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CHAPTER 11

Analyzing the Potential Impact of Indirect Tax Reforms on Poverty with Limited Data

Niger

Saloua Sehili and Quentin Wodon

Many countries in sub-Saharan Africa are confronted with the need to raise tax revenues so they are able to provide a range of services to their populations. In the context of the Millennium Development Goals, the levels of need in such areas as poverty reduction, education, health care, and access to basic infrastructure services are extremely high, and the ability to finance provision of those services cannot rely solely or too extensively on limited foreign aid. Therefore, tax revenues are required, and it is in the countries with the lowest levels of per capita gross domestic product (GDP)—and so the highest need—that tax and other government revenues as a proportion of GDP are the lowest. In addition, because of the high level of informality in their economies, very-low-income countries obtain a large share of tax revenues through consumption-related taxes (such as the value-added tax [VAT] or taxes on imports), which also tend to be more regressive than the taxes on incomes that are levied in richer countries.

Such a situation poses a difficult dilemma. Very-low-income countries are trying to increase their tax revenues to provide services to their populations in need; but, because much of the taxation is based on household



consumption, part of the burden of increased taxes falls on the consumption of poor people. Furthermore, because the poor in very-low-income countries are really extremely poor, even small increases in the price of the goods they consume related to an increase in the taxation rates on those goods may have important negative implications for households' ability to meet their basic needs.

This dilemma is illustrated in the case of Niger, one of the poorest countries on earth. Among the eight countries belonging to the West African Economic and Monetary Union (WAEMU), Niger has the lowest ratio of government revenues to GDP. The WAEMU countries share a common currency, the CFA franc. To maintain price stability and promote economic growth, these countries are required to follow eight convergence criteria, as presented in table 11.1.

The convergence criteria are defined in the following terms: (1) budget deficit as a share of GDP (there should be no budget deficit); (2) inflation rate (it should be below 3 percent per year); (3) public debt-to-GDP ratio (it should be below 70 percent so as not to have debt-service obligations that are difficult to honor); (4) debt arrears (there should be no such arrears, domestically or externally); (5) public wage bill as a share of GDP (it should not be above 35 percent so as to not impose too high a burden on the budget); (6) share of tax revenues used for domestic-funded investment (it should not be below 20 percent, so as not to depend only on donor funding for such investments); (7) trade deficit-to-GDP ratio (the maximum allowable trade deficit is 5 percent of GDP); and (8) tax revenue-to-GDP ratio (it should be at or above 17 percent, so as to enable governments to use tax revenues to provide basic services and improve the well-being of the population). As shown in table 11.1, in 2005 Niger's tax revenues as a share of GDP were only 11.3 percent, versus 14.0 percent to 19.0 percent in most other countries in the union (except Burkina Faso and Guinea-Bissau, which also had very low tax revenue-to-GDP ratios). The target level for the tax revenues-to-GDP ratio in the WAEMU zone is 17 percent.

In this chapter, our objective is to demonstrate how to use very simple techniques of tax incidence analysis to analyze the potential impact on the poor of indirect tax reforms, or at least to shed light on these issues, with an application to Niger.¹ The techniques used here are similar to those employed for benefit incidence analysis (see chapter 4). As noted by Demery (2003),² benefit incidence analysis typically is obtained by



Table 11.1. Country Performance for WAEMU Convergence Criteria, 2005

Convergence criteria	Member-country							Countries responding to each criterion (n)			
	Benin	Burkina Faso	Côte d'Ivoire	Guinea-Bissau	Mali	Niger	Senegal	Togo	2005	2004	2003
Budget deficit as share of GDP $\geq 0\%$	-0.9	-1.9	0	-7.2	0	-2.9	0.9	0.6	4	4	4
Inflation rate $\leq 3\%$	5.4	6.4	3.9	3.4	6.4	7.8	1.7	6.8	1	8	8
Public debt-to-GDP ratio $\leq 70\%$	39.9	37.7	79.3	301.7	69.7	66.3	48.2	100.2	5	3	3
Debt arrears 0 (billion CFA)	0	0	333.9	21.4	0	2.2	0	20.1	4	4	5
Domestic arrears 0	0	0	22.6	8.4	0	2.2	0	5.2	5	5	5
External arrears 0	0	0	311.3	13.0	0	0	0	14.9	5	4	5
Public wage bill as share of tax revenues $\leq 55\%$	37.5	39.8	45.7	108.7	32.6	35.5	30.2	32.4	3	3	4
Domestic-funded investment as share of taxes $\geq 20\%$	21.3	37.6	8.3	8.9	22.7	52.1	30.6	9.5	5	5	5
Trade deficit-to-GDP ratio $\geq -5\%$	-6.6	-11.4	1.5	-18.4	-10.2	-11.6	-9.4	-10.9	1	1	1
Tax revenues-to-GDP ratio $\geq 17\%$	14.8	11.8	14.5	11.5	16.1	11.3	19.0	14.1	1	1	1
Criteria respected (n)	3	3	2	0	5	2	7	2			
2005	3	4	2	2	5	2	7	3			
2004	5	4	1	1	5	3	7	3			
2003											

Source: WAEMU calculations, 2005.

Note: GDP = gross domestic product; WAEMU = West African Economic and Monetary Union. The shaded areas represent convergence criteria that are being respected. Negative numbers (for example, for the budget deficit as a share of GDP) indicate that there is such deficit, thereby implying that the country does not respect the convergence criteria.



combining data on the use of government services from household surveys with data on the cost of providing those services from government budgets. Benefit incidence analysis involves three steps. First, the unit cost of providing a particular service is estimated using government budget data. Second, household survey data are used to allocate the benefits of public spending for specific services to the households using those services. Third, the data at the household level are aggregated into benefit incidence statistics for subgroups of the population to compare how the subsidy is distributed across those groups. The most common way to group households is on the basis of indicators such as income or consumption per capita or per equivalent adult, often according to quintiles. On the basis of comparisons of the incidence of public spending by quintile, suggestions are then made regarding the possibility of reorienting public spending to allocate a larger share of it to the poor (that is, in most cases, to households in the bottom two or three quintiles.)

Here we follow the same approach for tax incidence. As for benefit incidence, we combine data on household consumption with data on the taxes levied by the state on various consumption goods. The empirical estimation also involves three steps. First, the tax rates on particular goods and services are obtained from administrative information about the tax system. Second, household survey data are used to allocate the taxes paid for specific goods and services to the households consuming those goods and services. Third, the data at the household level are aggregated into tax incidence statistics for subgroups of the population to compare how the taxes are distributed across those groups. The results obtained for tax incidence are then compared with those for the benefit incidence of public spending in the social sectors to get an idea of an overall tax and spending package's impact on the poor. Although there are important caveats to the conclusions that can be reached with such simple techniques, the results are potentially useful for informing policy.

The rest of the chapter is structured as follows. The next section first provides a review of medium-term targets for generating public revenues in Niger, and a description of the current structure of tax revenues. In the third section, we rely on household surveys data to assess the potential distributional incidence of selected reforms that were under consideration in the country in 2004 and early 2005. In the fourth section, we briefly show how the overall effect of any tax reform partly depends on how new tax revenues are spent. A brief conclusion completes the chapter.



Medium-Term Targets for Public Revenues and Structure of Taxation

Niger's fiscal performance has improved since 2000, owing to the implementation of fiscal adjustment policies and an improvement in public finances. Policies were aimed at ensuring a sustainable fiscal position and complying gradually with the above-mentioned convergence criteria of the WAEMU. On the revenue side, revenue increased from 8.6 percent of GDP in 2000 to 9.9 percent in 2003. On the expenditure side, current expenditure declined as a share of GDP during the same period. Capital expenditure increased by about 1.6 percentage points of GDP—from 5.7 percent of GDP to 7.3 percent, in line with the implementation of the poverty reduction strategy and supported in part by resources freed by the Heavily Indebted Poor Countries (HIPC) Initiative.

The overall budget deficit (on a commitment basis, excluding official budgetary grants), which stood at an annual average of 9.0 percent in the previous two years, declined to 7.7 percent a year between 2001 and 2003. The primary budget deficit was reduced by 1.0 percentage point of GDP—from 3.0 percent of GDP in 2000 to 2.0 percent in 2003. In addition, the government has made efforts to clear domestic arrears. Implementing the reform program enabled Niger to reach the completion point under the Enhanced HIPC Initiative on April 12, 2004, and to receive additional debt relief (topping-up) in the amount of \$142 million. After three years of implementation of the program covering the period from 2000 to 2003, the sixth Poverty Reduction and Growth Facility review and the ex post assessment of performance under the International Monetary Fund (IMF)-supported program concluded that economic and financial management during this period was appropriate for macroeconomic stability and poverty reduction.

The macroeconomic framework for 2005–07 in table 11.2 calls for an increase in domestic revenue mobilization. Under scenarios discussed between the World Bank and the IMF, real GDP growth would increase by an annual average of 4.2 percent throughout the period 2005–07. This growth would be supported by an increase in investment and a strengthening of nonmining activities (agriculture and services), new gold mining activities, and improvements in the economic policies of Niger's regional partners (especially Nigeria). Gross investment would increase from an estimated 15.9 percent of GDP in 2004 to 17.3 percent in 2007. Gross



Table 11.2. Recent Economic Performance and Medium-Term Macroeconomic Framework, 1997–2007

<i>Macroeconomic Indicator</i>	<i>1997–99</i>	<i>2000–03</i>	<i>2004</i>	<i>2005–07</i>
<i>Growth, investment and savings</i>				
Real GDP growth (%)	4.2	3.5	0.9	4.2
Primary	8.0	3.2	—	—
Secondary	2.3	2.4	—	—
Tertiary	3.3	4.0	—	—
Gross investment (% of GDP)	11.1	13.0	15.9	17.3
<i>Public finance</i>				
Government revenue (% of GDP)	8.8	9.6	10.5	11.6
Government expenditure (% of GDP)	17.3	17.4	18.2	18.8
Primary balance (% of GDP)	-7.0	-6.3	-7.0	-6.6
Overall balance (% of GDP)	-8.5	-7.8	-7.6	-7.2
<i>External debt</i>				
Debt service-to-export ratio (before debt relief, %)	20.3	26.8	12.3	9.7

Source: Authors' calculations, based on World Bank and International Monetary Fund data.

Note: — = not available; GDP = gross domestic product.

national savings would increase by 1.3 percentage points of GDP—from an estimated 10.0 percent of GDP in 2004 to 11.3 percent of GDP in 2007—as a result of increases in public and private savings. Annual average inflation would remain contained at 2.1 percent during 2005–07, reflecting prudent monetary policy at the regional level, a stable real exchange rate, and strong and sustainable economic growth. Taking into account the financing prospects and the need to ensure debt sustainability, the overall fiscal deficit (on a commitment basis and excluding budgetary grants) would decline from an estimated 7.6 percent of GDP to 6.5 percent by 2007. To this end, fiscal policy would aim at ensuring continued reduction in fiscal deficits through improved expenditure management and measures to boost revenue collection, with government revenue reaching 11.6 percent of GDP over the period 2005–07.

To understand how this increase in tax revenues could be achieved, it is useful to review Niger's tax system briefly. The rate of public revenue mobilization in Niger, which reached 14 percent of GDP in 1980 (at a time when uranium exports were larger), has hovered around the 10.0 percent mark in recent years, with a slight improvement in 2003 to 10.7 percent of GDP. This rate is the lowest among WAEMU member-countries, well



below the WAEMU average of about 15.0 percent and its target rate of 17.0 percent. According to IMF data, the main taxes are as follows:

- *Direct taxes:* These taxes account for roughly 15–16 percent of total tax revenues and comprise mainly taxes on industrial and commercial profits (*bénéfices industriels et commerciaux* [BIC], for 9 percent of total revenues), and taxes on wages and salaries (*impôts sur les traitements, salaires et revenus assimilés*, for 5 percent of total revenues). The BIC tax rate currently stands at 35 percent and is levied on commercial, noncommercial, agricultural, and other formal sector activities. There is also a flat 1 percent tax (*impôt minimum forfaitaire*) levied on total revenues (*chiffre d'affaires*) but deductible from the BIC tax. The personal income tax is a progressive tax levied on wages and salaries, with a maximum marginal rate of 45 percent, after various deductions, including deductions for family dependents.
- *Import taxes:* Since 2000, Niger has applied the WAEMU *tariff extérieur commun* (TEC) on imports originating outside of WAEMU countries. The TEC includes both permanent and temporary taxes, whose rates vary depending on the types of goods. Permanent taxes comprise the *droit de douane* (at a rate of 0 to 20 percent depending on goods), the *redevance statistique* (at a rate of 1 percent), and the *prélèvement compensatoire de solidarité* (also at a rate of 1 percent). Temporary taxes allowed by WAEMU include the *taxe dégressive de protection* (TDP) and the *taxe conjoncturelle à l'importation* (TCI). The TDP was put in place for a temporary period of four years (2000–03, with a one-year extension) for certain industrial or agroindustrial products to compensate for important reductions in tariff protection linked to the implementation of the TEC. The TCI aims to compensate agricultural, agroindustrial, cattle, and fisheries (excluding fish) products for important reductions in tariff protection resulting from variations in world prices. Although Niger does not apply the TDP, rice imports were subjected to the TCI until 2003. Imports also are subject to indirect taxes imposed on domestic products (including excise taxes imposed *ad valorem* on tobacco, cigarettes, alcoholic drinks, coffee, cola nuts, cosmetics, vegetable oils, and petroleum products), and to the 19 percent VAT. Imports originating from WAEMU member-countries are subject only to domestic taxes. At customs, a downpayment on industrial and commercial profits (the BIC) is collected for the *Droit General d'Im-*



portation at the rate of 3 percent if the importer is matriculated and 5 percent otherwise. Overall, import taxes represent approximately 20 percent of tax revenues.

- *Export taxes:* In 1996 the *redevance statistique* tax base, which was already in place for Niger's imports, was expanded to encompass exports at the rate of 5 percent and subsequently reduced to 3 percent. Exports in transit to Algeria, Libya, and Nigeria—exports called “transit special”—are subject to a *taxe spéciale de réexportation* at a normal rate of 5 percent, increased to 10 percent on cigarettes reexported to Nigeria, and to 15 percent on cigarettes reexported toward Algeria and Libya. On average, total revenues from export taxation represent 10–11 percent of tax revenues.
- *Value-added tax:* The VAT has been levied at a unique rate of 19 percent since 2001—an amount just below the upper limit of the interval in the WAEMU VAT Directive (16–20 percent). In 2002, VAT receipts accounted for 32 percent of total tax revenues. Despite a more efficient administration and progress in the receipts of this tax, this tax represented only 3.2 percent of GDP, well below the average among WAEMU members (5–7 percent of GDP). The VAT efficiency rate (VAT receipts as a share of GDP divided by the VAT tax rate) was 17.9 percent in 2002, versus an average of 27.0 percent in sub-Saharan Africa. If the VAT efficiency rate were brought up to 27.0 percent, public revenues would increase by 1.7 percent of GDP. The shortfall in VAT collections in Niger is due in part to exemptions but, more important, to a high level of informality, including high levels of autoconsumption, and to weaknesses in tax administration.
- *Other taxes:* Excise taxes account for slightly less than 8 percent of total tax revenues (of which slightly less than 1 percent comes from alcoholic beverages and 3 percent comes from tobacco products). Because Niger's excise tax rates are already in the upper limit of the WAEMU Directive, no further increases in these tax rates can be contemplated. However, additional categories of goods might be taxed, including sodas, sugar-sweetened drinks, and tea. It has been suggested that the excise tax on vegetable oils be eliminated (and that these oils be subjected instead to the VAT) to improve the competitiveness of firms using vegetable oils as inputs. Finally, all other taxes combined account for about 13 percent of total tax receipts. This combination includes the *redevance minière*, which itself represents 5 percent of total revenues.



Assessing the Impact of Indirect Tax Reforms: VAT Exemptions

Government proposals regarding VAT reforms that were discussed in 2004–05 were focused largely on final consumption products exempted from the VAT. The list of exempted products in 2004 included grains other than rice, inputs bought or imported for the purposes of an industrial installation established in Niger, computer equipment purchased for technical or professional education establishments, health and education products, agricultural inputs, road transport of people and merchandise, and household consumption of water and electricity for a monthly total of less than 50 m³ of water and 150 kWh of electricity. In addition, the investment code, agreements with certain companies and nongovernmental organizations, and certain externally financed projects also allow numerous exemptions from the VAT.

For example, as an investment incentive in the agricultural sector, the investment code exempts agropastoral outputs, including outputs of industrial agriculture; the processing of vegetable or animal goods and production for the purpose of exporting agricultural products; and livestock and fisheries products. Because it is difficult to increase VAT collections by reducing autoconsumption or reducing the size of the informal sector, an alternative means of generating higher VAT collections is to limit the number of exemptions.

Among the reforms in this area that were considered in 2004–05 were (1) imposing an excise tax at the rate of 5 percent on sodas and sugar-sweetened drinks, which could raise an additional CFAF 0.1 billion; (2) imposing an excise tax at the rate of 12 percent on tea, which could increase revenues by CFAF 0.4 billion; (3) eliminating the excise tax on vegetable oil and replacing it with the VAT; (4) eliminating the *tranches sociales* exemption from the VAT, defined with respect to household consumption of water and electricity, which could add CFAC 1.6 billion (especially through electricity consumption); and (5) subjecting processed food products (mainly milk, flour, sugar, and the like) to the VAT, which could raise an additional CFAF 1.3, 1.9, and 1.6 billion on milk, flour, and sugar, respectively. All proposals and estimated amounts of tax revenues to be generated above are indicative only, and many of the proposed goods for taxation have remained exempt.

Household survey data can be used to assess the tax potential of various commodities, as well as the incidence of the tax burden. This section



analyzes the potential effects of the past proposals for VAT reform on poverty and inequality, using consumption data in household surveys. For Niamey, the capital of Niger, we rely on the 1-2-3 survey³ implemented in 2004, which includes a detailed consumption module. For the country as a whole, we rely on the 1995 Economic and Social Conjuncture Survey (EPCES) data, which include Niamey in its sampling frame. As discussed below, the aggregate statistics obtained from the household surveys and presented in table 11.3 suggest, despite issues regarding data quality, that we can make the case that the analysis of the proposed reforms' potential impact on poverty and inequality can be conducted with reasonable confidence.

Table 11.3. Aggregate Statistics on Consumption Categories Targeted for Indirect Taxation

<i>Consumption category</i>	<i>Niamey 1994–95</i>	<i>Niamey 2004</i>	<i>Niger 1994–95</i>	<i>Niger 2003–04</i>
<i>National accounts</i>				
GDP per capita (million constant CFA)	—	—	867,900	1,586,500
Household consumption (million constant CFA)	—	—	728,960	1,326,100
Share of consumption in GDP (%)	—	—	83.99	83.59
Survey consumption estimate (million CFA)	59,076	272,389	752,277	—
Population, Niamey survey (number of persons)	410,517	797,920	—	—
Population, Niger survey/ United Nations (number of persons)	8,762,875	11,692,179	—	—
Share of population in Niamey (%)	4.68	6.82	—	—
Share of consumption in Niamey (%)	8.10	20.54	—	—
<i>Household spending in survey (million CFA)</i>				
Electricity	987	6,828	1,828	—
Water (private connections)	358	1,139	847	—
Oil	1,762	7,159	19,690	—
Flour	—	2,073	—	7,585–8,035
Milk	—	1,489	—	7,512–7,951
Sugar	—	1,405	—	16,580–11,497
Condiments	5,830	—	43,252	—



Table 11.3, continued

<i>Consumption category</i>	<i>Niamey 1994–95</i>	<i>Niamey 2004</i>	<i>Niger 1994–95</i>	<i>Niger 2003–04</i>
Tea	—	674	—	—
Sodas	—	251	—	—
All categories above as percent of total consumption (%)	15.13	7.72	8.72	—
<i>Potential tax revenues (million CFA)</i>				
Electricity	—	1,197	—	542–1,600
Water	—	442	—	Low to 307
Oil	—	+1,360/ –1,074	—	Low
Flour	—	394	—	500
Milk	—	283	—	495–1,300
Sugar	—	267	—	665–1,600
Condiments	—	n.a.	—	—
Tea	—	81	—	400
Sodas	—	13	—	100
Total potential tax revenues as percent of total consumption (%)	—	0.93	—	—

Source: Authors' estimates. The first three columns in the table are estimates based on household surveys; the last column is based on administrative data.

Note: — = not available; CFA = Niger franc; GDP = gross domestic product; n.a. = not applicable. All values in millions of CFA.

Aggregate Statistics

Consider first key parameters from the 1995 national survey (table 11.3). Total consumption as measured in the survey using the expansion factors is CFAF 752.277 billion, which is very close to the national accounts value of CFAF 728.960 billion. In Niamey, however, the aggregate consumption estimates for 1995 are too low. In 1995, Niamey apparently had a consumption share of only 8.10 percent for a population share of 4.68 percent, which implies an average per capita consumption level in Niamey at less than twice the national aggregate. In the 2004 survey, Niamey's consumption share (versus the national accounts estimate) was much higher at 20.54 percent for a population share of 6.82 percent (also higher because of migration). This finding suggests for 2004 a level of per capita consumption in Niamey about three times higher than in the country as a whole, which is probably more realistic. The aggregates in



table 11.3 show that it is better for Niamey to use the data from 2004, not only because the data are more recent and detailed, but also because they are of higher quality (not surprising, given the higher level of detail in the 2004 questionnaire than in the 1995 questionnaire).

Consumption by Category of Goods

The data in the 1995 survey enable us to look at the consumption distribution of a subset of goods (oils, condiments, piped water, and electricity). The data in the 2004 Niamey survey are more detailed, so we have information as well on the consumption of flour, milk, sugar, tea, and sodas. A key finding in both the Niamey 2004 survey and the national 1995 survey is that the goods selected for taxation represent 8–9 percent of total consumption. In the Niamey subsample for 1995, the proportion is higher (15 percent), but that is likely to be overestimated because, as discussed above, total consumption in the Niamey subsample for that year seems to be underestimated. Now, if the goods targeted for taxation represent roughly 8–9 percent of total consumption, we can assume that additional taxes imposed on households through a reduction in exemptions for those goods should be around 2 percent of total consumption. That assumption seems valid because the VAT rate is at 19 percent, and some of the proposals under consideration call for lower (for example, excise) tax rates on the targeted goods. Still, for some households the burden of additional taxes would be much higher than the average of 2 percent. For those households, the increase in taxation is cause for concern.

Tax Revenues by Category of Goods

Table 11.3 finally provides estimates of the tax revenues that could be expected from various goods in the Niamey 2004 survey, as well as the tax revenues anticipated in various government estimates. Electricity and packaged foods would bring in the largest revenues if these goods were taxed, followed by water consumption, tea, and sodas. There are some differences between the survey estimates and the government's estimates (and the latter may be more precise because they rely on data from customs for imported goods); overall, however, the orders of magnitude seem correct, and Niamey as well as other urban areas are likely to account for a relatively large share of the total tax revenues to be generated.



The shares of new taxes paid by poor or vulnerable households are similar in the 1995 and 2004 surveys and could reach 40 percent for some goods. Table 11.4 provides estimates of consumption shares for various goods by decile, and thereby estimates the shares of taxes that would be paid by households according to their per capita consumption of those goods. On the basis of poverty statistics from the mid-1990s and projections-based growth in GDP per capita, we assume that, at the national level, *at least* 60 percent of the population is poor—versus, say,

Table 11.4. Consumption Shares of Comparable Goods by Income Decile, 1995 and 2004 Surveys

Consuming group	Cumulative share of consumption (%)				Total consumption
	Condiments and targeted packaged food ^a	Vegetable oils	Electricity	Water	
<i>Niger, 1994–95</i>					
Decile 1 (poorest)	1.15	0.67	0.14	0.37	1.06
Decile 2	3.21	2.59	1.06	1.46	3.04
Decile 3	5.78	5.25	1.71	2.02	5.84
Decile 4	9.56	9.10	1.81	2.04	9.59
Decile 5	14.23	13.62	2.31	3.72	14.17
Decile 6 (low poverty line)	20.06	20.29	3.72	6.88	20.01
Decile 7	27.56	28.77	7.26	10.84	27.57
Decile 8 (high poverty line)	38.19	39.29	15.66	20.40	37.89
Decile 9	53.64	56.22	28.54	31.79	52.68
Decile 10 (richest)	100.00	100.00	100.00	100.00	100.00
<i>Niamey, 2004</i>					
Decile 1 (poorest)	0.93	3.35	1.75	1.77	2.07
Decile 2	2.89	9.43	4.66	8.99	5.73
Decile 3	6.78	14.28	6.60	19.56	10.01
Decile 4 (low poverty line)	12.02	20.17	12.50	27.39	15.34
Decile 5	17.26	26.86	17.04	31.64	21.89
Decile 6 (high poverty line)	25.75	37.52	23.85	43.72	28.86
Decile 7	38.15	49.76	35.77	53.33	37.46
Decile 8	52.85	67.46	45.69	60.75	48.11
Decile 9	70.23	76.75	59.95	73.86	62.39
Decile 10 (richest)	100.00	100.00	100.00	100.00	100.00

Source: Authors' estimates, based on the national 1994–95 survey and the 1-2-3 household surveys for Niamey in 2004.

a. Data on condiments come from the 1995 survey; data on packaged goods come from the 2004 survey.



40 percent in Niamey.⁴ Under such an assumption, the cumulative share of consumption of a good by (*at least*) the bottom six deciles at the national level, and the bottom four deciles in Niamey, would represent the share of the taxes that will be paid by the poor. For the packaged goods targeted for taxation (or condiments as a proxy in the 1995 survey) and for vegetable oils, these shares vary between 12 and 20 percent, and they are similar to the shares of total consumption accounted for by the poor (at 20 percent nationally and 15 percent in Niamey). This finding would suggest that 20 percent of the taxation on these goods would be paid by the poor—provided, of course, that only 60 percent of the population is considered poor at the national level and 40 percent in Niamey. If, instead, we consider 80 percent of the country's population to be poor, or at least vulnerable to poverty, and the corresponding proportion for Niamey to be 60 percent, then the share of the new taxes to be paid by poor people would be much higher—close to 40 percent for many goods. This is also the case for consumption of electricity and piped water, at least in Niamey.⁵

The analysis of the more detailed information in the 2004 Niamey survey confirms that poor and vulnerable groups could pay a substantial share of new taxes. The share of total consumption accruing to the bottom four deciles in Niamey is 15.34 percent (table 11.5). For oil and flour, the shares consumed by the poor are higher—20 percent and 25 percent, respectively. For all the other goods targeted for taxation, the share is lower—0 percent for sodas to 14.29 percent for piped water. Overall, when taking the sum of taxes to be paid on the various goods, the share is very similar to the total consumption share—about 15 percent. Now, if we consider that 60 percent of the population in Niamey is poor, or at least vulnerable, the shares of new taxes paid by poor or vulnerable groups increases to about 30 percent (and up to 40 percent for some goods). Of all the categories considered for taxation, the analysis suggests that flour would have the largest proportional negative impact on the poor because the share of total consumption of flour is highest among the poor. Another statistic provided in the table is the total per capita average tax payment by decile. When the reduction in excise tax for vegetable oils is included (to partially offset the imposition of the VAT on these oils), the annual per capita tax payment varies from CFAF 800 in the poorest decile to CFAF 12,710 in the richest decile. As a share of per capita consumption, these tax payments are relatively similar in all deciles. Howev-



Table 11.5. Incidence Analysis for Proposed Tax Reforms, Niamey, 2004 Survey

CFA per day

<i>Per capita consumption decile</i>	<i>Per capita consumption (n)</i>	<i>Impact of taxation on sodas</i>	<i>Impact of taxation on tea</i>	<i>Impact of taxation on vegetable oil (excise tax)</i>	<i>Impact of taxation on vegetable oil (VAT)</i>
Decile 1 (poorest)	76.37	0	0.05	-0.44	0.56
Decile 2	129.93	0	0.04	-0.78	0.98
Decile 3	164.48	0	0.04	-0.67	0.85
Decile 4 (low poverty line)	196.42	0	0.04	-0.78	0.99
Decile 5	230.99	0	0.06	-0.85	1.07
Decile 6 (high poverty line)	265.78	0.02	0.09	-1.46	1.85
Decile 7	322.24	0	0.14	-1.65	2.09
Decile 8	392.19	0.01	0.08	-2.35	2.97
Decile 9	527.15	0.01	0.29	-1.23	1.56
Decile 10 (richest)	1390.54	0.19	0.67	-3.09	3.92
Percent of total paid by bottom four deciles	15.34	0	11.33	20.08	20.08
Percent of total paid by bottom six deciles	28.79	8.70	21.33	37.44	37.41

<i>Per capita consumption decile</i>	<i>Impact of taxation on milk</i>	<i>Impact of taxation on flour</i>	<i>Impact of taxation on sugar</i>	<i>Impact of taxation on electricity</i>	<i>Impact of taxation on water</i>
Decile 1 (poorest)	0.02	0.37	0.03	0.1	0.1
Decile 2	0.14	0.27	0.07	0.4	0.2
Decile 3	0.12	0.21	0.15	0.3	0.2
Decile 4 (low poverty line)	0.09	0.42	0.19	0.9	0.3
Decile 5	0.04	0.43	0.18	0.7	0.4
Decile 6 (high poverty line)	0.17	0.51	0.32	1.2	0.7

continued on next page



Table 11.5, continued

Per capita consumption decile	Impact of	Impact of	Impact of	Impact of	Impact of	Impact of
	taxation on milk	taxation on flour	taxation on sugar	taxation on electricity	taxation on water	
Decile 7	0.36	0.72	0.46	1.9	0.7	
Decile 8	0.35	0.50	0.53	1.6	0.7	
Decile 9	0.45	0.66	0.63	2.4	0.6	
Decile 10 (richest)	1.42	0.92	1.09	5.9	1.7	
Percent of total paid by bottom four deciles	11.71	25.35	12.05	11.04	14.29	
Percent of total paid by bottom six deciles	18.35	44.11	25.75	23.38	33.93	
Per capita consumption decile	Sum, including	Sum, excluding	Share of	Share of	Share of consumption,	
	excise tax reduction on vegetable oil	excise tax reduction on vegetable oil	consumption, including excise tax reduction on vegetable oil (%)	consumption, including excise tax reduction on vegetable oil (%)	excluding excise tax reduction on vegetable oil (%)	
Decile 1 (poorest)	0.80	1.25	1.05	1.05	1.63	
Decile 2	1.30	2.07	1.00	1.00	1.60	
Decile 3	1.15	1.82	0.70	0.70	1.11	
Decile 4 (poverty line)	2.21	2.99	1.13	1.13	1.52	
Decile 5	2.00	2.85	0.87	0.87	1.23	
Decile 6	3.39	4.85	1.28	1.28	1.83	
Decile 7	4.72	6.37	1.46	1.46	1.98	
Decile 8	4.42	6.77	1.13	1.13	1.73	
Decile 9	5.32	6.55	1.01	1.01	1.24	
Decile 10 (richest)	12.71	15.80	0.91	0.91	1.14	
Percent of total paid by bottom four deciles	14.36	15.84	—	—	—	
Percent of total paid by bottom six deciles	28.54	30.85	—	—	—	

Source: Authors' estimates, based on the 1-2-3 household surveys for Niamey in 2004.

Note: — = not available.



er, it must be stressed again that this is an average and for some households the cost may be much higher. Also, given that many poor households have limited cash revenues at their disposal, the share of the tax increase in their total available cash would also be higher.

Because the total value of the new taxes that were to be obtained by a reduction in selected VAT exemptions considered by the government was limited, the effect on poverty could have been limited as well, at least on average. However, for some households consuming the goods considered for taxation in higher amounts, the increase in costs was probably substantial. In addition, the proposed implementation of the measures under consideration took place at a difficult time, after a crop year marked by a drought. Therefore, the VAT reform measures combined with the increase in the price of some food items (probably resulting from the lack of supply caused by the drought) led to a rapid and substantial increase in the final consumer price for a range of goods—and that led to protests. In their subsequent dialogue, the government and civil society organizations agreed on a new package of measures that enabled the country to achieve the goal of higher fiscal revenues while protecting the poor from most of the impact of the tax reform originally proposed. Interestingly and appropriately, the main good on which the decision to apply the VAT was maintained—sugar—is also one of the goods with a comparatively lower share of total consumption, and therefore lower tax to be paid by the poor (tables 11.4 and 11.5).

To analyze alternatives to increases in indirect taxation, one must consider ways of increasing tax revenues other than indirect taxation. As members of WAEMU, countries such as Niger have only limited ability to raise trade-related taxes. Given that indirect taxes, such as the VAT, tend to be less progressive than other taxes, it is important to assess how higher tax revenues could be obtained from direct taxes. As mentioned earlier, direct taxes account today for roughly only 15–16 percent of total tax revenues, a relatively low total. Data from the new, nationally representative 2005 Questionnaire des Indicateurs de Base du Bien-Etre, as well as the 1-2-3 Niamey survey, could be used to simulate the impact of measures to increase revenues from direct taxes. For example, some segments of the informal sector could be “formalized” to raise additional tax revenues without having a potentially large negative impact on the poor.

Beyond the simple analytic tools presented in this chapter, more powerful tools are available to analyze the potential effect of tax reforms on



poverty. One possibility is to rely on so-called balanced budget tax reform techniques by which tax rates are raised on goods consumed more by the better-off population, while rates are lowered on goods typically consumed more by the poor population. Beyond the simple distributional analysis presented here, it is also feasible to conduct general equilibrium analysis of the impact of tax reforms when a social accounting matrix and computable general equilibrium model are available. (Such tools are under construction for Niger.) Finally, apart from assessing the impact of tax reforms on poverty, it also is essential to look at how additional tax revenues are used in providing services that benefit the poor in the social sectors and/or in implementing poverty reduction programs anchored in the poverty reduction strategy, as illustrated with the preliminary analysis presented in the next section.

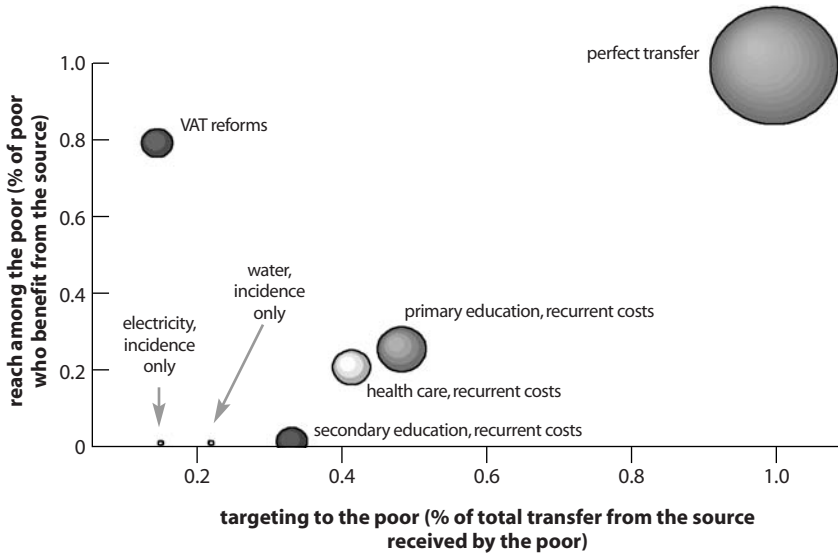
Comparison of the Incidence of Taxation to the Incidence of Social Spending

A necessary but not sufficient condition for tax reforms to benefit the poor is that the proceeds from the reform be allocated to the poverty reduction expenditures. Consider the case of the VAT reform mentioned above. To assess whether such a reform would likely be pro-poor, one must make assumptions in terms of how the new tax revenues will be spent. If the new revenues are spent for the implementation of the Poverty Reduction Strategy Paper (PRSP)—that is, if they benefit the social sectors and/or rural development—the reforms could be pro-poor. In other words, to analyze the potential effect of tax reform, it is important to look at the potential benefit incidence of the additional spending implemented with the additional tax revenues. There is a large body of literature on the benefit incidence of various types of subsidies (among others, see Grosh 1994; Subbarao et al. 1997; Coady, Grosh, and Hoddinott 2004; Komives et al. 2005). Here we conduct a very simple indicative analysis of how additional tax revenues could benefit the poor if the revenues were spent in various areas, assuming that any increase in spending would have a benefit incidence similar to that of existing spending in any given area. (As noted by Lanjouw and Ravallion [1999] and Ajwad and Wodon [2007], that assumption might not be the case in practice.)

The analysis is illustrated in figure 11.1 and in table 11.6 (on which most of the data displayed in figure 11.1 are based). Three indicators are



Figure 11.1. Incidence of VAT Reforms Compared with Social Sector Spending



Source: Authors' estimates.

represented in the figure: the share of the poor who benefit from public spending (or pay taxes), on the vertical axis; the share of total spending (or taxation) that benefits the poor, on the horizontal axis; and the size of the benefits (or taxes), which is proportional to the size of the bubble—a larger bubble indicates a larger benefit (tax). Note that although it was straightforward to obtain (partial) benefit incidence estimates for education, water, and electricity from the 2000 Multiple Indicators Cluster Survey (MICS), we had to make some assumptions in the case of health care. There we computed separately the benefit incidence parameters for three categories of care: women receiving professional prenatal care, women receiving professional care at the time of delivery, and children receiving professional care when sick following an episode of cough or diarrhea. Then we simply summed those three sets of data to obtain an overall estimate of the use of health facilities by various population deciles, *assuming that the cost of providing services in various parts of the country is constant*. As will be discussed below, those assumptions certainly exaggerate the share of the benefits of public spending accruing to poor people; and the same is true for education, where the unit costs of providing services in poorer

Table 11.6. Benefit Incidence Analysis for Selected Categories of Public Spending, Niger, 2000
percent

Assets decile	Education			Health care			Utilities		
	Share receiving primary education benefits	Share receiving secondary education benefits	Share of women receiving prenatal care	Share of women receiving professional delivery care	Share of children receiving professional care when sick (cough/diarrhea)	Share receiving health benefits	Share receiving water benefits	Share receiving electricity benefits	
1	1.94	0.16	0.82	0.28	0.18	1.28	0.00	0.00	
2	2.60	0.17	1.06	0.34	0.33	1.73	0.06	0.01	
3	2.41	0.42	1.19	0.47	0.33	2.00	0.12	0.18	
4	3.15	0.13	1.41	0.54	0.17	2.12	0.22	0.07	
5	2.84	0.35	1.47	0.57	0.34	2.38	0.44	0.14	
6	3.02	0.29	2.04	0.86	0.59	3.49	0.55	0.81	
7	3.50	0.35	1.65	0.76	0.52	2.93	0.71	1.17	
8	4.09	0.56	2.06	0.80	0.47	3.32	1.08	1.87	
9	4.39	0.83	2.98	1.23	1.05	5.25	1.20	1.47	
10	5.82	1.13	3.59	2.01	0.89	6.49	1.76	1.97	
Total	33.78	4.40	18.26	7.86	4.87	31.00	6.14	7.70	
Cost (million CFA)	23,417	8,700	—	—	—	14,050	—	—	

Source: Authors' estimates.

Note: — = not available. Benefit incidence is based on the 2000 Multiple Indicators Cluster Survey, with costs based on 2002 estimates of recurrent spending for education and health care using budget data and execution rates.



and rural areas are likely to be well below those of providing services in richer, urban areas, such as Niamey. Still, despite those weaknesses, the analysis does provide at least a first broad snapshot of the share of the benefits (that is, the number of beneficiaries) of social public spending that may accrue to the poor.

Size of Various Benefits and Taxes

For education and health care, the benefits are equated to total recurrent spending (that is, not taking into account capital expenditures that tend to be externally funded) in 2002 in the respective sectors—namely, primary education, secondary education, and health care as a whole. Spending on primary education, at CFAF 23.4 billion, is about three times the size of spending on secondary education (CFAF 8.7 billion). Health care spending is estimated at CFAF 14.05 billion. The proceeds from the VAT reform are estimated here at roughly 0.6 percent of GDP, or about CFAF 9.1 billion.⁶ In comparison to the current spending for education or health care, the increase in taxation from the VAT reform is not small—it could cover two-thirds of the health sector budget or 40 percent of the primary education budget. Note that for access to piped water and electricity we do not provide spending data because no direct connection or consumption subsidies for connected households are paid out of the budget.

Coverage

The vertical axis in figure 11.1 provides data on the share of the poor who benefit from various types of services (or pay indirect taxes). For benefits, the shares are low, at 26.6 percent for primary education, 2.5 percent for secondary education, 21.7 percent for health care, 2.0 percent for electricity, and 2.3 percent for piped water. All these estimates are based on data from the MICS 2000 survey. Given that substantial progress has been made to improve enrollment rates in education since 2000, and given that the coverage of health facilities and access to electricity and (to a lesser extent) piped water has improved since 2000, these estimates of the share of the poor who are likely to benefit from various types of expenditure are probably below the values for 2004. For taxes, we assume that up to 80 percent of the population could be affected, essentially because a large share of households consumes vegetable oils.



Targeting

The horizontal axis in figure 11.1 gives the share of various types of benefits or taxes that accrue to poor people. For simplicity, we assumed that the poor represent 60 percent of the population (that is, the first six deciles in table 11.6). Thus, a share lower than 60 percent would mean that, in proportion to their population size, the poor benefit less from the private transfers than do the nonpoor. If we consider, as we did above, that 80 percent of the population is poor, the qualitative conclusions obtained from figure 11.1 would not be affected because all the bubbles in the figure would shift to the right, with their relative positions on the horizontal axis remaining roughly the same. In all cases, targeting to the poor is below 60 percent, which means that poor people not only pay less than their population share of taxes, but also receive less than their population share of benefits from public spending in the social sectors. From the point of view of assessing the VAT reforms' potential redistributive impact, however, what matters is a comparison of the incidence of taxation to that of public spending in the social sectors, assuming that new tax revenues will be allocated to these sectors (or to other priority sectors of the PRSP, such as rural development). In figure 11.1, the fact that the share of the taxes paid by the poor is lower than the share of the benefits (or rather beneficiaries) in education or health care suggests that the reform *could* be pro-poor, provided that the tax revenues are fully allocated to these sectors. This statement, however, is based on rather strong assumptions to which we will return below. Note also in figure 11.1 that, given data on access to water and electricity, consumption subsidies allocated to these goods might largely benefit those who are better-off; said differently, an appropriate design of subsidies or inverted block tariff structures (as in the case of water) is important in properly targeting poor populations.

Eradicating Poverty

The large bubble in the upper right corner of figure 11.1 represents the size of a perfectly targeted transfer necessary to eradicate poverty (the coverage among the poor would be 100 percent, as would be the targeting among the poor, because the transfer would provide to each poor household exactly what is needed to lift the household to the poverty line). That transfer is estimated at approximately CFAF 148 billion. When looking at the size of the different bubbles, one immediately sees



that even pooling the resources from the various in-kind transfers to households through public support for education and health care, and then providing equivalent transfers in cash to households (assuming perfect targeting), would still supply insufficient resources to eradicate monetary poverty. This is just a reminder of the magnitude of the poverty eradication challenge in Niger; and it points up the fact that public resources and transfers, by themselves, cannot replace long-term growth to improve the population's living standards.

There are, however, many important caveats to be mentioned about the analysis offered above—caveats making it less likely that indirect tax reforms would be pro-poor. The analysis illustrated in figure 11.1 suffers from a number of weaknesses that must be highlighted and for which more work is required before a conclusion can be reached about the impact of reforms.

Upward Bias in the Estimates of Benefit Incidence Analysis

The share of public spending that reaches poor people is certainly lower than indicated in table 11.6 and figure 11.1. First, some of the revenues obtained from higher taxation are likely not to be used for the social sectors. Second, even when revenues are used for the social sectors, only a partial share of the spending is allocated to front-line service delivery that benefits the poor. Third, even when funding for the social sectors reaches villages and urban neighborhoods, the unit cost of providing services in rural areas where most of the poor live is lower than in urban areas. For example, because many schools in rural areas are staffed by contractual teachers whose wages are lower than the wages of other teachers, the share of education spending on a per student basis that benefits the poor will be lower than that spent for the nonpoor, even if the enrollment rates for the poor were equal to those observed for the nonpoor. This type of effect is not captured in our analysis because we are using data on beneficiaries rather than actual benefits or costs (see, for example, Wodon and Ye [2006] concerning the effect on benefit incidence analysis of taking into account differences in unit costs by area). The same is true for health care services, with unit costs lower in health posts than in hospitals. To better assess the share of social public spending actually reaching poor people, we would need to collect more data—for example, through public expenditure tracking surveys.



Need to Compare Tax Instruments Apart from the Incidence of Taxation and Spending

For virtually any tax reform we could conclude that the reform would be pro-poor because the share of the tax revenues paid by the poor would be lower than the share of the benefits from public spending received by the poor. That conclusion, therefore, should not prevent an analysis of alternative ways to raise taxes so as to provide social services because some taxes other than the VAT probably would affect the poor significantly less than the VAT itself would affect them.

Conclusion

In this chapter we have illustrated simple techniques to analyze the potential impact of indirect tax reforms on poor people, with specific attention to Niger. The analysis first provided a review of medium-term targets for generating public revenues in Niger, together with a description of the current structure of tax revenues. Then we relied on household survey data to assess the potential distributional incidence of selected reforms that were under consideration in the country in the first few months of 2005. Finally, the exercise briefly showed how the overall effect of any tax reform depends in part on how new tax revenues are spent.

The lessons presented in this chapter confirm that very-low-income countries, such as Niger, face a difficult dilemma. Although those countries are trying to increase their tax revenues to fund the provision of basic services for their population, they have limited means to do so (apart from increasing taxes on consumption goods simply because these taxes represent a large share of total government revenues). The problem is that a non-negligible share of consumption-related taxes is paid by poor people, and even small changes in the price of goods following an increase in taxation may be very difficult to absorb by a population with very low levels of income and consumption. One way out of this dilemma would be to raise other sources of tax revenues that do not affect the poor as much—but it is not necessarily easy to do so.

Another lesson from our analysis is that, although estimates of tax and benefit incidence can be obtained even when data sources are limited, it is important to be careful in their interpretation. For example, even if the poor are found to pay a lower share of tax revenues than the share of benefits they receive from public spending on education and health care,



there may be important caveats built into the estimates. To give one example, the poor population's share of the benefits from education and health care spending may be overestimated for a range of reasons. Furthermore, although some households may gain from higher taxes and from higher social spending funded by such taxes (say, because they have children going to schools), other households are likely to lose. Additional work and more information on the allocation of tax revenues to spending categories are needed to conduct a more detailed analysis.

Notes

1. There is a substantial and sophisticated literature on the impact of marginal tax reforms on poverty and inequality (for example, see Yitzhaki and Thirsk 1990; Yitzhaki and Slemrod 1991; Lambert 1993; Yitzhaki and Lewis 1996; and Makdissi and Wodon 2002). Although we are aware of this literature, simpler methods are often good enough to provide insights on the incidence of taxes and transfers, and those are the methods we rely on here.
2. Also see Subbarao et al. (1997) and Coady, Grosh, and Hoddinott (2004) for applications of the techniques to a large number of programs.
3. The 1-2-3 survey includes three different types of modules on employment, informal labor, and consumption that are fielded one after the other.
4. Estimates prepared by the National Statistical Institute with more recent 2005 data after this paper was written put the incidence of poverty at slightly below 63 percent nationally.
5. Connection rates outside Niamey were low in 1995, especially among the poor, but connection rates for electricity and water may have changed since 1995.
6. This estimate of 0.6 percent of GDP is based on IMF and government projections; in the analysis presented in the previous section, we obtained a slightly higher value, as the total tax was estimated at 0.9 percent of consumption, which itself accounts for about 80 percent of GDP.

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