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The Economic Status of Areas Surrounding Major U.S. Container Ports: Evidence and Policy Issues

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ABSTRACT This article examines the current economic status of the areas surrounding major U.S. container ports. We define a "port district" as the geographic area within a 7.5-mile radius of a port. Our sample includes the 10 largest container ports in the U.S. We find that when we compare port districts to their surrounding metropolitan areas, household unemployment and poverty rates are significantly higher in port districts. Thus, the same ports that serve as "economic engines" for the region and nation may be the cause of economic decline and deterioration in the immediate areas that surround them. This presents a challenge for policy makers who want to preserve the benefits of international trade while facing increasing opposition to port expansion by local communities.

Introduction

Historically, ports have been considered to be engines of economic development for the cities and regions where they are located. Firms wishing to export or import goods by sea found it advantageous to locate near a port to minimize land transportation costs. Traditional "break-bulk" methods for the movement and handling of cargo were labor intensive, creating significant direct local employment effects. Thus, according to Campbell, "ports have traditionally been centers of economic and cultural activities in cities, if not the raison d'etre of the city's initial development."[1]

However, with recent advances in transportation technology, the role of ports in local economic development has changed. Containerization has made the process of goods movement much more capital intensive, thus decreasing the local employment benefits of having a port. The relatively low cost of ground transportation has reduced the advantage to exporting businesses of locating near a port. Exporting businesses are now more likely to locate in areas where land is relatively cheap and where there is good access to

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transportation services, allowing them to ship their exports to the port district. Containerized imports increasingly flow to distribution centers located inland rather than coastal locations.

While the benefits of proximity to the port have declined over time, the costs have increased. The largest ports in the nation now process millions of containers per year. These containers must be loaded onto truck and rail and transported from the port area to their destinations. As a result, the traffic congestion and pollution arising from port activities is becoming an increasing concern in areas adjacent to ports.

This paper examines the current economic status of the geographic areas immediately surrounding the 10 largest U.S. container ports. The first section will discuss how the geographic concept of a port district, or port city, has been defined and characterized in the literature and how it is defined for the purposes of this study. The next section provides basic descriptive and comparative data from the sample of port districts. The third section contains a more disaggregated case study, which focuses specifically on the geographic area surrounding the Port of Long Beach. A summary of the main findings and implications for policy are discussed in the Conclusion.

Defining the Concept of a "Port District"

Literature review. The literature on port districts has grappled with the quickly changing reality of the relationships between ports and their cities. Ducruet and Jeong (2005) suggest that, while there is no consensus in the literature on the precise definition of a port city, "at a local scale, it is the area mixing port and urban jurisdiction and functions, the 'area in transition' (Hayuth 1982; Hoyle 1989); at a wider scale, it is the nodal system as a whole, including multiple cities and ports within a regional area (port range, country, continent), assuming land-sea connexion."[2]

Hoyle (1989) offers a historical outline of the evolution of the port–city interface including five stages. According to his typology, this interface has varied starting with the first, ancient, and medieval city port, involving the maximum economic interdependence and closest spatial association between port and city, to the ultimate emergence of "maritime industrial development areas." His work is summarized in Table 1.

A large number of port cities have passed into the fifth category. However, Hoyle notes that in cases where this migration has not occurred, there has still been a tendency for maritime areas to expand in size geographically and to operate functionally as separate industrial zones. The de-linking of the port and city has also occurred as high land costs and cheap transportation have created incentives for manufacturing industries to move away from city centers into areas where land is more available and affordable (as well as out of the country altogether) and as new technologies in shipping have led to a decline in direct port-related transportation employment in port cities.

As Hesse (2006) notes, the globalization of manufacturing has been a major factor in the expansion of port activities, as globally intertwined production systems have given rise to an increasing need to trade raw materials and semi-finished, as well as finished, products. However, increases in trade volumes at ports have not led to increased employment in water

TABLE 1. HOYLE'S TYPOLOGY OF PORT–CITY INTERACTIONS.

Stages of port–city interactions	Characteristics
(1) Primitive city port	Maximum functional interdependence, very close spatial association
(2) Expanding port district (19th C)	Introduction of railways, development of industry, expansion of cities
(3) Modern industrial port	Spatial separation between port and city, addition of oil-refining operations and large scale industries near port. Containerization.
(4) Maritime industrial areas	Further separation of port and city, urban consequences of port expansion and migration
(5) Waterfront redevelopment	Redevelopment of original port areas into other uses, in those cities in which a port has migrated away from the city center

transportation, since productivity gains in water transportation have offset the impact of increased trade volumes on port employment. Furthermore, Hesse finds an increasing tendency for logistics and distribution activities to locate further away from ports, thus reducing a second area of economic benefit to port cities.

One of the first studies to document the declining local economic benefits accruing to port cities was Campbell (1993). In a case study of the Port of Oakland, Campbell documents the dispersion of port-related functions and port-dependent industries throughout the Bay Area. He finds that as the Port of Oakland gained dominance in cargo handling over the Port of San Francisco during the 1970s and 1980s, maritime services employment remained concentrated in San Francisco. Furthermore, he finds that "port-dependent" industries in the Bay Area, which he defines based on the percentage of their business that relies on maritime trade, are not geographically concentrated in those counties containing ports. Thus, he concludes, "The general result of containerization thus appears to be the shift of port benefits from a local to regional and national scales."[3]

In a more recent article, Helling and Poister (2000) present evidence on the weakening economic links between ports and their host cities and declining direct employment in water transportation. Statistical evidence regarding these trends is found in Hall (2004), which compares the average annual employment growth rates of 21 major U.S. cargo ports to overall U.S. employment growth over the period 1980–1998. Hall finds that over this period, average employment growth in the metropolitan areas surrounding major cargo ports was 1.8 percent compared to 2.1 percent for the nation overall. Furthermore, he finds that employment in marine cargo handling and terminal operations declined at a rate of 2.8 percent for the nation as a whole and fell by 1.9 percent in the sample of port cities.

In an effort to determine how these trends may have affected the economic status of geographic areas surrounding U.S. ports, this paper examines current economic indicators for the 10 largest ports. For the purposes of our paper, we will define a concept that we will refer to as a "port district." Conceptually, this will be close to Ducruet's characterization of a port city in a local scale, or the "area of transition" between a port and its nearest adjacent urban area. We will examine the extent to which these port districts have been influenced by the "de-linking" trends noted by Hoyle.

Defining the concept of a "port district." In the next section, we describe a methodology used to define the concept of a "port district" that can be used to delineate a consistent geographical area surrounding ports within which economic statistics can be collected and compared. In our study, we use a sample of ports defined as the set of the 10 largest container ports in the nation. This set of ports is listed in Table 2, along with the total 2005 container volume of each port.

These ports are located in a diverse set of cities. Three of the ports listed are located in the two largest metropolitan areas of the nation, Los Angeles and New York. Others are located in much smaller urban areas, such as Charleston, South Carolina. In order to be consistent across ports and to define a concept of "port district" that reflects the geography immediately surrounding a port, we take the location of each port and draw a concentric circle around the port to define a geographic area that we would expect to be directly

TABLE 2. THE 10 LARGEST U.S. CONTAINER PORTS.

Port	2006 container traffic (TEUs)
Los Angeles (CA)	8,469,853
Long Beach (CA)	7,289,365
New York/New Jersey	5,092,806
Oakland (CA)	2,390,262
Savannah (GA)	2,160,168
Tacoma (WA)	2,067,186
Hampton Roads (VA)	2,046,285
Seattle (WA)	1,986,360
Charleston (SC)	1,968,474
Houston (TX)	1,606,360

Source: American Association of Port Authorities.
TEU, twenty-foot equivalent unit; CA, California; GA, Georgia; WA, Washington; SC, South Carolina; TX, Texas.

FIGURE 1. MAP OF THE PORT OF LONG BEACH.
Source: Microsoft MapPoint.

impacted by the port's presence. Figure 1 shows such a map, drawn for the Port of Long Beach. The figure illustrates a set of circles drawn around the port location, reflecting a 5-, 7.5-, and 10-mile radius around the port. In defining the port location, we use the address of the primary cargo handling facility of the port.

In defining the geographic concept of a "port district," we choose to define the concept as the area located within the 7.5-mile radius of the port.[4] This choice of geographic boundaries reflects a desire to not only pick up economic activity that occurs directly at the port but also in the areas immediately adjacent to the port.

In order to measure economic activity in our port districts, we utilize zip code data published by the U.S. Census Bureau. Data from the 2000 Census provide information on the individuals and households living in the port districts, and zip code data from the Census Bureau's "County Business Patterns" provide information on the economic activity of establishments operating within port districts. It should be noted that, because zip code areas are irregular, our 7.5-mile designation is only approximate and to some extent

underestimates the true area of the data collected. This is because, in collecting the data, we include data from any zip code that is observed to have the majority of its area within the 7.5-mile boundary.

The Economic Status of Port Districts

In this section, we present data from the residents and firms located within port districts to provide an overview of economic conditions in those areas. Except where noted, all data are from the 2000 Census. Comparisons to surrounding metropolitan areas are also provided. In our analysis, we split the Port of New York/New Jersey into two separate port districts, based on the location of the major container terminals in Brooklyn, New York and Newark/Elizabeth, New Jersey.[5] The main characteristics of each port district are summarized in Table 3.

As Table 3 indicates, all port districts have a population over 100,000, with the largest population (over three million) belonging to the Port of New York (where the 7.5-mile radius covers a portion of Brooklyn as well as Manhattan.). The metropolitan area used as a comparison is listed next to each port district. We find that in the majority of cases, per capita income is lower in the port district than it is in the surrounding metropolitan area, with the notable exception of Seattle and Charleston.

Table 4 shows the rates of unemployment and the percentage of families under the poverty level in each of the port districts and surrounding metropolitan areas.

In contrast to the per capita income indicator, which indicates that some port districts compare favorably to their surrounding metropolitan areas, we find a much more negative picture when comparing port district unemployment and poverty rates to surrounding metropolitan area statistics.

As Table 4 indicates, unemployment rates are higher in port districts than their surrounding metropolitan areas, with the sole exception of Tacoma, where unemployment is slightly lower in the port district. The seventh column of the table shows the extent to which port district unemployment exceeds unemployment in the surrounding metropolitan area ("port district excess unemployment"). When we compare the percentage of families falling below the poverty level, we find that without exception, poverty rates are higher in port districts than their surrounding metropolitan areas. In fact, poverty rates in many cases are significantly higher, exceeding poverty rates in the surrounding metropolitan area by as much as 8 percentage points.

Table 5 examines the prevalence of low-income families (comparing port districts to their surrounding metropolitan areas). The results are consistent with those in Table 4. In almost every case, the prevalence of low-income families is higher in the port district than in the surrounding metropolitan area, whether the low-income threshold is set at families earning less than $10,000 or less than $25,000.

Table 6 shows the minority composition of port districts compared to their surrounding metropolitan areas. The percentage of non-white residents is calculated by taking the ratio of the difference between the total population and the population that was reported as white (one race) in the decennial census to the total population. Similarly, the percent Hispanic is

TABLE 3. POPULATION AND PER CAPITA INCOME, PORT DISTRICTS, AND THEIR SURROUNDING METROPOLITAN AREAS.

Port district	Surrounding metropolitan area	A. Port district population	B. Metropolitan area population	C. Port district per capita income	D. Metropolitan area per capita income	Difference in per capita income (C–D)
Los Angeles	LA, Long Beach PMSA	580,020	9,519,338	$20,915	$20,683	$232
Long Beach	LA, Long Beach PMSA	811,476	9,519,338	$19,357	$20,683	($1,326)
New York	NY, NJ CMSA	3,054,202	21,199,865	$20,747	$26,604	($5,857)
New Jersey	NY, NJ CMSA	1,019,801	21,199,865	$20,325	$26,604	($6,279)
Oakland	Oakland PMSA	732,021	2,392,557	$27,299	$28,241	($942)
Savannah	Savannah MSA	151,888	293,000	$17,930	$20,752	($2,822)
Tacoma	Tacoma, WA PMSA	397,445	700,820	$21,499	$20,948	$551
Hampton Roads	Norfolk, VA Beach MSA	285,463	1,569,541	$16,752	$20,328	($3,576)
Seattle	Seattle, WA PMSA	555,841	2,414,616	$32,512	$27,751	$4,761
Charleston	Charleston MSA	177,061	549,033	$22,265	$19,772	$2,493
Houston	Houston PMSA	119,627	4,177,646	$16,225	$21,806	($5,581)

LA, Los Angeles; MSA, metropolitan statistical area; NY, New York; NJ, New Jersey; CMSA, consolidated metropolitan statistical area; PMSA, primary metropolitan statistical area. WA, Washington; VA, Virginia.

TABLE 4. UNEMPLOYMENT AND POVERTY RATES.

Port district	Surrounding metropolitan area	A. Port district unemployment	B. metropolitan area unemployment	C. Port district poverty rate (families)	D. Metropolitan area poverty rate (families)	Port district excess unemployment (A)–(B)	Port district excess poverty (C)–(D)
Los Angeles	LA, Long Beach PMSA	8.3	8.2	15.6	14.4	+0.1	+1.2
Long Beach	LA, Long Beach PMSA	8.7	8.2	15.7	14.4	+0.5	+1.3
New York	NY, NJ CMSA	9.3	6.7	18.3	10.2	+2.6	+8.1
New Jersey	NY, NJ CMSA	9.0	6.7	13.5	10.2	+2.3	+3.3
Oakland	Oakland PMSA	6.9	5.2	12.8	6.7	+1.7	+6.1
Savannah	Savannah MSA	7.8	5.6	16.7	11.0	+2.2	+5.7
Tacoma	Tacoma, WA PMSA	6.2	6.5	8.0	7.5	–0.3	+0.5
Hampton Roads	Norfolk, VA Beach MSA	8.8	5.7	15.1	8.4	+3.1	+6.7
Seattle	Seattle, WA PMSA	8.2	4.6	6.7	5.2	+3.6	+1.5
Charleston	Charleston MSA	7.4	5.5	12.7	10.7	+1.9	+2.0
Houston	Houston PMSA	6.2	5.7	12.9	11.1	+0.5	+1.8

LA, Los Angeles; MSA, metropolitan statistical area; NY, New York; NJ, New Jersey; CMSA, consolidated metropolitan statistical area; PMSA, primary metropolitan statistical area; WA, Washington; VA, Virginia.

TABLE 5. PREVALENCE OF LOW-INCOME HOUSEHOLDS.

Port district	Surrounding metropolitan area	A. Port district families income <$10,000	B. Metropolitan area families income <$10,000	(A)–(B)	C. Port districtfamilies income <$25,000	D. Metropolitan area families income <$25,000	(C)–(D)
Los Angeles	LA, Long Beach PMSA	8.7%	7.7%	+1.0	27.1%	26.1%	+1.0
Long Beach	LA, Long Beach PMSA	8.7%	7.7%	+1.0	27.7%	26.1%	+1.6
New York	NY, NJ CMSA	12.3%	6.9%	+5.4	31.6%	19.1%	+12.5
New Jersey	NY, NJ CMSA	9.4%	6.9%	+2.5	24.8%	19.1%	+5.7
Oakland	Oakland PMSA	8.0%	4.1%	+3.9	23.5%	13.6%	+9.9
Savannah	Savannah MSA	10.8%	7.0%	+3.8	33.3%	23.8%	+9.5
Tacoma	Tacoma, WA PMSA	5.0%	4.6%	+0.4	18.0%	17.5%	+0.5
Hampton Roads	Norfolk, VA Beach MSA	10.2%	5.4%	+4.8	31.8%	19.6%	+12.2
Seattle	Seattle, WA PMSA	4.3%	3.4%	+0.9	14.4%	12.3%	+2.1
Charleston	Charleston MSA	9.1%	7.1%	+2.0	24.0%	23.2%	+0.8
Houston	Houston PMSA	7.3%	8.7%	−1.4	24.4%	26.3%	−1.9

LA, Los Angeles; MSA, metropolitan statistical area; NY, New York; NJ, New Jersey; CMSA, consolidated metropolitan statistical area; PMSA, primary metropolitan statistical area; WA, Washington; VA, Virginia.

TABLE 6A. MINORITY POPULATION OF PORT DISTRICTS.

Port district	Surrounding metropolitan area	A. Port district % non-white	B. Metropolitan area % non-white	C. Port district % Hispanic	D. Metropolitan area % Hispanic
Los Angeles	LA, Long Beach PMSA	54.4	51.3	40.6	44.6
Long Beach	LA, Long Beach PMSA	53.2	51.3	37.7	44.6
New York	NY, NJ CMSA	53.4	64.1	21.3	18.2
New Jersey	NY, NJ CMSA	51.2	64.1	24.6	18.2
Houston	Houston PMSA	30.0	38.9	44.2	29.9
Oakland	Oakland PMSA	58.5	44.6	16.5	18.5
Seattle	Seattle, WA PMSA	29.3	21.4	5.1	5.2
Tacoma	Tacoma, WA PMSA	27.6	21.6	6.1	5.5
Charleston	Charleston MSA	36.5	34.9	1.6	0.4
Hampton Roads	Norfolk, VA Beach MSA	52.9	37.5	3.5	3.1
Savannah	Savannah MSA	58.6	38.8	2.5	2.2

Note: Port districts with largest surrounding metropolitan areas shaded. National average is 24.9 percent non-white, 12.5 percent Hispanic.

LA, Los Angeles; MSA, metropolitan statistical area; NY, New York; NJ, New Jersey; CMSA, consolidated metropolitan statistical area; PMSA, primary metropolitan statistical area; WA, Washington; VA, Virginia.

TABLE 6B. MINORITY POPULATION OF PORT DISTRICTS.

Port district	Surrounding metropolitan area	A. Port district % black	B. Metropolitan area % black
Los Angeles	LA, Long Beach PMSA	9.1	9.8
Long Beach	LA, Long Beach PMSA	13.3	9.8
New York	NY, NJ CMSA	27.2	28.7
New Jersey	NY, NJ CMSA	29.2	38.7
Houston	Houston PMSA	6.0	17.5
Oakland	Oakland PMSA	25.2	12.7
Seattle	Seattle, WA PMSA	8.0	4.4
Tacoma	Tacoma, WA PMSA	6.4	7.0
Charleston	Charleston MSA	33.9	30.8
Hampton Roads	Norfolk, VA Beach MSA	46.0	30.9
Savannah	Savannah MSA	54.7	34.9

Note: Port districts with largest surrounding metropolitan areas shaded. National average is 12.3 percent.
LA, Los Angeles; MSA, metropolitan statistical area; NY, New York; NJ, New Jersey; CMSA, consolidated metropolitan statistical area; PMSA, primary metropolitan statistical area; WA, Washington; VA, Virginia.

the ratio of those residents reported in the census as "Hispanic or Latino—any race," to the total population. The proportion of black residents is the ratio of residents reported in the census as black or African American (one race) to the total population.

Overall, the results here do not show a consistent difference between the port districts and the surrounding metropolitan areas. The proportion of the population that is non-white is higher in the port districts than in the surrounding metropolitan areas in about half of the areas and is similar to or lower than the surrounding metropolitan area in the other half. This is also the case for the proportion of Hispanic and black residents. When we compare the populations of port districts with the national population, however, we find all port districts to have a higher proportion of non-white residents than the nation. Also, when we divide the sample into two groups, containing the largest (shaded) and smallest metropolitan areas in the sample, we find a more consistent pattern among the port districts in smaller metropolitan areas. In these six port cities, the proportions of non-white, Hispanic, and black residents are almost always higher in the port district than in the surrounding metropolitan areas. This is not the case in the port districts located within the largest metropolitan areas, where the population is very diverse.

In a review of the literature on the subject of environmental inequality and environmental justice, Brulle and Pellow (2006) find an extensive literature documenting the existence of environmental inequality in the U.S. This literature finds that individuals of low

socio-economic standing and minorities are disproportionately affected by environmental hazards in their communities and the adverse health effects resulting from this exposure. Our findings are consistent with this literature, in that we find the population of port districts to be poorer than the general population and, in many cases, to have a higher proportion of minorities than the surrounding metropolitan areas. This would imply that the burden of environmental hazards created by the largest U.S. container ports is disproportionately borne by low-income and minority populations.

Next, we present data from establishments operating within the port district boundaries, from the Census Bureau's County Business Patterns zip code database. This information will provide evidence of the availability and quality of jobs in the port districts. In the case of New York and New Jersey, we are better able to break out the immediate surrounding metropolitan area using the County Business Patterns source, so these are defined differently in Table 7.

Table 7 reveals several interesting statistics. First, in spite of the high unemployment rate in port districts, as measured by the household statistics, the establishment data reveal that jobs are relatively plentiful in the port districts. For example, using the rough indicator of employment to civilian labor force in column (C), we find that in a number of port districts, total establishment employment exceeds the civilian labor force. Of course, residents of port districts will often find employment outside of the narrow geography where they reside, so this statistic will underestimate the employment opportunities available to port district residents, particularly in the large metropolitan areas such as Los Angeles and New York.

Table 7 also reveals that the average payroll paid to employees working within the port district is often higher than the associated average payroll in the surrounding metropolitan area.[6] This result would seem to be contradictory to the results presented earlier, suggesting that port district residents tend to be poorer than residents of the surrounding metropolitan area. However, it is very much consistent with the idea that port district residents, for whatever reasons, are not able to take advantage of the employment opportunities available in the port districts. The fact that income and payroll statistics are not positively correlated suggests that few port district residents are employed in the port districts where they reside.

These tables pose an interesting question. Why is it that, in spite of the economic benefits provided by the ports and evidence of ample employment opportunities in port districts, the economic status of port district residents is so low? We next turn to examine some hypotheses that can help us to understand these apparent contradictions.

One set of factors to consider are "externalities" resulting from economic activity at and around large ports. These externalities take several forms. First, port activities typically generate a significant amount of truck traffic in and around the port, leading to congestion on local roads and highways and noise and pollution in the environment. Ships loading and unloading at the port also generate pollution. Warehousing operations tend to spring up near ports, creating industrialized areas that are not highly sought after as residential locations. Thus, port operations may serve to cause surrounding areas to become less desirable locations for residential housing. As a result, local real estate prices may fall or rise more slowly than values in the surrounding metropolitan area. Poorer residents may

TABLE 7. ESTABLISHMENT DATA.

Port district	Surrounding metropolitan area	A. Establishments	B. Employment	C. Employment/civilian labor force	D. Average payroll	E. Metropolitan area average payroll	Port district excess payroll (D)–(E)
Los Angeles	LA, Long Beach PMSA	12,207	216,846	0.61	$37,043	$34,933	$2,110
Long Beach	LA, Long Beach PMSA	13,891	255,346	0.72	$36,994	$34,933	$2,061
New York	New York, Newark	54,536	704,221	0.51	$33,162	$49,284	($16,122)
New Jersey	New York, Newark	20,723	350,047	0.72	$34,780	$49,284	($14,504)
Oakland	Oakland PMSA	23,817	373,347	1.01	$39,896	$39,706	$190
Savannah	Savannah MSA	4,692	79,341	1.17	$27,653	$27,004	$649
Tacoma	Tacoma, WA PMSA	9,518	148,498	0.73	$30,459	$27,908	$2,551
Hampton Roads	Norfolk, VA Beach MSA	5,187	97,683	0.83	$26,604	$24,733	$1,871
Seattle	Seattle, WA PMSA	25,244	441,797	1.34	$39,923	$42,749	($2,826)
Charleston	Charleston MSA	6,274	103,521	1.03	$26,035	$25,284	$751
Houston	Houston PMSA	1,724	41,241	0.80	$38,966	$36,240	$2,726

Note: “New York, Newark” area consists of data from the cities of New York, Newark, and Jersey City combined. LA, Los Angeles; MSA, metropolitan statistical area; NY, New York; NJ, New Jersey; PMSA, primary metropolitan statistical area; WA, Washington; VA, Virginia.

move into the area then, attracted by relatively low prices or rents. Ironically, then, the same ports that serve as "economic engines" for the region and nation may be the cause of economic decline and deterioration in the immediate areas that surround them.

The observed high rate of unemployment among port district residents is also consistent with the literature on the spatial distribution of disadvantage in metropolitan areas. This literature began with the work of Kain (1968) but was subsequently refined and expanded upon by a large number of researchers (including, Houston 2005; Raphael 1998; Stoll, Holzer, and Ihlanfeldt 2000; Thomas 1998). According to this literature, indicators of disadvantage such as high unemployment and poverty rates are not spread evenly across metropolitan areas but rather are spatially concentrated in particular areas within large cities. These areas are also observed to have a high percentage of minority residents, and so fit the description of the port districts described above. A possible explanation for the high unemployment rates observed in these areas is that there is a "spatial mismatch" between job seekers and job openings, which are often located in suburban areas. This explanation has come to be known as the "spatial mismatch hypothesis."

The relevance of the spatial mismatch literature to the port districts seems questionable, given that our data also show a relative abundance of jobs available in these districts. But Stoll, Holzer, and Ihlanfeldt (2000) provide an explanation as to how this spatial mismatch could apply to the port districts in our sample. They find, in a survey of four major U.S. metropolitan areas, that the spatial distribution of jobs by skill level is not even. The central city tends to have a lower proportion of low-skilled jobs as a ratio to total jobs, compared to the suburbs. If this is the case in our port districts, then this would explain why we observe high unemployment and poverty rates, even in an area where the overall number of jobs is plentiful. The observed unemployment is a function of the spatial mismatch between low-skilled workers and low-skilled jobs.

Case Study: The Long Beach "Port District"

This section of the paper provides a case study of one of our port districts, the area surrounding the Port of Long Beach, California. Table 8 summarizes the residential and employment statistics for this port district.

TABLE 8. SUMMARY STATISTICS FOR LONG BEACH PORT DISTRICT.

	Long Beach Port district (A)	LA, Long Beach PMSA (B)	Ratio (A)/(B)
Per capita income	$19,357	$20,683	0.936
Unemployment rate	8.7	8.2	1.061
Poverty rate	15.7	14.4	1.09
Average payroll—establishments	$36,994	$34,933	1.06

LA, Los Angeles; MSA, metropolitan statistical area.

The port district of Long Beach, like many of the port districts studied, is characterized by residents with incomes below the average for their metropolitan statistical area (MSA) and unemployment and poverty rates above MSA levels. It also shares the characteristic of many other districts, in that average payroll in establishments operating in the port district is higher than the MSA average. In this case study, we will examine more disaggregated employment data for Long Beach in an effort to shed light on the question of why income levels in the district are so low, in spite of the relatively high wages paid by firms operating in the district.

In Table 9, the distribution of employment by sector as reported by Long Beach Port district residents in the census is compared to the distribution of employment by sector of Long Beach establishments. There are three sectors where the share of employment as reported by residents is significantly lower than the share of employment in Long Beach establishments. These sectors are manufacturing, professional and business services, and public administration. In the City of Long Beach, the manufacturing numbers are dominated by the presence of a Boeing manufacturing facility in the northern part of the city,

TABLE 9. LONG BEACH PORT DISTRICT RESIDENTS: EMPLOYMENT BY SECTOR.

Sectors	Long Beach (LB) Port district: residents	City of LB establishment data	Average payroll
Construction and mining	5.4	4.7	46,685
Manufacturing	15.5	17.7	51,515
Wholesale trade	4.7	4.2	50,557
Retail trade	10.4	9.0	26,035
Transportation/warehousing	7.7	5.7	42,026
Information	3.2	1.5	37,603
Finance	5.8	5.2	40,519
Professional services	10.0	14.5	40,347
professional, scientific and technical		4.7	55,561
management of companies		2.0	56,854
administrative support		7.8	26,969
Health services	20.2	11.0	35,531
Accomodation/food services	7.9	8.7	14,373
Other services	5.5	4.1	26,892
Public administration	3.8	13.7	51,585
TOTAL	100.0	100.0	

Source: Establishment data from California Employment Development Department and California State University, Long Beach Office of Economic Research.

which employs significant numbers of engineers and workers skilled in high-tech aerospace manufacturing. The public administration numbers in the city are boosted by the presence of a large state university.

The third column in Table 9 shows the average payroll of Long Beach establishments, by sector. In the case of manufacturing and public administration, where port district employment shares are low as compared to the city, wages are relatively high. In the case of professional services, another sector where the share of employment is relatively low among port district residents, wages are relatively high in two of the subsectors (professional, scientific and technical services, and management of companies) but are relatively low in the third subsector (administrative support.) The census does not break out these categories, so we do not know the relative concentration of jobs among port district residents in these subsectors of professional services. However, occupational data in the census do suggest a relatively small share of management and professional jobs held by port city residents. Table 10 compares the occupational status of port district residents as compared to residents of the City of Long Beach. Transportation occupations have a relatively high share in the port district, as compared to the city, where occupations in the service and management/professional areas have a smaller share in the port district as compared to the City of Long Beach overall.

Table 10 suggests that a relatively high share of jobs held by port district residents (as compared to Long Beach residents overall) are in occupations related to production, transportation, and material moving. However, a study by Monaco (2006) finds that the majority of transportation-related jobs generated by the Port of Long Beach go to individuals who reside outside the City of Long Beach. Monaco's study utilizes data from the 5 percent Public Use Microdata Sample (PUMS) file, obtained through the long form of the decennial census. Based on sample data, she estimates that only about 15 percent of port-related transportation jobs go to the residents of the City of Long Beach (this would imply an even smaller share going to residents of the port district, a small sub-area of the city).[7] Monaco's results are consistent with the "de-linking" of port and city described above by Hoyle (1989).

TABLE 10. OCCUPATIONAL STATUS OF PORT DISTRICT RESIDENTS.

Occupations	Long Beach Port district	City of Long Beach
Management, professional, and related	32.7	34.3
service	14.8	15.8
Sales and office	27.9	27.2
Construction, extraction, and maintenance	8.1	7.8
Production, transportation, and material moving occupations	15.9	14.7
TOTAL	100.0	100.0

A final area to explore in this case study is whether the externalities created by the operation of the Port of Long Beach have led to tensions between the local community and the port. There is evidence that this is, in fact, the case. Community activists and lobbying organizations, such as California's Coalition for Clean Air, have put pressure on local politicians to address these externalities. In response, California AB2650, a measure designed to reduce pollution by fining marine terminals for trucks idling more than thirty minutes inside terminals, was passed into law in 2002. A second measure is currently being considered, which would levy a fee on every container discharged at the Ports of Los Angeles/Long Beach, creating revenues to be used solely for the purpose of increasing the efficiency of port cargo movements and mitigating pollution stemming from port operations.

Conflicts between communities and ports are not limited to the case of Long Beach. Port expansion plans have been subject to significant community opposition in Charleston, North Carolina; Tacoma, Washington; Vancouver, Canada; Hamburg, Germany; and Felixstow/Harwich, UK, to name just a few.[8] Conflicts between ports and local communities regarding environmental issues affect most ports and have resulted in new environmental programs established in LA/Long Beach, New York/New Jersey, Tacoma, Houston, and other areas.[9]

Conclusion

In this article, we look closely at economic indicators of "port districts," which we define as the geographic areas within a 7.5-mile radius of a large container port. When we compare port districts to their surrounding metropolitan areas, we find that unemployment and poverty rates are significantly higher in port districts. Thus, the presence of a large container port has not served as an engine of growth for the local area surrounding the port; in fact, the reverse appears to be the case.

A possible explanation for this observed trend is that if large container ports generate significant local negative externalities, this may drive down rents in the vicinity of a port, thereby attracting low-income households. One important question regarding these trends is whether they point to the need for any policy response. One could argue that markets in this case are working—individuals with low incomes are doing the best they can for themselves in seeking out the most affordable housing, which happens to be adjacent to ports.

However, we would argue that there is a role for policy here if one takes a broader view of international trade and the goods movement required to support that trade. There is a broad consensus among economists and policy makers, that international trade is beneficial for a nation's economy. In order to support growing volumes of international trade, U.S. ports have had to expand rapidly in recent decades. To support increased future trade volumes, this trend of port expansion will need to continue. However, if expanding ports mean deteriorating port districts, those cities will likely oppose plans for port expansion.

The political economy of goods movement is thus similar to that of trade itself, while the benefits of trade are dispersed, the costs of trade (in this case, measured as the negative

externalities created by goods movement from the ports) are concentrated. Those hurt by trade (the communities surrounding ports) will therefore tend to pose staunch political opposition to efforts to expand ports. Without port expansion, trade cannot continue to expand.

The role for policy makers, then, is to seek out ways to mitigate negative impacts of ports on local economies so that the nation can continue to benefit from expanding trade. Examples of these types of policies would include policies designed to reduce ship and truck emissions at the port, investment in infrastructure to reduce congestion on local roads and freeways, the increasing use of "satellite terminals" to reduce local congestion (see Slack 1999), and policies designed to enhance the aesthetic properties of port-adjacent neighborhoods.

The results of this paper also suggest a second direction for policy. The evidence shows that in many port districts, jobs are plentiful, and yet the residents of port districts suffer from high unemployment and poverty rates. Job training programs could help residents to better take advantage of the economic opportunities available in port districts. To the extent that port district residents are better able to take advantage of the economic opportunities generated by the ports, they will have less incentive to oppose port expansion in the future.[10]

In an era of ever-increasing global commerce, the political tensions resulting from trade pose serious issues for policy makers. If trade is welfare enhancing for society at large, then efforts should be made to reduce the political conflict over trade by designing policies to assist those individuals for whom trade is welfare reducing. This argument has long been applied to the case of workers in industries hurt by international trade. However, it is equally applicable to the case of the residents of port districts, who must contend with the negative effects of the goods movement arising from port activities. Fortunately, a number of policy instruments exist that can improve the economic and environmental status of port district residents. These policies will serve not only to benefit port district residents but to also reduce the political opposition to expanding trade, which will serve national economic interests.

NOTES

1. Campbell (1993).
2. Ducruet and Jeong (2005:7).
3. Campbell (1993:223).
4. While the choice of distance (7.5 miles) is somewhat arbitrary, it is necessary to choose a specific boundary for data collection so that data from various port districts will be collected consistently.
5. There is a degree of overlap (a number of shared zip codes) in the 7.5-mile radius of the Ports of New York and New Jersey, as well as for the Ports of Los Angeles and Long Beach. The overlap is greatest for Los Angeles/Long Beach, which share 11 zip codes (out of a total of 15 and 21 zip codes, respectively). The Ports of New York/New Jersey share eight zip codes (out of a total of 48 and 31 total zip codes, respectively).
6. The big exception here is the case of New York and New Jersey, where port district payrolls are significantly lower, reflected the influence of Manhattan payrolls on the metropolitan area statistic.

7. Unfortunately, data from the 5 percent PUMS survey are not available at the zip code level and so cannot be used to construct port district statistics.
8. See Pearlstein (2006), Stueck (2007), Breen (2006), *News Tribune* (2007).
9. See Brevetti and Fischer (2007), DiBenedetto (2006), *News Tribune* (2007) and the *Journal of Commerce Online* (2007).
10. There is evidence in some port cities that residents are beginning to demand these kinds of programs. For example, see "Activists Challenge Port on Truck Pollution and Jobs," InsideBayArea.Com, August 23, 2007. This article describes how community activists are appealing to the Board of the Port of Oakland for increased port-related job opportunities to be made available to local residents, and for measures to be taken to reduce truck pollution at the port.

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