

**THE IMPACT OF RAILWAY STATIONS DEVELOPMENT ON
LAND PRICE: A CASE IN WEST JAPAN**

THESIS

**Submitted in partial fulfillment of the requirements for
the Degree of Master of Urban and Regional Planning**

By:

**MELANTON HENDRA SIREGAR
21040120413030**



**FACULTY OF ENGINEERING
MASTER PROGRAM IN URBAN AND REGIONAL PLANNING
DIPONEGORO UNIVERSITY
SEMARANG
2022**

**THE IMPACT OF RAILWAY STATIONS DEVELOPMENT ON LAND
PRICE: A CASE IN WEST JAPAN**

Submitted to
Master Program in Urban and Regional Planning
Faculty of Engineering, Diponegoro University

By:

**MELANTON HENDRA SIREGAR
21040120413030**


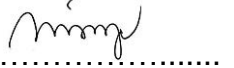

Submitted for the thesis defense
On December 23rd, 2022

Declared Passed

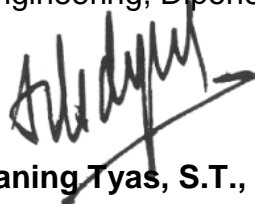
In fulfillment of the requirement for
the Master of Urban and Regional Planning Degree

Semarang, December 2022

Approval by Examiner Team:

Prof. Dr.sc.agr. Iwan Rudiarto, S.T., M.Sc. - Supervisor : 
Dr. -Ing. Wisnu Pradoto, S.T., M.T. - Examiner : 
Prof. Dr. Ir. Nany Yuliasuti, M.S.P. - Examiner : 

Acknowledged by,
Head of The Master Program in Urban and Regional Planning
Faculty of Engineering, Diponegoro University



Wido Prananing Tyas, S.T., M.D.P., Ph.D.*

STATEMENT OF ORIGINALITY

I hereby declare that this thesis has never been submitted to obtain a degree at any other university and, to my knowledge, does not contain the work or opinion ever written or published by others except the writing referred to in this manuscript and mentioned in the bibliography.

I certify that this document is free from plagiarism. If the document is later proven to be a plagiarism work from other authors' work and/or intentionally submitted work or opinion from other authors, then the author is willing to get academic sanction and/or legal sanction.

Semarang, December 2022



Melanton Hendra Siregar
21040120413030

COLLABORATION STATEMENT

This thesis is the result of the Double Degree Program curriculum,
a collaboration between

Master of Urban and Regional Planning
Diponegoro University

And

Graduate School of Advanced Science and Engineering
Hiroshima University

To my mother,

I love you.

ABSTRACT

Railway infrastructure development has been conducted for more than 100 years in Japan. The government initiated the development along with the private to provide the possible railway route in the whole country to serve all people in some types of railway transportation, including train, shinkansen, and tram. As a result, people enjoy personal experiences such as improvement in convenient mobility and regional development on a larger scale, including land use change and social change. This research examined the change in land prices due to the construction of new railway stations.

The analysis focus on the railway development in West Japan during 2015-2020. West Japan consists of 5 regions; Kansai, Chugoku, Shikoku, and Kyushu-Okinawa, which cover 24 prefectures. In all these regions, there are 273 new stations constructed and starting operationally in 2015-2020 as a part of 23,559 active railway stations in Japan in 2021. These 273 railways stop points include the new stations for the local train, shinkansen, and tram. In addition, the analysis focuses on how the land price of around 273 stations changed due to the stations' existence.

The methodology used in this research is the Causal Mediator Analysis to see how the railway stations affect the change in land price in some periods. The analysis does not only focus on how the independent variable, new railway stations, correlates to the dependent variable, the land price, and how the other variable affects this correlation. This new variable is called a mediator that, to some extent, has a direct impact on the independent variable and affects the dependent variable simultaneously. The mediator data are generalized from the telepoint pack database, the number of businesses constructed and started operating in the stations' area at some period.

The result shows that the direct impact of the treatment, the new stations, positively correlates to the land price significantly. In correlation with the mediator, the railway station's existence also significantly affects the increasing number of new businesses in the area. In the end, the whole correlation combining direct and indirect impact from the new railway stations positively affects the land price and new businesses in the station area. However, the number of independent variables could be added more in these equations to explain the variability of the result.

FOREWORD

To God be the glory as He always leads my study life during the years, and now I can complete this thesis.

This study would not have been possible without the support of many amazing people. I greatly appreciate my supervisor, Prof. Dr.sc.agr. Iwan Rudiarto, S.T., M.Sc., for all the guidance and motivation. Also, to my supervisor at Hiroshima University, Associate Professor Makoto Chikaraishi, who guided and supported me in my study and research. To all the lecturers and staff in Master of Regional and Urban Planning who helped me during the study, and the examiners (Dr. -Ing. Wisnu Pradoto, S.T., M.T. and Prof. Dr. Ir. Nany Yuliastuti, M.S.P.) who provided suggestions and inputs for me to finish this thesis, I also give my gratitude.

Thanks to my office, the Ministry of Investment/BKPM, for the opportunity to continue my study and the Kementerian PPN/Bappenas scholarship that financially supports me. Finally, the love and prayer from my mother and the whole family are also things I treasure during this study.

Thank you very much.

Semarang, December 2022



Melanton Hendra Siregar

TABLE OF CONTENT

APPROVAL SHEET	ii
STATEMENT OF ORIGINALITY	iii
COLLABORATION STATEMENT	iv
PAGE OF TRIBUTE	v
ABSTRACT	vi
FOREWORD	vii
TABLE OF CONTENT	viii
LIST OF TABLES	ix
TABLE OF FIGURES	x
CHAPTER I INTRODUCTION	1
1.1 Research Background	1
1.2 Research Question	4
1.3 Research Objective	5
1.4 Research Scopes	5
1.5 Research Originality	6
1.6 Research Benefits	7
1.7 Research Framework	7
1.8 Research Method	9
1.9 Research Systematic	15
CHAPTER II LITERATURE REVIEW	17
2.1 Transportation Infrastructure and Land Price	19
2.2 Transportation Infrastructure and Facility Density	22
CHAPTER III STUDY AREA	25
3.1 Study Area	25
3.2 Data Analysis	27
CHAPTER IV RESULT AND DISCUSSION	33
4.1 Result and Analysis	33
4.2 A Comparison between Hiroshima Prefecture and Osaka Prefecture	43
4.3 A Sample Case of Urban Development in Osaka Station Compared to Dukuh Atas Area, Jakarta	48
4.4 Policy Discussion	55
CHAPTER V CONCLUSION AND RECOMMENDATION	57
5.1 Conclusion	57
5.2 Future Direction	58
REFERENCES	59

LIST OF TABLES

TABLE II.1.	Effects of the Transport Infrastructure on Regional Growth....	20
TABLE II.2.	Transit-Oriented Development Indicators	24
TABLE III.1.	Prefectures in West Japan	26
TABLE III.2.	Business Facility Categories	28
TABLE III.3.	Nankō Port Town Line, Osaka Prefecture	31
TABLE IV.1.	Treatment and Dependent Variable Regression	33
TABLE IV.2.	Total Land Parcel	34
TABLE IV.3.	Treatment and Mediator Regression.....	35
TABLE IV.4.	Treatment, Mediator, and Dependent Variable Regression.....	36
TABLE IV.5.	Causal Mediator Analysis.....	37
TABLE IV.6.	Osaka Prefecture and Hiroshima Prefecture Profile Data	47

TABLE OF FIGURES

FIGURE 1.1.	Regions of Japan	6
FIGURE 1.2.	Research Framework	8
FIGURE 1.3.	Treatment and Dependent Variable	11
FIGURE 1.4.	Mediator and Treatment	11
FIGURE 1.5.	Treatment, Mediator, and Dependent Variable	12
FIGURE 2.1.	Land Price Factors	17
FIGURE 2.2.	The Urban System	22
FIGURE 3.1.	Study Area - West Japan.....	25
FIGURE 3.2.	Railway Stations in West Japan, 2020.....	27
FIGURE 3.3.	Buffer Area from One Railway Station	30
FIGURE 4.1.	Kernel Density Plot of Facility Location.....	34
FIGURE 4.2.	Buffer Area in Jike Station	40
FIGURE 4.3.	Land Price in Jike Station	41
FIGURE 4.4.	Buffer Area in Aki Kameyama Station	41
FIGURE 4.5.	Land Price in Aki Akameyama Station	42
FIGURE 4.6.	Business Facilities Number in Jike Station and Aki Akameyama Station.....	43
FIGURE 4.7.	Osaka and Hiroshima Prefecture	44
FIGURE 4.8.	New Railway Stations in Osaka Prefecture in 2015-2020.....	45
FIGURE 4.9.	New Railway Stations in Hiroshima Prefecture in 2015-2020.	46
FIGURE 4.10.	Osaka Station Map.....	48
FIGURE 4.11.	Osaka Station Development	49
FIGURE 4.12.	Busines Improvement District (BID), Osaka Station	50
FIGURE 4.13.	Dukuh Atas Area 2015	52
FIGURE 4.14.	Dukuh Atas Area 2020	53
FIGURE 4.15.	Land Use in Dukuh Atas Area 2017	54