

**An Empirical Study Of Brand Name, Land Costs, Income And Housing Availability's  
Impact On Residential Fittings In Hangzhou, China**

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**Abstract**

Provision of superb fittings in kitchen, washroom and living room has been regarded as developers' important weapon to get the upper hand market. It is common to find developers' advertisements around the globe about their residential innovative fitments. Nevertheless, developers in Hangzhou only provide bare flats to their customers. Home vendors have to find contractors for bedroom doors, floor and wall tiles; electrical suppliers for fridges and washing machines; plumbers for water pipes and water closet installation. While recent research on housing development focuses on the financial aspect, this paper contributes to filling the knowledge gap on the reasons behind these flats in Hangzhou. With the help of binary Probit Regression models, the paper concludes that there is a negative and significant relationship between bare flats and land costs.

Keywords: brand name, income, land costs, housing availability, residential fittings

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## **1. Introduction**

Provision of good-quality places of residents is one of the objectives among many dwelling professionals (Dempsey, 2009). Apart from location, transportation and other amenities, superb fittings have become one of the most important marketing strategies in distinguishing its product from their competitors. Residential units equipped with close-to-ideal kitchen and bathroom wares, decent floor and wall tiles, international renowned electrical appliance etc can be found in many cities in the world, e.g. Sydney, Hong Kong and London. Nevertheless, all these assumed features cannot be easily found in China housing market. Majority of flat vendors in Hangzhou only receive a grey flat without any plastering, open holes on the wall for exhaust fan to be installed, open-ended pipes on the floor for water basin connection. Fancy kitchen and bathroom design with electrical appliance is once in a blue moon case only.

## **2. Background**

Ever since Deng became the leader of the Communist Party at the end of 1970s, the economic system has been transformed from planned to market one. As real estate sector has played an important role in economic restructuring process, overwhelming policies have emerged in the 1980s and 1990s. All these aim at fostering the market mechanism in China's housing sector (X. Q. Zhang, 2001). Since 1978, the housing market in China has been gradually shifted from planned residential market where the government built and supplied most of the dwelling units to a private residential market produces most of these units (Allen, Ovsyannikova, Prazukin, & Worzala, 2004; Kaganova, 1999).

## **3. Literature Review**

Housing can be one of the most single investment for individual investors (Tse, Man, & Choy, 2007). While good arrangement in fittings within building envelope can save much payment on electric bill or even enhance sustainability, poor design fittings might increase indoor particulate matter emissions (Begum, Paul, Hossain, Biswas, & Hopke, 2009). As fittings inside the residential units do affect residents' quality of lives, many research has been done on residential fittings. Table 2 provides some of these examples. Although there are some papers in Chinese which has reviewed the pros and cons of bare and well-furnished flats e.g. Zhao, Zhang, et. al. (2003), Li and Pan (2003), Hai (2005), Zeng (2007) as well as problem of roughcast flats in China, e.g. Xu and Ji (2007), Zhou & Gong (2004). Most of them are theoretical work without empirical data supports.

<b>Content</b>	<b>Authors</b>
Interior designs of ancient residential buildings	Liang (1981, 2007), Lui and Liu (1992), (Yao, 1987)
Sustainability / energy saving	Bell and Lowe (2000), Bidhendi et al. (2008), Gao, et. al.(2001), Priemus (2005), Todd (2001, 2006), Vijayan and Ashok (2005),
The impact of culture on fittings	Mubarak (1997), Rahmaan (1990)
Special features of fittings	Papamanolis (2005)
Acoustic	Dance (1997)
Fittings's regulation	Reading (1912), Stone (1979), Li (2009)
Water supply fittings	Trabelsi (1979)
Fittings and health	Begum, et. al.(2009), Evans, et. al.(2001), Ho et al. (2008), Jaakkola, et. al.(1999), Leung et al.(1998), Robertson et al. (2001)
Quality of fittings	Hoxley (2002), Kangwa and Olubodun (2003), Mahdi et al (2006), Meloy et al. (2007)
Bare flats in China	Zhao , Zhang, et. al. (2003), Hai (2005), Zeng (2007), e.g. Xu and Ji (2007), Zhou & Gong (2004)

Table 1 Literature on residential fittings

### **3.1 Risk adverse behaviour**

In many economic settings, individuals are exposed to both aggregate risks and idiosyncratic risks. There is also a pool of empirical evidence which show that participants are exposed to risk at any different stages in their lives (Klonner, 2003). Under the assumption of risk averse, individual tries to lower the risks so long as the costs of doing so are less than the benefit. He may reduce the risk by 1) searching information, 2) choosing a risky option with which the burden of risk can be shared with the others 3) choosing less risky option (Cheung, 2000). The presale phenomenon is actually one of the vivid examples which show developers try to share the financial risks with those home buyers (Chau, Wong, & Yiu, 2007).

### **3.2 Brand Name**

In residential market, developers know more about the quality of the residential units than the purchasers do. Such information asymmetry often leads to moral hazard problem where sellers build houses with defects (Nayyar, 1993). Developers' opportunistic behaviors as such

impose risk on consumer. This risk can be reduced either by building trust between sellers and buyers or searching more information (Grover, Lim, & Ayyagari, 2006). Brand name provides consumer the evaluative and descriptive information (Keller, 2003) about the product's quality as well as the seller's incentive to achieve a high and consistent quality standard (Parkin, 2005), effectively lower the risks of consumers. That also explains why individuals are willing to pay a premium on branded companies for search costs reduction (Grover, et al., 2006).

### **3.3 Income, search and information costs**

Steven Cheung once comments “[r]eaching agreement on the price of a spring inside a camera incurs a proportionately higher cost than does the camera. Although the consumer can assess the value of the whole product, he does not have the expertise to recognize the value of each component part. He may not even know what some of them are or even that they exist. It simply costs too much to learn about everything in every commodity we buy...” (Cheung, 1983). There is no doubt that bundling residential units with fittings reduces the freedom of home vendors in choosing their most favorable or less desirable fittings. It can, however, lower the search costs of the purchasers effectively. This is particularly useful for those who do not have time and professional knowledge to assemble individual units themselves (Harris & Blair, 2006). In case of well-furnished flats, the residential vendors can save much cost on buying all the fittings such as washing basins, floor tiles, bath tubs etc. Or they do not need to make separate contracts with painters, plumbers etc. Tremendous information and search costs can be saved. One very obvious empirical observation, however, shows that such costs varied among all the residential vendors. This might be useful in providing explanation on why dwellers in wealthier cities, e.g. London, Hong Kong and Sydney are equipped with electrical appliance on top of basic kitchen and bathroom wares while poorer cities, e.g. Ghana, Malina and Penang are usually provided with basic furnishings only. Even though they live in the same city, their information and search costs for all those shopping can be of great different. Search costs of a waitress with \$30 hourly paid is not comparable to a businessman with \$3000 hourly income.

City	GDP of the country in World Factbook (Central Intelligence Agency, 2009)	Majority provisions in the city (evidence from the popular home sale website)	Examples
Sydney	\$38,200 (2008) \$37,800 (2007) \$36,800 (2006)	Yes, wall and floor tiles, kitchen and bathroom wares, electrical appliance are provided (Real Estate Australia Group, 2009)	“Vitrified floor tiles, Reconstituted Caesarstone bench tops, Omega/Smeg stainless steel appliances, Recirculating rangehood, Microwave oven with trimkit, Semi-intergrated dishwasher, Stainless steel under-bench sinks, Alder hob mixer tapware, Polyurethane kitchen cupboards” (Meriton, 2009).
Hong Kong	\$43,800 (2008) \$43,000 (2007) \$40,600 (2006)	Yes, wall and floor tiles, kitchen and bathroom wares, electrical appliance are provided (Midland Realty, 2009)	Furnished with the most luxurious fixtures and facilities, every unit in Centre Stage is a showcase of highly renowned brands. Meticulously crafted kitchen and washroom are full expressions of opulence and taste...” (Henderson Land, 2008).
London	\$36,700 (2008 est.) \$36,500 (2007 est.) \$35,700 (2006 est.)	Yes, wall and floor tiles, kitchen and bathroom wares, electrical appliance are provided (Rightmove, 2009)	“Using only the finest materials and products available and the latest innovations that technology provides, the homes boast a specification which is unlike any other in the area.” (Chienies Place, 2009)

Table 2 Examples of fittings provided by developers in 6 cities

City	GDP of the country in World Factbook (Central Intelligence Agency, 2009)	the	Majority provisions in the city (evidence from the popular home sale website)	fittings in the	Examples
Metro Manila	\$3,300 (2008 est.) \$3,300 (2007 est.) \$3,100 (2006 est.)		Floor finishes are provided, no electrical appliance except conditioners/fans are provided (Point 2 Homes, 2010b)		Hot tub, ceiling fan, hardwood floors, laundry room (Point 2 Homes, 2010a)
Penang	\$15,200 (2008 est.) \$14,800 (2007 est.) \$14,200 (2006 est.)		Majority are unfurnished or partly furnished (i Property, 2010)		Cornered glass windows creating seamless view and ample sunlight indoors. Full height wall tiles to all bathroom (Airmas Group, 2010)
Ghana	\$1,500 (2008 est.) \$1,400 (2007 est.) \$1,300 (2006 est.)		Water and power supply, paved road (Viviun International Property Listings, 2010b)		Features include running water, telephone, light, road (Viviun International Property Listings, 2010a)

Table 2 Examples of fittings provided by developers in 6 cities (con't)

### 3.4 Housing Availability

Under many circumstances, the market forces not only affect the prices, it also determines suppliers' incentives to provide something 'extra'. In case of shortage, suppliers who do not need to compete with other suppliers. They then try to save their production costs by providing limited features to their potential customers. For example, sellers in electrical shops provide finger ram as gift when they know that there is keen competition in the market. Similarly, shortage of staff results in admission of under qualified people in medical and education field (Hawthorne & Birrell, 2002; Ingersoll & Smith, 2003).

#### **4. Hypotheses**

In view of the above literature, we formulate the four hypotheses:

1. Residential units in higher land price area are more likely to be well-furnished.

In case of high land price, fitting costs become relatively small in overall construction costs, risks in provisions of unfavorable fittings (which lead to a decline in home purchase) become insignificant. As developers are risk averse, they are more likely to build well-furnished flats in high land price area.

Since there is no direct land price data in Hangzhou, the land price is estimated by the average selling price of each residential development obtained in Soufun (Soufun, 2009) minus yearly construction costs obtained from Hangzhou Statistical Yearbook (Hangzhou Statistics Bureau, 2008). The estimated land costs are then divided by market value of the residential units.

2. Branded developers build less bare flats

As the branded developers provide more information on quality of the residential units, consumers are more willing to buy well-furnished units. On the other hand, consumers would rather spend their money on the bare flats if the developers only build once under the study period – another example in Alkerolf lemon case.

To test this hypothesis, names of developers corresponds each residential developments was collected from Soufun (Soufun, 2009) and number of residential development built by each developers was counted.

3. Income and probability to buy bare units are negatively related.

Higher income people tends to have a higher search and information costs on assembling the components in residential units, it is postulated that they prefer well-furnished ones.

GDP per capita for each year data was collected from Statistical Year Book (Hangzhou Statistics Bureau, 2008).

4. Housing availability is negatively with the sale of bare flats.

Similar shortages in medical and education field, developers have no intention to provide fittings in case there are shortages in housing.

Demand (number of household) and supply (the completed residential area) information was

collected from Statistical Year Book (Hanzhou Statistics Bureau, 2008)

## 5. Research Method

In case of dichotomous dependent variables, ordinary least square (OLS) regression may not be the best choice in estimation of variables. First, since the dependent variable is a binary variable, the error term is also binary in nature. This means that we cannot presume the error term follows the OLS basic assumption of normal distribution (Gujarati, 2006). The Probit regression model uses the maximum likelihood estimation by iterative method (Quintana & Prevosti, 1990). It can deal with dichotomous dependent variables which cannot be handled by linear multiple regressions.

In a binary Probit model, interest lies primary in the response probability:

$$P(y=1|x) = P(y=1|x_1, x_2, \dots, x_k)$$

Consider a class of binary response in the form of:

$$P(y=1|x) = G(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k) = G(\beta_0 + x\beta)$$

Where  $G$  is a function taking on values in between zero and one, i.e.  $0 < G(z) < 1$  where  $z$  represent all the real numbers.  $x\beta = \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k$

Where  $x$  denotes the full set of explanatory variables (Wooldridge, 2003).

## 6. Data description

The table below provides basic information on economic situation, land costs and residential market in Hangzhou. GDP per capita has grown steadily over the 5-year study period from 3266 in 2003 to 52590 in 2007. Number of household (ten thousand) has also risen from 201.12 to 211.99 in 2007. Residential development for sale oscillates around 60. Percentage of bare flats, i.e. residential units without basic wall and floor finishes, kitchen and washroom fittings, however, has risen from 82%, reached the peak in 2005 and dropped to 78% in 2007.



Year	GDP per capita	construction costs (per square meter)	Number of development	Average Estimated Land Cost (per square meter)	Household (Ten thousand)	Percentage of bare flats %
2003	32667	2275	26	9349.538	201.12	81.8182
2004	38593	2023	61	11435.13	204.52	82.6923
2005	44555	2459	62	11535.16	207.42	83.0189
2006	51650	2340	51	10484.31	209.91	81.3953
2007	52590	2953	61	6368.902	211.99	78

Table 3 Summary of data (Hanzhou Statistics Bureau, 2008)

## 7. Results

The table below has shown the results of the regression. Model 1 is the ordinary Probit model, Model 2 and 3 are semi-log, Model 4 is a higher order Probit models. The negative and significant relationship at 99% level between bare units and land costs over housing market value confirms hypothesis 1 that there is a greater likelihood for well-furnished flats in high land costs area.

Although variables “BUILDONCE” and “GDP” exhibit negative values in all the four models, all are insignificant at 95% level. This implies that hypotheses 2 and 3 have not been refuted -- there is no solid evidence to show that branded developers with more repeated sales activities sell less bare flats. Likewise, higher income alone is insufficient to exhibit a clear relation with those who buy well-furnished flats. Similarly, there is insignificant relationship between housing availability and bare units sale. Hypothesis 4 has not been refuted as well.

	Model 1	Model 2	Model 3	Model 4
BUILDONCE	-0.184414 (-1.004701)	-0.110462 (-0.784469)	-0.140791 (-0.599988)	-0.251765* (-1.830174)
GDP	-2.77E-05* (-1.820559)	-1.56E-05 (-1.390897)	-1.43E-05 (-0.750378)	-1.82E-05* (-1.702489)
LDMV	-2.829150*** (-6.736360)			-6.348342*** (-3.157227)
LDMV <sup>2</sup>				-7.872668*** (5.369005)
LOG(LDMV)	-1.259419*** (-8.574870)		-0.542782** (-2.064191)	
AREAHSE	0.161245 (0.415030)	0.269610 (0.949848)		-0.350402 (-1.277067)
LOG(AREAHSE)			0.250552 (0.178264)	

Table 4 Results of Probit Regressions

\* significant at 90% level

\*\* significant at 95% level

\*\*\* significant at 100% level

Note:

BUILDONCE is a dummy variable; it equals to “1” if the developer only builds once within the 5-year study period and “0” if the developer builds more than once.

GDP denotes GDP per capita.

LANDCOST denotes the ratio of estimated land costs to open market value of the residential units.

AREAHSE refers to the completed residential area per household.

Dependent variable equals to “1” if the residential project provides bare units and “0” if not.

## 8. Conclusions

Conventional wisdom in many cities has shown the popularity of well-furnished flats. Yet, empirical evidence in Hangzhou goes against this. This paper confirms that land price and bare units hold a significant negative relation. In the near future, it is hope that the hypotheses can be tested in other cities in China.

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