Journal of International Economics 92 (2014) 330–348

Contents lists available at ScienceDirect

Journal of International Economics

journal homepage: www.elsevier.com/locate/jie

The impacts of trade liberalization on informal labor markets: A theoretical and empirical evaluation of the Brazilian case

Lourenço S. Paz [1]

Department of Economics, 110 Eggers Hall, Syracuse University, Syracuse, NY 13244, USA

ARTICLE INFO

Article history:
Received 5 July 2012
Received in revised form 26 November 2013
Accepted 2 December 2013
Available online 12 December 2013

JEL classification:
F1
H2
O17
O54

Keywords:
Brazil
Informal labor markets
Payroll tax
Trade liberalization

ABSTRACT

Following trade liberalization, several developing countries experienced a sharp increase in the share of informal manufacturing employment. In this paper, I examine the impacts of trade liberalization on the labor markets of a small open economy, in an environment in which tariffs affect firms' payroll tax compliance decisions. I demonstrate that a reduction in domestic import tariffs reduces the average formal wage and show that the direction of the effect on the share of informal employment depends on the initial labor market conditions. A cut in trading partner import tariffs decreases the share of domestic informal employment and increases the average formal wage. I confirm the model's principal findings empirically, using data from the 1989–2001 Brazilian trade liberalization episode. I find the results robust to endogeneity and self-selection concerns, which are addressed, respectively, using instrumental variable and switching regression approaches.

1. Introduction

The coexistence of formal jobs with informal ones that do not meet basic legal requirements not only is a common worldwide phenomenon but an increasingly important one (see, for example, Schneider and Enste, 2000). Indeed, in many developing countries, a substantive share of the workforce is employed informally—for instance, in Brazil, China, and Colombia in excess of 30% of all employment can be classified as informal.[2] For Brazil and Argentina, Neri (2002) and Pratap and Quintin (2006) provide empirical evidence that suggests the principal economic distinction between formal and informal jobs centers on firms' *payroll tax compliance decisions*. Thus, although most employers comply with a myriad of other labor market regulations, there is a sharp divide between those that do and those that do not pay payroll taxes.

Given the demarcation just described between the two job types, the extent of informal employment clearly has important ramifications for total government tax revenues. Indeed, Rodrik (1992) suggests that trade policy-government revenue channel is a key determinant of whether a country subsequently engages in trade liberalization. Hence, the potentially potent effects of a country's choice of trade policy instruments on its domestic formal and informal labor markets can magnify the relevance of Rodrik's (1992) remark. Furthermore, many observers regard informal employment as synonymous with inferior employment—see, for example the recent World Trade Organization–International Labour Organization report (Bacchetta et al., 2009). These latter concerns even have shaped the form of recent trade agreements reached by the United States with its Latin American trading partners, since many of them now require the counterparty to follow provisions concerning labor regulations and their enforcement.[3]

In view of the remarks just made, it is of considerable interest and potentially of great concern for policy makers that a recent and growing body of evidence points to the fact that trade liberalization episodes (in particular, those carried out by the economies of Latin America) are associated with a substantial increase in the share of informal workers employed in the manufacturing sector—see Perry et al. (2007). This phenomenon is illustrated in Fig. 1 for Brazil. Notice that in the aftermath of the trade liberalization process, which began in 1990, the share of informal workers employed in the Brazilian manufacturing sector increased from 12% to 20.4%. Most important,

E-mail address: lspaz@maxwell.syr.edu.
[1] Tel.: +1 315 443 5874; fax: +1 315 443 3717.
[2] As found by Goldberg and Pavcnik (2003) for Brazil and Colombia, and by Mao et al. (2013) for urban China.

[3] In particular, the 2006 United States trade agreement with Peru includes strengthening and broadening labor inspectors' powers and increases the level of fines (see Office of the United States Trade Representative, 2007). Similarly, the 2006 United States trade agreement with Colombia featured the creation of a Labor ministry and a substantial increase in the number of labor inspectors (see Office of the United States Trade Representative, 2011).

0022-1996/$ – see front matter © 2014 International Monetary Fund. Published by Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jinteco.2013.12.002

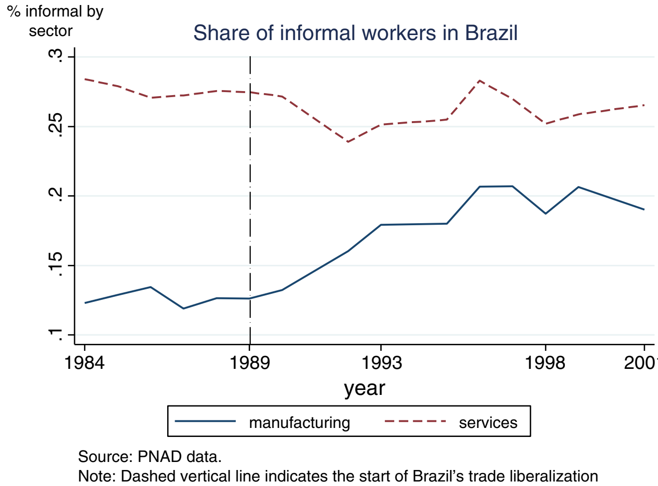

Fig. 1. Informality share in services and manufacturing in Brazil, 1984–2001.

notice too that, over the same period, the share of informal workers employed in the service sector remained stable. Another significant empirical feature associated with each of these trade liberalization episodes—as documented by Hanson and Harrison (1999) for Mexico and by Pavcnik et al. (2004) for Brazil—is the absence of any substantive change in the employment shares in the manufacturing industries. In view of these findings, it follows that, in response to trade shocks, intraindustry changes in the share of informal employment (hereafter, the *informality share*) might constitute a potent labor adjustment margin and so warrant careful investigation.

This latter observation motivates this paper. In it, I construct a theoretical model that is designed to capture the impact of trade policy changes in a country's formal and informal labor markets. More specifically, I consider an environment with heterogeneous firms, in which each firm's optimal payroll tax compliance decisions (and so its formal–informal employment choices) are endogenous. To explore the ramifications of changes in the trade environment on the informality share, I embed this payroll tax compliance decision in a small open economy (SOE) version of Davis and Harrigan's (2011) *Good Jobs*, *Bad Jobs* framework. The model then is implemented empirically using data from the 1989–2001 Brazilian trade liberalization.

The principal goals of the theoretical model are to uncover the effects of changes in import tariffs—domestic and those of the country's trading partners—on the equilibrium levels of the industry-level share of informal employment, the average formal wage, and the average informal wage. In contrast to the previous studies, a notable feature of my SOE general equilibrium framework is that it is rich enough to allow for countries of different sizes and to encompass both differential timing and magnitudes of policy changes. I find that a decrease in domestic import tariffs lowers the average formal wage but has a (genuine) ambiguous effect on the employment share of informal workers. More specifically, I show that the predicted sign of the domestic tariff-informality employment share nexus hinges on the initial (i.e., pre-reform) labor market conditions. A reduction in the country's trading partner's import tariffs decreases the informality share but increases the average formal wage; however, I show that the effect on the average informal wage is ambiguous.

As discussed later, the available empirical evidence concerning the magnitude and direction of the effect of changes in the trade environment on informal employment is far from conclusive. In this light, my paper further contributes to this important and growing body of literature not only by providing new estimates but also by introducing several important methodological improvements. First, consonant with Almeida and Carneiro's (2012) recent findings, I show that the *enforcement* of labor regulations is a key determinant of the extent of informal employment. The extant literature, however, has largely failed to address this important concern. In this paper, I take steps to address it by carefully controlling for spatial and temporal heterogeneity in enforcement efforts. Furthermore, I instrument for Brazilian import tariffs to address possible simultaneity concerns regarding the joint determination of import tariff levels and payroll tax enforcement efforts. Finally, to obtain consistent estimates of the trade policy effects on the average levels of formal and informal wages, I employ a switching regressions technique. This helps overcome a ubiquitous problem in the literature of failing to control the simultaneous determination of wages and formality employment status, thereby addressing the issue of worker self-selection between formal and informal work.

I evaluate the model's testable predictions using Brazilian data, which have several noteworthy merits. First, the definition of labor informality used in the theoretical model is directly observable in Brazilian household surveys, since they include a specific question concerning employer payroll tax compliance. This potentially represents a significant improvement in the literature, which has been hampered by the lack of a uniform definition of labor informality. Second, Brazil experienced economically significant changes in its trade environment. Specifically, as a result of the changes in trade policies that occurred during the 1990s, Brazil and its trading partners witnessed sharp decreases in their import tariffs. The changes in the trade environment led to changes in Brazilian import and export levels in excess of 60%. Third, Brazil's labor institutions and its labor market regulations remained stable throughout this period of trade liberalization. This is helpful in identifying the trade-environment–labor-market nexus, which is the central concern of this paper. In contrast, several other countries, including Chile, implemented substantial labor market reforms over the same period they were engaging in trade liberalization.

My empirical results provide evidence that the effects of a reduction in import tariffs by Brazil's principal trade partners are to raise the Brazilian industry-level average formal wage and decrease the share of informal employment. Alternatively, a reduction in Brazilian import tariffs has precisely the opposite effect. This former result is potentially of considerable policy importance because it suggests that increased access to large markets, such as the United States, offers a potent market-based remedy for improving labor conditions in developing countries. For the average informal wage, the empirical results are often not statistically significant and coefficients switch signs depending on which identification strategy is used. Thus, although multilateral trade liberalization may reduce informality and increase the average formal wage, the empirical results suggest that the benefits arising from trade liberalization differ according to the workers' propensity to be employed in a formal job. My paper findings still hold after several robustness checks, including a falsification test designed to test whether pre-existing trends in the data are driving the results.

This paper is related to a growing body of work that examines the nexus between the share of informal employment and changes in the international trade environment. For example, Acosta and Montes-Rojas (2010) conduct an empirical investigation using Argentinean data, and find that a decrease in domestic tariffs substantially increases the industry-level informality share in manufacturing. Alemán-Castilla (2006) find a decline in U.S. tariffs reduces the informality share in the Mexican tradable sector, but a decrease in Mexican import tariffs has no effect on informality. Goldberg and Pavcnik (2003), who use Brazilian and Colombian data, find that a decrease in import tariffs slightly increased the informality share in Colombia but had no effect in Brazil. Menezes-Filho and Muendler (2011), who also use Brazilian data, examine the effect of import tariffs on the likelihood a worker will switch form formal manufacturing employment to informal work. Their principal finding, however, is that tariffs have no effect on this transition probability. Bosch et al. (2007) also investigate the behavior of labor informality in Brazil; however, they find that changes in the international trade regime have little effect on the changes in the informality share observed over the period.