



Efficiency and productivity changes for Peruvian and Chilean ports terminals: A parametric distance functions approach



Víctor Chang^{a,1}, Beatriz Tovar^{b,*}

^a Division of Economics, Center for Research and Teaching of Economics (CIDE), Carretera Mexico Toluca 3655, Col. Lomas de Santa Fe, 01210 Mexico DF, Mexico

^b Infrastructure and Transport Research Group, Department of Applied Economics, University Las Palmas de Gran Canaria, Campus de Tafira, Modulo D, Despacho 2.20, 35017 Las Palmas de Gran Canaria, Spain

ARTICLE INFO

Available online 8 January 2014

Keywords:

Port terminal productivity
Port terminal efficiency
Port sector reform
Latin America
Technological change decomposition

ABSTRACT

The aim of this paper is to assess and compare the efficiency and performance of Peruvian and Chilean ports terminals. In order to do so we estimate total factor productivity (TFP) growth by applying Stochastic Frontier Analysis (SFA). A distance function was used on a sample of 14 ports terminals observed over the period 2004–2010 to evaluate their efficiency levels and to decompose productivity into technical efficiency, scale efficiency and technical change. We also decompose technical change – also known as technical progress or technological change – into several components. We find that the terminals improved their technical efficiency during the period of analysis, with Chilean terminals being more efficient than the Peruvians. This was influenced mainly by increased agility in the process of reforms implemented in Chile compared to Peru, which has allowed greater investment in infrastructure and technology in recent years. On average, TFP in the Chilean terminals declined while in Peruvian terminals it increased. The component “change in pure technical efficiency” and “scale changes” contributed positively to improvements in productivity in both countries, but the technological change component decreased. The latter result is related to the international financial crisis of 2008, which had a larger impact on the terminals of Chile, and is similar to results reported by other authors when analyzing TFP evolution in a period which included an international crisis. Moreover, the decomposition of the technological change shows that it was biased toward the capital input. These results have regulatory and economic implications, which are outlined.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

One of the main reasons for the high importance of the port sector in a country is that most of the domestic and international trade is carried by sea. In the case of Peru and Chile, which are the main gateway of trade in South America west coast, about 95% of commercial activity is done by this route. However, the importance received from those conducting public policy has not been the same in all countries. Port sector reforms in Chile have been more dynamic than those made in Peru and have allowed to deal with the changes the port sector has had in recent decades in a more agile and efficient way.

These changes are associated with the process of containerization of cargo and the development of highly specialized commercial vessels, which have demanded improvements in port infrastructure and investment in technology at ports and marine

terminals that allow them to serve larger ships and containerized cargo more efficiently.

Currently, according to The Global Competitiveness Index 2013–2014 (World Bank, 2013), Peru and Chile are ranked #101 and #45 regarding the rate of transport infrastructure and specifically in the post #93 and #32 respectively in the index of quality of port infrastructure out of 148 countries. These figures evidence the problem of the Peruvian port sector. The lack of infrastructure investments in Peru's ports and the obsolescence of existing ones have caused a loss of competitiveness, which impact on the country's logistics costs. According to Guasch and Kogan (2006), about 34% and 24% of the value of products exported from Peru and Chile respectively corresponds to logistics costs, while the regional average is 24% and in OECD countries is 9%.

On the other hand, according to the Instituto Peruano de Economía (2009)² the deficit in port infrastructure of Peru is approximately US\$ 3600 millions.³ This scenario motivates the

* Corresponding author at. Departamento de Análisis Económico Aplicado, Campus Universitario de Tafira, 35017 Modulo D. Despacho 2.20, Las Palmas de Gran Canaria, España. Tel.: +34 928 45 17 94.

E-mail addresses: victor.chang@alumnos.cide.edu, btovar@daea.ulpgc.es (V. Chang), beatriztova@gmail.com (B. Tovar).

URL: <http://www.personales.ulpgc.es/btoovar.daea> (B. Tovar).

¹ Tel.: +52 55 57 27 98 00.

² Peruvian Institute of Economy.

³ Investments considered are those of the South Dock in the Port terminal of Paíta, as well as those required for ports administered by ENAPU and projects for private ports. This amount represents 25.8% of the total of the transport gap.

development of this research, which aims to assess and compare the performance of Peruvian and Chilean ports.

The paper is organized as follows. After an introduction, the second section presents a brief description of the Peruvian and Chilean ports sector and the reform process. In Section 3 we undertake a brief review of the literature on port productivity analysis and shows the methodology employed. Section 4 describes the data and the variables used to estimate the model. Section 5 presents the empirical results. Finally, Section 6 presents the most relevant conclusions, possible policy implications and directions for future research.

2. The port sector and the reform process

In recent decades the port sector in Latin America has undergone major changes. Initially, the port organization was characterized by an almost exclusive participation of the public sector, monopoly control of labor markets, non-competitive rates and inefficiencies in services, which were mainly reflected in the long waiting times for ships and the low profitability (including losses) of Public Enterprises. As a result, each country began a series of modernizing reforms, which consisted of greater private sector participation and increased competition in services provision as well as the rupture of the labor markets monopoly and a redefinition of the port authority role.

During the 1990s, most public ports in Latin America were concessioned under a landlord scheme. Some have been transferred to the private sector and new ones are being built, but regulation remains as a public function. Countries like Panama, Argentina, Mexico, Colombia and Chile have advanced in the process of concessioning their ports. Investments in new infrastructure and machines have been made and private firms have participated in port operations.

Infrastructure and equipment investments are essential for business and economic growth. In recent years, Latin American countries have undergone major increase on their Gross Domestic Product (GDP) and many countries have enhanced their competitiveness levels in the region. Economic growth is a key aspect for development. It reduces poverty, inequality and it increases opportunities for the poor to participate in domestic and international markets and gain access to social services. Nevertheless, Latin American countries have not yet reached their economic potential due, among other things, to the gap in port infrastructure development (Wilmsmeier et al., 2013). Therefore, Latin American countries should avoid further delays in their reform process and continue with port concessions. As an attempt to address this issue, some organizations – such as the Inter-American Committee on Ports (CIP), supported by the Organization of American States (OAS) – promote similar policies, serving as forum for the Inter-American Member States and strengthening hemispheric cooperation in the port development process including the private sector.

2.1. Peru

The port system in Peru includes public and private terminals. Private terminals⁴ are generally characterized by the mobilization of certain specific load, while the public terminals have technical facilities for multiple uses. Among the public terminals, we can distinguish among the boat system port terminals, the fluvial ports and the port terminals of direct berth.

⁴ With respect to private marine terminals, it can be mentioned Talara, Bayovar Conchan and San Nicolas.

Table 1
Peruvian terminals analyzed.

Terminal	Located in port	Company	Management
Paita Terminal	Paita	TPE	Private since 2009
Salaverry Terminal	Salaverry	ENAPU	Public
Chimbote Terminal	Chimbote	ENAPU	Public
Callao North Terminal	Callao	APM Terminals Callao	Private since 2011
San Martín Terminal	San Martín	ENAPU	Public
Matarani Terminal	Matarani	TISUR	Private since 1999
Ilo Terminal	Ilo	ENAPU	Public

Source: TPE, ENAPU, APM Terminals Callao and TISUR.

Boat system port terminals are characterized by not having direct berthing facilities for commercial vessels, allowing only operations of loading or unloading of cargoes by barges or other small crafts, such as port terminal Pacasmayo, Supe, Huacho, Chancay, Chicama and Cerro Azul. Regarding the fluvial port terminals, they are those situated on the banks of a navigable waterway, adequate and suitable for river activities; among them are the terminal port of Iquitos, Yurimaguas, Pucallpa Puerto Maldonado. Finally, the direct berthing port terminals are those that have enough physical infrastructure and port equipment so the commercial ships can be docked or moored to the docks and conduct its operations of loading and unloading goods directly from the dock to the ship or vice versa, among them are the terminal ports of Paita, Salaverry, Chimbote, Callao North, San Martín, Matarani and Ilo. The later, direct berthing port terminals, are the Peruvian terminals to be evaluated in the present investigation (see Table 1).

Since 1970, management of port infrastructure and provision of services within the public port terminals were made by Empresa Nacional de Puertos del Perú (ENAPU). The ENAPU's main economic activity is the administration, operation, equipment and maintenance of terminals and docks in the country, whether sea, river or lake docks, as well as the construction thereof in case it is authorized.

The main problems facing the company were linked with the insufficient allocation of financial resources, high dependence on the public budget, the excessive number of workers and the shortage of technical criteria in the realization of investments. The company also faced the problem of the wrong rates charged for the use of infrastructure, which were not calculated on the basis of maintenance costs, and the problem that the proceeds from infrastructure operation were not intended for conservation thereof.

As a result, during the decade of the 1990s the process of port reform starts, which aimed to promote private investment in sea and river direct berth terminals in the charge of ENAPU. Table 2 shows, chronologically, the main issues of port reform process in Peru.

Today, marine terminals operating for public use under concession schemes are: Matarani Terminal at Matarani Port, Paita Terminal⁵ at Paita port, and Callao North Terminal,⁶ Callao South Terminal⁷ and Callao Minerals Terminal⁸ at Callao Port.

⁵ In the late 2009 the terminal of Paita was awarded to the Terminal Portuario Euroandino (TPE).

⁶ In April 2011 APM Terminals Callao won the award.

⁷ In July 2006 DP World Callao was granted the concession for the creation of Callao South Terminal. The creation of the terminal took a few years, and the company began operations in May 2010.

⁸ In 2011 Transportadora Callao was granted the concession for the creation of the Callao Mineral's Terminal at Callao port.

Download English Version:

<https://daneshyari.com/en/article/7498068>

Download Persian Version:

<https://daneshyari.com/article/7498068>

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