Richmond Port Feasibility Study Proposal*

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1   Introduction

Why are some areas in the city of Richmond more deprived than others? Specifically, why is there "neighborhood sorting" or poor households clustering in certain geographical regions? When does the "neighborhood sorting" occur? How does this "neighborhood sorting" relate to the Richmond Port development? (i.e., what percentage of the disparity can be attributed to the "port exposure") To answer these questions, first, we would like to develop a measure of "port exposure" for each dis-aggregated neighborhood in the city of Richmond, reflecting the local economy's nexus with the port business activities. Second, we would like to use unique, neighborhood-level panel data to study how each neighborhood's "port exposure" is connected to the neighborhood's social/economic development. Third, we would also like to investigate the impact of Covid-19 in shaping the local social/economic development disparity due to "port " exposure.

This project will be one of the first to present a study of port development vs. local economic disparity using historical economic and social data, which sheds light on the development of the internal structure of the city of Richmond. While existing studies generally indicate a positive effect of infrastructure investment such as airports, highways, or high-speed railroads in driving the prosperity of the local economy (usually, the analysis is carried out using aggregated data, i.e., country, states), relatively little is know about the consequences of seaport development on local social & economic development, especially at a fine spatial scale. To fill this gap, we will use the city of Richmond, CA, as a case study, employing neighborhood data to examine the impact of seaport development on local social/economic development.

The study will be closely related to studies on neighborhood sorting. Lee and Lin (2018) look at exogenous natural amenities as a driver of neighborhood sorting. Heblich et al. (2021) investigate the long-run consequence of historical pollution on neighborhood sorting. They point out that

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*A Preliminary Research Proposal

higher polluted neighborhood repels high-income residents even after pollution has waned. Chen et al. (2022) and Freeman et al. (2019) study how air pollution affects the residential choice between cities in China. This study will also be related to urban study using historical maps. Siodla (2015) and Hornbeck and Keniston (2017) use historical maps to understand the effects of great fires in San Francisco and Boston. Redding et al. (2016) use maps to document the destruction of London during World War II.

2 Project Scope

Identify the Richmond port development's impact on the City of Richmond's local economic and social development. Some key hypotheses to be tested include

1. Port development contributes to the "neighborhood sorting" phenomenon: some neighborhoods (Neighborhood Group A) benefit more from the port-related business activities than others (Neighborhood Group B).

2. Covid-19 may increase the development disparity between different neighborhoods (i.e., neighborhoods that have low vs. high exposure to the Port will behave differently since Covid).

3 Research Proposal

This study will analyze the exposure to port-related business activities in different neighborhoods and connect this exposure to the economics and social development of the neighborhood. Ideally, we will have the pre- and post-Covid data that provide the following information

1. Neighborhood classification based on various economics or social development criteria. i.e., median household income of the neighborhoods, average schooling rate in secondary school, crime rate, etc.

2. Measure of port's business activities and exposure of local neighborhood to those activities. i.e., businesses in the neighborhood that have partnerships with the port or rely on the trade activities of the port; the number of workers in the neighborhood that are employed by the port; the infrastructure of the port, and the utilization rate by the neighborhood

3. Exposure of local economy to Covid-19, for neighborhood and for the port activities.

4 Goal of The Research

1. Determine whether there is an observable trend of development disparity between different neighborhoods (whether the pandemic enlarges this disparity) and whether it has something to do with the port development

2. Determine whether there is a need to make further investment in the port and how further development of the port can disproportionately benefit certain neighborhoods compared to others

3. Determine what kinds of port development are most needed and most beneficial to the local economy and social development and quantify the economics/social benefit of port investment/development

5 Project Outcome

1. Helping disadvantaged neighborhoods that are lagged behind in economics or social development. i.e., reducing their crime rate and improving median household income through channels of economic investments.

2. Establish an optimal plan to reduce economic/social disparities between different neighborhoods

6 Budget and Support

SFSU mentorship program can assist with this project. Additional costs such as data collection costs might be covered using the SF State Research, Scholarly and Creative Activity (RSCA) Fund (Application deadline: Oct 10th, 2022)

7 Evidence Methodology

The empirical analysis aims to

- provide a measure of port activity exposure by neighborhood and document the pattern of neighborhood sorting

- provide evidence connecting neighborhood sorting with "port exposure" and investigate the impact of Covid-19 on the neighborhood development disparity

The reduced form empirical specifications take the following form

- Baseline specification to examine the nexus between port exposure and neighborhood sorting

$$Y_{it} = \beta_0 + \beta_1 Port_{it} + \beta_2 Covariates + FE + \epsilon_{it} \tag{1}$$

- DID regression to study the impact of Covid-19 on neighborhood sorting

$$Y_{it} = \beta_0 + \beta_1 Covid + \beta_2 Low + \beta_3 Covid * Low + \beta_4 Covariates + u_{it} \tag{2}$$

Where in both equations, i denotes a neighborhood, and t denotes time. $Y_i t$ is a time-varying measure of the neighborhood's local social/economic development; $Port_{it}$ is a measure of neighborhood i's exposure to Richmond Port activity; $Covariates$ include control variables; FE refers to fixed effects. $Covid$ is a time dummy equal to 1 if a time corresponds to a period after Covid; Low is a group dummy equal to 1 if a neighborhood is an area that has low port activity exposure.

Interpretation of the estimated coefficients in the DID equation.

- β_1: change of Y_{it} in high port exposure areas (control group) because of Covid. This variable measures Covid's impact on high port exposure areas. In other words, for the high port exposure areas, does Covid increases its Y_{it}?

- β_2: difference of Y_{it} between high port exposure areas (control group) and low port exposure areas (treatment group) before Covid. This variable reflects the disparity of Y_{it} between those two areas before Covid.

- β_3: Covid's impact on low port exposure areas relative to the high port exposure areas. This is the key interested parameter in a DID estimation. It will answer the following question: does Covid increases the social/economic development disparity between high port exposure areas vs. low port exposure areas?

8 Data

Data needed for this study may include (not limited to)[1]

City Structure: scaled at a fine level, which includes roads, railways, port facilities, public amenities, residential housing, and other buildings and their use. A map of Richmond is needed.

Measure of "port exposure": the number of business units related to port activities; the number of employees working for the port-related industries.; or any other data that can gauge the "port exposure".

Policy regime shift: any historical design or favorable policy change in facilitating port development. What are the past policies in promoting Port development and investment?

Local social/economics development: crime rate; income; the total number of business units; property price; share of low-skilled workers; share of the population in poverty; etc.

Neighborhood Sorting: information on the structure of the household, i.e., income (most desirable measure), gender, age, occupation, education level, etc.

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[1]Ideally, any privately owned data would be desirable, which can make the research more unique.

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