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Perspectives

Economic Perspectives on Falling Inequality in Brazil

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Introduction

Latin American is well known for having some of the highest rates of income and wealth inequality in the world. In particular, Brazil is often ranked as one of the most unequal Latin American countries according to several measures of inequality. Mexico is another Latin American example of prominent inequality. Brazil and Mexico have both embarked on ambitious trade liberalization programs over the last twenty years. At the same time, both countries have expanded income transfer programs (including conditional cash transfer programs). Globalization and government policy are at the center of the current debate about the forces that contribute to inequality.

The modern debate surrounding globalization focuses on the Latin American trade reforms of the 1990s. Early literature that focused on the effects of trade liberalization in Latin America suggested that inequality rose following trade liberalization, which ran counter to the predictions of neoclassical economic theory. Wood (1997), one of the most prominent papers in this literature, suggested that the rise in inequality in Latin America following trade liberalization may have been due to skill-biased technological change or the rise of China.

Since the 1990s, however, inequality has been falling across Latin America – including in Brazil and Mexico (López-Calva and Lustig 2010). Thus, the post-liberalization pattern of inequality in Latin America follows an inverted U-shape: the initial brief rise has been followed long and sustained fall in inequality. Reasons behind this pattern are the subject of much debate.

The goal of this paper is to explain how economists think about trade and inequality, with a particular focus on recent advancements in trade theory and empirical work. Along the way, the paper will describe recent trends in trade and inequality and explore various alternative explanations for observed changes proposed in recent empirical work that draws upon very large micro-data sets from different countries.

Theory: How economists think about the link between trade and inequality

Economists have produced a voluminous literature examining the link between wage inequality and globalization. The debate has been especially acute in developing

countries. When reviewing this literature, Goldberg and Pavcnik (2007) highlight the different approaches economists take and how this literature reveals that the relationship between globalization and inequality is subtle and complex. The models that economists use to frame the debate generally fall into two groups. The first includes neoclassical models that rely on differences between industries (for example, apparel and machinery) and factors (for example, capital and labor). The second group focuses on differences within industries (for example, between large and small apparel factories). In these models, similar workers in different sized firms received different wages and, as a result, forces that affect large and small firms differently contribute to inequality. Each approach has different implications for the link between globalization and inequality, and so we discuss each in turn.

Between Industries: The Neoclassical Approach

When Wood (1997) suggested that the Latin American experience conflicted with the "conventional wisdom," he was referring to the neoclassical trade models that rely on differences in factor endowments to explain trade patterns. In particular, the Heckscher-Ohlin theorem predicts that labor-abundant[1] countries will tend to produce and export labor-intensive[2] goods. The reason for this is that wages in labor-abundant

[1] The term *labor abundant* is relative. A country is *labor abundant* relative to another country if the ratio of the total number of workers over the total amount of capital is higher than that same ratio in another country.
[2] Like labor abundance, the term *labor intensive* is relative. Labor intensity, however, refers to industries. Labor intensive industries are those that produce using a higher labor to capital ratio than another industry.

countries tend to be lower and therefore the cost of producing labor-intensive goods will be lower than the costs of producing the same goods in high-wage countries.

When applying this model to inequality in developing countries, economists often differentiate labor in terms of education. Less-educated workers are often at the lower end of the wage distribution and workers with more education are often at the higher end. Less-skilled workers play the role of labor and more educated workers play the role of capital (nominally referred to as human capital).

Stolper and Samuelson (1941) show that the relative earnings of these two groups of workers are driven by changes in output prices. Usually trade liberalization would be characterized by falling import prices and rising export prices. If labor-abundant countries produce and export labor-intensive goods, trade liberalization should be followed by an increase in the price of labor-intensive goods in those countries. This price increase, in turn, would increase the wages of the less-educated workers relative to the earnings of the more educated workers. Formally, then, Stolper-Samuelson theorem would suggest that if the relative prices of labor-intensive goods were to rise, the wages of less-educated workers would rise relative to the wages of more-educated workers, which would cause wage inequality to fall. The implications of trade liberalization on wage inequality, therefore, depend on the change in output prices that happen when countries open to trade.

The Heckscher-Ohlin model and the Stolper-Samuelson models are fairly restrictive in the sense that the formal models usually assume that there are just two goods and two countries. Other assumptions further remove these models from reality.

One of the most significant is the assumption that technology is constant. Another is that there is no foreign investment. As Wood (1997), Esquivel and Rodriguez-Lopez (2003), Feenstra and Hanson (1997), and others have noted, changes in technology and foreign direct investment can also affect the relative demand for more educated and less educated workers and therefore affect inequality. They fall into the first group of studies, however, because they focus on differences between industries. The second group of studies focuses on differences within industries.

Within Industries

While the early debate about trade liberalization and inequality in developing countries was in full gear, Melitz (2003) was sowing the seeds for a deeper understanding of the links between trade and inequality. Melitz (2003) presents a theoretic model that is different from the neoclassical models described earlier in that it does not assume that all firms are identical. On the contrary, the model assumes that firms are very different from each other. These differences across firms arise from firm-specific production ability: some firms are simply more productive than others.

When the assumption of firm-specific differences in productivity is combined with assumptions about start-up costs (for both production and for exporting), firms within a given industry will separate into three groups. The first includes the firms that are not productive enough to compete with any other firms, so they simply shut down and do not produce. The second category consists of firms that are productive enough to produce, but not productive enough to export. Exporting requires higher

productivity, so that the model predicts that the exporting firms within an industry are the largest and most productive firms.

The results of this model suggest that inequality may arise from differences across firms within industries. If only a small fraction of firms export, then trade liberalization will allow these firms to expand – perhaps at the expense of the less-productive non exporting firms. If exporting firms pay higher wages, then wage inequality within industries (that is, between the exporters and the non-exporters) will increase. Trade liberalization may also allow firms that were paying lower wages to increase the wages they offer once they start exporting. In this case, trade liberalization might contribute to falling inequality.

Helpman et al. (2014) is a prominent example of a model that illustrates the effects of trade inequality. Through simulations, they show that trade and inequality follow an inverted U-shaped pattern: inequality rises at first and then falls. The main reason is that when the economy first liberalizes, the exporting firms will grow and share a part of their gains with their workers. Since the exporting firms were already paying higher wages, inequality rises. As liberalization increases, however, firms that were not exporting enter the export market. Their increased revenues are, in part, shared with workers. Since these firms were paying lower wages, the increase in wages paid to these workers will reduce inequality.

Between these two theoretic approaches, which has more empirical support? Are there other forces besides globalization that might also be contributing to changing

inequality in Brazil and throughout Latin America? To address these questions, we now describe Brazil's liberalization policies and experience.

Brazil: Economic Reform and Globalization

Like the rest of Latin America, Brazil suffered through the lost decade of the 1980s. Hyperinflation plagued the economy until the government reigned in price increases in 1994.Trade liberalization, however, can be traced back to 1988 when the government reduced tariffs and removed quantity restrictions on imports. Between 1988 and 1993, Brazil reduced the mean tariff rate from 52% to 14% (Sim-Sim David 2011).

The timing of Brazil's liberalization was similar to that of other countries in Latin America. Many Latin American countries liberalized around 1990. Mexico, for example, joined the General Agreement on Tariffs and Trade (GATT) in 1987. At that time, Mexico transformed many quantitative restrictions on imports into tariffs and then implemented a significant unilateral tariff reduction. Perhaps more well-known, however, was the 1994 North American Free Trade Agreement that added Mexico to the U.S.-Canadian Free Trade Agreement.

One of the principle effects of liberalization is to increase trade. Trade volumes increased significantly after liberalization. Figure 1 shows the pattern of exports for Mexico and Brazil over this period (imports follow a very similar path). Trade increases somewhat following the initial liberalization, and perhaps somewhat more for Mexico than Brazil. In particular, Mexico's trade jumps following the NAFTA in 1994. The 2001

U.S. economic recession appears as a drop in Mexico's exports. Mexico's exports increase with the U.S. economic recovery until 2008, when the global financial crisis is clearly apparent.

Brazil's trade increases somewhat after the 1994 macroeconomic stabilization, but the largest increase in exports comes shortly after China joins the World Trade Organization in 2001. The 2000s were largely characterized by China's increasing demand for global resources to fuel its economic growth. Figure 2 illustrates Brazil's rising dependence on Chinese demand. Brazil's two largest export destinations are the United States and China. Figure 2 shows the share of Brazil's exports going to each of these two countries. The share of Brazil's total exports going to China increase dramatically around the time China enters the WTO. The rise of China had a very significant effect on the global demand for primary products and in particular coincided with an increase in primary product exports from Latin America. To the extent that primary products intensively use less-skilled workers, it is possible that rising Chinese demand contributed to falling inequality throughout Latin America in general and in Brazil in particular.

Inequality in Brazil

There are many ways to measure wage inequality. Among all of these, perhaps the most well-known is the Gini coefficient.[3] Milanovic (2014) provides an extensive

[3] As is well-known, the Gini coefficient ranges from 0 (perfect equality) to 1 (perfect inequality).

collection of country-specific Gini coefficients from various years[4] that are estimated directly from worker-level datasets. The different datasets and resulting indices are harmonized so that they can be compared across countries.

Table 1 contains the top 25 most unequal countries according to the average value of available harmonized Gini values in the Milanovic (2014) dataset. The United States is the only developed country on the list, appearing at number 25. The Latin American countries (including Caribbean countries) are shown in italics. Brazil appears ninth on the list. Fifteen of the twenty-five most unequal countries are from Latin America (and the Caribbean).

Although very unequal, Latin America has been experiencing falling inequality over the last decade (and, in some countries, the last two decades). Figure 3 shows the evolution of Gini coefficient since 1985 for Brazil and Mexico. Arguably starting in 1988, inequality in Brazil has been falling overall. The Gini coefficient falls from 60.9 in 1988 to 52.8 in 2012 (a 13.3% reduction from the 1988 value).

Interestingly, Brazil's inequality starts to fall at about the same time as trade reforms. Other factors, however, may have been at work that might also have affected other Latin American countries. For comparison, Mexico's Gini is graphed alongside Brazil's Gini. While Brazilian inequality falls from 1988 to 1994, Mexican inequality is rising. Mexico liberalized relative to the world by joining the General Agreement on Tariffs and Trade in 1987, and the subsequent rise in inequality was the subject of a voluminous literature. The North American Free Trade Agreement between Mexico and

[4] The Autumn 2014 dataset covers 1950-2012.

the relatively skill abundant countries of the United States and Canada, however, went into effect January 1, 1994. As can be seen from Figure 1, Mexican inequality starts is low and continuous fall starting in 1994. While clearly not anything more than circumstantial, these figures illustrate a contemporaneous correlation between globalization and falling inequality.

Papers that formally analyze globalization and inequality in Latin America can be grouped into the same "between-industry" and "within-industry" categories described earlier. Studies in both groups agree that globalization played a significant role in falling inequality.[5] While there are many papers that analyze inequality and globalization in Latin America, there are relatively few papers that formally examine the link between output prices and relative wages. Most papers focus on import volumes rather than output prices, perhaps because trade data are often easier to find. Papers that focus on the relationship between output prices and wage inequality in Latin America tend to find support for the Stolper-Samuelson. For example, Robertson (2004) finds a strong relationship between output prices and relative wage in Mexico, and Beyer et al. (1999) find a significant relationship between output prices and wages in Chile.

Gonzaga et al. (2006) is one of the only papers to formally examine the link between output prices and relative wages in Brazil. Gonzaga et al. (2006) demonstrated that the changes in output prices in Brazil were consistent with changes in relative

[5] Studies that do not fall neatly into these groups reach similar conclusions. Gaspirini et al. (2009) document falling inequality throughout Latin America, but do not find that the declines are due to either policy or a permanent change in economic fundamentals. They do, however, acknowledge that favorable price movements coincided with a favorable international environment.

wages and therefore consistent with the Stolper-Samuelson theorem. Using a different empirical approach in the same theoretic framework, Sim-Sim David (2011) finds a negative and significant relationship between trade liberalization in Brazil that is consistent with the Stolper-Samuelson theorem. Ferreira et al. (2006) also find significant support for Stolper-Samuelson forces in Brazil over the 1998-1995 period. This result in particular differentiates Brazil from other countries that experienced a rise in wage inequality immediately following trade liberalization.

Papers that find support for between-industry explanations of inequality all acknowledge that these models explain only a part, and in many cases a small part, of the total change in inequality. Since these models only explain part of the change in equality, there is a lot of additional variation left for other models to explain. The predominant alternatives fall into the category of "within-industry" models. These models emerged recently and therefore are few in number. Perhaps the most prominent of these is Helpman et al. (2014), which argues that the relationship between trade and inequality is highly significant in Brazil. They show that their model illustrates how globalization is linked to the largest components of inequality – those parts that are within industries. They then conduct an empirical analysis and show that the predictions from their model are very closely matched to the observed patterns of inequality.

Not everyone, of course, agrees that trade liberalization contributed to falling wage inequality in Latin America in general or in Brazil in particular. Szèkely and Sàmano (2012) conclude the globalization contributed to the rise in inequality shortly

after trade liberalization, but other forces (especially the increase in education throughout the region) explain the subsequent fall in inequality. Interestingly, however, Szèkely and Sàmano (2012) document an inverted U-shaped pattern for inequality throughout Latin America that matches the pattern of inequality predicted by and empirically demonstrated by Helpman et al. (2014) for Brazil. Ravillion (2009) suggests that the macroeconomic reforms played a significant role in poverty reduction because most of the reduction in poverty occurred after 1994 when inflation was tamed. Ferriera et al. (2006) identify four factors that contribute to the decline in inequality: a decline in the return to education, rural-urban wage convergence, a possible decline in racial inequality, and an increase in social assistance transfers. While the first three of these could arguably be linked to globalization, the last one is almost certainly not linked to globalization. We explore the literature examining this explanation, therefore, in the next section.

Alternative explanations: CCTs in Brazil and transfer programs

While Brazil mostly followed the Washington Consensus[6] of the early 1990s, Brazil additionally innovated with social security and government support programs for low-income people (Ravillion 2009). Brazil's first CCT was the *Programa de Erradicação do Trabalho Infantil (PETI),* which was launched in 1996 and targeted child labor (Soares and Guerreiro Osorio 2007). Three additional national cash transfer

[6] The Washington Consensus is the term often given to the program of fiscal restraint, trade reform, privatization, and macroeconomic stabilization.

programs were launched in 2001: *Bolsa Escola*, *Bolsa Alimentação,* and the Auxìlio Gàs program (Sànchez-Ancochea and Mattei 2011). Shortly after coming into power, the Lula administration added a fourth program – the Food Hunger Combat Card (*Cartão Alimentação*). Although these programs had similar goals, program administration was distributed throughout the government and eventually concerns about coordination surfaced. In October of 2003, the Lula administration brought the various CCT programs under an umbrella program called *Bolsa Famìliar* (Sànchez-Ancochea and Mattei 2011).

Ferreira et al. (2009) and others have suggested that these programs, such as the *Bolsa Familiar*, played a very significant role in reducing poverty and inequality. In particular, Ferreira et al. (2009) suggest that without these programs, poverty would have been about 5% higher in 2004. Sànchez-Ancochea and Mattei (2011) argue that Bolsa Familiar explains about 10% of the drop in poverty between 2001 and 2008. Soares and Guerreiro Osorio (2007) suggest that the CCTs explain about 21% of the fall in poverty in Brazil. IPEA (2009) suggests that the CCTs explain about 34% of the decline in the value of the Gini coefficients between 2001 and 2008.

The general consensus of this literature is that government transfer programs explain at most a third of the change in inequality. The studies that decompose the changes in inequality across different potential explanations all agree that changes in labor income, whether due to between-industry or within-industry forces, explain most of the changes in inequality in Brazil over this period.

Conclusions

Inequality has been falling steadily for more than a decade throughout Latin America. This paper reviews recent economic literature that analyzes the link between globalization and inequality in Latin America generally and in Brazil in particular. A wide range of possible explanations have emerged, but most of the attention has focused on globalization and government support programs.

It is clear that government transfer programs have played a large and significant role in reducing inequality. In particular, the Conditional Cash Transfer programs in Brazil and Mexico have been very effective (especially given their size) in reducing poverty and reducing inequality. That said, however, there seems to be an emerging consensus that changes in labor income (rather than transfers) account for most of the changes in inequality. Labor income is determined by the labor market and forces that affect the labor market. Among these forces, globalization is often mentioned as one of the most powerful.

This paper describes how economists think about the link between globalization and inequality. There have been very important recent advances in how economists think about this link and especially how globalization affects the demand for less skilled workers between and within individual industries. The demand for workers between industries, as described by the neoclassical trade theories seems to explain a significant portion of falling inequality in Brazil. Perhaps even more important, however, are the changes that occur within industries, as described by new economic models that have

been specifically applied to Brazil. Put together, however, the experience of Brazil illustrates the powerful effect that globalization can have on reducing inequality.

This is not to say, of course, that globalization has been a panacea to Brazil's economic difficulties. On the contrary, globalization is a disruptive force that imposes often very significant adjustment costs on workers. Current research focuses on estimating the size of these adjustment costs. Prominent examples include Dix-Carneiro (2014) and Dix-Carneiro and Kovak (2014). These papers highlight the significant effect of adjustment costs in the economy and how these costs shape the results of globalization on workers. A valuable direction for future research would be to directly compare the costs and the benefits of globalization more broadly to provide an overall assessment of globalization in Brazil in particular and Latin America more generally.

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