Lockdown accounting

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Charles Gottlieb, Jan Grobovšek, Markus Poschke, Fernando Saltiel 29 August 2020

Many countries have implemented social distancing and lockdown policies to tame the spread of Covid-19. This column discusses the potential GDP and employment effects of lockdown policies for a broad cross-section of countries ranging in income per capita from Niger to Luxembourg. It shows that the employment and GDP effects of lockdown policies are U-shaped in income per capita. While workers in rich countries have a substantially higher ability to work from home, which mitigates declines in employment and GDP, poor countries concentrate employment and value-added in essential sectors that are not shut down. Middle-income countries see the largest declines as they feature relatively large employment shares in non-essential sectors and relatively low work from home ability

In response to the outbreak of Covid-19, 114 countries have implemented policies that require either the closure of, or the implementation of working from home, for all but essential workplaces (Hale et al. 2020). In sectors required to shutter workplaces, work can only be conducted from employees' homes. Cross-country differences in the ability to work from home (WFH) are therefore crucial in evaluating the economic implications of such policies. At the same time, countries differ substantially in their sectoral composition, implying that lockdowns targeting the same set of sectors may produce unequal outcomes in different economies.

Since the start of the pandemic, several papers have assessed the ability to work from home. Dingel and Neiman (2020) estimate that in the US, 37% of jobs are amenable to WFH. Projecting their measure of WFH ability by occupation across countries, the authors find that in the poorest economies, only around 5% of employment can be executed from home. However, this outcome hinges on the ability of self-employed farmers to work from home (Gottlieb et al. 2020). Adams-Prassl et al. (2020) estimate 45% and 43% of effective WFH employment for the US and the UK, respectively. Saltiel (2020) was the first to assess the feasibility of work from home using data sources from developing countries.[1]

Yet, as of now, the joint assessment of the ability to work from home and of the effects of lockdown policies on employment and output exists only for some rich countries. Barrot et al. (2020) projected a decline in GDP due to a lockdown of six weeks duration of 5.6% for France; Fadinger and Schymik (2020) project a decline of 1.6% of GDP per week of lockdown for Germany. There is no similar evidence on middle- or low-income

countries, despite some very recent work on Covid-19 there (e.g. Djankov and Panizza 2020).

Based on a recent paper (Gottlieb et al. 2020), in this column we provide estimates on the ability to WFH and on the effect of realistic lockdown policies on employment and GDP for a broad cross-section of countries, ranging in income per capita from Niger to Luxembourg. We show that the effect of specific policies depends both on a country's aggregate WFH ability and on its sectoral structure.

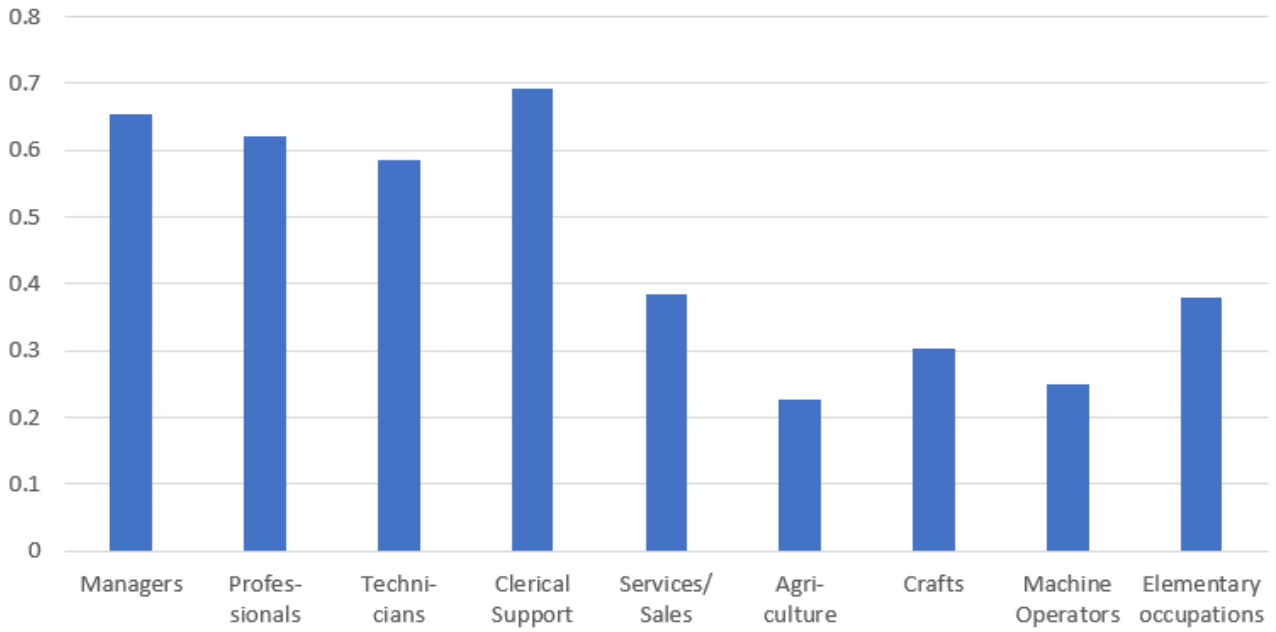
Who can work from home?

We develop a measure of the ability to work from home using the first two rounds of the STEP household surveys. These cover a representative sample of workers in urban areas of ten lower and upper-middle-income countries in 2012-2013, ranging in income per capita (ppp) from $3,700 (Kenya) to $15,000 (Macedonia). The data contain information on workers' job tasks, which we use to construct a measure of potential WFH ability.

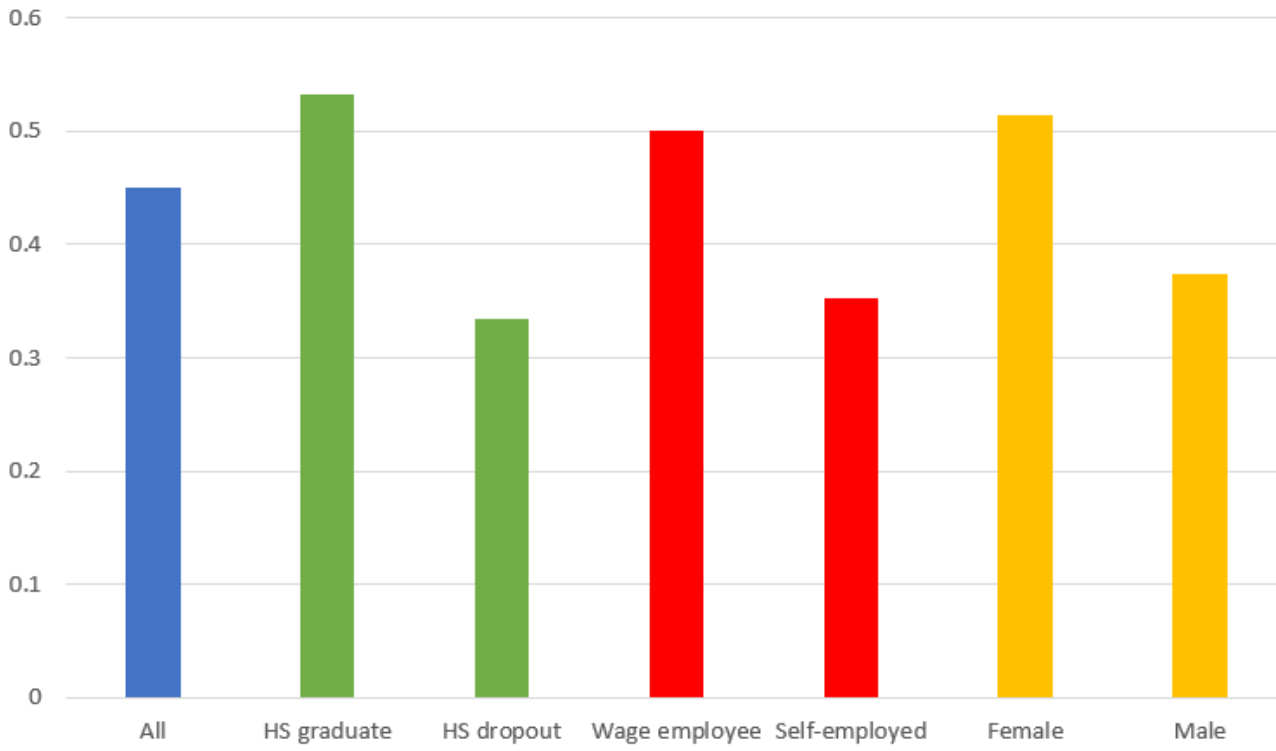
Overall, 45% of urban employment could be done remotely in the STEP countries. At the individual level, WFH ability varies strongly with a worker's occupation and demographics. Figure 1a shows the feasibility of WFH for nine major occupation groups. While the majority of jobs in managerial and professional occupations and in clerical support (groups 1-4) can be carried out from home, few jobs in elementary occupations, crafts, or occupations involving plant or machine operation (groups 6-9) can be done remotely. Figure 1b shows that mean WFH ability differs strongly across demographic groups: it is 20 percentage points lower for high school dropouts compared to graduates, and 15 percentage points lower for the self-employed compared to wage employees. Women have a far higher ability to WFH (51.5%) than men (37.4%). This assessment is based purely on job task characteristics. In practice, the ability to work from home depends also on household composition, in particular the presence and age of children (Alon et al. 2020a), and infrastructure (Brown et al. 2020). Yet, based on post-Covid surveys from Peru and the US, we validate our WFH measure and show that an increase in an individual's WFH score from 0 to 100 is associated with a 91 percentage point increased likelihood of remaining employed through April in the US, and 71 percentage points in Peru.

Figure 1 Ability to work from home…

a) by occupation



b) by demographic group



Working from home across countries

By combining WFH rates for 72 detailed occupation/demographic groups with their employment shares, we construct a measure of the aggregate urban WFH ability for 57 countries across the entire development spectrum. Figure 2 shows that the work from home ability in urban areas is substantially lower in poor countries: it ranges from roughly 35% in the poorest countries to about 53% in the richest.

Much of this variation is due to differences in the occupational structure of countries, which differs systematically with development (Duernecker and Herrendorf 2016). As shown in Figure 3, poor countries have low employment shares in high WFH-ability

occupations, such as managers and professionals, and high employment shares in low WFH-ability occupations. In addition, they have larger shares of high-school dropouts and self-employed workers. All of these factors reduce their WFH ability.

Figure 2 Aggregate work from home ability in urban areas across countries

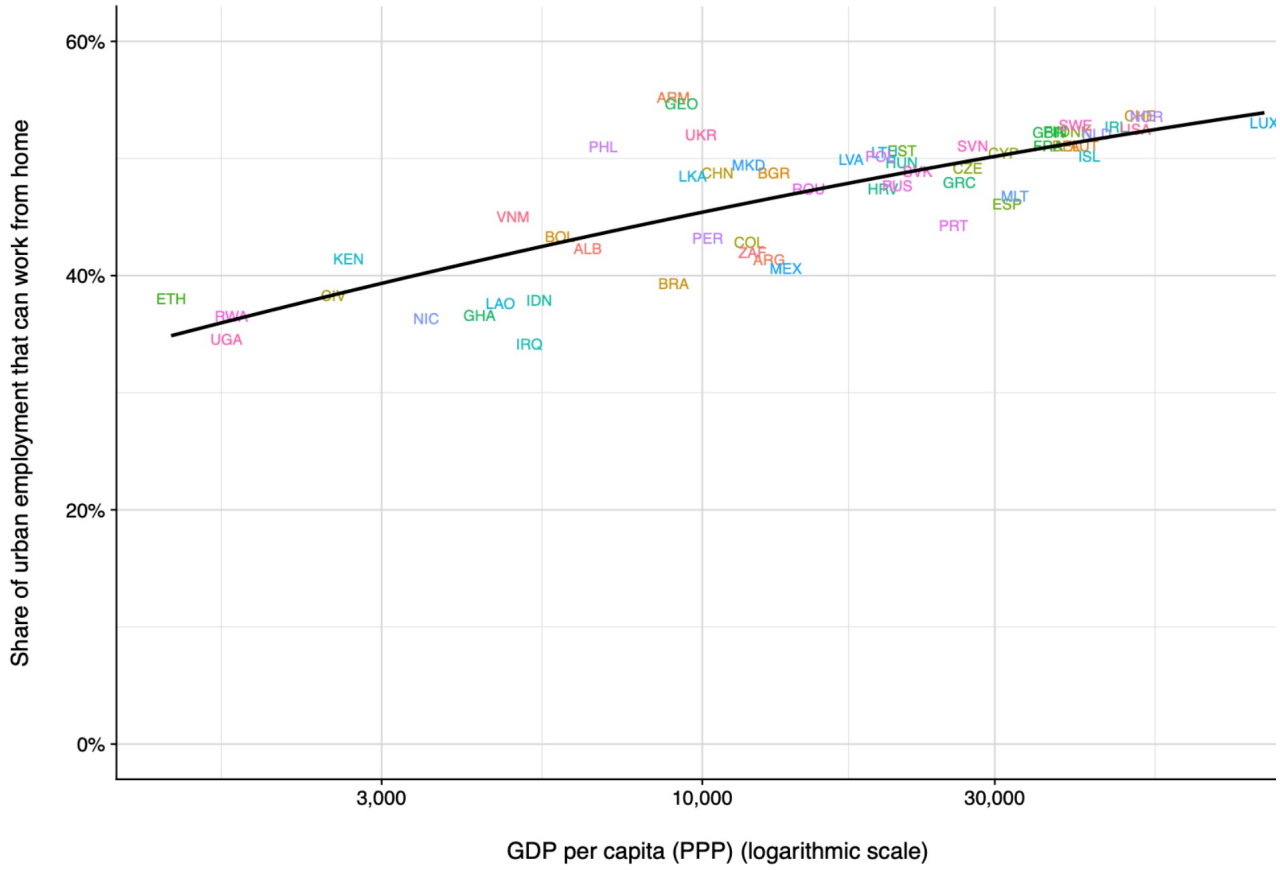
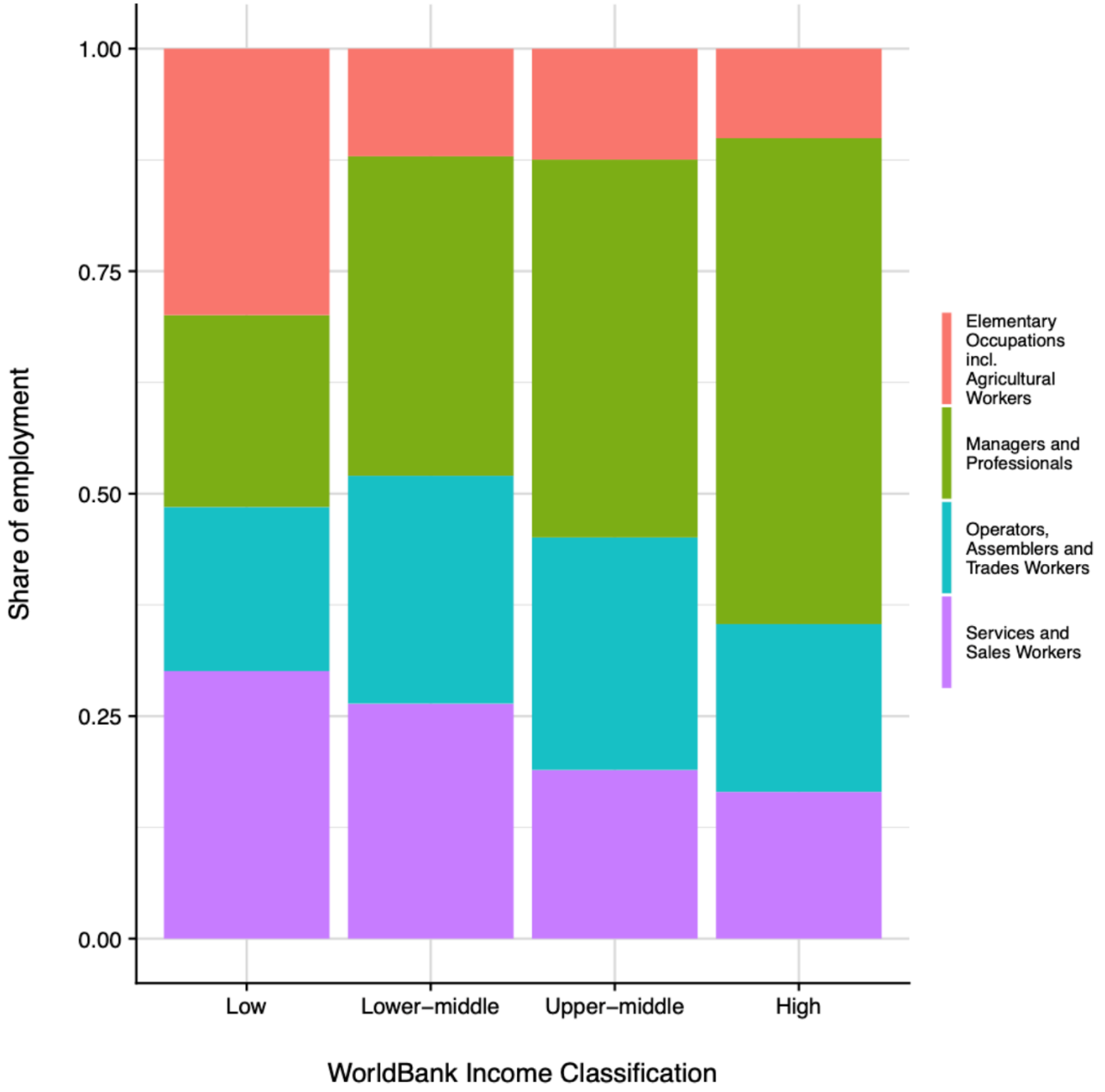


Figure 3 Urban occupation composition by country income group



The effects of sectoral lockdown policies

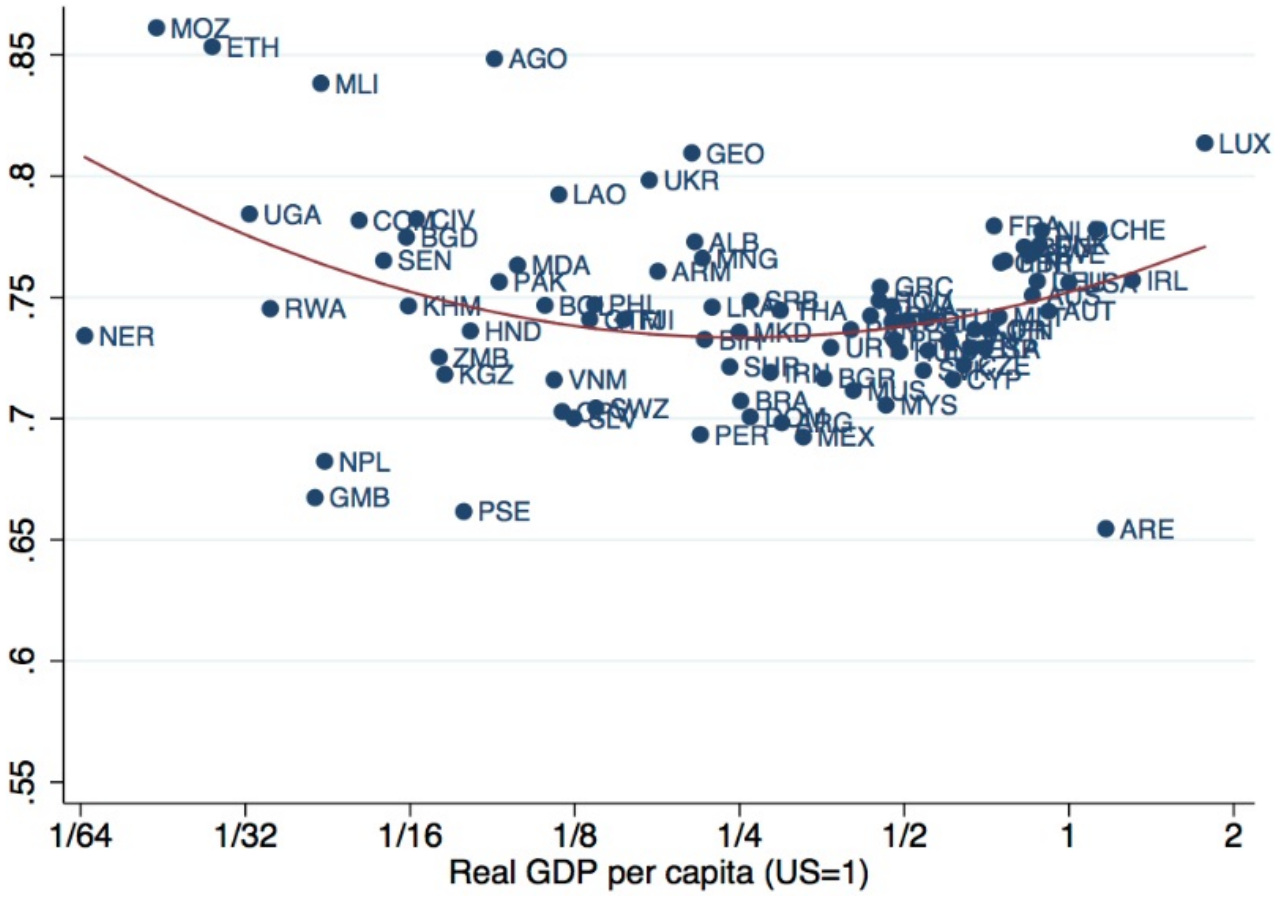
Lockdown policies in practice do not shutter the entire economy but focus on non-essential sectors. Workplaces in essential sectors can still operate, even if workers cannot work from home (e.g. the health sector, groceries, agricultural activities). As a result, the effect of lockdown policies on aggregate employment and output depends not only on a country's WFH ability, but also on its sectoral structure. We simulate various lockdown scenarios that shut down all workplaces in some sectors, a fraction of workplaces in others, and none in sectors considered essential. Employment that is shut down can be substituted with WFH, which we assume to be equally productive.

The main scenario we consider is a 'hard' lockdown policy, which we model based on measures implemented in Italy, Spain, and Germany.[2] We also simulate an alternative 'soft' lockdown, which is designed to capture the situation as shutdowns are eased. It lifts most of the restrictions on industry and half of the restrictions in services. The

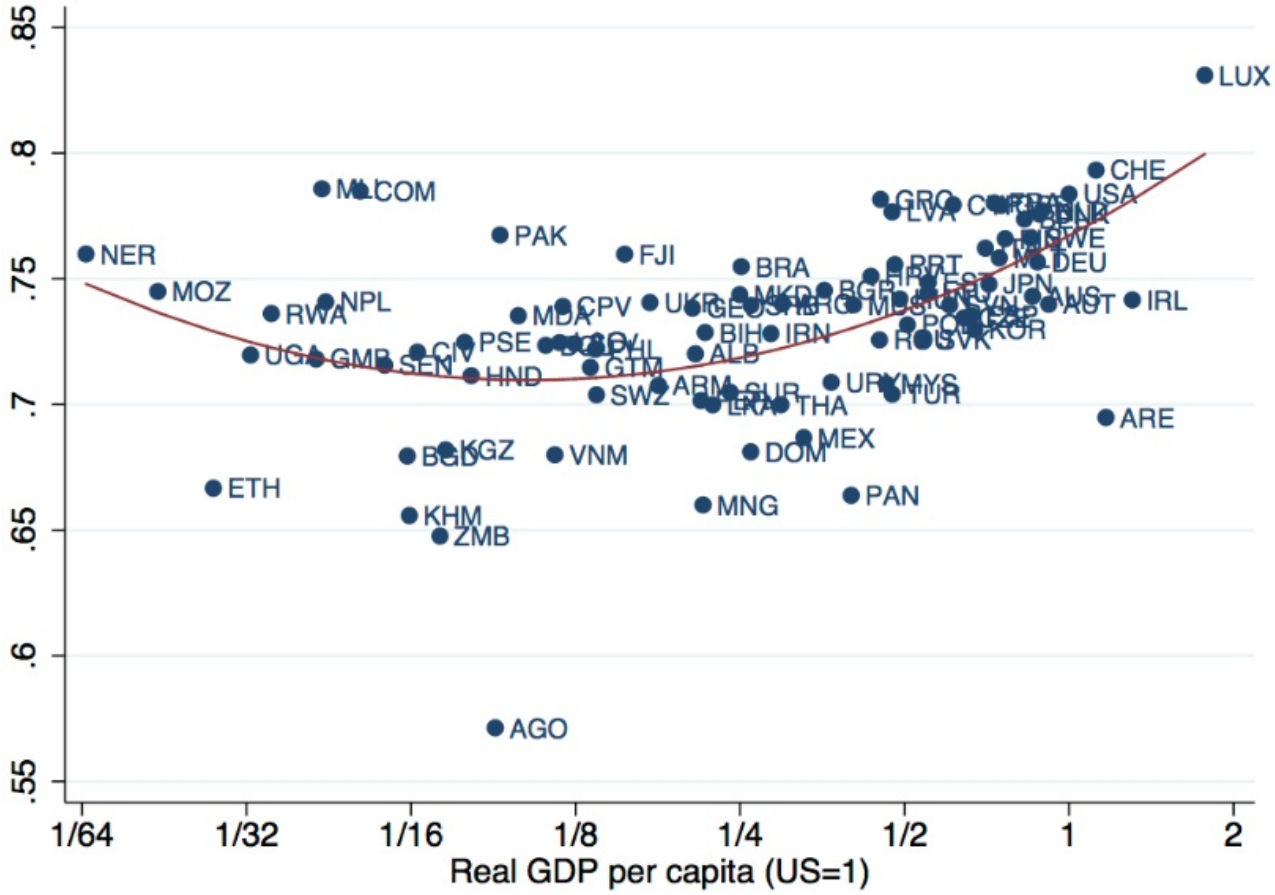
latter are relaxed more slowly as they involve more interpersonal interaction, which fosters the risk of virus transmission. To compute the impact on GDP, we employ a simple multi-sectoral model that aggregates sectoral employment.[3]

Figure 4 Employment and GDP by lockdown scenario, relative to pre-trend

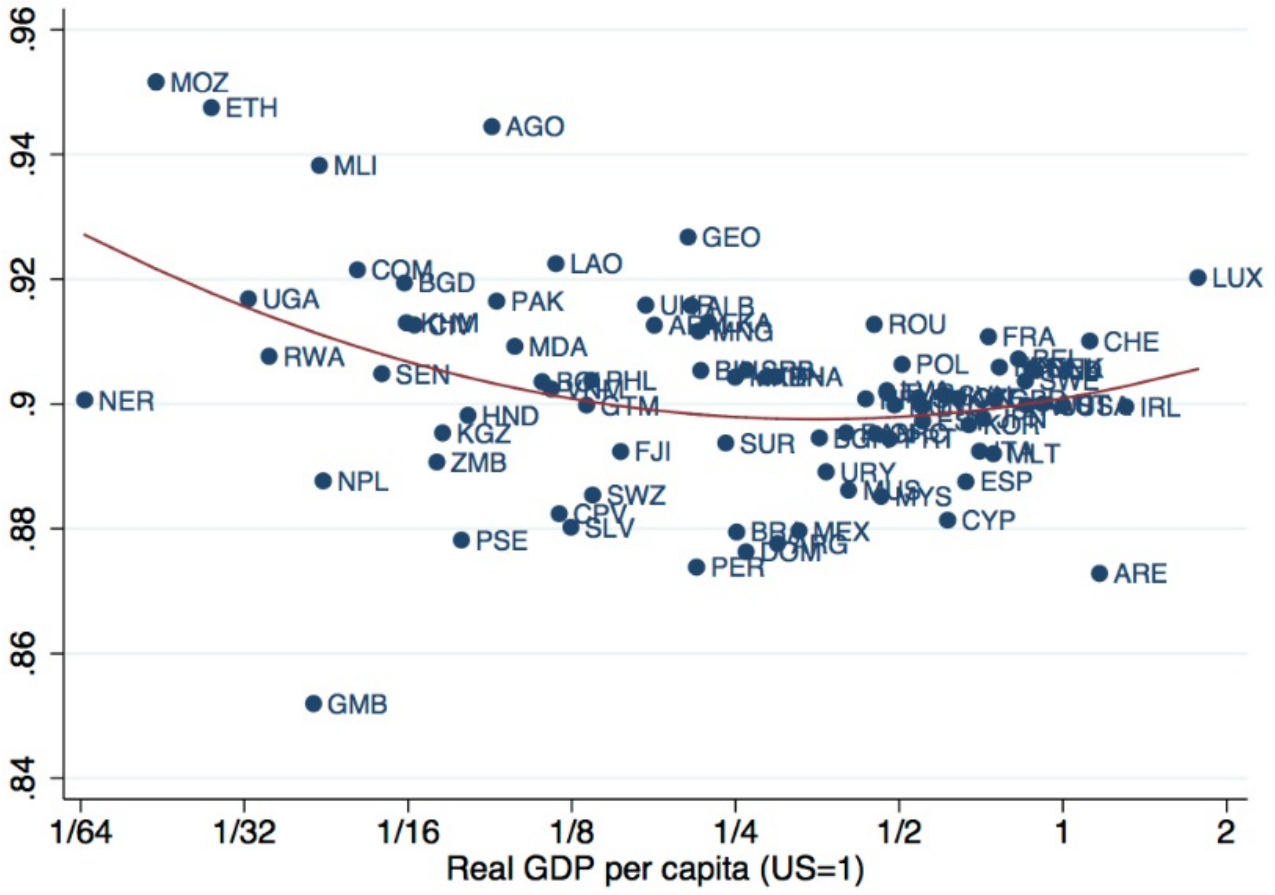
a) Employment, hard lockdown



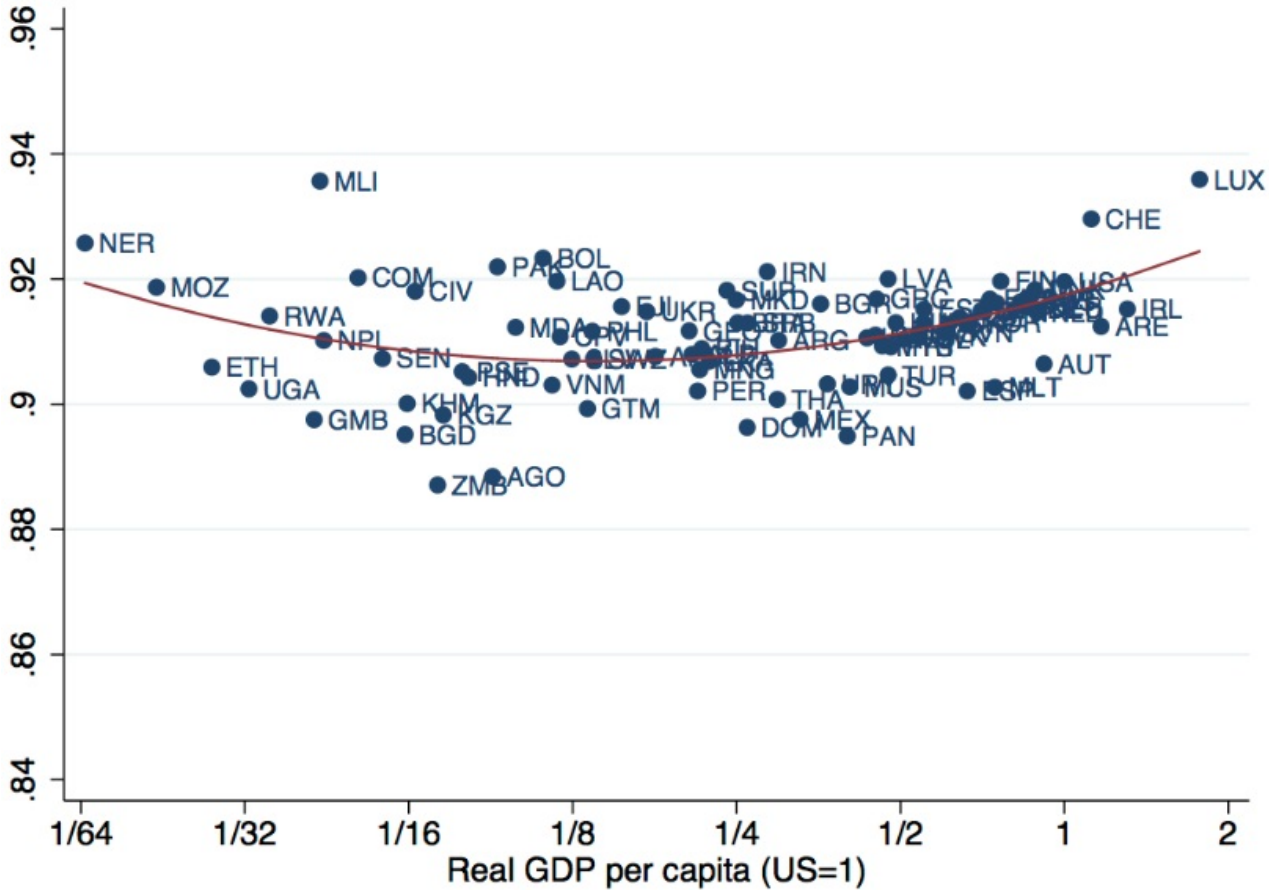
b) GDP, hard lockdown



c) Employment, soft lockdown



d) GDP, soft lockdown



Notes: Real GDP per capita of each country corresponds to the 2017 PPP-adjusted series from the Penn World Table, normalised to the US. The trend line is a quadratic fit of the logarithm of real GDP per capita.

Figure 3 presents the fraction of employment and GDP by lockdown relative to pre-trend against countries' real income per capita. The upper panel portrays the hard lockdown, and the lower panel the soft lockdown. Across countries, the hard (soft) lockdown generates an average employment drop of 25.5% (9.8%). GDP declines on average by 28.9% (8.9%) on an annualised basis. Under both scenarios, employment and GDP are U-shaped in income per capita. There are two forces at work. On the one hand, rich countries have a substantially higher WFH ability, which mitigates declines in employment and GDP. On the other hand, their sectoral composition favours poor countries, which concentrate employment and value-added in essential sectors that are not shut down. Middle-income countries see the largest declines as they feature relatively large employment shares in non-essential sectors and relatively low WFH ability.

The key driver of the sectoral composition effect is the agricultural sector, an essential sector that remains open. The low WFH ability in the sector is therefore less relevant. The sheer size of this essential sector in poor countries – on average, it accounts for 37.7% (23.2%) of employment (value-added) in the poorest quintile of countries, compared to only 2.1% (1.3%) in the richest quintile – mitigates the effects of the lockdown.

Conclusion

Lockdown policies have had large disruptive effects on economies across the globe. We document that the employment structure of economies across the income per capita spectrum is such that the potential employment and GDP effects of lockdown policies are of a similar magnitude for low- and high-income countries, and strongest for middle-income countries.

We also provide an online lockdown simulator that allows users to simulate user-defined sectoral lockdown policies, and foster the policy debate on the design of lockdown policies in low-, middle- and high-income countries (Alon et al. 2020, Barnet-Howell and Mobarak 2020).

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Endnotes

[1] More recently, Delaporta and Peña (2020) and Hatayama et al. (2020) have considered additional data sources.

[2] We implement this based on the measures of Fana et al. (2020), who document the degree to which various sectors are deemed essential and therefore exempted from the March 2020 lockdown decrees in Italy, Spain, and Germany. The lockdown policies in New York State and in the Canadian provinces of Ontario and Québec were broadly similar.

[3] This analysis abstracts from factors other than the lockdown that affect employment and output. Such factors could be, among others, reductions in labor supply (voluntary or for health reasons), financial frictions, or frictions in final or intermediate goods markets. It is also possible that lockdown policies trigger movements of economic activity to the informal sector. This would reduce their epidemiological effectiveness, while limiting their economic effects (Alon et al. 2020b). The model does capture adjustments in the demand and supply of final and intermediate goods.