**WORLD BANK GROUP**
Poverty & Equity

# POVERTY & EQUITY NOTES

## Welfare and competition (WELCOM): a simulation approach

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*This note focuses on the Welfare and Competition (WELCOM) microsimulation tool. WELCOM, an easy-to-use Stata-based package with minimum data requirements, was conceived as part of larger World Bank efforts to better understand how competition policy can improve market efficiency and reduce poverty, especially in developing countries. Using examples from Mexico and Ethiopia in the telecommunications and food sectors, this note shows how WELCOM can estimate likely distributional effects—that is, decrease in price and poverty, and increase in product uptake—from expanding competition.*

**Fully grasping the distributional effects of competition is central for policymaking.** Households at the lower end of the income distribution are commonly most negatively affected by market concentration, since they tend to consume more homogeneous goods, have less opportunity to substitute consumption, and have restricted access to markets.[1] Therefore, policies promoting competition in concentrated markets could help reduce poverty, and increase growth and productivity.

**The Welfare and Competition tool (WELCOM) fills an important analytical gap.**[2] While several studies have rigorously analyzed the casual relationship between market concentration and household welfare, conducting this analysis is demanding in terms of time, data needs, and identification of event studies.

### Methodology and Data

**WELCOM estimates likely welfare effects of changes in competition.** The tool uses a simulation approach based on minimum data requirements. WELCOM combines expenditure data from typical national representative household surveys used for poverty analysis with parameters on expected outcomes of competition reform, which would modify the market

structure of certain industries: for instance, breaking up a total monopoly to have only one-half of market share. Using this simple data and competition targets, the tool simulates likely direct distributional effects of competition mediated through changes in prices. WELCOM allows users to estimate models using variation in three alternative market structures: monopoly, oligopoly with a homogeneous good, and partial collusive oligopoly.

**Lower prices resulting from higher competition in production of any good benefits both current and potential new consumers previously "priced out" of a market.**[3] To identify the likely entry effects of new consumers due to lower prices of goods and services, as well as the likely welfare effects for those new entrants, the WELCOM tool has recently developed a new module on "Market Competition and the Extensive Margin Analysis." This new module has been piloted in Ethiopia (see case study on Ethiopia below).

### Case Study: Mexico

**Mexico's history of high market concentration follows the privatization of State-Owned monopolies in the 1990s.** One of the best known cases of privatized monopolies is the one of fixed line

telecommunications. Another known case of market concentration is the corn products market dominated by a duopoly. Both corn and telecommunications comprise a significant percentage of household spending.

**The sum of the expenditure share on these two goods by poor households is higher than for richer households** (Figure 1). The simulation assumes that the mobile telecommunication market behaves as an oligopoly and that corn markets act as a partial collusive oligopoly (PCO). The simulations use price elasticities of demand of −0.476 for mobile communications[4] and −0.876 for corn products[5].

**Figure 1: Expenditure share by income decile on mobile services and corn products**
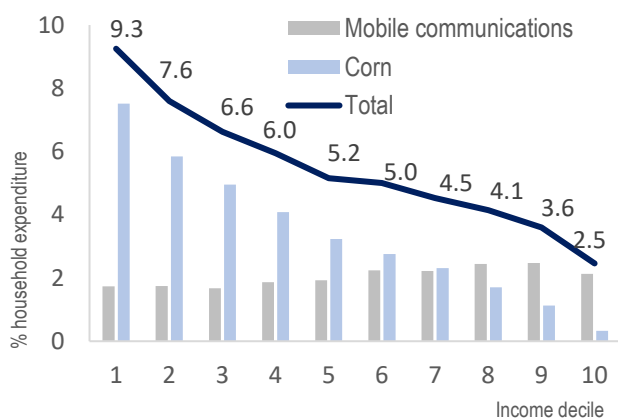


*Source:* Author's elaboration based on ENIGH 2014.

**Expanding competition in both the telecommunications and corn products industry would likely reduce poverty by almost one percentage point.** Reducing the market share of the oligopoly in corn products from 31.2 percent to 7.8 percent, and increasing competition from 4 to 12 firms in the mobile telecommunications sector, would induce a relative price drop of 38.5 percent for corn and 11.4 percent for mobile telecommunications. These price changes would reduce Mexico's poverty headcount by an estimated 0.8 percentage points (Figure 2 and Figure 3), and could produce a drop in the Gini index, which measures income inequality, of 0.32 points.

**Figure 2: Poverty reduction due to competition in mobile comms**
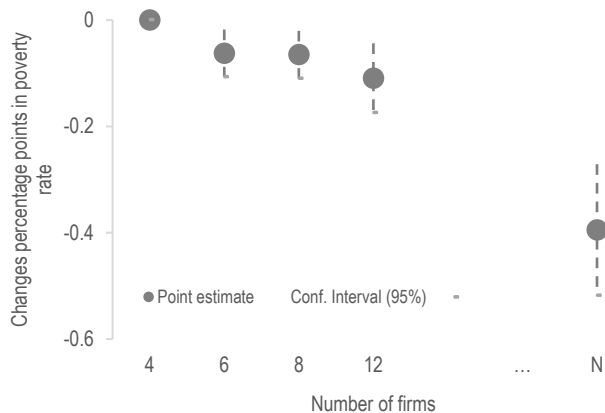


*Source:* Authors elaboration using WELCOM and ENIGH 2014.

Households in the richest deciles of the income distribution would benefit more in relative terms from lower concentration in the mobile communications market, since they spend a higher share of their incomes on telecommunications than on consumption categories such as food and beverages.

**Figure 3: Poverty reduction due to competition in the corn flour market**
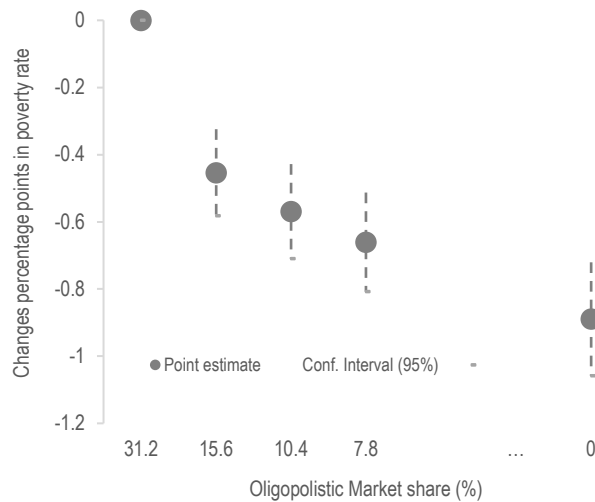


*Source:* Authors elaboration using WELCOM and ENIGH 2014.

In contrast, a decline in market concentration in corn products would benefit households at the bottom of the income distribution relatively more, since these goods represent a higher share of their food expenditures.

**Figure 4: Relative impact on household budgets by income decile**
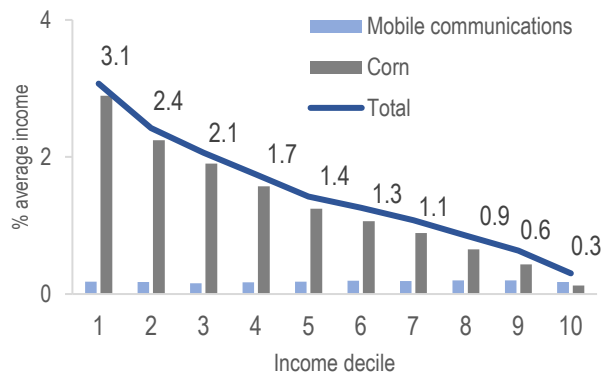


*Source:* Authors elaboration using WELCOM and ENIGH 2014.

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### Case Study: Ethiopia

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**The telecommunications market in Ethiopia is dominated by the state-owned monopoly provider**, Ethio Telecom. By 2019, Ethiopia's ICT market was one of the most concentrated worldwide, according to the Herfindahl-Hirschman index (HHI) (GSMA 2019).

**High market concentration and high prices in the telecom industry partially explain the low take-up of telecommunications by poor households.** Only 14 percent of households in the poorest decile reported spending on telecom services in the 2015/16 national household survey (HCES). The simulation conducted for this case study assumes that the mobile telecommunication market is a monopoly with price elasticity of demand (PED) of -1.5.[6]

**Opening the telecom sector to competition would have positive welfare effects for current consumers.** WELCOM estimates suggest that decreasing Ethio Telecom's mobile services market share from 100 to 45 percent would induce poverty reduction of 0.2 percentage points in the short-term and up to 0.8 in the long-term, assuming no additional take-up of telecommunications services; this implies that welfare gains accrue only to current users of mobile communication services.

**Breaking up the monopoly in telecommunications would also spur technology adoption (extensive margin), from users previously priced out of the market.** Using the expected relative decrease in prices of 25 percent due to increased competition, the "Market Competition and the Extensive Margin Analysis." module of the WELCOM tool estimates new user uptake of 4,423,938 new users, equivalent to a 4.9 percentage point increase in total individual users.

**Households between the third and seventh decile of the expenditure distribution would likely make up the largest portion of new users of telecom services,** with increases in the probability of expenditure of about 11.8 percent. Relative welfare gains (higher expenditure) for new users is expected to be between 1.14 and 1.33 percent (lower and upper bounds in Figure 5, respectively). Households in higher expenditure deciles would see the highest absolute welfare-enhancing effects from competition, since they are expected to spend more on telecommunication services than poorer households.

**Figure 5: Competition in telecom would induce higher use of mobile services**

Bars represent relative percentage change in probability of use, dots show relative welfare gain of old and new users as a percentage of average expenditure.
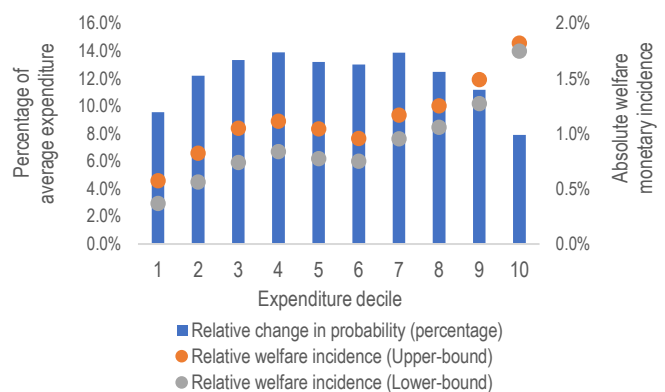


*Source:* HCES, 2015/16.
Notes: Upper-bound expenditure estimates were carried out using random imputation. Lower-bound estimates were carried out taking average expenditure by primary sampling unit.

## Conclusions

We applied the easy to use WELCOM tool to these case studies in Mexico and Ethiopia. The results—decreasing prices and increasing product uptake—show how the tool can help with policy making by estimating the effects on consumers and poverty reduction from freeing sectors to more competition. Mexico and Ethiopia provide useful examples to inform development practitioners and academics about the potential distributional gains of reducing concentration in key industries in developing countries.

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[1] Creedy, J. and Dixon, R. (1998). "The Relative Burden of Monopoly on Households with Different Incomes." Economic, New series, Vol. 65, No. 258 (May, 1998), pp. 285-293.; Urzua, C. (2013). "Distributive and Regional Effects of Monopoly Power." Economía Mexicana, 22(2), pp.279-295.

[2] For more information refer to: Rodriguez-Castelan, Carlos; Araar, Abdelkrim; Malasquez, Eduardo A.; Olivieri, Sergio; Vishwanath, Tara. 2019. Distributional Effects of Competition: A Simulation Approach. Policy Research Working Paper No. 8838. World Bank, Washington, DC.

[3] Changes in consumption expenditure due to changes in the products entering households' consumption basket.

[4] Elasticity is from Hausman, J.A. and Ros, A.J. 2013. "An econometric assessment of telecommunications prices and consumer surplus in Mexico using panel data." Journal of Regulatory Economics, 43(3), pp.284-304.

[5] Elasticity derived from Deaton's (1999) unit value model and the WELCOM elasticity of demand module.

[6] Fuss, Melvyn (2005), "The Impact of Telecoms on Economic Growth in Developing Countries". Vodafone Policy Paper Series 3.