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*Original Article*

# Interrelationships among key profit factors of Vietnamese residential projects using structural equation modeling

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## Abstract

This study aims to examine profit factors and their interrelationships to help real estate companies make effective project development decisions. The analysis results from questionnaire responses in 75 real estate companies, located in Ho Chi Minh City, Viet Nam, confirm five key profit factors with 16 associated variables. Interrelationships among the key profit factors were also investigated through a structural equation modeling. The variables, including population, income, transaction rate, construction cost, and construction loan's interest rate variables, were found crucial in developing a profit enhancement plan. Strong relationships among five key profit factors were also discovered. The housing finance factor, for example, has a strong positive relationship with the housing supply factor, but a negative relationship with the buyer capacity factor. The study results help real estate companies to better understand the profit factors, and make a better profit improvement plan.

**Keywords:** Ho Chi Minh City, profit, residential projects, structural equation modeling

## 1. Introduction

In Viet Nam, forecasted housing demand increases year by year, as shown in Table 1. It is estimated that 324,800 houses will be needed in 2019. In comparison with 275,000 houses requested in 2009, this represents 18.11% increase. It is also expected that the housing demand will increase by 43.27% in the next 40 years.

The increase in housing demand can be seen from the increase in population, population density, and GDP (gross domestic product) per capita, as shown in Table 2. From 2009 to 2013, both the population and population density in Viet Nam increased by 4.3%, while the GDP per capita increased by 55% (General Statistics Office of Viet Nam [GSO], 2014). These result in business boom in many industries, including real estate market.

It is, however, not only housing demand, but also other factors, such as construction costs, house prices, loans, and saving rates, that stimulate real estate market. Égert and Mihaljek (2007), for example, concluded that factors such as the GDP per capita, interest rate, and housing credit were key factors affecting house prices in central and eastern European countries. Kohn and Bryant (2011) confirmed seven key factors causing a housing bubble in the United States, such as housing inventory, vacancy rates, and mortgage rate. Park *et al.* (2010) found that a number of key factors, including urban population, housing supply, economic ability, and household sizes, affected to development policies in Korean real estate.

The above studies bring insight into the real estate market. Most of them, however, focus on policy maker viewpoints. Only few of them examine profit and loss of the developers, as it is difficult to have proper policies in a dynamic business environment. This research study, therefore

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Table 1. Housing demand estimation in Viet Nam (adapted from UN-Habitat, 2014).

| Housing demand and increased percentage | Year | | | | |
|---|---|---|---|---|---|
| | 2009 | 2019 | 2029 | 2039 | 2049 |
| Number of houses | 275,000 | 324,800 | 377,300 | 384,300 | 394,000 |
| Increased percentage | - | 18.11 | 16.16 | 1.86 | 2.52 |

Table 2. Viet Nam's characteristics (adapted from GSO, 2014).

| Characteristics | Year | | | | |
|---|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2012 | 2013 |
| Population (x1,000 persons) | 86,025 | 86,932 | 87,840 | 88,773 | 89,709 |
| Population density (persons/km$^2$) | 260 | 263 | 265 | 268 | 271 |
| GDP per capita (USD/person) | 1,232 | 1,333 | 1,543 | 1,755 | 1,910 |

aims to 1) identify profit variables comprehensively and systematically by modeling a relative complete system for further study, 2) examine key profit factors of residential projects, and 3) explore the underlying interrelationships among the key factors to help real estate plan for better profit policies.

## 2. Research Methodology

The research methodology in this study is shown in Figure 1. An extensive literature review is undertaken to identify variables affecting profits in residential projects. A questionnaire survey is developed and distributed to real estate companies located in Ho Chi Minh City, Viet Nam, for data collection purpose. Data collected are then used to conduct preliminary analyses, including normality and outliers tests, to increase confidence in the data. Confirmatory factor analysis is performed in a measurement model to confirm the five hypothesized factors influencing profit of residential projects. A structural model is finally developed based on the confirmed measurement model to examine interrelationships among five key profit factors.

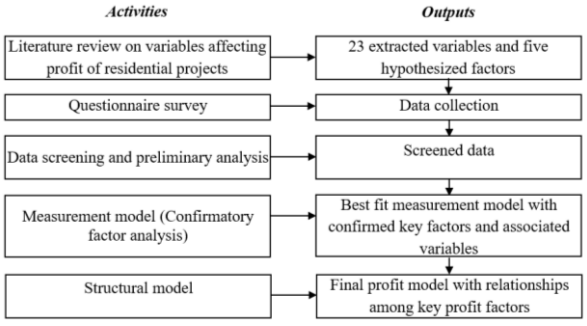


Figure 1. Research activities and expected outputs.

## 3. Structural EquationModelling (SEM)

The SEM approach is a collection of statistical techniques that allows a set of relationships among one or more independent (observed) variables and dependent variables (factors) to be examined (Doloi *et al.*, 2012; Islam & Faniran, 2005; Tabachnick & Fidell, 2012). Moreover, it allows examinations of mutual influences among variables, either directly or indirectly, through other variables as intermediaries (Islam & Faniran, 2005).

There are two types of SEM approaches, including covariance-based SEM (CB-SEM) and variance-based SEM (PLS-SEM) (Astrachan *et al.*, 2014; Hair *et al.*, 2014; Sarstedt *et al*., 2014). The differences between two SEM approaches are very small (Astrachan *et al.*, 2014; Hair *et al.*, 2014 Reinartz *et al.*, 2009). The CB-SEM, however, is widely applied, while the PLS-SEM is more adequate in the case of small sample sizes, un-normalized data, and complex structural models (Hair *et al.*, 2014). Nevertheless, the PLS-SEM cannot be applied if causal loops exist in structural models. It also cannot be used to confirm or test theories.

In this study, the CB-SEM is used to perform the structural equation modeling analysis. The model consists of two procedures: measurement and structural models (Kline, 2011). Measurement models work as a confirmatory factor analysis to specify how well factors are represented by observed variables. Structural models, on the other hand, explore relationships among key factors (Chen *et al*., 2012).

The appropriateness of SEM in investigating interrelationships among key factors is confirmed by a number of studies. Islam and Faniran (2005), for example, utilized an SEM approach to confirm key factors of project planning effectiveness. Doloi *et al.* (2012) examined causes of delay in Indian construction projects, while Li *et al.* (2013) examined factors influencing transaction costs in American projects utilizing an SEM approach.

## 4. Conceptual Model of Profit of Residential Projects

Based on the real estate- and construction-related literature, 23 observed variables affecting profit in residential projects are extracted, as shown in Table 3.

The 23 variables form a number of groups based on literature review. Park *et al.* (2010), for example, simulated the Korean residential market with four key factors: 1) housing demand, 2) housing price, 3) housing supply, and 4) government policies. Ho *et al.* (2010) summarized the Taiwanese housing market with five key factors: 1) urban population, 2) housing demand, 3) housing supply, 4) housing economics, and 5) housing finance. Amini *et al.* (2013), on the other hand, examined the Iran housing market with three main factors: 1) basic supply-demand model, 2) consumer afford-

ability model, 3) speculative demand model. A conceptual model is developed, in this study, based on five hypothesized factors: 1) Urban population, 2) Buyer capacity, 3) Housing supply, 4) Housing economics, and 5) Housing finance (Figure 2).

Table 3. Variables affecting profit in residential projects.

| Factor | Variable | Code | Explanation |
|---|---|---|---|
| Urban Population | Urban population | POP | More population leads to more houses purchased and owned, resulting in higher profit of residential projects (Park *et al*., 2013). |
| | Members in a household | NoM | With the trend of more small families, small- and medium-sized houses with low prices increase. Profit of real estate companies then increases through the economy of scale (Ho *et al.*, 2010). |
| | Number of households | NoF | More families result in more houses demanded (Amini *et al.*, 2013). |
| Buyer Capacity | Home ownership rate | HOW | Home ownership rate reflects number of households owned at least one house (Atefi *et al.*, 2010). |
| | Household income | AIN | Income directly affects housing affordability (Chen *et al.*, 2007). |
| Housing Supply | Housing supply | SuD | When supply is lower than demand profit increases due to housing scarcity. When supply is higher than demand, on the other hand, profit decreases through price deduction (Park *et al.*, 2010). |
| | Housing stock | HST | More houses stocked in the market lead to price deduction, and less profit (Park *et al.*, 2010). |
| | Housing pre-sale | PRE | The more houses presold, the better financial flow is, leading to chances of getting more profit (Lai *et al.*, 2004). |
| | Housing transaction | TRA | The more houses transacted and owned, the more profit is (Atefi *et al.*, 2010). |
| | Construction schedule | CCS | Any changes in construction schedule affect the loan payments and profits (Elazouni & Abido, 2014). |
| Housing Economics | GDP per capita | GDP | GDP per capita reflects the health of economy and demand in general (Funke & Paetz, 2013). |
| | Saving ratio | HSV | With more saving ratio, householders are able to afford a new house, leading to more houses sold and owned (Atefi *et al*., 2010). |
| | Consumer price index | CPI | Increasing consumer price index results in less profit (Golob *et al*., 2012). |
| | Construction cost | CCO | Savings in construction cost clearly increase profit (Barlas *et al*., 2007). |
| | House price | HPR | Higher house price might provide real estate companies more profit (Barlas *et al.*, 2007). |
| | Deposit interest rate | SAV | When the deposit rate is low, some households might invest on real estates (Golob *et al*., 2012). |
| | Taxes and fees | TaF | Taxes and fees, including corporation tax, administration, and marketing fees, contribute to structure of house prices (Park *et al*., 2010). |
| | Land and consultant costs | LCO | Land and consultant costs affect profit (Lerbs, 2014). |
| | Investor's expected profit | EPR | Investor's expected profit is the profit that investors hope to gain on a project (Barlas *et al.*, 2007). |
| Housing Finance | House loan's interest rate | HIN | Higher loan's interest rate results in fewer houses purchased and owned (Amini *et al.*, 2013). |
| | Construction loan's interest rate | CIN | Higher construction loan's interest rate leads to less profit (Golob *et al.*, 2012). |
| | Debt to equity ratio | DpE | Debt to equity ratio is a ratio of investor's debt to his own equity (Morri & Cristanziani, 2009). |
| | Buyer payment schedule | PAY | With flexible payment schedules, more households might be able to afford a house (Lai *et al.*, 2004). |

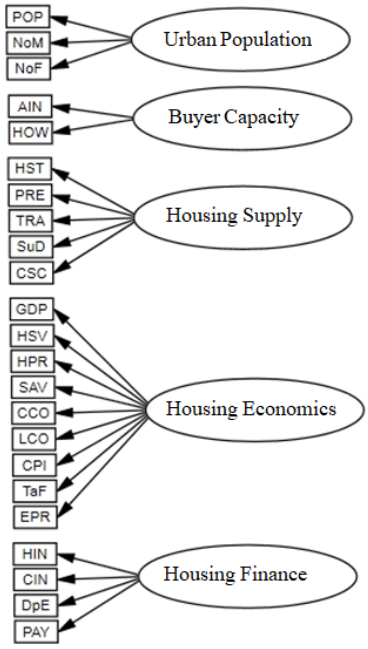


Figure 2. Conceptual model.

Table 4. Preliminary testing results.

| No. | Variable | Skewness | Kurtosis | Δ mean | Data set with z-score>± 3.29(*) |
|---|---|---|---|---|---|
| 1 | POP | -0.24 | 0.00 | 0.02 | - |
| 2 | NoM | -0.06 | -0.27 | 0.00 | - |
| 3 | NoF | -0.48 | 0.37 | 0.02 | 74 |
| 4 | AIN | -0.45 | 0.66 | 0.02 | 14 |
| 5 | HOW | -0.12 | -0.50 | 0.00 | - |
| 6 | SuD | -0.73 | 0.98 | 0.03 | - |
| 7 | HST | -0.75 | 0.73 | 0.05 | - |
| 8 | PRE | -0.73 | 0.78 | 0.04 | - |
| 9 | TRA | -0.53 | 0.87 | 0.02 | 14 |
| 10 | GDP | -0.76 | 1.61 | 0.03 | 99 |
| 11 | HSV | -0.04 | -0.26 | 0.02 | - |
| 12 | CPI | -0.30 | -0.31 | 0.04 | - |
| 13 | HPR | -0.36 | 0.26 | 0.03 | 16 |
| 14 | SAV | -0.65 | 0.87 | 0.02 | 16 |
| 15 | HIN | -0.51 | 0.51 | 0.03 | - |
| 16 | CIN | -0.30 | -0.04 | 0.02 | - |
| 17 | CCO | -0.42 | -0.14 | 0.03 | - |
| 18 | LCO | -0.55 | 0.11 | 0.05 | 113 |
| 19 | TaF | -0.19 | 0.39 | 0.00 | 113 |
| 20 | EPR | -0.10 | 0.12 | 0.01 | - |
| 21 | CSC | -0.63 | -0.33 | 0.06 | - |
| 22 | DpE | -0.66 | 1.15 | 0.04 | 131, 133 |
| 23 | PAY | -0.42 | 0.34 | 0.02 | 49 |

(*): There are a total of 158 valid data sets.

## 5. Data Collection and Preliminary Analyses

A questionnaire survey was developed, based on the 23 variables, using a five-point Likert scale (1 = not at all influential, 2 = slightly influential, 3 = somewhat influential, 4 = very influential and 5 = extremely influential). Altogether 330 sets of questionnaire were sent to 75 developers, with 161 responses received. Among those responses, three were rejected due to data incompleteness, resulting in 158 valid responses, representing 47.9% of the sets. More than half of the respondents (67%) had a background in civil engineering. About half of them were in management positions, and had at least 10-year experiences in the real estate industry. These, thus, confirm the suitability of the respondents in providing data for analyses.

The data collected are then screened using a number of preliminary analyses. The normality test is performed to confirm normal distribution of variables, using the skewness and kurtosis measures (Tabachnick & Fidell, 2012). The results show that all data follow a normal distribution, with all the skewness and kurtosis values in acceptable ranges of <±2 and <±7, respectively, see Table 4, (Chinda, 2010).

Outlier testing is performed to screen out a variable that has an extreme value, or two or more variables that have a strange combination of scores (Tabachnick & Fidell, 2012). In this study, the 5% trimmed mean and the standardized scores (z-score) tests are used to detect outliers. A difference between the mean and 5% trimmed mean (Δ mean) of less than 20%, and a z-score value of ± 3.29 are considered acceptable (Chinda, 2010). The results confirm no outliers in the data collected (Table 4).

The Cronbach's alpha method is also performed to assess the reliability of the collected data. The alpha value of 0.69, from 23 variables, is achieved in this study. According to Fan and Xiao (1998) and Chen *et al.* (2012), this value is acceptable to present a sufficient level of support for the consistency of the results. In summary, the preliminary analyses confirm the suitability of the 158 data to be used in SEM analyses.

## 6. Measurement Model of Key Profit Factors

The measurement model is performed to confirm five key profit factors and their associated variables (Chen *et al.*, 2012). In this study, the confirmatory factor analysis is conducted to confirm key factors and variables in the conceptual model (Figure 2). The results show that the variables, including the SuD, GDP, HSV, CPI, EPR, and CSC, have low squared multiple correlations (SMC) values, which are 0.006, 0.023, 0.000, 0.010, 0.012, and 0.09, respectively, and should be cut off (Mittal & Balasubramanian, 1987). The NoM variable is also removed from the model as it shows multi-collinearity (Kline, 2011). The correlation among the buyer capacity and the housing economics factors is also found to be very low, and is removed from the model. As a result, 16 remaining variables, with five key profit factors, form the measurement model.

The model is then assessed with model fit using a number of fit indices, including the $\chi 2$/degree of freedom ($\chi 2$/DF or CMIN/DF), root mean squared error of approximation (RMSEA), goodness of fit index (GFI), and comparative fit index (CFI) (Kline, 2011). The definitions and acceptable ranges of these fit indices are shown in Table 5.

Table 5. Fit indices of SEM models.

| Fit index | Assessment | Acceptable range | Reference | Conceptual model | Measurement model | Structural model |
|---|---|---|---|---|---|---|
| $\chi^2$/DF | Differences among a number of observations and parameters | < 3.00 | Norberg et al., 2007; Li et al., 2013 | 2.51 | 1.99 | 1.81 |
| GFI | Acceptable fitness among a model and data | ≥ 0.80 | Wang and Chiu, 2011; adapted from Doloi et al., 2012 | 0.76 | 0.88 | 0.89 |
| CFI | Improvement ratio of a model, in comparison with the null model | > 0.70 | Norberg et al., 2007; Chen et al., 2012 | 0.46 | 0.77 | 0.81 |
| RMSEA | Fitness of a model that can be accepted at the 0.05 probability level of confidence | ≤ 0.08 | Wang and Chiu, 2011; adapted from Doloi et al., 2012 | 0.10 | 0.08 | 0.07 |

The results of GFI, RMSEA, and CFI in the conceptual model reveal a need to modify the model to achieve a better fit (Table 5). In this study, modification indices are used to adjust the model. According to Kline (2011), fitness of a model improves if a relationship that has a high value of modification indices is set to the model. In so doing, a number of connections are added to the base model, as suggested by the modification indices results:

- SAV and HIN variables (coefficient = 0.29): Scholnick (1999) confirmed that the deposit interest rate and the housing loan interest rate had the same trend to increase or decrease.
- TaF and LCO variables (coefficient = 0.31): Capozza *et al.* (1998) stated that an increase in taxes led to a raise in land cost.
- DpE and HPR variables (coefficient = -0.31): Amini *et al.* (2013) concluded that developers increased their debt to equity ratio (by getting more loans from banks) to supply more houses. This led to an oversupply situation, resulting in lower house prices.
- HPR and HST variables (coefficient = 0.31): Hui and Yue (2006) confirmed that higher house prices reduced buyer capacity, resulting in more housing stocks.
- Urban population factor and the HOW variable (coefficient = -0.25): Atefi *et al.* (2010) confirmed that population growth led to more homeless families and lower ownership rates.

After the modifications, the best fit measurement model is achieved (Figure 3), with all fit indices in acceptable ranges (Table 5). The best fit measurement model confirms five key factors, and their 16 associated variables.

It is found that the urban population (POP), construction cost (CCO), construction loan's interest rate (CIN), number of housing transaction (TRA), and household income (AIN) variables, have high effects on profit due to their high loading on the respective factors of 0.86, 0.75, 0.71, 0.70, and 0.43, respectively (see Figure 3). It is also found that all five factors have correlations with each other, except for that between the buyer capacity and housing economics factors. Amini *et al.* (2013) confirmed a strong correlation between buyer capacity and housing supply factors; higher housing demand forces real estate companies to build more houses, resulting in more profit gained. Atefi *et al.* (2010) confirmed a strong correlation between the housing economics and housing finance factors; higher house price is an indication of higher housing loan interest rate. This leads to more profit gained from the residential projects.

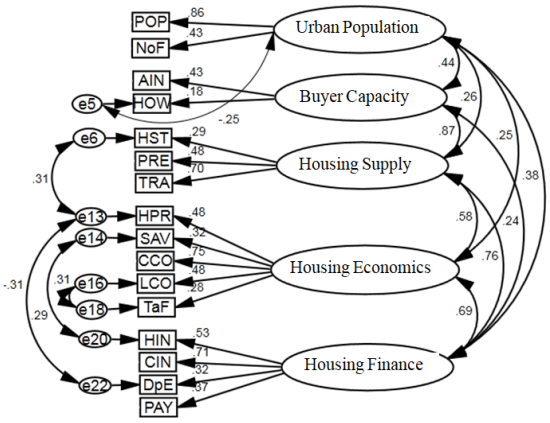


Figure 3. Best-fit measurement model.

## 7. Structural Model of Key Profit Factors

The best-fit measurement model is then performed with the structural model to examine direct and indirect relationships between the five key profit factors. In the structural model, a covariance (double-headed arrows) between two factors is replaced with paths (single headed arrows). In this study, nine paths are hypothesized based on the literatures.

- Urban population → Buyer capacity factors: Swan (1995) stated that an increase in adult population led to more home ownership rates due to more income.
- Urban population→ Housing supply factors: Glaeser *et al.* (2006) mentioned that increase in urban population raised number of houses supplied.

- Urban population → Housing economics factors: Ali *et al.* (2013) proved that population growth had substantial contribution to economic development.
- Urban population → Housing finance factors: Jappelli and Pagano (1994) concluded that increase in households raised housing loan needs and housing loan's interest rate.
- Housing economics → Housing finance factors: Amini *et al.* (2013) stated that an increase in house price led to an increase in housing loan's interest rate.
- Housing economics → Housing supply factors: Park *et al.* (2010) concluded that housing supply was reduced when taxes increased.
- Housing finance → Buyer capacity factors: Amini *et al.* (2013) stated that high housing loan's interest rate led to less buyer capacity, as monthly installments were increased.
- Housing finance → Housing supply factors: Nordvik (1996) concluded that bank loans had significant influence on housing supply; when loan increased, housing supply increased.
- Housing supply → Buyer capacity factors: Anderson *et al.* (2003) confirmed that when supplies in small- and medium-sized houses with low prices were available, buyer capacity increased.

The structural model is performed, and the path from the urban population to housing Supply factors is removed due to its low path coefficient (0.06). The best-fit structural model (i.e. the final profit model) is then achieved (Figure 4) with all fit indices in acceptable ranges, see Table 5. The final profit model explains direct and indirect relationships among the five key factors.

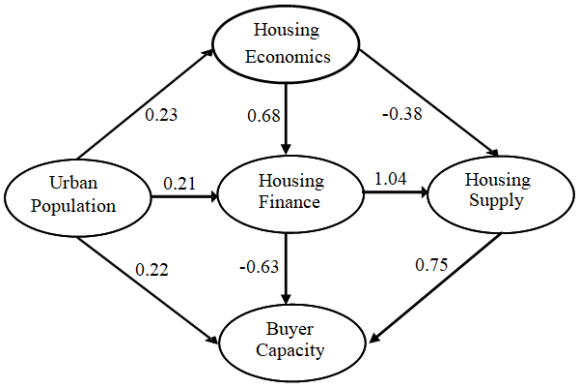


Figure 4. Final profit model

## 7.1 Urban Population factor

The urban population factor has direct effects on the housing economics, buyer capacity, and housing finance factors with path coefficients of 0.23, 0.22, and 0.21, respectively. When the urban population factor goes up by one standard deviation, the housing economics factor goes up by 0.23 standard deviations. Population growth (urban population factor), for instance, leads to higher houses prices (housing economics factor), which in turn, increases profit of residential projects (Borowiecki, 2009). The urban population factor also has indirect effects on the housing supply and buyer capacity factors through the housing finance factor. An increase in number of family (urban population factor) leads to higher housing loan's interest rate (housing finance factor), which is an indication of higher housing transaction (housing supply factor) (Atefi *et al.*, 2010). This leads to more profit from the residential projects. An increase in housing loan's interest rate, however, decreases buyer capacity in purchasing a house (buyer capacity factor), as monthly installments are also increased (Amini *et al.*, 2013). This, in turn, reduces profit of the projects.

## 7.2 Housing Economics factor

The housing economics factor has a positive effect on the housing finance factor, but a negative effect on the housing supply factor. An increase in house price (housing economics factor), for instance, leads to longer payment period (housing finance factor) (Atefi *et al.*, 2010). An increase in construction cost (housing economics factor), however, leads to less houses supplied (housing supply factor) and profit (Amini *et al.*, 2013). There is also an indirect relationship among the housing economics and buyer capacity factor through the housing supply factor. When taxes (housing economics factor) increase, houses supplied decrease (housing supply factor) (Park *et al.*, 2010). With fewer houses available, the number of houses owned (buyer capacity factor) decrease, resulting in less profit from the residential projects.

## 7.3 Housing Finance factor

The housing finance factor has a strong positive influence on the housing supply factor (path coefficient =1.04), but negative effect on the buyer capacity factor (path coefficient =-0.63). Increase in debt to equity ratio (the housing finance factor) raises houses supplied (Morri & Cristanziani, 2009). High housing loan's interest rate (housing finance factor), on the other hand, results in less houses owned (buyer capacity factor) (Amini *et al.*, 2013). This leads to less profit from the residential projects. The housing finance factor also affects the buyer capacity factor indirectly through the housing supply factor. When bank loans (housing finance factor) increase housing supply increases. This leads to more houses purchased and owned (buyer capacity factor), thus, increases profit of the projects (Park *et al.*, 2010).

## 7.4 Housing Supply factor

The relationship among the housing supply and buyer capacity factors is strong, with a path coefficient of 0.75. An increase in housing transaction (housing supply factor) leads to more ownership rate (buyer capacity factor) (Atefi *et al.*, 2010), resulting in more profit. The direct and indirect influences of key profit factors are summarized in Table 8. It is noted that the total influence is a sum of all influences one factor has on the other four factors. Based on Table 6, the housing economics and the housing finance factors have high total influences on the other factors. The two key profit factors, therefore, can be confirmed to be crucial in planning for a profit enhancement of residential projects in Ho Chi Minh City, Viet Nam, as they stimulate both demand and supply. To explain, real estate developers can focus on the two

most important variables, including the construction cost and construction loan's interest rate, based on the housing economics and the housing finance factors. They should set the house price that, in turn, stimulates higher housing demand in Ho Chi Minh City. The importance of these two variables are consistent with studies on profit enhancement of construction and real estate companies in Hong Kong, Malaysia, and Taiwan (Hung *et al*., 2002; Liu & Wang, 2008; Mahmood & Zakaria 2007). Apart from this, the debt to equity ratio should also be considered when developing a profit improvement plan, as it is widely mentioned in the studies in both Asian and Western countries (Liow, 2010).

Table 6. Direct and indirect influences a key factor has on the other four factors.

| Factor | Direct and indirect influence | Total influence |
|---|---|---|
| Housing Economics (HEc) | 0.38*(HSL)+0.68*(HFi)+0.29*(HSL*BCa) +0.71*(HFi*HSL)+0.43*(HFi*BCa) +0.53*(HFi*HSL*BCa | 3.02 |
| Housing Finance (HFi) | 1.04*(HSL)+0.63*(BCa)+1.04*0.75*(HSL*BCa) | 2.45 |
| Urban Population | 0.23*(HEc) + 0.22*(BCa)+0.21*(HFi) + 0.16*(HEc*HFi)+ 0.09*(HEc*HSL) + 0.22*(HFi*HSL) + 0.13*(HFi*BCa) + 0.10*(HEc*HFi*BCa) + 0.07*(HEc*HSL*BCa) +0.16*(HEc*HFi*HSL)+0.16*(HFi*HSL*BCa) + 0.12*(HEc*HFi*HSL*BCa) | 1.87 |
| Housing Supply (HSL) | 0.75*(BCa) | 0.75 |

Note: BCa – Buyer Capacity.

## 8. Conclusions

This study investigates key profit factors of residential projects with their associated variables in Ho Chi Minh City, Viet Nam. Confirmatory factor analysis results confirm the five key profit factors (the urban Population, buyer capacity, housing supply, housing economics, and housing finance factors), with their 16 associated variables. It is found that the number of people, income, transaction rate, construction cost, and construction loan's interest rate variables are the most important variables affecting profit of Vietnamese residential projects, as they represent high loadings on their respective factors. The interrelationships among variables are also explored. Deposit interest rate, for example, has positive relationship with housing loan interest rate. House price also has positive relationship with housing stocks. Debt to equity ratio, however, has negative relationship with house price.

The final profit model concludes relationships among the five key profit factors. The results show both direct and indirect influences among the five factors. The housing economics and the housing finance factors are confirmed to be the most important factors to improve profit of Vietnamese residential projects, with the focus on the construction cost, and construction loan's interest rate.

There are some limitations in this study. Data used in the study are from Ho Chi Minh real estate companies, in Viet Nam. Applying the study results in other countries may need data adjustment. External factors, such as foreigner demand and world economics are not also included in this research study.

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