person interactions, or by reducing the marginal costs of expanding access). Such flexibility in work arrangements is a key to promoting equity (Goldin 2014), so perhaps there is still much to be gained.[8]

There is some evidence that variation in institutional policies will prove to be important. Myers et al. (2020b) asked faculty to (1) report their satisfaction with their institution's response to the pandemic and (2) forecast their research output in the coming years.[9] They find a strong positive correlation between the satisfaction and forecast measures, even after conditioning on a large set of potential confounding variables – faculty with high satisfaction persistently had more optimistic forecasts of their research output. This preliminary evidence suggests that some institutions' policies helped. But how much they helped, and how much they may have decreased or increased inequalities amongst academic researchers, remains to be seen.

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8 For an in-depth discussion of such equity issues in the context of the pandemic's effect on female scientists and engineers, see Higginbotham and Dahlberg (2020).

9 To account for variation in respondents' beliefs about when the pandemic will end, Myers et al. (2020b) presents a hypothetical question to respondents when forecasting their output, and this hypothetical question includes a randomised value for the supposed duration of the pandemic so that these beliefs can, in theory, be held fixed across respondents.

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