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Edited By  
Prof. Zakaria Hossain  
Conference Chairman



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# **Geotechnique, Construction Materials and Environment**

*Edited by*

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## **Preface**

On behalf of the GEOMATE 2025 Organizing Committee, we would like to welcome you to attend the Fifteenth International Conference on Geotechnique, Construction Materials and Environment held at Kyoto Research Park (KRP), Kyoto, Japan, in conjunction with The GEOMATE International Society, Mie University Research Center for Environmental Load Reduction, Glorious International, Japan.

On Friday, 11 March 2011, at 14:46 Japan Standard Time, the northeast of Japan was struck and severely damaged by a series of powerful earthquakes, which also caused a major tsunami. This conference was first dedicated to the tragic victims of the Tohoku-Kanto earthquake and tsunami disasters. The Geomate 2025 conference covers three major themes with 17 specific themes including:

- |   |   |
|---|---|
| • Advances in Composite Materials       | • Ecology and Land Development          |
| • Computational Mechanics               | • Water Resources Planning              |
| • Foundation and Retaining Walls        | • Environmental Management              |
| • Slope Stability                       | • Public Health and Rehabilitation      |
| • Soil Dynamics                         | • Earthquake and Tsunami Issues         |
| • Soil-Structure Interaction            | • Safety and Reliability                |
| • Pavement Technology                   | • Geo-Hazard Mitigation                 |
| • Tunnels and Anchors                   | • Case History and Practical Experience |
| • Site Investigation and Rehabilitation |   |

This year, we have received many submissions from different countries. The participating countries are Australia, Azerbaijan, Bangladesh, Brazil, China, Czech Republic, Egypt, France, Ghana, India, Indonesia, Iraq, Japan, Malaysia, Morocco, New Zealand, Nigeria, Pakistan, Philippines, Poland, Saudi Arabia, Taiwan, Thailand, United Arab Emirates, United Kingdom and Vietnam. The technical papers were selected from the vast number of contributions submitted after a review of the abstracts. The final papers in the proceedings have been peer-reviewed rigorously and revised as necessary by the authors. It relies on the solid cooperation of numerous people to organize a conference of this size. Hence, we appreciate everyone who supports as well as participates in this joint conference.

Last but not least, we would like to express our gratitude to all the authors, session chairs, reviewers, participants, institutions, and companies for their contribution to GEOMATE 2025. We hope you enjoy the conference and find this experience inspiring and helpful in your professional field. We look forward to seeing you at our upcoming conference next year.

Best regards,



Prof. Zakaria Hossain,  
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## ***Keynote Papers***

# THE ECONOMIC RESILIENCE MODELING OF STREET VENDORS HOUSEHOLDS WITH SOCIAL CAPITAL AS AN INTERVENING VARIABLE: A CASE STUDY OF STREET VENDORS IN EAST JAKARTA

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## ABSTRACT

Problem statement from this research dissertation is to examine how East Jakarta street vendors achieve household economic resilience. The research approach used quantitative method were used to assess the economic resilience of the households of street vendors: (1) sociodemographic traits; (2) transitory locations (Loksem); (3) base/fixed sites (Lapak); (4) hawkers (Asongan); (5) local government-assisted locations (Lokbin); (6) social capital. Data from 420 respondents was gathered using a quantitative approach. In Lokbin, social capital influences the economic resilience of street vendors' households by acting as an intervening factor on factors including income, education, migrant status, and sales. The results of this research according to the Sobel Test, two variables street vendors with migratory status and those with a diploma or higher show significance and a positive impact only when mediated by the intervening variable of social capital. Economic resilience is positively impacted by the social capital variable. There is a statistically significant influence on the kind of street vendors evaluated at LokBin. Conclusion: the economic resilience is directly impacted by sociodemographic traits. The economic resilience of street vendors has been demonstrated to be mediated by social capital, sociodemographic traits, and trading location.

*Keywords: Economic Resilience; Social Capital ; Street Vendors; Sobel Test; East Jakarta*

## INTRODUCTION

The presence of street vendors (known locally as PKL) in major urban centers like Jakarta represents a critical component of the informal sector, especially in terms of providing employment opportunities for low-skilled migrant populations. While this sector plays a vital role in absorbing labor and reducing unemployment, it also poses significant urban challenges, including spatial disorder, traffic congestion, and urban slum development.

Street vending is not unique to Jakarta or developing countries such as Indonesia. Similar phenomena are observed globally in Syria [1], Uganda [2], Australia [3], and India [4]. Street vendors operate within the informal economy, often turning to vending as a livelihood strategy due to limited access to education, technical skills, and financial capital. Despite these constraints, the sector remains attractive due to its low entry barriers and flexibility. However, unregulated vending practices, often facilitated by informal agreements with local authorities (referred to as "hidden actors"), result in widespread misuse of public spaces such as sidewalks, overpasses, green belts, city parks, and urban forests.

A large portion of street vendors in Jakarta are long-settled migrants. The continuous rural-to-urban migration flow driven by improvements in transportation, technology, and public services reflects a common belief that urban areas offer better

life prospects compared to rural regions [5]. Female migrants, in particular, constitute a substantial part of this workforce and actively contribute to both local and global informal labor markets [6]. Their journey is often marked by limited resources, lacking in skills, capital, and formal education [7]. The informal sector, however, offers a degree of resilience due to its adaptability, even during times of economic instability. Its capacity to generate employment plays a crucial role in alleviating poverty and reducing unemployment [8][9].

Social capital encompasses elements such as group affiliation and networking, mutual trust and solidarity, social cohesion and inclusion, collective action, information sharing, and empowerment. Within the street vending community, these components form the foundation of mutual support systems, enabling access to markets, trading techniques, and informal financing channels outside conventional financial institutions [10]. This form of capital is often complemented by spiritual capital and the strategic use of micro-spatial environments for living, production, and vending, all contributing to the household's economic resilience.

Based on the aforementioned discussion, this study is designed to address the following research questions:

- 1) Is there a direct influence of social capital, vending location, and sociodemographic characteristics on the economic resilience of street

vendor households?

- 2) Is there an indirect influence of vending location and sociodemographic characteristics on the economic resilience of street vendor households through the intervening variable of social capital?

This research fills the research gap related to economic resilience in the informal sector, specifically the economic resilience of street vendors.

## RESEARCH SIGNIFICANCE

This study is grounded in a strong theoretical foundation, particularly drawing from theories of social capital and household economic resilience within the context of the informal sector. Social capital serves as the primary framework, based on the approach developed by [11], as well as key concepts introduced by [12] and [13].

### *Social Capital*

Social capital as a set of norms, networks, and trust that facilitates cooperation and collective action among members of a community. The concept of social capital was also developed. They classify social capital into six key dimensions: (1) Group and network; (2) Trust and solidarity; (3) Collective action and cooperation; (4) Information and communication; (5) Social cohesion and inclusion; and (6) Empowerment and political action.

The six dimensions illustrate how communities are interconnected, how trust is built, and how systems of information exchange and mutual support are developed—particularly vital in enhancing economic resilience among vulnerable groups such as street vendors.

### *Economic Resilience*

In addition to the social capital framework, the theory of household economic resilience also serves as a critical reference in this study. According [14], economic resilience refers to a household's sustained ability to meet its basic needs—such as food, education, healthcare, and shelter—while also possessing the capacity to recover from economic shocks. This resilience is not solely measured by income levels but also by adaptability, income diversification, and the strength of their social networks.

This research aligns with findings who examined the impact of social capital on the well-being of informal sector actors in Jakarta. Their study demonstrated that social capital, particularly in the form of trust and networks, plays a significant role in enabling micro-entrepreneurs to access economic opportunities and endure socio-economic pressures. These findings reinforce the notion that in informal economies, social relationships are not merely supplementary; they are a foundational element of household economic sustainability.

In this research, street vendors' economic resilience is assessed based on a framework, using survey indicators such as: housing conditions, household income, children's education, and financial security. However, due to the pandemic's economic impact, most vendors saw a sharp decline in their savings—some reported having no savings at all.

## HYPOTHESIS

After conducting a literature review and selecting theoretical references aligned with the chosen research variables, the following research hypotheses were formulated for analysis:

1. **Hypothesis 1 (H1):** There is a direct influence of social capital on the economic resilience of street vendor households.
2. **Hypothesis 2 (H2):** There is a direct influence of street vendor type, based on vending location, on the economic resilience of street vendor households.
3. **Hypothesis 3 (H3):** There is a direct influence of sociodemographic characteristics on the economic resilience of street vendor households.
4. **Hypothesis 4 (H4):** There is an indirect influence of vending location and sociodemographic characteristics on the economic resilience of street vendor households through the intervening variable of social capital.

## RESEARCH METHODS

The researcher conducted a field survey over a period of six months, from November 30, 2021, to May 27, 2022. The study focused on street vendors (PKL) located in East Jakarta, covering ten districts: (1) Cakung, (2) Cipayung, (3) Ciracas, (4) Duren Sawit, (5) Jatinegara, (6) Kramat Jati, (7) Makasar, (8) Matraman, (9) Pasar Rebo, and (10) Pulogadung.

The research adopted a quantitative approach, beginning with the collection and analysis of numerical data. This approach aimed to enhance the depth and contextual understanding of deductive findings by providing complementary insights. As suggested by [16], such a strategy is expected to enrich data interpretation and offer more comprehensive and applicable solutions to real-world problems.

### *Quantitative Data Processing*

The sampling method for the quantitative phase employs multi-stage random sampling, taking into account quotas for each municipality, with selected sub-districts and urban villages in East Jakarta. Primary data collected from street vendors will be processed using SPSS to examine research variables including trading locations, sociodemographic characteristics, and their impact on household

economic resilience.

## RESULTS AND DISCUSSION

### Descriptive Statistics Processing Results

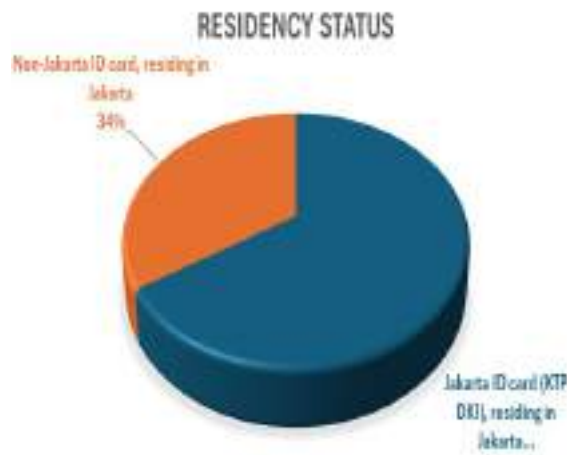


Figure 1. Residency Status  
(Source: Processed by Author, 2023)

Referring to the field survey results in Figure 1 it is evident that the majority of street vendors have become Jakarta residents and enjoy the facilities provided by the DKI Jakarta Provincial Government. Street vendors with non-Jakarta ID cards still choose to live in Jakarta because the facilities and trading advantages they obtain are greater than those in their places of origin.

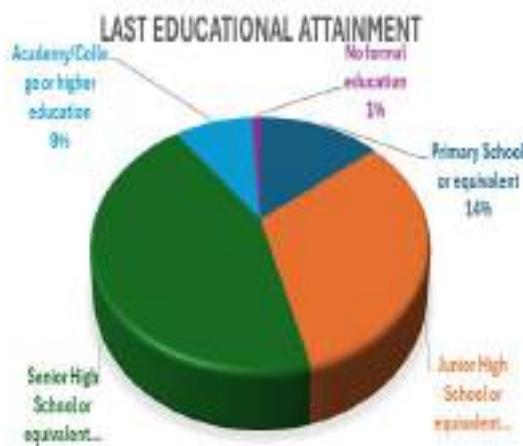


Figure 2. Educational Background  
(Source: Processed by Author, 2023)

Based on Figure 2, the educational background of street vendors is dominated by high school graduates and equivalent (44%), followed by junior high school and equivalent (32%), elementary school and equivalent (14%), academy/higher education (9%), and no schooling (illiterate) (1%). From an educational perspective, the majority of street

vendors have low education levels with only a few having higher education.

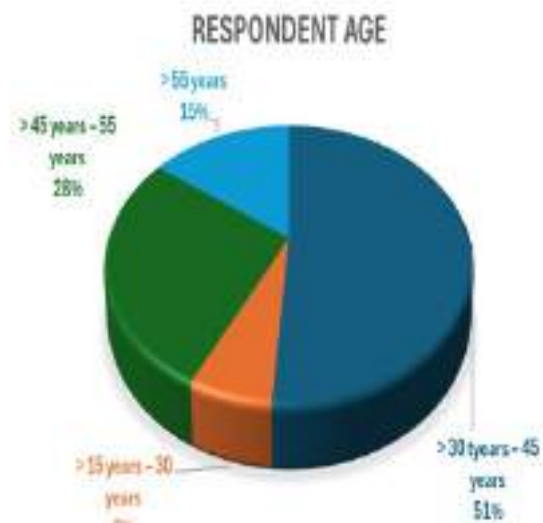


Figure 3. Respondent Age  
(Source: Processed by Author, 2023)

The primary data analysis results in Figure 3 show that the age of street vendors who trade is mostly within the productive age range of >30 years – 45 years (41%), followed by >15 years – 30 years (25%), >45 years – 55 years (22%), and the least represented are those >55 years old at (12%). The majority of street vendors are in their productive years with only a few being elderly.

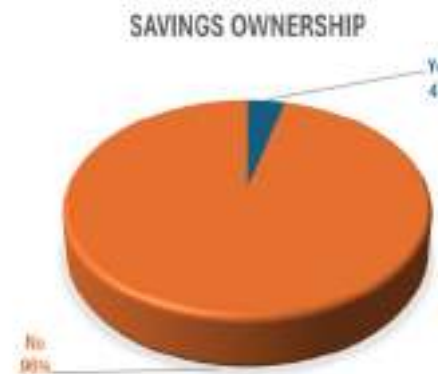


Figure 4. Savings Ownership  
(Source: Processed by Author, 2023)

Furthermore, from the primary data results in Figure 4, it was found that 96% of street vendors do not have savings and only 4% of street vendor respondents have savings. Based on field interviews, street vendors who have savings mostly already use digital marketing/marketplaces, including WhatsApp, Instagram, GoFood, and GrabFood. Therefore, it can be concluded that digitalization is important for improving the economic resilience of street vendors.

### Hypothesis and Sobel Test Results

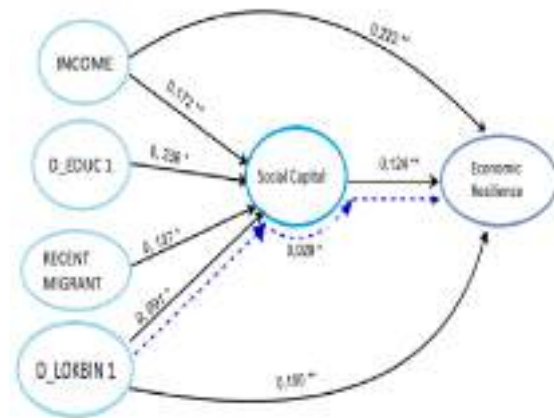


Figure 5. Conceptual Model of Social Capital as an Intervening Variable (Research Novelty)  
(Source: Processed by Author, 2023), where \*) Significant at  $\alpha=10\%$ ; \*\*) Significant at  $\alpha=5\%$ )

1. **Hypothesis-1 (H1)** is accepted/proven, confirming that there is a direct influence between social capital and the economic resilience of street vendor households at a 5% significance level. The regression coefficient of social capital on street vendor household economic resilience has a positive direction of 0.124. In the scope of social sciences, referring to statistical test results is more focused on analyzing the direction/pattern of relationships between variables. Therefore, it can be concluded that if social capital is good/quality, then the economic resilience of street vendor households will also increase.
2. **Hypothesis-2 (H2)** is accepted/proven, confirming that there is a direct influence between the types of street vendors based on their trading locations in Designated Areas (LokBin) and street vendor household economic resilience at a 5% significance level. For the other three trading locations: Temporary Locations, Permanent/Stall Locations, and Mobile/Peddling Locations, these are not significant/do not affect street vendor economic resilience. The regression coefficient of LokBin on street vendor household economic resilience has a positive direction of 0.190. This can be concluded that LokBin has a positive impact on street vendor household economic resilience. In other words, street vendors in LokBin have better economic resilience compared to street vendors in other trading locations.
3. **Hypothesis-3 (H3)** is accepted/proven, confirming that there is a direct influence between sociodemographic characteristics in the income aspect of street vendors and street vendor household economic resilience at a 5%

significance level. For other sociodemographic characteristics such as age, gender, education level, and migration status (recent and lifetime) are not significant/do not directly affect street vendor economic resilience. The regression coefficient of income on street vendor household economic resilience has a positive direction of 0.222. This can be concluded that street vendors with high income will have good household economic resilience. This means that the better the income level of street vendors, the more economically resilient they become.

4. **Hypothesis-4 (H4)** is accepted/proven, confirming that there is an indirect influence between trading locations and sociodemographic characteristics on street vendor household economic resilience through the intervening variable of social capital at a 10% level. This is proven by the Sobel test, where the regression coefficient of the intervening variable has a positive direction of 0.127. The results of this calculation show that social capital has an intervening influence on other variables, namely income, diploma-level education and above, street vendors with recent migrant status, and those selling in LokBin, on street vendor household economic resilience.

### Analysis of Direct Effect of Trading Location on Street Vendor Household Economic Resilience

The results of the second hypothesis test show that only Street Vendors (PKL) who trade in Designated Areas (Lokbin) have a significant effect on their household economic resilience. Three other types of locations—Temporary Locations (Loksem), Permanent/Stall Locations, and Mobile/Peddling Locations—do not show meaningful effects.

Lokbin is an area officially provided by the DKI Jakarta Provincial Government as regulated in Governor Regulation No. 10 of 2015 concerning Street Vendor Management and Empowerment. The purpose is to avoid sporadic buying and selling activities in public spaces, maintain city order, and improve public comfort and safety.



Figure 6. Street Vendors as Hawkers (Source: by Author, 2023)



Street vendors in Lokbin receive various facilities such as tents, tables, and chairs, as well as affordable cleaning and security fees (Rp 150,000/month). This is much cheaper compared to unofficial 'tribute' costs when trading illegally (Rp 500,000–600,000/month). This allows street vendors in Lokbin to allocate more funds for business development.

Nevertheless, many street vendors are reluctant to move to Lokbin because the location is considered less strategic—far from crowds, stations, bus stops, or public activity centers. They prefer public spaces such as sidewalks and parks that are frequently passed by the public.



Figure 7. Street Vendors with Lapak for Selling  
(Source: by Author, 2023)

This phenomenon aligns in The Production of Space, which explains that social activities require space. Street vendors create their own "social space" in public spaces as a form of survival struggle in the city. Similar problems occur in various large cities, but countries like Japan have provided special places for street vendors that are neat, clean, and comply with regulations, including limited operating hours and food hygiene permits.

In Jakarta, the challenge is how to encourage street vendors to be more interested in trading in Lokbin. One solution is to make Lokbin more attractive, for example by adding public facilities such as free wifi, entertainment stages, and budget-friendly culinary zones for young people and students, so that the location becomes a comfortable and strategic gathering place.

#### **Analysis of Direct Effect of Sociodemographic Characteristics on Street Vendor Household Economic Resilience**

Based on data processing results, it is proven that the sociodemographic characteristic that has a significant direct effect on household economic resilience is street vendor income. Other sociodemographic characteristics have indirect effects on street vendor household economic resilience.

The educational level of street vendors is dominated by high school graduates and equivalent

(44%), followed by junior high school and equivalent (32%), elementary school and equivalent (14%), academy/higher education (9%), and no schooling (illiterate) (1%). From an educational perspective, the majority of street vendors have low-to-medium education, with only a few having higher education. Illiterate street vendors are still found, though not many. During field surveys, most street vendors still consider formal education not a priority because they allocate their time, energy, and thoughts to focus on trading. Therefore, education level does not have a significant direct effect on street vendor household economic resilience, and they feel satisfied with low-to-medium education levels as long as they can have sufficient income for their families.

#### **Analysis of Social Capital as an Intervening Variable on Street Vendor Household Economic Resilience**

There is an influence of social capital as an intervening variable on street vendor household economic resilience. Generally, street vendors have low-to-medium education levels, forcing them to pursue this profession in the urban informal sector according to the data. A street vendor can achieve higher education if they utilize the social capital they possess. One sub-dimension of social capital is networks/kinship groups (Group and Network).

The sub-dimension of social capital utilized by street vendors is Trust and Solidarity, where there is mutual trust and solidarity between both parties, resulting in the practice of social capital sub-dimensions in the form of Empowerment and Political Action. The existence of the Information and Communication sub-dimension plays a role when street vendors who initially worked as employees seek places to study while selling online through social media and colleagues, enabling them to complete their studies successfully..



Figure 8. Selling Facility at Lokbin (Source: by Author, 2023)

There are several important aspects that make recent migrants more economically resilient compared to lifetime migrants: (1) **social factors**; (2) **cultural factors**; and (3) **communication factors**.

Information and communication aspects as impacts of urban modernization become driving factors for recent migrants' economic resilience, especially those who utilize online marketing. Marketing through marketplace utilization on social media helps street vendors increase income and profits, enabling them to achieve household economic resilience.

## 1. CONCLUSION

The study found that social capital within the street vendor (PKL) community in East Jakarta's Designated Locations (Lokbin), when supported by adequate income levels, positively influences household economic resilience. However, individual factors such as age, gender, education level, and migration status both recent and lifetime do not have a significant or direct impact on economic resilience. Street vendors can improve their income by using digital marketing and marketplace platforms like WhatsApp, Instagram, GoFood, and GrabFood. Increased income enables them to meet daily needs, save, and strengthen their economic resilience. While recent migrant status does not directly affect economic resilience, it does have a direct influence on social capital. The study suggests further research into how street vendors utilize social capital as an intangible asset and what factors influence their willingness to relocate to Lokbin for improved economic conditions.

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