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Pro-poor trade policy in Sub-Saharan Africa ☆

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ABSTRACT

This paper examines the presence of a pro-poor bias in the existing structure of protection of six Sub-Saharan African (SSA) countries, Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Gambia, and Madagascar. We build on a simple agricultural household production model and we propose an extension to include adjustments in labor income. Our approach, which can be implemented without repeated cross-sections of household level data, suits well the data constraints in SSA. It also allows us to capture the heterogeneity in trade protection at the tariff line level. The pro-poor bias indicators suggest that SSA's trade policies tend to be biased in favor of poor households, as these policies redistribute income from rich to poor households. This is because protection increases the agricultural prices of goods that are sold by African households and this effect dominates both the impacts of higher consumption prices and the strong Stolper–Samuelson effects that benefit skilled over unskilled workers.

1. Introduction

Trade liberalization makes some individuals better off and others worse off. Reductions in tariffs and non-tariff barriers affect consumer and producer prices, which in turn affect household production, household consumption, labor earnings, and transfers. Since the poor and the rich generally consume different bundles and have different sources of income, trade policy affects them differently. This may lead to a systematic bias in trade policy. In this paper, we propose an empirical framework to measure the pro-poor or anti-poor bias in trade protection and we apply this framework to six countries in Sub-Saharan Africa (SSA): Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Gambia, and Madagascar.

Trade policy is pro-poor if the *existing* structure of protection benefits poor households proportionately more than rich households. Note that this implies that the *elimination* of the existing structure of protection is actually pro-rich, or anti-poor, in the sense that the resulting proportional change in welfare is larger for rich than for poor households. We thus propose a simple indicator of pro-poor bias given by the difference between the percentage change in welfare of the average household in the top and bottom deciles of the income distribution. A larger index reveals a larger poverty bias in the existing structure of trade protection (i.e., a larger redistribution from rich to poor households associated with the existing levels of protection).

To identify pro-poor trade policies, we need to compute the changes in welfare at the household level that would be caused by the elimination of the observed levels of trade protection. We work with a framework where changes in household welfare are approximated by changes in household real income and where these changes in welfare can be decomposed into consumption, production and labor income effects (Deaton, 1997; Winters et al., 2004). Measuring the consumption and production effects is straightforward with information on consumption and production shares. Labor income effects, which are potentially very important because labor earnings represent between 30 and 70% of total household income in our target SSA countries, are harder to measure. In particular, we need to calculate the share of labor income derived from different types of labor (skilled and unskilled) and to estimate the responses of the returns of these different types of labor to changes in prices, i.e., the wage–price elasticities.

The recent literature has estimated these elasticities by either exploiting the time-series variation in prices and in household surveys or the long aggregate time series in wages and prices. See for instance Nicita (2009) for Mexico, Porto (2006, 2010) for Argentina, Ravallion (1990) for Bangladesh, Revenga (1997) for the U.S., and Ural

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Marchand (2012) for India. This identification strategy requires data that is typically unavailable for most Sub-Saharan African countries. To circumvent this problem, we put forward a framework to estimate wage–price elasticities based on duality theory. Young's theorem suggests that the second cross derivatives of the GDP function with respect to goods' prices and factor endowments are equal, which implies that the first derivative of factor prices with respect to goods' prices (the wage–price elasticities) is equal to the first derivative of quantities with respect to factor endowments. This is convenient because of the widespread availability of detailed information on quantities exported and imported at the tariff line level, as well as data on factor endowments. We can then estimate the impact of changes in the endowment of unskilled and skilled labor on imported and exported quantities at the six-digit level of the Harmonized System (HS). According to Young's theorem, this impact is equal to the impact of changes in goods prices on unskilled and skilled labor wages.

An advantage of our methodology is that it allows for the estimation of the responses of wages to price changes of very disaggregated goods (at the six-digit level of the HS, for example). This is impossible with the current methods that utilize either household data or aggregate time series data. Estimating disaggregated elasticities is, however, important.[1] Trade policy is determined at the tariff line level, and there is significant variation across tariff lines within industries in terms of both protection levels and production techniques (i.e., factor intensities). For example, the HS 52 category ("cotton") includes products such as "raw cotton, not carded or combed" (HS 520100) and "woven cotton fabrics with less than 85 percent cotton" (HS 521011), which differ in production techniques. In addition, trade policy also varies. In Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, and Madagascar, the tariff on raw cotton is half the tariff on woven cotton fabrics. In Ethiopia, the tariff on woven cotton fabrics is three times larger than the tariff on raw cotton (30 versus 10%). This interplay between trade protection and production techniques at a disaggregated level affects skilled and unskilled wages. Aggregation at higher levels than the tariff line level at which trade policy is determined may lead to aggregation bias. The methodology developed in this paper avoids these potential biases.[2]

Our empirical results suggest that, with the exception of Ethiopia, domestic Sub Saharan Africa's trade policy is biased in favor of poor households.[3] As expected, the three channels identified in the paper go in different directions. Our overall results are mainly explained by the production (agricultural sales) channel which is pro-poor, except in Ethiopia. Given that agricultural sales represent a large share of poor households' income, the prevalent protection to agricultural products in these countries benefits poor households more than rich households. In contrast, SSA trade policy protects skilled labor, which is predominantly owned by richer households.[4] The consumption (or expenditure) channel is neither systematically pro-rich nor pro-poor. It varies across countries depending on the correlation between the structure of protection and consumption patterns among poor and rich households. In four out of six countries, the consumption effect is pro-rich, but in the remaining two, it is pro-poor. Nevertheless, the contributions of the consumption and labor income effects are always dominated by the contribution of the production effect.[5]

The remainder of this paper is organized as follows. Section 2 describes the analytical framework used to measure the pro-poor bias of trade policy. Section 3 describes our three-step empirical methodology for the implementation of the analytical setup. In the first step, we describe the harmonization of different household surveys to compute budget and income shares at the household level in each SSA country. In the second step, we measure the restrictiveness of trade policy. In the last step, we describe our empirical methodology to estimate the impact that changes in trade policy have on wages of skilled and unskilled workers in SSA. Section 4 presents the results, Section 5 performs a robustness analysis, and Section 6 concludes.

2. Pro-poor trade policy

Our measure of the pro-poor bias of trade policy is based on estimates of the differential impact of trade barriers on the real income of the poor vis-à-vis the non-poor, or more generally, on the differential impact of trade on household incomes at different levels of income. The theoretical framework that we use to derive the welfare impact of price changes is based on the standard model introduced by Deaton (1989, 1997) and expanded by Ravallion (1990), Porto (2006, 2010), Nicita (2009), and Coello et al. (2011). Household h welfare is measured with the indirect utility function V_h:

$$V_h = V_h(y_h, \mathbf{p}), \tag{1}$$

where y_h is the household income and $\mathbf{p}$ is a vector of good prices. In our analysis, and because of limitations of our data, we focus on the prices of traded goods (non-traded goods, except for labor, are not considered here).

Household income is determined in a farm-household model, as in Singh et al. (1986) or Benjamin (1992). Each household has an endowment of labor, which can be allocated to various possible activities.[6] Households can consume some leisure, work on their own farm to produce goods to sell to the market, or sell labor off-farm (or purchase labor in the labor market). Households may also benefit from government transfers that can be related to tariff revenue or be independent of it. Household income is defined as:

$$y_h = wL_h + \sum_g \pi_{h,g}(\mathbf{p}) + G_h + \phi_h T, \tag{2}$$

where w is the wage rate, L_h is the (net) amount of labor sold in the market by household h, $\pi_{h,g}$ is the profits obtained from selling good g, G_h is the government transfers to household h not associated with tariff revenue, ϕ_h is the share of tariff revenue redistributed to household h and $T = \sum_g t_g p_g^* m_g$ (where p_g^* is the international price of the good g, m_g is the good g imports and t_g is the good g tariff rate) is the tariff revenue collected over all goods g subject to tariffs.

To derive the first order welfare impact of a change in price p_g, we need to totally differentiate (1) and (2). As in most of the related literature, we assume that markets are perfect and complete, so that the principle of separability holds. For our purpose, this implies that households

[1] Goldberg and Pavcnik (2004), in their review of the empirical literature on trade, income inequality and poverty, called for a higher product disaggregation in empirical studies of the impact of trade on wages. The high product aggregation in household surveys makes the identification of worker reallocation across very aggregated sectors difficult and thus may reduce the estimates of the impact of trade reforms on wages.

[2] Note that our approach cannot capture the heterogeneity in wage–price elasticities across worker characteristics as in Porto (2006, 2010) or Nicita (2009). While those studies can estimate different impacts for workers in different regions and with varied levels of work experience, here we can only capture the heterogeneity across characteristics for which we have endowment data available across countries and time. Given the available data, this heterogeneity is limited to differences in skill endowments. Another advantage of their approach using household-level data is that they do not need to make any assumption regarding the function of the labor market. As will become clearer, we assume perfect labor market mobility.

[3] This implies that the removal of trade barriers will bring relatively larger benefits to rich households.

[4] Note that this implies that the elimination of SSA's own trade policies would lead to increases in unskilled wages, and decreases in skilled wages. Since SSA is mostly abundant in unskilled labor, and protection is often granted on imported, skilled-intensive goods, these results are consistent with the standard Stolper–Samuleson predictions.

[5] One could explore the impact on social welfare of these redistributional consequences of trade reform using a framework similar to the one recently put forward by Francois and Rojas-Romagosa (2011) where a pro-poor bias in the existing structure of trade protection would imply gains to society from the removal of trade protection that would be smaller than those obtained for an economy with representative consumer and producer.

[6] Households are also endowed with other factors of production, such as land or assets, which are assumed for simplicity to be fixed.