One world of labour regulation, two worlds of trade: examples of Belgium and Brazil

MICHAEL HUBERMAN
Université de Genève, Switzerland, and Université de Montréal, Canada,
michael.huberman@unige.ch

Supposedly, labour regulation makes firms less competitive in international markets. This paper studies the adoption of labour laws in Belgium before 1914 and Brazil in the 1920s. In the two countries, regulation induced investments in new plant and equipment. The rise in labour productivity made Belgian firms better exporters in the context of expanding world trade. Brazil did not reap similar gains because international trade was collapsing.

1. Introduction: the object of the Belgium–Brazil comparison

“International trade”, Kindleberger (1963, p. 13) wrote, “is distinguished in kind from domestic trade [because] it runs between different political units. This accounts for differences in national economic politics—in monetary, exchange, trade, wage, and similar areas”. In the current wave of globalization, the varieties of national labour-market policies have emerged as a source of vexing discord (Rodrik 2011). Time and again, business leaders and workers in countries harbouring extensive and tighter labour laws have condemned trading partners considered to have weaker and inferior sets of rules. Of course, business and labour have opposing views on how to minimize the harm of an uneven playing field: the former insisting on lower national standards, the latter recommending an international labour code to prevent backsliding. Nonetheless, the core of their arguments is identical. The adoption of stricter regulation in any one country relative to its partners has adverse effects on its export performance, encourages imports, and puts downward pressure on wages and employment.

Research in economic history suggests that these claims are greatly exaggerated. Why would firms and workers engaged in competitive international markets penalize themselves? The historical evidence actually points to the contrary. “At its inception”, Engerman (2003, p. 60) claimed, labour regulation, like the minimum age of work for children, “imposed only such standards as those that had already been achieved, or that the actual standards meant only a very small change from what was already occurring”. By extension, the rising tide of income lifted levels of regulation of commercial partners, leaving minor effects on trade balances. The trouble with this type of reasoning, as Kindelberger insisted, is that countries fix their own laws and according to their own timetables, and trading partners cannot always design their social policy with sufficient foresight to take into account domestic interests elsewhere. There has been limited historical research along these lines, however.

1 It may be that states adopted “beggar thyself” policies because domestic motives trumped considerations of foreign trade. The relation between domestic politics and international pressures is discussed in Huberman (2012), which extends the argument of this paper and gives full references.
This paper treats explicitly the adoption of labour regulation in an open economy framework. The emphasis is on the effects of labour regulation as opposed to its determinants, a subject treated by Huberman and Meissner (2010). My findings give partial comfort to the received view that regulation had small negative effects on labour market outcomes—but the explanation differs. It is not that the laws simply codified existing practices; rather, regulation, under certain conditions, was a driver of output and export growth in new varieties and products shipped to an expanding number of outlets.

To identify the link between exports and labour regulation, I compare the development of the textile industries in Belgium and Brazil in the different external environments they confronted before and after the First World War. Their histories of regulation were typical of Old and New World countries, labour laws being widely adopted in Europe before 1914 and in the Americas in the 1920s. The two were also representative of Old and New Worlds in that Belgium was relatively abundant in labour, Brazil in resources. Yet, despite differences in initial endowments, and markedly divergent economic and political histories, by the eve of the war both countries had established cotton-textile industries of similar size, accessing the same technologies, and employing comparable proportions of young and female workers whose fortunes were tied to international markets.2

In both economies, regulation was met by the substitution of capital for labour. But, here is where the similarities ended. The new laws seemed to have had salutary effects in Belgium only. In Europe, regulation made firms better exporters because, in the expanding world economy, they shipped higher quality goods to new destinations. Whereas Southern Cone producers altered product lines in response to the new laws, world markets were closing down, thereby undoing any potential effects of regulation on enhancing productivity and improving labour market outcomes. The upshot is that concerns regarding the effects of labour regulation on tradable activities were misplaced. The binding constraint was ultimately market access.

Some preliminary comments on the relevance of the Belgium–Brazil comparison are in order. In his pioneering study, Bloch (1928) likened comparative economic history to the experimental method, a means of systematically gathering evidence to test the validity of explanations of historical problems. Bloch restricted his studies to Europe—what was the unique variable promoting enclosures in England not present in France—because of their common origins and because of their influence on each other. Recently, economic historians (Pomeranz 2000) have pushed the frontier outwards, comparing seemingly distinct and far-flung units across time and space. Pursuing this line of reasoning, practitioners of the New Comparative Economic History have embedded the comparative method into a broader study of the interdependence or “interactions” of regions and countries in the international economy (Hatton et al. 2007, p. 3).

My study of Belgium and Brazil is in this vein. I am as interested in a comparison of the effects of labour regulation in two different trade environments, as in the effects of the international

2 In 1914, Belgian and Brazilian industries had about 1.5 million spindles [International Labour Office (ILO) 1937, p. 84] each. By this measure, Brazil’s industry in 1895 was about half the size of Mexico’s; by 1927, it was three times as large, by far the biggest industry in South America. In per capita terms, the Belgian industry was slightly larger in size than that of France and Germany. Female employment in the Brazilian and Belgian industries was between 50 to 60 per cent ILO (1937, pp. 220–24). The textile sector was a major, if not the largest employer in manufacturing in both economies. In Belgium, employment in textiles as a share of total industrial workforce was about 12 per cent in 1910 (De Brabander 1981, p. 82). In Brazil, the value of textile production amounted to 25 per cent of manufacturing output (Bulmer-Thomas 2003, p. 135).
economy on the performances of regulated industries. The juxtaposition of the two provides an appraisal of the histories of regulation that differ from standard interpretations.3 According to the typical narrative of Belgian economic history, aggregate growth before 1914 was dependent on a handful of staple industries that are believed to have performed poorly. Average annual growth was modest, about 2 per cent per annum between 1890–1910 (Horlings and Smits 2002, p. 86). Van der Wee and Goossens (1991) described an economy as “ossified, rigid, and imprisoned in traditional, unviable sectors, without economic future”. The adoption for labour regulation, which followed the extension of the franchise in the early 1890s, threatened the international competitiveness of labour-intensive industries and precipitated a wave of capital exports. The trouble is that this interpretation does not sit well with subsequent performance. The share of employment in textiles actually increased over the period, the export performance of cotton goods being particularly strong, about four times the growth of per capita income between 1890 and 1910 (Horlings 1997, p. 130).

In Brazil, labour regulation was initiated during the macroeconomic dislocation caused by the First World War (French 2004). In the wake of inflation and exchange rate fluctuations, selected groups of business and labour sought the support of the state. On the one hand, the state granted manufacturers increased tariff protection and, on the other, it acquiesced to labour’s demand for improved working conditions. Regulation is cast as one pillar of the inward-looking regime that dictated Brazilian economic policy for much of the twentieth century (Haber 1997, 2006). The cause célèbre in this narrative is the stunted development of the textile industry that had emerged before the war. Even as aggregate performance was anaemic—GDP per capita grew by less than a half per cent per annum between 1870 and 1913 (Maddison 2001, p. 196)—Brazilian industry, according to Fishlow (1972, p. 322), “had achieved by 1919 substantial autonomy in the production of consumer goods”, a success that was built as much on intense domestic competition as on tariff protection. Over the long term, the interventions of the corporatist state thwarted further expansion. Haber (1992, p. 362) is succinct: The 1920s offer vivid illustration of how “Brazilian industrialists chose once again in a time of trouble to turn to the state to structure the market, rather than to pursue a process of reinvestment and modernization in order to become internationally competitive”. In this view, labour regulation harmed industrial competitiveness, provoking a steep rise in imported goods, which was subsequently curtailed by import substitution policies. Again, there are number of loose ends with this approach. We know that Brazilian firms were viable exporters in the war years, and Haber (1992, p. 357; 2006, p. 560) himself recognized a “good deal of variation” in firm performance in the 1920s. That profits and productivity levels did not hold up in the interwar period may have had as much to do with the absence of external opportunities as with the culture of retrenchment.

This paper is organized into three sections. In Section 1, I introduce a wage-push model to study the effects of regulation on labour and capital shares over the short, medium, and long terms. I find that the experiences of Belgian and Brazilian textile industries broadly conform to the model’s expectations. In Section 2, I integrate the wage push in an open-economy framework. Informed by trade models with heterogeneous firms, I argue that labour regulation induced technical and organization changes. I then proceed to explain why the link between regulation and trade was stronger in Belgium than in Brazil. In the concluding section, I draw some implications of my findings for the study of labour regulation in an open-economy setting.

3 Pomeranz (2000, p. 9) refers to this approach as “reciprocal comparisons” because it assumes that neither unit of comparison is the baseline. Belgium could have been Brazil, and vice versa, if it were not for the coincidence in the timing of the trade expansion and contraction.
2. One world of labour regulation

To study the effects of labour regulation, I follow Caballero and Hammour's (1998) dynamic model of industrial relations with imperfect competition that was intended to track the consequences of legislation adopted in France in the 1970s on labour's and capital's shares of output. Faced by growing social pressures, the government legislates a shorter working week without a proportional change in wages. This is a form of “wage push”. In the very short run, the supply of capital is inelastic, and militant labour is able to appropriate a larger share of the quasi-rents. There is a fall in output and markets at home and abroad contract. These losses induce the substitution of capital for labour in the medium to long terms. Pressures to substitute away from labour are most keen in open economies because investors have an incentive to develop or seek out new technologies (and products) to guarantee returns they could earn elsewhere. The end result is that capital's share increases along with output and reverts to its long-run level. The rise in the capital to labour ratio has implications for the nature of production and trade.

2.1 Labour regulation in the Old World

The Belgian and Brazilian experiences conform to this model. In both countries, domestic and foreign pressures lay behind the wage push. In Belgium, long-term real-wage stagnation incited domestic mobilization in the “social upheaval” of the late 1880s (Kossmann 1978). But, trading partners also threatened to cut off market access and abrogate commercial treaties, if Belgium failed to initiate social legislation (Huberman and Meissner 2010). The state ultimately gave in. An 1889 law made it illegal for children under 12 years of age to be employed in industry, and for boys aged 12–16 and girls 12–21 to work more than 6 days a week and more than 12 h a day; night work was prohibited for boys under 16 and for girls under 21 years. From 1892 onwards, night work was prohibited for women over 21 (De Herdt 2001).

Figure 1 describes the effects of the adoption of labour regulation in the cotton-textile industry, a hotbed of discontent over long working days for women and children (Scholliers 1996, p. 225). Into the 1880s, producers, concentrated mainly in Ghent and its countryside, spun a range of coarse to medium yarns, serving mainly domestic markets. Tariff protection was uneven, the spinning sector relatively more insulated than weaving. Small firms operating a combination of ring and mules dominated the industry. The labour force was mixed, about 10 per cent of which were young workers and children directly affected by the new law. The lost hours had to be made up by adult women and men, whose wages were about twice that of younger workers. Because of the importance of labour costs in the industry, ranging between 30 and 50 per cent, business bemoaned that a cutback in the supply of young workers would reduce Belgium’s international competitiveness.5

4 In line with the model, French workers’ compensation per hour in the 1970s moved upwards, but as unemployment rose, labour’s share of output eventually returned to its initial level.
5 Taking the proportion of young workers affected by the laws at 10 per cent, and assuming that children were replaced by women whose wages were 50 per cent greater, labour costs would have risen by 5 per cent. This is a lower bound estimate because it assumes that female wages would not have risen and that capacity was fully utilized. Clark (1987, p. 146) calculates profit rates for a sample of countries. The 5 per cent difference in manufacturing costs between Germany and France translated into a difference of profit rates of 10 per cent. Contemporaries made similar calculations. The International Association of Labour estimated that for a group of western European
The initial response of firms was to hire adolescents as apprentices, whereas other businesses evaded compliance by moving parts of production to the countryside, where wages were up to 40 per cent lower—akin to outsourcing to the informal sector (Scholliers...
Real wages (Figure 1a) were on the increase before the new law was adopted, a trend that may be partially explained by external pressure on Belgian social policy. Anyway, nominal wages spiked upwards in 1899. In the short term, capital’s share of output was squeezed (Figure 1b), productivity stagnated (Figure 1c), and new investment in the industry was halted. Belgium’s overall trade balance between 1890 and 1891 fell by more than 5 per cent (Mitchell 1981).

Belgian producers eventually adapted to legislation. The Caballero–Hammour model provides a roadmap of the process. Figure 1d tracks the ratio of spinning machines to yarn output (after correcting for yarn spun and type of machinery). The capital-output ratio was flat in the immediate period after 1889. But, within a medium time frame, seeking to realize a rate of return available elsewhere, the industry scrapped older spinning mules and replaced them with ring-spinning machines operated by less skilled workers, mainly women and adolescents (Figure 1e). The new machinery contained more spindles per frame and allowed faster turning speeds. The supply of raw cotton was varied and did not impede the installation of new technologies. In the urban sector, many of the newly constructed large mills integrated spinning and weaving processes and began to specialize in medium yarn counts. Initially, productivity did not rise as expected (Figure 1c) because a cluster of weaving sheds using rudimentary techniques were temporarily set up in the countryside to escape compliance or to fill orders that could not be met by the formal sector. But, the modern sector began to achieve healthy profits based on expanding export markets and long production runs (Van Houtte 1949, p. 150; Scholliers 2001). By the late 1890s, Belgian exports were competitive, even taking market share at the expense of the British (Figure 1f). I will return to this performance below.

The Belgian model was typical of the tried-and-tested strategy forged in the heyday of the industrial revolution of substituting capital for labour (Allen 2009), except that it was policy induced. Labour regulation in leading industries such as textiles and mining was emulated in other activities, the rise in wages spurring an economy-wide search to save on labour. Because other European countries were going through similar processes, labour-intensive industries everywhere responded similarly. Businesses across the continent benefited from new investments in the research and development of labour-saving technologies. Of course, the manner in which each country and sector dealt with the change in input prices depended on local demand and supply. In Belgium, although labour as a whole became scarcer, women still earned only 60 per cent of what men received doing the same work into the 1900s. Primary school enrolment of children 5–14 years of age in Belgium was about half of its continental neighbours, and, even as women’s participation in the labour market fell, that of adolescents was unchanged (De Vries 2008, p. 220). Altogether, new capital investment in Belgian textiles was directed towards semi-skilled labour, men moving out of the industry into expanding sectors, mining and engineering (Buyst 2007).

In Indonesia, Harrison and Scorse (2003) found weak compliance with the new minimum wage law enacted in the late 1990s. Over time, compliance of firms oriented towards the export market increased, a result comparable to the main findings of this paper.

The real exchange rate appreciated by 2 per cent in 1889 and another 3 per cent in 1890 (López-Córdova and Meissner 2003).

Scholliers (1996, pp. 87–90) provides evidence on the increase in female textile employment. As capital replaced labour, unemployment rose, putting downward pressure on wages—nominal values actually fell by 5 per cent from 1900 to 1910 (panel a)—exactly as the Caballero–Hammour model would have predicted.
With historical hindsight, the oft-repeated puzzle is to explain employers’ hostility to labour regulation in the first place, and the related problem of why firms needed the stick of factory laws to seize the opportunities of realizing higher returns. Part of the answer to the first question is that the new labour legislation was unanticipated, certain laws being imposed on Belgium by trading partners. Regardless of origin, business feared the thin edge of the wedge: passage of piecemeal legislation may have led to more substantial changes in the distribution of income. Not all firms shared this view, especially those that had already upgraded to newer technologies. Herein lies part of the answer to the second query. There was a distribution of firm types. Some high-productivity businesses took the initiative to make additional improvements in equipment, but others failing to make necessary investments exited. On average, the industry became more capital intensive. The mix of firm types is central to my explanation of how the new labour laws made firms better exporters and importers.

2.2 Labour regulation in the New World

Brazil had an ample supply of cotton and abundant cheap labour, but the industry was slow to emerge from the shadows of foreign competition in its home market. Originally situated in the countryside, producers drew on local labour supplies. By the 1880s, a modern urban industry was emerging in the Southern Cone. The labour forces in Rio de Janeiro and São Paulo, the hubs of the industry, were composed of workers from the coffee export sector and unskilled immigrants. Both groups had limited experience of factory life and, it was believed, they were considerably less efficient than European labour.\(^9\) At least initially, owners and workers clamoured for protection, although this did not prevent imports of cheap and fine items.\(^10\)

Around the turn of the century, the fortunes of the industry changed. By 1900, British machine builders had started exporting ring-spinning machines that treated a variety of cotton grades.\(^11\) The machines delivered to Brazil contained fewer spindles than the typical ring frame Lancashire exported, and they could be more easily operated by women having little or no factory experience. The southern industry soon began exploiting local supplies of short-stapled fibres, much inferior to those of the north, and commenced producing cheaper grades of yarn that found a large domestic market (Clark 1910, p. 33). Ring spinning was adapted to meet the qualities of the labour force and of raw materials.

If foreign technology laid the basis for long-term growth, local adaptation had untapped the “democratizing potential” of ring spinning (Saxonhouse and Wright 2010, p. 551). The movement in the gender gap coincides with this interpretation. The earnings of women and men remained low, but as women gained job experience and accumulated human capital, wage differences between the two groups narrowed. In the São Paulo textile industry, the gap closed by about 25 per cent for carders and spinners in the period from 1912 until 1920; only in the finishing processes did the wage gap widen. In all activities, women earned about one-half that of men before the war and about two-thirds after (Ribeiro

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\(^9\) Clark (1987, p. 166) reported that Brazilian workers were one-third less efficient than their British, Canadian, and US counterparts.

\(^10\) The tariff was the primary source of government revenue (Versiani 1971, p. 53).

\(^11\) Centro Industrial do Brasil (1917, p. 333).
The supply of women into the industry kept up with demand; the percentage of female workers was about 65 per cent in the interwar years, whereas it was only 50 per cent 10 years earlier (Hahner 1977, p. 92). On an international scale, the participation of women in the industry rivalled that of Japan, slightly exceeding that of Belgium.

As the labour market adjusted, textile production proceeded unabated. Protectionism, often invoked as its principal cause, was only part of the story. Although tariff levels remained high, they were specific and currency fluctuations eroded their effectiveness (Suzigan 1986, pp. 379–83). Inevitably, demands for greater protection resurfaced, but state authorities were wary of granting compensating increases fearing lower custom revenues. Anyway, the extension of the rail network had created a large and integrated domestic market in which stiff competition prevailed (Leff 1982, p. 176; Summerhill 2003). A hallmark of the Brazilian industry was the entry of new firms and the expansion of older business financed by a well-functioning capital market and framed by an indigenous model of corporate governance that protected and encouraged local and foreign investors (Musacchio 2009).

There was great deal of heterogeneity in firm size, organization, and capital intensity. Whereas certain companies constructed large, vertically integrated mills, powered by the newly installed electrical grid in southern states, other establishments remained small, specialized enterprises. Concentration ratios were quite low in Brazil when compared with Mexico, where financial markets were less developed (Haber 1997).

Before the war, the industry became cost competitive at coarse grades, the US trade representative (Garry 1920, p. 35) estimating that domestic prices of unfinished and dyed goods fell by 10 and 25 per cent between 1900 and 1913 alone. As demand was price elastic, Brazilian producers captured the home market in a short time span. Although they were to rebound later, imports of Belgian cotton fell by a third between 1880 and 1900. Overall imports in the 10 year period after 1900 fell by more than 80 per cent (Garry 1920, p. 41), leaving a small negative balance in trade in cotton goods (Stein 1957, p. 193). Even before the end of the war, Brazil had begun to sell goods in Montevideo and Buenos Aires (Redfield 1920, p. 59). Summarizing these developments, Fishlow (1972, p. 319) concluded unambiguously: “Despite the de-facto reduction in the protection enjoyed by domestic producers, textile output resisted foreign competition as well as it did because of growing productivity in the industry”.

In 1918, local manufacturers prided themselves as captains of the seventh largest textile industry in the world (CIFTA 1919, p. 25), and invoking comparisons with Japan—which used similar mixing techniques of raw materials, operated the same type of machinery, and employed a comparable proportion of women—they boasted that the industry was on the cusp of a major breakthrough. The expansion in textiles would lead the economy away from dependence on resources, and because of its size and stature, have knock-on effects in other industrial activities (Fishlow 1972, p. 323). In São Paulo, Dean (1969, pp. 104–17) found signs of growth in processed foodstuffs and footwear manufacture exploiting the labour and managerial skills accumulated in the textile industry.

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12 Trends in income equality in Frankema (2009) closely trace the movement in the gender wage gap.

13 Bulmer-Thomas (2003, p. 143) advised against overemphasizing the effectiveness of the tariff. Inflation in the early 1890s reduced the degree of protection, but the subsequent depreciation of the currency restored protection levels. Between 1898 and 1905, the exchange rate appreciated as Brazil sought to join the gold standard (Haber 2006, p. 550). Brazil was on the gold standard from 1906 to 1914 and from 1926 to 1930.

14 For the fall in local prices, see CIFTA (1917, pp. 324–27).
Employers in the aftermath of the war did not foresee the coming changes to the industrial relations environment (CIFTA 1919, p. 23; Ribeiro 1988, p. 78; Weinstein 1996, p. 56). Like the adoption of Belgian legislation, the labour laws in the 1920s had both domestic and foreign origins. After a prolonged strike in Rio in 1919 and under pressure to conform to the International Labour Organisation’s recommendations, many factories adopted the *semana inglesa*, a compressed workday of 8 h, Monday through Friday and half-day on Saturdays (Von der Weid and Bastos 1986, p. 194); in total, hours per week fell from 60 before the war to 48 h after (Garry 1920, p. 33; Pearse 1923, p. 3). In 1923, firms’ contributions to accident compensation increased; a 1925 law requiring paid vacations was followed by a 1926 provision restricting child labour (Ludwig 1985, pp. 173–74; Ribeiro 1988, pp. 159–61; Colistete 2007).15 By this date, Brazilian and Belgians toiled the same hours per week.

A classic wage push was underway in textiles with overall unit costs increasing by about 5–10 per cent.16 The response in Brazil was not atypical. Initially, firms sought to move operations to the countryside to avoid compliance, but the skill level of the rural labour force could not match that of the urban sector. Figure 2 tracks the effects of labour regulation for the Brazilian textile industry based on evidence taken from the censuses and industry surveys of the urban and modern sector. Figure 2a presents the trend in real wages for textile workers in São Paulo. The fall in earnings after 1915 was a catalyst of the 1919 strike wave. Wages spiked upwards after the imposition of regulation in 1919, rising again in the mid 1920s when more laws came on the books. Again, capital was in the short run hostage to labour. Labour’s share of output (Figure 2b) in the industry increased initially. As in Belgium, the rise in wages induced capital deepening (Figure 2c) and the continued makeover of the workforce. In the absence of adjustment, foreign capital would seek better returns elsewhere. Although these figures mask the dispersion in the types of firms, for this sample of businesses, the number of spindles per worker was 50 per cent greater in 1929 than 1921 (Figure 2d), and larger factories (Figure 2e) hired increasing numbers of women. The responses, however, failed to reap the advantages accruing to Belgian firms before 1914. The forecast of export expansion had proven to be overly optimistic (Figure 2f). In fact, imports rose faster. I will say more about foreign markets below.

### 3. Two worlds of trade

Consider a trade model of heterogeneous firms integrating interindustry trade based on comparative advantage and intraindustry trade pinned down by product differentiation (Bernard et al. 2007). These models start with the observation that export firms are scarce because of the fixed costs of doing business abroad. Exporters pay higher wages, are generally bigger, and more capital and skill intensive than other firms. A fall in trade costs induces new entrants into the export sector. The variety of goods traded increases, even as

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15 In Rio de Janeiro, manufacturers petitioned the government to raise tariffs in 1919 because the “law of work accidents and granting of the 48 h workweek, adopted by the owners in accordance with the spirit of the times, increased our costs (CIFTA 1919, p. 35)”.

16 Figures were calculated based on cost estimates of raw materials, labour, fixed capital, and interest payments, and of hours of work per week for a sample of São Paulo mills before and after the adoption of the new labour law. All data are from Von der Weid and Bastos (1986).
low-productivity firms exit because of increased competition. All together, the reallocation of resources improves average industry productivity and consumer welfare.

Now, consider the adoption of labour regulation. In a standard trade model, regulation hurts exporters of labour-intensive goods. But, exporters are fundamentally different from non-exporters. In the wage-push model, regulation promotes new investments in plant and machinery and firms grow in size. As labour productivity rises, more firms make the

There was also the link between trade and the direction of technical change. Because skills are relatively more scarce in the world economy than in any one country, as trade deepens, the relative price of skill-intensive goods rises. The change in product prices induces more innovations directed at skilled workers (Acemoglu 2002).
cutoff of being viable exporters, even if trade costs remain unchanged. Expansion occurs along the intensive margin (or the average import or export value per firm product) and extensive margin (or the number of firms and trade products).  

To be clear, success in overseas markets depends on comparative advantage and firm attributes. In parallel fashion, labour regulation imposes a penalty on inefficient firms, whether or not they benefit from comparative advantage. The net result is more exports and imports and the reallocation of resources to productive activities.

3.1. The Old World in the golden age of globalization

The Belgian experience conforms to the hybrid model of heterogeneous firms in an open economy confronting a wage push. After the adoption of limits on child labour in 1889, the government introduced partial restrictions of night work for women in 1892, before eliminating it completely in 1909. Because the ability of business to offset these costs in lower wages was constrained—workers were mobile—unit labour costs increased. In line with its neighbours, the state introduced sickness (1894), old age (1900), and accident (1902) insurance schemes, all of which mandated employer contributions (Huberman and Lewchuk 2003). To be sure, certain insurance schemes pertained to selected sectors, like mining, but higher costs of inputs and intermediate goods were passed on to non-insured and non-regulated sectors.

Did labour regulation make imports cheaper and exports more expensive? Initially, trade balances with certain commercial partners deteriorated. The negative results hold up after controlling for GDP per capita and real exchange rates. With Brazil, the deficit actually doubled from 1890 and 1900, the key decade in the adoption of labour laws. But by 1905, the trade balance was in fact positive, and by 1910, it had increased three-fold. The decomposition of trade along intensive and extensive margins provides a window on how regulation’s supposedly harmful effects on the trade balance were offset. Consider first the textile industry. Into the 1880s, the export trade was limited to a handful of Ghent firms, mainly occupied in the finishing stages of Lancashire goods. From 1870 to 1889, growth of textile exports was slow, 2.20 per cent per annum, the principal destinations being Belgium’s close neighbours. In contrast, exports surged from 1890 until the war, about 6.70 per cent per annum. At this juncture, the state harmonized tariffs in the industry which effectively meant lower duties on imported yarns. The gain in productivity more than offset the increase in labour costs. On the intensive margin, Belgians shipped the same items, but at lower prices to established customers. But, by various measures, the extensive margin was the faster growing sector of activity. To new markets, businesses shipped the “old staples”; to all outlets, they sent higher quality goods. In 1880, Belgium exports of cottons were

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18 On intensive and extensive margins, see Bernard et al. (2009).

19 In a regression of the determinants of the trade balance that includes indicator variables for various pieces of legislation, and controls for income and the exchange rate, minimum age legislation had a negative sign in the short run. The coefficient was not significant, however. Over the long run, the negative signs on certain coefficients, for instance accident compensation, become positive (Huberman 2012). For contemporary assessments of labour regulation and trade, see Belgium, Annales parlementaires, 1894–1895.

20 Belgium, Tableau général, various years.

21 Figures from Van Houtte (1949, p. 263).

22 Jacks et al. (2010) reported that Belgium’s trade costs were actually stable during the last decades before the war.
limited to a dozen European countries; by 1914, Belgium exchanged a range of items with 54 countries, including 12 Latin American and 7 Asian outlets (Kertesz 1917, p. 333).

Belgian trade with Brazil mirrored this pattern. Trade in cotton textiles, chiefly of coarse goods, peaked in the 1880s. In the wake of the adoption of labour legislation, and the increased presence of Brazilian producers in local markets, the value of Belgian textile exports contracted, by more than a half by 1900. The response of Belgian producers was to sell new quality items, primarily medium to fine yarns, and finished items; by 1910, export receipts were back at 1880 values.

Across a broad range of sectors, regulation precipitated similar responses. As labour became relatively scarcer, firms reacted by investing in new capital equipment and by upgrading product lines (Vandervelde 1911). Exports of the new staples, metals, and chemicals rose by about 20 per cent per annum in the decade before the war (Horlings 1997). Most telling was the expansion along the extensive margin. The country imported and exported 77 items in 1870, 95 in 1890, 152 in 1900, and 189 in 1910. A similar trend holds regarding destinations: Belgium had 36 trading partners in 1870, 55 in 1890, 107 in 1900, and 114 in 1910. To be sure, the fall in trade costs and rise in world income had increased demand for Belgian goods, but the broad range of items sold abroad indicates that supply side factors mattered too.

The conjunction of regulation and export-led growth was apparent in changes in business structure. On the one hand, regulation had more bite in large establishments because factory inspectors were more prone to monitor them. On the other hand, large firms were more productive and, hence, better exporters. In 1910, Belgian companies engaged in tradable activities were about five times bigger than those in the domestic sector, their capital–labour ratios being three times greater.24 Challenged by foreign competition, low-productivity firms exited, and output and employment reallocated towards more productive ends. By the eve of the war, 59 per cent of workers were occupied in the international sector, 21 per cent in the domestic, and 20 per cent in other branches.

The change in orientation of Belgium exports had ramifications for the terms of trade. To begin, consider that labour regulation was widespread in the Europe in the decades before 1914, the new labour laws prompting a movement up the quality ladder everywhere, and a general rise in export prices. This stands in contrasts to view that swings in prices of primary resources lay behind the movement in the terms of trade in the long nineteenth century. There was an Old World side to this story. As prices of manufactured goods rose, the terms of trade moved in the same direction. In this fashion, Europe externalized the costs of regulation beyond its borders. The top panel in figure 3 tracks the terms of trade for Belgium from 1890 until the war, using prices of cotton textile exports and grain imports. Into the mid 1890s, prices exhibited no discernible trend, but from 1900, the terms of trade rose by about 20 per cent as new labour laws came on the books.25 Changes of this order had substantial benefits for small open economies like Belgium because the real-income effect of terms-of-trade movements is generally held to be proportional to the volume of trade.

23 Figures on products and destinations from Belgium, Tableau général, 1870–1914. See also Abraham et al. (1997).
24 Figures in this paragraph are from Cassiers (1989, pp. 38–40). On exports and growth into the interwar years, see Cassiers and Solar (1990).
25 This general price rise in Belgium in the same period was in the order of 10 per cent (Scholliers 1995, p. 132). Movements in the terms of trade for other countries in the European core replicate the trend for Belgium. For sources, see Huberman (2012).
The flip side is presented by Brazil in the lower panel of figure 3. Here, I track import prices of Belgian textiles and export prices of coffee. The terms of trade is an independent series calculated by Blattman et al. (2007). Until 1900 or so, the terms of trade mirrored the movement of coffee prices, but the relation loosened as the Old World adopted legislation and exported more expensive products. After 1908, even as coffee prices rose steadily, the terms of trade remained flat because of the offsetting effects caused by the high prices of imported intermediate and finished goods. Of course, this gave space in local markets for producers of cheap goods like textiles, another indicator of the interdependence of industries.

Figure 3. Terms of trade: Belgium and Brazil. Sources and notes: Belgian textile export prices and Brazil import prices from Van Houtte (1949). Brazil coffee export prices and terms of trade are from Blattman et al. (2007).

26 It is preferable to use home prices to calculate the terms of trade, but a long series of Brazilian prices of textile imports is unavailable. Garry's (1920, p. 4) price series (F.O.B.) of textile imports for 1907–1913 increases by 10 per cent.
in the core and the periphery. Consumers and producers across Old and New Worlds, it seems, footed the bill of Belgium’s labour laws. Epifani and Gancia (2009, p. 630) observed a similar phenomenon in the last decades of the twentieth century. “If the price of a Nokia phone partially reflects high domestic taxes, every unit sold to foreigners provides a subsidy to the Finnish welfare state”.27

3.2 The New World in the interwar years

So far, I have claimed that labour regulation had similar effects on capital investment in Old and New Worlds. Big and mechanized Belgian firms succeeded in the favourable trade environment before 1914. Despite parallel advances in manufacturing, the Brazilian experience with regulation unfolded differently. There are a number of competing explanations. Failure has been ascribed to the inherent weaknesses of the textile industry, the growing muscle of local protectionist interests, and the state’s attempt to exploit labour policy to secure social control that inevitably harmed competitiveness (Haber 1992; French 2004, pp. 15–9; Colistete 2007, pp. 99–100). In this section, I advance the complementary hypothesis that international political-economy factors were part of the equation as well.

Recall that by 1914, Brazilian producers had made inroads elsewhere in the Southern Cone. Undoubtedly, intracontinental trade was limited because neighbours had similar factor endowments, but the war years provided a unique opportunity for Brazil because of the absence of “external interference” or intervention of major trading partners (Albert 1988, p. 93). The USA came to be a major importer of coffee, cocoa, and rubber and replaced the UK as the main supplier of industrial goods. Brazil also established closer commercial ties with its nearest neighbours. A relatively open economy until 1931, Argentina’s manufacturing sector actually declined during the war (Diaz Alejandro 1970). Argentinean consumers were known to have had a preference for European goods, but they were also sensitive to price (Gravil 1975, p. 48). In this market, Brazil competed head on with foreign rivals—and seemed to have fared well. Figure 4 gives shares of Brazilian trade with

27 Kindleberger (1956, p. 305) wrote: “Small countries which innovate or imitate in these income elastic goods had high export prices and favourable terms of trade”.

Figure 4. Share of Brazil’s trade with Argentina. Sources and notes: Instituto Brasileiro de Geografia e Estatística (IBGE). Sector externo.
Argentina. The war years were clearly exceptional as exports and import shares spiked at 18 and 23 per cent. 28

Historians are less than unanimous on whether or not the industry benefited from the war years. Some (Dean 1969, pp. 88–104) claimed that the textile industry was starved for capital and that existing plants and equipment tended to be run for longer hours. But others, like Miller (1981, p. 710), found that: “Brazil manufacturers did benefit from the war, producing more and selling it at higher prices”. In São Paulo, between 1915 and 1920, the number of textile companies increased by 30 per cent, workers and capital by 50 per cent, spindles 55 per cent, and output doubled. 29 More pertinent is to explain the collapse of exports in the 1920s. Did Brazil ultimately fail to upgrade product lines because of a fundamental lack of human and physical capabilities? Did labour regulation cut into industry’s international competitiveness? Did foreign markets close down for reasons beyond Brazil’s control?

The history of cotton textile industry after the war can be divided into two subperiods, before and after 1925. In the wake of labour regulation after 1919, businesses invested in new capital equipment and the average size of firms increased (see figure 2c–e). The appreciation in the exchange rate in the early 1920s, in anticipation of the return to gold, was an invitation to foreign investment and an incentive for businesses to import machinery, which reached its summit in 1925 (Versiani 1971, p. 152). Average profits for a sample of firms peaked in the same year (Haber 1992, p. 346). Employment rose steadily until 1926, by which date it had doubled its 1919 figure (Versiani 1971, p. 153). The British trade delegate (Pearse 1923, p. 28) imagined the new global trading order, one based on footloose capital and public technology seeking out sources of cheap labour and raw materials. São Paulo would serve as the base of regional and continental trade.

Based on expansion at home, the industry would look outwards. The rub was that success in foreign markets depended, eventually, on the export of high-end goods, a pattern industries elsewhere pursued (Singleton 1997). Again, Brazil met this condition. According to purchase orders of new ring-spinning machines, into the 1890s, Brazil ordered machines specialized in spinning low counts of yarn, well suited to its labour and resource endowments (Saxonhouse and Wright 2004). By 1914, the industry had begun purchasing equipment to spin medium grades, a tendency culminating during the war and after the passage of labour laws. In Belgium, yarn counts actually fell after the adoption of labour regulation in 1889, but by the early 1900s, the trend in counts was decidedly upwards. As legislated hours of work per week in the two countries converged, the challenge of labour regulation would seem to have been met by an improvement in product quality.

The point is that Brazil had the physical and human capabilities to expand in foreign markets, and further export expansion based on its experience in the war was not a great leap. In this scenario, labour regulation, as it had in Belgium, would serve as an incentive to pursue the production of higher valued goods. Based on companies’ balance sheets, Haber (1992, p. 355) presented a record of “volatile” profits, which he attributed to long-standing weaknesses in productivity improvements. But, a complementary reading is that the mixed record was the outcome of sorting, churning, and shedding within the industry as firms came to challenge, and be challenged, in open markets. Throughout these years, the tariff proved ineffectual (Fishlow 1972, pp. 326–27). Manufacturers had petitioned for

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28 The share of Argentinean trade with Brazil peaked during the war (Albert 1988; McRea et al. 1931, p. 72).
29 In 1915, the average textile establishment in São Paulo employed nearly 600 workers, 25 per cent greater than in the rest of the industry. In the non-tradable sector, metals and food processing, the average was about 35 workers (Lobo 1978, pp. 608–10).
increased protection, but the government hesitated because of the importance of customs revenue (CIFTA 1925, pp. 68–83). At the same time, as imports of textile goods rose in the early 1920s, Brazilian exports had modest success in its neighbours’ markets (figure 2f).

In contrast, the years after 1925 were sombre. Foreign markets collapsed. Argentine became the object of a hemispheric Anglo-US trade rivalry (Lewis 1975). Lancashire, which was losing ground in India, began unloading goods at discounted prices in an attempt to retain a foothold in Latin America, reneging on a promise to assist Argentina in setting up its own textile industry in exchange for Commonwealth preferences for its exports. British intervention succeeded at Brazil’s expenses. International political economy forces caused Brazil to lose the advantages of market size that, for instance, Japanese firms had managed to exploit in South Asia.

There was a domestic side to this story. Stein (1957, p. 143) claimed that the spree in machinery purchases earlier in the decade inevitably led to overproduction and price cutting. But, the domestic market was not insulated from changes in the international economy. The global contraction in trade depressed commodity prices, thereby restricting domestic demand on which industry expansion was built. Perhaps the most telling shock was the direct threat of “ferocious international competition” (Bulmer-Thomas 2003, p. 186) in the home market. As the exchange rate, prices of foreign textiles fell by nearly 40 per cent between 1923 and 1926 alone (Versiani 1971, pp. 54–55). Trade balances deteriorated. With Belgium, a small negative balance in 1925 had multiplied four-fold by 1928, imports mainly comprising of machinery and high-end manufactured goods.30 Still, Brazilian manufacturers were able to meet the decline and, beginning in 1927, relative prices began to shift in favour of domestic goods (Haber 1992, p. 357). But, Brazilian producers could not contend with unfair trade practices in their own backyard, particularly the dumping of goods by the British.31 It was these practices that forced manufacturers to the wall, ultimately provoking demand for increased protectionism.

As export markets collapsed—trade costs had become prohibitive—the benefits of regulation that had accrued to Belgian firms vanished. Twenty years previously, Old World countries made the necessary adjustments to labour regulation in the context of expanding foreign markets, a luxury that was not available to Brazil. The shift of resources to exporters did not materialize, and the concomitant productivity gains were lost. Commenting on the failure to find markets for high-end goods, a United Nations’ (1951, p. 23) field study of the São Paulo textile industry, reported:

All the mills manufacture a limited number of yarns and are outstanding for the high quality of their management. The productivity of mills nos. 3 and 5 should be higher since conditions of manufacturing and supervision there are excellent. However, they were designed to make very fine yarns and, at the time of the investigation, market conditions obliged them to manufacture yarns of a much lower count. As a result, their processes were thrown off balance, causing a reduction of productivity.

Plagued by insufficient demand, the state raised tariffs (1929) and placed an embargo on the import of foreign machinery (1931). Labour had its rewards too. In 1943, Getúlio Vargas assembled existing laws on regulation and social entitlements in the Consolidation of Labour Act, proclaimed—by its architect at least—as the world’s most progressive legislation

30 Figures from IBGE (1901–1939), Valor em libras do intercâmbio comercial com os principais países.
31 Ribeiro (1988, p. 81) and Von der Weid and Bastos (1986, p. 120).
Labour policy was imposed in a top-down and corporatist fashion and embedded in the larger import substitution initiative. In the Belgian mirror, the inward response of Brazil was as much a consequence of the contracting interwar trade environment as it was the result of domestic political forces.

4. Implications

Previous studies of regulation have tended to find only small effects of labour regulation on wages, employment, and profits because business either anticipated the new regulations or contributed to their makeup. In this view, regulation was the offspring of the general rise in income. Do these results go through in an open-economy framework? If major trading partners went through a parallel evolution, then the rise in income everywhere would have lifted regulation upwards. The trouble with this view is that the development process was inherently uneven, and commercial rivals could not anticipate the reform agenda of neighbours. Under these conditions, labour regulation harmed competitive advantage.

The comparison of Belgian “success” and Brazilian “failure” has identified an alternative reason why labour regulation has had benign effects in an open economy. In Belgium before 1914 and in Brazil in the early 1920s, business responded similarly to the labour laws, substituting new and more equipment for expensive labour. Regulation was a potential source of export expansion. Although both countries were poised to benefit from these changes, only Belgium realized the gains of trade attached to regulation. A closed-economy analysis actually understates the welfare benefits the new laws had. In the expanding world economy before 1914, rising wages in the export sector had spillover effects in other activities. Consumers chose from a greater variety of products. And, while regulation in a closed economy would have sparked new capital investments as well, in the spirit of new trade models with heterogeneous firms, the allocation of resources in an open economy had aggregate productivity effects. Brazil producers, workers, and consumers did not realize these benefits because market access in the 1920s was closing down.

My study of labour regulation in Belgium and Brazil has exposed the difficulty, if not futility, of disentangling domestic and external factors. Countries, as Kindleberger wrote, set their own laws and rules, but the uneven playing field did not threaten international competitiveness. The take-home point for the debate on trade and labour standards today is cautiously optimistic. For rich countries, their more advanced regulatory environments, in addition to providing workers with a safety net, enhance and deepen their competitive advantages. From the perspective of poor countries, the adoption of the labour standards may serve as a lever to expand their range of exports and trading partners, at the same as reducing dependence on child labour and improving working conditions. The experiences of Belgium and Brazil make clear, however, that these benefits are not automatic, depending as they do on market access, which as history records cannot be guaranteed.

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