Japan and the World Economy 28 (2013) 13–23

Contents lists available at SciVerse ScienceDirect

Japan and the World Economy

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

The causal effects of exporting on domestic workers: A firm-level analysis using Japanese data

Ayumu Tanaka *

Research Institute of Economy, Trade and Industry (RIETI), Japan

ARTICLE INFO

Article history:
Received 24 February 2012
Received in revised form 15 December 2012
Accepted 11 June 2013
Available online 20 June 2013

JEL classification:
F16
J31
L81

Keywords:
Exporting
Non-regular workers
Firm heterogeneity

ABSTRACT

Japan has experienced rapid growth of non-regular workers under globalization in the 2000s. This study seeks to identify the causal effects of exporting on the changes in the share of non-regular workers and the growth of worker-hours (employment times working-hours) in Japanese manufacturing and wholesale sectors using extensive firm-level data. I employ a propensity score matching technique and investigate whether firms that start exporting experience higher increase in the share of non-regular workers and higher growth of worker-hours than do non-exporters. First, I find positive effects on the growth of worker-hours in manufacturing but not in wholesale. Second, contrary to public fears, I find little evidence that exporting results in the increase in the share of non-regular workers in both manufacturing and wholesale.

1. Introduction

Japan has experienced rapid growth in the share of non-regular workers in the 2000s under globalization.[1] The share of non-regular workers has grown rapidly from 26.0% in 2000 to 33.7% in 2010.[2] Some have argued that this rapid growth of non-regular workers was partly caused by globalization.

To examine this argument, this study seeks to identify the causal effect of exporting on the share of non-regular workers using extensive Japanese firm-level data. I employ a propensity score matching technique and investigate whether firms that start exporting experience an increase in the share of non-regular workers compared with non-exporters. Unlike previous studies, this work examines the effects of exporting in not only manufacturing but also the wholesale sector, in which many firms conduct exporting.[3]

Countering the above argument, I find little evidence that export-starters in either sector have a greater increase in the share of non-regular workers than do non-exporters. Japanese manufacturing firms that started exporting between 2003 and 2005 experienced a greater labor growth, but not a greater increase in the share of non-regular workers, than did non-exporters. In contrast to manufacturing, the wholesale sector did not experience higher labor growth. Wholesale firms have increased their share of non-regular workers more than non-exporters did, but the effects of exporting disappeared three years after starting exporting.

The remainder of this paper is divided into six sections. In Section 2, I discuss a possible link between exporting and the share of non-regular workers under the current situation in the Japanese labor market. In Section 3, I introduce my empirical strategy. In Section 4, I briefly describe the data and variables used in this paper and present descriptive statistics of the data. In Section 5, I present the estimation result of firms' decisions to start exporting. In Section 6, I report the causal effects of exporting. The summary and conclusion are presented in the final section.

2. Japanese labor market and the effects of exporting

In Japan, firms can employ both regular and non-regular workers. As explained in Esteban-Pretel et al. (2011), regular workers are workers holding a permanent, full-time job. They are called "regular workers" due to the fact that they are traditionally

* Tel.: +81 3 3501 8356.
E-mail addresses: tanaka-ayumu@rieti.go.jp, ayumu21@gmail.com

[1] According to the World Bank's *World Development Indicators 2010*, in Japan, the share of exports in GDP grew to 17.60% in 2007 from 10.99% in 2000.

[2] *Labour Force Survey* by the Japanese Statistics Bureau of the Ministry of Internal Affairs and Communications.

[3] Bernard et al. (2010) revealed that wholesalers accounted for 10% of the 2002 U.S. exports.

0922-1425/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.japwor.2013.06.003

majority in Japan. Non-regular workers receive lower average wages and benefits, and are subject to lower employment stability. They are also widely excluded from access to training, promotion possibilities within the firm, and are normally not eligible to become unionized (Esteban-Pretel et al., 2011). They are generally less skilled workers since college-educated workers are less likely to work as non-regular workers (Asano et al., 2011). The propensity for working as non-regular workers remains persistently high among female workers (Asano et al., 2011).

Non-regular workers consist of part-time and dispatched workers. Firms can employ dispatched workers, even in manufacturing after deregulation in 2004.[4] Hiring costs are relatively low for both types of non-regular workers as compared with regular workers. Firms can easily fire non-regular workers because such workers have short employment terms. Thus, the labor market for the non-regular workers can be regarded as less frictional as compared with the market for regular workers.

Dispatched workers differ from part-time workers in several ways. The most important difference is that dispatched workers are employed indirectly via intermediary agents by firms that pay fees to the agents,[5] while part-time workers are employed directly by firms. Another difference is that dispatched workers work more hours per day than do part-time workers. In some firms, dispatched workers perform the same tasks as regular workers do but earn much lower wages.

The relationship between exporting and the share of non-regular workers has yet to be examined. Several theoretical studies, such as Helpman et al. (2010), Amiti and Davis (2011), and Davis and Harrigan (2011), consider the relationship between exporting and workers at home, assuming an imperfect labor market.[6] However, those studies did not consider the relationship between exporting and the share of non-regular workers. The standard firm heterogeneity models of export based on Melitz (2003) assume that a firm must incur fixed costs as well as additional variable costs when it exports. However, these models do not give any clue to what kind of workers a firm increases when it starts exporting.[7] Empirical works such as Wagner (2002) provide the findings on the causal effects of exporting on the employment growth but they do not consider heterogeneity of workers.

In this respect, this study contributes to the literature by distinguishing regular workers from non-regular workers. Regular workers are skilled and high-wage workers with high hiring costs, while non-regular workers are unskilled and low-wage workers with low hiring costs. Which type of workers a firm prefers when it starts exporting is an interesting new question. Thus, this study attempts to provide the first evidence of a relationship between exporting and the share of non-regular workers in both the manufacturing and wholesale sectors.

The relationship between exporting and the share of non-regular workers is unclear. Exporting may decrease the ratio of non-regular workers to total labor because exporting requires skilled workers as shown in previous studies such as Bernard and Jensen (1997) and Brambilla et al. (2010), while non-regular workers are less skilled than regular workers.[8]

On the other hand, exporting firms may require a higher ratio of non-regular workers because they face the high volatility of sales. Although Buch et al. (2009) show that exporters have a lower volatility of sales than non-exporters, in my data both continuing exporters and export-starters on average face higher volatility of sales than non-exporters in both manufacturing and wholesale sectors, as Table 12 of Appendix shows. Furthermore, for export-starters' volatility of export sales is higher than those for continuing exporters (Table 12). Thus, export-starters may prefer non-regular workers because they can fire non-regular workers easily once their export sales drop.[9]

The effects of exporting on the growth of labor are also unclear and may depend on industry characteristics.[10] Exporting may bring about an increase in labor as a whole in manufacturing simply because exporting firms require more labor to produce products for foreign markets and they must incur fixed costs of exporting as in Melitz (2003). This conjecture is consistent with empirical evidence by Wagner (2002) which finds positive causal effects of exporting on employment growth. However, I cannot predict whether exporting increases labor in the wholesale sector and there is no evidence for the wholesale sector. Conceptually, most wholesale firms may not require additional labor for exports because they do not produce products themselves but instead procure and export products produced by manufacturing firms (Ahn et al., 2011; Akerman, 2010). By extending the analysis to the wholesale sector, this study contributes to the literature.

In sum, the Japanese labor market consists of different types of workers, and the effects of exporting on domestic workers are theoretically ambiguous. Thus, the impact of exporting on labor and the share of non-regular workers in Japan are empirical issues requiring the analysis of disaggregate firm-level data. This study contributes to the literature by distinguishing types of workers and extending the analysis to the wholesale sector.

3. Empirical strategy: propensity score matching

3.1. Strategy

To evaluate the causal effects of exporting on the growth of labor and the growth of the share of non-regular workers, I use propensity score matching (PSM). Many previous studies in trade literature have employed this technique, including Wagner (2002) and Girma et al. (2004). PSM restrict our focus on only export starters and ignore continuing exporters. In other words, PSM can analyze the effects of extensive margin, that is, becoming exporter, while other methods such as estimation of labor demand equation (LDE) enable us to analyze the effects of intensive margin, that is, change in export sales. Although several studies such as Barba Navaretti et al. (2003), Harrison and McMillan (2011), and Yamashita and Fukao (2010) estimate LDE to examine the effects of foreign activities on parent firms' domestic labor demand, to the best of my knowledge, few studies employ this approach to examine the effects of exports. This study also prefers the PSM, although I believe both approaches are complementary.

[4] Asano et al. (2011) provide a more detailed explanation.

[5] The agents pay wages to dispatched workers from the fee. The average ratio of the fee to the wage received by the workers was approximately 1.47 in 2008, which is calculated based on the Japanese Ministry of Health, Labor and Welfare's *General Survey on Dispatched Workers*.

[6] Research on the relationship between trade and wage has a long tradition. Harrison et al. (2010) surveys recent developments.

[7] One of the exceptions is Amiti and Cameron (2012). While they focus on skilled and unskilled workers, this paper focuses on regular and non-regular workers. As this paper explains, regular/non-regular differences depend on not only skill difference but also other factors such as contract terms.

[8] The average wages of non-regular workers are much lower than those of regular workers, as shown in Section 4.

[9] Indeed, exporting firms fired many dispatched workers in Japan during the Great Recession from 2008 to 2009. This trend became an object of public concern.

[10] A more important question may be whether or not FDI (or outsourcing) replaces domestic employment. However, the main purpose of this paper is to provide the first evidence on the relationship between exporting and share of non-regular workers. As for FDI, using the same data and methodology, Tanaka (2012) has already revealed that the impact of starting FDI on employment is significantly positive in both manufacturing and wholesale but the impact on the share of non-regular workers is significantly positive in only manufacturing. Yamashita and Fukao (2010) also find no evidence that Japanese outward FDI reduces domestic employment, using a different approach.