

GUANGDONG AND HONG KONG UNIVERSITIES

“1+1+1” Joint Research Collaboration Scheme

粵港高校「1+1+1」聯合資助計劃



The Rise and Fall of GBA Ports in 20th Century

A Spatiotemporal Dynamic Analysis on Institutional Change and Port System Development

1 Synopsis

This project focuses on the Greater Bay Area and examines the relationship between institutional change and port system development since 1900. It aims to develop a data-driven analytical framework to investigate how port systems evolve under different institutional contexts, on top of critical environmental factors overlooked by historians and Geographers revealed by the Water Conservancy Reports of Republican Guangdong. It combines textual data processing with quantitative and spatial analysis to better understand the relative competitiveness of ports of the Greater Bay Area. One of the key research questions of the project is how Guangzhou lost its primacy in maritime logistics to Shanghai and Hong Kong during the 20th century.

2 Research Framework and Methodology

This project adopts a data-driven framework to examine the relationship between institutional change and port system development. The major research materials are policy documents and Cantonese Water Conservancy reports published during the Republican Period. From this pool of information, structured variables are constructed for the application of Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI) measurement of market structure. Meanwhile, Dynamic Shift-Share Analysis (DSSA) is applied to examine structural changes over time.

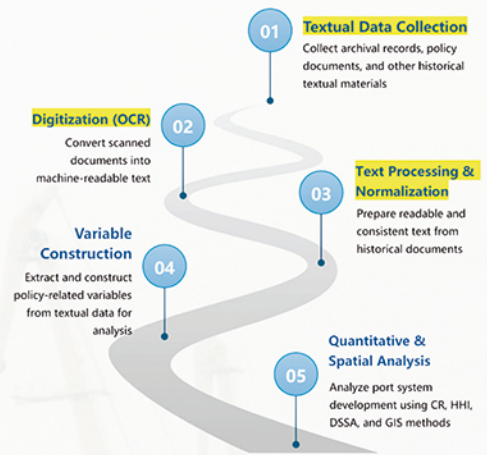
Through extensive archival research across archives in Hong Kong, Macau, and Zhuhai, the project uses historical contextualisation to shed light on present-day concerns by revisiting decisions made in the past.

3 Current Progress

Initial efforts have focused on extracting information from textual data to support the analysis of institutional change. OCR is applied to transform the historical records into digital data.

In addition, preliminary text normalization has been explored on selected materials. Historical texts, including classical Chinese expressions, have been converted into more accessible modern Chinese using locally deployable and adjustable large language models (e.g., Qwen), thereby improving readability and supporting later processing.

At this stage, the OCR-related work remains exploratory and feasibility-oriented, with the main purpose of identifying workable processing strategies for complex historical materials rather than producing a finalized analytical dataset. There are some challenges to text-processing and data organization, as the historical materials are not composed in standardized structure for direct quantitative analysis, not to mention that maps, annotations, and textual contents are closely combined in hybrid pages.



4 Future Works

In a few months' time the research team will continue consolidating the technical groundwork and improving the preparation of source materials for later analysis that using indicators such as the Concentration Ratio (CR), the Herfindahl-Hirschman Index (HHI), and Dynamic Shift-Share Analysis (DSSA), in order to examine changes in the port system over time.

An international workshop on historical port in the interactions and competitiveness of Republican Chinese Ports is scheduled to be held in BNBU Centre in August 2026. It aims to produce a book-form publication by reputable academic publisher on the historical elements of major ports of the Greater Bay Area, namely, Hong Kong, Whampao (Canton/Guangzhou) and Macau, as well as their mutual competitions and the land and water routes connecting them.

In light of the modern port analytical tools employed by the project, a systematic enquiry on how Guangzhou lost its primary status as the major seaport of China will be conducted at the later stage. No less than three articles are expected to be published in top-tier journals. The planned topics include: the factors contributed to rise of Hong Kong as the main seaport of GBA in early 20th century, the destructive competition between Guangzhou and Hong Kong that facilitated the rise of Shanghai in the same period, and the supremacy of the port of Hong Kong in the Chinese coast after the World War II.

5 Conclusion

The project has developed an initial data processing workflow and identified key issues related to data quality, textual complexity, historical interpretation, and data structuring. These issues also highlight the importance of combining technical methods with the interdisciplinary strengths of the research team in the next phase of the project. Through the continued integration of textual data with analytical methods, the study is expected to contribute to a clearer understanding of the relationship between institutional change and port system development which is unachievable by qualitative and textual methodologies.

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