Poverty Consequences of COVID-19 Epidemic-Induced Lockdowns in Senegal: Extent and Implications from a Household Survey

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Bringing Rigour and Evidence to Economic Policy Making in Africa

Poverty Consequences of COVID-19 Epidemic-Induced Lockdowns in Senegal: Extent and Implications from a Household Survey

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Contents

List of tables
Abstract

1. Introduction 1

2. Study Context 3

3. Early Empirical Evidence on the Impact of COVID-19 7

4. Methodology and Data 9

5. Results and Discussions 12

6. Conclusion 18

Note 19

References 21

Annex 23

List of tables

1.	Impact of COVID-19 on income, as a proportion of GDP, country-wide	12
2.	Poverty impact of COVID-19, at the national poverty line, country-wide	13
3.	Impact of COVID-19 on inequality (Gini coefficient), country-wide	13
4.	Size of uniform transfer, relative to GDP, for a constant poverty headcount (national lines), country-wide	14
5.	Income losses due to the crisis	15
6.	Income losses across industries (10 most affected), country-wide	15
7.	Impacts on poverty and inequality	17
8.	Monthly budget for the universal transfer to keep poverty headcount constant, fiscal impoverishment and gains to the poor	17
A1.	Survey evidence of the monthly impact of the crisis on turnover/income across aggregate industries (%)	23
A2.	Additional assumptions about income losses across industries and types of income	24
A3.	Income lost due to lockdown, scaled by GDP (Approach 1)	24
A4.	Estimated poverty rate, national poverty line, for the whole country (Approach 1)	25
A5.	Estimated poverty rate, national poverty line, for Dakar (Approach 1)	25
A6.	Estimated poverty rate, national poverty line, for other urban areas (Approach 1)	26
A7.	Estimated poverty rate, national poverty line, for rural areas (Approach 1)	26
A8.	Size of uniform transfer needed to keep poverty headcount constant, scaled by GDP (Approach 1)	27
A9.	Average fiscal impoverishment as a share of national poverty line, inclusive of transfer to keep headcount constant, national level (Approach 1)	27
A10.	Average fiscal gains to the poor as a share of national poverty line, inclusive of transfer to keep headcount constant, national level (Approach 1)	28
A11.	Estimated income losses across industries (Approach 2)	28

Abstract

This paper aims to assess the short-run distributional impact of the COVID-19 pandemic in Senegal by specifically looking at income losses, poverty and inequality impacts, and how the Government would go about offsetting them. Using a detailed household expenditure survey and two approaches that make various assumptions regarding the riskiness of income sources and types, the share of households losing income and the extent of those losses, the paper suggests that the welfare consequences are indeed very large. An increased share of households losing more and more income would lead to an estimated income loss of up US$ 263.3 million per month or 12.6% of monthly GDP, poverty rate reaching 72.3%, and a worsening in inequality. With survey evidence of the extent of losses across industries and income types, the paper shows that losses tend to emanate from rural areas as opposed to Dakar and other cities, and from industries such as transport/travel, financial intermediation and housing services (per capita losses), agriculture and personal services (absolute losses). The paper also provides an estimate of the monthly budget (US$ 246.6 million, or 11.8% of monthly GDP) in the form of adult-equivalent uniform transfer that would fully offset the poverty impact, conditional on a targeted mechanism that espouses the distributional impact across geographical locations.

Key Words: *COVID-19, Poverty, Inequality, Fiscal policy, Senegal*

1. Introduction

The ongoing COVID-19 pandemic is associated with unprecedented and significant health and economic challenges to the world economy, both developed and developing countries. The latter, especially those in Africa, are expected to shoulder substantial economic and social costs as a result of ill-equipped and ill-resourced healthcare systems, very limited government budget and fewer public health tools available to slow the spread of the virus, and already harsh living conditions for a large segment of the population.

Although it is too early to fully determine the scale of the crisis and its actual impacts, early evidence suggests that the crisis has already reverted many of the positive economic and social trends. In its revised flagship annual report, the African Development Bank (AfDB) has projected that GDP across the continent would contract by 1.7% in 2020, a drop by 5.6 percentage points from the pre-COVID-19 projection, under the assumption of a substantial impact over a short duration (AfDB, 2020).[1] Although these figures are below the global contraction in GDP by 4.9%, the impact on low income households is expected to be more severe, jeopardizing the significant gains of poverty reduction in almost all developing countries over the past three decades (IMF, 2020a). In fact, the crisis could push an estimated 71 million people worldwide (or 100 million under the downsize scenario) into extreme poverty in 2020, and more than a third of these new poor will reside in Sub-Saharan Africa (World Bank, 2020a). These figures amount to an increase from 8.23% in 2019 to 8.82% (or 9.18%). This represents a reversal to the continuous decline of poverty since 1998, and a return to the 2017 levels.

To the extent that the incidence of the pandemic, the pace at which it evolves and the scope and effectiveness of policy responses vary significantly across countries, one would expect the distributional impact to vary greatly from one country to another. Even within any given country, the impact would vary across household and individuals. For instance, World Bank (2020b) suggests that the welfare impact is very likely to vary across different groups (and over time), with respect to dimensions such as gender (male vs female), the type of economic activities and sources of incomes (self-employment vs salaried employment, or formal vs informal sectors), and the geographical location (urban vs rural settings).

This heterogeneity in countries' socio-economic structures, in addition to the extent to which the crisis has been developing, calls for a clear understanding of the specific

context of the country in question and various specificities that would serve as valuable inputs into the design of effective public responses. The latter could for instance rely on a clear knowledge of the economic losses from the perspective of households and individuals (income and job losses across industries, household characteristics and locations), and the corresponding impact on poverty and inequality. In the process of offsetting these negative impacts, these estimates indicate the extent of fiscal costs of mitigation policies and serve as inputs into the targeting mechanisms.

This research aims to analyze the distributional consequences (poverty and inequality) of epidemic-induced lockdowns in the specific context of Senegal, and the fiscal costs of offsetting them. More specifically, the research uses country-level household survey to estimate: (i) the loss of income these lockdowns cause across the income distribution; (ii) the increase in poverty and inequality brought about by the income losses; and (iii) the Government expenditure that would be necessary to offset these adverse effects.

Two methodological approaches are considered, and they are based on the notion of "at-risk income"; that is, income most likely to be negatively affected as a result of the pandemic and the related measures. The first approach makes assumptions on these income and economic activities that could be reduced by the crisis, and considers different combinations of the share of households losing income (from 0 to 100%) and the proportion of their income that is lost (from 10% to 100%). The second approach goes one step further with specific assumptions on the actual share of income being lost, based on specific knowledge of the specific context and two firm and household surveys. In each case, poverty and inequality measures are computed, and a policy response in the form of universal transfer is considered with the aim to fully offset these negative impacts.

The results suggest that the distributional impact is indeed very large. As more and more households lose an increasing share of their at-risk income as a result of the crisis, the latter is estimated to generate income losses of up to 12.6% of monthly GDP, and a sharp increase in poverty that could go up to 72.3% in the worst case scenario of 100% of households losing 100% of their income at risk. This effectively negates the gains in terms of poverty reduction over the last two decades. Inequality is also found to worsen. These impacts vary greatly across industries and geographical locations. The universal transfer needed to offset these impacts, for example by reverting to the pre-crisis poverty headcount, would require a budget of up to 11.8% of monthly GDP, with a targeting mechanism that would espouse the geographical distribution of the impact of the crisis.

The rest of the paper is structured as follows. The next section (2) describes the study context. Section 3 provides a quick summary of the early evidence. Section 4 introduces the methodological approaches and the data, and the set of assumptions needed to run the simulations. Section 5 presents and discusses the results. Section 6 concludes.

2. Study context

In Senegal, since the first officially reported case of coronavirus on 2nd March 2020, the epidemic has spread widely but its pace has certainly been slowed by various containment measures in addition to public programmes to mitigate the impact on businesses and households. As of 17th July 2020, the country had (officially) recorded 8,544 cases, of which 5,809 have recovered from the disease, 160 have died, while 2,574 are still hospitalized.[2] Its total confirmed cases rank the country 9th in Africa.3 With 73.6% of the total cases, Dakar is the epicenter of the crisis. The capital city is home to 23.1% of the 16 million Senegalese and close to 39.5% of non-agricultural economic activities, but only 0.3% of total landmass.[4]

In addition to direct health responses, which comprise expanded testing, importations and donations of personal protection equipment (PPE), new facilities for care, PPE regulations and production, the Government's mitigation strategy has included, among others:[5]

- **Population movement:** Bans on public gatherings, nightly curfews, closure of schools and religious institutions, limitation of transportation, travel bans (inter-region and international);

- **Broad fiscal policies:** Financial support for private businesses (delayed payment taxes until 15th July 2020), general stimulus (creation of "Force COVID-19", a response and solidarity fund, CFA 1 trillion strong), and non-food price control (ceiling prices for hydro-alcoholic gels);

- **Business policies:** Launch of e-commerce platform, restrictions on formal and informal markets (operating days and hours), restrictions on restaurants (closure on 14th March until 11th May 11);

- **Social protection policies:** Cash transfers (for the diaspora and for children in economic and social difficulties), food aid (distribution of rice, oil, pasta and soap to vulnerable households), utility bill support (free water for close to one million households and free electricity for 662,000 households), and wage support (obligation to pay a bonus of at least 70% of the salary to laid-off employees); and

- **Monetary and financial policies** in the form of debt restructuring, which aims to cover the public debt vis-à-vis the domestic private sector (some CFA 302 billion).

The adjustment mechanisms that underlie the introduction of these public response strategies follow closely an increased understanding of the spread of the crisis and its sheer economic and social costs. However, faced with the health and economic challenges of protecting lives while reviving economic activities, many of the lockdown measures have now been phased out or extended. However, the fact that the number of reported cases are still rising, and the country is on the red list of travel restrictions for many other countries, such as the European Union, is suggestive that the fight against the virus is far from over.

The COVID-19 crisis has occurred in a general context of strong economic growth and declining poverty. In effect, since 2015, growth has averaged more than 6% despite a slowdown in 2019 when the rate fell to 5.3% from 6.4% a year earlier (World Bank, 2020c). Pre-crisis projections have suggested a positive outlook, with growth rate at 6.3% in 2020 and 6.8% in 2021, thanks to the second phase of the *Plan Senegal Emergent* (Plan for Emerging Senegal), which calls for implementation of reforms to stabilize the macroeconomic environment, stimulate private investment, and accelerate the economy's structural transformation over the 2019-2023 period.[6]

This overall economic performance has been translated into a steady decline of poverty. With a rate of 57.3% in 2001, the poverty rate has indeed gone from 46.7% in 2011 to 37.8% in 2019, the lowest in the West African sub-region (WAEMU, 2020).[7]

These positive economic and social trends are poised to be altered significantly by the crisis. Various forecasts suggest that Gross Domestic Product (GDP) growth would decline significantly, although the rate will still be positive. For instance, World Bank (2020c) has indicated that growth could drop to 1.3% in 2020, down from an initial projection of 5.3%, which corresponds to a 4 percentage points loss in economic activity as a result of the crisis and its aftermath. Most of these economic losses are expected to occur in the services sector (5 percentage points drop) and the industry sector (2.8), while the agricultural sector is expected to lose relatively little (0.3).

From the perspective of the African Development Bank, AfDB (2020), the country's GDP is expected to grow by 2.8% (or 0.1% in the worst case scenario), which amounts to a loss of economic activity by 4 percentage points (6.7) in GDP growth in 2020 due to COVID-19. The losses come about as a result of an anticipated contraction in the tourism sector (60%) and transport (9%), and a fall in investment (3%). The latter is expected to occur because of the heightened constraints on the government budget (rise in both public deficit and public debt), more uncertainty and reduced demand and markets (which reduces domestic and foreign investment), and a significant drop in remittance flows originating from hard-hit countries such as France, Spain, Italy, and the USA.

The pandemic is also expected to impact household welfare. Under the assumption of zero per capita GDP growth, World Bank (2020c) has forecasted a stagnation of the (international) poverty rate, but as a result of significantly higher risk of a protracted

COVID-19 outbreak, the country could experience a significant increase in poverty in the short-term.

More micro evidence has provided a breakdown of these figures. For instance, a national agency in charge of small and medium enterprises (SMEs) had undertaken in May 2020 a survey to document the extent of the crisis from firms' perspectives.[8] Preliminary results suggest that 90% of businesses across the country have reported being "very negatively" or "negatively" hit by the pandemic. The largest economic loss has been reported in hotels, bars and restaurants, with a 71.6% decline in turnover. Interestingly, in the "textile industry", while 12.6% of surveyed firms reported various levels of negative impact, two-thirds have registered a positive turnover, certainly due to the additional lucrative market of face masks. Furthermore, in the retail sector, 44.6% have reported a decline in turnover while 28.6% have indicated no impact and 33.3% have seen an increase in activities, most likely due to higher demand for COVID-19-related products such as detergents and other sanitary and cleaning products, and some form of panic buying that sends consumers rushing to constitute reserves.[9]

The survey also indicates that, of the various measures put in place by the Government to contain the spread of the virus, the following are reported to be the most impactful ones:

(i) travel ban across various parts of the country;

(ii) closure of national borders; and

(iii) prohibition of public gatherings (of more than 10 persons).

While 74% of surveyed businesses report no knowledge of the public initiatives to help SMEs, 94% are in need of public assistance (mostly in the form of market access and fiscal stimulus) to weather the impact of COVID-19 on their activities and survival.

From a household perspective, another survey has sought to provide insights into the socio-economic impact of COVID-19 in Senegal (Ba, 2020).[10] As of May 2020, 81% of those who were employed immediately prior to 2nd March 2020 have declared a reduction in earnings or income. The extent of the individual losses tends to vary across gender (women being more affected than men – 86% against 79%), age (positive correlation), education (89% among those with no formal instruction, 85% for those with primary-school education, against 68% for highly educated), the type of activities (84% for the informal sector and 53% to 71% in the formal sector between skilled and unskilled workers) and geographical locations (highest reduction in regions in the southern regions of Ziguinchor (95%) and Kolda (92%), compared to Dakar, the capital (78%)).

The survey also indicates that only 35% has continued their work "normally", while the rest has either lost their job (37%) or have started working part-time (28%). All these have translated into a worsening of living conditions, with a reduction in food security. The survey indicates that 23% households have gone from 3 to 2 meals per

day while 45% of households report a decline in the quality of food, which has become less nutritious and less varied. Furthermore, fear fueled by the rapid contagion of the virus has led to reduced frequentation of hospitals, with more women refusing to seek medical attention (18%) than men (12%). In addition, use of face masks is relatively very widespread (83%), mostly among young people (18-25 years), well educated, skilled workers, and in regions such as Dakar and Thies (most economically affluent regions in Senegal). The survey also suggests that, as of 26th April 2020, at least 13% of households had received some form of aid or assistance, either from the central government or local administration (mayors) or from a non-governmental organization (NGO).[11]

Additional initiatives to document and monitor the crisis and how it unfolds includes a telephone survey on household being conducted by the World Bank and the National Statistical Agency.[12] These complementary efforts are important in the face of the rapidly evolving crisis and the sense of urgency with which the Government has to react. In this scramble to mitigate the impact of the crisis, a clear understanding of the cost mechanisms of the outbreak to the economy and to households from the ongoing literature, in addition to contextual analyses, could provide valuable insights.

3. Early empirical evidence on the impact of COVID-19

The fast-evolving nature of the ongoing crisis suggests that the true social and economic costs are not yet fully known, but most short-run estimates indicate significant economic losses and costs, depending on:

(i) the spread of the pandemic;

(ii) the extent of the containment measures that have led to business closure (temporarily or undefinedly), the widespread restrictions on travel and mobility, the financial market turmoil, an erosion of confidence and heighted uncertainty;

(iii) the swiftness and scope of policy responses to mitigate the consequences to businesses and households; and

(iv) the methodological approaches used in the simulation exercises.

The relatively few studies have indeed indicated that the crisis has generated substantial adverse impact on the economy and on households' and individuals' welfare and well-being. There are various channels through which the cost mechanisms are developed (World Bank, 2020b). They include:

(i) direct and indirect impacts on labour income (lost earnings because of illness or the need to take care of sick household members, laid-out our furlough), and non-labour income (reduction in international/internal remittances and private transfers);

(ii) the direct impact on consumption (reduction in domestic and foreign supply, changes in prices, reduced access to credit); and

(iii) a disruption in services as a result of quarantines and other containment measures (suspension of classes and feeding programmes in schools, potential saturation of health system in countries with high incidence of COVID-19, and disruptions in mobility).

Globally, the crisis is expected to negate the progress towards achieving the United Nations' goal of ending poverty by 2030. Using microdata from the World Bank's PovcalNet dataset and computing through the Stata's PovcalNet interface, Sumner et al. (2020) estimate that under the worst case scenario (20% contraction

in income or consumption), the crisis could increase the number of poor by as much as 420–580 million. The results also indicate a great deal of heterogeneity, with countries in regions such as the Middle-East and North Africa, South-Asia and Sub-Saharan Africa (SSA) being hit the hardest, as opposed to Latin America and Europe and Central Asia. At the international poverty line of US$ 1.9/day, SSA is found to account for a third of those newly living in poverty.

Using the same World Bank's computational tool, Valensi (2020) also indicates that the pandemic will likely negate the poverty reduction gains from the past decade. Least Developing Countries (LDCs) where poverty rates are already high are found to be left behind, as they represent the main locus of extreme poverty.

ILO's (2020) simulations based on Computable General Equilibrium (CGE) modelling provide evidence that the crisis will impact labour and poverty in three different ways: the quantity of jobs (both unemployment and under-employment), the quality of work (e.g. wages and access to social protection), and the effects on specific groups who are more vulnerable to labour market shocks. Global unemployment is estimated to rise by 5.3 million under the low case scenario 24.7 million under the high case scenario. Unemployment is also estimated to increase globally on a large scale as a result of significant downward adjustments to wages and working hours. The overall losses in labour income amount to between US$ 860 billion and US$ 3,440 billion, which will likely translate into reduced consumption for households and market opportunities for business firms. Consequently, the crisis could push as many as 8.8 million people into extreme and 35.0 million into moderate working poverty (at US$ 3.20 per day, Purchasing Power Parity - PPP), with a disproportionate impact on people with underlying health conditions and older people, young persons, women, unprotected workers (including the self-employed, casual and gig workers), and migrant workers, mostly in middle income countries.

Using IFPRI's global CGE model, Vos et al. (2020) provide evidence that the slowdown will greatly impact poverty and food security. GDP, household consumption, agri-food production and trade are found to contract at a similar pace in both developed and developing countries, provided that the slowdown is caused by labour productivity or total factor productivity shocks. When it comes to welfare, the poorest nations face significantly greater adversity. The authors' estimate that a 1-percentage point decrease in global GDP would increase poverty (at US$ 1.90 level) by between 14 and 22 million people. SSA countries are poised to host most of the new poor (about half of them), mainly in rural areas (about two-thirds of them).

Overall, these early contributions have clearly indicated that the economic slowdown will be of significant magnitude, and the welfare implications will also be important. But to the extent that these results tend to be highly aggregated, thereby hiding significant differences within countries in terms of which socio-economic groups and specific industries are more affected by the crisis and by how much, national policies could lack context-specific policy guidance that would help in the design of tailored policy responses. The latter call for a country-based study building on specific assumptions that are informed by clear knowledge of the specific health, economic and social context and how it shapes the broad social and economic cost mechanisms documented so far in the literature.

4. Methodology and data

The methodology relies on household data to analyze the distributional impact of the income losses as a result of the COVID-19 crisis. The data used are the 2011 *Enquête sur la Pauvreté au Sénégal* (ESPS – Poverty Survey in Senegal), a nationally representative household survey like the World Bank's Living Standard Measurement Surveys (LSMS). Relevant to this study is a set of individual and household information pertaining to labour market and employment status of household members, income sources, consumption patterns, and the national poverty line of CFA 266,061.1 and the extreme (or food) poverty line of CFA 119,346.1.

The analyses starts by making assumptions about the extent to which households lose income as a result of the pandemic, based in particular on the type of work and income, the industries, etc. Pre-crisis income are then adjusted with these losses, and welfare analyses (in terms of poverty and inequality) are conducted by comparing the pre- and post-crisis situations. Two approaches are considered to analyze the welfare distribution, depending on how far the assumptions go about the extent of income losses.

Approach 1

In the face of non-existing data that would accurately inform about the extent to which households may have lost income, this first approach considers different scenarios that combine the share of households losing income (from 0 to 100%) and the share of their income that is lost (from 10 to 100%). Underlying these various scenarios is the notion of "at-risk income"; that is, income most likely to be affected by the crisis. On the opposite, safe income is considered immune from the crisis.

From our knowledge of the context, we first hypothesize that wages and salaries earned by employees in the public sector are safe, and pensions to retirees, as the system is run by the government that has not been bankrupted or declared a cessation of payment, thanks in part to donations and foreign assistance. The public sector comprises various segments such as the general administration, education, health, and public works.[13]

Top management in all industries are also considered not to have lost income. It is hypothesized that if businesses were to adjust to the crisis, they would more likely target workers at the lower end of the skill distribution, who could then be laid out or furloughed

or experience a pay cut. If high-skilled workers were to be affected, their relatively large savings and physical or financial assets would likely help them successfully weather the potentially adverse effects. Moreover, own-consumption agriculture is also considered as safe income to the extent that the corresponding goods do not transit to the market, and therefore are not subject to any crisis-related restrictions.

Outside these sources, all other incomes are expected to be affected by lockdown measures, either directly or indirectly, although to a varying degree. They include, among others, wage and salaries in 2-digit private industries (whether formal or informal, employment or self-employment), rents, interests, and remittances and other private transfers.

The structure of income (shares of safe and at-risk income) is then translated into consumption, as information on the latter tends to be more reliable than that on income when analyzing welfare in a typical developing country context. These 2011 data are deflated to the 2019 prices using the consumer price index and real GDP per capita growth over the period, while assuming that a fraction of income growth goes to consumption (85%). Another crucial assumption is that the labour market structure has not changed significantly over the same period.

This first approach goes on to compute the distributional statistics across various scenarios of the share of income losers and lost income. Changes in poverty indicators through the three measurements of Foster-Greer-Thorbecke (FGT-0,1,2) are obtained, in addition to the Gini coefficient, considering different poverty lines (national, and international at US$ 1.9, US$ 3.2 and US$ 5.5). The policy simulations consider a universal transfer (excluding individuals whose income has not been affected by the crisis), with the objective to fully off-set the adverse impact as captured by each measure of poverty (that is, reverting to pre-crisis levels).

Approach 2

This second approach goes one step further. For income already identified as “at-risk”, more precise assumptions are made about the actual share of lost income. These assumptions are mostly based on actual surveys, such as the one conducted by ADEPME (mentioned above) on turnover losses, and some educated guesses. We hypothesize that turnover losses are a fairly good proxy for wage and salary losses to employees. In addition to civil servants and top management workers, the survey suggests that the following are not affected:

(i) workers in the textile and retail industries, where we average the losses to zero; and

(ii) self-generated income (own consumption).

For industries such as air transport and recreation, culture, and sport services, losses are assumed to be 100%, as there have been a complete ban that ends up shutting down these activities.[12]

Regarding remittances, they are expected to fall at unprecedented rates. In Sub-Saharan Africa (SSA), the inflows are projected to decline by 23.1% in 2020, the second largest drop after Europe and Central Asia (World Bank, 2020d). In Senegal, the Government is expecting a decline by 30% in 2020 as a result of the crisis.[15] Both figures will be applied alternatively to remittances lost by households, irrespective of the origins (internal vs external) and locations (rural vs urban), as there is no additional information that would help differentiate along those lines.

Additional income sources include rents (housing, equipment, cars), financial assets, and various commissions. To the extent that they do not fall into specific industries, and because they represent a relatively tiny fraction of households (2.2%), losses for these types of income are hypothesized to be equal to zero.

Similar to the previous approach, income losses will be accounted for to obtain the post-crisis situation, and welfare analysis will compare the pre- and post-crisis poverty and inequality levels. The policy response to be simulated will also be a universal transfer needed to fully mitigate the impact on households.

5. Results and discussions

Results from approach 1

Table 1 shows income losses based on various combinations of the share of households losing income and the extent of lost income. As more and more households are adversely impacted by the crisis, and the share of lost income rises, total income losses increase to ultimately reach 12.6% of monthly GDP (or US$ 263.2 million) when 100% of households lose 100% of their at-risk income. This will be referred to as the *worst case scenario*, as opposed to no household losing income (base scenario). Various combinations of household and income shares provide somewhat more realistic case scenarios. For example, considering the case of half of households losing half of their income, the total losses amount to 3.1% of monthly GDP. The fact that the doubling of these shares (households and lost income), going from 50% to 100%, results into more than a doubling of the losses (in fact, a 4-fold increase) is suggestive of the non-linear process that governs the losses. It could also indicate that as the shares increase, newly affected households have more to lose than those already accounted for.

Table 1: Impact of COVID-19 on income, as a proportion of GDP, country-wide

Share losing income \ Share of income lost	10%	50%	80%	100%
0%	0.000	0.000	0.000	0.000
10%	0.001	0.006	0.010	0.012
50%	0.006	0.031	0.049	0.062
80%	0.010	0.050	0.080	0.100
100%	0.013	0.063	0.101	0.126

Source: Author's calculations

The extent of income losses varies greatly across urban and rural settings.[16] In any combination of the shares of losing households and lost income, total losses are more important in rural than in urban areas: 6.0% of monthly GDP (or US$ 125.3 million), against 4.3% in Dakar (89.1), and 2.3% in other cities (47.4). But combining Dakar and other cities would make the urban areas relatively as much affected as the rural areas.

Table 2 shows the impact on poverty at the national poverty line. In the base scenario of no household losing income, the poverty rate stands at 39.0%. As more and more households lose an increasing share of their income, the national poverty rate shoots up to ultimately reach 72.3% in the worst-case scenario. This represents an increase by 33.4-percentage points. Similar patterns are also observed when changing the poverty lines to the international thresholds of US$1.9, 3.2. and 5.3 per person and per day.

Following the same patterns of income losses, the poverty impact varies significantly across geographical locations. In rural areas, which is home to most of the poor and where income losses are estimated to be the largest, going from the base to the worst case scenario, the poverty rate rises from 49.0% to 83.1% (a 34.1 percentage point increase). In Dakar and urban areas, the increase is from 17.9% to 53.4% (35.5 percentage increase) and from 35.0% to 63.8% (28.8 percentage point differential), respectively. When combined, these two geographical locations would make the urban poverty increase smaller than in rural areas, although the poverty incidence is higher in rural areas both before and during or after the crisis.

Table 2: Poverty impact of COVID-19, at the national poverty line, country-wide

Share of income lost / Share losing income	10%	50%	80%	100%
0%	0.390	0.390	0.390	0.390
10%	0.392	0.413	0.419	0.422
50%	0.409	0.495	0.539	0.553
80%	0.420	0.548	0.626	0.649
100%	0.430	0.595	0.692	0.723

Source: Author's calculations

Table 3 indicates how inequality is affected by the crisis. Nationally, the Gini coefficient is estimated to go from 0.378 (base scenario) to 0.571 (worst case scenario). The 50%-50% mark of the shares of impacted households and lost income also corresponds to a significant deterioration of inequality. By generating adverse effects on economic activities, jobs and income, the crisis will therefore have a differentiated impact on individual and household well-being, effectively widening the gaps among them (some being worst hit than others).

Table 3: Impact of COVID-19 on inequality (Gini coefficient), country-wide

Share of income lost / Share losing income	10%	50%	80%	100%
0%	0.378	0.378	0.378	0.378
10%	0.379	0.384	0.392	0.399
50%	0.381	0.407	0.444	0.482
80%	0.383	0.420	0.477	0.538
100%	0.384	0.427	0.494	0.571

Source: Author's calculations

If the Government were to mitigate these negative impacts, it could envision a universal transfer policy. To fully offset the impact on poverty rate, the budget needs to be subsequent. In the worst case scenario, the total monthly uniform transfer would amount to 11.8% of monthly GDP as shown in Table 4, or CFA 135 billion (US$ 248 million). This is close to the estimated total losses of US$ 263.2 million. The corresponding (monthly) per-adult-equivalent (pae) transfer would be CFA 13,042 (or US$ 23.7).[17] Relative to the national poverty line, this average monthly uniform pae transfer needed to keep headcount constant would represent 54.8%.

Moreover, the average fiscal impoverishment to the poor as a share of national poverty line, inclusive of transfer to keep headcount constant, is estimated at 5.2% in the worst case scenario.[18] This indicates the extent to which individuals have been made worse-off as a result of the crisis and the transfer policy combined. Furthermore, the average fiscal gains to the poor as a share of national poverty line, inclusive of transfer to keep headcount constant, represents 5.0%. This is an additional suggestion that the transfer mechanism is reducing the welfare impact of the crisis. As before, differences across regions follow similar patterns, with the lowest impoverishment rate at 4.7% and the highest gains to the poor with 7.0%.

Table 4: Size of uniform transfer, relative to GDP, for a constant poverty headcount (national lines), country-wide

Share of income lost / Share losing income	10%	50%	80%	100%
0%	0	0	0	0
10%	0.000	0.005	0.007	0.007
50%	0.005	0.025	0.045	0.057
80%	0.007	0.042	0.074	0.096
100%	0.009	0.051	0.088	0.118

Source: Author's calculations

Results from approach 2

Income losses from the second approach, which are based on specific assumptions about the extent of losses for the identified "at-risk incomes", are shown in Table 5. Nationally, the estimated total loss represents 4.9% of monthly GDP, and concerns 12.8 million individuals or 79% of the total population. As with the first approach, rural areas are more affected with 50.4% of total monetary losses and 62% of the number of income losers.

Income losses vary greatly across industries, as one would expect, depending on how the losses are captured. Table 6 shows the losses for the 10 most affected industries.[19] Intensity-wise, the transportation sectors, mostly by air or on water, register the highest lost income per income loser as a result of the shutdown of airports and the complete closure of the maritime liaison between Dakar and Ziguinchor in the south. Implementing travel bans via these transportation modes tends to be less challenging than land transport, which comes ninth in terms of lost income per income loser.

Table 5: Income losses due to the crisis

	Income loss			# people in HHs losing income	Share of population losing income
	CFA (billion)	in US$ (million)	Share of monthly GDP		
National	681	1,239	4.9%	12,756,369	79%
Dakar	221	401	1.6%	2,667,534	71%
Other urban	117	212	0.8%	2,172,753	67%
Rural	344	625	2.5%	7,916,083	86%

Source: Author's calculations

Furthermore, the list includes industries that one would expect to be severely affected by the crisis, such as:

(i) recreation, culture and sports, as related sites or events have been banned;

(ii) the financial sector as a result of the slowdown of economic activities and the heightened climate of risk and uncertainty; or

(iii) hotels and restaurants that follow the ban on gatherings and a slump in tourism and travel industries.

Table 6: Income losses across industries (10 most affected), country-wide

Industries	Total lost income (million FCFA per month)	In million US$	Share in total losses (%)	Total employed	Total income losers	Share of losers (%)	Lost income per income loser (CFA per month)
Transport (air)	1,170.04	2.13	2.29	10,263	7,519	73.3	155,611.5
Transport (water)	909.12	1.65	1.78	10,382	7,767	74.8	117,048.5
Recreation, culture, sports	899.16	1.63	1.76	11,641	11,340	97.4	79,291.4
Financial intermediation	285.15	0.52	0.56	7,957	3,878	48.7	73,529.0
Housing	434.18	0.79	0.85	7,811	7,811	100.0	55,585.4
Research & Development	55.62	0.10	0.11	1,453	1,037	71.4	53,633.2
Hotels/ restaurants	1,795.26	3.26	3.51	38,604	35,254	91.3	50,923.5
Office supply/ITC materials	93.31	0.17	0.18	3,123	2,202	70.5	42,376.4
Transport (land)	3,857.73	7.01	7.54	97,014	93,151	96.0	41,413.7
Editing/printing	190.87	0.35	0.37	4,855	4,833	99.5	39,493.4

Source: Author's calculations

From the standpoint of the severity of the losses, in 25 out of the 60 industries that are accounted for, more than 90% of workers have lost some share of their income, and in 5 industries such as housing services and transportation materials, 100% of workers have been affected. As far as absolute losses are concerned, the agricultural sector (farming and livestock) is by far the most affected, with total losses amounting to CFA 20.1 billion per month (or US$ 36.5 million), accounting for 39.2% of the combined industry losses. This could be explained by the sheer size of the agricultural sector, which is home to 42.4% of workers, and almost all of them (99.4%) have lost some proportion of their income. Additional reasons include:

(i) the travel ban among the Senegalese regions and with the neighbouring countries, which effectively prevents migrant farm workers from rejoining the fields or shuts the urban markets and major sub-regional markets to produce from rural agriculture; and

(ii) lost internal remittances due to lost income and jobs in urban areas that could affect agricultural activities in rural areas (purchase of various inputs).

Furthermore, the closure of the maritime route between Ziguinchor, a major agricultural production zone, and Dakar, an important market, is synonymous with lost economic opportunities for farmers in the South.

On average across industries, the typical Senegalese industry is estimated to lose CFA 886 million per month (or US$ 1.6 million). With an average of 62.5% of workers being affected, the lost income per loser averages CFA 32,788.9 per month (or US$ 59.6) across industry.

Table 7 indicates how poverty and inequality are impacted by the crisis. At the country level, the poverty rate is estimated to reach 55.4%, an increase by 16 percentage points. This corresponds to 2.67 million people being pushed into poverty by the crisis. With such an impact, the pandemic effectively erases the continuous poverty reduction gains over the last two decades. The estimated poverty rate as a result of the crisis is in fact above the 2002 poverty rate of 53%.

As with the previous approach, and in line with the distribution of income losses, the impact on poverty is larger in rural areas than in urban areas combining Dakar and other cities. The rural areas are in effect home to 65% of the new poor. As a result of the largest spike in poverty (19-percentage points), rural poverty rate, which was above the urban poverty rates prior to the crisis, becomes even larger after the crisis, effectively creating greater inequality between rural and urban households. This explains why inequality within rural and within urban areas is less affected than inequality at the national level.

Table 7: Impacts on poverty and inequality

	Poverty Rate			# of people falling into poverty	Gini Coefficient		
	Before Crisis	After Crisis	Change		Before Crisis	After Crisis	Change
National	0.390	0.554	+0.165	2,672,200.4	0.378	0.420	+0.042
Dakar	0.179	0.326	+0.146	551,400.4	0.309	0.344	+0.035
Other urban	0.350	0.465	+0.116	377,334.5	0.307	0.340	+0.033
Rural	0.490	0.680	+0.190	1,743,465.4	0.290	0.320	+0.030

Source: Author's calculations

To offset the poverty impact of the crisis, the Government could consider a universal transfer. Table 8 suggests that an estimated monthly budget of CFA 48.6 billion (or US$ 88.4 million), representing 4.2% of GDP, is required to revert to the poverty headcount prior to the crisis. This would amount to transferring a pae amount of CFA 4,687.7 per month.

As far as the targeting mechanism is concerned, the fiscal intervention would be more oriented to rural areas, which turn out to concentrate people affected by the crisis (income losses and poverty). The transfer policy is able to reduce the number of people who might have been made worse-off, as suggested by the fiscal impoverishment estimates that go from 8.8% (impact of the crisis only) to 1.6% (accounting for the impact of both the crisis and the transfer). Poor people are also able to gain from the transfer policy in terms of increased well-being. The transfer would provide them with additional income that ends up making up more than their initial income loss. In either case, the rural poor tend to benefit the most from the transfer as they enjoy a larger decline in the fiscal impoverishment rate to the lower figure of 1.4%, and larger fiscal gains (3.5%).

Table 8: Monthly budget for the universal transfer to keep poverty headcount constant, fiscal impoverishment and gains to the poor

	Total Budget		Share of annual GDP	Average transfer pae (CFA)	Share of excess transfer in total	Impoverishment		Gains
	In billion CFA	In million US$				Crisis only	Crisis + transfer	Crisis + transfer
National	48.6	88.35	4.2%	4,687.7	25%	0.088	0.016	0.027
Dakar	15.2	27.57	1.3%	6,050.1	40%	0.047	0.014	0.013
Other urban	7.2	13.12	0.6%	3,327.6	27%	0.060	0.022	0.019
Rural	25.8	46.84	2.2%	4,414.2	15%	0.115	0.014	0.035

Source: Author's calculations

6. Conclusion

The COVID-19 crisis is expected to generate relatively large welfare consequences to households in Senegal. With an estimated income loss of up to 12.6% of monthly GDP and a poverty rate that can reach 72.3% in the worst case scenario, the pandemic will effectively, in a short span, negate the welfare gains (i.e., poverty reduction) over the last two decades.

But with the right policy intervention in the form of a universal transfer, the Government can fully offset the impact, thereby reverting to the pre-crisis poverty level, provided that the amounts of money necessary fall within the realm of what the Government can muster. In addition to a specific targeting mechanism that is based on the heterogenous impact of the crisis across industries and geographical locations, the policy intervention should evolve at the same pace as the increasing body of health and economic evidence generated by much needed additional research.

Notes

1. Under the worst case scenario of the crisis continuing beyond 2020, the contraction is expected to be much deeper at 3.4%, a fall by 7.3 percentage points from the pre-COVID-19 projections.

2. Source: Ministry of Health. http://www.sante.gouv.sn/Pr%C3%A9sentation/coronavirus-informations-officielles-et-quotidiennes-du-msas (accessed on 17th July 2020).

3. Source: WHO coronavirus disease (COVID-19) situation report No. 178. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports (accesses on July 17, 2020).

4. Source: National Agency for Statistics and Demography – ANSD. https://www.ansd.sn/ressources/publications/Rapport_population_060219%20002%20RECsn%20.pdf and http://www.ansd.sn/ressources/publications/Rapport%20global-juil-2017.pdf (accessed on 17th July 2020).

5. Source: IFPRI. https://www.ifpri.org/project/covid-19-policy-response-cpr-portal (accessed on 17th July 2020).

6. The African Development Bank: Senegal Economic Outlook. https://www.afdb.org/en/countries/west-africa/senegal/senegal-economic-outlook (accessed on 17th July 2020).

7. The new household survey (2018-2019) has been conducted in conjunction with the rest of West African Economic and Monetary Union (WAEMU), and the corresponding data have yet to be released to the public. http://www.uemoa.int/sites/default/files/bibliotheque/projet_commucationresultats_ehcvm_juin2020_13072020_obs.pdf (accessed on 17th July 2020).

8. *Agence pour le Développement et d'Encadrement des Petites et Moyennes Entreprises* (ADEPME). https://www.senegalpme.com/conf_presse/ (accessed on 10th July 2020). The author has viewed a draft report of the survey, which has yet to be published.

9. These survey evidence are somewhat surprising, as one would expect retail to have very large losses because the lockdown either prohibits their activity or greatly reduces demand, and in many countries, manufacturing has shut down. In the face of a lack of additional evidence that would certainly help better portray the scale of the losses across industries, the study will make use of these findings.

10. Source: http://www.peopledatasense.com/first-impacts-of-covid-19-on-senegalese-population/ (accessed on 10th July 2020). The full report is referenced in the bibliography list.

11. The aid consisted of soaps and alcohol-based hand rub products. Additional measures (food distribution, utility price subsidies and cash transfers) would come later.

12. Results and data have yet to be publicly available.

13. While these sectors (education and health) also comprise some private segments, we hypothesize that the latter have not been *significantly affected*; private education have gone virtual during the pandemic, and most have managed to make parents pay. Despite evidence that individuals have to postpone seeking medical attention, we also hypothesize that workers in this sector have not been affected, and it is very likely that the pandemic may have increased the need for more medical attention.

14. See Table A1 in the annex for detailed assumption about incomes losses across industries and income types.

15. Source: https://www.france24.com/en/20200501-money-dries-up-from-senegal-migrants-in-virus-hit-europe (accessed on July 20, 2020).

16. The sub-national figures are shown in the annex, and additional figures cited in the text are also available in the annex or upon request.

17. "Per-adult equivalence" scale accounts for the difference between adult and youth/infants when it comes to the amount and quality of food consumption. When aggregating total consumption, adults will be given a weight of 1, while their younger counterparts will be assigned a smaller weight (for example 0.7 or 0.5 for children above or under the age of 14 years).

19. Fiscal impoverishment to the poor refers to the situation in which poor people are made poorer as a result of a fiscal policy that effectively reduces their income or consumption. Fiscal gains refers to the opposite.

19. Detailed losses for all industries are shown in the annex.

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Annex

Table A1: Survey evidence of the monthly impact of the crisis on turnover/income across aggregate industries (%)

Industries	Very negatively (60-100%)	Negatively (30-59%)	Moderately (10-29%)	Unaffected (no loss)	Positively (increased turnover)	Losses (weighted average)
Agriculture	22.2	27.9	29.3	7.1	-	41.8
Food industry	7.3	10.5	9.3	14.3	-	30.0
Textile industry	4.8	2.5	5.3	-	66.7	0.0
Other industries	5.4	6.5	5.3	14.3	-	26.3
Construction	5.8	6.5	6.7	7.1	-	34.0
Retail services	13.2	19.4	12.0	28.6	33.3	0.0
Transport/telecom	5.9	2.0	4.0	-	-	54.0
Hotels/bars/ restaurants	11.3	1.0	1.3	-	-	71.6
Services to enterprises	15.1	15.4	20.0	-	-	45.6
Personal services	8.4	7.0	6.7	-	-	50.8

Notes: For each industry, the average is computed using the mid-values of the impact intervals, weighted by the corresponding shares of firms that fall in the intervals. For the textile and retail industries, because the range of the positive impact is not specified and given the large fraction of firms that fall into this positive interval, the average is set to zero. These figures are then distributed to the 2-digit sub-industries that make up each of these 10 listed aggregated industries.
Source: ADEPME (survey conducted in May 2020)

Table A2: Additional assumptions about income losses across industries and types of income

Income types/industries	Share of income losses (%)
Safe incomes	
Public sector	0%
Pensions	0%
Top management workers	0%
Own consumption	0%
Other income (interest/rent/commission)	0%
At-risk income	
Air transport	100%
Recreation/culture/sports	100%
Remittances	23.1/30%

Note: Except for remittances, which figures originate from a World Bank report (mentioned in the text and referenced), and the Senegalese Ministry of Finance (quoted in the media), all the assumptions are made by the author and mostly based on knowledge of the study context.

Table A3: Income lost due to lockdown, scaled by GDP (Approach 1)

Share of income Lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10%	0.001	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.012
20%	0.002	0.005	0.007	0.010	0.012	0.014	0.017	0.019	0.022	0.024
30%	0.004	0.007	0.011	0.014	0.018	0.021	0.025	0.029	0.032	0.036
40%	0.005	0.010	0.015	0.020	0.025	0.029	0.034	0.039	0.044	0.049
50%	0.006	0.012	0.019	0.025	0.031	0.037	0.043	0.049	0.056	0.062
60%	0.008	0.015	0.023	0.030	0.038	0.045	0.053	0.060	0.068	0.075
70%	0.009	0.018	0.026	0.035	0.044	0.053	0.062	0.071	0.079	0.088
80%	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090	0.100
90%	0.011	0.023	0.034	0.046	0.057	0.068	0.080	0.091	0.103	0.114
100%	0.013	0.025	0.038	0.050	0.063	0.076	0.088	0.101	0.113	0.126

Note: Monthly GDP is CFA 1,149.2 billion (or US$ 2.09 billion)
Source: Author's calculations

Table A4: Estimated poverty rate, national poverty line, for the whole country (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390
10%	0.392	0.397	0.400	0.407	0.413	0.416	0.418	0.419	0.421	0.422
20%	0.399	0.407	0.414	0.426	0.436	0.443	0.449	0.451	0.454	0.457
30%	0.401	0.414	0.423	0.441	0.456	0.466	0.475	0.480	0.484	0.487
40%	0.403	0.418	0.431	0.454	0.471	0.487	0.501	0.509	0.516	0.522
50%	0.409	0.428	0.444	0.472	0.495	0.513	0.529	0.539	0.547	0.553
60%	0.413	0.434	0.454	0.486	0.515	0.539	0.558	0.571	0.579	0.586
70%	0.417	0.442	0.464	0.499	0.531	0.560	0.583	0.600	0.610	0.619
80%	0.420	0.449	0.473	0.512	0.548	0.580	0.606	0.626	0.638	0.649
90%	0.425	0.461	0.489	0.531	0.570	0.611	0.639	0.659	0.675	0.687
100%	0.430	0.469	0.503	0.551	0.595	0.639	0.669	0.692	0.709	0.723

Source: Author's calculations

Table A5: Estimated poverty rate, national poverty line, for Dakar (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179
10%	0.179	0.183	0.183	0.191	0.203	0.204	0.205	0.207	0.210	0.210
20%	0.197	0.206	0.209	0.218	0.237	0.244	0.249	0.251	0.257	0.258
30%	0.197	0.207	0.217	0.227	0.246	0.254	0.264	0.272	0.278	0.283
40%	0.197	0.208	0.218	0.237	0.265	0.275	0.289	0.299	0.308	0.316
50%	0.199	0.211	0.222	0.243	0.280	0.293	0.309	0.323	0.336	0.344
60%	0.201	0.218	0.233	0.254	0.290	0.307	0.323	0.343	0.356	0.366
70%	0.211	0.228	0.243	0.272	0.312	0.333	0.356	0.381	0.399	0.411
80%	0.217	0.240	0.257	0.285	0.327	0.367	0.392	0.417	0.440	0.453
90%	0.217	0.246	0.270	0.303	0.345	0.398	0.424	0.452	0.478	0.495
100%	0.225	0.255	0.285	0.318	0.370	0.428	0.456	0.487	0.513	0.534

Source: Author's calculations

Table A6: Estimated poverty rate, national poverty line, for other urban areas (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
10%	0.351	0.352	0.357	0.358	0.363	0.368	0.373	0.377	0.377	0.377
20%	0.352	0.353	0.362	0.367	0.379	0.386	0.395	0.400	0.401	0.403
30%	0.355	0.359	0.370	0.381	0.394	0.413	0.426	0.431	0.435	0.437
40%	0.355	0.365	0.379	0.391	0.412	0.430	0.448	0.455	0.462	0.463
50%	0.358	0.374	0.393	0.406	0.433	0.453	0.472	0.481	0.492	0.494
60%	0.360	0.378	0.398	0.414	0.446	0.470	0.492	0.503	0.518	0.523
70%	0.362	0.382	0.405	0.423	0.467	0.493	0.516	0.527	0.543	0.550
80%	0.364	0.388	0.411	0.436	0.487	0.514	0.541	0.554	0.574	0.581
90%	0.365	0.389	0.412	0.438	0.492	0.520	0.551	0.565	0.585	0.594
100%	0.371	0.396	0.428	0.464	0.527	0.555	0.590	0.605	0.628	0.638

Source: Author's calculations

Table A7: Estimated poverty rate, national poverty line, for rural areas (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490	0.490
10%	0.492	0.495	0.498	0.502	0.504	0.512	0.515	0.517	0.518	0.520
20%	0.498	0.503	0.509	0.516	0.523	0.533	0.539	0.544	0.546	0.550
30%	0.502	0.512	0.522	0.533	0.543	0.557	0.567	0.575	0.578	0.582
40%	0.507	0.523	0.539	0.555	0.571	0.589	0.602	0.613	0.618	0.623
50%	0.511	0.533	0.553	0.578	0.595	0.615	0.632	0.644	0.651	0.657
60%	0.515	0.539	0.563	0.597	0.616	0.640	0.659	0.673	0.681	0.688
70%	0.519	0.551	0.578	0.618	0.644	0.671	0.692	0.709	0.718	0.725
80%	0.525	0.563	0.593	0.639	0.667	0.700	0.722	0.740	0.751	0.758
90%	0.528	0.570	0.603	0.655	0.685	0.724	0.749	0.770	0.781	0.791
100%	0.534	0.582	0.619	0.677	0.711	0.756	0.784	0.807	0.819	0.831

Source: Author's calculations

Table A8: Size of uniform transfer needed to keep poverty headcount constant, scaled by GDP (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10%	0.000	0.002	0.003	0.003	0.005	0.005	0.006	0.007	0.007	0.007
20%	0.002	0.004	0.005	0.007	0.009	0.011	0.013	0.014	0.015	0.016
30%	0.003	0.005	0.007	0.009	0.014	0.017	0.020	0.023	0.025	0.026
40%	0.003	0.007	0.008	0.012	0.018	0.023	0.027	0.031	0.035	0.037
50%	0.005	0.010	0.014	0.020	0.025	0.032	0.038	0.045	0.050	0.057
60%	0.005	0.010	0.016	0.023	0.029	0.038	0.048	0.058	0.066	0.071
70%	0.007	0.012	0.018	0.027	0.035	0.045	0.056	0.067	0.075	0.083
80%	0.007	0.014	0.021	0.031	0.042	0.052	0.064	0.074	0.086	0.096
90%	0.008	0.016	0.026	0.036	0.049	0.060	0.070	0.084	0.096	0.109
100%	0.009	0.018	0.028	0.039	0.051	0.064	0.074	0.088	0.103	0.118

Source: Author's calculations

Table A9: Average fiscal impoverishment as a share of national poverty line, inclusive of transfer to keep headcount constant, national level (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10%	0.001	0.002	0.004	0.006	0.008	0.011	0.014	0.018	0.023	0.028
20%	0.002	0.004	0.007	0.010	0.014	0.019	0.025	0.033	0.042	0.051
30%	0.002	0.006	0.009	0.014	0.018	0.025	0.032	0.042	0.054	0.067
40%	0.003	0.006	0.011	0.016	0.021	0.027	0.036	0.047	0.061	0.078
50%	0.003	0.007	0.011	0.016	0.022	0.029	0.037	0.047	0.062	0.078
60%	0.003	0.008	0.012	0.016	0.022	0.028	0.034	0.042	0.056	0.075
70%	0.003	0.008	0.012	0.016	0.021	0.027	0.032	0.040	0.054	0.074
80%	0.003	0.008	0.011	0.015	0.018	0.023	0.028	0.037	0.047	0.065
90%	0.003	0.007	0.010	0.013	0.015	0.019	0.025	0.031	0.042	0.056
100%	0.003	0.006	0.009	0.012	0.014	0.018	0.025	0.030	0.038	0.052

Source: Author's calculations

Table A10: Average fiscal gains to the poor as a share of national poverty line, inclusive of transfer to keep headcount constant, national level (Approach 1)

Share of income lost / Share losing income	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10%	0.001	0.002	0.003	0.004	0.006	0.007	0.008	0.008	0.009	0.009
20%	0.003	0.004	0.006	0.008	0.010	0.012	0.015	0.016	0.017	0.018
30%	0.003	0.006	0.008	0.010	0.014	0.017	0.020	0.022	0.024	0.025
40%	0.003	0.007	0.008	0.011	0.016	0.020	0.023	0.026	0.029	0.030
50%	0.004	0.008	0.012	0.016	0.020	0.024	0.028	0.032	0.034	0.038
60%	0.004	0.008	0.012	0.017	0.021	0.026	0.031	0.036	0.040	0.041
70%	0.005	0.008	0.012	0.017	0.022	0.027	0.032	0.038	0.040	0.043
80%	0.004	0.008	0.012	0.017	0.023	0.028	0.033	0.037	0.042	0.044
90%	0.004	0.008	0.013	0.019	0.025	0.030	0.035	0.040	0.044	0.048
100%	0.004	0.009	0.014	0.019	0.025	0.030	0.034	0.040	0.046	0.050

Source: Author's calculations

Table A11: Estimated income losses across industries (Approach 2)

Industries	Total Lost Income (million CFA per month)	in million USD	Share in Total Losses (%)	Total Employed	Total Income Losers	Share of Losers within Industry (%)	Lost Income per Income Loser (CFA per month)
Transport (air)	1,170.0	2.13	2.29	10,263	7,519	73.3	155,611.5
Transport (water)	909.1	1.65	1.78	10,382	7,767	74.8	117,048.5
Recreation, culture, sports	899.2	1.63	1.76	11,641	11,340	97.4	79,291.4
Financial intermediation	285.1	0.52	0.56	7,957	3,878	48.7	73,529.0
Housing services	434.2	0.79	0.85	7,811	7,811	100.0	55,585.4
Research & Development	55.6	0.10	0.11	1,453	1,037	71.4	53,633.2
Hotels/bars/ restaurants	1,795.3	3.26	3.51	38,604	35,254	91.3	50,923.5
Office supply/ITC materials	93.3	0.17	0.18	3,123	2,202	70.5	42,376.4
Transport (land)	3,857.7	7.01	7.54	97,014	93,151	96.0	41,413.7
Editing/printing	190.9	0.35	0.37	4,855	4,833	99.5	39,493.4

continued next page

Table A11 Continued

Industries	Total Lost Income (million CFA per month)	in million USD	Share in Total Losses (%)	Total Employed	Total Income Losers	Share of Losers within Industry (%)	Lost Income per Income Loser (CFA per month)
Insurance	51.5	0.09	0.10	3,434	1,392	40.5	37,024.4
Chemical products	152.3	0.28	0.30	4,926	4,680	95.0	32,549.0
Radio equipment/ material	266.5	0.48	0.52	8,599	8,364	97.3	31,865.7
Services to firms	1,661.4	3.02	3.25	63,044	53,587	85.0	31,004.1
Mining (non-metal)	424.5	0.77	0.83	18,101	14,062	77.7	30,185.1
Services provided by organizations	358.5	0.65	0.70	14,366	11,880	82.7	30,176.1
Fishing	2,768.5	5.03	5.41	106,074	101,406	95.6	27,301.1
Construction	3,536.0	6.43	6.91	148,659	141,325	95.1	25,020.0
Transport materials, other	486.1	0.88	0.95	19,480	19,480	100.0	24,951.7
Personal services	6,934.0	12.61	13.55	288,644	281,099	97.4	24,667.5
Auxiliary transport services	235.3	0.43	0.46	10,769	9,889	91.8	23,798.7
Food industry	697.5	1.27	1.36	35,803	29,682	82.9	23,499.1
Furniture	326.0	0.59	0.64	14,601	14,497	99.3	22,489.3
Metallic works	444.4	0.81	0.87	22,231	20,913	94.1	21,248.1
Glass, arts products	269.6	0.49	0.53	13,945	13,024	93.4	20,702.7
Fuel (natural)	112.3	0.20	0.22	6,674	5,627	84.3	19,958.5
Mining (metal)	519.7	0.94	1.02	28,818	27,173	94.3	19,125.0
Automobile	289.2	0.53	0.57	15,355	15,323	99.8	18,875.4
Uranium	29.3	0.05	0.06	1,822	1,554	85.3	18,874.3
Financial auxiliary services	17.2	0.03	0.03	2,542	966	38.0	17,775.1
Electrical machines/ equipment	64.3	0.12	0.13	4,083	3,758	92.0	17,121.5
Rubber	23.1	0.04	0.05	1,428	1,428	100.0	16,181.9
Refinery	21.3	0.04	0.04	2,486	1,321	53.1	16,152.8
Machine/ equipment, other	440.4	0.80	0.86	27,863	27,489	98.7	16,020.5

continued next page

Table A11 Continued

Industries	Total Lost Income (million CFA per month)	in million USD	Share in Total Losses (%)	Total Employed	Total Income Losers	Share of Losers within Industry (%)	Lost Income per Income Loser (CFA per month)
Tobacco	36.9	0.07	0.07	2,418	2,418	100.0	15,249.1
Wood products	831.7	1.51	1.62	56,852	56,268	99.0	14,781.4
Silviculture	73.2	0.13	0.14	5,061	5,061	100.0	14,462.6
Papers	27.9	0.05	0.05	2,199	1,933	87.9	14,442.3
Metal products	291.9	0.53	0.57	25,452	24,111	94.7	12,106.2
Musical instruments	10.6	0.02	0.02	1,469	923	62.8	11,535.7
Agriculture, livestock	20,067.4	36.49	39.20	1865,619	1,854,091	99.4	10,823.3
Charcoal	31.3	0.06	0.06	4,460	3,788	84.9	8260.0
Garments	0.0	0.00	0.00	38,953	0	0.0	-
Retail	0.0	0.00	0.00	753,147	0	0.0	-
Leather and travel articles	0.0	0.00	0.00	8,504	0	0.0	-
Water	0.0	0.00	0.00	2,543	0	0.0	-
Textiles	0.0	0.00	0.00	86,924	0	0.0	-
Household own production	0.0	0.00	0.00	187,894	0	0.0	-
Water drainage	0.0	0.00	0.00	2,175	0	0.0	-
Education	0.0	0.00	0.00	95,038	0	0.0	-
Health	0.0	0.00	0.00	33,417	0	0.0	-
Post and telecom	0.0	0.00	0.00	17,090	0	0.0	-
Public administration	0.0	0.00	0.00	56,998	0	0.0	-
ITC and network	0.0	0.00	0.00	6,918	0	0.0	-
Repairing articles: retail and services	0.0	0.00	0.00	54,337	0	0.0	-
Wholesale	0.0	0.00	0.00	11,871	0	0.0	-
Automobile articles: retail and services	0.0	0.00	0.00	17,612	0	0.0	-
Electricity and heat	0.0	0.00	0.00	9684	0	0.0	-
Total	51,190.4	93.1	100.0	4,403,485	2,933,304	-	-
Average	882.6	1.6	1.7	75,922	50,574	62.5	32,788.9

Source: Author's calculations

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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