FISCAL POLICY, INCOME REDISTRIBUTION AND POVERTY REDUCTION: EVIDENCE FROM TUNISIA

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FISCAL INCIDENCE AND POVERTY REDUCTION: EVIDENCE FROM TUNISIA[1][2]

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ABSTRACT

Applying standard fiscal incidence analysis to the National Survey of Consumption and Household Living Standards for 2010, this paper estimates the impact of Tunisia's tax and transfer system on inequality and poverty and assesses who benefits from public spending on education and health. Our results show that Tunisia fiscal policy reduces inequality and extreme poverty through redistributive public spending. However, the headcount ratio with the national poverty increases implying that a large number of the poor pay more in taxes than what they receive in cash transfers and subsidies. This is due to a relatively high burden of personal income taxes and social security contributions for low-income households.

1. Introduction

By conventional standards, Tunisia is a success story. With a Gini coefficient of 0.397, Tunisia is one of the most equal countries in the Middle East and North Africa region. Since 1990, the country has experienced a sustained rate of growth of GDP between 4 and 5 percent and the incidence of poverty decreased from 32.4 percent in 2000 to 15.5 percent in 2010.[4] Although the decline in poverty has been driven by economic growth, it is also due to increased government transfers and subsidies. Judging by the record on economic growth and poverty reduction, Tunisia should have enjoyed political and social stability. However, discontent was brewing under the surface and, in 2011, Tunisia experienced a revolution that ushered in a profound political transformation that involved the democratization of its institutions and fiscal reform. Is there anything in the pre-2011 fiscal compact that could shed light on explaining the widespread social discontent? While as shown in this paper, fiscal policy in Tunisia reduced inequality and extreme poverty, a substantial portion of the moderately poor and vulnerable paid more in (direct and indirect) taxes than what they received in cash transfers and consumption subsidies from the state. Although one should be very cautious in attributing causality, the high burden of personal income and payroll taxes at relatively low levels of income, may have contributed to the discontent. This paper estimates the impact of Tunisia's safety net system and the taxes used to fund them on inequality and poverty. [5] The paper also assesses who benefits from public spending on education, health and student housing. Using the National Survey of Consumption and Household Living Standards for 2010, the most recent survey data available, we apply standard fiscal incidence analysis as described in Lustig and Higgins (2013) and in chapters one, five, and seven of Lustig (2016a).[6] Because this methodological framework has been applied to other middle-income countries under the Commitment to Equity[7] project, are able to compare the results for Tunisia with those of other countries.[8]

Fiscal incidence analysis just looks at what is paid and what is received without assessing the behavioral responses that taxes and public spending may trigger on individuals or households. This method is often referred to as the "accounting" approach. Put simply, the accounting approach consists of starting from a pre-fiscal income concept—henceforth called market income—and allocating the proper amount of taxes and transfers to each household or individual.[9] The basic incidence analysis used here is point-in-time rather than lifecycle and does not incorporate behavioral or general equilibrium modeling. That is, we do not claim that the pre-

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[4] Measured with the official poverty line of US$ 4.19/day in PPP 2005. Source National Bureau of statistics http://www.ins.tn/

[5] The results are based on the CEQ Master Workbook of Results: Tunisia of September 9, 2015, which is available upon request.

[6] It should be noted that this paper uses primarily Lustig and Higgins (2013). To avoid confusion, this version has been removed from the CEQ Institute's website but is available upon request.

[7] For details about the project visit www.commitmentoequity.org.

[8] See, for example, Bucheli et a. (2014), Cabrera, Lustig and Moran (2015), Higgins and Pereira (2014), Higgins and Lustig (2016), Higgins et al. (2016), Inchauste and Lustig (Forthcoming), Jaramillo (2014), Lustig (2015, 2016b, and 2016c), Lustig and Pessino (2014), Lustig, Pessino, and Scott (2014), Paz-Arauco et al. (2014), and Scott (2014) as well as the CEQ Working Paper series available in www.commitmentoequity.org.

[9] The tax incidence literature includes a long list of studies with empirical estimates of incidence going back more than half a century: Musgrave et al. (1951); Musgrave (1959); Musgrave, Case and Leonard (1974); Pechman and Okner (1974). Similarly, on the expenditure side, there is a long tradition using the traditional approach: Meerman (1979) and Selowsk (1979).

fiscal income obtained from this exercise equals the true counter-factual income in the absence of taxes and transfers. It is a first-order approximation.

As indicated by Younger (2016), the first-order approximation captures the largest share of the compensating variation. Since the ratio of the second-order term to the first-order increases in the size of the price change and the demand elasticity, the first-order approximation is more accurate for smaller price changes and for more inelastic demands. Many of the demand and supply functions in a typical incidence analysis tend to be inelastic at least in the short-run. However, if price changes are non-marginal and/or demand and supply functions are not inelastic, second order effects will be more significant. In the results section below, we provide some evidence that assuming away the second-order effects for the case of Tunisia is not far-fetched.

Despite being a basic incidence analysis that does not incorporate second-round or general equilibrium effects, the analysis is not a mechanically applied accounting exercise. We analyze the incidence of taxes by their (assumed) economic rather than statutory incidence. For instance, we assume that persona income taxes and contributions (both by employee and employer) are borne by labor in the formal sector. Furthermore, the method and resulting studies are among the most comprehensive and comparable tax-benefit incidence analyses available for middle income and low income countries to date.

There exist studies that have looked at the equity implications of specific fiscal interventions in Tunisia. One study, for example, looked at cash transfers and subsidies and found that they reduced poverty from 16.5 percent to 15.5 percent, when poverty was measured with the national poverty line, and that 48.8 percent of the poor were not covered.[10] The same study also found that subsidies were not well targeted: the poor received only 9.2 percent of the subsidies overall and 12 percent of food subsidies in particular. Another study on energy subsidies found that 13 percent were allocated to the poorest quintile while the richest quintile received 29 percent of these subsidies.[11] To the best of our knowledge, however, no studies have analyzed the incidence of fiscal policy from both the spending and revenue sides. The purpose of our paper is to fill this gap.

Our results show that, when taxes and transfers (including the monetized value of education and health services) are taken together, Tunisia's fiscal policy reduces the Gini coefficient from 0.43 to 0.35. Comparisons to other middle-income countries indicate that the redistributive effect is somewhat lower than in Brazil and Chile but higher than in Mexico and much higher than in Indonesia and Peru.[12] When in-kind transfers in public education and health are excluded, the Gini declines by 0.05 points, which means that two thirds of inequality reduction is accounted for by the combined effect of taxes, cash transfers, and subsidies. The redistributive effect of the latter—that is excluding in-kind transfers--is higher than in any of the countries mentioned above and lower only than in South Africa. Thus, fiscal policy is quite redistributive in Tunisia.

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[10] AfDB, CRES (June 2013).
[11] World Bank, (2013).
[12] Lustig (2016b).

The impact of fiscal policy on poverty depends on the poverty line. For the lower poverty lines of US$1.25 and US$2.50 per day (in 2005 PPP), the combined effect of taxes, transfers, and subsidies reduces poverty. However, this is not true when one uses Tunisia's national poverty line (TND5.02 per day, equivalent to US$3.4 in 2005 PPP) or the middle-income international poverty line of US$4 per day (in 2005 PPP). After taking into account all taxes, direct cash transfers, and indirect subsidies and using Tunisia's national poverty line, the rate of poverty increases from 12.3 percent to 13 percent. This increase is primarily due to the high burden of direct taxes and social contributions at relatively low income levels. As mentioned above, the fact that the moderately poor and the population vulnerable to poverty were net payers into the system may be a factor that explains the widespread social discontent that fueled the 2011 revolution.

The paper is structured as follows. In section 1, we briefly describe the Tunisian tax system, social programs, and subsidies. Section 2 presents the methodology, data and key assumptions. clarifications. Section 3 discusses the main results. Section 4, concludes.

2. Taxes, Social Spending, and Subsidies

In what follows, we describe the main characteristics of the tax system as well as the systems of direct transfers, education, health and indirect subsidies.

Table 1. General Government Revenues, 2010

	National Accounts 2010 (% of GDP)	Incidence analysis (% of GDP)
Total General Government Revenue	**24.3**	**10.29**
Tax Revenue	*20.9*	*10.29*
Direct taxes	*8.3*	*4.29*
Corporate income tax	4.01	…
Indirect taxes	*12.6*	*6.1*
VAT	6.1	6.1
Customs taxes	1.0	…
Consumption duties	2.6	…
Others indirect taxes	2.9	…
Non-tax revenue*	3.1	…

Sources: Calculation based on data from the website of the Ministry of Finance: http://www.finances.gov.tn/index.php?option=com_content&view=article&id=121&Itemid=302&lang=fr
(*) Non-tax revenue includes oil and gas revenue and revenue from privatization and participation.

<u>2.1 Taxes</u>

The Tunisian Tax system is composed of two main categories: direct taxes and indirect taxes. Direct taxes include the Personal Income Tax (PIT) and Corporate Tax while indirect taxes include value-added tax (VAT), consumption duties, and other indirect taxes. As reported in Table 1, the ratio of total tax revenue to GDP was about 21 percent in 2010, which is comparable to other middle-income countries.[13] Indirect taxes are the main source of tax revenue (almost two-thirds of total tax revenue) and VAT represents about a third of total tax revenue. Even so, direct taxes represent a high burden on labor in particular if one adds contributions to PIT (Tables 2 and 3).

Personal Income Tax

The PIT is levied on different sources of income such as labor, pensions, interest, and dividends. The tax rates imposed start from 15 percent and rises to 35 percent as indicated in the Table 2. The PIT is paid primarily via source withholding tax on wages, and progressive rates are applied to incomes higher than TND1,000 (US$696) for public employees or higher than TND5,000 (US$3480) for corporations and individuals not employed by the government. Several exemptions apply. Workers earning the minimum wage (or less) and foreign consular employees do not pay income taxes. Interest received from deposits in foreign currency, savings accounts for housing (purchases or improvements), and other special savings accounts, are exempt from income taxes as well. Deductions include premiums on life insurance and deductions for marital status and dependents.

Table 2: Rate of Individual Income Tax

Taxable income brackets (in Tunisian Dinar – TND, annual)	US$	Rate (%)
0 - 1,500	0 - 1,044	0
1,500 - 5,000	1,044 - 3,480	15
5,000 - 10,000	3,480 - 6,960	20
10,000 - 20,000	6,960 - 13,920	25
20,000 - 50,000	13,920 - 34,800	30
More than 50,000	More than 34,800	35

Source: website of the Ministry of Finance
http://www.finances.gov.tn/index.php?option=com_content&view=article&id=75&Itemid=258&lang=fr

Social Security Contributions

The Tunisian social security system is based only on a contributory system and is administrated completely by the government. Compulsory social security covers benefits relating to pensions, family benefits, coverage of risk such as illness, accidents at work, and occupational diseases. All benefits were provided either by National Social Security Fund (Caisse Nationale de Sécurité Sociale, CNSS) or the National Pension and Social Security Fund (Caisse Nationale de Retraite et de Prévoyance Sociale, CNRPS); CNSS covers workers from the private sector whereas the

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[13] See Lustig (2016c).

CNRPS covers all employees of the State and local public authorities and public institutions. Social security contributions vary on whether or not the worker belongs to an agricultural activity or non-agricultural activity. Self-employed workers are required to join the National Social Security Fund. They may voluntarily insure against risks of accidents at work and illnesses[14]. Either under CNSS or CNRPS, the main benefit for contributors is a retirement pension. The pension is based on wages, subject to contributions that the insured has collected over the last 10 years before the age of retirement. The description of social security contributions is summarized on Table 3.

Table 3: Social Security Contributions by Regime

NON AGRICULTURE REGIME	Employer contribution (%)	Employee contribution (%)	Total (%)
Pension	7.76	4.73	12.50
Sickness, Maternity	4.61	2.90	7.60
Family Allowances	2.21	0.88	3.10
Accidents / Occupational Diseases	0.40 – 4.0	-	0.40 – 4.0
Welfare workers - Special State Fund	1.51	0.38	1.90
TOTAL	16.97 – 20.57	9.18	26.15-29.75
AGRICULTURE REGIME	Employee Contribution (%)	Employee Contribution (%)	Total (%)
Pension	3.50	1.75	5.25
Sickness, Maternity	4.18	2.80	6.98
Accidents / Occupational Diseases	0.04	0.01	0.05
TOTAL	7.72	4.56	12.28
INDEPENDENT REGIME	Employee Contribution (%)		
Pension	7.00		
Sickness, Maternity	7.26		
Accidents / Occupational Diseases	0.45		
TOTAL	14.71		

Source: Centre des Recherches et des études Sociales (CRES 2012).

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[14] The contribution rate is not the same across all regimes and they do not pay for all the same social protection: for example, non-agricultural employees do not receive family allowances. Agricultural workers, independent operators, and self-employed workers in agriculture benefit from different rates.

Corporate Taxes

Corporate income tax is imposed to companies established in Tunisia. The tax rate amounts to 30 percent of profits except for small businesses and agriculture (10 percent) and firms dealing financial, telecommunications, insurance, oil production, refining, transport, and distribution sectors (35 percent). It is worth noting that 97 percent of companies are micro enterprises having between (0-5) employees. Most of these enterprises do not pay taxes and part of the informal sector which highlights the problem of tax evasion.

Indirect Taxes

Indirect taxes are collected mainly through the VAT, which represents almost 50 percent of Total indirect tax revenues. Other taxes include: customs taxes (7.3 percent), and consumption taxes, including excise taxes (20.3 percent). VAT is collected using the credit invoice method and the rates amount to either 6, 12 or 18 percent[15]. Exports are zero rated. There are a number of exempt goods, the most important ones being: primary foods, nurseries, education (primary, secondary, tertiary, vocational), equipment destined to the agriculture sector, air transport, and interest from banks. Consumption taxes are also applied to alcoholic beverages, wine and tobacco, personal vehicles and fuels. Rates are applied as ad valorem rates or as specific taxes, in particular for alcoholic beverages and tobacco.

Other indirect taxes also include customs taxes and registration fees, which are applied to the sale of property (rates range from 2 to 5 percent of the value), professional training tax (1 percent of gross payroll for manufacturing industries), and tax on insurance contracts (5 percent for contracts in maritime and air transport and 10 percent for others).

Data on indirect taxes in Table 1 was obtained from the DGELF[16] of the Ministry of Finance.

2.2 Social Spending

Social spending excluding contributory pensions accounts for 10 percent of GDP. This amount includes direct cash transfers and in-kind spending on education and health. Contributory pensions amount to 8.7 percent of GDP; thus, if contributory pensions are included, total social spending equals 18.7 percent of GDP. Direct transfers include the cash transfer program PNAFN (Programme National des Familles Nécessiteuses; in English, National Assistance Program for Families in Need) and scholarship assistance given to students. These two programs amounted to 0.3 percent of GDP in 2010. Other cash transfers represent a combined 0.5 percent of GDP and include grants distributed to local communities, youth activities, and NGOs and special treasury funds. In-kind transfers are benefits received from universal free public education and health systems. The main programs are described below. Their respective budget is presented in Table 4. Compared to other countries with similar income per capita, Tunisia spends slight less than predicted on direct transfers, above on education (as a share of GDP), and well below on health (as a share of GDP).

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[15] for fertilizer, handicrafts, medical activities, canned food, and compound feed for cattle; 12 percent for computers, computer services, hospitality, food, equipment not produced locally, and four horsepower cars; and 18 percent as the general rate applicable to products and services not subject to another rate.

[16] La Direction Générale des Etudes et de la Législation Fiscales.

Table 4: Tunisia; General Government Expenditure, 2010

	2010 (% of GDP)	Incidence analysis (% of GDP)
Total General Government Expenditure	**29**	
Primary government spending	**23**	
Social spending	*18.7*	*17.7*
Total Cash Transfers	1.30	0.30
PNAFN	0.15	0.15
Scholarships	0.15	0.15
Other cash transfers	0.5	---
Subsidies	2.4	2.4
In-kind Transfers	6.2	6.2
Education	4.6	4.6
Health	1.6	1.6
Housing and Urban	0.03	0.03
Contributory Pensions	8.7	8.7

Source: Ministry of Finance, Public Finance Report (2011).

Direct Transfers

Created in 1986, the PNAFN is the main cash transfer program for low income households. This national program was designed to cover the whole country in order to mitigate the adverse effects of the IMF-led structural adjustment program, in particular in areas with a high number of poor families. In 2010, this program covered 520,337 beneficiaries (i.e. 135,000 households) for a total of about TND100 million, compared to 1986 when it covered 250,000 beneficiaries (74,000 households).[17] The monthly amount paid to the beneficiary was around TND70 (US$48,8) per Household in 2010. As a share of GDP, the program is rather small 0.15 percent (Table 4). Household eligibility for PNAFN is based on surveys conducted by the Ministry of Social Affairs. Eligibility criteria include: income below the poverty threshold, inability to work, absence of head of household, lack of family support, or the presence of disabled and/or chronically ill family members. Although no formal evaluation of the program prior to the 2011 revolution existed, it has since been acknowledged that the program suffered from weaknesses in the identification of eligible families and from being influenced by subjective criteria.

Direct social assistance also includes a scholarship program for students in tertiary education. According to a report from the Ministry of Higher Education, in 2010 the number of beneficiaries was 98,533 and the total amount of grants was equivalent to TND56 million (US$38.9 million) per year, or 0.15 percent of GDP (Table 4).[18] The head of household's total income cannot exceed the official minimum wage for a student to be eligible to receive the scholarship.

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[17] Total spending for PNAFN came from CRES (Research Center for Social Studies).
[18] Total spending for scholarships was obtained from the Ministry of Higher Education.

Other cash transfers are about 0.5 percent of GDP and include grants distributed to local communities, NGOs, nurseries and cultural activities in the local areas.

Education

At all levels of education there are two systems: a public education system and a private education system. Tunisia's public education system includes basic, secondary, and tertiary education. Mandatory basic education is composed of two cycles: 6 years of primary school and 3 years of lower secondary school or preparatory cycle. Secondary school is 4 years. Public primary and secondary education is practically free (beneficiaries pay the equivalent of only US$3 per year). Tertiary education is also considered free as students pay about US$25 per year for undergraduate education and US$50 for graduate education. Primary and secondary education spending amounts to 4.6 percent of GDP in 2010 (Table 4); of which, tertiary education accounts for 1.7 percent.

Since 2002, primary school gross enrollment has been almost universal, averaging 100 percent for both sexes. The net enrollment rate for individuals aged 6-16 years has increased by 3.3 percentage points, reaching 93.4 percent. Access to basic and secondary education mainly benefited girls, who since 2005, now make up the majority of enrolment. In terms of net enrollment of youth between 12-18 years, girls represented 84.5 percent compared to 75.8 percent for boys. The enrollment rate in tertiary education for individuals between 20 and 24 years has increased from 25 percent to 37 percent between 2000 and 2010.

Health

Healthcare in Tunisia is provided through a contributory national health insurance program for the non-poor and a free or subsidized system for low-income individuals and households. The latter has two programs. The Free Health Care (AMG1) program targets poor families and provides a five-year assistance program. The second program is the Subsidized Health Care (AMG2) program, which grants "health care discount cards" to families based on income and family size[19]. Beneficiaries receive a lump sum payment based on the costs of the service. The healthcare discount card is also issued for a period of five years and needs to be revalidated every year at a cost of TD 10 (US$7).

In 2010, the contributory system had 2,202,447 affiliates and the free and subsidized systems had 197,411 and 448,810, respectively. Public expenditure on contributory and noncontributory healthcare systems was equivalent to 1.66 percent of the GDP in 2010.

2.3 Indirect Subsidies

The subsidy system in Tunisia has long been directed at basic consumption products, energy, and transport. These subsidies were equal to 2.4 percent of GDP in 2010.[20] In 2010, however, the

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[19] For two-member households, annual family income cannot exceed an amount equal to the guaranteed minimum wage (SMIC). Annual income cannot exceed 1.5 times the minimum wage for families with 3 to 5 members, and cannot exceed twice the minimum wage for families with more than 5 members.

[20] In 1988, subsidies equaled 8.5 percent of GDP and almost half of the subsidy costs were for wheat. Since the Tunisian revolution in 2011, subsidies have risen again to reach 6.9 percent of GDP in 2013 (World Bank, 2013). Existing studies by the African Development Bank (2013) and World Bank (2013) point to the need to reform the

composition of subsidies was 1.2 percent for food, 1 percent for energy consumption, and 0.3 percent for transport.[21] Data on subsidies for primary products and energy in Table 1 was obtained from the DGELF[22] of the Ministry of Finance.

The composition of products in the subsidized basket witnessed many changes between 1990 and 2010. Although subsidies on primary products and transport were established in the 1990s, the energy subsidy was introduced for the first time in 2003. The subsidy was introduced following increases in energy prices in the international market in order to promote the competitiveness of the private sector and support the purchasing power of the middle class.

3. Methodology, Data, and Main Assumptions

This study uses the methodology of the Commitment to Equity project (CEQ) as presented in Lustig and Higgins (2013) and Lustig (2016a). [23] Essentially, the method consists of taking a household income and/or expenditure survey and allocating taxes and transfers to derive four income concepts at the household level: market (or pre-fiscal) income, disposable income, consumable income, and final income. Disposable income equals market income minus personal income taxes and social security contributions plus cash transfers. Consumable income equals disposable income minus indirect taxes plus indirect subsidies. Final income equals consumable income plus the imputed value of government spending on education and health and housing. Contributory pensions can be considered deferred income or pure government transfers. We carried out our exercise for both scenarios. Here we present the results for the case in which contributory pensions are considered deferred income and were included as part of market income. The scenario in which they are treated as a pure transfer is available upon request.[24]

Once the income concepts have been generated, we calculate the Gini coefficients and poverty indicators such as the headcount ratio to assess how taxes and transfers impact inequality and poverty. Poverty is estimated with the national poverty line as well as the international lines of $1.25, $2.50, and $4 in 2005 ppp dollars per day. A detailed description of the general method and indicators can be found in chapters 1, 5, and 7 of Lustig (2016a).

Note that empirically, one often needs to start from a concept different than market income because household surveys report incomes after taxes, for example, or because household surveys do not collect income data.[25] This was the case in the study for Tunisia. Since the household survey is consumption-based, we assumed that consumption equals disposable income[26] and market income was generated "backwards," applying a "net to gross" conversion.[27]

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subsidy system because subsidies are relatively regressive. However, these subsidies play a key role in maintaining purchasing power for vulnerable groups who spend almost all their total revenue on food consumption.

[21] World Bank, 2013.

[22] La Direction Générale des Etudes et de la Législation Fiscales.

[23] As indicated in the Introduction, this paper uses primarily Lustig and Higgins (2013). To avoid confusion, this version has been removed from the CEQ Institute's website but is available upon request.

[24] For details, see Lustig and Higgins (2013) and Lustig (2016a).

[25] Many low and middle income countries collect information on consumption or expenditures only (Ferreira, Lustig, and Teles, 2015).

[26] Of course, this leaves out savings and, thus, this assumption may yield somewhat lower incidence of PIT especially for richer households for whom incomes are likely to be higher than consumption. While having to make this assumption is not ideal, for the time being, there is no conventional method to reproduce the amount of saving (or dissaving) which should correspond to each household based on their consumption and other characteristics. The

In other words, we subtracted direct transfers and added income taxes and payroll taxes (without property taxes) and social contributions (including those paid by the employer) to consumption and, thus, obtained market income.

We used the National Survey of Consumption and Household Living Standards of 2010 from the National Institute of Statistics which includes three components: expenditures, living standards, and food. In our analysis, we included individuals who appear in all three because that allowed us to impute, for example, the benefits derived from cash transfers. The final sample is of national coverage and is statistically representative for large cities, medium-sized cities, and small towns as well as rural areas. This sample has 23,764 individuals and 5,456 households. Although this is about half of the number of households that are included in the expenditures-only component, the sample is still representative of the Tunisian population.[28]

Because our consumption survey did not include estimates for imputed rent for owner's occupied housing, we used an estimation of the latter by INS-ADB-WB (2012).[29] In this paper, the imputed rent was estimated through a log linear regression model including variables controlling for the characteristics of the housing and geographic locations. According to these estimations, the housing rent is evaluated at TND211 (US$147) per month per household in cities, TND129 (US$90) in small and medium-sized towns, and TND119 (US$83) in non-communal cities.

Since the household survey does not necessarily include explicit information on all the taxes and transfers analyzed here, some had to be simulated or imputed. Data on direct taxes includes only income tax and was imputed according to the tax rate that is applicable to each level of income to formal workers (Table 2). Here we assume that formal workers are those who contribute to social security. We assume that formal workers do not evade taxes. Information on which individuals contribute to the social security system is reported in the survey and contributions were imputed according to whether the household head is salaried or non-salaried and works in agriculture or non-agricultural sector (Table 3). In what follows, these simulations are described in greater detail.

The incidence of personal income tax was simulated as follows. We used two different tax rates following Tunisian tax law: a regular regime for salaried workers and a flat regime for independent workers. The total of direct taxes is generated among taxpaying individuals in the survey by applying tax rates on their net income revenues (as estimated from the survey) and then was scaled down so that the proportion of personal income taxes to private consumption by households in the survey matched the same ratio obtained from administrative accounts. We assumed that only individuals who reported being affiliated to the social security system paid personal income and payroll taxes. The rate of tax evasion calculated from the survey (i.e., the percentage of workers who do not pay income tax) was found to be 40 percent which is similar

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saving rate for households in 2010 equaled 11 percent of disposable income in national accounts. Probably most of this saving corresponded to the high income households. If that is the case, and assuming that high income individuals actually paid PIT, our results probably underestimate the extent to which direct taxes reduce inequality.

[27] Working « backwards » is a practice followed in fiscal incidence analysis. See, for example, Immervoll and O'Donoghue (2001).

[28] As it happens with practically every income or expenditure survey, Tunisia's probably features under-reporting of expenditures especially among richer households and truncation (the very rich are not captured by the surveys).

[29] This publication was jointly produced by the National Institute of statistics (INS), the African Development Bank (ADB) and the World Bank (WB).

to estimates on the size of the informal sector according to some studies.[30] In our exercise, the share of tax revenue paid by salaried workers equaled 73 percent which is similar to the 75 percent reported in national accounts[31].

The survey directly reports whether the individual contributes to a social security regime, and which one. The imputed contributions to social security are simulated as a percentage of market income and include contributions to pensions, health, and death benefits. The contributions include both the employee's and the employer's contributions and the rate depends on three factors: whether the worker is in the public sector (Caisse Nationale de retraite et de prévoyance sociale [CNRPS]) or the private sector (Caisse Nationale de sécurité sociale [CNSS]), under the salaried regime or non-salaried regime, and whether the worker is in the agricultural or non-agricultural sector.

The incidence of VAT was simulated by applying the relevant rate to detailed consumption data on consumption products, energy products, transport, and health. The VAT rates vary between 6, 12 and 18 percent plus special rates on imported products.

Direct cash transfers that were included in this study are PNAFN and scholarships because for the others there is not enough information in the survey to estimate their incidence. The survey only reports the number of recipients and not the amount of the transfers. In particular, the third component of the survey, called Quality of Life, reports whether the individual received free healthcare; if affirmative, we know that the household must have received PNAFN. The total number of beneficiaries in the survey is very similar to that in the administrative data, which is reassuring and validates the chosen method.

The amount of per capita benefits from PNAFN was imputed by taking the values from the administrative accounts for each of the programs. However, given that the number of beneficiaries in the survey is smaller than in administrative accounts, we used a probit model to impute likely beneficiaries who did not report receiving the PNAFN so total number of beneficiaries in the survey matches the number in national accounts. The survey also reports information on recipients of the scholarship program for students belonging to low-income families. The amount allocated to each beneficiary equals the total annual amount paid according to administrative records (see previous section) divided by the number of beneficiaries in the survey. The number of beneficiaries in the survey is almost equal to the number reported by the ministry.[32]

The incidence of in-kind education and health was estimated by imputing the average cost of the service to the users of education and health services. This approach has the limitation that it treats benefits uniformly regardless of context: that is, the differences in the quality of education between schools in rich versus poor areas, for example, are assumed away. The survey reports whether the individual attends school (and if so, whether public or private school) and their level

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[30] See the survey by the Solidarity Center and the Tunisian Worker Union. http://www.solidaritycenter.org/wp-content/uploads/2014/11/Tunisia.Informal-Economy-Report.UGTT_.2014.ENGLISH.pdf

[31] This percentage is calculated from national accounts published by the National Institute of Statistics; data is also available in the website of the Ministry of Finance http://www.finances.gov.tn

[32] It was assumed that the benefits for PNAFN and scholarships are accurate in absolute terms so the figures here were not scaled down to match the proportions in surveys and national accounts. For a justification, see Lustig (2016), Chapter 5.

of education. The number of beneficiaries is taken from the household survey The annual cost per capita is the ratio between the annual budget for each educational level and the number of beneficiaries. The average cost includes administrative and capital expenditures divided by the number of beneficiaries. For education, we calculate the average cost of primary and secondary education together, on the one hand, and the average cost of tertiary education, on the other. Regretfully, the budget that is publicly available does not separate primary from secondary education spending. In the second stage, we scale down spending for the different levels of education so the ratio of total spending by level divided by consumption in the survey is the same as the ratio of spending to disposable income in administrative accounts.

Health benefits per person are equal to Ministry of Health's budget on capital and current expenditures in public hospitals and health centers divided by the number of beneficiaries from the survey, we determined the average spending per individual. Following survey categorizations, we divide health expenditures into normal care spending, expenditures related to maternity care, and hospitalization. Hospitalization costs equal five times the average cost of normal or maternity care, taken here as a numeraire. Each category of spending is a multiple of the unit average cost of normal care. The coefficient for each individual is a function of the type of care the patient received, and the number of times this individual received services. The average cost unit is calculated by dividing the Ministry of Health's budget by the total multiplier coefficient of all patients reported in the survey.[33]

Subsidies in this study are calculated based on information reported on food and non-food consumption. They include subsidies on primary consumption products, energy subsidies, and transport subsidies. The amount of subsidies is adjusted downward to match their ratio to disposable income in administrative accounts and the household survey.

4. Results

4.1 The Impact of Fiscal Policy on Inequality

Under the benchmark scenario in which contributory pensions are treated as deferred income, fiscal policy in Tunisia reduces inequality quite significantly: the Gini coefficient for market income declines from 0.43 to a final income Gini of 0.35, a decline of 0.08 Gini points (Table 5). When in-kind transfers in public education and health are excluded, the Gini declines by 0.05 points, which means that two thirds of inequality reduction are accounted for by taxes, cash transfers and subsidies. Compared to other middle-income countries, the redistributive effect of taxes, cash transfers, subsidies and in-kind transfers (from market to final income), is somewhat lower than in Brazil and Chile but higher than in Mexico and much higher than in Indonesia and Peru.[34] However, the redistributive effect of taxes, cash transfers, and subsidies—that is,

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[33] Let's illustrate with an example. Let's assume that the Ministry of Health's budget is $100 and 50 individuals reported using health services. The average benefit is $2 per individual. Let's assume that 25 individuals received hospitalization care once and normal care twice, while the other 25 received only normal care once. Under these assumptions, each individual in the first group of 25 individuals accumulated a multiplier equal to 7= (5+2) while for the remaining 25 the multiplier equals 1. The total multiplier for the 100 individuals equals (25 * 7) + (25 * 1) = 200. The average spending for the first 25 is (100/200) * 7= $3.5 while for the second group of 25 equals (100/200) * 1 = $0.50. The weighted average of the two values is $2, which is exactly right.

[34] Lustig, Nora (2016b).

excluding in-kind transfers-- is higher than any of the countries mentioned above and lower only than in South Africa. Thus, fiscal policy is quite redistributive in Tunisia.

Table 5. Tunisia: Inequality and Poverty Indicators for each Income Concept

	Market income	Disposable income	Consumable income	Final income
Inequality indicators				
Gini coefficient	0.43	0.39	0.38	0.35
Theil index	0.33	0.28	0.25	0.21
90/10	7.78	6.34	5.64	4.74
Headcount poverty indicators (%)				
National poverty line[35]	12.90	13.14	13.00	–
US$1.25 per day at 2005 PPP	0.52	0.34	0.24	–
US$2.50 PPP per day at 2005 PPP	5.03	4.60	3.76	–
US$4.0 PPP per day at 2005 PPP	14.27	14.89	15.00	–

Source: own estimates based on the National Survey of Consumption and Household Living Standards of 2010. CEQ Master Workbook of Results: Tunisia, September 9, 2015 (available upon request).

The redistributive effect generates a low rate of horizontal inequality in the sense of re-ranking. Which means that ranking of individuals before and after fiscal programs is not altered (Bourguignon 2011; Duclos et al. 2003). For example, considering the redistributive effect of market income to consumable income, the extent of horizontal inequity measured by the so-called Atkinson-Plotnick index is 0.0069, or 12 percent of the change in vertical inequality. Compared to other middle income countries, this is a bit higher than in South Africa (7.5 percent) but lower than in Brazil (30 percent) and Indonesia (45 percent).[36]

4.2 The Impact of Fiscal Policy on Poverty

To assess the impact of fiscal policy on poverty, we compared the headcount ratio between market income and consumable income; that is, after taxes, cash transfers, and subsidies. Following conventions, we do not add the monetized value of in-kind transfers in education and health because poverty lines are not generated with these components in mind. The results are in Table 5. The impact of fiscal policy on poverty depends on the poverty line. For the lower poverty lines of US$1.25 and US$2.50 per day (in 2005 PPP), the combined effect of taxes, transfers, and subsidies reduced poverty. However, this is not true using Tunisia's national poverty line (TND5.02 per day, equivalent to US$3.4 in 2005 PPP) or the middle-income international poverty line of US$4 per day (in 2005 PPP).[37]

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[35] TND 5.026 per day equivalent to $3.4 in 2005 PPP.
[36] Brazil: Higgins and Pereira (2014); Indonesia: Afkar, Jellema, and Wai-Pei (Forthcoming); and South Africa: Inchauste et al. (Forthcoming).
[37] While the results are point estimates based on a sample, at this point the methodology did not allow us to make pairwise comparisons attaching statistical significance to the observed differences.

In relation to the national poverty line, the rate of poverty increased from 12.3 percent to 13 percent after taking in account all taxes and direct cash transfers and indirect subsidies. This increase is due particularly to the high burden of direct taxes and social contributions at relatively low income levels as shown in Table 6. For people in the bottom forty percent, direct taxes and social contributions amount to roughly 4 percent of market income, which are not compensated by the direct transfers, except for the poorest decile. In fact, an unusual result for the case of Tunisia is that individuals become net payers to the fiscal system after *direct* taxes and transfers from the *second* decile onwards. Given the large reliance on indirect subsidies as a redistributive instrument, after considering the impact of indirect taxes net of subsidies, net payers (in cash terms) start at higher income levels: the third decile. Nevertheless, in spite of the large amount of subsidies, the headcount ratio for consumable income is still a bit higher than for market income with the national poverty line, due to indirect taxes[38].

Table 6 - Fiscal Incidence by Decile

Deciles	Direct Taxes	Contributions	Direct Taxes and Contributions to SS	Net Market Income	Flagship CCT	Other Direct Transfers (Targeted or Not)	All Direct Transfers	Disposable Income	Indirect Subsidies	Indirect Taxes	Net Indirect Taxes	Consumable Income	In-kind Education	In-kind Health	Housing and Urban	Final Income
1	-0.8%	-0.9%	-1.7%	-1.7%	3.3%	2.9%	6.2%	4.5%	23.6%	-15.3%	8.3%	12.8%	55.6%	18.4%	0.3%	87.2%
2	-1.5%	-2.0%	-3.6%	-3.6%	1.4%	1.6%	3.0%	-0.5%	17.8%	-14.6%	-3.2%	-2.7%	39.7%	6.4%	0.2%	49.0%
3	-1.7%	-2.3%	-4.0%	-4.0%	0.8%	1.1%	2.0%	-2.0%	15.8%	-15.6%	0.2%	-1.8%	25.1%	5.0%	0.0%	28.4%
4	-3.4%	-3.8%	-7.2%	-7.2%	0.6%	1.0%	1.6%	-5.5%	13.8%	-15.1%	-1.3%	-6.8%	20.6%	5.2%	0.1%	19.1%
5	-4.2%	-4.7%	-8.9%	-8.9%	0.5%	0.7%	1.2%	-7.7%	12.0%	-15.4%	-3.4%	-11.1%	16.5%	5.8%	0.1%	11.3%
6	-5.0%	-5.6%	-10.6%	-10.6%	0.4%	0.6%	0.9%	-9.6%	10.6%	-15.1%	-4.5%	-14.1%	15.4%	3.8%	0.0%	5.1%
7	-6.1%	-6.5%	-12.6%	-12.6%	0.3%	0.5%	0.8%	-11.8%	10.1%	-13.6%	-3.5%	-15.4%	13.5%	3.7%	0.1%	1.8%
8	-7.7%	-7.4%	-15.2%	-15.2%	0.2%	0.3%	0.4%	-14.7%	8.7%	-13.8%	-5.1%	-19.8%	10.2%	1.7%	0.0%	-7.9%
9	-9.2%	-7.6%	-16.8%	-16.8%	0.1%	0.1%	0.3%	-16.5%	7.4%	-13.2%	-5.8%	-22.4%	6.8%	2.0%	0.0%	-13.5%
10	-11.8%	-8.4%	-20.2%	-20.2%	0.1%	0.1%	0.2%	-20.0%	5.1%	-11.8%	-6.7%	-26.6%	3.5%	1.0%	0.0%	-22.2%
Total Population	-7.8%	-6.6%	-14.5%	-14.5%	0.3%	0.4%	0.8%	-13.7%	9.0%	-13.5%	-4.4%	-18.1%	11.7%	3.0%	0.0%	-3.4%

Source: own estimates based on the National Survey of Consumption and Household Living Standards of 2010. CEQ Master Workbook of Results: Tunisia, September 9, 2015 (available upon request).

In sum, the poorest decile is the only decile that does relatively well. The poorest decile receives transfers equivalent to that of its market income (104 percent), including in-kind transfers, mainly imputed to education (55 percent) and indirect subsidies (23 percent), and to a lesser extent health (19 percent) and cash transfers (6.1 percent). Moreover, this category is supported by a low burden of direct taxes which stand at 2 percent of its market income, although indirect taxes amount to 15 percent of market income. Overall, the poorest decile's market income is increased by 87 percent.

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[38] Indirect taxes here include excise taxes on alcohol, tobacco, tea, perfume and transport, among others.

4.3 Who Benefits from Direct Transfers and Subsidies and Who Bears the Burden of Taxes

In Table 7 we show the concentration shares of each component of fiscal policy analyzed here. Several results stand out. The share of benefits of PNAFN and Other Direct Transfers received by the poorest 20 percent is 32.5 and 24.7 percent, respectively. In other words, spending on these direct transfers appears to be pro-poor. However, the richest ten percent also benefit from these transfers: they receive 8.2 and 6.6 percent, respectively. Most importantly, indirect subsidies, which account to 2.3 percent of government spending as shown above, are not pro-poor at all. The bottom 20 percent of the population receive 11.7 percent of indirect subsidies, while the richest 10 percent receive 18.3 percent.

Table 7: Tunisia: Concentration Shares of Taxes and Transfers by Decile

		Direct Taxes (%)	Contributions (%)	Flagship CCT (%)	Other Direct Transfers (Targeted or Not) (%)	Indirect Subsidies (%)	Indirect Taxes (%)	Education (%)	Health (%)	Housing and Urban (%)
Deciles	1	0.20	0.30	19.20	13.20	5.20	2.20	9.40	12.20	21.40
	2	0.60	1.00	13.30	12.20	6.50	3.50	11.10	7.00	17.60
	3	0.90	1.50	10.60	11.10	7.60	5.00	9.30	7.30	6.30
	4	2.30	3.10	9.70	12.30	8.30	6.00	9.50	9.50	14.90
	5	3.50	4.70	9.50	10.80	8.70	7.50	9.30	12.90	13.20
	6	5.10	6.60	8.60	10.40	9.30	8.80	10.40	10.20	5.60
	7	7.50	9.40	7.10	11.90	10.70	9.70	11.10	11.80	20.10
	8	12.00	13.80	6.60	7.20	11.80	12.50	10.60	7.10	0.00
	9	19.70	19.20	7.20	4.40	13.70	16.50	9.80	11.50	0.00
	10	48.20	40.40	8.20	6.60	18.30	28.10	9.60	10.40	0.90
Total Population		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: own estimates based on the National Survey of Consumption and Household Living Standards of 2010. CEQ Master Workbook of Results: Tunisia, September 9, 2015 (available upon request).

Spending on education is fairly even across deciles. This result is expected because enrollment rates are becoming almost universal in Tunisia, including among people in poorer categories. Our results show that spending on primary and secondary education is progressive in absolute terms: that is, the per capita benefit decreases with income. Transfers which feature such a characteristic are called "pro-poor." When the per capita transfer decreases with income, the concentration coefficient becomes negative, as shown in Table 8.[39] Spending on tertiary education is progressive in relative terms only: that is, the benefit as a proportion of market income decreases with income. When this occurs, the concentration coefficient is lower than the market income Gini. As shown in Table 8, the concentration coefficient for tertiary education is much lower than the

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[39] See Enami, Lustig, and Aranda (2016).

market income Gini. Spending on tertiary education is, thus, equalizing but not pro-poor. Still, only 0.1 percent of total students enrolled in tertiary came from the bottom decile; for primary and secondary, the proportion is 0.8 percent. Health spending is distributed fairly equally across all deciles. In other words, per capita health benefits are roughly equal across the distribution.

Table 8 – Concentration Coefficients by Specific Category

Program	Concentration Coefficient
Gini Coefficient for Market Income	*0.43*
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Other Scholarships	-0.18
PNAFN	-0.17
Primary & Secondary Education Spending	-0.08
Total Education Spending	-0.01
Health Spending	0.04
Total Health Spending	0.04
Hospitalization	0.07
Subsidy	0.21
Tertiary Education Spending	0.21

Source: own estimates based on the National Survey of Consumption and Household Living Standards of 2010. CEQ Master Workbook of Results: Tunisia, September 9, 2015 (available upon request).

The observed distribution of benefits from direct transfers and subsidies appears to indicate that there is room for improving the situation of the poorest and the vulnerable groups (those with incomes below US$4 and from US$4 to US$10, 2005 PPP per day, respectively) through better targeting. Furthermore, once the burden of taxation is taken into account, the combination of direct and indirect taxes puts a significant burden on the vulnerable (those in the group from US$4 to US$10 a day), who represent 37 percent of the population and are net payers into the fiscal system. On average, this income group pays in direct and indirect taxes about 8 percent of their market income, when only the cash components of fiscal policy are taken into account (i.e., without considering the imputed value of in-kind transfers in education and health). They only become net receivers if one adds the monetized value of in-kind benefits in education and health: final income is 17.3 percent higher than market income for the vulnerable, on average.

4.4 Second-order Effects

To what extent the assumptions that are necessary to ignore second-order effects are valid in the Tunisia? As mentioned in the introduction, the second order effect depends on the magnitude of price changes and the elasticity of the relevant demand and supply functions. The lower the price change and the lower the elasticity, the lower the second order effect.

Available estimates on demand and supply elasticities for Tunisia indicate that they are small. For example, Daldoul et al., (2016) estimated the demand elasticity for public transport at around -

0.4; Dhraief et al., (2013) estimated the demand elasticity for meat at between -0.2 and -0.8 for meat; and, Talbi and Nguyen (2014) estimated the demand elasticity for energy (including residential, industrial, and transport) at around -0.25. Marouani and Othmani (2016) estimated that the labor supply responses to changes in contributions to social insurance pensions is just 0.033, which indicates that changes in tax rates will not have a significant impact on the supply of labor. Alm (2015) analyzed tax reform in a general equilibrium framework and showed that a10 percent reduction in the labor tax rate reduced formal sector output in most scenarios by 3 to 7 percent; that is, the elasticity was quite below one.

In general, then, the assumption of low demand and supply elasticities seems to be broacly supported by empirical estimates of these elasticities. What about price changes? It turns out that the highest potential price variation concerns energy subsidies which range from 35 percent for gasoline (petrol) to 100 percent for electricity and 250 percent for Butane. Removing these subsidies, of course, will not result in "marginal" price changes. However, even in this case the second-round effects might be limited because average spending on energy represents 5.6 percent of total spending (Arrar and Verme, 2013).

Thus, at least in the short run, our exercise is likely to capture changes in the post-tax/subsidy price variation by the first order effect. Even when the expected price change turns out to be large, the effect will be limited because of the small weight of the relevant goods in total spending and/or their relative small elasticity.

5. Conclusion

Using the National Survey of Consumption and Household Living Standards of 2010, this paper estimated the incidence of the general government's taxation and spending in Tunisia. On the tax side, the analysis includes personal income taxes, VAT, and excise taxes on consumption goods and services. This represents 86 percent of total general government revenues. On the expenditure side, we include the cash transfer program PNAFN, scholarships, contributory pensions, subsidies, and spending on education, health and housing for students. These items comprise 43 percent of general government expenditures.

The market income Gini coefficient falls from 0.43 to 0.35 (after taxes and transfers), mainly due to taxes (30 percent of the decrease) and in-kind services (30 percent of the decrease). Most of the equalization is produced by personal income taxes and contributions to social security. Direct taxes are progressive and the VAT is regressive. Cash transfers contribute little to redistribution. Although the cash transfer program PNAFN is strongly progressive and equalizing, their share in the budget remains very limited (only 0.15 percent). Subsidies are equalizing though much less than cash transfers because benefits to the non-poor are higher than their population share (i.e., subsidies are progressive but only in relative terms). Primary and secondary education are strongly redistributive and equalizing while tertiary education is progressive only in relative terms because the poor still have limited access. Health spending is progressive and equalizing for primary healthcare whereas hospitalization services are progressive in relative terms. When all transfers and taxes are taken into account, the ratio of the top decile's average per capita income to the poorest decile's changes from 18 to 6 times.

The impact of fiscal policy on poverty is less appealing. While fiscal policy reduces poverty with the two lower international poverty lines, the headcount ratio for consumable income is higher than the headcount ratio for market income with the national poverty line and the international moderate poverty line of US$4 per day in 2005ppp. Only the bottom two deciles receive more on average in transfers and subsidies than what they pay in (direct and indirect) taxes. The remaining eighty percent are net payers. The main factor behind this result is that even low income households pay relatively high rates of personal income taxes and contributions to social security. In light of the results, to improve the poverty reducing impact of fiscal policy, the budget allocated to the cash transfer program PNAFN should be increased and subsidies should be more   targeted   to   the   poor.

References

Affairs, M.o.S. "Les Programmes Sociaux De Lutte Contre La Pauvreté Et D'amélioration Des Conditions De Vie ", 2011.

Afkar, R., J. Jellema, and M. Wai-Poi. "The Distributional Impact of Fiscal Policy in Indonesia," *The Distributional Impact of Fiscal Policy: Experience from Developing Countries. Washington, DC: Banco Mundial.(próximamente)*, 2016.

Alm, J. "Analyzing and Reforming Tunisia's Tax System," in, 2015.

Araar, A., and P. Verme. "Reforming Subsidies: A Tool-Kit for Policy Simulations," *World Bank Policy Research Working Paper*, 2012.

Arauco, V.P., G.G. Molina, E.Y. Aguilar, and W.J. Pozo. "Explaining Low Redistributive Impact in Bolivia," *Public Finance Review,* **42**, 326-45, 2014.

Bank, N.I.o.S.A.D.B.W. "Measuring Poverty Inequality and Polarization in Tunisia," in, 2012.

Ben Cheikh, N.B.S. "Enquête D'evaluation De La Performance Des Programmes D'assistance Sociale En Tunisie," *Unpublished paper*, 2015.

Bibi, S., and J.-Y. Duclos. "Poverty-Decreasing Indirect Tax Reforms: Evidence from Tunisia," *International Tax and Public Finance,* **14**, 165-90, 2007.

Bibi, S., and J.Y. Duclos. "A Comparison of the Poverty Impact of Transfers, Taxes and Market Income across Five Oecd Countries," *Bulletin of Economic Research,* **62**, 387-406, 2010.

Decomposing Income Inequality in the Arab Region. Economic Research Forum Working Paper Series. 2010.

Bibi, S., and M.K. Nabli. "Income Inequality in the Arab Region: Data and Measurement, Patterns and Trends," *Middle East Development Journal,* **1**, 275-314, 2009.

Bourguignon, F. "Non-Anonymous Growth Incidence Curves, Income Mobility and Social Welfare Dominance," *The Journal of Economic Inequality,* **9**, 605-27, 2011.

Bucheli, M., N. Lustig, M. Rossi, and F. Amábile. "Social Spending, Taxes and Income Redistribution in Uruguay," *Departamento de Economia, Facultad de Ciencias Socilaes Universidad de la Republica, Documentos de Trabajo,* **12**, 12, 2012.

Coady, D. *Poverty and Social Impact Analysis by the Imf: Review of Methodology and Selected Evidence*, International Monetary Fund, 2008.

Daldoul, M., S. Jarboui, and A. Dakhlaoui. "Public Transport Demand: Dynamic Panel Model Analysis," *Transportation,* **43**, 491-505, 2016.

Devarajan, S., L. Mottaghi, F. Iqbal, G. Mundaca, T. Laursen, M. Vagliasindi, S. Commander, and I. Chaal-Dabi. "Corrosive Subsidies," *MENA Economic Monitor*, 2014.

Dhraief, M.Z., M. Oueslati, and B. Dhehibi. "Income, Education and Age Effects on Meat and Fish Demand in Tunisia," *International Journal of Food and Agricultural Economics (IJFAEC),* **1**, 1-12, 2013.

Duclos, J.-Y., and A. Araar. *Poverty and Equity: Measurement, Policy and Estimation with Dad*, Springer Science & Business Media, 2007.

Duclos, J.-Y., V. Jalbert, and A. Araar. "Classical Horizontal Inequity and Reranking: An Integrating Approach," *Research on Economic Inequality,* **10**, 65-100, 2003.

Duclos, J.-Y., and M. Tabi. "The Measurement of Progressivity, with an Application to Canada," *The Canadian Journal of Economics/Revue canadienne d'Economique,* **29**, S165-S70, 1996.

Elgazzar, H.V., Paolo; Lahga, Abdel Rahmen; Marouani, Mohamed Ali; Kojima, Masami; Evans, Brooks Fox; . "Towards Greater Equity : Energy Subsidies, Targeting and Social Protection in Tunisia," in World Bank, 2013.

Enami, A., N. Lustig, and R. Aranda. "Analytic Foundations: Measuring the Redistributive Impact of Taxes and Transfers," in Tulane University, Department of Economics, 2016.

Fabrizio, M.S., M.A. Goumilevski, and M.K.R. Kpodar. *A New Tool for Distributional Incidence Analysis: An Application to Fuel Subsidy Reform*, International Monetary Fund, 2016.

Ferreira, F.H., N. Lustig, and D. Teles. "Appraising Cross-National Income Inequality Databases: An Introduction," *The Journal of Economic Inequality,* **13**, 497-526, 2015.

Finance, M.o. "Annual Report of Public Finance," 2011.

Health, M.o. "Annual Repor," in, 2010,.

Higgins, S., and N. Lustig. "Can a Poverty-Reducing and Progressive Tax and Transfer System Hurt the Poor?," *Journal of Development Economics,* **122**, 63-75, 2016.

Higgins, S., N. Lustig, W. Ruble, and T.M. Smeeding. "Comparing the Incidence of Taxes and Social Spending in Brazil and the United States," *Review of Income and Wealth*, 2015.

Higgins, S., and C. Pereira. "The Effects of Brazil's Taxation and Social Spending on the Distribution of Household Income," *Public Finance Review,* **42**, 346-67, 2014.

IMF. "Article Iv Consultation, Tunisia," in, 2012.

Immervoll, H., and C. O'donoghue. "Imputation of Gross Amounts from Net Incomes in Household Surveys: An Application Using Euromod," in EUROMOD at the Institute for Social and Economic Research, 2001.

Inchauste, G., N. Lustig, M. Maboshe, C. Purfield, and I. Woolard. "The Distributional Impact of Fiscal Policy in South Africa," *Policy Research working paper,* **7194**, 2015.

Jaramillo, M. "The Incidence of Social Spending and Taxes in Peru," *Public Finance Review*, 1091142113496134, 2013.

Jouini, N., and N. Rebei. "The Welfare Implications of Services Liberalization in a Developing Country," *Journal of Development Economics,* **106**, 1-14, 2014.

Kakwani, N.C. "Measurement of Tax Progressivity: An International Comparison," *The Economic Journal,* **87**, 71-80, 1977.

Lambert, P. *The Distribution and Redistribution of Income*, Manchester University Press, 2001.

Lustig, N. "Commitment to Equity Handbook: Estimating the Redistributive Impact of Fiscal Policy," in proceso, 2016.

Lustig, N. *Fiscal Policy, Income Redistribution and Poverty Reduction in Low and Middle Income Countries*, 2016.

Lustig, N. "Inequality and Fiscal Redistribution in Middle Income Countries: Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa," *Journal of Globalization and Development,* **7**, 17-60, 2016.

Lustig, N., and S. Higgins. "Commitment to Equity Assessment (Ceq): Estimating the Incidence of Social Spending, Subsidies, and Taxes-Handbook," *Subsidies, and Taxes-Handbook (September 1, 2013)*, 2013.

Lustig, N., and C. Pessino. "Social Spending and Income Redistribution in Argentina During the 2000s the Increasing Role of Noncontributory Pensions," *Public Finance Review,* **42**, 304-25, 2014.

Meerman, J. *Public Expenditure in Malaysia: Who Benefits and Why*, Oxford University Press, 1979.

Musgrave, R.A., J.J. Carroll, L.D. Cook, and L. Frane. "Distribution of Tax Payments by Income Groups: A Case Study for 1948," *National Tax Journal,* **4**, 1-53, 1951.

Musgrave, R.A., K.E. Case, and H. Leonard. "The Distribution of Fiscal Burdens and Benefits," *Public Finance Review,* **2**, 259-311, 1974.

Othman, M.B., and M.A. Marouani. "Labor Market Effects of Pension Reform: An Overlapping Generations General Equilibrium Model Applied to Tunisia," 2016.

Pechman, J.A., and B.A. Okner. "Who Bears the Tax Burden? Studies of Government Finance Series," 1974.

Razmara, S. "Consumer Food Subsidy Programs in the Mena Region," *World Bank Report.(19561-MNA)*, 1999.

Researc, M.o.H.E.a.S. "Annual Report," in, 2010.

Sdralevich, M.C.A., M.R. Sab, M.Y. Zouhar, and G. Albertin. *Subsidy Reform in the Middle East and North Africa: Recent Progress and Challenges Ahead*, International Monetary Fund, 2014.

Selowsky, M. *Who Benefits from Government Expenditure?*, Published for the World Bank [by] Oxford
    University Press, 1979.

Talbi, B., and D.K. Nguyen. "An Empirical Analysis of Energy Demand in Tunisia," in, 2014.

Tuck, L., and K. Lindert. *From Universal Food Subsidies to a Self-Targeted Program: A Case Study in
    Tunisian Reform*, World Bank Publications, 1996.

Younger, S. *Box 1-1: Ignoring Behavioral Responses to Tax and Expenditure Policies. » in Chapter 1, Nora
    Lustig, Editor, Commitment to Equity Handbook. A Guide to Estimating the Impact of Fiscal Policy
    on Inequality and Poverty*, 2016.