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Social stability challenged by Covid-19: Pandemics, inequality and policy responses

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Received 9 June 2020; received in revised form 17 September 2020; accepted 2 October 2020

Available online 5 December 2020

Abstract

The public health measures implemented to limit the COVID-19 pandemic are likely to affect economic inequalities. In this paper we first provide a theoretical framework to analyse how income inequality contributes shaping the trade-off between economic lockdown and contagion. Our empirical analysis on EU countries shows that the lockdown is likely to significantly increase inequality and poverty and that the magnitude of the change is larger in more unequal countries. To avoid social collapse, countries must consider inequality as an additional source of fragility, while supranational, coordinated health and fiscal policies are needed in the interest of all European economies.

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JEL Classification: D31; E61; H31; I30

Keywords: COVID-19 pandemic; Lockdown; Inequality; Social stability; Supranational policy coordination

1. Introduction

The spread of COVID-19 pandemic over the globe has been accompanied by an increasing debate over the trade-off between economy lockdown and contagion. Shutting down the economy to slow down the contagion prevents the collapse of the healthcare systems and massive deaths, but comes at the cost of a potentially devastating supply- and demand-sided crisis (similar to

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a post-war scenario). The alternative is letting the virus spread over the population, suffering the inevitable human losses while building herd immunity, supposedly avoiding severe economic consequences. To this aim, virtually all Western governments – but some in particular, like the US, the UK, Brazil, and some Nordic EU economies –, have been initially very reluctant to impose restrictions on social interactions and delayed the lockdown, even after the Italian experience showed the devastating consequences of an uncontrolled contagion. Concerns of economists and analysts are not limited to macroeconomic aggregates (Guerrieri et al., 2020; OECD, 2020; Dorn et al., 2020), but, as suggested by the experience of other infections (see, for example, Parker, 2002), have gradually extended to distributive aspects (Milanovic, 2020a; Ahmed et al., 2020; Fisher & Bubola, 2020), as both the pandemic and the lockdown are likely to asymmetrically affect individuals across the income distribution. As the worse-off are in the most vulnerable position, the resulting contagion/inequality spiral can potentially undermine social cohesion and the overall stability of economic systems.

In this paper we develop a conceptual framework for the analysis of how economic inequality, besides other structural and policy-related features, shapes the trade-off between contagion and lockdown, and the associated risks (Section 2). We then set up a simulation exercise for 31 European economies under different lockdown scenarios (Section 3). Our results (Section 4) confirm that, as the extent of the lockdown grows, income inequality and poverty are likely to increase significantly and disproportionately more in high inequality/poverty countries. As the capacity of such economies to implement extensive and adequate policy responses is limited, they might be forced to relax public health measures prematurely and this way increase the risk of new waves of contagion that could easily spill over to other countries. Our main policy implication, discussed in the final section, is that a coordinated supranational policy effort is the only option and in the interest of all countries participating to the global economy.

2. Conceptual framework: pandemic, lockdown and inequality

The trade-off between contagion (C) and economy lockdown (L) is illustrated in Diagram 1 (left panel) as a downward sloping curve, the CL schedule. C measures the share of people infected out of the total population; L is the extent of the lockdown, measuring the duration and intensity of public health measures. In the absence of a pandemic, the economy is *off* the CL schedule, in point 0. As the infection starts to develop, the country climbs up along the vertical axis. The point in which the country enters the CL curve depends on the reaction of the authorities to the pandemic: a “herd immunity” strategy places the economy in the upper section of the CL schedule (high C , low L); an “early” lockdown, aimed at preventing the spread of the infection, places the economy in a lower-right position (depending on the strength of the restrictions). Once on the CL schedule, the country can move along the curve in response to public health measures decided by the authorities.

A threshold exists for both C and L that restricts the feasible options along the CL schedule between A and B. Beyond these thresholds, the stability of the system is endangered due to social tensions and conflict originating, respectively from: (i) the spread of panic/fear and rivalry in accessing treatments if the infection grows beyond the capacity of the health system (over C^{Max}); (ii) the incapacity of an increasing share of the population to meet their basic needs in the case of a significant lockdown (over L^{Max}). The existence of C^{Max} is well described by the sudden change of strategy of those countries that, after having underestimated the severity of COVID-19, realised how socially unsustainable a herd immunity choice would have been and switched towards the lockdown. The thresholds are higher for countries with more inclusive healthcare systems (higher

C^{Max}) and more generous social welfare/protection (higher L^{Max}), and *vice versa*. Hence, other things being equal, a weaker capacity of the State in such domains allows less degrees of freedom along the CL schedule (A'B' instead of AB).

The non-linearity of the CL schedule indicates increasing marginal rate of substitution between C and L: when the contagion is already spread (high C) a larger increase in L is indeed necessary to reduce C by a given amount, compared to the one needed when C is low. CL schedules of different slopes identify countries' heterogeneity in the extent of the trade-off, as a flatter curve indicates that any decrease of contagion will require a higher increase in the extent of the lockdown (right panel of [Diagram 1](#)).

The slope of CL depends on a complex set of structural and institutional characteristics, which include: (i) the industry composition and the level of technology (which affects the share of the economy that can be kept alive even when social distancing measures are implemented); (ii) working conditions and standards, as safer and healthier work conditions favour lower contagion rates; (iii) cultural settings impacting social discipline and mutual respect, that increase the efficiency of any increase in L in reducing C; (iv) socio-economic inequalities, as higher inequality shapes a flatter CL schedule. The latter is the focus of our research. The higher the number of households with vulnerable economic positions in the economy (due to household members being in low productivity, security, and protection jobs), the higher the increase in L needed to reduce C by a given amount. The income losses due to any increase of L will indeed drive a large share of households below their subsistence income and force individuals to search for alternative income and/or ignore restrictions, in order to provide for their basic needs. The mediating role of the family is crucial here: not necessarily the vulnerable employment position of one individual translates into dramatically lower household incomes and welfare, if the household can count on other income earners with less vulnerable income sources or on non-labour incomes that remain unaffected by the lockdown.

However, socio-economic inequalities impact not only the slope but also the position of the CL schedule, i.e., more unequal countries will tend to have CL schedules shifted upward-right, as any level of L will imply better conditions for the pandemic to spread. A relatively higher number of individuals will indeed: (i) suffer poor health and poor living conditions (less squared meter per person, poorer facilities and hygiene standards, etc.); (ii) not be able to satisfy their basic needs (as they have low incomes and the most vulnerable labour positions and income sources) and be forced to violate the restrictions.

To sum up, as described in the right panel of [Diagram 1](#), the higher the inequality, the flatter and more outwards shifted the CL schedule. This means that more unequal countries face a pandemic with more limited and worse options along the trade-off curve (A'B' compared to AB, with all options implying higher C and/or L). Furthermore, lower L^{Max} and C^{Max} (i.e., less inclusive health and welfare systems) contribute to flattening and shifting the CL curve, further restricting the feasible options. Under such circumstances, the implementation of a lockdown in case of a pandemic fatally exposes the country to high risk of social collapse (by exceeding C^{Max} or L^{Max}). The implementation of a lockdown, if not accompanied by income compensation measures, is likely to increase inequality, as the restrictive measures will hit proportionally more the most vulnerable and unprotected employment segments (the informal sector, temporary or self-employed workers, low income, etc.), deteriorating their income position.

As shown in [Diagram 2](#), such an increase in inequality will shift the CL schedule upwards and proportionally more the higher is the severity of the lockdown (as we have already discussed, higher inequality means both an upper and a flatter curve). It is noteworthy that the extent of the

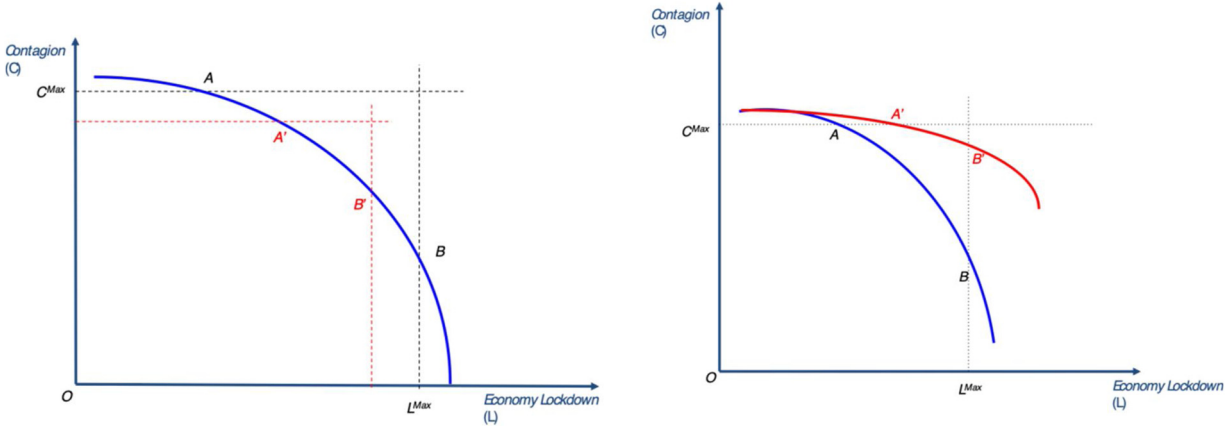


Diagram 1. The trade-off between contagion and economic lockdown (the CL schedule).

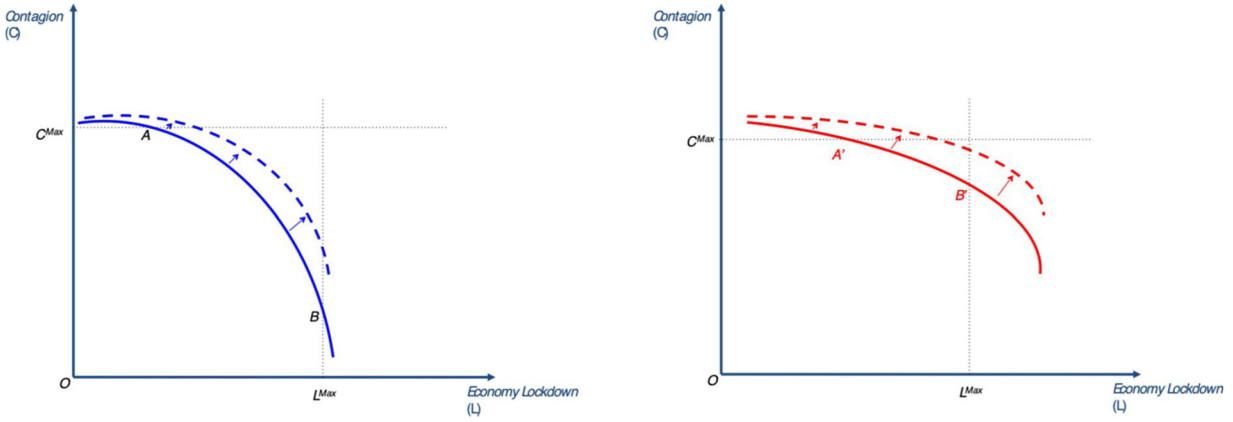


Diagram 2. The feedback loop between inequality and contagion in the absence of policy intervention.

shift, in the absence of any extraordinary income compensation measures, will also depend on the existing safety nets, i.e. the levels of social transfers (such as unemployment benefits) and the protection granted to workers (i.e., the level of labour market regulation, for example in terms of protection of temporary workers and firing procedures). Once again, a stronger presence of the State emerges as an insurance against social instability in the event of an adverse shock, like a pandemic.

The crucial point here is that in more unequal countries (right panel of [Diagram 2](#)) the shift is larger because: (i) the share of economically vulnerable individuals is larger; (ii) to achieve the desired rate of contagion a higher L is needed. Without a policy intervention to support incomes of worse-off individuals, this will not only expose such countries to new pandemics (or to other waves of the same pandemic), but will rapidly drive them closer to unsustainable social conflicts and the collapse of the system.

3. Methods

In order to simulate the effects of the economic lockdown on inequality we adopt an *ex-ante* microsimulation approach ([Bourguignon & Spadaro, 2006](#)) applied on the latest available [EU – Survey on Income and Living Conditions \(SILC\) data](#), which refer to year 2018 and 31 countries (EU-27 plus the UK, Norway, Switzerland and Serbia). The extent of the lockdown (L) ranges from 0 (no pandemic, no lockdown) to 5, with higher levels representing more restrictive public health measures, such as longer lockdown duration and stricter measures of social distancing. Depending on each country's characteristics (in particular the size of its welfare/social protection system), $L = 5$ can fall before or after L^{Max} .

In the case of a lockdown, each employed person will suffer a penalty in terms of income loss. Inspired by recent relevant discussions ([Milanovic, 2020b](#); [ILO, 2020](#); [Dingel & Neiman, 2020](#); [Barbieri et al., 2020](#)), we first allocate jobs in five risk groups ([Table 1](#)) based on the vulnerability of the sector of employment and of the occupation within each sector (the maximum level of detail in SILC data corresponds to two-digit NACE and ISCO classifications, respectively). The initial index of economic loss for $L = 5$ ranges from 0 (workers who suffer no economic effects of the lockdown) to 0.9 (hardest hit by the lockdown). Additionally, we account for the characteristics that exacerbate the vulnerability of the job positions, such as being self-employed, on a temporary or part-time contract, working in a small firm (less than 10 employees), sitting in the lowest NACE/ISCO group wage quintile, and being chronically ill. We assume that the presence of each of these k characteristics will augment by 0.1 the loss index to the worker. The maximum of the loss index is truncated to 1, which means that the worker has lost all of her/his employment income.

The extent to which economic vulnerability in dependent employment will materialise in the income/job-losses depends on the strength of the country-level employment protection legislation. On the other hand, in the case of job loss, any European worker can rely on a social protection system which enables them to apply for compensating incomes such as unemployment benefits or social assistance. In order to incorporate such effects in the income loss index, the size of [expenditures on social protection as a % of GDP](#) (Eurostat data) and the 5b Index of Labor market regulations ([Economic Freedom of the World dataset, 2020](#)) are used, respectively, as proxies for countries' social (SP_c) and employment (EP_c) protection levels. The indicators are then transformed to a scale between 0 – low protection and 0.2 – high protection for EP_c , and between 0.05 – low protection and 0.25 – high protection for SP_c . This means that the two protection systems attenuate the loss from 0 to 20% and from 5 to 25%, respectively. The minimum level for

Table 1

Initial index of economic loss depending on the sector of activity and occupation of the worker.

Initial loss in L5 scenario	Sectors of employment (two-digit NACE code) and occupations (two-digit ISCO code) that are exceptions within their sectors
0	- Sector Q (Health) – all workers
0.2	- Sectors J (Information and Communication), O (Public administration) and P (Education) - Executive managers (ISCO code 11), Health Professionals and Technicians (22, 32) in all sectors except Q - Lower level managers (12–14) in sector K - Teaching Professionals (23) in Sectors A–F, K–M and R–U - Refuse Workers (96) in Sectors B–F, K–M and R–U
0.5	- Sectors A (Agriculture) and K (Financial and Insurance Activities) - Science and Engineering Professionals and Associates (21, 31) in sectors B–F - Agriculture workers occupations (61–63) in sectors B–F, K–M and R–U - Metal / Machinery Workers (72) in sectors G, H, L/M and R–U - Electrical and Electronic Trades Workers (74) in sectors B–F, L/M and R–U - Agricultural, Forestry and Fishery Labourers (92) in sectors B–F, L/M and R–U
0.7	- Sectors G (Trade), H (Transport) and R–U (Arts, Other Services, Households) - Lower level managers (12–14), Other professionals (21, 24–26, 31) in sector L/M - Clerks (41–44) in sector K - Sales and Protective Services Workers (52, 54) in sectors A–F, K–M - Handicraft and Printing Workers (73) in sectors B–F
0.9	- Sectors B–E (Mining, Manufacturing, Electricity, Utilities), F (Construction), I (Accommodation and Food Service) and L/M (Real Estate/Professional activities) - Personal Service Workers (51) in all sectors except in sector Q - Building; Handicraft and Printing; Food and Wood workers (71, 73, 75) in sectors K and R–U - Plant and machine operator (81, 82, 83) in sectors K and R–U - Elementary workers (91, 93–95) in sectors K and R–U - Street and related sales and service workers (95) in all sectors except O, P and Q

SP_c was set at 0.05 in order to allow for the fact that even the countries with the weakest social protection system provide a support to workers if they lose their job. Robustness checks of the results (available upon request) with different values of SP_c and EP_c confirm the main findings presented in the results section. In the final step, we multiply the individual loss index by the country-level $(1 - SP_c)$ and $(1 - EP_c)$ values to obtain the corrected loss index.

To simulate the effects of different levels of the lockdown, we assume that the loss index varies linearly in L , i.e., we multiply the loss index in scenario L5 by $L/5$ (with $L = 1, 2, \dots, 5$). More formally, we define the economic loss function as the share of income that person i in the country c will lose in the case of the lockdown level L :

$$Lossindex_{c,i,L} = f(NACE/ISCOgroup_{c,i}; vuln_{k,c,i}; EP_c; SP_c; lockdown_L)$$

$$L = 1, \dots, 5. \tag{1}$$

To exemplify, if a worker has a loss index 0.5 in a given L, this means that (s)he will suffer a decrease of 50% of her/his annual labour earnings due to the immediate effects of the lockdown (not working or working fewer hours depending on the extent of L) and its subsequent consequences (changes in demand patterns that reverberate on labour demanded by firms).

In order to simulate the changes in household disposable income due to the lockdown, we first multiply the annual workers' net labour earnings by the loss index in each of the lockdown scenarios. We then aggregate the income losses to the household (*h*) level and calculate the disposable incomes (per adult equivalent) for different levels of L as:

$$Dispinc_{c,h,L} = Dispinc_{c,h,0} - \sum_h (Lossindex_{c,i,L} * Employmentincome_{c,i})L = 1, \dots, 5. \quad (2)$$

where $Dispinc_{c,h,0}$ is the baseline (original) disposable income for household *h*. The household level of analysis is crucial here in order to take into account the potential mediating effect of the household characteristics (size, income earners, income sources, etc.) on individual welfare. Lastly, we use the baseline and simulated disposable household incomes to calculate changes in income inequality indicators when different levels of L are implemented.

It is important to underline that all our simulations provide results in the absence of any extraordinary countervailing measure. Brunori et al. (2020), by implementing a similar approach on EU-SILC data for Italy, simulate the effects of the lockdown on inequality comparing the effects of the measures implemented by the Italian government with alternative policy scenarios. The geographical scope of our study (31 countries) prevents a similar approach and the simulated changes in inequality we report here have to be regarded as potential upper bounds for any level of lockdown. However, it should also be noted that our analysis only marginally accounts for the relevant role of the informal economy in shaping the vulnerability of workers and this might attenuate the simulated increase in inequality especially for the contexts in which the informal sector has a larger share (typically, high inequality countries). Similarly, other important distributive dimensions are necessarily left out from our analysis, as they more likely pertain to the long-run. We refer, for example, to the increase in education inequality if socially distant learning is less accessible and effective for lower income households; or to the widening of gender disparities if the increase in the family workload imposed by the lockdown is not symmetrically shared between the parents.

4. Results and discussion

4.1. Lockdown and income inequality

A first important piece of information provided by our results is the different exposure of the European economies to the economic consequences of a lockdown. This is the resulting effect of all the factors that converge into our labour income loss function (i.e., job/employment characteristics, welfare and labour market regulations). Fig. 1 reports the average loss suffered by individual workers of each country in the case of a maximum lockdown and illustrates a clear geographical pattern.

Virtually all Eastern Europe countries emerge as the most vulnerable economies; Nordic and continental Western countries, on the other hand, would suffer the lowest median loss, and Southern EU countries sit in the middle of the distribution. This index of vulnerability of labour incomes has, unsurprisingly, a strong negative correlation with the corresponding country level size of the

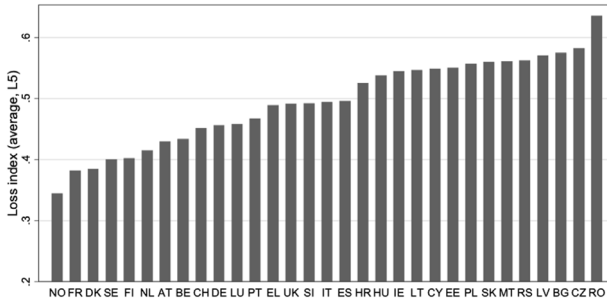


Fig. 1. Average labour income loss after L5 lockdown.

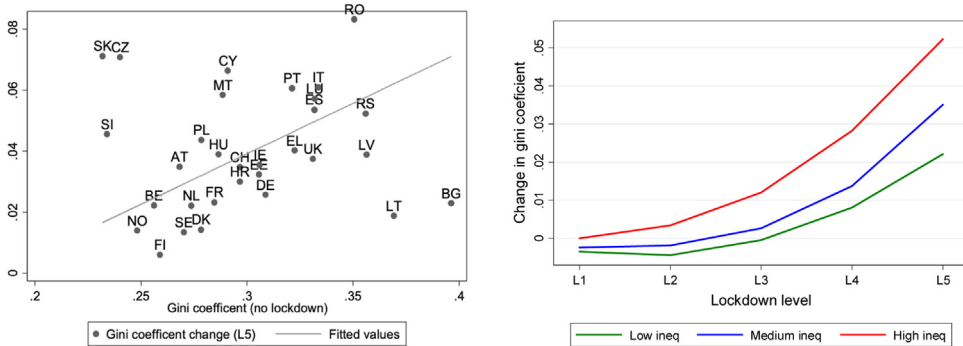


Fig. 2. Changes in Gini coefficients after lockdown.

Note: Lines in the right panel represent median changes in gini coefficients at different levels of lockdown for three groups: low-, medium-, and high-inequality countries (group division based on the gini levels before lockdown).

public administration (i.e., the share of more sheltered job positions) and the strength of the social and employment protection system.

Our main interest lies in understanding how this average loss reverberates on income inequality; this depends on how the loss is distributed across the income ladder and on the mediating role exerted by the household. As shown in Fig. 2, and consistent with the evidence provided by studies with a similar approach for single countries (see Brunori et al., 2020, for Italy), the lockdown is likely to increase income inequality. Fig. 2 (left panel) illustrates the correlation between the existing level of household equivalent income inequality (Gini index) and its change under a L5 scenario. The regression coefficient, corrected for the observations that have unusual influence on the regression (Cameron & Trivedi, 2009), is positive and significant ($b=0.331$; $p<0.01$). Countries with higher levels of inequality before the lockdown are likely to experience its sharpest increase. This is a first empirical outcome that is, generally speaking, corroborative of the framework and mechanisms described in Section 2 (see in particular Diagram 2).

Our simulations indicate that, under the most restrictive lockdown scenarios and in the absence of specific countervailing measures, the increase in income inequality would range from about one (Nordic countries) up to eight Gini points (in some Eastern and Mediterranean countries). Interestingly, some economies emerge as exceptions to the general tendency. The Czech Republic and Slovakia, in particular, despite belonging to the pool of low inequality countries, would experience a significant increase in the Gini coefficient. This is due to the fact that their employment structure and vulnerability levels are similar to other Eastern-European economies, as indicated by

their position in Fig. 1. This suggests that, in contrast to Nordic economies, behind the notorious low inequality in the Czech Republic and Slovakia lies a high level of fragility of the main income sources that, in the event of an adverse shock with such asymmetric effects in specific industries, can trigger an extensive change in distributive patterns.

Again, consistent with our conceptual framework, the Gini changes between low and high inequality countries are more pronounced at higher levels of lockdown (Fig. 2, right panel). At L1, median Gini changes in the three groups are practically equal (and close to zero); when the extent of the lockdown increases, the Gini index grows in all groups, but proportionally more in the high-inequality pool of countries. The median Gini change in L5 for the group of high-inequality countries is 5.2, while for the group of low-inequality countries it is 2.2 Gini points. A sensitivity analysis carried out to test the stability of our outcomes to changes in the assumptions underlying the loss function (e.g., the role of the welfare state or employment protection) confirms all trends just described, only producing small changes in the magnitude of the effects. The same holds for the other empirical evidence presented below.

The Gini coefficient, as an aggregate measure of inequality, is sensitive to changes in the whole distribution, but does not provide information on which part of the distribution is more/less affected. Percentile ratios (typically, p_{90}/p_{10} , p_{90}/p_{50} , and p_{50}/p_{10}), on the contrary, are insensitive to shifts of income within the boundaries, but emphasize extreme values and illustrate what happens at the tails of the distribution.

The analysis of P_{90}/P_{10} and P_{90}/P_{50} ratios suggest the same trends as for the Gini index (Fig. 3, top and middle panels), indicating that countries with higher levels of starting inequality will face the highest increase in case of L5 (P_{90}/P_{10} : $b = 0.068$, $p < 0.05$; P_{90}/P_{50} : $b = 0.159$, $p < 0.01$). Similarly to the dynamics of the Gini index, at lower levels of lockdown there is little heterogeneity in the effects observed in low- and high-inequality countries; however, already at intermediate levels of lockdown, middle and high-inequality countries would experience remarkably higher increase in inequality, that would diverge spectacularly in L4 and L5.

Interestingly, the bottom tail of the income distribution (p_{50}/p_{10} – bottom panels of Fig. 3) provides a different picture, as pre-lockdown p_{50}/p_{10} level has no significant effect on its change in the case of L5 ($b = 0.083$; $p > 0.3$). In order to explain this exception, we first look at the consequences of lower intensive lockdowns. Up to L3 the p_{50}/p_{10} ratio, i.e. the distance between households with low and middle incomes, would decrease. This trend is visible in all countries, but particularly in those with high pre-lockdown inequality (Fig. 3, bottom right panel). This is due to the fact that the income of the households at the middle of the distribution typically depends on labour incomes from (vulnerable) employment to a high degree, and would therefore decrease significantly in the case of a lockdown. On the other hand, incomes of the households at the bottom of the income distribution rely more intensively on social transfers (pensions, social assistance, unemployment benefits, etc.), and would remain unaffected, or suffer a limited loss, in the event of a lockdown.

This explanation is supported by the evidence provided in Fig. 4, in which we plot the ratio between the median income of households with 90% or more of their income represented by social transfers, and the median income of the country. In the case of no pandemic and lockdown, the median income of such a household type amounts to about 75% of the median household disposable income. As the lockdown level increases, their relative position in the income distribution improves, and in L3 it gets close to the median income. Therefore, those who were at the bottom of the income distribution, as a consequence of the lower-level lockdown, climb up the relative income ladder and get closer to the middle of the distribution, leading to a decrease in the P_{50}/P_{10} ratio.

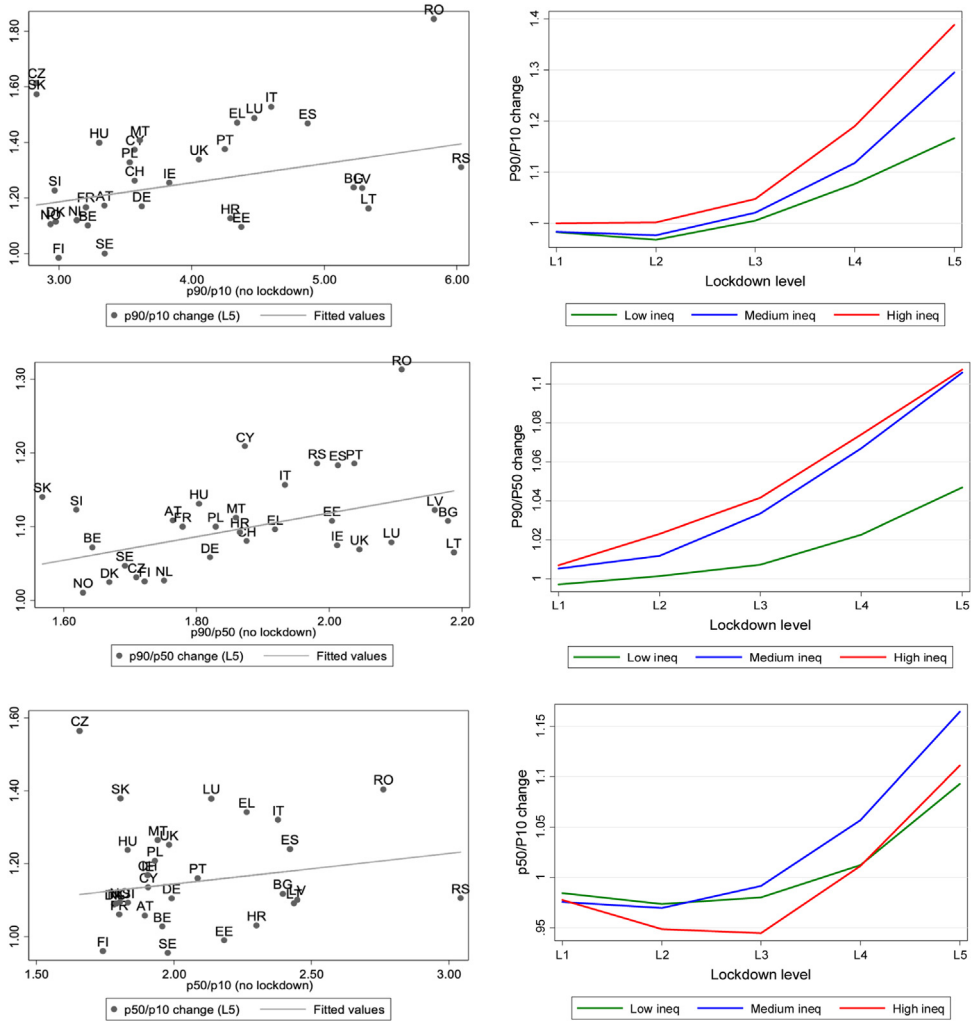


Fig. 3. The impact of lockdown on p90/p10 (top) and p90/p50 (middle) and p50/p10 ratio (bottom panels). Note: Lines on the right-side panels represent median changes in ratios at different levels of lockdown for three groups: low-, medium- and high-inequality countries (group division based on the each ratio levels before lockdown).

As the extent of the lockdown grows, the income of pre-lockdown worse-off households becomes higher than the median and they switch their position with those at the middle of the income distribution in L0. The latter, due to the vulnerability of their incomes become the “new poor”. In that context, the rise in p50/p10 ratio at L4 and L5 illustrates the further deepening of the differences between the “old poor” (households relying on social transfers) that are now at the middle of the distribution, and the “new poor” (households relying on vulnerable employment) that slide down towards the bottom. The increase of the p50/p10 ratio in L4 and L5 indicates that, in such scenarios, the “new poor” would end up in an even more difficult position than the “old poor”.

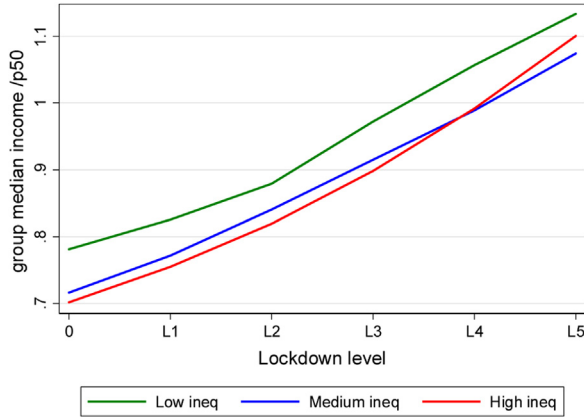


Fig. 4. Ratio between median incomes of the households relying on social transfers and the average country median income, at different levels of lockdown.

Note: Lines represent median changes in the ratio at different levels of lockdown for three groups: low-, medium- and high-inequality countries (group division based on p50/p10 ratio before lockdown).

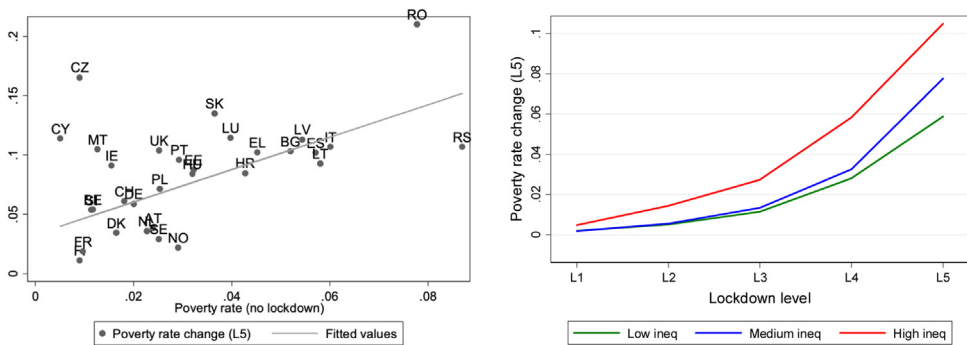


Fig. 5. Changes in poverty as a consequence of the lockdown.

Note: Lines on the right-side panel represent median changes in poverty rates at different levels of lockdown for three groups: low-, medium- and high-inequality countries (group division based on the poverty levels before lockdown).

As highlighted in Fig. 4, this effect would materialise in all inequality country-groups, to approximately the same extent, albeit from different starting points. Given that the described structural evolution dominates the changes happening in the lower part of the distribution, the effect of the pre-lockdown p50/p10 in Fig. 3 (bottom panels) is attenuated and less straightforward.

4.2. Lockdown and poverty

Given the previous discussion and evidence on the position of the households relying on vulnerable labour income, the lockdown is also likely to increase the number of poor households. Fig. 5 (left panel) indicates that in the case of a L5 lockdown, in countries with currently higher poverty rates (measured as the share of household below 30% of the median equivalised household income) the increase in poverty would be higher ($b = 1.368$; $p < 0.01$). Consistent with what has been previously observed, the magnitude of poverty changes would remarkably differ across groups of countries as the extent of the lockdown increases. At lower levels, the growth of poverty

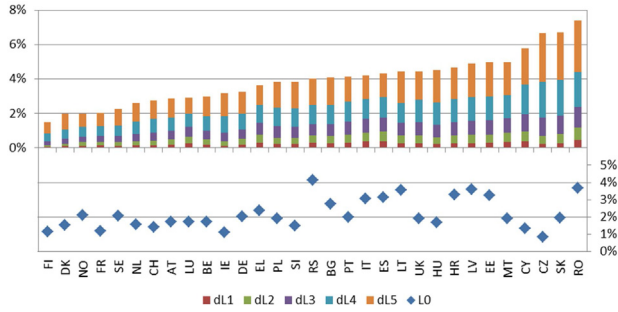


Fig. 6. Percentage of GDP needed to alleviate poverty in L0 (dots) and change in the percentage after different levels of lockdown (stacked bars).

Note: Dots in the lower part of the figure represent the percentage of GDP needed to alleviate at-risk-of poverty (cut-off point at 60% of the median equivalised income) in the absence of a lockdown (L0). Stacked bars in the upper part represent additional percentage of GDP needed to alleviate poverty for each additional level of lockdown (dL1 to dL5). Therefore, the total bar represents the total additional percentage of GDP needed to alleviate poverty in L5 scenario.

is less pronounced (e.g. less than 2% increase for all groups in L2). On the other hand, at higher levels of lockdown, median poverty rate changes for low-inequality countries would go up by 6%, and for high-inequality countries by 10%.

Results presented in Fig. 5 are robust to the change in poverty threshold. When the threshold is set to 40, 50 and 60% of the median equivalised household income (the latter representing the cut-off point of Eurostat’s at-risk-of poverty rate) outcomes confirm that the differences in the magnitude of poverty changes between low- and high-poverty countries are significantly increasing for higher levels of lockdown.

The increase in poverty rates describes how many households slide below the poverty threshold as a consequence of the lockdown, not how deep their poverty is. From a policy perspective, the dynamics of poverty rates alone is therefore poorly informative on the effort needed to alleviate (or at least attenuate) the increase in poverty. To fill this gap we report in Fig. 6 the amount of transfers (as a percentage of GDP) needed to drive poor households’ incomes to the 60% of the median equivalised household income (the at-risk-of-poverty threshold). In the lower part of Fig. 6 (dots) we present the percentage of GDP needed to alleviate at-risk-of poverty in the absence of a lockdown (L0). With some exceptions, the general trend suggests that Nordic and Western countries need up to 2% of their GDP to alleviate at-risk-of poverty, while the countries of Southern and Eastern Europe need between 2 and 4%.

In the upper part of the graph (stacked bars), we show the additional effort needed to alleviate poverty that would materialise in lockdowns L1–L5. As a general rule, Southern and Eastern Europe countries are again those that would face the largest effort at all levels of the lockdown. In these countries, in a L5 scenario, the amount of resources needed would increase between 4 and 8% of GDP and the total cost of trimming down at-risk-of-poverty would climb up, ranging between 6 and 12% of GDP. For the Nordic and Western countries the increase in L5 would be significantly lower (between 1 and 3% of GDP), with an amount of resources needed to alleviate overall poverty (current one plus the increase due to the lockdown) ranging between 3 and 5% of GDP.

Such evidence indicates that the potential consequences of a lockdown might be difficult (not to say impossible) to tackle exactly in those contexts less able to afford large-scale countervailing measures, due to their generally harder public budget constraints.

5. Conclusions

Our analysis shows that the outbreak of a pandemic, if not paralleled with effective and timely economic compensation measures, can challenge the stability and sustainability of economic systems. The lockdown of the economy needed to slow down the contagion is indeed likely to generate a substantial increase in economic disparities. This would largely depend on changes at the bottom of the distribution, with an increasing pool of the “new poor” added to the pre-lockdown ones and ending up in an even relatively worse position. Our simulations show that this challenge is much more severe for countries endemically characterised by higher inequality. A first policy implication of our analysis is that economic analysts and, more importantly, policy makers wishing to shape more robust social environments should carefully consider this additional source of fragility stemming from high levels of economic disparities.

Income inequality and poverty, according to our results, can raise significantly even in the case of intermediate levels of lockdown; in order to prevent this outcome, the extent and effectiveness of existing social protection mechanisms, as well as the timing of implementation of extraordinary measures able to support those more severely hit, are crucial. It should be underlined, however, that such measures, despite directly benefitting the worse off, are in the interest of all (including the best-off and those unaffected by the lockdown), because they decrease the risk of social collapse.

The costs of such countervailing measures will be higher for more unequal countries, which are often characterised by harder budget and financial constraints (as we have shown for the European context). For these economies, resorting to indebtedness would mean increasing financial and political fragility, besides needing to implement future austerity measures, which would further frustrate growth prospects and increase inequality. In the realm of public health, if such economies are forced to lift necessary public health measures (i.e., the lockdown) prematurely because the economic costs of containment are unsustainable, the pandemic will inevitably begin to spread again, fuelling a devastating spiral. When such economies are strongly integrated with other ones (as in Europe), such economic and health risk might easily spill over to other countries, ultimately thwarting their efforts to stop the pandemic and boost the recovery in the whole region. A coordinated, supranational level of action in terms of health policy and fiscal response is therefore not a matter of solidarity, as noble as that motivation may be. Rather, a mutual help mechanism, able to support the most vulnerable countries, would be in the self-interest of all countries.

The lesson coming from the COVID-19 experience is that the global transmission of negative shocks does not only concern the economic and financial sphere; pandemics can quickly spread globally, too. In such a scenario the policy options are clear: either reinforcing international policy cooperation in all fields (health, finance, economy) or limiting drastically the interactions with the rest of the world, i.e. reverting the globalisation trends that have dominated the world economy for a long time.

Acknowledgments

Work of Marko Vladislavljević is supported by the Ministry of Education, Science and Technological Development of Serbia.

References

- Ahmed, F., Ahmed, N. E., Pissarides, C., & Stiglitz, J. (2020). Why inequality could spread COVID-19. *The Lancet Public Health*, [https://doi.org/10.1016/S2468-2667\(20\)30085-2](https://doi.org/10.1016/S2468-2667(20)30085-2)
- Barbieri, T., Basso, G., Scicchitano, S. (2020). Italian Workers at Risk during the COVID-19 epidemic. Available at SSRN: <https://ssrn.com/abstract=3572065> or <https://doi.org/10.2139/ssrn.3572065>.
- Bourguignon, F., & Spadaro, A. (2006). Microsimulation as a tool for evaluating redistribution policies. *The Journal of Economic Inequality*, 4, 77–106. <https://doi.org/10.1007/s10888-005-9012-6>
- Brunori, P., Maitino, M. L., Ravagli, L., & Sciglione, N. (2020). *Distant and Unequal. Lockdown and Inequalities in Italy*. Mimeo. Available at: http://www.unicaldine.it/research/BMRS_2020.pdf (Last accessed 08 May 2020)
- Cameron, A. C., & Trivedi, P. K. (2009). *Microeconometrics using Stata*. College Station, TX: Stata press.
- Dingel, J. I., & Neiman, B. (2020). *How Many Jobs can be Done at Home?* NBER Working Paper No. 26948. <https://doi.org/10.3386/w26948>
- Dorn, F., Fuest, C., Göttert, M., Krolage, C., Lautenbacher, S., Lehmann, R., Link, S., Möhrle, S., Peichl, A., Reif, M., Sauer, S., Stöckli, M., Wohlrabe, K., & Wollmershäuser, T. (2020). *The Economic Costs of the Coronavirus Shutdown for Selected European Countries: A Scenario Calculation*. IFO Econ Pol Policy Brief.25/2020.
- [dataset] EU – Survey on Income and Living Conditions (SILC) data. (2020). Eurostat. <https://ec.europa.eu/eurostat/web/income-and-living-conditions/data>
- [dataset] Expenditures on social protection as a % of GDP. (2020). Eurostat. https://ec.europa.eu/eurostat/statistics-explained/index.php/Social_protection_statistics_-_pension_expenditure_and_pension_beneficiaries
- Fisher, M., & Bubola, E. (2020). *As Coronavirus Deepens Inequality, Inequality Worsens its Spread*. New York Times (Last accessed 28 April 2020). <https://www.nytimes.com/2020/03/15/world/europe/coronavirus-inequality.html>
- [dataset] Economic Freedom of the World dataset. <https://www.fraserinstitute.org/studies/economic-freedom-of-the-world-2020-annual-report>, 2020
- Guerrieri, V., Lorenzoni, G., Straub, L., & Werning, I. (2020). *Macroeconomic Implications of COVID-19: Can Negative Supply Shocks Cause Demand Shortages?* NBER Working Paper No. 26918. <https://doi.org/10.3386/w26918>
- International Labour Organisation (ILO). (2020). *COVID-19 and World of Work: Impacts and Responses* (ILO monitor 2nd edition). (Last accessed 28 April 2020). https://www.ilo.org/wcmsp5/groups/public/-dgreports/-dcomm/documents/briefingnote/wcms_740877.pdf
- Milanovic, B. (2020a). *The Real Pandemic Danger Is Social Collapse, Foreign Affairs, March 19, 2020* Available at <https://www.foreignaffairs.com/articles/2020-03-19/real-pandemic-danger-social-collapse> (Last accessed 8 May 2020).
- Milanovic, B. (2020b). *Four Types of Labour. Global inequality* Available at <http://glineq.blogspot.com/2020/03/four-types-of-labor-and-epidemic.html> (Last accessed 28 April 2020).
- OECD. (2020). *Evaluating the Initial Impact of COVID-19 Containment Measures on Economic Activity. Secretary-General of the OECD. March 2020*. (Last accessed 08 May 2020). https://read.oecd-ilibrary.org/view/?ref=126_126496-evgsi2gmqj&title=Evaluating_the_initial_impact_of_COVID-19_containment_measures_on_economic_activity
- Parker, R. (2002). The Global HIV/AIDS Pandemic, Structural Inequalities, and the Politics of International Health. *American Journal of Public Health*, 92(3), 343–347. <https://doi.org/10.2105/AJPH.92.3.343>