Beyond Public vs. Private: Is There A Third Option to Improve the Economic Competitiveness of US Ports?

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Problem Statement and Motivation

- Most of the major US ports are managed by various type of mixed public and private partnership, whereas all of the Panama canal ports are privatized
- One key question unanswered in the literature is the effect of various types of privatization in port competitiveness
- This research fulfills the gap in the literature by providing a quantitative measure of the impact of the various type of privatization on port competitiveness

Technical Approach

- Determine the quantitative measure of port competitiveness
- Determine the quantitative measure of private sector involvement in US ports' operations
- Perform an empirical analysis to quantify the effect of various type of privatization and other determinants on port competitiveness
- Panel data for 11 major US ports and 4 Panama canal ports used for the empirical study

Measure of port competitiveness

US Container Ports	Average TEU*	TEU Ranking	Opr. Revenue (mean)	Opr. Income (mean)	Inc. Ranking
Port of Los Angeles (CA)	6,042,464	1	$329,380.1	$110,796.6	3
Port of Long Beach (CA)	5,166,581	2	277,550.9	142,896.5	2
Port Authority of NY &NJ	3,928,789	3	2,173,376	307,277.7	1
Port of Virginia (VA)	1,971,166	4	153,494.6	-1,880.1	10
Port of Oakland (CA)	1,707,165	5	172,923.8	76,975.1	5
Port of Seattle (WA)	1,571,320	6	263,597.5	97,486.7	4
Port of Houston (TX)	1,414,614	7	142,418	12,002.1	9
Port of Tacoma (WA)	1,340,600	8	80,663.1	13,813.5	8
Port of Miami (FL)	900,890	9	82,329.6	15,607.0	7
Port of Jacksonville (FL)	777,786	10	35,112.8	-3,318.5	11
Port of Everglades (FL)	687,648	11	97,849.7	35,786.7	6
Panama Container Ports	**Average TEU**	**Ranking**			
MIT	1,349,384	1			
Balboa	1,281,550	2			
CCT	446,930	3			
Cristobal	231,464	4			

*TEU: Twenty foot Equivalence Unit

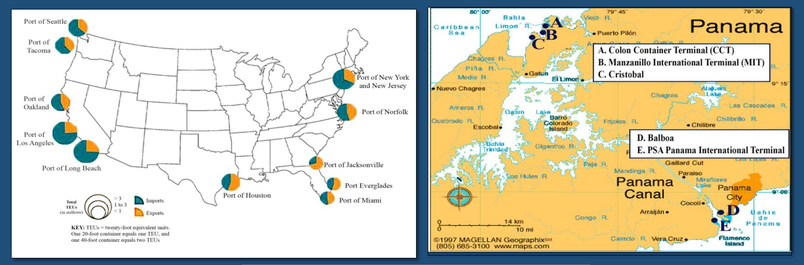

Figure 1: Sample data collection for the study

Quantifying Privatization of selected US Ports

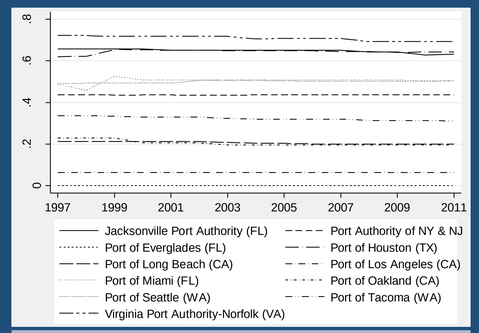

Figure 2: Ratio of privately owned port assets to total assets for selected US ports

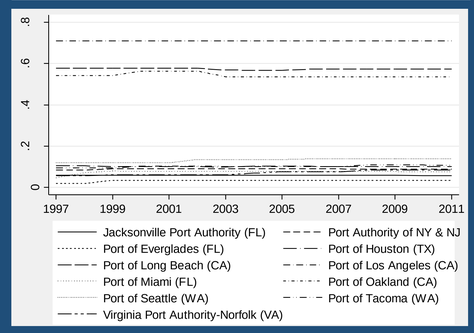

Figure 3: Ratio of joint public-private owned port assets to total assets for selected US ports

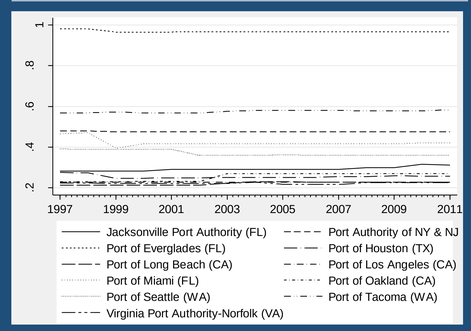

Figure 4: Ratio of publicly owned port assets to total assets for selected US ports

Empirical model specification

- $Y_{it} = f(X_{it};\beta) + v_{it} + \mu_i$, where
- Y_{it} is the measure of port competitiveness
- μ_i is the time invariant unobservable individual effect $\sim N(0, \sigma_\mu^2)$
- v_{it} is the random disturbance
- X_{it} are the set of dependent variables and β's are their coefficients to be estimated

Estimation result for US ports

Dep var: ln(TEU)	Model 1	Model 2
$\ln(global\ TEUs)$	0.163 (0.072)**	0.191 (0.81)**
$Quaylength$	-0.010 (0.001)***	-0.001 (6.47 E-04)***
$Railroad\ access$	0.284 (-0.126)**	0.047 (0.136)
$\ln(pop_{500})$	1.511 (0.177)***	1.645 (0.201)***
$Distance$	-1.79 E-04 (2.78 E-04)	-0.001 (2.55 E-04)***
$Public$	16.70 (2.625)***	
$Public^2$	-19.438 (3.14)***	
$Mixed$	2.429 (0.255)***	2.813 (0.352)***
$Private$		3.101 (1.282)**
$Private^2$		-3.921 (1.291)***
$Constant$	-10.066 (3.498)***	-18.403 (3.651)***
Observations	122	122
N	11	11
R^2	0.823	0.781

Estimation result for US & Panama ports

Dep var: ln(TEU)	
$\ln(global\ TEUs)$	0.448 (0.147)***
$Maxberth$	-9.98E-05 (5.09E-05)**
$\ln(pop)$	0.541 (0.154)***
$Distance$	-0.003 (5.74E-04)***
$Mixed$	1.71 (2.021)***
$Private$	3.421 (0.758)***
$Private^2$	-3.310 (0.693)***
$Constant$	13.067 (3.699)***
Observation	166
N	15
R^2	0.707

Key findings

- Macroeconomic conditions, physical characteristics, railroad access, accessibility to market and competition between ports are important factor for explaining competitiveness of ports
- Pure Private and Pure Public do not lead to most competitive ports. The combination provides more desirable results. This is because a pure public does not get the efficiency and effectiveness gains of private sector operations. Pure private does not have access to public funding that could make operations more efficient and effective. Around 50-50 split provides most optimal results.
- The optimal public ownership (from Model 1) is calculated to be 43%, optimal private ownership is 39% (from Model 2) and optimal private ownership is 52% (from Model 3).