

## Social Innovations vs international Trade?

### Core labour standards and exports

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Version très provisoire et non révisée. Ne pas citer.

#### Résumé –

Les normes de travail définies par l'OIT en 1998 sont universelles mais très différemment appliquées dans les pays. Elles sont d'autant mieux respectées que les pays disposent d'un revenu élevé. Néanmoins la causalité entre les normes de travail et la croissance reste une question controversée. Les stratégies de croissance par les exportations peuvent inciter les pays en développement à contenir la progression des normes de travail d'une part pour accroître leur dotation en travail non qualifié et ainsi renforcer leur avantage comparatif relativement aux pays qui les respectent, d'autre part à mener des stratégies de « dumping social » qui visent à accroître plus directement la compétitivité. Nous utilisons un modèle de gravité en coupe pour évaluer l'impact du niveau de respect des normes de travail sur le commerce en distinguant d'une part les effets bilatéraux sur la spécialisation géographique et, d'autre part, les effets sur l'ouverture aux exportations et aux importations. Nous montrons que, toutes choses égales par ailleurs, les pays qui respectent les normes de travail tendent à échanger davantage avec les pays qui ne respectent pas les normes de travail qu'entre eux, alors que les pays qui ne les respectent pas tendent à échanger davantage entre eux. Ces effets jouent surtout sur le travail des enfants et la liberté d'association. De même, toutes choses égales par ailleurs, les pays qui respectent les normes de travail, tendent à être moins ouverts que les pays qui ne les respectent pas mais de manière différente selon les normes avec une relation non-linéaire pour certaines d'entre elles (travail des enfants, travail forcé).

#### Abstract –

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Labour standards defined by the ILO in 1998 are universal but applied very differently in countries. They are much better respected in high income countries. However, the causality between labour standards and growth remains a controversial issue. The strategies of export-led growth might encourage developing countries to contain the rising process of standards, first to increase their unskilled labour endowments for strengthening their comparative advantage relative to complying countries, and then to pursue strategies of "social dumping", which aim more directly at increasing competitiveness. We use a gravity model to assess the trade impact of pushing back the level of compliance with labour standards in distinguishing one hand the effects on bilateral trade (geographical specialization) and, secondly, the effects on the export and import openness. We show that, other things being equal, countries that meet the standards of work tend to trade more with no-complying countries, while countries that do not respect standards tend to trade more each other. These effects are mainly identified on child labour and freedom of association. Similarly, all other things being equal, countries that meet labour standards, tend to be less open than countries that do not comply but in different ways according to the standards with a non-linear relationship for some of them (child labour, forced labour).

JEL – F11, F13, F16, F43, F47, F51, J8

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## 1. INTRODUCTION

ILO's "*Declaration on Fundamental Principles and Rights*" (1998) defines four core standards, embodied in eight conventions. These rights are considered to be universal and must apply to all people and all Nations, regardless of the level of economic development. This Declaration was inspired by the *World Summit for Social Development* in Copenhagen (1995), which included seven Agreements. Since little protection against child labour was included in the existing ILO conventions, a new convention was added to cover its worst forms (Convention 182). The four core labour standards, embodied in eight conventions, are:

Freedom of association and the right to collective bargaining (Conventions 87 and 98);

Elimination of all forms of forced or compulsory labour (Conventions 29 and 105);

Elimination of discrimination in respect of employment and occupation (Conventions 100 and 111);

Recommended minimum age for child workers (Convention 138) and the worst forms of child labour (Convention 182).

There is a consensus as regards the positive correlation between the quality of labour standards and the level of development. Income per inhabitant would be one of the drivers of compliance with core labour standards (Casella, 1996; Busse, 2004; Arestoff and Granger 2003). Bazillier (2008) confirms the positive impact of core labour standards on long-run growth. However, the direction of causality and the channels of transmission are still discussed.

If it is largely considered that “growth is good for labour standards”. However, this assertion is not enlightening. It is based on cross-section analysis with a long-run perspective and nothing is said about the influence of labour standards on growth. If low labour standards impede growth, we cannot expect an improvement of labour standards attesting the initial assertion.

Endogenous growth models thus emphasize the positive role of accumulating production factors, especially human factors (Lucas, 1988; Romer, 1989). In these models, the long-run growth rate increases the greater the amount of time devoted to

training and decreases the more priority is given to profits in the present. Child labour and inadequate health and safety conditions also combine to push down the rate of accumulation of human capital and, consequently, future growth rates. Even, the various forms of violating labour standards are aimed at and result in lowering the cost of labour and paying for it below the equilibrium price (marginal productivity of labour), which maintains under-productivity and, consequently, under-development. Low capitalistic processes provide little incentive to the employer to invest in order to increase labour productivity. According to Piore (1994), low investment is a way of avoiding geographical concentration, which leads to dispersed industry and makes monitoring work conditions more complicated. Aidt and Tzannatos (2002) believe that upholding workers' rights facilitates coordination and increases productivity by reducing the effects of labour/management conflict on production and helping small open economies to adjust more rapidly to economic shocks and this at the lowest possible cost. Martin and Maskus (2001) show that, if the markets are competitive, it is more likely that freedom of association will increase production and competitiveness by improving productivity. The freedom of association and collective bargaining are also often preferred to the introduction of a minimum wage, which may lead to higher adult unemployment and a higher level of child labour (Basu, 2000; Dinopoulos and Zhao, 2007).

Trade openness must be included in the chain of causality. Some authors locate trade openness at the beginning of the process (Griswold, 2001): the best way to improve labour standards would be to encourage growth assumed being stimulated by open trade. In this case, we speak of "endogenous" development of labour standards: opening up trade encourages growth and income which in turn helps to reduce poverty, raise real wages and improve the respect of labour standards. Any measure that would result in the decline of international trade would therefore be counter-productive. However, these predictions do not help to explain the persistence of differences in the levels of labour standards in countries with similar income levels. Neither has any immediate or significant improvement been observed in the level of standards in high-growth countries (India and China).

The virtuous "endogenous" process assumes compliance with two hypotheses: trade openness stimulates growth and growth leads to improved labour standards.

During the 1990s, many studies served to consolidate the first link in the chain of causality: opening up trade encourages growth (Edwards, 1992, 1998; Dollar, 1992; Ben David, 1993; Sachs and Warner, 1995; Ales and Glaeser, 1999). This causality has nonetheless been challenged by methodological criticism, notably by Rodriguez and Rodrik (2000), who highlight the difficulty of measuring openness. If trade has an influence on growth, the opposite may equally be true.

Nonetheless, subsequent studies tend to confirm a positive relation: Frankel & Romer (1999) find that an increase in the ratio between trade and GDP of 1% would push up income per inhabitant by 0.5% to 2%. In any case, this relation is more likely to be due to the "exogenous" geographical characteristics of a country than to trade policy (see also Irwin & Tervio, 2002). Although there is a pretty strong assumption regarding the causal nature of foreign trade, the connection with trade liberalisation policies is therefore less certain (nonetheless, see Wacziarg & Welsh, 2008). These cross-section studies cannot exclude the existence of "outliers", in other words, countries that diverge from this trend. They do not therefore exclude different levels of sensibility between growth and trade in different countries depending upon a combination of criteria, such as geography or institutions (Rodrik ed., 2003).

Furthermore, we have also to consider the direct link between labour standard and trade, which might jeopardize the assumed virtuous indirect link transiting by growth.

Many authors emphasise the possible negative effects of globalisation on certain social standards, especially as regards child labour. Edmonds and Pavcnik (2002) the gradual relaxation of the rice export quota increased the relative price of this product and therefore the income of the rural population and the decline of child labour in rural areas.

According to Busse (2004), opening up trade significantly reduces discrimination against women and child labour. On the other hand, its impact on forced work and union rights is more ambiguous. However, Arestoff and Granger (2003) show that opening up trade has a negligible effect on the composite indicator regarding compliance with the ILO's four core labour standards. Edmonds and Pavcnik (2006) find a negative relationship from trade to child labour, which becomes statistically insignificant when cross-country income differences are controlled.

Inversing the causality, labour standards might also determine trade. Export-led growth strategies make pressure on labour cost and might drive to lowering labour standards or significant lags on the pace of potential improvement due to the growth.

The paper aims to explore this causal link between the compliance of core labour standard and trade. The question is at the core of the debate on the inclusion of a social clause in trade agreements. While the Singapore Conference of the WTO has denied any link between labour and trade, highlighting a significant relationship would question this assertion. A positive relationship between non-compliance with core labour standards and exports would confirm an incentive to lower labour standards for a competitive matter.

## **2. THEORETICAL ISSUES AND PREVIOUS EMPIRICAL EVIDENCE**

Many studies are based on a usual HOS theory. Increasing unskilled labour force in countries where this factor is relatively abundant deepens the comparative advantage and drives to higher trade with developed countries having the opposite factor endowment. However, increase in exports of goods intensive in low-skilled labour might cause a degradation of the terms of trade (see, for example, Brown, Deardorff and Stern, 1996)

If the non-compliances with certain core labour standards, such as child labour and forced labour, allows intensive use of the workforce (child labour, prison labour, etc.), the short-term effects on employment and growth might be attenuated by substituting one labour category for another. Assuming that child labour and adult labour are totally interchangeable, the use of child labour may entail a proportion of the adult labour force being excluded from the market (Basu and Van, 1998; Hansson, 1981; Granger, 2003) Similarly, forced labour might be alternatively used to free labour and, therefore would have an undetermined effect on endowments.

The positive, even ambiguous, effect of child and forced labour on unskilled labour endowments might be counter-balanced by the violation of other labour standards. If discrimination prevents certain categories of the population from having access to work, it affects the quantity of labour used in production. It also creates rigidity and affects productivity, thus preventing a more effective allocation of resources (Brown, Deardorff and Stern, 1996; Maskus, 1997; OECD 1996).

The role played by freedom of association and collective bargaining rights is the most highly challenged aspect, mainly due to the effects of “closed shop” unions, widely thought of as negative, in some Latin American countries (Elliott, 2003). Nonetheless, the unions' legitimacy usually lies in the challenge they present to the excessive and abusive powers of employers, which are often inadequately regulated by the public authorities and advantaged by other core standard violations, such as forced labour and child labour. The monopsonic behaviour of the employers leads to the labour being underpaid (Granger, 2003; Martin and Maskus, 1999; Morici and Shulz, 2001; Shelburne, 2004). The firms that have the advantage of a monopoly over recruitment can ration out their labour demand, and, therefore, production and exports, to put pressure on the price of labour.

Another link is the competitive pressure of labour costs in other countries. "Social dumping", a term subject to some controversy, may be defined as an impingement of workers' rights applied for the purposes of boosting competitiveness, in both the import and export markets alike. It is thus a means of putting pressure on wage costs and production costs. A strict definition would imply that such an impingement refers to "normal" practice in the producing country: violation of national laws, exemptions granted to certain export industries. A country initiating "social dumping" practices might trigger a *race-to-the-bottom* process e.g. a prisoner's dilemma process. This does not so much involve North-South trade as South-South trade, given that countries in the South are rivals competing in the international market for similar sectors (Elliott, 2003): the repercussions of social dumping by an exporting country are actually felt more intensely in the countries with similar comparative advantages and specialisations (textile-garment industry). One consequence is the increasing risk of deteriorated terms of trade making more uncertain the expected increase of the value of exports.

Finally, lowering labour standards may contribute to influence trade by two channels at least: change in unskilled labour endowments and an increasing gap between labour productivity and labour costs.

Because theory is ambiguous, only empirical studies might settle the issue. Early studies showed the absence of correlation between labour standards and the volume of trade (OECD, 1996, 2000; Mah, 1997; Raynauld and Vidal, 1998) but they did not use reliable indicators. The number of ILO conventions ratified by a country is the most frequently used indicator in empirical studies (Rodrik, 1998; Busse, 2003; Cooke &

Noble, 1998). Because of a gap between the content of conventions and their effective application, this indicator must be considered with caution (Chau & Kanbur, 2001).

Rodrik (1998) shows that timework and child labour contribute to a higher share of labour-intensive exports in total exports. Van Beers (1998) finds that labour standards influence trade in 18 OECD countries. Granger (2005) has built her own indicators on the four core labour standards and concludes that violation by Southern countries tends to raise the volume of North-South trade. These last studies confirm the existence of a trade-labour linkage.

Many empirical and econometric studies focus on the specific case of freedom of association and collective bargaining, and its impact on trade and economic performance. They show that collective bargaining improves overall economic competitiveness (see, for example, Aidt and Tzannatos, 2002; Martin and Maskus, 2001). Nonetheless, the estimates by Galli and Kucera (2004) fail to reveal any definite connection between upholding union rights and exports of labour-intensive goods.

So far, the question has been tackled from a unilateral point of view: do countries observing core labour standards trade more with the world? However, trade relations concern couples of countries and are influenced by bilateral trade costs such as tariffs, transport and insurance costs. Moreover, the observance of labour standards might influence these trade costs for various reasons. Current-preferential agreement negotiations include labour standards provisions. Following Bagwell & Staiger (1998), two respectful countries should conclude more reciprocal tariff reductions, which imply lower trade costs. However, the respect of labour standards is costly and might impede exports, especially towards countries importing labour-intensive and high price-elasticity goods. Implementation of multinational firms in low-ranked countries to serve world markets might be detrimental to trade between high-ranked countries.

Our empirical study aims to verify whether and how labour standards affect bilateral trade.

### **3. METHODOLOGY**

The hypothesis derived from the factor endowment theory is that countries violating labour standards, which actually concerns labour-abundant countries, should increase their relative endowment in unskilled labour trade with countries respecting them. The “social dumping” hypothesis is that the same countries should trade more with the rest



of the world than complying countries (all thing being equal), although the race-to-the-bottom effect is supposed to reduce the competitive advantage expected by the firms and countries.

A good framework is the Anderson and van Wincoop's specification of the gravity model. Gravity models predict bilateral trade by the product of national incomes (GDP) and the distance between partners. Distance is a proxy for transport costs and the model may be "augmented" by other variables affecting bilateral trade costs. The model proposed by Anderson and van Wincoop (2003) introduce country fixed effects (export and import), which capture all unilateral effects as level of development or remoteness and reduce the risk of endogeneity. They also impose unit income elasticities and the product of GDPs is then considered as a denominator of the independent variable, which is expressed in logarithm. The advantage is to circumvent two difficulties: co linearity with country fixed effects and a plausible endogeneity with trade variables.

In a monopolistic competition framework, with full and exclusive specialisation (one variety, one country) where consumers have a CES preference function with a common elasticity among all goods ( $\sigma > 1$ ), the gravity equation can be written as:

$$X_{ij} = \frac{Y_i Y_j}{Y_w} \left( \frac{t_{ij} \Pi_i}{\Pi_i P_j} \right)^{1-\sigma} \quad (1)$$

$$P_j^{1-\sigma} = \sum_i \Pi_i^{\sigma-1} \theta_i t_{ij}^{1-\sigma} \quad \forall j \quad (2)$$

$$\Pi_i^{1-\sigma} = \sum_j P_j^{\sigma-1} \theta_j t_{ij}^{1-\sigma} \quad (3)$$

Where  $X_{ij}$  are the exports from country  $i$  to country  $j$ ,  $Y_i$  et  $Y_j$  are levels of GDP,  $Y_w$  is world GDP,  $\theta_i$  is the income share of country  $i$ , and  $t_{ij}$  are costs associated to trade from country  $i$  to country  $j$  ( $t_{ij} \geq 1$ ) With the symmetry of trade costs ( $t_{ij} = t_{ji}$ ),  $\Pi_i = P_i$  and Equation 1 then becomes:

$$X_{ij} = \frac{Y_i Y_j}{Y_w} \left( \frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (4)$$

From this theoretical foundations, empirical investigations usually proxies for trade costs and include other variables acting on bilateral trade (augmented variables). Price indexes  $P_i$  and  $P_j$  are "multilateral resistance" terms. They summarize the average trade

resistances between a country and all its trading partners. Taking account the complexity of nonlinear techniques estimation of prices, export and import country fixed effects are usually used to quantify "multilateral resistance" in a way that integrates omitted variables and makes possible the isolation of "bilateral" and "unilateral" effects of institutional variables (Feenstra, 2004).

The equation to estimate is then

$$\text{Log}(X_{ij}/Y_i Y_j) = \alpha_l \text{Log}(D_{ij}) + \sum_k \alpha_k \Psi_{ijk} + \sum_{k'} \beta_{k'} Z_{ijk'} + \sum_i \alpha_i DE_i + \sum_j \alpha_j DI_j + \square_{ij} \quad [5]$$

$D_{ij}$  = distance between  $i$  and  $j$  ;  $\square_{ijk}$  = a  $k$ -vector considering a mutual characteristic (language, border, trade agreement, factor endowment...).

.  $\square_{ijk'}$  = the  $k'$  bilateral variables of interest ;

$DE_i$  ( $DI_j$ ) = export (import) fixed effects (dummy variable).

.  $\square_{ij}$  = error term respecting the usual conditions.

However, this choice leads to an additional issue in cross section: unilateral variables such as income or the level of labour standards are perfectly collinear with country (export and import) fixed effects. Then, we can only introduce bilateral (dyadic) variables. Bilateral trade between two countries are a function of differences in factor endowments, hypothetically influenced by the respect of labour standards. Due to the fact that all developed countries, which are also skilled-labour abundant, have high labour standards with few deviations, we can introduce a measure of the heterogeneity in regard of respect of labour standards. If the violation of labour standards increases the endowment in unskilled labour, we expect a positive relation between bilateral trade and the measure of heterogeneity. By acting in this way, we also reduce the risk of endogeneity by causality bias, because the respect of labour standards in one country cannot be considered as the consequence of trade relations with another country. Only few bilateral agreements impose "social clauses" with very debatable effectiveness (Siroën and alii, 2008).

In a second step, the effect of the labour standard index on the overall trade, hypothetically due to a "social dumping" strategy can be estimated by regressing the

fixed effects variables with country-specific variables, including the indicator of compliance with labour standards.

The second econometric issue deals directly with the empirical methods used to estimate gravity equations. There is a long tradition of log-linearizing (Equation 5) and estimating the variables of interest by OLS. However, Santos Silva and Tenreyro (2006) show that heteroskedasticity is a frequently underestimated issue for gravity models, even when a Huber-White estimator is used. OLS-estimated elasticities can then be highly misleading. To bypass these problems, Santos Silva and Tenreyro (2006) advocate testing trade variables in levels, *i.e.*, to test  $X_{ij}$  instead of  $\text{Log}(X_{ij})$ , and using a robust Poisson Pseudo-Maximum Likelihood (PPML) estimator because it produces estimates that are robust to heteroskedasticity (Winkelmann, 2003). This method of estimation also permits taking into account zero trade because the  $\text{Log}(0)$  issue disappears. However, to consider nil values does not deal with the issue of censored variables ( $X_{ij}$  cannot be negative). The zero-inflated Poisson regression (ZIP) we use has the feature of specifying an equation that determines whether the observed trade flow is zero or not.

So, the second type of equation to estimate is

$$X_{ij} = \alpha_l \text{Log}(D_{ij}) + \sum_k \alpha_k \Psi_{ijk} + \sum_{k'} \beta_{k'} Z_{ijk'} + \sum_i \alpha_i DE_i + \sum_j \alpha_j DI_j + \square_{ij} \quad (6)$$

#### 4. DATA

The information on bilateral exports comes from the International Monetary (*IMF*, *Direction of Trade Statistics*). Data on GDP are extracted from the World Bank's World Development Indicators. Distance ( $dist_{ij}$ ) is the great arc circle kilometric distance between the two capitals of countries  $i$  and  $j$  (*CEPII database*). Contiguity ( $contig_{ij}$ ) and colonial ties are also taken from CEPII's "Distance" database. The Common language data are from *CIA World Factbook*. Dummies indicating a common membership in a preferential trade agreement ( $agreement_{ij}$ ) are from the WTO database.

We have a problem with the usual variables of common language and common colonial link. First, in multilingual countries it is sometimes arbitrary to determine the common language and, second, there is an obvious link between language and colonizer. So, we use a new variable called "cultural distance" ( $culdist_{ij}$ ) taking the value 1 when two countries share the same language (at least one language considered as official by the *CIA* database) and/or had a colonizer-colonized link.

Because we consider the contribution of labour standard to labour endowment as a channel of transmission, we must control relative factor endowments. We use as a proxy the difference between GDP per capita :

$$factorend_{ij} = MaxGDPpercapita/MinGDP\ per\ capita.$$

Few databases include the respect of labour standards as defined by the ILO's declaration. Some consider the laws regardless of their implementation. Others focus on other social aspects (minimum wage, for example)<sup>1</sup> or only certain standards. Papers have previously used the Granger's database (Granger, 2003, 2005; Granger and Siroën, 2010), which separately scores each core labor standard (child labor, forced labor, discrimination, union rights) from 1 (total violation) to 4 (total respect). The coding method is based on the exploitation of a large amount of qualitative and quantitative information from various sources, such as ILO, US Department of Labor, US Department of State, NGOs reports.

However the Granger's database scored only 65 countries, the limitation being due to a choice giving a priority to diversified sources. Bazillier (2007) prefers to expand the

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<sup>1</sup> See, OECD (1996), Rodrik (1996), Mah 1997, Van Beers (1998)

sample to 155 countries, left to reduce the sources used for scoring. He uses similar method of scoring for the same period (end of 90s). The index quotes the four core labour standards + the number of ratified ILO's conventions, from 1 (total compliance) to 5 (total disrespect). He uses the MCA (Multiple Correspondence Analysis) method to build an aggregated index. Bazillier shows a high correlation between its own indicator and the Granger's one. Applying systematically the same methods of aggregation for the same countries and even if parameters are quite different, we verified they give similar results. We can consider that differences should be due to the size of the sample, not to serious differences in the assessment of compliance with labour standards.

However, the Bazillier's index has been rebuilt. Indeed, we have chosen to only consider the compliance, not the official laws, regulations or international conventions. For example, USA have ratified only 14 conventions (only 2 of the eight "core" ILO's conventions) and Myanmar...19. From the Bazillier's database, we use the same weighting method (MCA) to obtain a new aggregated index (*Agindex*) excluding the ratification of conventions.

We use this index to introduce the "social distance" between  $i$  and  $j$  in the equation :

$socdist_{ij} = 1 + |Agindex_i - Agindex_j|$  (one is added to avoid the nil value for equally scored countries).

However, the social index only gauges social heterogeneity whatever the level of labour practices. A couple of countries violating labour standards will have the same value as a couple of complying countries. We then introduce two dummies variables:  $respect_{ij}$  taking the value 1 when the couple of countries complies labour standards (if  $Agindex > 0.75$  in  $i$  and  $j$ ) and  $norespect_{ij}$  when it does not ( $Agindex \leq 0.75$ ). The reference is the heterogeneous case: one country complies and not the other one. The hypothesis of factor endowment lets to expect a negative sign for the two variables.

## 5. EVIDENCES

We first consider the bilateral effect of the compliance with labour standards e.g. the factor endowment effect.

From (6) we estimate bilateral exports with usual variables of geographic distance ( $dist_{ij}$ ), common border ( $contig_{ij}$ ), trade agreement ( $agreement_{ij}$ ), cultural distance ( $culdist_{ij}$ ), economic distance ( $factorend_{ij}$ ) and our variables of interest. We use three methods of estimation: LSO ("pure" Anderson and van Wincoop specification with unit

income-elasticities and excluding nil values), PPML (including nil values) and ZIP (filtering nil values).

We first (table 1, column 1 to 3) test the indicator of social distance ( $socdist_{ij}$ ), which is never significant. Note that the indicator of factor endowment ( $factorend_{ij}$ ) is significantly negative in LSO (col. 1) but significantly positive in the two other estimations more economically distant countries significantly (5%) trade more.

The absence of social distance effect might be due to the fact that the factor endowment hypothesis differently acts when the couple complies with labour standards and when the couple violates them. We then introduce  $respect_{ij}$  and  $norespect_{ij}$ , which are defined above. The full validation of the factor endowment hypothesis would imply two negative signs because the reference is the heterogeneous case (one complies, the other not), which is assumed to increase differences in relative factor endowment. The three methods of estimation gives similar results even if coefficients are more significant in LSO. columns 3 (PPML) and 4 (ZIP) show that the factor endowments hypothesis is not invalidated for complying countries: a couple of countries having high labour standards will trade more each other than with countries practicing low labour rights. Adversely, violating countries export more with complying ones ( $norespect_{ij}$  negative). If these results highly mitigate the factor endowment hypothesis, it gives the social dumping hypothesis a chance.

Table 1 – The influence of complying with labour standards on bilateral exports

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	LSO	PPML	ZIP	LSO	PPML	ZIP
	$\ln(x_{ij}/GDP_i \cdot GDP_j)$	$x_{ij}$	$x_{ij}$	$\ln(x_{ij}/GDP_i \cdot GDP_j)$	$x_{ij}$	$x_{ij}$
$contig_{ij}$	0.646** *	0.579* **	0.575* **	0.624** *	0.574* **	0.569* **
	(5.33)	(7.12)	(7.08)	(5.14)	(7.01)	(6.97)
$distcult_{ij}$	0.821** *	0.130* *	0.128* *	0.821** *	0.135* *	0.132* *

	(13,28)	(1.81)	(1.78)	(13.30)	(1.84)	(1.81)
	-	-	-	-	-	-
ln(dist <sub>ij</sub> )	1.399***	0.630***	0.632***	1.415***	0.629***	0.631***
	(41.44)	(19.09)	(19.14)	(42.19)	(18.95)	(19.01)
agreement <sub>ij</sub>	0.750**	0.535*	0.528*	0.752**	0.542*	0.536*
	*	**	**	*	**	**
	(8.86)	(6.75)	(6.70)	(8.89)	(6.91)	(6.87)
ln(factoren d <sub>ij</sub> )	-	0.050*	0.044*	-	0.043*	0.036*
	0.037**	*	*	0.065***	*	
	(2.24)	(2.20)	(1.93)	(4.04)	(1.98)	(1.68)
socdist <sub>ij</sub>	-0.036	0.054	0.046			
	(0.34)	(0.40)	(0.34)			
respect <sub>ij</sub>				2.163**	1.036*	1.010*
				(2.47)	(1.83)	(1.78)
norespect <sub>ij</sub>				-	-	-
				2.513***	1.144**	1.117**
				(2.88)	(2.03)	(1.97)
Constant	-	4.881*	4.960*	-37.962	6.069*	6.115*
	38.647***	**	**		**	**
	(55.21)	(6.91)	(7.01)	(47.92)	(13.93)	(14.11)
R <sup>2</sup>	0.43			0.43		
Wald Chi2			110798			109237
Observatio ns	12772	17465	17,465	12772	17,465	17,465
Country fixed-effects	yes	yes	yes	yes	yes	yes

Robust standard errors in parentheses; \*\*\* : 1%; \*\* : 5%; \* : 10%

In the theoretical part of the paper we stressed the fact that, even if child labour or forced labour are expected to increase the endowment in unskilled labour, standards had controversial effects for two main reasons: the substitution effects (for example, child labour might decrease demand for adults and mitigate the expected increasing effect) and the nature of the violation (for example, the restrictive monopsonistic demand for labour in absence of trade unions).

Table 2 gives the coefficient of the previous variables of interest (the other coefficients are hardly affected), which are disaggregated to the level of each labour standard. Results are only given for ZIP estimations.



Table 2 – Effects of each labour standards on bilateral exports (ZIP)

	First ZIP equation	Second ZIP equation		
	Social distance	Both respect	Both not respect	
Child Labour ( $CL_{ij}$ )	0.035	2.323***	-2.216**	
Forced Labour ( $FL_{ij}$ )	0.016	0.415	-0.551	
Discrimination ( $Dis_{ij}$ )	0.038**	1.789***	-1.985***	
Freedom of Association ( $FA_{ij}$ )	-0.033	1.070*	-1.062*	

\*\*\* : 1%; \*\* : 5%; \* : 10%

Social distance is only significant for discrimination. The coefficient of respect-no respect dummies are coherent with the results found at the aggregated level (table 1, column 6). Two labour standards (Child Labour, Discrimination) are highly significant what is not the case for Forced Labour. Freedom of association is poorly significant even with the same signs. If countries violating labour standards tend to export more to complying countries, this fact is mainly due to child labour and discrimination at work and, less clearly, to Freedom of association.

Social distance takes the value 1 (same index), 2, 3, 4 or 5. An alternative to quantify the influence of social distance is to introduce 4 dummies variable for each score, except 1, which will be the reference (close countries). Table 3 only shows the results for the variable of interest. It confirms that social distance has low effects on trade but with interesting result for child labour. Child labour differences acts positively till 3 and increasingly negative for higher differences. We can also note that discrimination is no longer significant.

Table 3 – Effects of bilateral difference between labour standards on bilateral exports (ZIP)

Social distance	Child Labour	Forced Labour	Discrimination	Freedom of association
2	0.148**	0.030	-0.093	0.043
3	0.088	-0.183**	0.042	-0.102
4	-0.250**	0.110	0.079	0.019
5	-0.772***	0.174	0.121	-0.240

\*\*\* : 1%; \*\* : 5%; \* : 10%

The previous estimations were only concerned by bilateral exports. They tried to quantify the influence of the level of compliance with labour standards on geographical specialization of countries. However, they tell nothing of very clear about the volume of trade with all countries. Anderson and van Wincoop (2003) consider that export and import fixed effects are good proxies for the “multilateral resistance” under what the bilateral trade is not only influenced by “dyadic” variables affecting the couple, but also by idiosyncratic variables which are specific to a country but affecting all bilateral relations. Baldwin and Taglioni (2006) consider that fixed effects reduce the risk of endogeneity. They include all omitted variables having an idiosyncratic dimension.

In a second step we then regress export and import fixed effects extracted from the gravity model. The first issue is to choose the “preferred” gravity equation. Following the recent literature, we consider that ZIP is the most confident method of estimation. Because the social distant (*socdist<sub>ij</sub>*) is never significant we exclude this equation (table 1, column 4) and choose the equation estimated in the table 1-column 6. Theoretically, fixed effects are drained from bilateral effects of labour standards. However, the index is built from the combination of unilateral variables. We have then extracted fixed effects from a gravity equation letting aside bilateral indexes of labour standards as a useful source of comparison.

We introduce some unilateral variables  $GDP_i$ , population ( $pop_i$ ) and remoteness (landlocked countries: *landlock<sub>i</sub>*). Usually, population is barely significant but we prefer to keep in order to control for economic development because:

$$\square \ln (GDP/pop) + \square .\ln(GDP) = (\square + \square) .\ln (GDP) - \square .\ln (pop)$$

A variable contributing to higher fixed effects (lower multilateral resistance) is pro-trade. To validate the hypothesis of “social dumping” as instrument of a successful mercantilist strategy of “export-led growth”, low labour standards are expected to contribute to increase exports. Concerning imports, expectations are not so clear because social dumping might also be an instrument to protect the country from imports. However, mercantilism implies also facilitations for imported goods devoted to transformation for final exports, what is typically the case of free or special trade zones, frequently criticized about their social behaviour.

We first regress the value of the aggregated index ( $Agindex_i$ ) by OLS (table 4). The index varies from 0 (no compliance) to 1 (full compliance). We also test a non-linear (parabolic) relation.

The regression using fixed effects which are extracted from a gravity model without bilateral labour standards only gives significant results in the non-linear relation with import effects: more compliance with labour standards increases import-openness till a threshold of 0.65.

When fixed effects are drained from mutual respect of labour standards, results are more significant as well as linear as non-linear specifications. Improvements of labour standards tend to decrease import and export openness. Improvements of labour standards tend to decrease import and export openness. More precisely, following the non-linear relation, the improvement increases exports and imports only till the low threshold of 0.36 and 0.45 respectively.

**Table 4 – Impact of the compliance with labour standards on trade (fixed effects) (aggregated index)**

Fixed effects extracted from	Gravity model without bilateral labour standards				Table 1, column 6			
	Export fixed effect	Export fixed effect	Import fixed effect	Import fixed effect	Export fixed effect	Export fixed effect	Import fixed effect	Import fixed effect
Ln(GDP <sub>i</sub> )	0.977* (16.21)	0.986* (16.15)	0.852* (25,75)	0.868* (26,76)	0.932* (14.40)	0.966* (15.28)	0.807* (20.06)	0.848* (24,70)
Ln(pop <sub>i</sub> )	-0.101 (1.32)	-0.110 (1.43)	- 0.111*** (2.67)	- 0.128*** (3.14)	-0.046 (0.57)	-0.08 (1.01)	-0.057 (1.13)	- 0.098** (2.28)
Landlock <sub>i</sub>	-0.264 (1.45)	-0.265 (1.45)	- 0.466*** (4.65)	- 0.469*** (4.83)	-0.280 (1.43)	-0.286 (1.51)	- 0.483*** (3.97)	- 0.490*** (4.78)
Agindex <sub>i</sub>	-0.248 (0.66)	1.026 (0.74)	0.293 (1.41)	2.517* (3.42)	- 1.703*** (4.20)	2.898* (2.02)	- 1.171*** (4.64)	4.398* (5.64)
Agindex <sub>i</sub> <sup>2</sup>		-1.112 (0.95)		- 1.942*** (3.14)		- 4.018*** (3.33)		- 4.863*** (7.43)
Constant	- 20.674*** (24.71)	- 21.035*** (22.90)	- 17.317*** (37.72)	- 17.948*** (36.79)	- 19.976*** (22.24)	- 21.282 (22.40)	- 16.621*** (29.77)	- 18.201*** (35.27)
Observations	137				137			
R <sup>2</sup>	0.87	0.87	0.95	0.95	0.83	0.85	0.91	0.94

Robust standard errors in parentheses; \*\*\* : 1%; \*\* : 5%; \* : 10%

Once again, we have to deep the analysis taking into account the different influence of each standard. It is quite frequent to note a non linear relation between institutional variables (democracy, corruption, inequalities...) and the endogenous macroeconomic

variables (growth<sup>2</sup>, trade<sup>3</sup>,...). Then, we have regressed the fixed effects with each labour standards varying from 1 (total compliance) to 5 (total disrespect) one time assuming a linear relation, the second time assuming a non linear (parabolic) relation. Note that, comparatively with the previous table, the interpretation of the sign must be inversed: a negative sign would mean that more compliance with labour standards would boost trade (exports or imports). Labour standards are separately regressed.

Results are much contrasted.

The more robust relation is with forced labour in linearity as well as non-linearity. More a country uses forced labour, more this country trades. If we consider the non-linear relation, the effect is inversed (lower standards = lower trade) at the threshold of 3.38 for exports and 3.60 for imports.

For freedom of association, evidences are different for export and import fixed effects. Concerning the exports, the linear relation behaves well with a positive and significant sign (lower standard-higher exports) and the non linear does not work. The linear relation is also significant for imports but the non-linear regression highly improves the quality of the test (F, R<sup>2</sup>) with once again a U-inversed relation at the threshold of 3.88. Amongst countries scored 4 we find Indonesia, Kenya, Morocco (and many Mediterranean countries), Malaysia, Russia, Singapore, etc.

**Table 5 – Impact on trade of the compliance with each labour standard (fixed effects)**

	Export fixed effect		Import fixed effect	
Child Labour (CL)	0.031 (0.38)	0.922*** (3.34)	0.040 (0.79)	0.953*** (5.93)
Child Labour (CL <sup>2</sup> )	- 0.158*** (3.36)		- 0.162*** (5.92)	
Forced Labour (FL)	0,177*** (2.60)	0,994*** (3.30)	0,144*** (3.44)	0,626*** (3.34)

<sup>2</sup> For example : Barro (1996), Bazillier and Sirven (2008)

<sup>3</sup> For example : Granger and Siroën (2005)

Forced Labour (FL <sup>2</sup> )	- 0,147*** (2.78)	-0,087** (2.64)		
Discrimination (Dis)	0,094* (1.72)	-0.152 (0,51)	0.120*** (3.58)	0,249 (1.38)
Discrimination (Dis <sup>2</sup> )	0.040 (0.85)	-0.021 (0.73)		
Freedom of Association (FA)	0.310*** (4.89)	0.582** (2.05)	0.144*** (3.47))	0.675*** (3.74)
Freedom of Association (FA <sup>2</sup> )	-0.045 (0.98)	- 0.087*** (3.01)		

Robust standard errors in parentheses; \*\*\* : 1%; \*\* : 5%; \* : 10%

The relation between trade and child labour is clearly of a U-inversed type with the threshold of respectively 2.92 and 2.94; amongst countries at the “quasi-maximum” of 3: Bolivia, China, India, Morocco, Brazil, Vietnam i.e. the emerging countries what means that lower standards would contract trade.

Only the linear specification gives significant results for discrimination with a positive relation: more discrimination-more trade.

## 6. CONCLUSION

*In progress*

The empirical conclusions that violating labour standards has a positive impact on exports imply that developing countries which adopt a growth strategy based on foreign trade may be tempted to violate labour standards, especially in certain sectors or in certain places - namely, within free trade zones.

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