Impact of Southern Expressway on Land Prices

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Abstract: This research quantitatively examined the impact of southern expressway on land prices, with the focus on lands near the southern expressway interchanges from Makumbura to Welipanna. Data were collected within 20 km from the nearest interchange and prices were tested against different factors. The distance to nearest interchange showed very weak correlations for all interchanges, and price against distance seemed to have a unimodal distribution. However, the distance to Colombo showed relatively strong correlation with the land, especially the studied interchange is close to Colombo. Linear multiple regression results validated the impact of distance to Colombo, in addition it showed other factors such as distance to economic centres, supermarkets, and schools to be influencing, but not the Southern expressway. In contrast to real-estate marketing campaigns the results elucidated the Southern expressway has little to no direct impact on land prices. Further studies, especially the temporal variation of prices are recommended.

Keywords: Distance, factors affecting land price, land price, Southern expressway.

1. INTRODUCTION

Present day land is a finite property with highly increasing demand but in the past, the land was just a personal or group property where the ownership was passed from generation to generation (Little, 1976) According to Ping (2005), the price is the best expression to compare land values in a functional market. The price of a land mainly depends on present or future services it includes and its production potential. There is a basic difference between value and price of a land. Value prescribes an actual benefit of the land in relation to other similar lands and market price prescribes what a land might be sold for at a specific period in time (Ping, 2005). The behaviour of the variance of land prices is an important topic of interest in for many groups such as government, property developers, investors, buyers etc. Many factors influence the price of a land such as location, topography, and climate, availability of water, and sewer lines (or public services) (Abayagunawardhana, 1992; Dowall, 1993). Also factors such as proximity of the land to major cities, schools, hospitals, supermarkets etc. could be important (Dowall, 1993; Gomes and Hashan, 2017). Infrastructure development projects such as highways are also of interest as they may increase or decrease the value of a land. Highways could have different, sometimes opposite impacts on land prices (see: Guidry, 1999). As per Guidry (1999) land-locked issues drastically deduct the appeal for buying because they force the dwellers to find alternative routes to enter the land since the original entrances would have been sacrificed in the name of the highway construction. The alternate routes might not provide access as easily as the old ones used to, so the property values would be consequently reduced. Another obvious concern is, highways naturally bring more traffic and congestion to the area. (Little, 1976; Kumari, 2015). In contrast, some studies have shown highways could result in increased land prices due to improved accessibility. As an example, highways are considered to be good alternatives to rail transport (Ghebregziabiher, 2007). Therefore, it is conspicuous, relationships are highly study area specific. Southern expressway is the first E class highway in Sri Lanka and consists with eleven interchanges between Makumbura to Godagama. The objective of this research was to find whether the Southern Expressway has resulted in change of land prices. In this regard impact of southern expressway as well as other major roads were studied using price as the response variable. The main explanatory variable was distance to the expressway. In tandem, different factors that might affect the land prices were also analysed. In this regard land prices from five interchanges were studied using simple bivariate correlations to linear multiple regression.
2. METHODOLOGY

Data collection was done within 20 km radius of five interchanges of the southern expressway in 2017. In this regard land sale advertisement on newspapers and online media were referred (verified by calling and/or visiting the sites). This method resulted in unbiased collection of data. Nevertheless, in certain cases no advertisements on lands of certain localities were found (e.g. west side, first 10 km of the Kottawa interchange). Makumbura, Kahathuduwawa, Galanigama, Dodangoda and Welipanna were the interchanges considered for detailed analysis. The data collected included distance to the nearest interchange, nearest school, hospital, economic center, bus stop, railway station, and supermarket. Data was initially analyzed in a bivariate platform to identify the co-efficient of correlations (also validated using Pearson’s correlations), then multiple linear regression was used to study the combined effects of factors. Prior to linear multiple regression variables that cause multicollinearity were identified and omitted from analysis. In all cases P<0.05 considered to be significant, and coefficient of correlation > 0.5 considered to give a strong correlation. In this regard a maximum variation of inflation of five was considered. For statistical analysis IBM SPSS V21 was used.

3. RESULTS AND DISCUSSION

3.1. Land price variation with distance to nearest interchange

Figure 1 shows the land price variation with distance to the nearest interchange from the both directions (i.e. East and West). As an example, Makumbura interchanges west side includes land between the interchange and Galle road. The obvious observation was non-linear variation of price with distance. The coefficient of correlation values in many cases were less than 0.1 indicating poor correlation (similar results were obtained from Pearson’s correlation analyses; data not shown). When the land is located very close to the expressway land prices were low. However, further after a certain distance prices got increased indicating influence of different factors, perhaps the other major highways.

3.2. Land price variation with distance to Colombo

Figure 2 shows the land price variation against distance to Colombo. All interchanges gave strong correlations indicating that the land price is more dependable with distance to Colombo than the distance to nearest interchange. It should be noted, the strength of correlation did seem to be more stronger when the interchange is close to Colombo as it changed from 0.3 (for Makumbura) to 0.2 (Welipenna).

3.3. Influence of other factors

Moving away from the economic center land prices getting reduced (data not shown). Land prices started to increase approximately in 6 km away from the major town in all the studied interchanges. The impact of factors such as supermarkets and government schools (could be scattered in the study interchanges) seemed to be bit complex as such it gave positive, negative or no relationship for different study areas. Closer to the hospital price got increased in all the interchanges (data not shown), other than in Makumbura. However, it was found that the distance to the nearest hospital only affects for the land price where lands are located within 10 km from the hospital (data not shown). Similar to distance to government hospital distance to nearest bus stop showed a positive correlation, except for Makumbura (data not shown). However, distance to the nearest bus stop only affects for a land price where lands located within 1.5 km from the bus stop.
Figure 1 Land Price Variation from the Interchange ((a) Makumbura, (b) Kahathuduwa, (c) Galanigama, (d) Dodangoda, (e) Welipenna)
Figure 2 Land Price Variation with Distance to Colombo of lands considered in (a) Makumbura, (b) Kahathuduwa, (c) Galanigama, (d) Dodangoda, and (e) Welipenna Interchanges
3.4. Cumulative impact of factors on land price

Table 1 shows results of linear multiple regression carried out for study areas of different interchanges and all interchanges. The shown models include variables \( P < 0.5 \). We see two limitations. Firstly, the conclusions are valid only within the considered radius from the interchange (< 20 km). Secondly, non-linear models have not been incorporated in the analysis. The interchanges close to Colombo (i.e., Makumbura and Kahathuduwa) gave distance to Colombo as the most influencing factor. Therefore, it is conspicuous the role of the major economic center or the commercial hub of Sri Lanka playing on land prices. In addition, Colombo includes reputed schools, important government agencies and private organisations. Away from Colombo, different factors observed to be significant. In Galanigama interchange, distance to nearest economic center was the most significant. Further analyses found that there were major towns like Bandaragama, Horana and Panadura located near to Galanigama interchange, and services like health, transport, education was high when near to these townships. In the Dodangoda interchange, distance to a supermarket was the most influencing. However, this could be due to an autocorrelation of a variable or variables that we have not considered. This is particularly true as some supermarkets are relatively new, and there is a chance, supermarkets emerged to cater the increased population. Same as Galanigama, in the analysis found distance to nearest economic center is the most significant factor in the Welipanna area. When near to the Welipanna also several major towns situated like Benthota, Aluthgama, Horawala etc. Due to those highly developed cities land value around those areas are getting increased. The equation for all interchanges gave distance to Colombo as a price reducing factor. Nevertheless the coefficient was relatively small, elucidating impact is rather minor. Also, the low coefficient of correlation proves a universal model for all lands is not appropriate.

![Table 1 Simple multiple linear model equations (Y – Price per perch, A – Distance to Colombo, B – Distance to bus stop, C – Distance to hospital, D – Distance to economic centre, E – Distance to supermarket). All cases \( P < 0.05 \) | Interchange | Model Equation | \( R^2 \) |
---|---|---|
Makumbura | \( Y = -95092(A) - 53403(B) + 3007578 \) | 0.81 |
Kahathuduwa | \( Y = -24105(A) - 23025(C) + 599623 \) | 0.79 |
Galanigama | \( Y = -373(D) + 145026 \) | 0.72 |
Dodangoda | \( Y = -41875(E) + 305421 \) | 0.70 |
Welipanna | \( Y = -32973(D) + 525347 \) | 0.66 |
All Interchanges | \( Y = 283(A) - 39175(D) - 93308(B) - 30367(E) \) | 0.54 |

4. CONCLUSIONS

Price of a land against distance from an interchange did not have a proper linear, logarithm or exponential correlation, and showed a weak unimodal behavior. Clearly the distance from the interchanges of the southern expressway has no impact on the land prices. However, factors such as distance to Colombo and other factors such as distance to economic centers, townships etc. had more and significant impact. Distance to Colombo was more influencing when the interchange was closer to Colombo. Therefore, the current conditions are such that Southern expressway does not shape land prices, but factors that shaped prices in the past still playing the major role. More studies considering temporal variations are recommended.

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6. REFERENCES


