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Minimum Wages and Household Poverty: General Equilibrium Macro–Micro Simulations for South Africa

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Summary. — The poverty-reducing effects of minimum wages depend on its effectiveness in targeting the poor and the extent to which job losses and price increases offset income gains. We develop a general equilibrium microsimulation model to simulate the economywide effects of minimum wages in South Africa. We find minimum wages lead to a marginal decline in poverty and overall inequality. However, job losses are more likely to affect the poorest among minimum wage workers, while rising production costs reduce overall household welfare. The policy is not an effective anti-poverty tool in South Africa given poor targeting and adverse price effects, which are often unaccounted for in policy simulations.

Key words — Sub-Saharan Africa, South Africa, minimum wages, poverty, general equilibrium modeling, microsimulation modeling

1. INTRODUCTION

Minimum wages are used widely in developing countries to protect vulnerable workers, reduce wage inequality, and lift the working poor out of poverty. The political popularity of minimum wages stems in part from the fact that the policy offers a means for redistributing income without having to increase government spending or establish formal transfer mechanisms (Card & Krueger, 1995). The challenge to policymakers is to find that wage level that is considered fair given workers' needs and the cost of living, but does not harm employment or a country's global competitiveness (Figueiredo & Shaheed, 1995; Gindling & Terrel, 2010).

Economic theory as well as applied work in the area of minimum wages tends to focus on the employment effects of the policy. Fields and Kanbur (2007), however, argue that a more pertinent welfare question is how minimum wages affect poverty. This is especially true in developing countries where poverty reduction remains a major policy goal, and where attachment to the labor market does not necessarily mean not being poor. However, minimum wages are sometimes considered ineffective in targeting the poor in developing countries, mainly because the poor are more likely to be unemployed, self-employed, or employed in informal sectors where enforcement of minimum wage policy is challenging (Lustig & McLeod, 1997).

This study undertakes an empirical investigation of how minimum wages impact on poverty in South Africa. We develop an *ex ante* macro–micro modeling framework that captures both the economywide and micro-level distributional effects of minimum wages. The analysis contributes to earlier *ex post* and *ex ante* analyses by modeling the various channels through which minimum wages affect poverty within an integrated framework. South Africa presents a unique case study, not only because minimum wage policy design differs from one country to the next in terms of targeting or the level of the wage minimum in relation to the poverty line, but also because of the unique characteristics of its labor market (Section 3 elaborates). Our results are therefore not necessarily representative of developing countries in general. That said, the conceptualization and methods used are novel and, we believe, widely applicable.

The paper is organized as follows. Section 2 discusses pertinent theoretical and modeling issues with reference to the existing literature. Section 3 provides background on South Africa's labor market, including details of the minimum wage policy. Section 4 introduces the model and Section 5 presents and discusses the simulation results. Section 6 draws conclusions.

2. THEORETICAL CONSIDERATIONS AND ANALYTICAL FRAMEWORK

Both *ex post* and *ex ante* evaluations of the *employment effects* of minimum wages examine the factor demand responses (or wage elasticities) at the level of the firm or sector. While these employment responses are a crucial starting point, evaluations of the *poverty effects* of minimum wages require a more comprehensive understanding of the overall distributional effects of the policy. In an extension to the standard employment-focused minimum wage theory, Fields and Kanbur (2007) show that when poverty impacts are of interest it is no longer just the wage elasticity that matters. Also important are the extent and nature of income sharing within or

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between households (i.e., a consideration of how employment and wage changes in the labor market are linked back to specific households and individuals within households) and the aversion to poverty as captured by the choice of poverty measure.

Fields and Kanbur (2007) make a valuable contribution in highlighting these additional channels. However, their extended model still rests on a number of simplifying assumptions.[1] In practical applications where many of the strict assumptions of their model are relaxed, several further poverty impact channels have been identified. These include considerations around compliance with and/or enforcement of minimum wage legislation in different sectors (Gindling & Terrel, 2010), how minimum wages impact on labor supply and wage levels in sectors not covered by minimum wage legislation (Gindling & Terrel, 2010), and the location of minimum wage workers (as potential beneficiaries) within the overall income spectrum (Burkhauser, Couch, & Wittenburg, 1996; Lustig & McLeod, 1997). The impact of minimum wages on production costs and consumer prices may also have welfare implications (Bird & Manning, 2008). Finally, efficiency wage theorists claim higher wages reduce shirking, raise the efficiency of labor utilization, or directly increase worker productivity due to increased nutritional intake (see Shapiro & Stiglitz, 1984). These induced labor productivity gains may reduce employment losses associated with minimum wages.

Gindling and Terrel (2010) provide a thorough review of the literature on minimum wages and poverty in developing countries. Among these, the *ex post* cross-country studies surveyed by them are fairly consistent in the message that an inverse relationship exists between (changes in) poverty and (changes in) the minimum wage, while results from country-level analyses using micro-data, which include *ex post* and *ex ante* approaches, are more mixed. They stress that *ex post* analyses such as their own in Honduras fail to isolate the effects of minimum wages *per se* from those of other external shocks. This common problem of *ex post* analyses is solved by *ex ante* models, which allow for real-time policy analysis in a manner that is less time-consuming and less costly than *ex post* analyses (Bourguignon & Spadaro, 2005). However, *ex ante* models rely on explicit assumptions about economic behavior and as such should be viewed as exploratory tools rather than predictive tools.

Somewhat surprisingly, there are few examples of *ex ante* simulations of minimum wages and poverty. Models developed by Hertz (2002) and Bird and Manning (2008) respectively provide for an interesting comparison. Hertz's (2002) household survey-based model identifies those domestic workers in South Africa that benefit from a hypothetical minimum wage and those that are most likely to lose their jobs (based on econometrically estimated employment probabilities) under a range of wage elasticities. Through combining wage income gains and losses at the household-level he is able to demonstrate how poverty declines as long as the wage elasticity parameter is inelastic. Bird and Manning (2008) simulate the poverty impact of minimum wages in Indonesia using a short-run model in which firms mitigate the effect of increased production costs by raising consumer prices rather than by shedding jobs. While about one-fifth of households benefit from higher wages, the remainder requires a higher level of income to acquire the same basket of goods as before. The authors conclude that while minimum wages are mildly progressive under the targeting and the funding mechanisms assumed, they are unlikely to significantly reduce poverty in Indonesia.

The above two *ex ante* approaches capture partial effects only, with two major omissions: first, the models restrict firms' cost mitigation options; and, second, neither model considers the indirect implications of price changes in the economy. In reality firms are likely to use a combination of lay-offs, charging higher prices, and profit reduction to mitigate production cost increases. Poverty impacts are likely to be sensitive to the mitigation strategy followed. For example, when the wage elasticity is low and the employment response is small, more minimum wage workers will benefit, but minimum wage sectors will be forced to raise prices. Conversely, when the wage elasticity is high, fewer workers will benefit from higher wages but price increases will be smaller.

The indirect effects of minimum wages stem from the fact that higher prices in minimum wage sectors spill over into other sectors via inter-industry linkages. Ultimately, aggregate demand and consumption patterns will be affected by price and household income changes, which in turn have secondary implications for production and employment in the economy via various demand channels. We therefore argue that economywide general equilibrium models are better equipped than partial equilibrium models to deal with the complex cost mitigation strategies and indirect price and demand effects associated with minimum wage policies. Yet, despite their discernable advantages, not many general equilibrium applications of minimum wages and poverty exist. Standard neoclassical modeling applications include analyses by Holland, Bhattacharjee, and Stodick (2006) in the United States and Paes de Barros, Corseuil, and Cury (2001) in Brazil, while Gibson and Van Seventer (2000) apply a structuralist general equilibrium model to evaluate the effect of wage increases in South Africa.

The limited number of general equilibrium modeling applications probably relates to the fact that traditionally these models are not used in the analysis of microeconomic policies. Even modern neoclassical computable general equilibrium (CGE) models which are often highly disaggregated are not particularly well suited to analyzing poverty and distributional changes at the level of the household. This stems from the restrictive assumption that income distributions within representative household and factor groups in the model are static (Bourguignon & Spadaro, 2005). For poverty assessments, at least, survey-based partial equilibrium models (or microsimulation models) in the mold of those described above are more appropriate. However, by linking macro- (CGE) and microsimulation models sequentially, the advantages of each modeling approach can be exploited. Such an integrated modeling framework is developed here for South Africa and used to evaluate the poverty effects of minimum wages.

3. SOUTH AFRICA'S LABOR MARKET AND MINIMUM WAGE LEGISLATION

During 2002–06 South Africa's Department of Labor adopted eleven sectoral determinations that govern general conditions of employment in various economic sectors or occupation groups, including setting minimum wages. Sectors or occupation types covered include (1) the retail sector, (2) domestic workers, (3) farm workers, (4) forestry workers, (5) taxi operators, (6) security personnel, (7) the hospitality industry, (8) contract cleaners, (9) learnerships (government subsidized training-linked apprenticeships), (10) children working in performance arts, and (11) the civil engineering sector. This study considers the first eight sectoral determinations. Those covering learnerships and children working in performance arts are excluded from our analysis because these particular occupation groups are not properly defined or distinguished