DOES RAIL TRANSPORT IMPACT HOUSE PRICES AND RENTS?

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Abstract

Rail transport is one of the factors that boost economic growth. Increased accessibility while saving travel costs and time offered by rail transport attracts foreign and local investments, which lead to increased house prices and rents. Nonetheless, it is argued that noise pollution coming from rail transport may also reduce house prices and rents because these areas are less desirable for occupation and investment. Hence, this research aims to establish rail transport’s impact on house prices and rents through a critical review of the literature. An overview of previous studies shows that house prices and rents are significantly influenced by proximity to rail transports. This indicates that proximity to rail transports is accounted for when making house purchase and rent decisions. Thus, property valuers, planners, and developers should consider rail transport location in planning, developing, and valuing properties.

Keywords: Rail transports; House prices; House rents

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INTRODUCTION
By 2050, 68% of the world's population will be urban, adding nearly 2.5 billion individuals to the existing metropolitan population (UN-DESA, 2018). Cities worldwide are increasing their investment in metros, to meet the rising demand for urban travel (Anupriya et al., 2020). The International Association of Public Transportation claimed that about 45 metro lines have operated during the previous decade. Over the next five years, an additional 200 new metro lines are projected. Rail transports are critical in addressing the population’s urban mobility requirements to satisfy employment, retail, and recreation activities (Diaz, 1999; Hess & Almeida, 2007). These activities eventually accelerate a nation’s economy, making transportation infrastructure critical to growth. When a region adds train service, expectations regarding the project's effects on the surrounding area, particularly on housing prices and rentals, often arise. Although substantial studies on the rail transportation effect on property values and rentals have existed, the evidence is inconsistent and ambiguous, since conclusions are contingent on the local characteristics of the rail transit systems analysed. These many instances often emerge as individual anecdotes in studies examining the effect of rail transport on house prices and rentals. Existing research on the effect of rail on house prices and rentals is insufficient and based on anecdotal information, leaving regional planning for rail investments without a clear empirical foundation for assessing the investment's future effect. Additionally, this lack of accurate information constrains the ability of rail transportation authorities to devise plans that maximise the benefits of favourable home prices and rentals.

Thus, this study attempts to establish the rail transportation effect on the housing market. This review paper will determine if rail transportation has a beneficial or detrimental effect on the local housing market, hence filling a knowledge gap on rail transportation's effect on home prices and rentals. This paper begins with a general discussion on rail transportation in the second section. The third section examines the effect of rail transportation on housing prices and rentals. Section four discusses the results, followed by Section five's conclusions and implications.

RAIL TRANSPORT AND THE HOUSING MARKET
Rail Transport
Rail transport is a mode of transporting people and commodities through wheeled vehicles that operate on tracks. It is a safe, quick, and cost-effective form of transportation for both long and short distances. Maximum efficiency can be attained especially for transferring mass numbers of people and commodities (Lin & Ponrahono, 2019). Rail transport, which started in ancient Greece as human-hauling contraptions, has grown into a contemporary, complex, and sophisticated system that is utilized in both urban and cross-country networks. Rail transport is
more organised than automobile travel owing to its established routes and timetables, and it enables economic advancement. Rail transport increases investment and attracts foreign investors due to efficient and fast service, cost savings, improved traffic safety and reduced pollution. Nowadays, rail travels include airport rail connections, funicular railway line, heavy rail, Light Rapid Transit, Mass Rapid Transit and monorails. It is also known by the term metro, subway, mass transit and underground.

**Rail Transport Impact on House Price and Rent**

House prices and rents are susceptible to changes surrounding them. Any changes in attributes may increase or decrease house prices and rents. In general, house attributes can be grouped into locational, structural, and neighbourhood (Goodman, 1989; Williams, 1991). Structural attributes represent the characteristics and conditions of the house. Structural attributes include age of building, floor area, kitchen cabinets, lot area, materials and finishing types, neighbourhood area, number of rooms, repair condition and structural condition (Adi Maimun, 2011). Structural conditions may affect house prices and rents positively or negatively. Meanwhile, neighbourhood attributes may include socio-economy, externalities, local authority services (Chin and Chau, 2003) and facilities (Roe et al., 2004). A housing area that has all facilities required will form a good market (Nor Asmahan, 2012) because facilities provided enhance the economic activity of that area. The location factor lies in the bid-rent theory as posited by Alonso (1964). According to Alonso's bid-rent hypothesis, people are willing to spend a portion of money for location. An attractively located house is highly sought after and pushes prices up through the bidding process, whilst an unattractive location will bring down prices. The location of a property mainly influences purchase decisions and thus is reflected in house prices and rents. Numerous individuals are ready to pay a premium for an enviable location. (Prasad & Richards, 2008).

Houses located near the city centre, for instance, will likely fetch high prices since many economic and business activities mainly take place within the city centre area. In contrast, houses located farther from the city centre will decrease in price (Chin & Chau, 2003). It has been reported that good access to a transportation system such as rail transport will enhance the price and rent of houses nearby. This is possible due to strong demand for houses located close to the rail transport system (Pan et al., 2014). Houses located close to railway stations are highly sought after because of their strategic location and easy access to public utilities (Alan Tong, 2010). In addition, the effects of rail transport are also acutely felt in the residential sector due to the large number of consumers (buyers and renters) within the property market segment. As a result, most research within this field has concentrated on the residential sector. Table 1 summarises prior research on rail transport effects on house prices and rents.
Table 1: Summary of Previous Studies: Rail Transport Effects on House Prices and Rents

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Types of Rail Transport</th>
<th>Approach</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benjamin and Sirmans (1996) Washington, D.C.</td>
<td>Metro</td>
<td>Hedonic model</td>
<td>Rent decreased by 2.4 to 2.6% per 100m away from Metro station.</td>
</tr>
<tr>
<td>Lewis-Workman and Brod (1997a) New York</td>
<td>Rapid rail: New York City MTA</td>
<td>Hedonic model</td>
<td>Price decreased by $2,300 per 100ft away from the station areas.</td>
</tr>
<tr>
<td>Lewis-Workman and Brod (1997b) San Francisco</td>
<td>Rapid rail: BART</td>
<td>Hedonic model</td>
<td>Price decreased by $1,578 per 100ft away from the station.</td>
</tr>
<tr>
<td>Delmelle and Duncan (2012) Charlotte, North Carolina</td>
<td>Light Rail</td>
<td>Hedonic model</td>
<td>Price increased by 0.1% per mile (1609m) closer to the LRT station.</td>
</tr>
<tr>
<td>Dziauddin et al. (2013) Klang Valley, Malaysia</td>
<td>Light Rail Transit (LRT)</td>
<td>Hedonic model</td>
<td>Price increased by RM10,560 (straight-line-distance model) and RM6,610 (network-distance model) for houses located within 1,000m from LRT station.</td>
</tr>
<tr>
<td>Pan et al. (2014) Houston, Texas and Shanghai, China</td>
<td>METRO Rail</td>
<td>Hedonic model</td>
<td>Price increased by 1% per 100m closer to METRO Rail.</td>
</tr>
<tr>
<td>Mulley, Tsai and Ma (2018) Sydney</td>
<td>Light Rail Line</td>
<td>Geographically Weighted Regression (GWR)</td>
<td>Price increased by over 0.5% per 100m closer to the LRT station.</td>
</tr>
<tr>
<td>Pilgram and West (2018) Minneapolis, Minnesota</td>
<td>METRO Blue Line</td>
<td>Hedonic model</td>
<td>Price increased by 3% for houses located within a half-mile of METRO station (compared to other houses in South Minneapolis). Prices increased by 30% for houses located within 800m to LRT station.</td>
</tr>
<tr>
<td>Dziauddin (2019) Kuala Lumpur, Malaysia</td>
<td>Light Rail Transport</td>
<td>Hedonic model</td>
<td>Price increased up to 39% for houses located ¼ mile closer to METRO Rail.</td>
</tr>
</tbody>
</table>

Overall, the body of research used the Hedonic model to establish the relationship between rail transport and house prices and rents. This method is popularly used.
as it can measure the impact of each quality on the total price and rent of houses (Asmawi et al., 2018; Rahman et al., 2019). Using the Hedonic model, previous studies examining the relationship between rail transport and house prices and rents tend to vary in findings. Early research demonstrated a positive relationship between rail transport and house prices and rents. These include works by Boyce et al. (1972), Dewees (1976), Lerman et al. (1978), Dvett et al. (1979), Damm et al. (1980), Bajic (1983), Voith (1991), Al-Mosaind et al. (1993), Gatzlaff and Smith (1993), Benjamin and Sirmans, (1996), Lewis-Workman and Brod (1997a; b). Recently, researchers have also found positive effects of rail transports on house prices with between 0.1% to 39% increase in values for homes located near rail stations (Delmelle & Duncan, 2012; Pan et al. 2014; Mulley et al., 2018; Dziauddin, 2019; Pan, 2019). Nonetheless, some studies have found rail transport’s adverse effects on house prices. In other words, house prices tend to decline the farther away from rail transportation from where the housing is located. Discounts that vary in strength were reported for studies based in the United States, such as in Philadelphia (Slater, 1974), Atlanta (Nelson & McCleskey, 1990; Baum-Snow & Kahn, 2000; Bowes & Inlanfeldt, 2001), Portland (Al-Mosaind et al., 1993; Dueker & Bianco, 1999; Chen et al., 1998), Boston, Chicago, Portland, and Washington (Baum-Snow and Kahn, 2000), Dallas (Clower and Weinstein, 2002), San Francisco (Weinberger, 2001), Buffalo (Hess & Almeida, 2007), San Diego (Duncan, 2008) and in Asian countries such as Seoul, Korea (Bae et al., 2003), Bangkok, Thailand (Chalermpong, 2007) and Shanghai (Pan & Zhang, 2008). This negative effect is attributed to noise pollution (Bowes & Ihlanfeldt, 2001), visual intrusion, and rail right-of-way’s association with industrial uses (Diaz, 1999). Meanwhile, there are cases where findings are less conclusive due to mixed results. Rail transportations was reported to impact house prices positively and negatively in Atlanta (Nelson, 1992), San Diego, San Francisco, Sacramento, and San Jose (Landis et al., 1995), San Diego (Ryan, 2005) and Bogotá (Munoz-Raskin, 2010).

**DISCUSSION**

Different findings established by previous studies showed that rail transport might impact housing in various ways, either positive, negative or mixed, based on the type of externalities produced by rail transport. Although there is a long history of literature examining rail transport’s effects on house price and rent, most studies were based in the United States. Only two research projects were based in Malaysia, occurring only in 2013 and 2019. Most studies also analysed the impacts of LRT on the local property market. Very few have attempted to investigate whether MRT will affect the housing market. This includes Malaysia. The lack of Malaysian empirical research, particularly on MRT station impacts on house prices and rents, raises a question on whether MRT will impact the housing market, and if so, what is the magnitude of impact? The lack and
uncertainty of market information affect the property market player’s decision-making, such as valuing houses and developers in developing areas. Thus, there is a crucial need for a study investigating the impact of MRT on the local Malaysian housing market.

CONCLUSION
This paper established several key findings related to rail transport’s impact on house prices and rents. The study concluded that the effect of rail transport on the housing market is situation-dependent. Positive impacts from rail transport were expected if the accessibility and attractiveness of the surrounding area are improved. In contrast, an area may experience a decline in values if rail transport produces negative externalities such as noise, visual intrusion, and the rail right-of-way’s association with industrial uses. The various price and rent impacts of rail transport highlights the necessity for a locally based study, particularly in Malaysia. The findings of the study contribute to the clarification of the rail transport impact on housing market literature. Property market players such as valuers, planners and developers may find the study findings beneficial in making various property-based decisions, such as planning, developing and valuing properties.

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