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**Taxation Policy and Gender Employment in the
Middle East and North Africa Region**

A Comparative Analysis of Algeria, Egypt, Morocco, and Tunisia

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ABSTRACT

Empirical evidence suggests that women are more vulnerable to chronic poverty and gender inequality is likely to condition the impacts of policies on the rest of the economy and consequently on poverty itself. While gender-responsive budgeting has made significant headway into economic policy, taxation has lagged behind. Because tax policy is the most economically direct way by which governments can influence individual behavior, requests have been made for gender-responsive tax policy that promote gender equality. This study applied to Algeria, Egypt, Morocco, and Tunisia aims to contribute to this debate by assessing the induced gender employment bias of current taxation policies in these countries. It explores the pattern of male and female employment and discusses the indirect tax distortions across sectors within each country and between countries. The possible impact of the indirect tax distortion on male and female employment is quantitatively assessed using a gender-focused computable general equilibrium model. The analysis reveals that indirect taxes, in particular import duties, are biased for female employment in Algeria and Egypt, but not in Morocco and Tunisia. Female labor-intensive industries in Algeria and Egypt are highly protected in the benchmark and are not competitive internationally so that removing protection would increase competition with cheaper import substitutes and cause the sector to contract and lay off workers. In contrast, the same female labor-intensive industries are less protected in Morocco and Tunisia. Hence, removal of indirect taxes in these countries would result in quasi-neutral effects between male and female salary and wage earnings. The taxation policies in the Middle East and North Africa region have changed over the last decade and may undergo significant changes in the coming years. In light of this unpredictability, an assessment of the tax-related relative price bias on men and women constitutes a crucial step toward providing adequate guidance to planners, policymakers, and other stakeholders.

Keywords: taxation, employment, gender, Middle East and North Africa, general equilibrium modeling

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1. INTRODUCTION

In recent years, developing countries have committed to broadening development goals beyond economic growth by pursuing strategies to achieve the Millennium Development Goals. At the same time, they are engaged in a myriad of strategies, ranging from macropolicy reforms to globalization, whose employment, poverty, and income distributional effects are expected to be crucial. However, there is a growing recognition that government policy reforms have quite different effects on men and women (Çağatay, Elson, and Grown 1995). To the extent that women are more vulnerable to chronic poverty—owing to gender inequalities in the distribution of income, limited access to productive inputs such as credit, and limited labor market exposure—it is necessary that any analysis of macropolicies and shocks on individuals' well-being account for the gender dimension.

Gender-discriminatory practices are less tolerated in competitive economies because they contribute to inefficient use of human resources (Alsop, Bertelsen, and Holland 2006). Empirical evidence suggests that developing countries with less gender discrimination tend to have higher growth and lower poverty rates (Klasen 1999). Thus, it is likely that gender inequality strongly conditions the impacts of macropolicies on the rest of the economy and consequently on poverty itself.

Since the last decade, a number of governments have taken heed of gender awareness by implementing gender-responsive budgets.¹ However, while gender-responsive budgeting has made significant headway into economic policy, the taxation side has lagged behind. Since tax policy is the most economically direct way by which governments can influence individual behavior, calls have emerged recently for gender-responsive tax policy that promotes gender equality.² Alesina, Ichino, and Karabarbounis (2008) argued that gender-based taxation can alter spouses' bargaining power and can induce a more balanced allocation of household work and working opportunities between males and females, thereby resulting in greater income sharing within the family.

Fiscal policy, both government spending and taxation, can affect women's welfare and their prospects for economic empowerment. Sen (1976) confirmed that government spending through social programs improves gender inequality within the household and that cutbacks in these programs generally affect women. For instance, decreasing government social service expenses shifts the economic burden of reproduction from the public toward females, particularly in the area of child- and healthcare provision. On the other hand, taxation affects women's decisions on labor supply, household production, and time use (Barnett and Grown 2006).

Accounting for the gender-dimensional impact of fiscal policy is particularly important in North Africa. The report "Women and Poverty in North Africa" ("Femmes et Pauvreté en Afrique du Nord" 2002) found that women, in comparison with men, participate less in economic activities, suffer from higher unemployment rates, experience more salary discrimination, have lower social security coverage, have less access to property and wealth, have less access to education, and have more limited access to primary services.

This study analyzes in a comparative manner the tax policy-induced gender bias in employment in Algeria, Egypt, Morocco, and Tunisia—herein collectively referred to as the Middle East and North Africa (MENA) region. It explores the patterns of distortions across sectors within each country and between countries and, ultimately, the differing employment effects of fiscal policy on men and women. We place particular emphasis on the possible male and female employment impacts of distortion due to indirect tax and subsidy policies in the four focus countries. Specifically, this paper seeks to find out to what extent government indirect tax and subsidy policies distort female relative to male employment and income incentives.

¹ Australia started to implement gender-responsive public budgeting decisions at all levels of government starting in the 1980s. A number of governments committed to incorporating gender-responsive budgets during the 1995 United Nations World Conference on Women in Beijing.

² Barnett and Grown (2006) stated, "Taxation and expenditure need to be analysed together for a full understanding of the income and gender impacts of government fiscal policy ... as it determines the path and distribution of development."

Taxation is a very sensitive issue because it facilitates sustainability of government operations, especially the provision of public services; creates additional distortions in the economy; and can alter economic behavior, thereby affecting disposable income and the prices of goods and services. Since women are more likely than men to be poor (“Femmes et Pauvreté” 2002), an analysis of the differential impact of tax policy reforms on economic activities, as well as on patterns of employment and distribution of the fiscal burden on men and women, needs to be conducted.

The focus on fiscal policy is particularly interesting for Algeria, Egypt, Morocco, and Tunisia for at least three reasons. First, the taxation policies in these countries have been changing over the past few years, as we will discuss in the next section, and it is likely that further reforms will take place in the coming years. Second, the burden of the tax system is not proportionally distributed across industries. Third, although there has been a growing interest in the effects of public spending on men and women respectively, assessing the gender impact of tax policy is little explored in the MENA region.

Tax policy reform brings about changes in economic structure arising from resource reallocation effects, which in turn affect factor prices, men’s and women’s employment, household income, and consumer prices. In this context, we use a gender-focused computable general equilibrium analysis to measure the impacts of the current tax system/distortion on the relative employment of men and women. We take advantage of a growing literature on the methodology of quantifying the impacts of trade and tax policies on relative price incentives³ and adapt this methodology to simulate a complete removal of indirect (import, product/sales, and production) taxes and their replacement by direct taxes (on households’ income) in each of the four countries—in order to effectively measure the indirect tax policy–induced relative price incentives for male and female employment. By comparing the simulation results with the benchmark, a tax is deemed to be discriminatory against female employment if removing it leads to higher employment for women relative to men. Indeed, this analysis constitutes a necessary step in order to inform planners, policymakers, and other stakeholders.

The rest of the paper is arranged in five sections. Section 2 discusses the trends and structures related to gender-based economic activities and taxation for Algeria, Egypt, Morocco, and Tunisia. Section 3 provides a brief survey of literature on taxation and gender, while Section 4 describes the analytical framework and the inherent structure of each economy based on its social accounting matrix. Section 5 explains the results of our policy simulations, and Section 6 concludes by summarizing the main findings.

³ The technique is applied to analyze effective protection rates in the agricultural sector by Jensen, Robinson, and Tarp 2002; Anderson, Martin, and van der Mensbrugge 2006; and Robinson and Ahmed 2008, among others.

2. TAXATION AND GENDER IN ECONOMIC ACTIVITIES

To put the following analysis into perspective, this section discusses the economic activities and taxation trends of Algeria, Egypt, Morocco, and Tunisia. It highlights important trends and structures by making use of available data from various sources.

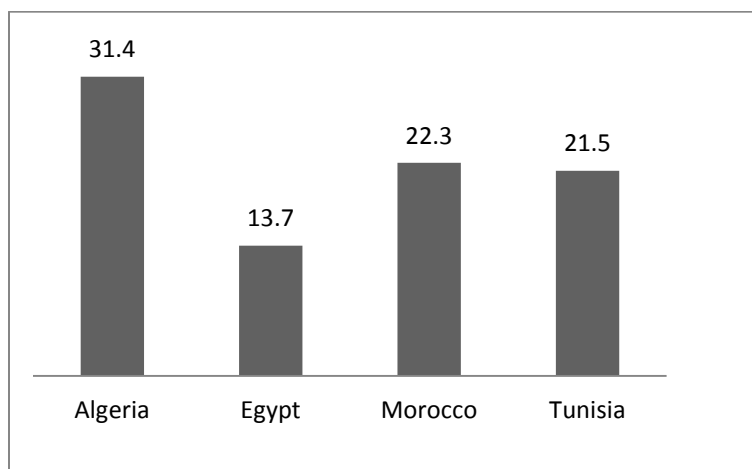
Taxation Systems

Taxation plays a central role in development strategy. One can categorize the functions of taxation into three main purposes: First, raising revenue for governance and the maintenance of government functions; second, redistribution of income and wealth to reduce inequality, for instance high taxes on income profits and capital gains; and third, repricing economic alternatives in order to influence behaviors and to allocate resources for social and economic goals, for example excise taxes on liquor and tobacco, luxury goods import taxes to protect local producers, or taxation influencing the fluctuation of the economy.

Whether it is implemented to raise revenue, to redistribute income and welfare, or to influence economic incentives, taxation distorts the relative prices of goods and services and, ultimately, affects the reallocation of resources within the economy. Therefore, fiscal policy is an effective policy instrument that could increase female employment and exposure to economic activity.

The ratio of taxes to gross domestic product (tax-to-GDP ratio)⁴ is commonly used to analyze tax burden. Among our focus countries, Algeria has the highest tax burden, at 31 percent, while Egypt has the lowest, at 14 percent.⁵ The tax burdens in Tunisia and Morocco stand between these two values, at around 20 percent (Figure 2.1).

Figure 2.1—Tax burden, 2002



Source: World Bank (2009).

Note: Tax burden is expressed as the ratio (percent) of taxes to gross domestic product.

To simplify the analysis at this point, we classify the wide range of tax instruments into four categories: (1) taxes on income, profits, and capital gains levied on individuals' and firms' income; (2) taxes on goods and services, including general sales and value-added taxes, the selective excise tax on goods and services, taxes on the use of goods or property, taxes on extraction and production of minerals, and profits of fiscal monopolies; (3) taxes on international trade, such as import duties, export duties,

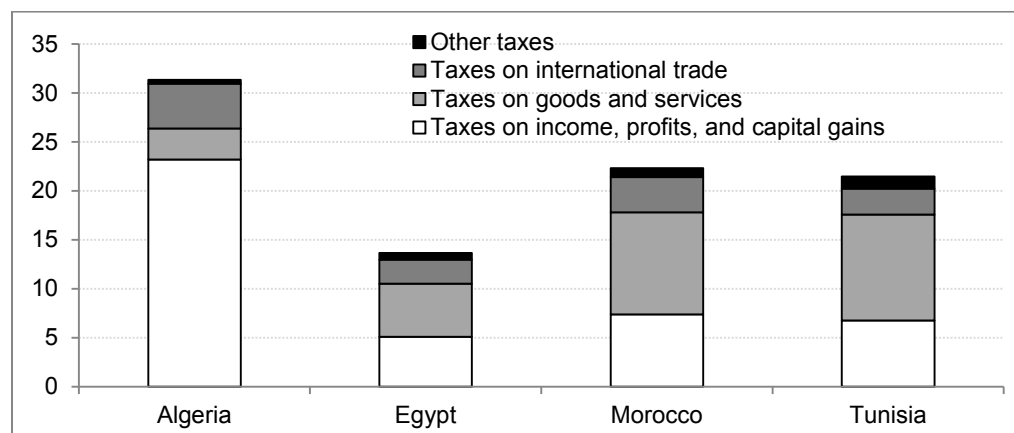
⁴ The total amount of taxes and social security contributions as a percentage of GDP.

⁵ In 2005, the tax-to-GDP ratios for the United States and for the 27-member European Union were 27 and 40 percent, respectively (Eurostat 2007).

profits of export or import monopolies, exchange rate profits, and exchange rate taxes; and (4) other taxes, including employer payroll or labor taxes, taxes on property, and taxes not allocable to other categories, such as penalties for late payment or nonpayment of taxes.

Figure 2.2 depicts the contribution of each tax category to the overall tax burden in the four focus countries. It shows that Algeria relies primarily on direct taxes (taxes on income, profits, and capital), Morocco and Tunisia depend primarily on indirect taxes and to a limited extent on the direct tax, whereas Egypt relies equally on indirect and direct taxes. Owing to global trade liberalization, the contribution of tax on international trade is not as significant as that of direct and indirect taxes.

Figure 2.2—Contribution to the tax burden, 2002



Source: World Bank (2009).

Note: Total tax burden is expressed as the ratio (percent) of taxes to gross domestic product.

The tax-to-GDP ratio has been decreasing for Egypt from nearly 20 percent in 1992 to less than 15 percent in 2002, while it has stabilized at between 20 and 25 percent in Tunisia and Morocco.⁶ In contrast, the tax-to-GDP ratio in Algeria has been less smooth, showing successive periods of significant ups and downs, with the lowest value, of 20 percent, recorded in 1998 and the highest, 37 percent, in 2000. These movements reflect in large part movements in international oil prices, which are an important source of government revenue in Algeria, as we will see below.

Direct taxes⁷ in Algeria increased during the last decade, from 17 percent in 1994 to 30 percent in 2000, before settling down to less than 25 percent in 2002. The burden of tax on international trade has dropped marginally over time, while taxes on goods and services have been stable at less than 5 percent. Egypt has a more diversified tax system than Algeria's. The direct tax-to-GDP ratio in Egypt fell during the period 1992–2002, following an important increase at the beginning of the 1990s. The tax burden has shifted to taxes on goods and services, which increased over the same period, particularly during the periods 1991–92 and 1998–99. The burden of tax on international trade and other taxes also decreased during the period.

In Morocco, the ratio of direct taxes to GDP showed a relative increase between 2002 and 2005, while other taxes stagnated. However, compared with Algeria's data, this increase was moderate during the short period for which the data are available. In Tunisia, both direct income taxes and taxes on goods and services increased during 1990–2005. The burden of taxes on international trade declined to 4 percent in 1996 and has been falling ever since, finally reaching 2 percent in 2005. The falling burden of taxes on

⁶ Year-by-year statistics from World Bank (2009).

⁷ In this paper, direct taxes include taxes on income, profits, and capital gains, while taxes on goods and services, as well as import tariffs, are classified as indirect taxes.

international trade shifted to taxes on goods and services in the second half of the 1990s and to direct taxes after 2000.

In Algeria, Morocco, and Tunisia, direct taxes—taxes on incomes, profits, capital gains, and so on—have been increasing over the last few years to compensate for forgone revenues from international trade. On the other hand, both taxes on goods and services and production taxes partially substituted for taxes on international trade in Egypt and Tunisia. This tax category is relatively important in Tunisia and Morocco, where it represents more than 10 percent of GDP. The burden of taxes on goods and services is between 5 and 6 percent in Egypt and below 5 percent in Algeria.

Table 2.1 presents the average specific tax rates for each country. In general, indirect tax rates are higher in industry than in agriculture and services. Agriculture (except in Algeria) and services (except in Egypt) have the lowest specific tax rates. However, this does not necessarily mean that those two sectors are less taxed than the industrial sector. The widespread informality in these sectors contributes to narrow tax bases and consequently to the appearance of a low specific tax rate even though the nominal tax rate is higher.

Table 2.1—Specific tax rates by category of product

Sector	Algeria	Egypt	Morocco	Tunisia
Agriculture	9.6	0.1	2.0	2.0
Industry	13.1	2.7	6.9	10.8
- Mining	15.0	1.4	4.2	22.4
- Light manufacturing	10.9	1.8	7.4	9.1
- Heavy manufacturing	12.5	4.4	6.5	9.7
Services	4.7	4.7	3.4	2.0
All	10.3	3.2	5.1	7.2

Sources: Algerian social accounting matrix (SAM) 2002 (Bouazoune 2008); Egyptian SAM 2006/07 (Egypt, Office for National Statistics 2008); Moroccan SAM 2003 (Abdelkhalek 2007), Tunisian SAM 1998 (Chatti 2002).

Industry is the most heavily taxed sector, except in Egypt, where services bear the highest burden (Table 2.1). We also analyzed the tax-to-consumption ratio within the industrial sector, which confirmed that mining is the most taxed industrial sector in Algeria and Tunisia, heavy manufacturing has the highest industrial tax burden in Egypt, and light manufacturing is heavily taxed in Morocco. The distribution of the tax burden among industries within each country is presented in Table A.1 in Appendix. Public and social services, agriculture, and trade services are the less taxed industries.

Gender in Economic Activities

Women's participation in economic activity is interesting for the simple but strong reason that it contributes to the alleviation of both overall and female poverty. Hoddinott and Haddad (1994) suggested that increased women's participation results in an increase in contribution to family income, thereby positively affecting women's intrahousehold bargaining power.

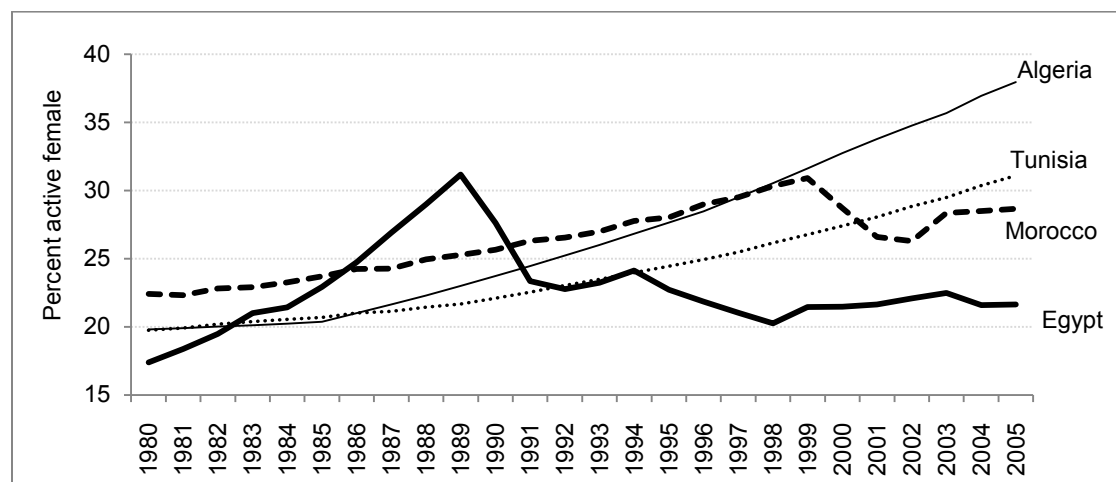
The analysis of the gender division of labor is crucial in understanding the effects of economic and fiscal policies on men and women, and their respective prospects for economic empowerment. This section describes the inherent characteristics of gender participation in economic activity in the four countries. Although we do not discuss trends in gender wage gap among the four case study countries due to lack of data, we do discuss the trends in male and female economic activities over the past decades, including their distribution across industries. This information is crucial in order to understand the tax-related relative price bias on women and men, and how it may contribute to eliminating the gender gap in the labor market and to reducing poverty among women.

In general, men and women perform different activities. Men's activities are more market oriented, whereas women are more exposed to domestic work. Similarly, there is a gender division in the labor market, with women tending to perform different and fewer jobs than men. In the Middle East and

North Africa region, women represented only 27 percent of the total labor force in 2004—the lowest female labor force participation rate in the world.⁸ Kabeer (2003) contended that this constraint is related to existing social norms in the region.

Figure 2.3 shows that women’s participation in market activities varied considerably among the four countries but nonetheless increased between 1980 and 2005. The increase was particularly significant for Algeria and only a little lesser so for Tunisia and Morocco, although the latter shows a declining trend since 1999. On the other hand, Egypt started a declining trend beginning in the early 1990s after reaching a peak of 31 percent in 1988.

Figure 2.3—Female labor force participation rate



Source: World Bank (2009).

Note: Female labor force participation rate is expressed as the ratio (percent) of female engaged in market activities to female population ages 15-64.

Women tend to be more concentrated in agriculture and services, while men are somewhat distributed in all sectors, particularly services. A closer look at these factors, given in Table 2.2, confirms that the distribution of male and female employment varies substantially among the four countries. In Morocco, agriculture accounts for 57 percent of female wage employment, while in Algeria, it is the service sector that accommodates female employment the most, at 63 percent.

Table 2.2—Distribution of female wage employment in 2003

	Female (%)				Male (%)			
	Agriculture	Industry	Services	All	Agriculture	Industry	Services	All
Algeria	11.0	25.2	63.8	100.0	22.8	23.8	53.4	100.0
Egypt	39.0	6.2	54.8	100.0	27.7	22.9	49.4	100.0
Morocco	56.8	18.6	24.6	100.0	39.2	20.7	40.1	100.0
Tunisia*	15.4	36.3	48.3	100.0	16.4	33.1	50.4	100.0

Sources: World Bank (2009). Tunisia: The National Observatory for Employment and Skills (2007).

Note: * Data for 2004.

⁸ Gender statistics 1980–2004 are from World Bank (2009).

Furthermore, the ratio of female to male employment varies across industries within the same country. For the economies as a whole, this ratio varies from 15 percent in Egypt in 2006—confirming low women’s participation in economic activities (Figure 2.3)—to 30 percent in Morocco in 2006 and 32 percent in Tunisia in 2004. Although Algeria recorded a substantial increase in female participation (Figure 2.3), women were far less intensive relative to men in market activities, at 18 percent in 2002.

In general, female-intensive industries are textiles, agriculture (except in Algeria), food manufacturing, miscellaneous light manufacturing, and social services. Men are more intensive in building and construction, electricity and water, mining and quarrying, miscellaneous and heavy manufacturing, trade and repairs, and transport and communication (except in Egypt for transport and communication).

3. IMPACTS OF TAXATION POLICY ON MEN AND WOMEN: A REVIEW

This section discusses the differential impact of taxation policy on men and women. There is no doubt that the taxation policies in the four countries have been changing, often quite substantially, as in Tunisia and in Egypt. Fiscal policy reform is likely to continue over the coming years in these countries and will differentially impact male and female workers. The scope of these effects and their consequences on the economies and on poverty reduction still need to be quantified. As a result, the analysis of the tax-related relative price bias on male and female employment constitutes a necessary step toward providing adequate guidance to policymakers.

Incorporating gender perspectives into macroeconomic models has gained considerable attention since the 1980s. This line of research seeks to understand how economic policies affect men and women differently and how gender differences in economic behavior may affect macroeconomic outcomes. Essentially, the gender perspectives on economic policies emerged from efforts to underscore the differential impacts on men and women of macroeconomic stabilization policies and structural adjustment programs prescribed by donor agencies to many developing countries during the 1980s. Gender perspectives on economic behavior resulted from efforts to demonstrate the relevance of gender as part of the formal macroeconomic spectrum (Çağatay, Elson, and Grown 1995).

Barnett and Grown (2006) emphasized that establishing the link between gender and macroeconomic policy requires the incorporation of four important factors: (1) the reproductive or unpaid-care economy; (2) gender differences in paid formal or informal employment wages and occupational segregation; (3) gender differences in decisionmaking, that is, consumption, savings and investments, and risk taking; and (4) gender differences in property rights.

The absence of these stylized facts corroborated *ex post* criticisms that macroeconomic models used to analyze structural adjustment programs during the 1980s were gender blind (Elson 1995). For instance, by not modeling the reproductive economy, they failed to predict the shift in the economic burden of reproduction from the public toward females, particularly in the area of healthcare provision. Moreover, by not accounting for the gender differences in behavior and labor market structure, those models underestimated the economic cost of restructuring (Çağatay 2003), especially the intensification of women's unpaid work and labor force participation.

In a recent review of the literature, Stotsky (2006) validated that accounting for gender differences in behavior may actually lead to different predictions of macroeconomic outcomes, governance structure, and composition of public expenditures and taxation. Among macroeconomic variables, Stotsky (2006) highlighted differences between men and women in consumption, savings, and investment (risk taking) due to women's tendencies to prioritize expenditures that benefit the entire household, to prefer productive savings, and to be more averse to risk. Thus, policies that favor the shift of resources toward women's control tend to reinforce growth and reduce volatility. Finally, Stotsky (2006) found a simultaneous relationship between economic growth and gender inequality, confirming the importance of a gender perspective in assessing growth as well as changes in labor and product markets.

Taxation affects a myriad of social and economic decisions. From a public finance point of view, taxation serves both the financing and the steering function. The former ensures the viability of government operations, whereas the latter is an instrument to influence behavior. Indeed, taxation has the effect of altering disposable income and the relative prices of goods and services, thereby affecting household decisions on work, savings, consumption, time allocation—labor, leisure, home production—and investment (Pleuffer and Weibert 2005).

Taxation is an important subject from the perspective of both development policy and gender, since men and women have different economic behavior and thus are likely to be impacted differently by government taxation. Tax systems treat women and men differently in ways that can negatively affect their decisions on whether and how much to work (Stotsky 1996). Gender bias in tax systems can be classified as explicit or implicit. Explicit bias includes specific provisions of the law that are directly

linked to the sex of the taxpayer, whereas implicit bias pertains to differential economic impact of tax provisions on men and women, owing to typical social arrangements or economic behavior. Between the two, implicit biases are more difficult to identify because they are mostly based on value judgments that vary from society to society (Stotsky 1996). The following discussion of gender bias in government taxation primarily makes use of reviews by Barnett and Grown (2006) and Stotsky (1996).

Income Taxes

The literature contends that detecting explicit gender bias is easiest in income taxes. For instance, joint filing as opposed to individual filing of income taxes creates more gender bias since a higher marginal tax rate is imposed on the second earner. To the extent that most women are secondary earners, joint filing provides a clear tax preference in favor of the husband. This has the effect of dampening women's labor force participation and hours of formal work. On the other hand, although individual filing creates a more gender-equal environment, biases in the allocation of nonlabor income can remain, owing to its differential allocation among men and women. This is particularly so for capital and other nonlabor resources that generally rest under men's control.

Commodity Taxes

Gender biases in commodity taxes are mostly implicit and difficult to demonstrate because they depend on the goods and services covered by the tax. For instance, commodity taxes imposed upon basic goods and services create a bias against women because women tend to devote resources toward primary goods, including family nourishment, childcare, healthcare, and well-being. In contrast, even if primary goods are not covered, commodity taxes still have the effect of altering the relative prices of taxed and untaxed goods. For instance, Smith (2000) finds that in South Africa, the burden of the tax is mostly imposed upon the poor and on women due to differential consumption patterns. In Vietnam, enterprises in the trading sector, which employs more women, are assessed commodity taxes, thereby altering the relative prices of the paid and unpaid economy. This has the effect of eventually distorting the distribution of work between the two economies.

Trade Taxes

Analyzing the explicit bias of trade taxes is possible only via a thorough analysis of commodity tariff protection. The gender bias in protection may or may not hurt women, depending on whether a sector can take advantage of expanding opportunities. However, to the extent that most women in developing countries are found in the subsistence or the import-competing agricultural sector as well as in low-value-added industries and services, the bias may be in the form of job losses and lower wages for women workers once protection walls are dismantled. On the other hand, trade liberalization may also reduce consumer prices, which may benefit women more than men, confirming the importance of assessing the net impact of trade liberalization.

Fontana and Wood (2000) found that trade liberalization appeared to be more favorable to women in Bangladesh, owing to higher female intensity in export-oriented sectors, when compared with Zambia. Cockburn *et al.* (2008), in a comparison of four developing countries (Ghana, Honduras, Senegal, and Uganda), found that trade liberalization increased the gender wage gap in favor of men, especially among unskilled workers, since men are more active in export-oriented sectors such as cash crops and mining, whereas women contribute more to import-competing sectors, such as food crops. Furthermore, the ensuing growth effects further widened the overall gender wage gap, because the labor demand-reducing productivity gains from increased openness were greatest in female-intensive sectors, in which trade rose markedly.

Corporate Taxes

Corporate tax gender bias depends on whether the corporate sector is male- or female-dominated. However, to the extent that the majority of investors are men, and since control of resources mostly rests among them, it is possible that reducing corporate taxes creates a bias against women. Nevertheless, lower corporate taxes may also bring about an increase in foreign direct investment, which may result in higher employment among women.

Huber (2005) analyzed the gender implications of tax reform in four Latin American countries (Argentina, Chile, Costa Rica, and Jamaica) and found that tax and social reforms may have imposed gender-based disadvantages for three reasons. First, lower tax revenue reduced the capacity of the state to correct existing gender imbalances through spending. Second, indirect taxes are generally regressive and affect poor women more because they are primarily responsible for family nourishment. Third, most women are not covered by social insurance programs because most of them are working in the informal sector.

Laframboise and Trumbic (2003) argued that per capita gross domestic product in the Middle East and North Africa (MENA) region would have been higher if women had not been underutilized. They concluded that the tax system treated men and women differently, resulting in differing decisions on work, consumption, and spending habits. They found that government spending on health and education had little effect on the welfare of women and that government public spending was not a statistically significant explanation of education performance. However, they could not prove a clear gender bias due to lack of gender-related data, and they concluded that women in MENA countries were not burdened by the regressive features of indirect taxation any more than in other developing countries.

4. ANALYTICAL FRAMEWORK

Government taxation systems influence relative prices, individual and corporate behavior, and the allocation of male and female labor services. Tax-induced relative price distortions have an economywide set of repercussions and strong general equilibrium effects. Thus, to understand the likely distributional impacts of taxation on male and female employment and revenue, this study uses country-specific computable general equilibrium (CGE) models for Algeria, Egypt, Morocco, and Tunisia.

The core of the models developed to analyze the employment effect of the taxation policy in the four countries is based on the neoclassical general equilibrium theory as presented by Decaluwé, Martens, and Savard (2001). The model seeks to explain production, consumption, and prices in an economy in which agents respond to relative prices as a result of profit- and utility-maximizing behaviors. Markets simultaneously adjust relative prices in order to reconcile endogenous supply and demand decisions, thus determining levels of production and consumption.

The Core Model

The economy is collapsed into three major parts: the supply of commodities, the demand for commodities, and institutional constraints. Then the model builds equations to capture the behavior of and interactions between the three components. Perfect competition prevails in the sense that producers and consumers take as given the relative prices that simultaneously clear all markets. Household behavior is rational, which implies that in the presence of complete markets, there is a separation between their production and their consumption decisions.

Producers maximize their profit under a given technology and independent prices. A representative industry-specific producer has a two-level nested constant elasticity of substitution production technology. The latter combines the value-added (composite factors) and the intermediate demand (composite inputs) in a fixed proportion. In its turn, value-added is an aggregation of capital and labor in a quasi-fixed proportion.⁹ Finally, intermediate consumption of goods and services is combined in a fixed proportion.

The relationship between *the rest of the world* and the domestic economy is determined by the substitutability between imported and domestically produced commodities on the supply side (Armington assumption) and by the substitutability between the domestic and international markets on the use side. The relative prices of foreign goods—defined by international fixed prices, the exchange rate, and government interventions—determine the allocation of supply and demand between domestic and international markets.¹⁰

Consumers maximize their utility under limited budgets and given market prices. A representative household has Stone-Geary preferences, resulting in a linear expenditure system. Consumers receive labor and capital incomes, as well as transfers from other institutional sectors.

The model specifies a number of structural features designed to reflect the characteristics of the studied economies. The closure rules—which equilibrate commodity, factor, and foreign exchange markets, and reconcile the government budget constraint—and the mechanism to equilibrate savings and investment levels are discussed next.

All *commodity markets* follow the neoclassical market-clearing price system, in which jointly determined producer and consumer prices vary only by given tax, subsidy, and margin rates.

⁹ The value of the elasticity of substitution is fixed at 0.2.

¹⁰ Because of the relatively high level of aggregation of products in the national accounts tables, we assume a high elasticity of substitution between locally produced and foreign goods, in both the domestic and international markets. For Morocco, the highest values estimated by Abdelkhalek (1996) and quoted in Annabi, Cockburn, and Decaluwé (2006) are used for import (3.17) and export (0.89) elasticities. For Egypt, the values of 2.6 and 3.0 proposed by Löfgren (2001), also quoted in Annabi, Cockburn, and Decaluwé (2006) are used for import and export elasticities, respectively. Finally, since elasticity estimates are unavailable for Tunisia and Algeria, we use the values of closed economies, that is, Morocco for Tunisia and Egypt for Algeria.

We assume perfectly elastic *labor* supplies owing to high male and female unemployment rates in the region. In other words, employers have no difficulty in recruiting workers. Thus, workers receive fixed real wage rates—that is, wages are indexed to the average economywide price. Unemployment is not explicitly modeled but is symmetrically explained by employment results with the assumption of a fixed labor supply.

Capital is industry specific, and as a consequence, there are as many returns on capital as there are capital-using industries in the economy.

The *foreign exchange market* equilibrates via adjustments of the real exchange rate. The current account balance is exogenous and pre-specified at the base-year level. With fixed foreign borrowing and transfers from abroad, higher imports of some goods will require lower imports, higher exports, or both, of other goods in order to keep the current account balanced. Pressures to change export or import quantities (and hence demand and supply of foreign currency) are therefore equilibrated by adjustments in the real exchange rate.

Government is passive in the sense that it does not optimize any objective function and its role is limited to that of regulating economic activity. Its earnings comprise revenues raised from indirect taxes, direct taxes, trade taxes, and net foreign borrowing. Government expenses consist of subsidies, current expenditures on the services provided by the public sector, investment, and transfers to households and firms. Current government and investment expenditures are rigid. Government deficit is covered by borrowing on the domestic credit market (crowding-out effect).

While foreign savings are exogenous, domestic private *savings* are *investment* driven. Savings are generated by exogenous constant rates for households and by residual savings from firms. Private investment is equal to net savings available after government borrowing is covered.

The *numeraire* is the nominal exchange rate—however, the real exchange rate remains endogenous through flexible domestic prices. All nominal values are thus measured relative to the price of internationally traded goods. The model solves for one-period equilibrium, and results are interpreted in comparative static terms.

Tax Features

The competitive market is affected by the government taxation system. The model collapses the wide range of tax instruments into one direct tax category (consisting of taxes on income, profits, and capital gains) and three indirect tax categories (taxes on goods and services, import duties,¹¹ and production taxes).

The direct taxes are levied on the gross incomes of individuals, the profits of corporations and enterprises, capital gains, and other assets. They are specified as a fixed ratio of gross earnings computed using data from the social accounting matrixes (SAMs).

On the one hand, basic prices, which are either market-clearing prices for locally produced commodities or border prices for imported products, are taxed and give rise to producer and consumer prices. The specific tax rates are determined using data from the SAMs. An import-specific tariff rate is the ratio of import duty receipts to the value of imports. A product-specific tax rate is defined as the ratio of the total tax receipts to the total supply (domestic and foreign) of the product at basic cost. The production-specific tax rate is also a ratio of tax receipts to the domestic supply at factor cost.

Gender Dimensions

Standard CGE models generally fail to distinguish gender-specific impacts, notably through their neglect of differentiated male and female labor markets and nonmarket production. Men and women are considered to be identical in terms of access to the labor market and wage rates. However, it has become

¹¹ Apart from import duties, other taxes on international trade, including export duties, profits of export or import monopolies, exchange profits, and exchange taxes do not explicitly appear in the national account because they are not applicable in the studied economies.

clear that men and women can be affected very differently by macroshocks and macropolicies, given that they tend to have unequal access to the labor market as a result of their nonmarket responsibilities and, even within the labor market, which they generally work in quite different sectors.

A gender-neutral CGE model can be made gender focused in different ways. This study follows one of the steps described by Fofana, Cockburn, and Decaluwé (2003) in integrating a gender dimension into a standard CGE framework. Most standard CGE models make the implicit assumption that male and female workers are perfect substitutes in market production and thus do not distinguish them. However, many studies underline the fact that there is segmentation in the labor market between men and women, and different levels of market work flexibility according to the domestic tasks they perform. Also, it is observed that male and female workers tend to concentrate in different sectors and occupations, which further undermines the hypothesis of perfect substitutability. Finally, it is widely recognized that there is often a gender bias against women in the labor market in terms of wage earnings and job opportunities.

This study segments the labor market into male and female labor submarkets and separates workers by sex. Male and female workers are considered as different factors of production in the same way workers are differentiated according to skill or geographical location in other contexts.

Therefore, male labor and female labor are imperfect substitutes in the aggregate sector i labor demand.¹² The conditional demand for male and female labor depends on their initial sectoral shares, relative wage rates, and degree of substitution in sectoral production.

The gross earnings of male and female workers are equal to the volume of labor services demanded by productive sectors valued at indexed wage rates. Household labor income consists of male and female wage incomes.

An operational CGE tool for policy impact simulation requires the use of a SAM to calibrate the model to a specific economy. In order to apply the above methodology, the SAM should be made gender focused by disaggregating some economic variables by sex.

Gender-Focused Social Accounting Matrixes

Our analysis focuses on the employment and income characteristics of salary- and wage-earning workers, since this information can be easily separated by sex. As a result, information on male and female payrolls from a nationally representative household or labor survey is used to decompose salary/wage accounts between men and women in the standard SAM. Male labor payments are derived as residuals after subtracting the female counterpart from the industry's payroll. Female labor income is distributed among representative household groups using the shares of female labor earnings in the household's labor revenue. Male labor earnings are also obtained as residual.

Algeria

We used the 2002 SAM for Algeria¹³, which has 53 accounts including 1 salary and wage account and 3 tax accounts: direct taxes on households and corporations, production tax net of subsidies applied to activities, and indirect taxes net of subsidy levied on goods and services (including sales tax, value-added tax, and tariffs). Information from the supply and use table for 2002 is used to break down the indirect taxes into tariffs and other indirect taxes (sales tax and value-added tax). Male and female salary/wage and employment data, made available by the National Office of Statistics for 2002, are used to make the SAM gender focused (Table A.2, Appendix).

¹² We assume a low substitution between male and female for each labor category, with the value of elasticity fixed at 0.2. Therefore, rigidity in male and female employment is assumed, owing to the high concentration of female employment in a few industries. When we ease the substitutability between male and female labor in sectoral employment, our results do not significantly change. Once again, this is due to higher concentration of female employment, that is, their initial shares, in industries that deem the substitutability between male and female labor to be more than the elasticity value.

¹³ Bouazouni (2008).

Egypt

A 2006/07 SAM¹⁴, with 1 salary and wage account and 4 tax accounts, is used for the Egyptian economy. The tax revenues include direct taxes on households and corporations, domestic taxes on locally produced and imported goods and services, and import duties levied on imported goods. The salary and wage payments account and the incomes account of the standard SAM are disaggregated into male and female wages and salaries using industry- and household-specific shares of female labor payments and incomes estimated from the Egypt Labor Market Panel Survey 2006¹⁵ (Table A.3, Appendix).

Morocco

The analysis uses the 2003 SAM¹⁶ with 106 accounts, including 1 salary and wage account and 11 tax accounts: value-added tax, product subsidies, product tax, production tax, production subsidies, direct income tax, and import tariffs classified according to five trading partners. The tax instruments are then aggregated into four categories, which include product taxes net of subsidies, taxes on production net of subsidies, direct income tax, and aggregated import tariffs, for comparison purpose among countries covered by the study. Various sources of information are used to disaggregate the total wage payments between male and female labor.¹⁷ The salaries and wages data, as well as the employment data, are collected from International Labour Organization databases and the 2000-2001 national household consumption and expenditure survey¹⁸. They are used in the sectoral decomposition of salary and wage income presented in Table A.4 (see Appendix).

Tunisia

The SAM built for 1998,¹⁹ with 4 salary and wage accounts, 19 activity and product accounts, and 12 representative households, is used for Tunisia. The SAM features four tax accounts: import tariffs, consumption tax on domestically produced and imported goods, production tax net of subsidies, and direct income tax on households and corporations. The disaggregation of payroll between male and female workers by skill level and industry (Table A.5 in Appendix) is based on two additional sources of information, the survey on small business for 1997 and the national labor force survey for 1999 made available by the National Institute of Statistics²⁰. The 2000 household consumption and expenditure survey²¹ contributed to disaggregate household accounts based on the gender and socioprofessional category of the household head.

¹⁴ Central Agency for Public Mobilization and Statistics, CAPMAS (2008).

¹⁵ CAPMAS (2009).

¹⁶ Abdelkhalek (2007).

¹⁷ Revenue information is not included in the 2001 household survey.

¹⁸ High Commission for Planning, HCP (2009).

¹⁹ Chatti (2002).

²⁰ National Institute of Statistics, NIS (2009).

²¹ NIS (2009).

5. RESULTS AND DISCUSSION

In order to understand the possible impact of indirect taxation on male and female employment, we simulate a nondistortionary scenario in which all indirect taxes and subsidies in the economy are eliminated. The government fiscal revenue loss is compensated by a lump-sum tax, that is, an absolute amount on households' income. Owing to the government revenue neutrality built into our simulation, we no longer discuss the tax burden for each country but instead pay particular attention to the labor market and gender impacts.

To better understand the implications of the tax policy shock, we trace its expected effects by analyzing the transmission channels into the economy. Particular attention is given to changes in male and female paid employment earnings by computing and comparing their expected wage rates at the benchmark—the distortionary scenario—and after replacement of all indirect taxes with a lump-sum tax levied on households' income—the nondistortionary scenario.

Macroeconomic Effects

Since the analysis focuses on the short-run impact, the adjustments from the shock pass mainly through prices and less through volumes, which are less flexible. Furthermore, we do not expect significant changes in gross domestic product (GDP), since we simply replace one tax category with another (Table 5.1).

The elimination of initial price distortions brought about by tariffs, sales taxes and subsidies, and production taxes and subsidies improves the price competitiveness of the four economies, with average domestic prices falling between 1.1 percent in Egypt and 7.7 percent in Tunisia (Table 5.1). The degree of reduction in domestic price depends on the initial level of the indirect tax burden, openness, and more importantly, the tariff protection imposed by each economy. It is for this reason that the lowest and highest reductions in average domestic price are attained in Egypt and Tunisia, as they respectively impose the lowest and highest tariff rates. Both Algeria and Morocco experience intermediate domestic price reductions owing to their midlevel tariff rates.

The resulting price reduction is translated into an improvement in domestic firms' competitiveness in the international market, since their exports are now relatively cheaper. Indeed, export volumes for the four countries improve (Table 5.1). On the other hand, the elimination of indirect taxes results in cheaper imports, creating an increase in import volumes for the four economies.

Table 5.1—Percent change in selected macro variables

Variable	Algeria	Egypt	Morocco	Tunisia
Tax burden	18.5 (17.9)	6.5 (6.4)	10.9 (10.7)	15.3 (14.3)
Specific tariff rate	4.7	2.1	4.1	7.3
Openness	62.0	67.3	53.2	98.1
Coverage rate	92.8	90.6	66.7	92.8
Change in average domestic price	-5.7	-1.1	-5.7	-7.7
Change in export volume	8.2	19.5	48.3	84.2
Change in import volume	9.7	15.3	28.2	64.2
Change in GDP (constant price)	0.2	0.3	-0.3	0.5

Source: Author's calculation from simulation results.

Note: Indirect tax burden in parentheses. GDP = Gross domestic product.

Sectoral and Price Effects

The elimination of all indirect taxes is translated into a reduction in consumption prices in the economies (Table 5.2). The reduction in economywide consumer prices is negatively related to the level of initial indirect tax prevailing in the respective economy. Generally, the higher the initial indirect tax rate for an economy is, the greater the fall in consumer prices when that tax is eliminated.

Table 5.2—Sectoral effects of the simulation model

	Specific tax rate				Ratio		Change in volume				Change in price					
	t ^M	t ^S	t ^C	All	M/C	X/S	Q ^M	Q ^X	Q ^S	Q ^D	P ^M	P ^X	P ^S	P ^{VA}	P ^D	P ^C
Algeria																
Agriculture	14.2	7.2	1.1	9.7	22.3	0.1	1.8	90.3	0.0	0.5	-12.4	-6.9	-12.3	-3.6	-12.3	-13.3
Natural resources	13.0	13.9	1.1	15.0	0.8	64.1	163.9	3.7	0.2	1.5	-11.5	-0.4	-0.3	26.7	-0.5	-3.4
Manufacturing	12.3	2.8	6.4	12.4	34.9	2.0	8.4	151.5	-0.1	3.3	-10.9	-9.7	-11.8	-4.8	-11.5	-16.9
Services	0.0	3.3	1.7	4.8	17.8	8.8	8.5	17.5	0.3	0.9	0.0	-1.7	-2.8	5.8	-2.6	-4.5
All	10.9	7.2	3.0	10.6	19.4	25.3	9.7	8.2	0.2	1.8	-9.8	-0.7	-4.8	10.0	-5.7	-10.3
Egypt																
Agriculture	0.2	0.0	0.1	0.1	7.5	3.4	-3.8	2.4	0.0	-0.3	-0.2	-0.3	-0.7	0.0	-0.7	-0.7
Natural resources	0.1	0.0	1.4	1.4	12.0	36.1	9.9	3.3	0.0	1.2	-0.1	-0.4	0.9	1.0	0.8	-0.7
Manufacturing	5.5	0.0	1.5	2.9	30.5	9.3	12.5	38.7	-0.1	3.5	-5.2	-3.3	-3.5	-2.0	-4.0	-5.7
Services	0.0	0.0	5.0	5.0	8.5	24.0	34.1	15.4	0.5	3.3	0.0	-1.6	2.7	5.1	2.4	-2.7
All	4.1	0.0	2.5	3.2	18.8	16.0	15.3	19.5	0.1	2.9	-3.9	-1.8	-0.5	2.2	-1.1	-4.0
Morocco																
Agriculture	26.0	0.1	0.1	2.0	7.2	5.7	61.7	99.7	-0.1	5.4	-20.7	-6.8	-15.2	-17.3	-15.8	-16.6
Natural resources	2.5	5.7	0.1	4.2	47.6	17.2	6.2	13.1	1.5	3.8	-2.4	-1.4	-1.9	14.9	-2.2	-2.5
Manufacturing	6.9	0.4	5.5	7.4	26.3	16.5	30.2	53.8	0.0	8.5	-6.4	-3.7	-6.1	1.8	-6.4	-12.8
Services	0.0	0.4	3.2	3.5	9.9	10.7	13.6	15.6	0.5	1.1	0.0	-1.6	-1.4	1.4	-1.3	-4.5
All	6.9	0.4	3.9	5.3	20.1	13.4	28.2	48.3	0.2	5.4	-6.4	-3.4	-5.4	-1.4	-5.7	-10.0
Tunisia																
Agriculture	18.4	-0.7	0.4	2.0	11.8	3.2	21.9	102.9	-0.2	2.9	-15.5	-7.6	-13.6	-13.1	-13.9	-14.6
Natural resources	18.1	0.1	18.0	22.3	23.4	19.5	270.3	412.2	-0.8	70.7	-15.3	-16.6	-9.4	-1.4	-12.8	-30.4
Manufacturing	14.8	-1.1	3.9	7.8	35.7	24.8	53.1	90.7	0.7	19.5	-12.9	-5.7	-9.8	-1.9	-11.2	-17.5
Services	0.0	-3.2	4.9	1.8	6.9	25.9	41.2	14.0	0.7	2.8	0.0	-1.4	1.2	3.3	1.1	-4.2
All	14.0	-1.8	4.7	6.3	24.5	22.7	64.2	84.2	0.5	15.8	-12.3	-5.0	-5.9	-0.9	-7.7	-14.0

Sources: Authors' calculation from simulation results and from Algerian social accounting matrix (SAM) 2002 (Bouazoune 2008); Egyptian SAM 2006/07 (Egypt, Office for National Statistics 2008); Moroccan SAM 2003 (Abdelkhalek 2007); and Tunisian SAM 1998 (Chatti 2002).

Notes: M/C = Import ratio; X/S = Export ratio; M = Import; X = Export; S = Supply; C = Consumption; D = Local sale; VA = Value-added; P = Prices; Q = Volumes; t = Tax rates.

Across the four countries it is the consumers in Tunisia that benefit from the greatest fall in consumer prices (14 percent), owing to a higher average tax rate (4.7 percent) on goods and services (Table 5.2). The consumers in Algeria and Morocco also gain from the reduction in consumption prices (10.3 and 10.0 percent, respectively), whereas Egyptian consumers experience the lowest decrease in consumer prices, Egypt showing the lowest average tax rate (2.5 percent) among the studied economies.

Across commodities, it is manufactured goods that register the greatest reduction in consumption price in all countries due to their high import penetration rates. Consumption prices of natural resources also fall in Morocco and Tunisia for the same reason. Agricultural products are highly protected in Morocco and Tunisia, and also witness a significant reduction in prices with the elimination of tariffs and taxes on goods and services. High import penetration and tariff rates also contribute to a significant reduction in agricultural consumption prices in Algeria.

In general, export volumes increase significantly due to an improvement in the price competitiveness of the economy (Table 5.2). However, the expansion in exports varies across sectors and countries, and the change in export volumes is affected by the export capacity of each sector and country.

Production costs decline with cheaper inputs in the nondistortionary scenario; as a result, value-added prices increase, resulting in a higher remuneration of productive factors and higher demand for such factors (essentially labor) since capital is fixed due to the short-run perspective of the study. The elimination of the price distortions induced by indirect taxes is beneficial to producers in the studied economies, Algeria and Egypt in particular, as they experience an increase in the value-added prices (which fall less than do the average domestic prices, shown in Table 5.2). Factors employed in natural resources benefit the most because of their higher initial export capacity and the cheaper input costs. Factor remuneration and demand also increase in private services, which benefit from the reduction of input costs and less openness to external trade, the latter making them less exposed to import competition than are manufacturing and agriculture.

Distribution Impact between Men and Women

The gender focus of the study brings us to the analysis of male and female employment implications of the model's sectoral and price impacts. In understanding the labor market and gender employment impacts, it is important to remember that laborers move freely across the sectors, male and female labor are imperfect substitutes, and the services sector employs between 60 and 80 percent of men and women in the four countries. After services, manufacturing employs the most laborers, both male and female.

In general, the elimination of distortions caused by indirect taxes brings about positive effects on both male and female labor as their expected real wages increase (Table 5.3). However, the employment and wage gap increases in Algeria and Egypt, while it does not change significantly in Morocco and Tunisia.

Table 5.3—Percent change in expected real wages

	Algeria		Egypt		Morocco		Tunisia	
	Male	Female	Male	Female	Male	Female	Male	Female
Wage rate	-4.9	-5.6	0.2	-0.8	-4.9	-4.8	-6.9	-7.1
Unemployment rate*	-0.9	-0.1	-0.8	-0.7	-1.1	-1.2	-1.1	-1.1
Expected wage rate	1.9	0.2	2.2	1.3	2.2	2.3	2.2	1.9

Source: Authors' calculation from simulation results.

Note: * Unemployment is expressed in percentage point.

In Algeria, the fall in labor employment and expected wage rates for females, relative to males, is driven by a greater contraction of female labor-intensive industries—textiles and leather, among others—when indirect taxes are eliminated (see Table A.6 in Appendix). This output-contracting effect is due to the heavy tariff protection afforded to these industries at the benchmark, effectively shielding them from import competition but at the same time making them less competitive internationally (see Table A.7 in Appendix). Nevertheless, owing to output expansion, labor demand in the services sector increases, effectively absorbing female laborers displaced by changes in these industries. The impact of all these female labor reallocations is a higher decline in the effective real wage for female workers relative to their male counterparts (Table 5.3), suggesting an increase in wage gap in favor of males.

In Egypt, the elimination of indirect tax distortions results in a general improvement for all sectors except for manufacturing, where the price of real value-added falls (Table 5.2). Therefore female employment falls in manufacturing, with one of the most female-intensive sectors, “other manufacturing,” suffering from the greatest reduction in employment. Similar to the situation in Algeria, production falls in the heavily protected and predominantly female labor-intensive sectors—nonmetals, textiles, and food. Hence, the expected real wage of women in Egypt decreases relative to that of men (Table 5.3).

The impact of eliminating all indirect taxes in Morocco is slightly unfavorable to the agriculture sector but advantageous to the natural resources, manufacturing, and services sectors (Table 5.2). Therefore the fall in male and female employment in agriculture is compensated by the increase in employment in the three other major sectors. Demand for female labor in Morocco increases the most in natural resources, although in absolute terms it is the combined increase in manufacturing and services that accounts for the largest increase in female employment. This is not surprising, since these sectors together account for 93 percent of the total female labor force in the country. Essentially the main reason behind the increase in female employment in Morocco in spite of the elimination of all indirect tax distortion is that the country's entire manufacturing industry (including the female-intensive textile sector) is less protected than those of Algeria and Egypt (see Table A.7 in Appendix). Overall, any significant change in the expected real wage rate for both male and female labor is observed (Table 5.3).

The services sector stands out as the largest gainer from the elimination of indirect tax distortions in Tunisia. Indeed, this stems from the reduction in the value-added price and the output contraction in both the agriculture and the natural resource sectors in the country (Table 5.2). Because of this, female employment falls in these two sectors, especially in natural resources. However, output expands in both manufacturing and services, absorbing all female and male laborers displaced in the two contracting sectors. However, it should be noted that the greater fall in female employment relative to that of males in agriculture and natural resources brings about negative distributive effects in the form of a slightly higher reduction in female expected real wages relative to those of their male counterparts (Table 5.3).

Decomposing Indirect Tax-Induced Distortion

In summary, our analysis confirms that the removal of indirect taxes contributes to increased gender disparities in employment and wages in Algeria and Egypt. Based on the underlying data, it can be deduced that the current indirect tax policy is biased toward female relative to male employment in the two countries. Recall that this is because female labor-intensive activities (such as textiles) in Algeria and Egypt are highly protected at the benchmark and are not competitive internationally. Therefore removing protection would cause the sector to contract and lay off workers, owing to cheaper import competition. In contrast, the same female-intensive sectors are less protected and more export oriented in Morocco and Tunisia. Hence, the removal of indirect taxes results in quasi-neutral effects between male and female workers and their corresponding wage revenues. This is not surprising since women contribute more to the export-oriented industries in Morocco and Tunisia than in Algeria and Egypt.

As we have shown so far, indirect taxation policies have differing distributive impacts across countries and between male and female workers. However, we have analyzed the global picture only by looking at the effects of eliminating all indirect taxes in the four countries, but we have not investigated the respective contributions of all the components of indirect taxes. Could it be that one component is more distortionary than others? To have a better perspective, we now decompose the contribution of each indirect tax component—tariffs, sales tax, and production tax—to trace their individual effects on the changes in male and female labor earnings.

Regardless of the component breakdown, eliminating indirect taxes brings about positive effects on both male and female expected real wages (Table 5.4). In Algeria, the reduction in expected real wage arising from the removal of tariff protection—which affects female labor-intensive activities (such as textiles) the most—is effectively compensated by the increase in real wages owing to the elimination of both product (sales) and production taxes. In Tunisia, the negative real wage impact of removing production taxes and subsidies is countered by the real wage increase arising from the elimination of both import and product (sales) taxes. Note that real wages increase in all countries because the consumption price index falls more than nominal wages fall, owing to the elimination of indirect taxes.

Table 5.4—Comparison of percent change in expected real wages

	Algeria		Egypt		Morocco		Tunisia	
	Male	Female	Male	Female	Male	Female	Male	Female
All taxes	1.9	0.2	2.2	1.3	2.2	2.3	2.2	1.9
Import tax (tariff)	-0.5	-1.5	0.6	0.2	0.6	1.0	0.9	0.9
Product (sales) tax	0.6	0.6	1.5	1.0	1.2	1.1	2.2	2.0
Production tax (or subsidy)	1.8	1.0	0.0	0.0	0.4	0.4	-1.1	-1.2

Source: Authors' calculation from simulation results.

6. CONCLUSION

This study analyzed in a comparative manner the tax policy–induced gender bias in Algeria, Egypt, Morocco, and Tunisia. A gender-focused computable general equilibrium framework was employed to measure the impacts of the current tax system’s distortion on the relative employment of men and women. A nondistortionary indirect tax scenario was simulated by removing all indirect taxes and subsidies in the economy. The government’s revenue loss was compensated by a lump-sum (direct) tax on households’ revenue.

Our analysis confirms that eliminating indirect taxes and subsidies contributes to an increase in economic disparities, particularly among male and female paid workers in Algeria and Egypt. The indirect tax policy in these two countries protects female paid workers and their economic contribution, in the form of labor income, to their respective households. This is because female labor–intensive activities (such as textiles) in Algeria and Egypt are highly protected at the benchmark and are not competitive internationally. Removing protection would therefore cause the sector to contract and lay off workers, owing to cheaper import competition. In contrast, the same female-intensive and export-intensive sectors are less protected and therefore more competitive in Morocco and Tunisia. Hence, the removal of indirect taxes results in quasi-neutral effects between male and female labor and their corresponding wage revenues.

The taxation policies in the Middle East and North Africa region have changed over the last decade and may undergo significant changes in the coming years. In light of this unpredictability, an assessment of the tax-related relative price bias on men and women constitutes a crucial step toward providing adequate guidance to planners, policymakers, and other stakeholders.

Our analysis has been limited by the availability of recent macroeconomic data. The starting point of our analysis is based on the latest available social accounting matrix (SAM) database for each country, which we have extended by disaggregating male and female labor categories. While we have made every effort to extend the current SAMs to account for gender classification, our quantitative assessment and tax policy simulation results are based on the underlying economic structure provided by the existing matrixes.

The tax policy simulations aim to compare, contrast, and deduce general conclusions and global assessments about the possible impact of indirect tax policy reforms on gender in the four countries. Our intention is not to recommend a removal of all taxes in the countries we are examining. Rather, the study should be viewed as an assessment of the differential impacts of taxation on men and women using a quantifiable, economywide model.

APPENDIX: SUPPLEMENTARY TABLES

Table A.1—Distribution of the tax burden

Morocco		Algeria		Egypt		Tunisia	
Category of industry	%	Category of industry	%	Category of industry	%	Category of industry	%
Repairs	0.0	Public services	0.0	Food and beverage	2.1	Public services	0.2
Public administration and social security	0.1	Transport and communication	5.4	Agriculture, vegetal	0.0	Agriculture	2.0
Education, health, and social services	0.7	Petroleum-related services	6.0	Agriculture, animal	0.3	Other services	2.6
Trade	0.9	Building	6.3	Social services	0.5	Transport and telecommunication	3.3
Printing and reproduction	1.3	Other private services	7.1	Oil and extraction	1.4	Construction	3.7
Agriculture and forestry	2.0	Trade	7.7	Petroleum/chemical/plastic	2.1	Textile, apparel, and leather	4.2
Fishery and aquaculture	2.1	Processed food	9.5	Basic metal	2.3	Chemicals	8.5
Processed food	2.3	Agriculture	9.6	Transport and communication	2.8	Quarrying products	9.2
Paper and cardboards	2.4	Water and energy	9.7	Metallic machinery & equipment	3.1	Electricity	9.2
Other transport materials	2.7	Mining	11.2	Other manufacturing	5.6	Miscellaneous manufacturing	9.6
Basic metal	2.8	Hotels and restaurants	11.2	Electricity and construction	5.8	Mechanical	13.1
Textiles	2.9	Leather and footwear	14.8	Other private services	8.0	Food processing	14.0
Manufacture of nonmetallic materials	2.9	Construction materials	14.9	Textiles	10.6	Water	14.8
Structural metal	3.0	Metals	15.3	Other nonmetallic manufacturing	14.2	Mining and petroleum	31.4
Machineries and equipment	3.3	Petroleum	15.5	ALL	3.2	ALL	6.4
Transport	3.6	Wood and paper	17.0				
Wood and wood products	4.0	Textiles	17.2				
Garments	4.0	Chemicals and plastics	18.0				
Chemicals	4.0	Miscellaneous industry	22.1				
Mining	4.2	ALL	10.3				
Property, real estate, and ownership of dwellings	4.6						
Insurance and financial activities	5.0						
Rubber and plastics	5.4						
Electricity, gas & water production & distribution	5.5						
Furniture	6.9						
Leather and footwear	7.4						
Other nonfinancial services	8.2						
Hotels and restaurants	9.6						
Construction	10.6						
Postage and telecommunication	11.7						
Automobiles	11.8						
Petroleum refining	27.0						
Tobacco	63.2						
ALL	5.1						

Sources: Algerian social accounting matrix (SAM) 2002 (Bouazouni 2008); Egyptian SAM 2006/07 (Egypt, Office for National Statistics 2008); Moroccan SAM 2003 (Abdelkhalek 2007), Tunisian SAM 1998 (Chatti 2002).

Table A.2—Distribution of labor payments by industry in Algeria, 2002

Industry	Male (%)	Female (%)	All (%)
Agriculture	5.6	2.0	5.0
Water and energy	1.3	0.4	1.2
Petroleum	3.9	2.3	3.7
Services and construction for petroleum	1.7	1.1	1.6
Mining and quarrying	0.3	0.2	0.3
Metal industry	1.5	1.3	1.5
Construction materials	1.3	1.2	1.3
Building and construction	18.1	1.2	15.4
Chemicals, rubber, and plastic	0.7	0.6	0.7
Food processing	1.3	6.3	2.1
Textiles	0.4	1.7	0.6
Leather and footwear	0.1	0.1	0.1
Wood and paper	0.6	1.0	0.7
Other manufacturing	0.1	0.2	0.1
Transport and communication	6.7	3.5	6.2
Trade	6.0	1.4	5.3
Hotels and restaurants	1.2	0.4	1.1
Other private services	2.7	1.0	2.4
Public services	46.5	74.1	50.8
ALL	100.0	100.0	100.0
Values (million Algerian dirhams)	867,080	161,875	1,028,955

Source: Algerian social accounting matrix 2002 (Bouazoune 2008).

Table A.3—Distribution of labor payments by industry in Egypt, 2006/07

Industry	Male (%)	Female (%)	All (%)
Agriculture, vegetal	3.5	6.2	4.0
Agriculture, animal	1.0	1.6	1.1
Oil and extraction	3.5	0.0	2.8
Food manufacturing	7.0	4.4	6.6
Textiles	4.3	2.8	4.0
Chemistry	1.7	1.0	1.6
Nonmetallics	1.3	0.2	1.1
Basic metallics	1.0	0.1	0.8
Metallics and machinery	3.4	0.0	2.8
Other industry	1.3	2.5	1.5
Electricity and construction	13.4	5.7	12.0
Transport and communication	8.1	1.8	7.0
Other productive services	14.7	29.9	17.4
Social services	35.8	43.7	37.3
ALL	100.0	100.0	100.0
Values (million Egyptian pounds)	154,761	34,239	189,000

Sources: Egypt Labor Market Panel Survey for 2006 and Egypt Social Accounting Matrix 2006/07.

Table A.4—Distribution of labor payments by industry in Morocco, 2003

Industry	Male (%)	Female (%)	All (%)
Agriculture and forestry	2.5	5.1	2.9
Fishery and aquaculture	1.5	0.6	1.4
Mining	1.6	0.6	1.4
Processed food	3.2	2.8	3.2
Tobacco	0.2	0.2	0.2
Textiles	1.1	0.9	1.1
Garments	2.1	11.2	3.4
Leather and footwear	0.4	0.5	0.4
Wood	0.3	0.4	0.3
Paper and cardboard	0.4	0.5	0.4
Printing and reproduction	0.3	0.4	0.4
Petroleum refining	0.2	0.3	0.2
Chemicals	2.4	4.4	2.6
Rubber and plastics	0.4	0.7	0.4
Manufacture of nonmetallic materials	1.0	1.2	1.0
Basic metal	0.4	0.1	0.3
Structural metal	1.2	0.4	1.1
Machinery and equipment	1.9	0.7	1.7
Automobiles	0.4	0.2	0.4
Other transport materials	0.1	0.0	0.1
Furniture	0.4	0.5	0.4
Repairs	0.0	0.0	0.0
Electricity, gas, and water production and distribution	2.5	0.9	2.2
Construction	4.9	0.2	4.3
Trade and repairs	8.4	3.1	7.7
Hotels and restaurants	1.4	1.8	1.5
Transport	5.1	1.4	4.6
Postage and telecommunication	1.6	0.4	1.5
Insurance and financial activities	4.5	5.6	4.6
Property, real estate, and ownership of dwellings	3.3	0.1	2.9
Public administration and social security	25.0	16.5	23.8
Education, health, and social services	20.7	36.4	22.9
Other nonfinancial services	0.5	1.5	0.6
ALL	100.0	100.0	100.0
Value (thousand Moroccan dirhams)	11,023	1,641	12,665

Sources: Morocco National Household Consumption and Expenditure Survey 2000-2001 and International Labour Organization 2009.

Table A.5—Distribution of labor payments by industry in Tunisia, 1998

Industry	Firm status	Male (%)	Female (%)	All (%)
Agriculture	Rural	3.6	3.0	3.5
	Public	1.1	0.9	1.0
Food processing	Private	1.3	1.2	1.3
	Informal	1.2	0.1	0.9
Quarrying products	Public	0.9	0.3	0.8
	Private	0.8	0.6	0.7
	Informal	0.4	0.0	0.3
Mechanical	Public	1.2	0.2	0.9
	Private	1.7	3.4	2.1
	Informal	0.2	0.0	0.1
Chemicals	Public	1.0	0.3	0.8
	Private	0.8	0.8	0.8
Textiles, apparel, and leather	Informal	0.0	0.0	0.0
	Private	2.1	20.1	6.9
	Informal	0.9	1.6	1.1
Miscellaneous manufacturing	Public	0.3	0.3	0.3
	Private	1.1	1.5	1.2
	Informal	0.6	0.0	0.4
Mining and petroleum	Public	2.0	0.6	1.7
	Private	0.1	0.3	0.1
Electricity	Public	1.2	0.7	1.1
Water	Public	0.9	0.2	0.7
Construction	Informal	13.3	0.4	9.9
	Public	8.7	2.8	7.1
Transport and communication	Private	1.2	0.9	1.1
	Informal	1.3	0.0	1.0
Other services	Private	7.1	11.0	8.2
	Informal	8.9	4.9	7.9
Public services	Public	36.1	43.8	38.2
ALL		100.0	100.0	100.0
Values (million Tunisian dinars)		6 018	2 153	8 171

Source: Tunisian social accounting matrix 1998 (Chatti 2002).

Table A.6—Ratio of female to male employment earnings (percent)

Morocco		Algeria		Egypt		Tunisia	
Category of industry	Ratio	Category of industry	Ratio	Category of industry	Ratio	Category of industry	Ratio
Tobacco	17.6	Chemicals	74.5	Nonmetallics	17.0	Mining and petroleum	8.5
Petroleum refining	37.2	Building materials	75.8	Textiles	28.2	Food processing	15.3
Postage and telecommunication	20.9	Metallics	63.2	Other private services	9.3	Electricity	14.6
Construction	0.9	Energy and water	17.1	Electricity and construction	5.8	Transport and telecom.	7.9
Hotels and restaurants	97.0	Hotels and restaurants	11.0	Transport/com munication	22.7	Other services	22.5
Other nonfinancial services	236.0	Textiles	52.0	Food, processed	11.8	Quarrying products	10.6
Automobiles	7.6	Wood and paper	78.3	Other manufacturing	30.5	Construction	1.3
Leather and footwear	25.2	Food, processed	83.0	Oil and extraction	0.0	Miscellaneous manufacture.	15.1
Property, real estate, and ownership of dwellings	3.3	Miscellaneous industry	83.3	Chemicals	2.9	Textiles, apparel., and leather	325.1
Furniture	25.2	Mining	64.7	Basic metallics	2.1	Mechanical	27.4
Electricity, gas & water production & distribution	7.6	Other private services	14.2	Social services	11.2	Chemicals	22.0
Insurance and financial activities	97.0	Leather	60.0	Metallics and equipment	0.0	Agriculture	38.6
Garments	105.5	Petroleum-related services	51.7	Vegetal agriculture	25.7	Water	5.7
Transport	5.7	Transport/comm unication	17.6	Animal agriculture	40.5	Public services	39.7
Chemicals	37.2	Building	1.0	ALL	14.9	ALL	32.3
Textiles	16.9	Agriculture	10.5				
Machinery and equipment	7.6	Petroleum	20.9				
Other transport materials	7.6	Trade	11.9				
Manufacture of nonmetallic materials	25.2	Public services	27.0				
Basic metal	7.6	ALL	23.1				
Leather and footwear	37.2						
Fishery and aquaculture	11.6						
Paper and cardboards	25.2						
Education, health, and social services	37.3						
Structural metal	7.6						
Trade and repairs	7.8						
Mining	7.6						
Wood products	25.2						
Printing and reproduction	25.2						
Agriculture and forestry	60.4						
Repairs	25.2						
Public administration and social security	14.0						
Processed food	17.6						
ALL	29.6						

Sources: Algerian social accounting matrix (SAM) 2002 (Bouazoune 2008); Egyptian SAM 2006/07 (Egypt, Office for National Statistics 2008); Moroccan SAM 2003 (Abdelkhalek 2007), Tunisian SAM 1998 (Chatti 2002).

Table A.7—Specific tariff rate by product

Morocco		Algeria		Egypt		Tunisia	
Category of industry	Tariff rate	Category of industry	Tariff rate	Category of industry	Tariff rate	Category of industry	Tariff rate
Repairs	0.0	Energy and water	0.0	Electric and construction	0.0	Public services	0.0
Electricity, gas & water production & distribution	0.0	Petroleum-related services	0.0	Transport and communications.	0.0	Other services	0.0
Construction	0.0	Transport and Communication.	0.0	Other services	0.0	Transport and telecom.	0.0
Trade and repairs	0.0	Trade	0.0	Social services	0.0	Construction	0.0
Hotels and restaurants	0.0	Hotels and restaurants	0.0	Animals	0.1	Electricity	0.0
Transport	0.0	Other private services	0.0	Oil	0.1	Miscellaneous manufacture	0.0
Postage and telecommunication	0.0	Public services	0.0	Vegetables	0.2	Mechanical	0.0
Insurance and financial activities	0.0	Building	6.1	Processed food	3.5	Water	0.0
Property, real estate, ownership of dwellings	0.0	Mining	8.8	Metal equipment	3.8	Mining and petroleum	0.0
Public administration and social security	0.0	Metallics	10.2	Chemicals	4.8	Textiles, apparel, leather	3.6
Education, health, and social services	0.0	Construction materials	10.7	Nonmetals	6.5	Quarrying products	9.6
Other nonfinancial services	0.0	Chemicals and plastics	11.5	Basic metals	7.0	Agriculture	17.1
Transport materials	1.1	Agriculture and fishery	14.2	Other manufacturing	10.4	Chemicals	29.1
Textiles	1.5	Processed food	16.4	Textiles	14.6	Food processing	56.1
Garments	2.3	Wood and paper	17.3	ALL	4.1	ALL	14.0
Mining	2.5	Petroleum	18.8				
Machinery and equipment	3.0	Miscellaneous industry	25.2				
Chemicals	3.1	Textiles	34.2				
Printing and reproduction	3.3	Leather	34.3				
Fishery and aquaculture	3.4	ALL	10.9				
Paper and cardboard	4.5						
Petroleum refining	5.0						
Basic metal	5.6						
Leather and footwear	6.3						
Structural metal	8.3						
Furniture	9.7						
Rubber and plastics	10.2						
Automobile	11.2						
Wood	11.6						
Manufacture of nonmetallic materials	12.8						
Tobacco	23.8						
Agriculture and forestry	26.2						
Processed food	43.4						
ALL	6.9						

Sources: Algerian social accounting matrix (SAM) 2002 (Bouazouni 2008); Egyptian SAM 2006/07 (Egypt, Office for National Statistics 2008); Moroccan SAM 2003 (Abdelkhalek 2007), Tunisian SAM 1998 (Chatti 2002).

REFERENCES

- Abdelkhalek, T. 1996. *Élasticités de Substitution et de Transformation et Sensibilités Prix et Revenu: Une Analyse Sectorielle du Commerce Extérieur Marocain*. Rabat, Morocco: Ministry of Foreign Trade.
- _____. 2007. “Matrice de Comptabilité Sociale du Maroc pour l’Année 2003.” Mimeo, National Institute of Statistics and Applied Economics, Rabat, Morocco.
- Alesina, A., A. Ichino, and L. Karabarbounis. 2008. *Gender-Based Taxation and the Division of Family Chores*. Discussion Paper No. 2164. Cambridge, MA, US: Harvard Institute of Economic Research.
- Alsoop, R., M. Bertelsen, and J. Holland. 2006. *Empowerment in Practice: From Analysis to Implementation*. Washington, DC: World Bank.
- Anderson, K., W. J. Martin, and D. van der Mensbrugghe. 2006. “Distortions to World Trade: Impacts on Agricultural Markets and Farm Incomes.” *Review of Agricultural Economics* 28 (2): 168–194.
- Annabi, N., J. Cockburn, and B. Decaluwé. 2006. *Functional Forms and Parameterization of CGE Models*. Modeling and Policy Impact Analysis Working Paper 2006-04. Dakar, Senegal: Partnership for Economic Policy.
- Barnett, K., and C. Grown. 2006. *Gender Impacts of Government Revenue Collection: The Case of Taxation*. Economic Paper No. 62. London: Economic Affairs Division of the Commonwealth Secretariat.
- Bouazouni, O. 2008. “Matrice de Comptabilité Sociale de l’Algérie—Exercice 2002.” Mimeo, Research Center for Economics Applied to Development, Algiers, Algeria.
- Çağatay, N. 2003. “Gender Budgets and Beyond: Feminist Fiscal Policy in the Context of Globalization.” *Gender and Development* 11 (1): 15–24.
- Çağatay, N., D. Elson, and C. Grown. 1995. “Introduction.” *World Development* 23 (11): 1827–1836.
- Central Agency for Public Mobilization and Statistics. 2009. Egypt Labor Market Panel Survey for 2006. Cairo, Egypt. Accessed September 14.
- _____. 2008. “New Social Accounting Matrix for 2006/07.” Cairo, Egypt. Accessed November 30.
- Chatti, R. 2002. “Matrice de Comptabilité Social de la Tunisie pour l’Année 1998.” Mimeo, Institut des Hautes Etudes de Tunis, Tunisia.
- Cockburn, J., B. Decaluwé, I. Fofana, and V. Robichaud. 2008. “Gender and the Dynamic Gain from Trade.” Paper presented at the 11th annual Conference on Global Economic Analysis, Helsinki, Finland, June 12–14.
- Decaluwé, B., A. Martens, and L. Savard. 2001. *La Politique Economique du Développement et les Modèles d’Equilibre Général Calculable*. Montreal: University of Montreal Press.
- Elson, D. 1995. “Gender Awareness in Modeling Structural Adjustment.” *World Development* 23 (11): 1851–1868.
- Eurostat. 2007. “Rise in Overall Tax Burden in the EU27 to 39.6% of GDP in 2005.” Press release, Eurostat Press Office, Luxembourg.
- “Femmes et Pauvreté en Afrique du Nord.” 2002. Paper presented at the 17th meeting of the Intergovernmental Committee of Experts of the Economic Commission for Africa, Tanger, Morocco, April, 3-5.
- Fofana, I., J. Cockburn, and B. Decaluwé. 2003. “Modeling Male and Female Work in a Computable General Equilibrium.” Mimeo, Inter-University Centre on Risk, Economic Policies, and Employment (CIRPÉE), Laval University, Quebec, Canada.
- Fontana, M., and A. Wood. 2000. “Modeling the Effects of Trade on Women at Work and at Home.” *World Development* 28 (7): 1173–1190.
- High Commission for Planning. 2009. National Household Consumption and Expenditure Survey 2000-2001. Rabat, Morocco: Statistics Directorate. Accessed February 2.

- Hoddinott, J., and L. Haddad. 1994. *Does Female Income Share Influence Household Expenditures? Evidence from Cote d'Ivoire*. Working Papers Series 94.17. Oxford, UK: Centre for the Study of African Economies, University of Oxford.
- Huber, E. 2005. *Gendered Implications of Tax Reform in Latin America: Argentina, Chile, Costa Rica, and Jamaica*. Geneva: United Nations Research Institute for Social Development.
- International Labour Organization. 2009. NationMaster database. Accessed November 3. www.nationmaster.com/red/country/mo-morocco/lab-labour&all=1.
- Jensen, H., S. Robinson, and F. Tarp. 2002. *General Equilibrium Measures of Agricultural Policy Bias in 15 Developing Countries*. Trade and Macroeconomics Division (TMD) Discussion Paper No. 105. Washington, DC: International Food Policy Research Institute.
- Kabeer, N. 2003. *Mainstreaming Gender Equality in Poverty Eradication and the Millennium Development Goals*. London; Ottawa: Commonwealth Secretariat; International Development Research Center and Canadian International Development Agency.
- Klasen, S. 1999. *Does Gender Inequality Reduce Growth and Development? Evidence from Cross-Country Regressions*. Policy Research Report on Gender and Development Working Paper Series No. 7. Washington, DC: World Bank Development Research Group / Poverty Reduction and Economic Management Network.
- Laframboise, N., and T. Trumbic. 2003. *The Effects of Fiscal Policies on the Economic Development of Women in the Middle East and North Africa*. Working Paper 03/244. Washington, DC: International Monetary Fund .
- Löfgren, H. 2001. *Less Poverty in Egypt? Exploration of Alternative Pasts with Lessons for the Future*. TMD Discussion Paper No. 72. Washington, DC: IFPRI.
- National Institute of Statistics. 2009. Survey on Small Business for 1997. Tunis, Tunisia. Accessed February 20.
- _____. 2009. National Labor Force Survey for 1999. Tunis, Tunisia. Accessed February 20.
- _____. 2009. Consumption and Expenditure Survey for 2000. Tunis, Tunisia. Accessed February 20.
- Pleuffer, B., and S. Weibert. 2005. "Gender Bias in Tax Systems: The Example of Ghana." *Accountancy Business and the Public Interest* 5 (2): 32–53.
- Robinson S. and H. Ahmed. 2008. "Identifying and Measuring Agricultural Policy Bias in Ethiopia." Paper presented at the 11th annual Conference on Global Economic Analysis, Helsinki, Finland, June 12–14.
- Smith, T. 2000. "Women and Tax in South Africa." in *Women's Budget Series: 2000 Issue*. Cape Town, South Africa: Parliamentary Committee on the Quality of Life and Status of Women, Community Agency for Social Enquiry, and Institute for Democracy in Africa.
- Stotsky, J. 2006. *Gender Budgeting*. Working Paper 06/232. Washington, DC: IMF.
- Stotsky, J. 1996. *Gender Bias in Tax Systems*. Working Paper 96/99. Washington, DC: IMF.
- World Bank. 2009. World Development Indicators Database. Accessed November 3 <http://devdata.worldbank.org>.

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