



Poverty & Equity Global Practice Working Paper 208

THE REDISTRIBUTIVE EFFECTS OF FISCAL POLICY IN MALI AND NIGER

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June 2019

ABSTRACT

This study assesses the redistributive effects of fiscal policy in Mali and Niger. Fiscal policy is poverty increasing in Mali (by 2.4 percentage points) and Niger (2.5 percentage points). This is a result of primarily two factors: indirect taxes (value-added taxes and import duties) and direct fiscal transfers. Although the richest people in Mali and Niger pay the majority of indirect taxes, the poorest people pay a nonnegligible amount (more than 8 and 10 percent for the bottom three deciles, respectively). Although existing direct fiscal transfers have poverty-reducing effects, they are too small (Mali) or not well targeted (Niger).

This paper is a product of the Poverty and Equity Global Practice Group. It is part of a larger effort by the World Bank to provide open access to its research and contribute to development policy discussions around the world. The authors may be contacted at mhounsa@worldbank.org, mcoulibaly2@worldbank.org, and asanoh@worldbank.org.

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The Redistributive Effects of Fiscal Policy in Mali and Niger¹

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Keywords: fiscal policy, fiscal incidence, social spending, inequality, poverty, taxes

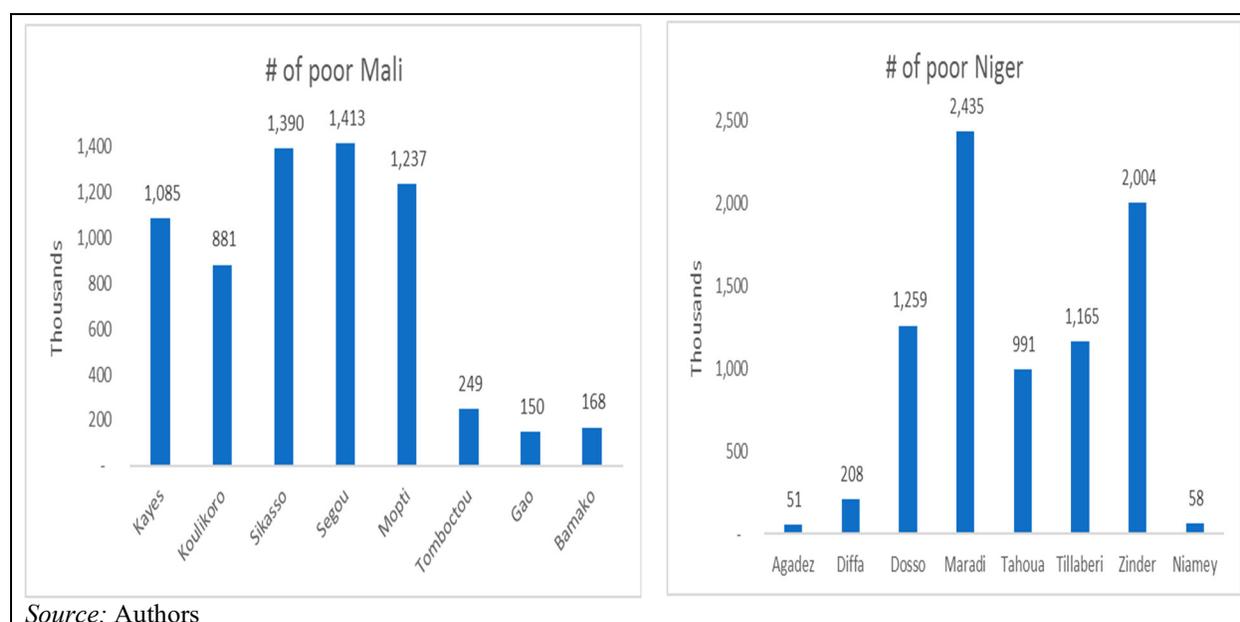
JEL Classification: H22, I38, D31

¹ Thierry Hounsa, Mohamed Coulibaly, and Aly Sanoh (World Bank, Poverty and Equity Global Practice) prepared this report. The authors are extremely grateful to Johannes Hoogeveen, Gabriela Inchauste, Alejandro de la Fuente, Karolina Goraus, and Mathew Wai-Poi. The findings, interpretations, and conclusions of this paper are those of the authors.

1. Introduction

The geographical distribution of poverty is a good indicator of regional disparities in Mali and Niger. In the former, the poverty rate was 40.4 percent in 2014 (49 percent in rural areas, which account for 94 percent of the country's 6.5 million poor). The poverty rate is higher in the regions of Segou (54 percent) and Mopti (57 percent) but relatively low in the northern regions and in the city of Bamako (7.8 percent). The majority of the poor are concentrated in the south, with more than 1 million poor people in each of the regions of Kayes, Sikasso, Segou, and Mopti. In terms of agro-ecological zones, the poverty rate and the number of poor are higher in the two zones (semi-arid and arid) devoted to agriculture, where 88 percent of all poor people lived in 2014 (figure 1).

Figure 1. Regional Distribution of Poverty in Mali and Niger, 2014



The majority of Niger's 8.2 million poor (2014 estimate) live in rural areas, where food insecurity is high. Although there is wide annual variation in the incidence of regional poverty, there are two clusters of regions. There are the low-poverty regions that include the capital city of Niamey, Agadez in the north, and Diffa in the northeast and account for 12 percent of the population but less than 5 percent of the poor. The high-poverty regions include the remaining five regions, in the southwest of the country (Tahoua, Dosso, Maradi, Tillaberi, Zinder). Of these regions, Maradi has not only the highest incidence of poverty (67 percent), but also the highest concentration of poor, with 30 percent of all poor people in the country located in this single region. Finally, poverty incidence also differs widely across agro-ecological zones, being highest in rural agricultural zones, where 65 percent of poor people (about 5.3 million people) reside.

Reducing poverty and inequality has become the major objective of public policies in developing countries. Fiscal policy and public spending are now seen as instruments to be used to reduce poverty and inequality even if theory and evidence point to the existence of one thing without the

other (e.g., inequality reduction but worsening poverty through fiscal policy). Nevertheless, in a context of limited financial resources in these countries, decisions must be made about which sectors are to benefit from greater public expenditure. For example, if many resources are devoted to energy subsidies, there will be fewer resources available for education, health, infrastructure, and other areas of government intervention. Energy subsidies are important for the modern industrial sector, but they benefit mainly nonpoor households. It is therefore important to identify the sectors for which public spending will lead to a significant reduction in poverty and inequality.

State public spending is financed partly from money that the government collects from households and other economic agents in the form of taxes. For households, paying taxes to the state reduces income and purchasing power. It must therefore be ensured that tax collection does not exacerbate inequalities or result in great deterioration in living conditions of vulnerable households.

The main focus of this report is how taxes and budget expenditures in Mali and Niger redistribute resources among the welfare quantiles. The objective is to prompt reflection on potential indicators that might help measure the contribution of fiscal policies to the reduction of poverty and inequality. It presents a fiscal incidence analysis using the Commitment to Equity (CEQ) Institute methodology to assess how taxes and spending distribute resources among the income deciles in Mali and Niger (Appendix A). One of the advantages of the CEQ methodology is that it allows an analysis of the contribution of taxes and public spending to reduction of poverty and inequality. It is possible that taxes are a source of inequality but that the redistributive effect of public spending will be sufficient to more than compensate for the inequalities that the taxation system causes such that, overall, the fiscal system² helps reduce inequality.

Our fiscal incidence analysis uses a partial equilibrium approach. It does not model the behavior of agents in response to different government fiscal interventions and does not consider general equilibrium effects. The data used came from the latest Integrated Survey on Agriculture (*Enquête Agricole de Conjoncture Intégrée*, EACI) and (*Enquête nationale sur les Conditions de Vie des Ménages et Agriculture* (ECVM/A), from 2014/15, and the national budget for 2014. We use simple notions of progressivity and the pro-poor nature of spending and taxes. A public expenditure (or tax) is progressive, in relative terms, if the proportion of expenditure (or tax) in relation to income decreases (increases) with household income. A public expenditure is pro-poor if it is progressive in absolute terms—in other words, if the absolute amount (e.g., per capita) of public expenditures decreases with household income.

The analysis had three broad results.

- (a) In both countries, poverty is high, but the gap between poor and wealthy is small, so rapid improvements could be made. The amount needed (under perfect targeting) to fully

² The fiscal system includes taxes and public expenditures.

eliminate poverty through fiscal transfers to the poor is the same as currently received each year in official development assistance.³

- (b) Existing direct fiscal transfers have poverty-reducing effects but are too small (Mali) or not well targeted (Niger). In addition, significant expenditures are made on items that reduce poverty only slightly (e.g., subsidies).
- (c) Although direct taxes are progressive and reduce inequality directly by making postmarket incomes more equal and indirectly by financing pro-poor transfers and spending, the current formal tax base is small, so value-added taxes (VATs) will remain the main tax revenue source in the medium term, but VATs have significant poverty-increasing effects.

Various options exist to restructure fiscal policy to have a greater effect on poverty while remaining revenue neutral. These options require sequencing and a combination of redirecting some spending from subsidies to direct transfers, improving targeting of these transfers (Niger), and reducing the VAT or creating exemptions for goods and services that account for a significant share of poor household consumption. This can be made revenue neutral by reducing subsidy spending further or increasing the general VAT rate on nonexempt items.

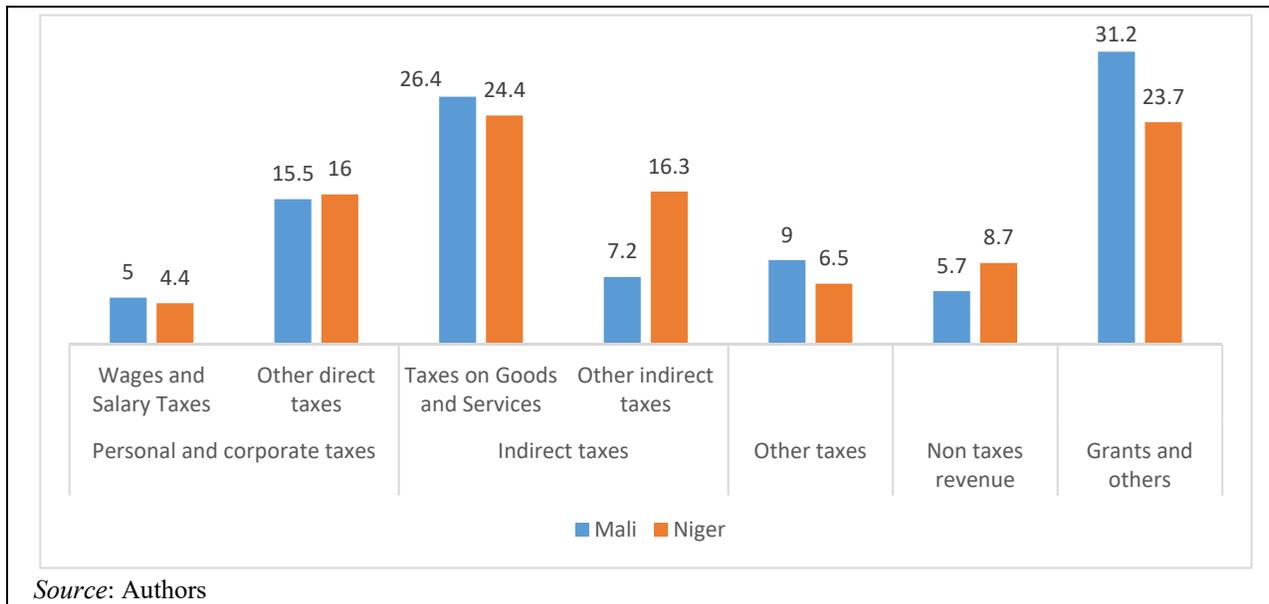
The remainder of this report comprises the following sections: section 2 provides an overview of the Malian and Nigerien fiscal framework, section 3 presents the results with respect to the progressivity of taxes and expenditures, section 4 analyzes the overall effect of fiscal policy on poverty and inequality, and section 5 concludes.

2. Fiscal Framework

The structure of government revenue in the Malian and Nigerien budgets is similar to that of other countries in West Africa, with a predominance of (indirect) taxes on goods and services. This partly reflects the lower (direct) tax pressure in these (developing) economies than in more-developed countries. Indirect taxes account for more than one-third of total revenue in these two countries, whereas taxes on income, profits, and property accounted for less than one-fourth of total revenue in 2014 (figure 2). In principle, it is possible to analyze fiscal incidence from a budget revenue standpoint, but this report focuses on the wage and salary tax (WST) and taxes on goods and services, including VATs, import taxes, and other indirect taxes.

³ With poverty gaps less than 15 percent, the shortfall that needs to be made up for to bring every poor Malian and Nigerien up to each country's national poverty line is USD657 million (5 percent of gross domestic product (GDP)) for Mali and USD832 million (11 percent of GDP) for Niger.

Figure 2. Structure of Budget Revenue in Mali and Niger, 2014



The analysis of spending begins with measurement of the incidence of public spending on education, health, and targeted social programs. It also includes the effects of specific subsidies for electricity and liquefied petroleum gas (in Mali) and agricultural subsidies (in both countries). The social spending considered accounted for approximately 30 percent of total government expenditures in 2014 in Mali and 27 percent in Niger (Appendix B). The method for analyzing public expenditure generally comprises three stages. First, the value of the unit costs of the public expenditure or subsidy is estimated. Second, coverage of the spending or subsidies is identified and allocated to users or beneficiaries. Third, the results are aggregated and presented, showing the magnitude of public spending relative to household spending and income broken down according to quantile.

3. Distribution of Taxes and Transfers

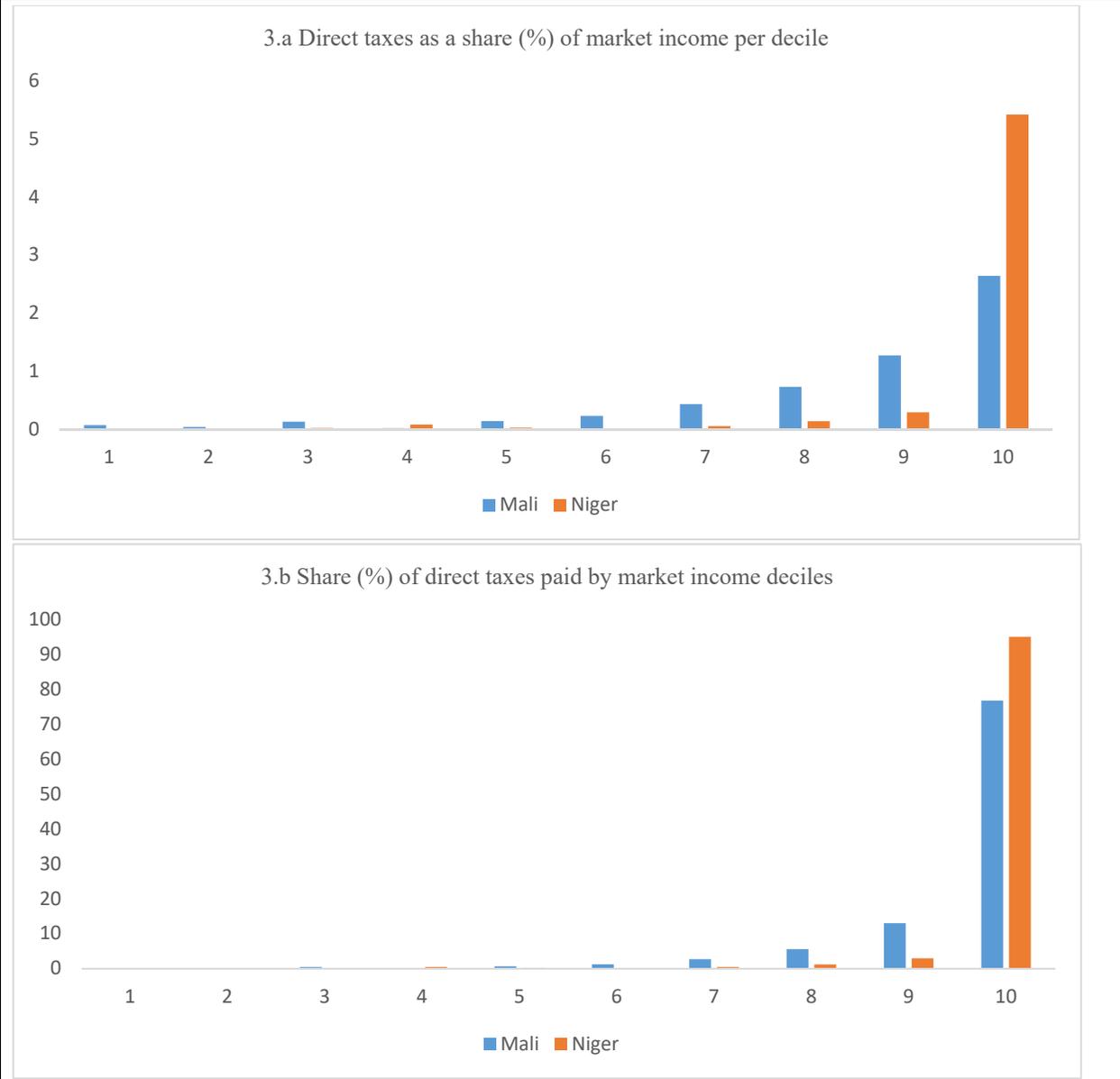
Direct Taxes: WST

Direct taxes included in this analysis are the WST, a monthly tax on gross salaries of people employed in the formal sector. A person is working in the formal sector if he or she is entitled to annual paid leave, sick leave, or a retirement pension as an employment benefit. In Mali, wage earners who are employed by private and public organizations pay the WST, whereas in Niger, international organizations and family employees are exempted from the WST.

The richest individuals pay most of the direct taxes in both countries. The share of direct taxes increases with market income decile (figure 3.a). The richest individuals in Mali and Niger pay nearly all the direct taxes collected (figure 3.b). The richest decile pays more than 75 percent of total direct taxes in Mali and 95 percent in Niger, whereas the three bottom deciles pay less than 2 percent of total direct taxes (0.54 percent in Mali, 0.09 percent in Niger). These findings indicate

a high level of informality in the countries, because the poorest individuals are more likely to work in informal sectors, evading tax payment and leaving all the burden on the small number of the richest individuals, who are employed in formal sectors.

Figure 3. Distributional Effects of Direct Taxes in Mali and Niger, 2014



Source: Authors.

Direct taxes in Mali and Niger are much more progressive than in other countries (Figure C.1). This is related to the high level of informality of the two countries’ economies, with a large proportion of the population working in informal sectors and therefore not paying the WST while the small proportion working in formal sectors pay almost all the direct taxes. As mentioned in the preceding paragraph, the former are essentially the poorest individuals and the latter the richest ones.

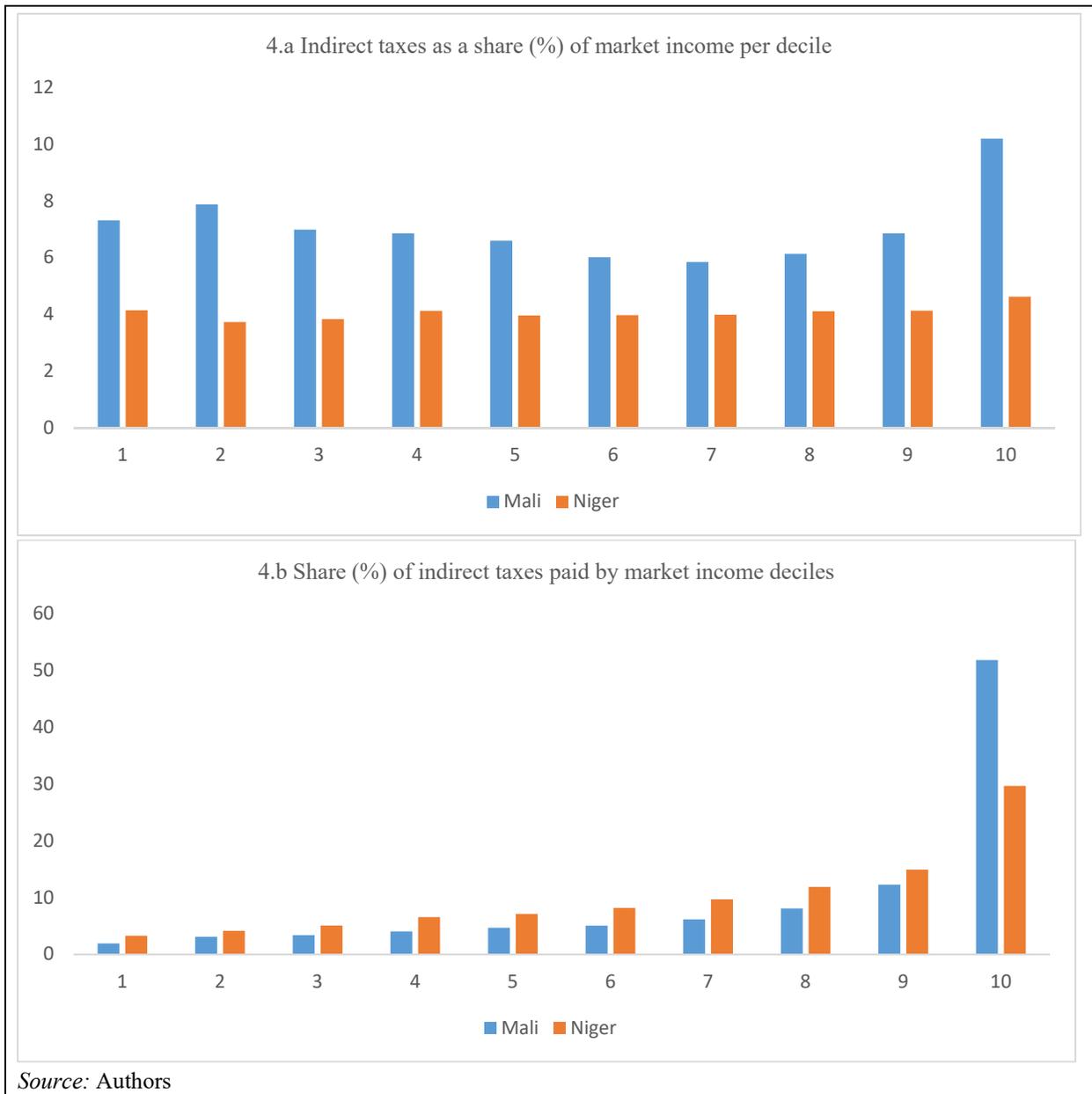
Indirect Taxes: VATs, Import Taxes, and Other Consumption Taxes

Indirect taxes on consumption of goods and services are considered through their effective rate derived from each country's social accounting matrix (SAM). This allows informality to be corrected for when assessing the effect of the various indirect taxes. In reality, because of the high level of informality in developing economies such as Mali and Niger, the statutory rates of indirect taxes cannot provide an accurate estimate of the actual indirect taxes collected because tax evasion can be significant, but the effective rates from the SAM indicate the actual taxes collected, meaning that they correct for informality. In Mali, indirect taxes are estimated by analyzing price multipliers using the 2005 SAM, calibrated and updated based on 2012 macroeconomic indicators; in Niger, indirect taxes are estimated using the effective rates derived from the 2011 SAM.

The direct and indirect effects of the VAT are considered in this assessment. The effective rates applied to each product in the SAM represent the direct effect of VATs on consumers. In an economy with exempt sectors, VATs have indirect effects on prices through VATs paid on inputs. In general, the producers can claim VAT refunds for the inputs they used. The VAT is therefore levied only on the final product, but for sectors that are exempt from the VAT, no VAT is paid directly on final goods, although the VAT has an indirect effect. A VAT paid on inputs results in higher producer prices because producers cannot claim VAT refunds for the inputs they used to produce the final (exempted) goods. In this regard, the input-output matrix is used to determine the indirect effects of VATs in exempt sectors. The total effect of the VAT is equal to the sum of the direct and indirect effects.

Although the richest individuals in Mali and Niger pay the majority of indirect taxes, the poorest individuals pay a nonnegligible amount. The richest decile is the main contributor to indirect taxes in the two countries, paying more than 50 percent of all indirect taxes in Mali and approximately 30 percent in Niger (figure 4.b). Nonetheless, in contrast to direct taxes, the poorest individuals pay a significant amount of all indirect taxes. For instance, the poorest 30 percent pay more than 8 percent of all indirect taxes in Mali and more than 12 percent in Niger. Moreover, total indirect taxes paid is not negligible, especially with respect to the incomes of the poorest individuals. As a share of market income, all indirect taxes represent approximately 7 percent for the poorest deciles in Mali and 4 percent in Niger and approximately 10 percent for the richest decile in Mali and 5 percent in Niger (figure 4.a). In addition, indirect taxes are slightly progressive because they increase overall as a share of market income with increasing income decile.

Figure 4. Distributional Effects of Indirect Taxes in Mali and Niger, 2014



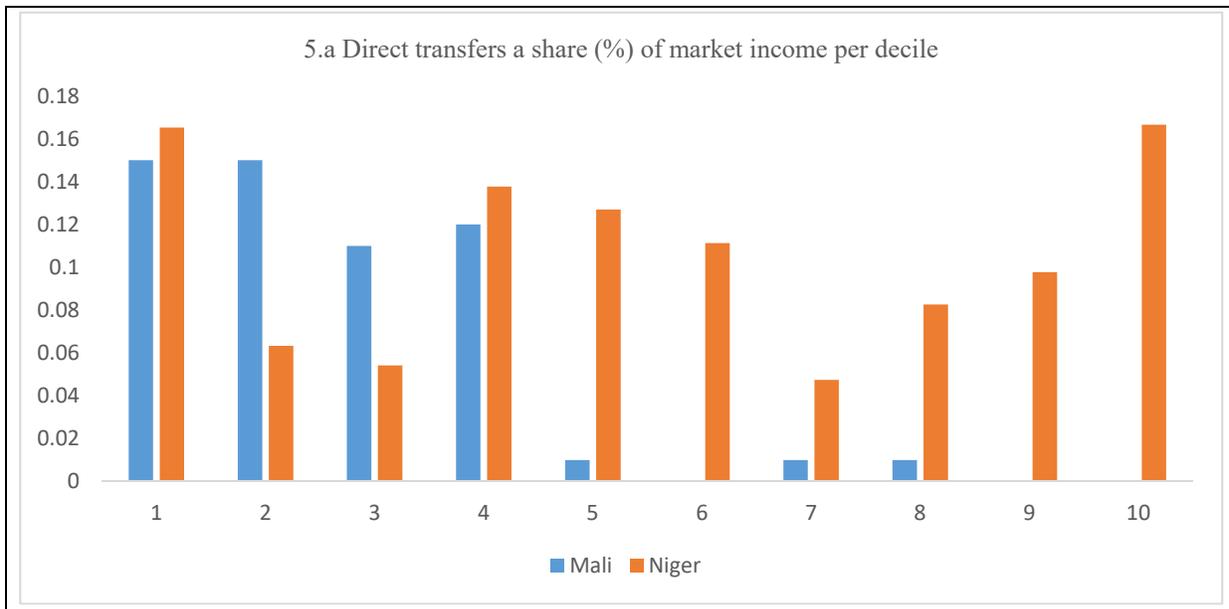
Direct Transfers

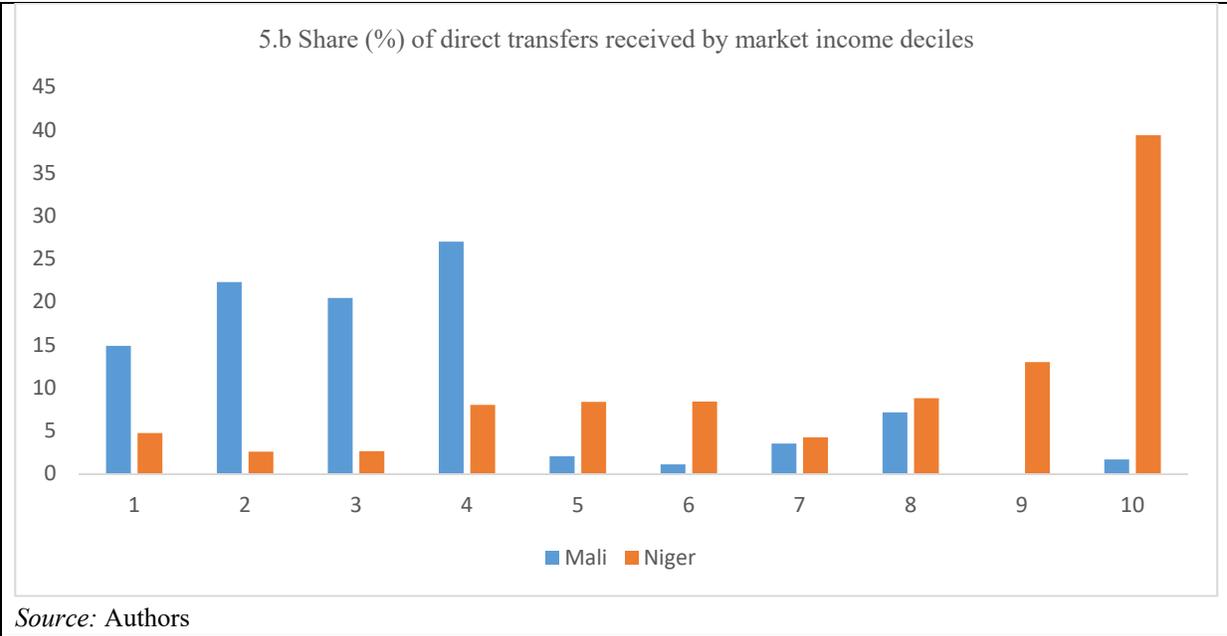
Direct transfers include a cash transfer program in Mali and scholarships and school meal programs in Niger. The first is the *Jigisemejiri* cash transfer program, of which the World Bank is the main funder. The aim of this program is to cover 75 percent of households below the poverty line by the end of the project, which targets poor and food-insecure households. In 2014, the program covered Bamako and Sikasso. The second is support of grant to university students meeting the criteria of the *Direction des Bourses et des Aides Financières* (e.g., citizenship, submitting an application). The third is a meal program that covers primary and secondary students

mostly located in nomadic (*cantines nomades*) and sedentary (*cantines sédentaires*) regions, with the aim of improving school attendance and success rates.

In contrast to Mali, in Niger, the richest people benefit the most from direct transfers. In Mali, the poorest 40 percent receive nearly 85 percent of the total amount transferred to households, meaning that cash transfers are pro-poor. This is related to the design of the *Jigisemejiri* cash transfer program, which explicitly targets people below the poverty line, as described earlier. In Niger, the richest 30 percent receive more than half of total direct transfers, mainly because less than 1 percent of the population in Niger was attending university in 2014, and 95 percent of them were in the top three deciles, and because school grants (scholarships) account for 70 percent of total direct transfers in the country. Direct transfers are clearly not pro-poor in Niger (figure 5.b).

Figure 5. Distributional Effects of Direct Transfers in Mali and Niger, 2014





The amount of total direct transfers is small, especially for the poorest people. Although direct transfers are pro-poor in Mali, their small size may limit their effect in improving the well-being of the population (figure 5.a). Direct transfers account for less than 1 percent of market income for each of the four bottom deciles. This is also true for Niger, where in addition to not being propoor, direct transfers are marginal.

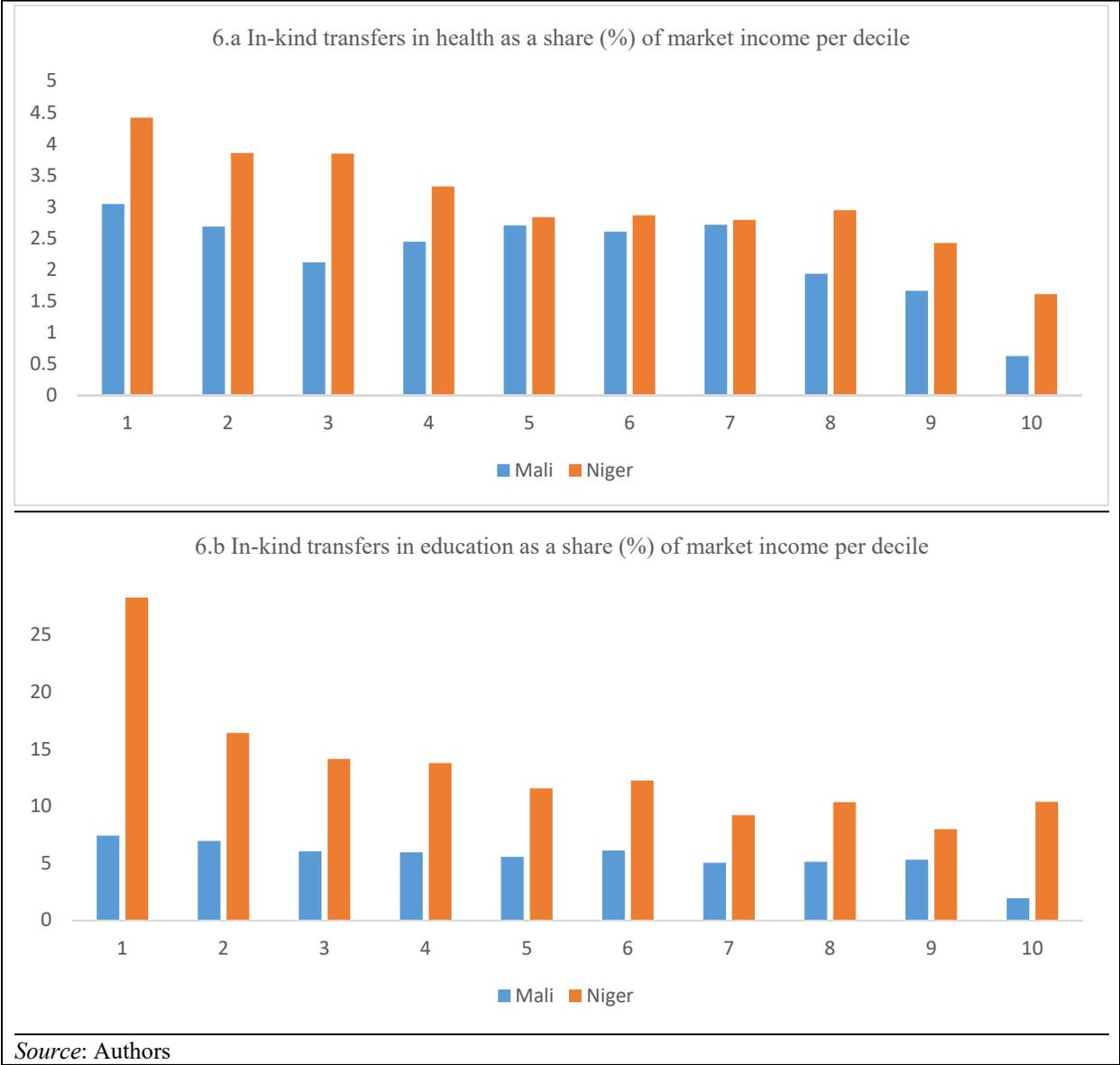
Health and Education Expenditures

Public expenditures on education and health are considered through their unit costs, which are imputed to every individual who uses public health and education services. Public spending on education includes salaries, operating expenses, and investments in physical infrastructure. The total number of individuals enrolled in primary, secondary, and higher education is estimated directly from the survey, and the unit costs of each level of education are obtained by dividing public spending on education by total national enrollment. Then, the amount of education spending to be transferred to each household is determined by multiplying the number of individuals in the household enrolled in primary, secondary, and tertiary education in 2013/14 by the respective unit costs. For health, the number of individuals who visited a public health care provider or were hospitalized during 2013/14 is estimated based on the survey. The unit cost is determined by dividing total health spending by the total number of individuals. This assumes more-equitable distribution among health service users than happens in reality; health service users do not receive the same levels of benefits depending on the nature of the service received, but it is not possible to distinguish health spending for different types of services in the budget data. The calculation of the unit costs of education and health is refined here by estimating specific unit costs according to region.

Health and education spending are globally progressive in Mali and Niger. In-kind transfers in health and education are overall progressive in the two countries (figure 6). Their progressivity is

higher in Niger than in Mali, meaning that health and education spending as a share of market income decreases more rapidly with increasing income deciles for Niger. In addition, education spending, especially for higher education, benefits mostly the richest individuals because they are more likely to attend university in developing economies in general.

Figure 6. Distributional Effects of In-Kind Transfers in Mali and Niger, 2014



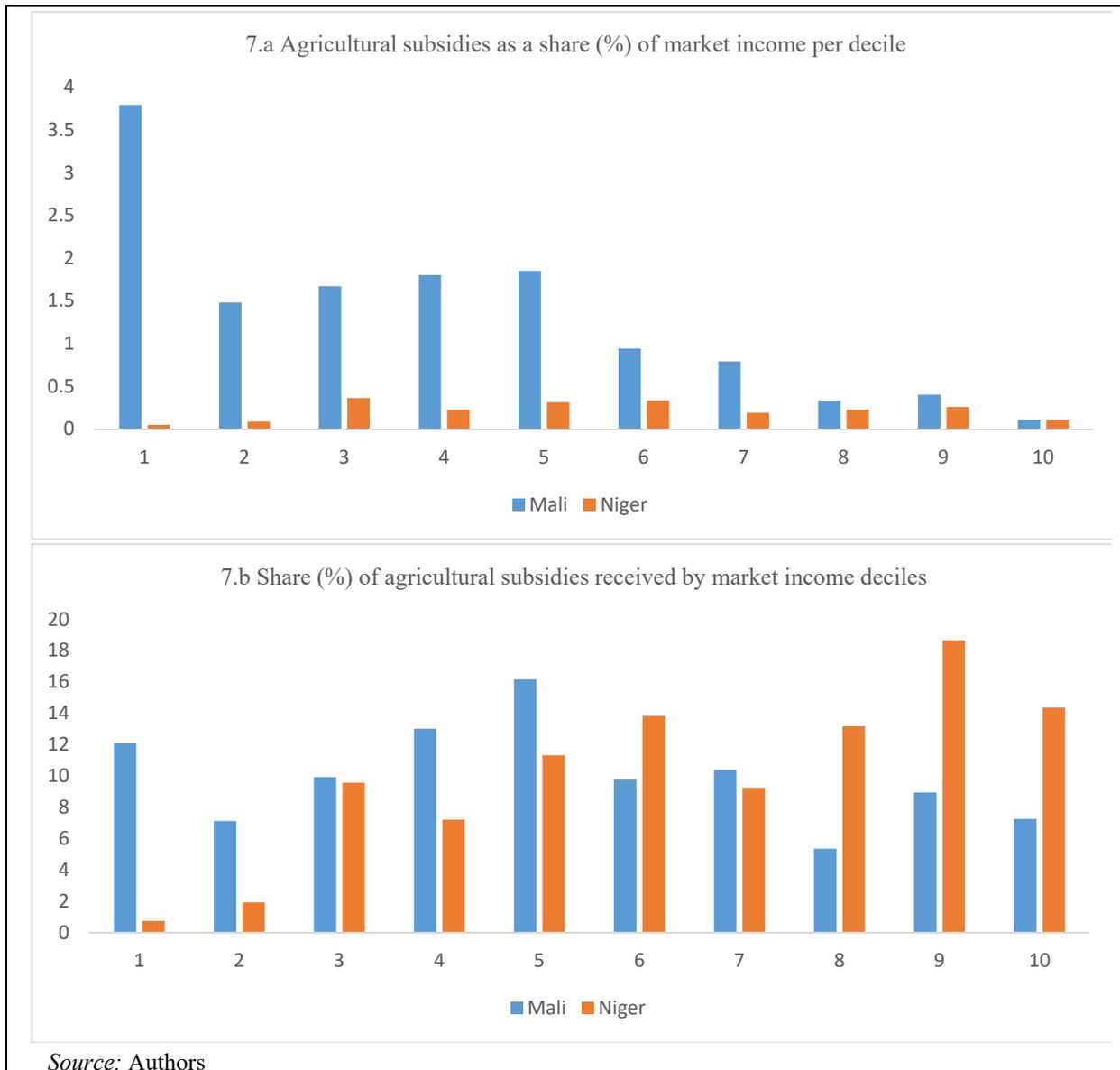
Incidence of Indirect Subsidies: Energy Subsidies and Agricultural Subsidies

Indirect subsidies included in this analysis are energy subsidies (only in Mali) and agricultural subsidies. For the former, the survey data are used to estimate annual household consumption of gas and electricity. Then, the subsidy per kilogram of gas and per kilowatt-hour of electricity is estimated by dividing the total public subsidy in 2014 by total annual consumption of gas and electricity. The average price of gas and the electricity rate brackets are also used to determine

consumption levels. Consequently, the total value of the subsidy that the household receives is the product of the subsidy per kilogram or kilowatt-hour and annual household consumption. For agricultural subsidies, the survey data are used to identify the direct beneficiaries of the agricultural services that the government provides to farmers. Then, the per capita spending of the program is calculated by dividing total expenditures of the program by total beneficiaries. Accordingly, the per capita amount is imputed to each beneficiary to represent the value of agricultural subsidies they receive.

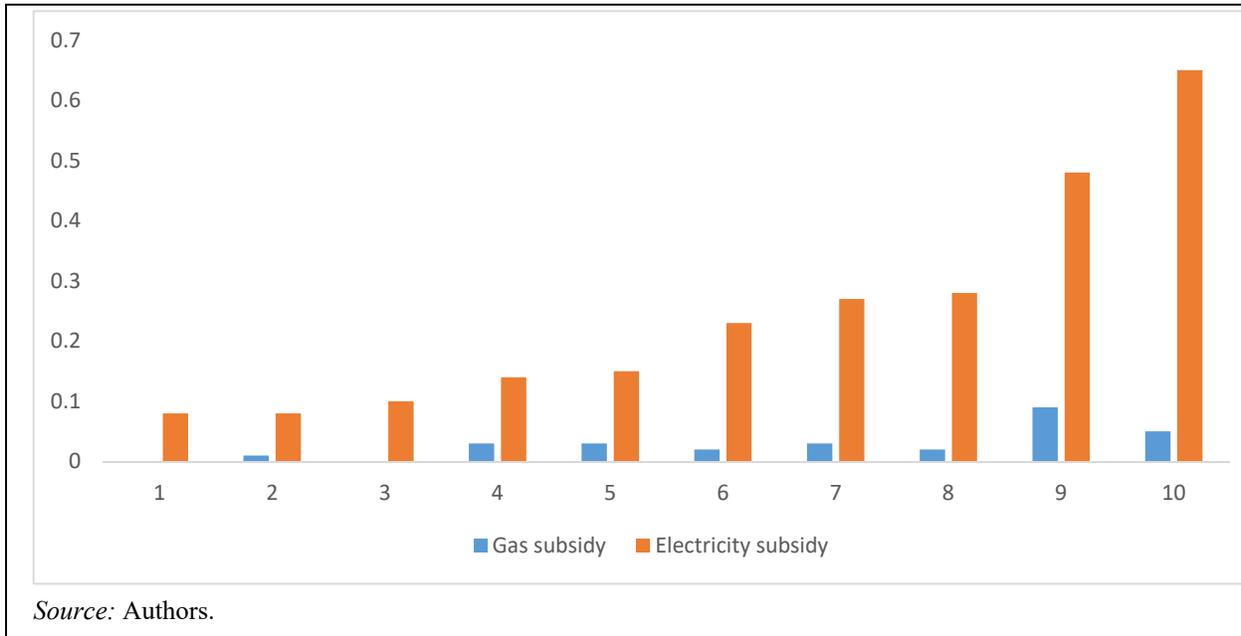
The poorest benefit the most from agricultural subsidies in Mali, whereas the richest benefit the most in Niger. The poorest 50 percent receive 58.3 percent of total agricultural subsidies in Mali and 30.7 percent in Niger (figure 7.b). Moreover, agricultural subsidies are progressive in Mali. For instance, as a share of market income, the total benefit of agricultural spending decreases as income level rises, whereas in Niger, there is no evidence of the progressivity of agricultural subsidies, and the share of total agricultural subsidies in market income fluctuates with income level (figure 7.a).

Figure 7. Distributional Effects of Agricultural Subsidies in Mali and Niger, 2014



The richest benefit the most from energy subsidies in Mali. Gas and electricity subsidies are globally regressive (figure 8), which the fact that domestic energy services are currently not affordable for the poorest partly explains. As a result, only the few better-off individuals with access to these services benefit from the subsidies. In the case of electricity, for example, only 27 percent of the population, who are overall nonpoor individuals, had access in 2014. This evidences bad targeting (at the poor) of energy subsidies. To really help the poorest individuals benefit from subsidies, the first step should be to provide access to gas and electricity services.

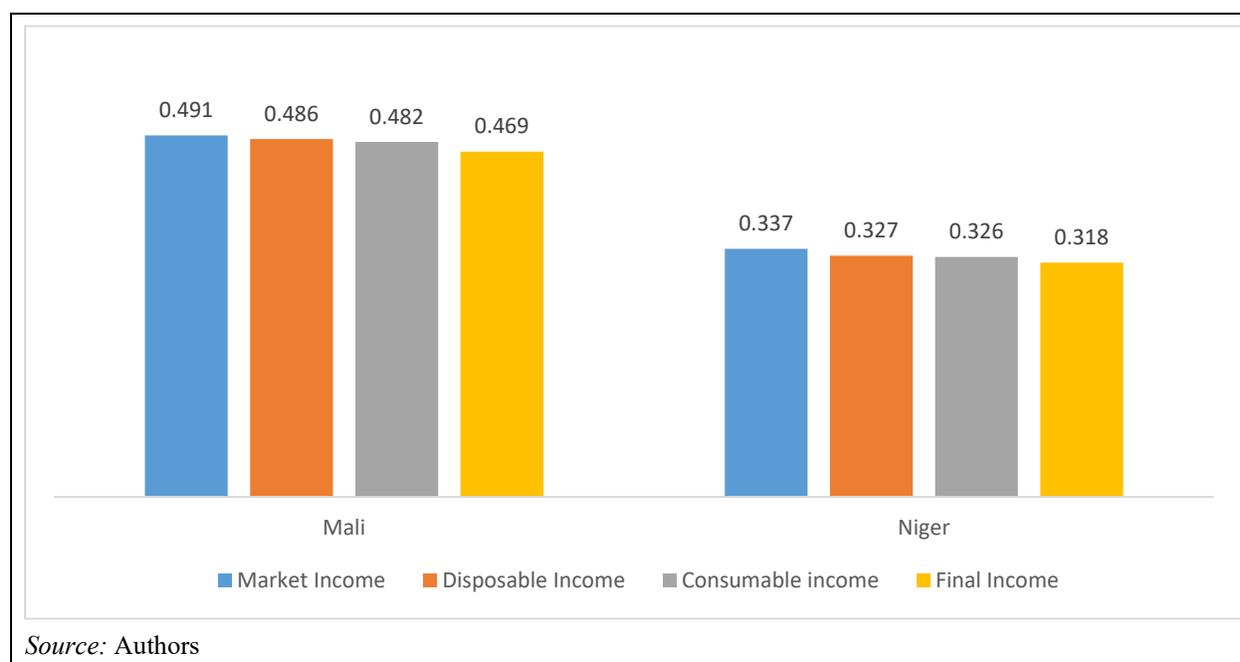
Figure 8. Energy Subsidies As a Share (%) of Market Income Per Decile in Mali, 2014



4. Effect of Taxes and Public Spending on Poverty and Inequality

Fiscal policy has a favorable but marginal effect on reduction of inequality in Mali and Niger. The effect of fiscal policy on inequality is similar in the two countries (figure 9). In Mali, taxes and public spending reduce the Gini index by 4.5 percent, or 0.02 Gini points, from market income to final income (figure 9). Without in-kind benefits (health and education), Mali's fiscal policy achieves a redistributive effect of 0.01 Gini points, corresponding to a 2 percent drop. In Niger, taxes and public spending reduce the Gini index by 5.6 percent from market income to final income, corresponding to a 0.02 Gini point decrease from market income to final income. Excluding in-kind benefits, Niger's fiscal policy leads to a redistributive effect of 0.01 Gini points.

Figure 9. Effect of Fiscal Policy on Inequality in Mali and Niger, 2014



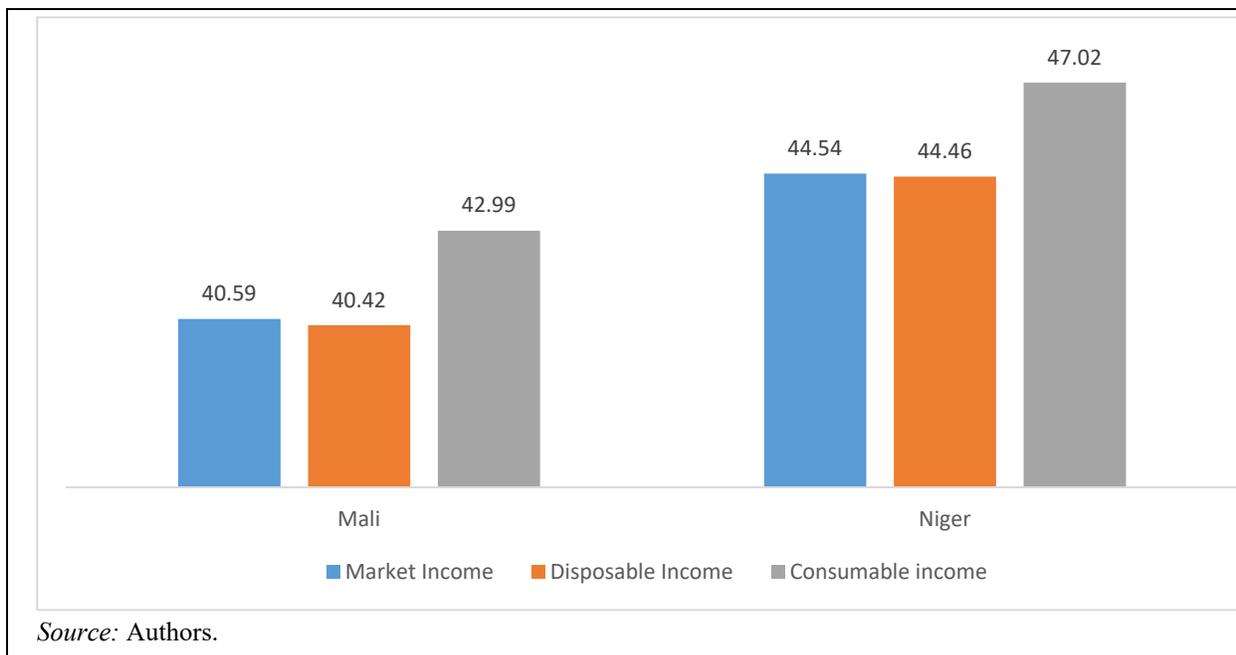
The redistributive effect of fiscal policy in Mali and Niger is lower than in other countries. In a set of 11 developing countries, the redistributive effects in Mali and Niger are below the average, with Niger having a better redistributive effect than Mali (Figure C.2). In the set of selected countries, only three (Bolivia, Indonesia, Zambia) perform worse than Mali. The other countries achieve a higher level of fiscal redistribution, with South Africa having the best fiscal redistribution.

The marginal contributions to inequality reduction of the various fiscal interventions show that (direct and indirect) taxes and basic education (primary education for Niger) are the most redistributive interventions in Mali and Niger. Direct transfers achieve a low level of redistribution in Mali given that they account for a small share of total spending, and they increase inequality in Niger given that they mostly benefit the richest, as explained earlier (Figure C.3). In addition, agricultural subsidies reduce inequality, although they have a low redistributive effect, especially in Niger. In contrast, energy subsidies (gas and electricity) increase inequality in Mali. The country's fiscal policy would have had a greater redistributive effect without energy subsidies. Education and health spending also reduce inequality, with the exception of spending on higher education, because most of the individuals receiving higher education are from the richest deciles in developing countries in general.

Fiscal policy increases impoverishment in Mali and Niger. For instance, the poverty rate (measured using the national poverty line) rises by 5.9 percent (2.4 percentage points) in Mali and 5.5 percent (2.5 percentage points) in Niger from market income to consumable income because of the impoverishing effect of indirect taxes (figure 10). The trend of poverty variation observed is similar to that of other African countries. From market income to disposable income, poverty rates decrease as a result of the combined effect of direct transfers and taxes, but when indirect taxes

and subsidies are considered, the poverty rate for the corresponding income concept (consumable income) increases, leading to a global poverty increase for the fiscal system.

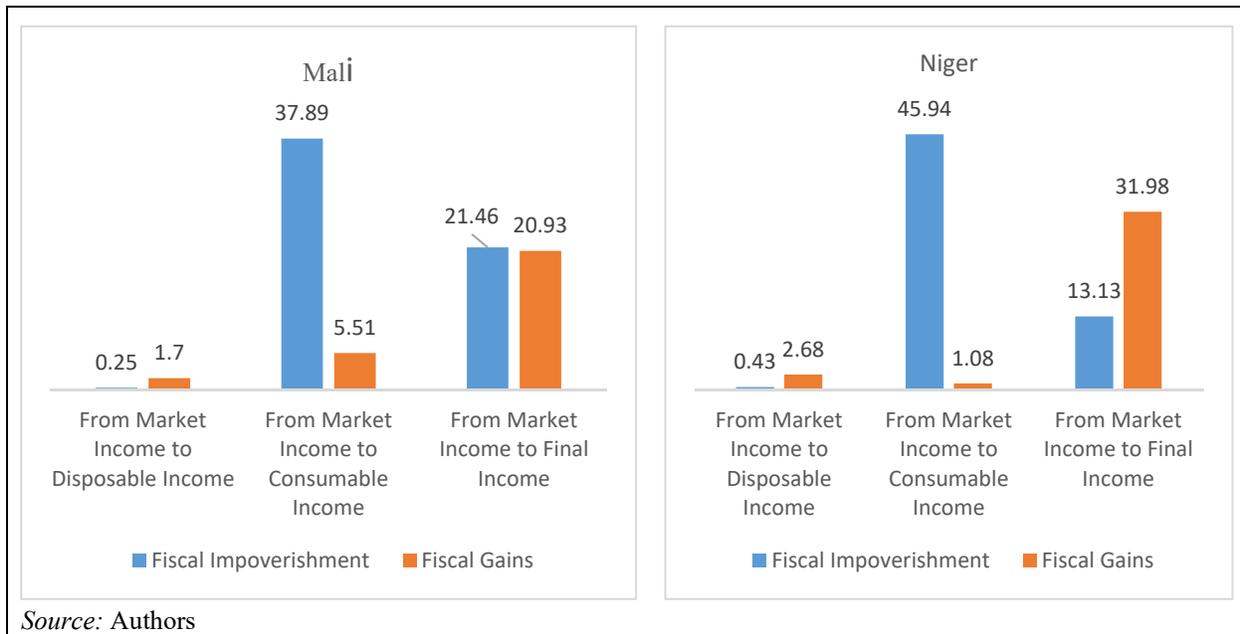
Figure 10. Effect of Fiscal Policy on Poverty in Mali and Niger, 2014



Direct taxes (-0.01 in Mali and Niger) and transfers (0.02 in Mali, 0 in Niger) have little effect on poverty because the richest households pay most of the direct taxes, and direct transfers are relatively small. In addition, in Niger, direct transfers are not well targeted at the poor. In contrast, indirect taxes have a strong impoverishment effect (-3.66 in Mali, -2.44 in Niger) that is, in absolute value, greater than the poverty reduction effect (0.79 in Mali, 0.02 in Niger) of indirect subsidies (Figure C.4). Of indirect tax categories, VATs have the strongest impoverishment effect (-1.79 in Mali, -0.94 in Niger). As a result, poverty headcount measured according to consumable income is far above poverty headcount measured according to market income, confirming that fiscal policy is impoverishing in Mali and Niger.

Calculation of the poverty indexes before and after application of the fiscal policy shows that the increase in poverty is due to taxation in the two countries, but it does not show the proportion of households that have become poorer or richer because of the various fiscal interventions. Although payment of taxes impoverishes households, the benefits from public spending enrich them, and the net effect may therefore be positive (enrichment) or negative (impoverishment). The indicators that Lustig and Higgins (2016) propose are used to assess fiscal impoverishment of and fiscal gains to poor people. Fiscal policy is considered to have impoverished individuals if they were not poor before the policy was applied and became poor after its application or if they were already poor and dropped further below the poverty line after the policy's application.

Figure 11. Fiscal Impoverishment and Fiscal Gains in Mali and Niger, 2014



Direct taxes have a relatively neutral effect on fiscal impoverishment. When moving from market income to disposable income and thus considering direct transfers net of direct taxes, almost no one becomes poor or is fiscally impoverished in the two countries. This is because direct transfers are targeted solely at the poor (for Mali), and only the richest members of the population pay direct taxes. Alternatively, when indirect taxes net of indirect subsidies are considered, 37.9 percent of the population is fiscally impoverished in Mali and 45.9 percent in Niger (figure 11). Hence, indirect taxes have a strong impoverishing effect. People pay more in indirect taxes than they receive in indirect subsidies.

The benefits of in-kind transfers in education and health somewhat attenuate the strong impoverishment effect of indirect taxes. Education and health spending greatly decrease fiscal impoverishment; from 37.9 percent at consumable income, fiscal impoverishment drops to 21.5 percent at final income in Mali and from 45.9 percent to 13.1 percent in Niger.⁴ Moreover, with a small proportion of fiscal gainers at consumable income, fiscal gains rise significantly because of in-kind transfers.

5. Conclusion

This paper aimed to assess the effect of spending and taxes on poverty and income distribution in Mali and Niger. We analyzed the incidence of two-thirds of total tax revenue, including the WST, VAT, import taxes, and other indirect taxes. We also analyzed the effect of spending on education

⁴ In most cases, spending on education and health is not included when assessing fiscal impoverishment and gains.

and health and of transfers and indirect subsidies that represent more than one-fourth of general government expenditures.

The results show that the fiscal system is progressive in Mali and Niger, but that fiscal policy has a limited effect on distribution of revenue and a negative effect on poverty. The fiscal system reduces the Gini index by only 4.5 percent in Mali and 5.6 percent in Niger and results in a 5.9 percent higher poverty rate in Mali and a 5.5 percent higher rate in Niger. The low redistributive effect of fiscal policy in the two countries is mainly because of poor targeting of energy subsidies (in Mali) and the small size of direct transfers (in both countries). The redistributive effect is more limited in Mali and Niger than in South Africa (0.077) and Tunisia (0.044). Results for 11 countries in Latin America show a redistributive effect ranging from 0.02 to 0.14 (Lustig 2015).

The various indirect taxes have a strong impoverishing effect despite reducing inequality. It will be important to reform indirect taxes by lowering tax rates on the products that poor people consume most. Indirect subsidies should also be better targeted to mitigate the impoverishing effect of indirect taxes. The fiscal system could deliver more benefits to individuals who the tax system impoverishes, by transferring more resources (higher levels and broader coverage) through the cash transfer program.

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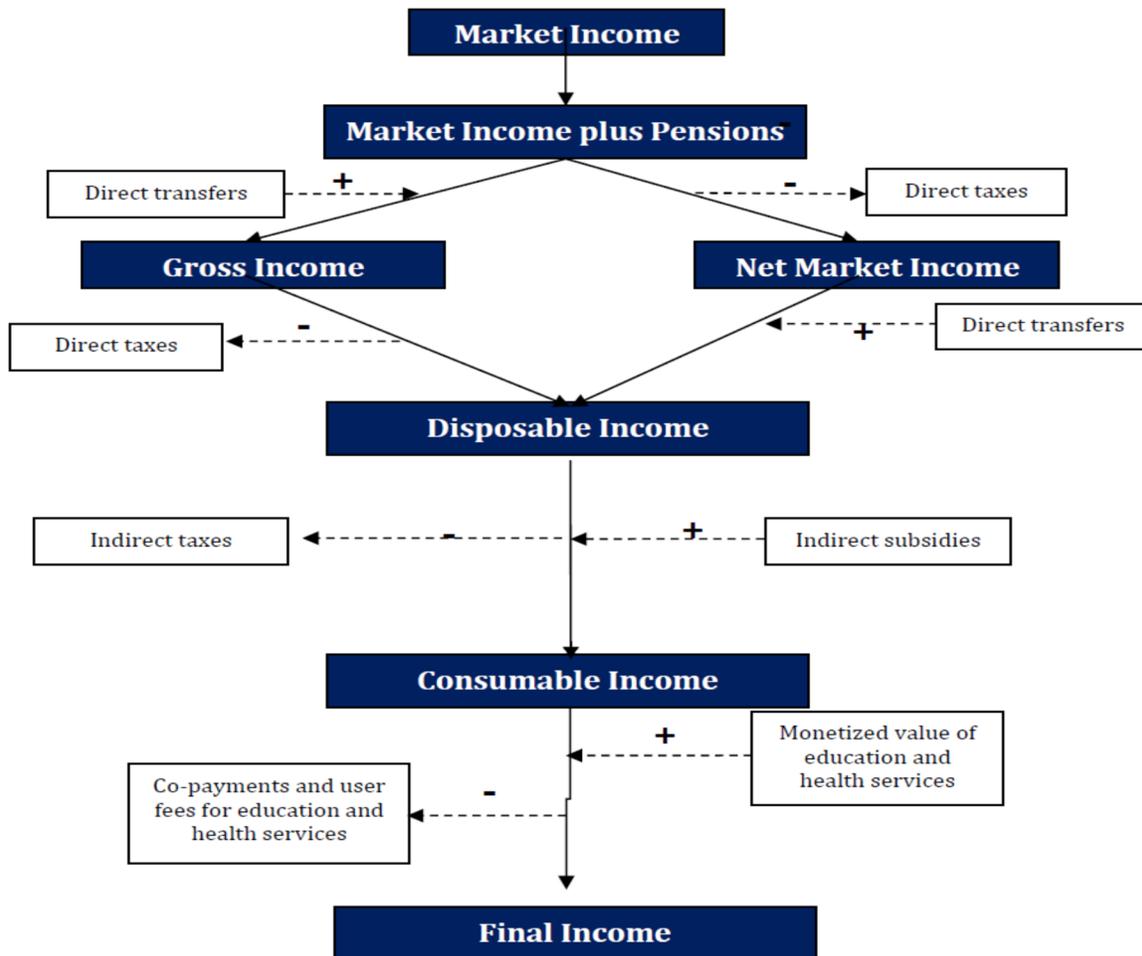
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Appendix A: Methodology

We used the Commitment to Equity (CEQ) methodology that the CEQ Institute developed. The general objective of the CEQ methodology is to assess the effect of a state's fiscal policy and its public spending on household welfare. The CEQ method seeks to identify the households that bear the burden of taxes and those that benefit from state social spending. The method uses two types of data: data from the state budget and national accounts and microdata obtained from household surveys. Eligible households are allocated the amount of social spending they have received and the taxes they have paid, using institutional criteria and household survey data. When information is not available from a household survey, information from other sources may be used. The analysis uses various income concepts to measure the effect of each fiscal intervention on poverty and inequality.

Market income is prefiscal income—that is, household income before any fiscal intervention. It includes gross income from labor and capital, self-production, and private transfers. Net market income is calculated by deducting direct taxes from market income. The direct taxes considered here are taxes on salaries and wages. Disposable income is obtained by adding direct transfers to net market income. We assume that household consumption from the *Enquête Agricole de Conjoncture Intégrée* data is equal to disposable income. Other income concepts are calculated using a backward and forward approach. (See figure A.1 for definitions of the various income concepts in the CEQ approach.) It is thus possible to calculate poverty and inequality indexes for different income concepts to assess the effect of different fiscal interventions on household welfare. The direct transfers considered are cash transfers that households receive under the *Jigisemejiri* social safety net program. The beneficiary households were randomly selected based on the geographical areas that the program covered, the number of program beneficiaries, and their poverty status. When indirect subsidies are added to disposable income, and indirect taxes are deducted, the result is consumable income or postfiscal income—that is, household income after various fiscal interventions. Energy (gas and electricity) and agricultural subsidies are the two types of indirect subsidies considered. Indirect taxes include the value-added tax (VAT), import taxes, and other indirect taxes. Given the importance of the informal sector in Mali, the risk of tax evasion is high. The rates used for the various indirect taxes are therefore effective rates calculated based on the Mali 2012 social accounting matrix (SAM) rather than statutory rates. Moreover, in addition to the direct effects of the VAT, indirect effects for the exempt sectors are considered using the input-output matrix from the 2012 SAM. The overall effect of indirect taxes on household welfare is therefore equal to the sum of direct and indirect effects and is assessed based on the Paasche variation by assuming price-inelastic demand. Final income is determined by considering the monetized value of public education and health services net of payments that households make to benefit from those services. The benefits of education (and health) spending are allocated to households for which at least one member uses the public education (or health) service. To assess the progressivity of different taxes and expenditures, we used the Kakwani index, which is equal to the difference between the concentration coefficient of a tax and the Gini index of prefiscal income. The tax is progressive if the Kakwani index is positive and regressive if it is negative.

Figure A.1. Income Concepts in the Commitment to Equity Methodology



Methods of Allocation

The CEQ methodology consists of different methods of allocating taxes and social spending from the national account to individuals in the household survey. The methods include direct identification, which is used when the beneficiaries of social spending (taxpayers) and the amount they received (paid) are reported in the survey; imputation, which is used when the beneficiaries of spending (taxpayers) are reported in the survey but not the amount they receive (paid); and simulation, which is used when neither the beneficiaries of spending (taxpayers) nor the amount they received (paid) is reported in the survey. The allocation method is selected based on the availability of information in the survey. The allocation methods used in the case of Niger are described below for each item of the fiscal system.

Direct Transfers

The *Jigisemejiri* social safety net program is aimed at transferring cash to some households given their poverty status. Beneficiary households were randomly selected based on the geographical areas that the program covered, the number of program beneficiaries, and their poverty status.

Scholarships and support to nongrant students in Niger are given to university students meeting the criteria of the *Direction des Bourses et des Aides Financières* (e.g., being a citizen, submitting an application). Thus, that program covers university students who are Nigerien citizens. The beneficiaries of that program and the amount they received are reported in the two surveys, so the allocation method is direct identification.

School meals. The government has, depending on the area, two types of school feedings (*cantines nomades* and *cantines sédentaires*) to improve school attendance and success rates. School meal programs cover primary and secondary students. Although the surveys do not directly identify beneficiaries, they indicate education level and each individual's type of school. The statistical book of the National Institute of Statistics also contains data on the geographical repartition of school meals. Potential beneficiaries (people attending primary and secondary schools) are identified, and the current program repartition is considered through regional quotas to select beneficiaries in each region randomly and impute the per capita cost of the program.

Direct Taxes

People with any type of salaried employment except with international organizations and family employees must pay wage taxes, a progressive monthly tax on gross salary. The surveys determine the different types of salaried employment and the (net) wages that employees receive. Net wages are grossed up, and the corresponding taxes that employees pay are simulated based on prevailing tax brackets and considering the wages fiscal pressure in the surveys (total taxes on wages/total household consumption) to be equal to the wages fiscal pressures in the national account (total taxes on wages/total household consumption).

Indirect Taxes

VATs, import duties, and other taxes on goods and services are included through their effective rate derived from Niger's SAM in 2012 for each category (sector of products). The same effective rate is considered in 2011 and 2014, assuming that an effective indirect tax rate does not significantly change over a short period of time. The consumption level of an individual in each product category (SAM classification) is computed in the surveys by matching the survey products to the SAM categories. Then, the SAM effective rate in each category for the different taxes is applied to the corresponding categories in the surveys to deduct (or impute) the part of the total consumption expenditure falling into indirect taxes (direct effects). The input-output matrix is used to determine the indirect effects of each tax, considering that nonexempt sectors of VAT have only direct effects.

Indirect Subsidies

The government subsidizes agriculture by providing agricultural extension services or inputs to farmers to train them on, for example, farming techniques and mechanization. The surveys have one section on agricultural extension services, which allows the beneficiaries of the program to be directly identified. Then, total program expenditures are divided by total number of beneficiaries to determine and impute to each beneficiary the per capita program cost.

Subsidies on energy. The survey data were used to estimate annual household consumption of gas and electricity. The subsidy per kilogram of gas and per kilowatt-hour of electricity was estimated by dividing the total public subsidy in 2014 (approximately CFAF 40 billion for electricity and CFAF 6 billion for domestic gas) by total annual consumption of gas (20,000 metric tons) and total consumption of electricity (1,180 GWh). The average price of gas (CFAF 583 per kilogram) and the electricity rate brackets were also used to determine consumption levels. The total value of the subsidy that a household received is the product of the subsidy per kilogram or kilowatt-hour and annual household consumption.

In-Kind Transfers

Spending on education. The surveys indicate the level of education and the type of school each individual is attending, and education spending is organized according to school level (primary, secondary, university). We impute the average cost of public spending to each individual currently in school depending on the number of students and school level (primary, secondary, university).

Spending on health. The surveys allow who uses public health services to be determined. Then, we impute the average cost of central health expenditures to each beneficiary (individual who uses public health services) and the average cost of regional health expenditures to beneficiaries in the corresponding regions.

Appendix B: Public Spending in Mali and Niger, 2014

Public Expenditures	Amount (CFAF, Billions)	Share in the Budget(%)	Share in the GDP	Included in the Analysis	Allocation Method
Public Powers and General Administration	150.90	10.1%	2.1%	No	-
Jigisemejiri	15.10	1.0%	0.2%	Yes	Simulation
Diplomacy & Foreign Affairs	26.11	1.7%	0.4%	No	-
National Defense & Security	201.67	13.4%	2.8%	No	-
Basic education	179.13	11.9%	2.5%	Yes	Imputation
Higher Education and Scientific Research	88.67	5.9%	1.2%	Yes	Imputation
Youth, Sport and Culture	21.70	1.4%	0.3%	No	-
Health	85.19	5.7%	1.2%	Yes	Imputation
Social Sector	41.21	2.7%	0.6%	No	-
Employment	6.15	0.4%	0.1%	No	-
Agriculture	157.29	10.5%	2.2%	No	-
Agricultural Subsidies	34.50	2.3%	0.5%	Yes	Imputation
Hydraulic Mine And Industry	113.55	7.6%	1.6%	No	-
-Gas Subsidies	6.50	0.4%	0.1%	Yes	Imputation
-Electricity Subsidies	42.00	2.8%	0.6%	Yes	Imputation
Urban Planning and public Infrastructures	96.81	6.5%	1.4%	No	-
Transportation	27.81	1.9%	0.4%	No	-
Communication	30.61	2.0%	0.4%	No	-
Internal Debt	28.51	1.9%	0.4%	No	-
External Debt	62.38	4.2%	0.9%	No	-
Interest on external Debt	20.59	1.4%	0.3%	No	-
Non-Distributed Deposits	162.05	10.8%	2.3%	No	-
Total	1500.33	100.0%	21.1%	-	-

Expenditure	Included in the analysis	2014Million FCFA	Share in total Expenditure (%) 2014	Share in GDP (%) 2014	Allocation method
Total expenditure	-	1,357,273	100%	33.36%	-
Social Spending	-	362,036	26.67%	8.90%	-
Social assistance of which	-	12,480	0.92%	0.31%	-
Scholarships and accessories to tertiary studies	Yes	9,399	0.69%	0.23%	Direct identification
Social support for non-grant tertiary students	Yes	1,500	0.11%	0.04%	Direct identification
Non cash transfer	-	1,581	0.12%	0.04%	-
School feeding	Yes	1,581	0.12%	0.04%	Simulation
Transfers in kind	-	349,551	25.75%	8.59%	-
Education of which	-	278,350	20.51%	6.84%	-
Primary	Yes	168,113	12.39%	4.13%	Imputation
Secondary	Yes	59,808	4.41%	1.47%	Imputation
Tertiary	Yes	50,429	3.72%	1.24%	Imputation
Health of which	-	71,201	5.25%	1.75%	-
Free health care	Yes	7,856	0.58%	0.19%	Imputation
Central	Yes	50,365	3.71%	1.24%	Imputation
Agadez	Yes	238	0.02%	0.01%	Imputation
Diffa	Yes	203	0.01%	0.00%	Imputation
Dosso	Yes	273	0.02%	0.01%	Imputation
Maradi	Yes	348	0.03%	0.01%	Imputation
Tahoua	Yes	470	0.03%	0.01%	Imputation
Tillaberi	Yes	363	0.03%	0.01%	Imputation
Zinder	Yes	2,845	0.21%	0.07%	Imputation
Niamey	Yes	8,241	0.61%	0.20%	Imputation
Subsidies of which	-	5	0.00%	0.00%	-
Agriculture	Yes	5.02	0.00%	0.00%	Imputation

Source: Authors based on each country's BOOST (Budget Data).

Appendix C: Additional Figures

Figure C.1. Progressivity of Direct Taxes in Selected Countries

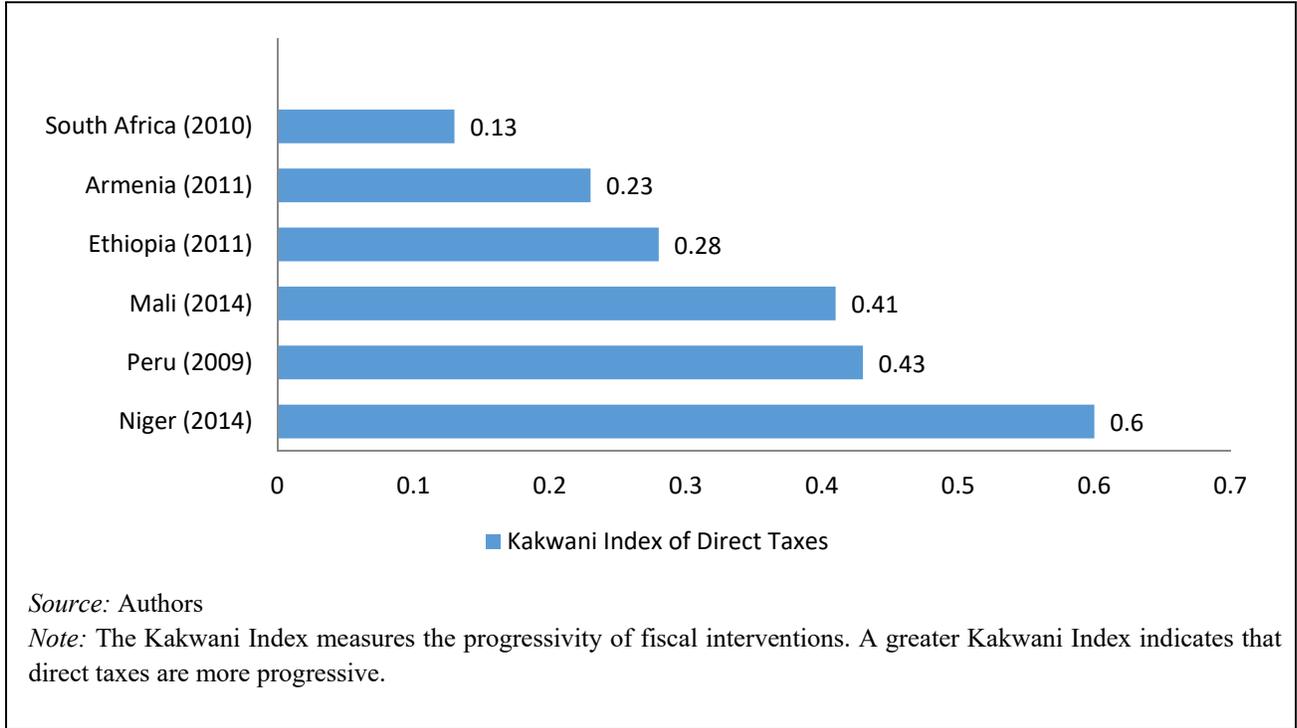


Figure C.2. Redistributive Effects of Fiscal Policy in Selected Developing Countries

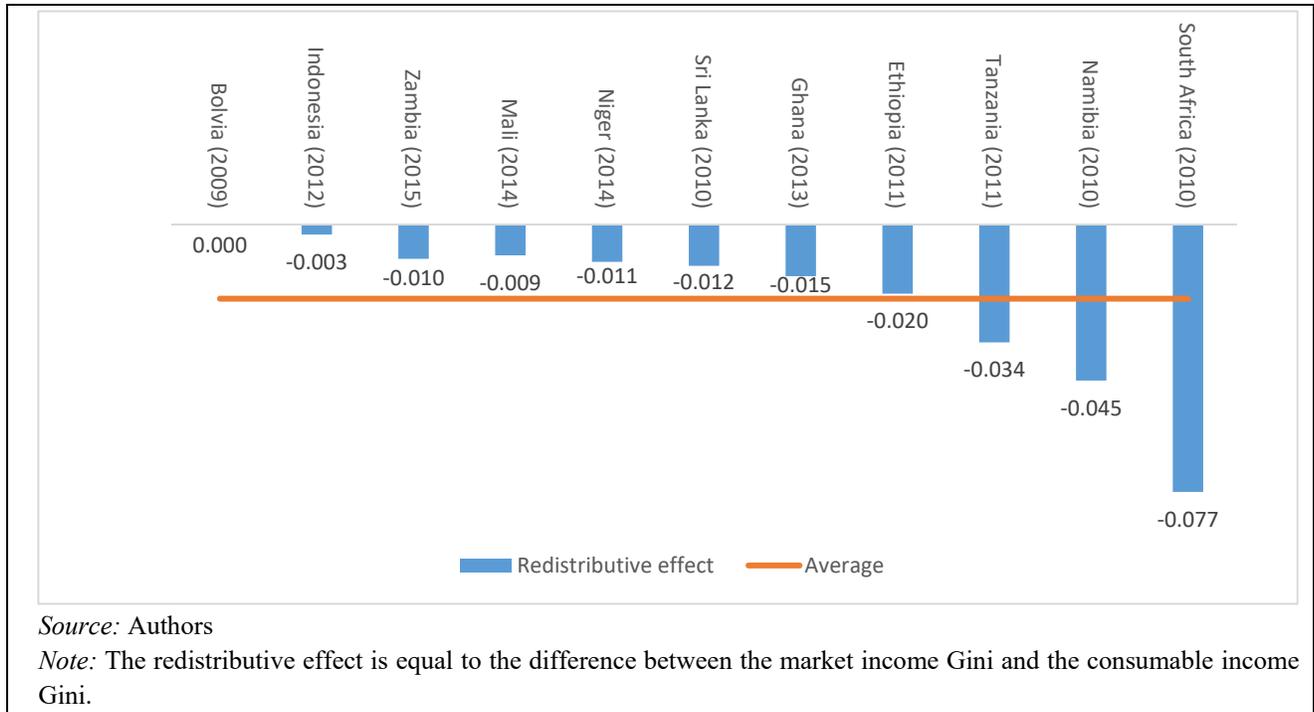


Figure C.3. Marginal Contributions to Inequality Reduction in Mali (left) and Niger (right), 2014

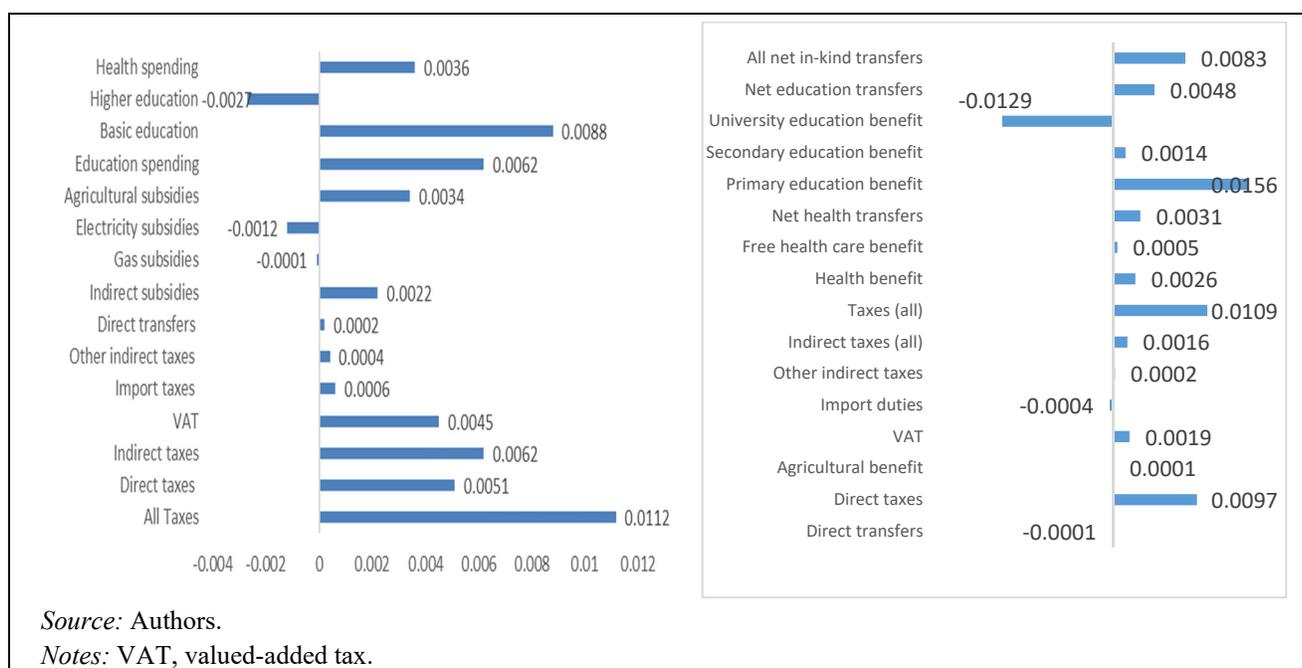


Figure C.4. Marginal Contributions to Poverty Reduction in Mali and Niger, 2014

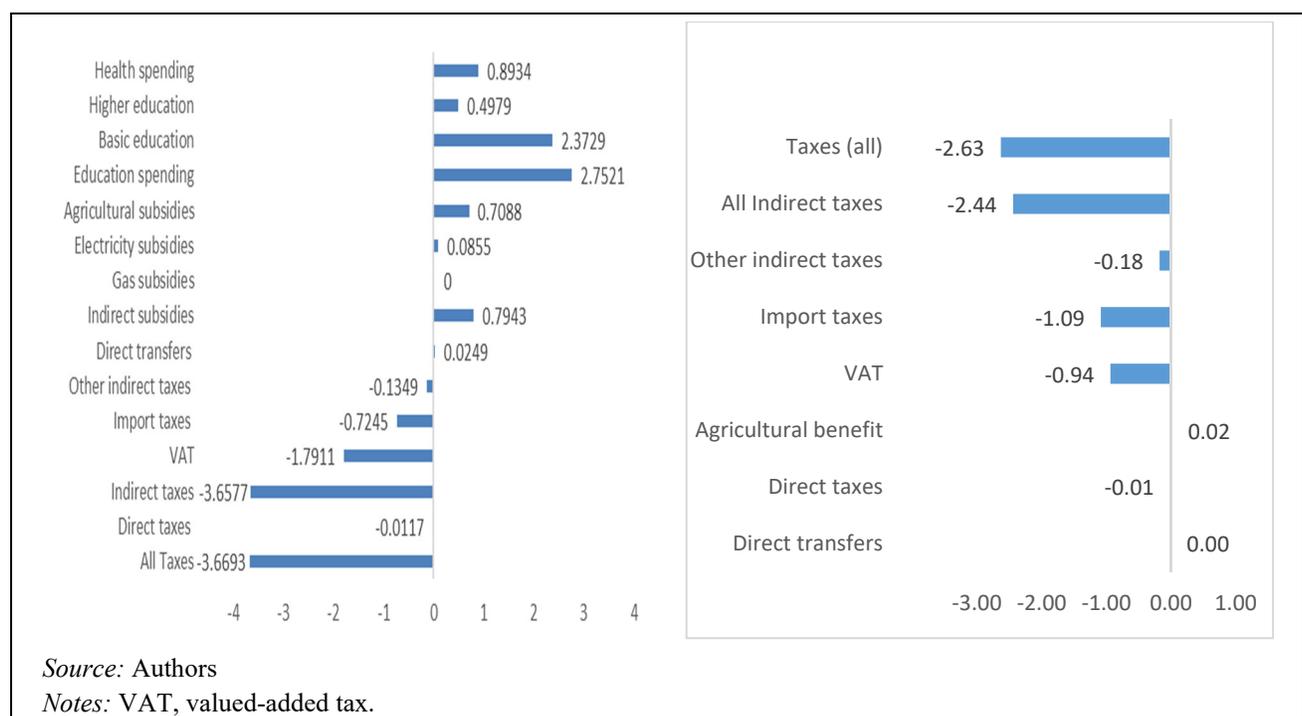


Table C.1. Fiscal Table in Mali and Niger, 2013-2017

	Mali					Niger				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Revenue and grants	17.4	17.1	19.1	18.3	20.0	24.6	23.0	23.3	20.3	21.2
Total revenue	14.5	14.9	16.4	16.7	18.4	16.6	17.6	17.9	14.2	14.5
Tax revenue	12.3	12.6	14.0	14.9	15.2	15.2	15.6	16.0	13.5	13.1
Nontax revenue	0.6	0.7	0.7	0.5	1.4	1.2	1.9	1.8	0.6	1.0
Other revenues	1.7	1.6	1.8	1.3	1.9	0.1	0.1	0.2	0.1	0.3
Grants	2.8	2.2	2.7	1.6	1.6	8.0	5.5	5.4	6.0	6.7
Total expenditure and net lending (payment orders basis)	19.8	20.0	20.9	22.3	22.9	27.2	31.1	32.4	26.3	26.9
Budgetary expenditure	18.2	18.4	19.2	21.1	21.2	27.2	31.1	32.4	26.4	26.4
Current expenditure	12.2	12.0	11.9	12.2	12.4	13.5	14.6	15.4	14.0	13.7
Capital expenditure	6.0	6.5	7.3	8.9	8.8	13.7	16.4	16.9	12.3	12.7
Other Expenditures	1.6	1.6	1.7	1.2	1.7	0.0	0.0	0.0	0.0	0.5

Source: Governments of Mali and Niger

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