

How Does Trade Liberalization Affect Racial and Gender Inequality in Employment? Evidence from Post-Apartheid South Africa

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Over the past four decades, trade barriers fell rapidly around the world as many developing countries sought to integrate into global markets. A key question of interest has been the impact of trade liberalization on labor market outcomes.¹ While most of the literature follows classical trade theory in focusing on national outcomes and overall welfare, there is a smaller but growing literature on the regional effects of trade policy within a country, taking districts or micro-regions as unit of analysis.² In this paper, we examine how greater trade openness in post-Apartheid South Africa affected employment by race, gender and skills, using district-level analysis.

Inequality, poverty and unemployment in South Africa are very high. These vary largely along racial lines, but also have other

dimensions, including gender and skills, as seen in Table 1.³ It is thus important to analyze any differential effects of trade liberalization on specific groups, which is where the contribution of this paper lies.⁴

[Insert Table 1 Here]

Theoretical predictions of the standard Heckscher-Ohlin model suggest that abundant factors would gain from trade under perfect factor mobility. This implies that unskilled labor would benefit in labor-abundant developing countries, particularly in a country such as South Africa with high unemployment among the unskilled. The Heckscher-Ohlin prediction contrasts with recent trade models that predict lower wages and employment for unskilled labor in labor-abundant countries (Banerjee and Newman, 2004; Kovak, 2013).⁵ Uneven effects of trade liberalization on

¹ See Goldberg and Pavcnik (2007) for a literature review.

² Recent contributions include Topalova (2010), Kovak (2013), Mehta and Hasan (2012) and McCaig (2011).

³ South Africa's Gini coefficient is 0.69 with income per capita and 0.65 with expenditure per capita (Statistics South Africa, 2014b).

⁴ Our paper contributes to the growing literature on gendered effects of trade reforms, including Juhn et al. (2013) and Klein et al. (2014).

⁵ This result is mainly driven by the assumption of imperfect reallocation of labor across regions, and particularly higher short-run reallocation costs for unskilled workers following trade liberalization.

different groups of workers could arise due to their concentration in sectors strongly affected by liberalization, or by intra-sectoral factors such as occupational segmentation or discrimination, or a combination of these.

Our results support the latter set of predictions. We find that trade liberalization in South Africa negatively affected employment of less educated workers, which holds across different groups of race and gender. Controlling for education, we find that African and female workers were especially vulnerable to job losses. One of the channels of these differential impacts is the pronounced effect of trade liberalization on manufacturing, which had steep tariff cuts. The estimated differential effects by gender and race are highest in manufacturing compared to other industries, and particularly strong for low-skilled manufacturing employment.⁶

This evidence supports the predictions of segmented labor market theory. Employment of different groups is highly segmented by industry and skills, and trade liberalization has differential effects on various segments. In contrast, we find no evidence of an equalizing effect of increased foreign competition on domestic employment outcomes.⁷

⁶ We omit the results for non-manufacturing sectors for reasons of space, showing results for total employment and for manufacturing.

⁷ Such an effect has been proposed through a lower discrimination channel (Becker, 1957), or through technological upgrading and

I. Trade Reform in South Africa

South Africa pursued rapid tariff liberalization between 1995 and 2002. South Africa's offer to the General Agreement on Tariffs and Trade (GATT), implemented from 1995, had three main components: overall reduction in tariffs, cutting of tariff peaks, and consolidation of tariff lines to simplify the tariff structure and reduce tariff dispersion. The New Tariff Rationalization Process of 1996 emphasized the further reduction of tariff peaks and the consolidation of tariff lines, the conversion of specific duties into ad valorem rates and the capping of those rates.⁸

Free trade areas were implemented with the European Union and Southern African Development Community in 2000, with most of the decline in protection in the early 2000s resulting from these. Between 2000 and 2009, there was little new multilateral liberalization. From 2009 onwards, trade policy shifted significantly to place greater emphasis on industrialization and employment.

II. Data and Results

We use detailed household and labor microdata, matching this to tariff data at the level of 371 districts. The period of analysis,

associated lower demand for physical skills (Juhn et al., 2013).

⁸ Using scheduled tariff rates, the simple average tariff rate fell from 22% in 1994 to 7.9% in 2004, while tariff collection rates fell from 13.6% to 6.1% over the same period.

1995-1998, is particularly apposite as the period of rapid tariff liberalization. Analysis at district level allows for the study of the wider labor market effects of liberalization, beyond firms and industries directly affected.

We use the October Household Surveys (OHS) for 1995-1998, which are nationally representative official surveys.⁹ We define local labor markets as districts. The sample is all employees aged 15 and over. Tariff data at the 3-digit ISIC Revision 3 industrial classification level is from Edwards (2005). Effective tariff rates were calculated by weighting nominal tariffs by the imports of each industry. The sectoral composition of employment at the three-digit sectoral level in each district at the beginning of trade reform, to avoid endogeneity, was used as weights to construct a weighted average of tariffs at the district level. Depending on their industrial composition of employment at the time of the reform, some South African districts were more exposed to reductions in trade protection than others. Following Topalova (2010), Kovak (2013) and others, our identification relies on this relative exposure to estimate the effect of trade reform.

⁹ Although it would be helpful to have employment data before liberalization began in 1995, we use the 1995 OHS (as the first available suitable data) as the initial period assuming that employment shares adjusted gradually to trade liberalization. Due to lack of prior data, Kovak (2013) also takes the year of liberalization as the baseline period. OHS is available for 1999 but it lacks a district identifier.

We calculate the district-level tariff $Tariff_{dt}$ as follows:

$$(1) Tariff_{dt} = \sum_i Empshare_{id}^{1995} \times Tariff_{it}$$

where $Empshare_{id}^{1995}$ is the share of employment in industry i and district d in 1995 and $Tariff_{it}$ is the national ad-valorem tariff applied to industry i in year t .

A possible concern with this district-level tariff variable arises as districts with an initial high proportion of employment in nontradable sectors will have a low tariff measure (as nontradable sectors are assigned zero tariffs). Given that most services activities in South Africa have relatively low productivity, such districts are likely to have low levels of industrialization and poor physical and human capital, and hence low prospects for economic and employment growth. This could lead to a correlation between tariffs and employment outcomes that is unrelated to the effects of trade liberalization. The estimations could thus be confounded if there are such non-trade-related factors that lead to conversion or diversion of employment outcomes across districts. A positive estimate would not necessarily mean that liberalization reduced employment. Following previous studies, we address this concern by constructing a weighted average of tariffs applying to

tradable sectors, ignoring nontradable sector employment (Mehta and Hasan 2012; Topalova, 2010). This variable, referred as traded tariff $Traded_Tariff_{dt}$, is calculated as in Eq. (1), restricted to the tradable sectors, i.e. i is a member of tradable sectors.

To examine the effect of district-level tariffs on district-level employment levels, we estimate the following equation:

$$(2) \ln Emp_{dt} = \alpha + \beta \ln(1 + Tariff_{dt}) + \gamma Post_t X_{d,1995} + \theta Y_{dt} + \delta_d + \tau_t + \varepsilon_{dt}$$

where $\ln Emp_{dt}$ is the log of employment level in district d at time t , $Post_t X_{d,1995}$ is a set of initial district indicators interacted with a post-reform time dummy controlling for the effects of initial district conditions over the reform period, Y_{dt} is a set of district-level controls, δ_d are district-level fixed effects controlling for time-invariant heterogeneity of districts, τ_t are year fixed effects controlling for any macroeconomic shocks, and ε_{dt} is the error term.¹⁰ The coefficient of interest, β , represents the average effect of trade protection on district-level employment.

To the extent that $Tariff_{dt}$ is correlated with the initial size of a district's nontraded sector and thus correlated with its initial

employment, the OLS estimates will be biased. We deal with this problem by using $Traded_Tariff_{dt}$ as an instrument for $Tariff_{dt}$. The first stage results, omitted here to save space, indicate a strong relationship between the two variables.¹¹

Table 2 presents the results of regressing district-level employment on district tariffs focusing on (i) employment of all sectors in the top portion and (ii) manufacturing employment in the bottom. There is a generally positive and statistically significant relationship between trade protection and employment. Districts facing larger tariff reductions experienced slower employment growth (or higher employment losses) than comparable districts facing smaller tariff declines. The OLS point estimate for total district employment is 0.19, increasing to 0.30 (significant at the 1 percent level) when $Traded_Tariff_{dt}$ is used as an instrument for $Tariff_{dt}$. This indicates that a 10 percent larger tariff decline facing a district caused a 3 percent larger employment decline. The average difference between the district-level tariff change in districts at the 5th and 95th percentile was 13.4 percent per year. Based the column 3 estimate, a district at the 5th percentile experienced a 4 percent larger

¹⁰ We also tried specifications with region-year fixed effects to control for any time-varying regional effects that could be correlated with district tariffs, and the results are very similar.

¹¹ From the first stage regression, R^2 is 0.58, and partial F-statistic is 254.92.

employment decline (or smaller employment increase) than a district at the 95th percentile.

Columns 4 to 7 of Table 2 show important differences by gender and by race. The effects of tariffs on employment are consistently stronger and more significant for women than for men. The difference is even more pronounced by race, with trade liberalization having stronger negative effects on African employment. This points to the persisting importance of race in South Africa. The coefficient on whites is consistently not statistically significant, except for a negative coefficient for educated whites. This is the only negative and significant coefficient throughout, and implies that educated whites gained from trade liberalization.

Another key finding from panels B and C of Table 2 is that tariffs consistently affect the employment of uneducated workers more strongly than of educated workers. This is particularly for uneducated female and African workers. Finally, we find that coefficients for overall manufacturing employment are larger than total employment and other industries (results omitted for latter). This implies that manufacturing jobs were particularly vulnerable to shocks from tariff cuts, and within manufacturing, uneducated female and African workers faced the most significant job losses.

III. Conclusion

This paper provides empirical evidence that the relationship between trade protection and employment is strongly differentiated by race, gender and skills. The employment of uneducated female and African workers is particularly strongly affected by liberalization. This underscores the importance of analyzing the effects of trade liberalization not only on aggregate welfare but also on the welfare of specific vulnerable groups, especially in a country with high inequality along multiple dimensions.

Our results provide support for two channels of the differential effects across groups: (i) inter-industry differences in exposure to trade liberalization, and (ii) the intra-industry adjustment to this exposure. First, the overall effects of tariff liberalization vary *across industries*. This is due to inter-industry differences in the pace of tariff liberalization as well as inter-industry differences in domestic-international productivity gaps and hence in industries' vulnerability to liberalization. Labor market segmentation by race and gender, with disadvantaged groups concentrated in industries more affected by liberalization, causes the employment of these groups to be disproportionately affected. Second, there are *intra-industry* differences in how trade liberalization affects the

employment of different groups. Occupational segmentation, with Africans and women concentrated in lower-skilled and lower-productivity occupations, leads to these groups' employment being disproportionately affected, as seen in the differences in results by skills categories.

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TABLE 1. UNEMPLOYMENT AND POVERTY IN SOUTH AFRICA

	Strict unemployment	Expanded unemployment	Poverty headcount
Women	27.5	36.4	47.1
Men	23.8	30.8	43.8
African	28.3	37.5	54.0
White	8.1	9.4	0.8
Not completed high school	30.2	40.5	50.4
Completed high school	21.0	25.9	17.0
Total	25.5	33.4	45.5

Notes: Employment data is for all persons aged 15-65, poverty data is per capita for all persons; poverty by schooling is for all persons aged 18+. Race and sex in the poverty figures refer to the household head.

Sources: Unemployment data calculated from Quarterly Labour Force Survey, 2nd Quarter 2014 (Statistics South Africa, 2014a), poverty data from Statistics South Africa (2014b) and authors' calculations.

TABLE 2. TRADE LIBERALIZATION AND EMPLOYMENT WITHIN DISTRICTS

Dependent variables: Average log annual employment (in log pts)

	I. Total Employment						
	All workers			Female	Male	African	White
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>A. All education levels</i>							
Tariff	0.185*** (0.064)		0.302*** (0.067)	0.293*** (0.062)	0.235*** (0.068)	0.312*** (0.092)	0.030 (0.126)
Traded tariff		0.143*** (0.037)					
<i>B. High school education</i>							
Tariff	0.096 (0.066)		0.254*** (0.096)	0.110 (0.159)	0.232*** (0.072)	0.271*** (0.141)	-0.004 (0.145)
Traded tariff		0.121*** (0.040)					
<i>C. No high school education</i>							
Tariff	0.258*** (0.065)		0.381*** (0.060)	0.346*** (0.075)	0.335*** (0.058)	0.342*** (0.069)	0.148 (0.145)
Traded tariff		0.181*** (0.040)					
II. Manufacturing Employment							
	All workers			Female	Male	African	White
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<i>A. All education levels</i>						
Tariff	0.277*** (0.084)		0.416*** (0.067)	0.325*** (0.091)	0.061 (0.086)	0.382*** (0.084)	-0.253 (0.192)
Traded tariff		0.213*** (0.047)					
<i>B. High school education</i>							
Tariff	0.015 (0.113)		0.002 (0.109)	-0.101 (0.193)	-0.105 (0.096)	0.259 (0.237)	-0.402** (0.193)
Traded tariff		0.001 (0.092)					
<i>C. No high school education</i>							
Tariff	0.238** (0.095)		0.353*** (0.094)	0.218** (0.092)	0.063 (0.101)	0.263** (0.114)	0.304 (0.440)
Traded tariff		0.178*** (0.057)					
IV with traded tariff	No	No	Yes	Yes	Yes	Yes	Yes
District, year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initial district indicators × post-reform	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1261	1261	1234	1213	1225	1136	602

Notes: Robust standard errors in parentheses are clustered at the district-year level. District indicators include log of district's population, percentage of workers in a district employed in manufacturing, employed in agriculture, employed in tradables, finished high school, percentage of Africans in a district, and percentage of workers with trade union membership in a district, and percentage of population living in urban areas of a district. "No high school education" includes workers with less education than a complete high school education and "high school education" indicates workers who have at least completed high school.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.