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Quasi-landlord port financing in China: Features, practice and a contract theory analysis

Jihua Zhang

School of Economics, Ocean University of China, Qingdao 266100, China

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ABSTRACT

Since the 1970s and 80s, landlord port has been the dominant port financing model in western large and medium-sized container ports. In China, many prospective port projects have also explored a landlord port financing model. However, some evidence suggests that landlord port financing in China is a variant of the international mainstream landlord port financing model. Based on an explanation of their unique features and practices, this paper analyzes the Chinese quasi-landlord port financing model from a contract theory perspective, in which it can be viewed as a double-level principal–agent relationship and two-layer profit distribution contract with three participants: the state-owned assets administration department, the port investment company and the operators. Furthermore, the results show that in the Chinese quasi-landlord port financing model, whether in the case of both joint venture and port land lease (fixed rent), or in the case of both joint venture and port land transfer, the optimal incentive scheme is the same as in the international landlord port financing model with profit sharing rent or mixed rent.

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1. Introduction

Early port financing was recorded in the port history during Roman times. A great variety of port infrastructure financing models developed. However, by the 1970s and 80s, a wave of port liberalization and reform swept through most Western countries influenced by the neoliberal emphasis on private participation in port financing. Eventually, the landlord port became the dominant model for large and medium-sized container ports in the West. Under the landlord port model, port infrastructure can still be financed externally by government subsidies, bonds, etc. However, its unique feature is that another infrastructure financing occurs within the port system. A port authority or public enterprise acts as the landlord, and port land is granted to private operators through concessions.[1] The concession fee paid to the port authority or public enterprise contributes to construction capital for the next period, which maintains turnover in port financing.

The landlord port financing model, which is characterized by port concession, has been widely recognized and successful throughout the world. Most of the world's top 100 container ports are landlord ports and many other ports are transitioning

E-mail address: zhangjihua6811@gmail.com

[1] The landlord port model is diverse and impossible to classify precisely (Notteboom, 2006). The property rights arrangements in a landlord port can take many forms. Murthy and Notteboom (2001) distinguished four major combinations: (a) public/government ownership and public participation in operations; (b) public/government ownership and private participation in port/terminal construction, operations and management; (c) public/government ownership and private participation in superstructure installation and operations and (d) private ownership and operations. Drewry (2011) presented two types of ports: publicly owned landlord port company with private terminal operators and privately owned landlord port company with private terminal operators. This paper focuses on the public landlord, private operator port, which is called the POPO (Public Ownership and Private Operations) model by Murthy and Notteboom (2001).

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toward this model (Baird, 2002). In China, many domestic ports, such as the port of Shanghai, port of Nantong, Qinzhou port in Guangxi, Zhapu port in Zhejiang, Dalian Dayaowan port area and Dongjiakou port in Qingdao, are exploring this model to solve port infrastructure investment and financing problems. However, some evidence indicates that the Chinese landlord port financing model currently promoted and implemented is a variation of the international mainstream landlord port, which we call it "quasi-landlord port" financing. This observation yields the following questions: Why can port land lease be a financing model in this type of landlord port? What is the uniqueness of Chinese quasi-landlord port financing? Is Chinese quasi-landlord port financing optimal for all participants in port land lease?

Most landlord port studies categorized it as a port management model (Goss, 1990a; González and Trujillo, 2008; Younis et al., 2010). The port reform toolkit published by the Public–Private Infrastructure Advisory Facility of World Bank explained the mixed characteristics of landlord port which aims to balance public (port authority) and private (port industry) interests (World Bank, 2007). Liu and Li (2008) argued that this model represents a public–private partnership (PPP) in which both public and private sectors possess advantages in providing port services and supplies. As the mainstream management model, its dominance largely derives from the internal advantages, such as effective handling of cargo and low costs (Saundry and Turnbull, 1997; Harding et al., 2007; UNCTAD, 2009). But the landlord port also suffers from two weaknesses: First, pressure from various private operators increases the risk of operating over capacity. Second, port managers may risk misjudging the timing of capacity additions (World Bank, 2007). Based on the Matching Framework approach, Lacoste and Douet (2013) assessed the adaptation of the landlord port model to France's major seaports.

Other studies give special attention to the efficiency of landlord port. Some research has noted that landlord port is the most desirable form to improve port efficiency and profits (Notteboom and Winkelmans, 2001; Wang et al., 2013; Trujillo et al., 2013). By introducing intra-port competition, private enterprises and market forces are all involved in port infrastructure provision, thus private firms cannot monopolize essential assets (Goss, 1990b; Trujillo and Nombela, 1999; Fink et al., 2002; Shkaratan, 2012). However, Juhel (2001) presented the opposite view: landlord port might create monopolies. The concessions fees charged to operators is greater than the original cost of the capital in the infrastructure investment, therefore, the landlord port model distorts competition (Acciaro, 2004). Van Reeven (2010) also stated that the intra-port competition in the landlord port model reduces profits.

In addition, in view of the importance and complexity of terminal awarding in landlord port management, a thorough study of terminal awarding and the relevant concession contracts have drawn many researchers' attention recently. The awarding practice and procedures were elaborately discussed and the Demsetz-alike auction was recommended (Theys et al., 2010; Notteboom and Verhoeven, 2009; Notteboom et al., 2012b; Ferrari et al., 2015; Engel et al., 2004). Notteboom (2006) emphasized the role of concessions as port governance tools. Other academic papers highlight some critical issues about concession contracts, including the design of agreements (Juan et al., 2004; Parola et al., 2012), durations (Theys and Notteboom, 2010), post contractual moral hazard problem (Wang and Pallis, 2014), risk allocation (Cruz and Marques, 2012), calculation of concession fees (Ferrari and Basta, 2009), and the impact of concessioning on port competition, entry barriers, profits and on the balance between public and private sector control (Kaselimi et al., 2011; Pallis et al., 2008; Saeed and Larsen, 2010; Notteboom et al., 2012a). Furthermore, using the game theoretical approach, optimal tariff schemes and equilibrium concession contracts were discussed. Saeed and Larsen (2010) argued that an optimal concession contract should have high unit fees (variable cost) and low annual rent (fixed cost). Chen and Liu (2015) found that fixed-fee contract is best for the port authority.

Existing studies of port finance are widespread, but the number of academic papers dealing with landlord port financing is still fairly small. Byrne et al. (1996) argued that the overall goal of port finance is to obtain funds at the lowest cost and the highest amount for long-term needs. Investments in ports should cover all of the internal infrastructure, superstructure and the infrastructure for maritime access and for hinterland connections (Meersman, 2005). Since the late 1980s, private sector has more and more participated in port activities. World Bank's Private Participation in Infrastructure (PPI) Project Database and the work of Sommer (1999) revealed that private participation in seaport projects is not evenly distributed, especially in developing countries. Moreover, there still remain some disputes and disagreements on privatization theoretically. The advocates (e.g., Gómez-Ibáñez and Meyer, 1993; Trujillo and Nombela, 1999), believed that private capital investment has a positive impact on port efficiency. Others noted that privately owned seaports suffered from as much trouble as publicly owned ports in recovering total capital investment costs (Baird, 1999). Although as an intermediate model that combines both public funding and private investment (Musso et al., 2006), landlord port financing can only be found in few studies. The port reform toolkit noted that landlord port represents a financing model in which basic infrastructure is co-financed by the government and port authority, while the superstructure and equipment are provided by the private operator (World Bank, 2007). Desai (2005) identified the risks and risk factors in landlord port investment. Zou and Zhang (2007) argued that the landlord port model is essentially a type of port infrastructure financing that takes advantage of state-owned land and shoreline resources. Other studies in China mainly focus on the applicability of the landlord port model, obstacles encountered in practice and policies (Sun and Yu, 2006; Xiao, 2010). Overall, there is no academic literature tailored to landlord port that offers a detailed and theoretical illustration on this financing model. Most studies are still limited to the introduction and description of its financing function. These specific literature fails to provide evidence of why landlord port represents a new financing model and whether Chinese "quasi-landlord port" financing model is optimal.

From the perspective of contract theory, different port financing models represent different contractual arrangements. It is worth noting that Chen and Liu (2015) have probed into the optimal concession contracts with the hypothesis that port authority maximizes fee revenues. However, their model paid special attention to port pricing, mainly from the view of game

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