



Product standards and export quality: Micro evidence from China



Cui Hu*, Faqin Lin

School of International Trade and Economics, Central University of Finance and Economics (CUFE), 39 South College Road, Haidian District, Beijing, 100081, PR China

HIGHLIGHTS

- This paper studies whether the product standards improve the product quality.
- China's transaction level data from customs are used for investigation.
- We exploit EU's policy on lighter's standard as a natural experiment.
- Triple difference method is adopted for identification.
- The results reveal that lighter standards lift export quality of China's lighters to EU.

ARTICLE INFO

Article history:

Received 2 March 2016

Received in revised form

28 June 2016

Accepted 30 June 2016

Available online 5 July 2016

JEL classification:

F12

F15

Keywords:

Product standards

Export quality

Triple difference

ABSTRACT

Using European Union's decision on lighters on 11 May 2006 that only lighters which are child-resistant are placed on the market as a natural experiment, this paper firstly examines the impact of product standards on export quality causally. We use China's HS-8 digit product level trade data and triple difference approach to analyze whether the product standards causally improve the product quality. We get the answer yes.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

Product standards not only affect trade flows, but should also affect product quality directly. They are usually issued by high income countries and such standards are often regarded as some kind of trade barrier by less developed nations. Thus, it is still unclear whether such standards improve or impede export quality. Due to asymmetric information in trade relations, it may decrease the export quality of developing countries. For example, the policy we study in this paper requires that lighters less than 2 Euros must be installed with safety locks, and exporters may satisfy the standard but using inferior materials of other parts to save cost. While there is an increasing number of empirical studies on how product standards affect trade flows (Fontagné et al., 2015; Schuster and Maertens, 2015), the evidence on how product

standards affect export quality is rather scarce. To the best of our knowledge, this paper offers the first causal empirical evidence on product standards on export quality using China's micro export data.

On 11 May 2006, by Decision 2006/502/EC, the European Commission required that the Member States take measures to ensure that only lighters which are child-resistant are placed on the market (short for "CR policy" thereafter). The decision was in effect on 11 March 2007. Using this policy as a natural experiment, we examine the impact of the product standards on export quality. We employ China customs data during 2004–2008 that covers export transactions of every Chinese exporter for investigation.¹

China offers an ideal context to investigate how "CR policy" affects export quality of lighters. On one hand, China is the main importing source of lighters to EU, which accounts for more than 60% of its imports since 2005. On the other, the majority of lighters

* Corresponding author.

E-mail address: pkucuihu@gmail.com (C. Hu).

¹ The data has relevant information, such as trade value, export destination.

Table 1

Basic results for the effect of product standards on export quality.

Explained variable	(1) Unit value	(2) Unit value	(3) Quality	(4) Quality
EU × Lighter × Transition	0.088 (1.49)	0.056 (0.95)	0.027 (0.23)	−0.084 (0.29)
EU × Lighter × Implement	0.204 [*] (1.92)	0.209 ^{**} (1.97)	0.698 ^{***} (3.26)	0.705 ^{**} (2.16)
Exchange rate		−0.167 ^{***} (−19.38)	−0.117 ^{***} (−6.72)	−0.033 ^{***} (−25.77)
Other interactions	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Product fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Observations	1 259 403	1 259 403	1 259 403	13 025 040

Note: t value in parentheses; Columns (1) and (2) use unit value as the rough measure of quality and other columns use quality measure by Khandelwal et al. (2013). Specifically, column (3) uses estimated quality measure column (4) adds firms not exporting lighter. Other interactions denote EU × Lighter, EU × Transition, EU × Implement, Lighter × Transition and Lighter × Implement.

^{*} Significant at 10%.

^{**} Significant at 5%.

^{***} Significant at 1%.

exported by China could not meet the new standards when EU issued the policy. Using unit price as the quality measure as done by Bas and Strauss-Kahn (2015), and the quality measure estimated by the method provided by Khandelwal et al. (2013), we document that product standards lift export quality.

2. Method and results

We estimate the “effective quality” for each firm–product–country observation based on the method proposed in Khandelwal et al. (2013). In particular, we estimate the following model,

$$\ln x_{fhtc} + \sigma \ln p_{fhtc} = \varphi_h + \varphi_{ct} + \xi_{fhtc} \quad (1)$$

where the subscripts f , h , c and t stand respectively for firm, HS 8-digit product category, destination country and year. x denotes the export quantity, and p is the unit value. φ_h is product fixed effect. φ_{ct} is country–year fixed effect. σ represents the elasticity of substitution. As showed by Khandelwal et al. (2013), with CES utility function accounting for product quality, the estimated log quality equals to $\hat{q}_{fhtc} = \hat{\xi}_{fhtc} / (\sigma - 1)$, where $\hat{\xi}_{fhtc}$ is the residual of Eq. (1) with OLS regression. The intuition behind this approach is that conditional on price, a variety with a higher quantity indicates higher quality. Therefore, the choice of σ is vital for the estimated quality. Instead of picking from existing literature, we use the substitution elasticity estimated with our sample, which reaches a value around 1.45 and falls in the range found by Broda et al. (2006) for China.²

Triple difference method is used to estimate the effect of CR policy on lighter quality. Our triple difference actually relies on three levels of variation. The first is region variation by treating EU as the treatment (EU = 1 and non-EU = 0). The second is the policy treatment by time variation ($t = 0$ before policy and $t = 1$ when there is policy). And the third variation is the lighter treatment. The sample we mainly estimate constitutes of firms exporting only lighters and firms exporting both lighters and other goods.³ Lighter treatment means that observations with exporting lighters will be assigned the value 1; otherwise, the value is 0 (Lighter = 1 and non-Lighter = 0). Thus, basically, the estimation

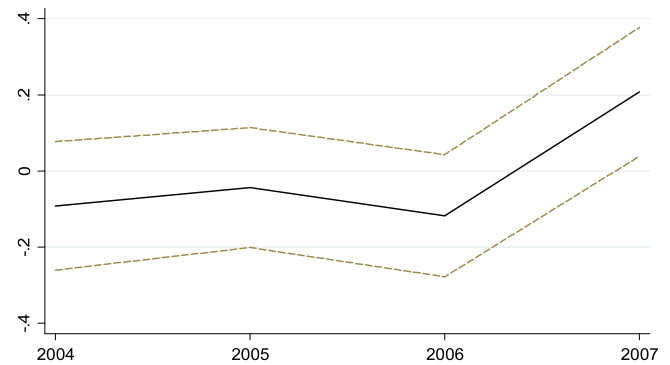


Fig. 1. Flexible estimates of the relationship between product standards and export quality. Note: The solid line is coefficient. The dashed lines represent the 95% confident interval, and the quality is estimated according to method described in the section 2 by Khandelwal et al. (2013). Exchange rate, all other interactions and fixed effects are controlled.

idea of the triple difference can be characterized by an equation as follows:

$$\begin{aligned} \text{ATT}_{\text{Triple Difference}} = & [(\text{Quality}_{\text{EU,Lighter},t=1} - \text{Quality}_{\text{EU,Lighter},t=0}) \\ & - (\text{Quality}_{\text{EU,NLighter},t=1} - \text{Quality}_{\text{EU,NLighter},t=0})] \\ & - [(\text{Quality}_{\text{NEU,Lighter},t=1} - \text{Quality}_{\text{NEU,Lighter},t=0}) \\ & - (\text{Quality}_{\text{NEU,NLighter},t=1} - \text{Quality}_{\text{NEU,NLighter},t=0})]. \end{aligned} \quad (2)$$

In order to characterize the triple difference estimator, we run the following regression:

$$\hat{q} = \beta \text{EU} + \gamma \text{Lighter} \times \text{Transition} + \gamma \text{EU} \times \text{Lighter} \times \text{Implement} + Z + \text{FEs} + \epsilon \quad (3)$$

where $\hat{q}$ is the estimated quality; EU × Lighter × Transition (Implement) are interactions of three dummy variables to capture the variance of lighter quality with new standards of EU announced in 2006 and effective in 2007, and Transition equals to year 2006 dummy and Implement equals to after year 2007 dummy. Z includes other control variables such as all the two term interactions (EU × Lighter, EU × Transition, EU × Implement, Lighter × Transition and Lighter × Implement) and the exchange rate which is defined as the Chinese RMB against foreign currency. FEs are the fixed effects including firm, product, country and year. Finally, ϵ is the error term clustered at country–product level.

Table 1 reports the main results of our investigation. Columns (1) and (2) use unit value as a rough proxy of quality and other

² The Chinese elasticity of substitution estimated by Broda et al. (2006) is from 1.34 to 108.19.

³ Lighters include products whose HS codes are “96 131 000”, “96 138 000”, and “96 139 000”.

Download English Version:

<https://daneshyari.com/en/article/5058238>

Download Persian Version:

<https://daneshyari.com/article/5058238>

[Daneshyari.com](https://daneshyari.com)