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Effects of Free Trade on Women and Immigrants: CAFTA and the Rural Dominican Republic

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Summary. — We construct a disaggregated rural economywide model with a focus on gender and immigration as well as on the allocation of time to wage work, household production activities, and housework (reproduction). We use this model to simulate the impacts of the Dominican Republic-Central American Free Trade Agreement (DR-CAFTA) on rural incomes and welfare in the Dominican Republic. We find that elimination of agricultural import tariffs hurts both agricultural and non-agricultural households, *via* adverse factor-market effects, but impacts vary substantially by workers' gender and country of origin. Females and Haitian immigrants tend to fare better than Dominican males, and there are ramifications for both market and non-market activities.

Key words — gender, immigration, general equilibrium models, Dominican Republic, Haiti, Central America and the Caribbean

1. MOTIVATION AND LITERATURE REVIEW

Who are the winners and losers from free trade? It is generally believed that trade liberalization has positive impacts for most, although its effects may differ across social classes, industries, and regions within countries. Identifying losers is particularly relevant in rural areas of less developed countries, which are home to 75% of the world's poor. The sign and size of impacts are likely to be determined by idiosyncratic factors such as preferences, income sources, and differences in employment opportunities across households and worker groups.

There are fundamental differences between men's and women's access to labor markets, production activities, and intra-household wealth in rural economies (Anker, 1998). Reliance on immigrants for low-skilled labor in agricultural production is a frequent phenomenon throughout the world (Taylor, 2010), and most international migration is toward developing countries (Massey *et al.*, 1998). In light of this, the restructuring of rural economies around new trade regimes is unlikely to be neutral with regard to gender or immigration status. Despite growing awareness that the impacts of policy outcomes vary among demographic groups, neither gender nor immigration have been the focus of much trade policy modeling.

The present research brings gender and immigration status squarely into a model aimed at understanding the impacts of agricultural trade and policy shocks in a rural economy. Our Gender and Immigration Model (GIMO) draws heavily on the Computable General Equilibrium (CGE) tradition, with the important distinction that it is constructed for a rural rather than a national or multi-nation economy. The key question we address is whether workers' gender and immigration status shape policy impacts in the rural Dominican Republic, and if so, how. We explicitly model the imperfect allocation of labor among paid and unpaid work, agricultural and non-agricultural work, housework, and leisure. Our model highlights ways in which workers may be affected differently depending on their gender and national origin as well as disparities in welfare impacts among female- and male-headed Dominican and Haitian immigrant households.

(a) *Modeling the impacts of agricultural trade and policy reforms*

For developing countries entering into new trade regimes, reforms frequently entail the elimination of import tariffs on agricultural products (Taylor, Yunez-Naude, & Jesurun-Clements, 2010). Overwhelmingly, the view of researchers and policy makers alike has been that urban residents win but rural populations lose from food tariff removal. The urban gain results from lower consumption costs, while the rural loss is a consequence of increased competition with imported agricultural and livestock goods, which depresses both profits and wages in a sector in which less developed countries presumably have a comparative advantage.

Aggregate empirical studies offer mixed findings on the welfare effects of trade reforms. Tangermann (2005), using the Global Trade Analysis Project (GTAP) platform, concludes that full agricultural liberalization by high-income countries would enhance the nonagricultural terms of trade for developing countries, thus yielding income gains. However, Anderson and

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Valenzuela (2007), also using a GTAP model, find negative effects of own-country agricultural trade reforms on agricultural value-added in all the developing countries they considered.

Micro agricultural household theory suggests that the impacts of agricultural market liberalization on less developed country rural welfare are ambiguous. Rural households lose as agricultural producers or suppliers of factors to farms when the prices of farm goods decrease. However, they also consume food, and many farmers are net buyers of protected commodities (Minot & Goletti, 1998; Zezza *et al.*, 2008). Like urban households, they stand to benefit as consumers. Whether the negative production or positive consumption effect dominates is an empirical question, and the answer may be different for different types of rural households. Furthermore, market linkages create general equilibrium effects. For example, a decrease in the price of food grains may benefit households that grow fruits and vegetables if it leads to a drop in wages or land rents. Even the apparently simple impacts of agricultural trade reforms on factor prices are ambiguous; they depend on the relative factor intensities of the directly and indirectly affected activities.

New research using disaggregated rural economywide models (DREMs) casts doubt on the assumption that rural household welfare is inversely related to food prices. Taylor, Dyer, and Yúnez-Naude (2005) find that lower import tariffs on food reduce nominal incomes for nearly all rural household groups in El Salvador, Guatemala, Honduras, and Nicaragua. However, they also lower consumption costs substantially. The net effect on welfare is positive in most cases, implying that pre-CAFTA agricultural protection policies were disadvantageous for most rural household groups.

Trade liberalization thus unleashes a complex interweaving of influences in rural markets, and the net welfare outcomes are difficult to predict. Computable General Equilibrium (CGE) modeling is a useful tool to research this topic, and it occupies a central place in the prolific literature on trade integration. CGEs are designed to portray whole economic systems with many actors and activities interacting in multiple markets and through multiple feedback channels. They can highlight specific mechanisms underlying aggregate impacts of trade policies. CGEs all share a similar structure, with equations describing the behavior of each institution or actor in the model: production activities, factors, households, and exogenous actors such as governments or world markets, as well as the flow of goods and income between actors (i.e., activities demanding factors or households paying for commodities). They are differentiated by their scope (the boundaries of the economy being modeled); the disaggregation of production sectors, factors and households; and the choice of functional forms representing the behavior of groups of similar agents. In their most disaggregated form, they nest general equilibrium models of individual, heterogeneous actors within a general equilibrium model of a larger economy (Dyer, Boucher, & Taylor, 2006). Aggregate country CGEs also may be nested within a multinational CGE model (e.g., Robinson, Burfisher, Hinojosa-Ojeda, & Thierfelder, 1993).[1]

(b) *Disaggregation of trade policy impacts*

It is often convenient to think of trade policy impacts in terms of GDP or *per-capita* income. However, such aggregate outcomes tend to hide important variations in impacts across sectors and socioeconomic groups. Because of this, it has become standard for CGE models to distinguish among multiple productive activities, household types, and worker groups. Studies using the GTAP model, arguably the most commonly used aggregate general equilibrium modeling platform, recently emphasized the importance of disaggregating poverty impacts (Hertel, Keeney, Ivanic, & Winters, 2009).[2]

Distinct labor groups may be included in CGE models if modelers have access to disaggregated information on salaries paid to workers participating in different activities, holding different positions, or earning different wages. The number of worker categories in CGE models of trade reforms usually is limited. The criterion of choice is almost always skill level, although a rural–urban divide is not uncommon (Cloutier *et al.*, 2008). GIMO distinguishes laborers by their gender and national origin.

The number of household types in CGEs usually is limited but on occasion reaches several dozen (Devarajan & van der Mensbrugghe, 2000; Harrison, Rutherford, & Tarr, 2003) or even all households surveyed for the study (Chitiga, Cockburn, Decaluwé, Fofana, & Mabugu 2010; Cockburn, 2002; Dyer *et al.*, 2006). The level of disaggregation is a function of data availability and modeling objectives. Greater disaggregation enables modelers to explore differences in the ways in which households experience policy shocks, and in some models, the ways in which heterogeneous household responses shape aggregate outcomes.

Almost all models distinguish household types by their initial income levels relative to a poverty line or as income percentiles (Cloutier *et al.,* 2008). This is a convenient criterion clearly correlated with capital ownership, skill levels, and expenditures. It allows researchers to interpret simulation results in terms of inequality. Income patterns are also related to a household's endowment of production factors. For example, landowners can derive income from their capital by way of agricultural production, while landless households have to sell their labor for wages. That is why many models of rural economies distinguish households by land ownership (Adelman, Taylor, & Vogel, 1988; Bautista & Thomas, 2000; Taylor & Dyer, 2009). Sometimes, households are also distinguished by their primary source of income (agriculture, wage labor, transfers, *etc.*). In our model, we distinguish agricultural from rural non-agricultural households. The agricultural policies embedded in CAFTA will alter the prices of agricultural commodities and thus affect the income of agricultural households directly. Non-agricultural households may be affected *indirectly via* general equilibrium effects on rural factor and commodity markets. Differentiating between agricultural and non-agricultural rural households highlights these indirect income effects. This is particularly important in light of the non-negligible share of non-agricultural households in the rural economies of the developing countries long thought to be predominantly agricultural (Ellis, 2000).

While high levels of disaggregation are now standard in economywide models, gender and immigration status are rarely used as a basis for categorizing household types or worker groups. This masks potentially important trade reform impacts.

(c) *Disaggregating gender and immigrant status in an economywide model*

Labor market disparities along gender, social, or ethnic divisions have been studied extensively. The distribution of males and females across occupations is notoriously unequal, at all geographic levels. Worldwide, in order to equalize this distribution, about 60% of working females would have to switch jobs; this figure is usually higher in developing than in developed countries (Anker, 1998, p. 175). In the US, racial and