

Still on the Road to Capitalism? Weighing the Visible Hand of Government Intervention in the Chinese Property Market

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Abstract: This paper introduces a model to describe the Chinese property market. In doing so, the aim is to comment on the applicability of the current property "market models", but also to discuss China, and the current state of its journey to capitalism. We use a straightforward empirical model, and employ data, collected in the period 2000–2010, on the market performance of the real estate industry. We find that "market models" explain as little as 1% of the variance in property sales. Adding a variable that accounts for government intervention to the specification creates a "regulated market model". And with this specification, the predictive power of the model soars to 87%. In the "regulated market model", however, the significance of the price system disintegrates. Meaning that government supply, and not price, dominates. The implications of our study are significant. Because, not only do we evidence the important role of government's "visible hand" in the Chinese property market but, by implication, illustrate that China remains a controlled economy.

Key words: property markets; China; capitalism; socialism; government intervention **JEL codes**: D04, O18, O53, P11, P21, P51, R31, R52

1. Introduction

This journal has a long-standing interest in regulated economies, and has dedicated many pages, in particular, to the unfolding story of China's road to capitalism (Li et al., 2000). One of the most dramatic stories, however, that of the property market remains relatively untold.

In 1949, the communist party came to power in China and soon after the state embarked on a policy of nationalizing all private property (Kuang, 1992; Wang, 1990). Between then and 1976, housing was treated as a welfare right, to which everybody was entitled. It was distributed according to the formal definitions of minimum and maximum per person space entitlements (Andrusz, 1984). Property could not be bought or sold (Zhou and Logan, 1996). And rental rates were set such that "ownership" of rental property yielded no returns (Deng et al., 2009).

The result, however, was the emergence of a situation in which the minimum cost of maintenance was more than three times as much as the rent collected. And the actual cost of providing housing was almost twenty-five times as high (World Bank, 1992). There was thus little incentive, during this period, for housing investment and/or improvement. And as a result of this policy of nationalization, China suffered both severe shortages in housing, and a deterioration of its existing housing stock. By 1978, the norm was 3.6 m² per person (Li, 1998), 60%

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of the households were in housing without exclusive use of running water, 72% without sanitary facilities and 71% without their own kitchens (cited in the World Bank, 1992).

Recognizing the limits of a centrally planned public housing system, the state embarked upon a period of economic reform in 1979. Property rights were re-introduced, and the freedom to buy, and to sell, and to reap the benefits of improvement turned what was once a drain on government resources, and a non-productive investment, into an engine of economic growth. Huge increases in investment, a massive public housing privatization project, and strong government incentives for home purchase, saw homeownership rates rise to 80%. And with this living conditions increased dramatically; average per person living spaces increased from 3.6 m² in 1978 to 26.11 m² in 2005 (Ye and Wu, 2008). So profound have the changes been, in fact, that prominent scholars suggest that, at least in terms of the property market, China has completely moved from a centrally planned public housing system to a market-based system, with competition in both production and consumption (Ye and Wu, 2008; Deng et al., 2009).

Others point out that this new market-based system has its own particularly Chinese characteristics. Local government continues to play a strong role in the market because, according to the Chinese Constitution, all land still belongs to the state. Local governments are permitted to expropriate rural land for urban uses. And by controlling both the land supply, and the zoning regulations, local governments can decide what can be built, when, and by whom. In the most recent 5-year plan (2011–2015) housing policy continues to feature prominently.

So how market-based is China's new market-based property system? Fortunately, a number of models have been created to explain the behavior of the real property market. And most of these point to factors like price, interest rate and income as being the more important explanatory variables (e.g., Quigley and Redfearn, 1997; Gottlieb, 1976; Quigley, 1999; Mankiw and Weil, 1989; Hendershott, 1991; Englehardt and Poterba, 1991; Aelpeovich, 1995; Woodward, 1991; Dipasquale and Wheaton, 1992; Case et al., 2005; Campbell, 2006). To the best of our knowledge, however, few have applied such models to the Chinese property market.

Using data on the Chinese property market — in the period 2000 to 2010 — this paper aims to fill that gap. We present and test the applicability of two models: a standard market model, which includes all the factors that presently dominates the analysis of property markets, and a new model for the regulated economy, which explicitly accounts for the role of government intervention. By differencing the two, we attempt to gauge the scale and effect of government involvements. And, by doing so, we aim to discover how market-based China's new market-based property system is, but also to comment on the state of China's road to capitalism.

We find, in the base case, and using a standard market model — specified according to suggestions of the current literature on the analysis of property markets — that in China markets work. The standard model behaves as expected. And price is significant in explaining market movements. From this, one might conclude that China offers an open and transparent market. But the market model explains as little as 1% of the variance in Chinese property sales. Consequently we next move to consider the application of a regulated market model, which explicitly includes a measure of governmental intervention; the "government" or "G" Factor. By doing so, we find that the predictive power of our models soar to 87%. By accounting for the effects of government intervention, however, we see that the price system disintegrates: in models that include the G-Factor only the G-Factor significantly impacts property sales. We thus conclude that, despite the reforms, the Chinese property market remains heavily regulated market. And one that is incomparable with the Western markets that the current models are based upon. In terms of the Chinese road to capitalism, our findings suggest that while progress has been made, the property market remains firmly under the control of the government.

The remainder of this paper is structured in the usual way. Section 2 reviews the literature on the property

market and the role of government intervention. *Section 3* discusses the data, with which we test our hypotheses, and the models used to analyses it. *Section 4* presents the result, *Section 5* discusses the implications, and *Section 6* concludes on the nature of the market.

2. Literature

2.1 The Chinese Property Market

The story of the Chinese property market is one of a few key dates and policy documents. Together, these form three distinct phases in the evolution of the market: Nationalization (1949–1976), followed by two distinct periods of economic reform 1979–1994 and 1994–Date.

2.1.1 Nationalization: 1949-1976

In 1949 the communist party came to power in China. And the state quickly moved to nationalize land and to dismantle the system of private housing. The government confiscated all properties that had belonged to former officials, "anti-communist reactionaries" and foreign capitalists (Zhou and Logan, 1996). The Municipal Bureau of Housing Management (MBHM) was set up in 1953, with the purpose of nationalizing: (1) all residential housing that was 100 m² or larger (housing owned by overseas Chinese and by the remaining petty bourgeoisie, such as merchants and small business owners, was usually within this target range); (2) all privately owned rental housing; and (3) all privately owned commercial buildings. Some property remained outside this net. But during the Cultural Revolution (1966–1976), all remaining private property was completely taken over by the socialist state (Kuang, 1992; Wang, 1990).

After the Cultural Revolution, the sale of land and development of real properties for speculative purposes were prohibited (Wang, 1990). Housing was treated as a welfare right, to which everybody was entitled and was ideally intended to be distributed according to a formal definition of a minimum requirement and a maximum entitlement of space per person (Andrusz, 1984). Rental rates were set such that 'ownership' of rental property yielded no returns (Deng et al., 2009; Lee, 1988). In fact, the minimum cost of housing maintenance was more than three times as much as the rent collected. And the actual cost of providing housing was almost twenty-five times as high (World Bank, 1992). There was thus little incentive for housing investment and improvement. And as a proportion of Gross Domestic Product (GDP) housing investment averaged only 1.5% in the period from 1949 to 1978 (World Bank, 1992). Consequently, the Peoples Republic suffered both severe shortages in housing and deterioration of its existing housing stock. The Chinese norm was the assignment of 2 persons to a one-room unit, 3–5 persons to a two-room unit and 6–8 persons to a three-room unit (Friedman, 1983). But in reality housing was not available for such a distribution (Zhou and Logan, 1996). And as the population grew — from 541 million in 1949 to 961 million in 1978 — the effect was that average per capita dwelling space dropped; from 4.5 m² in 1949, to 3.6 m² in 1978 (Li, 1998).

2.1.2 Economic Reform: 1979-1994

Recognizing these limits, the state embarked upon a period of economic reform in 1979. The State Council formed the Housing Reform Task Force in 1982. And four cities (later extended to 80 other cities and towns in 23 provinces) were designated for experimentation in housing reform (Wang and Murie 2000; Zhou and Logan, 1996). Rental rates were adjusted, the existing housing stock began to be privatized, and the state began a process of confirming and registering ownership titles to properties that had been seized during the Cultural Revolution.

In 1988 the Chinese central government issued an important document: Implementation Plan for a Gradual

Housing System Reform in Cities and Towns. It aimed explicitly to transform housing from a welfare good into a quasi-commodity, with the purpose of raising funds to recover the costs of construction and maintenance, and of limiting the demand for housing (Zhou and Logan, 1996). As a result, public housing units throughout the country started to be sold to their sitting tenants, at heavily discounted prices. And when units could not be sold, efforts were made to raise the rent; even if the increase was still largely symbolic and still fell far short of what was necessary to cover basic maintenance costs. Rent increases were intended to stimulate investments by residents (by making purchase more economical than renting) and by public and private investors (by increasing their returns). And so policy-makers began to rely on market forces to undo the scarcities and inequalities that characterized the socialist housing system.

Prior to this, there was no "market for property". Although there was some private housing in the cities, and exchanges of public housing were allowed, sales were uncommon. All land was (and still is) owned by the state. Land requisition for development projects was handled through the central planning process. And the central, provincial and municipal governments had the power to appropriate urban land gratis, to acquire buildings with minimum payment to owners, and to acquire rural land with payment for fair compensation to owners (the people's communes) for government approved development projects. In 1988, however, the Chinese National People's Congress amended the Constitution, stipulating for the first time that "land-use rights can be transferred". For the first time, the government legally recognized property rights.

Property rights remained weak, however. And the government — particularly the municipal government — continued to control the market. In 1992 "*The Temporary Measure for Pricing Commodified Housing*" was jointly issued by the Ministry of Commodity Pricing, the Ministry of Construction and the Ministry of Finance. This measure became the legal basis for price setting, and dictated, through legislative means, how open the pricing system should be. In practice, however, municipal governments set prices arbitrarily, with land prices as low as 10 yuan per m² or as high as 1500 yuan per m², and commoditized housing selling for as low as 500 yuan per m² or as high as 3000 yuan per m² (Zhou and Logan, 1996). Clearly therefore, while some steps had been made in the right direction, much work needed to be done to complete the task.

2.1.3 Economic Reform: 1994–Date

Another milestone in the move towards a market system came in 1994, when the Chinese central government issued *The Decision on Deepening the Urban Housing Reform*. Within this, supply-side and demand-side programs were created to facilitate the development of a housing market. On the supply side, the government decided to build a multi-layer housing provision system for different income groups. And on the demand side, a dual housing finance system was established to combine both social saving and private saving (Wang and Murie 2000; Deng et al., 2009). Families who paid market prices for their units got full property rights — including the right to resell their units on the open market — while families who pay subsidized prices would have partial ownership but face restrictions regarding resale (State Council, 1994).

Immediately after the 1994 reform, the country saw the rapid growth of a professional housing development industry and an unprecedented housing construction boom. Yet instead of being sold to individual urban families, most of the housing units were purchased by work units, which then resold them at deeply discounted prices to their employees (Wang and Murie, 1996). Since many of the work units were state owned and were not subject to hard budget constraints, their purchase behaviors significantly distorted the emerging housing market (Zhou and Logan, 1996). In 1990, and in urban China as a whole, 59% of housing was owned and managed by work units (Yang and Wang, 1992). And even in Shanghai, where only 12% of housing was owned and managed by work

units in 1990, some 86% of new investment capital for public housing construction was raised by work units (Bian et al., 1995; Zhou and Logan, 1996).

Recognizing this, the Chinese central government decided, in 1988, to cut the link between work units and housing provision. Specifically, it issued *A Notification from the State Council on Further Deepening the Reform of the Urban Housing System and Accelerating Housing Construction*, which prohibited work units from building or buying new housing units for their employees. This, effectively, terminated the distribution of housing strategy, urban residents were encouraged to seek houses in the market — according to their own saving and income conditions — and could no longer rely on governments, or any other kind of institutional support, in acquiring property. As such, the 1998 reform marked a turning point of China's housing reform, and with it China was said to have established a real market mechanism in both housing production and consumption (Deng et al., 2009; Ye and Wu, 2008).

The effect of this reform was certainly tangible. The policy was fully implemented from January 2000. And from 1997 to 2005, the annual housing investment amount increased by about 6 times (Ye et al., 2006). Living standards soared; the per capita floor space in urban areas rose from 3.6 m^2 in 1978 to 17.8 m^2 in 1997, to 24.97 m^2 in 2004 (Ye & Wu, 2008). Thanks to both massive public housing privatization, and strong government incentives for home purchase, the levels of homeownership in China soared too, to reach 80 percent in 2004 (Feng 2003). And with 36 million more "affordable houses" due in the coming years, according to the latest 5-year plan (2011–2015), it is likely that this level will continue to rise (Peoples Republic of China, 2010).

2.1.4 A True Chinese Property Market?

According to prominent scholars, the 1988 reform completely transformed the Chinese market, and completing the move from a centrally planned public housing system to a market-orientated one, in both production and consumption (Ye and Wu, 2008; Deng et al., 2009).

Stronger property rights, freedom to buy, and to sell, and to reap the benefits of improvement turned what was once a drain on government resources, and a non-productive investment, into an engine of economic growth. As a percentage of GDP, investment in housing rose from an average of 1.5% in the period from 1949 to 1978 (World Bank, 1992), to a level of 7% in 2005. This, a massive public housing privatization project, and strong government incentives for home purchase, saw homeownership rates rise, to reach 80% in 2004. With this living conditions increased dramatically; from an average of 3.6 m² per capita in 1978 (Li, 1998), average living spaces increased to 26.11 m² in 2005 (Ye & Wu, 2008). And as demand remains high — since 2003, housing prices have grown at an average of over 10% (Feng, 2003) — it appears that the transformation of the property market has been more or less complete success.

This new market-based system, however, has its own historic footprint and particularly Chinese characteristics (Deng et al., 2008). Local governments play a strong role in the market because, according to the Chinese Constitution, all land belongs to the state. Local governments are the representatives of the state and are in charge of expropriating rural land for urban uses and allocating it among different users. And by controlling both the land supply, and the zoning regulations, local governments can decide what can be built, when, and by whom. A plethora of terms have emerged to describe the result: state-capitalism, socialist market economics. But the obvious question remains: how market-based is China's new market-based property system?

2.2 Modeling the Market

To answer this question, we will test the applicability of two property market models: the standard market model, which includes all the factors that presently dominates the analysis of market-based property systems, and

a new model for the regulated economy, which attempts to explicitly account for the role of government intervention in the property market system.

2.2.1 The Standard Model

In a market economy, the market — guided by the self-interested desire of individuals to maximize their private profits — is the "invisible hand" (Smith, 1776) of "spontaneous order" (Hayek, 1949). In a market economy, price, supply and demand, and individual economic decisions, allocate resources. And government enforces contracts (Cooter and Ulen, 2004).

In a market economy, market forces can therefore be expected to explain most of the variation in the property market. And several scholars have attempted to specify a market model, using such market forces, that accurately describes the behavior of the property market in a market economy (e.g., Quigley and Redfearn, 1997; Gottlieb, 1976; Quigley, 1999; Mankiw and Weil, 1989; Hendershott, 1991; Englehardt and Poterba, 1991; Aelpeovich, 1995; and Woodward, 1991; Dipasquale and Wheaton, 1992; Case et al., 2005; Campbell, 2006). Most of these points to approximately the same significant list of factors (see Table 1). Household income, national economic indicators (measured in terms of gross domestic product), house prices, and interest rates together explain the lions-share the variance. Although employment rates (as a precursor to household incomes) also plays a part, as does housing supply, investor expectations and a willingness to spend, vacancy rates, mortgage availability and demographic change.

Variable	Sutton 2002	Quigley 1999	Gotlieb 1976	Mankiw &Weil 1989	Case et al. 2005	Cambel 2006	Wheaton 1990	Dipisquali & Wheaton 1992	Kummerow 1999
Housing Supply							_		_
Income	+	+							
Interest Rates	_								
Investor Expectation Vacancy Rates		_					_	+	
Employment		+							
Household Spending Stock Prices	+				+	+			
Housing Starts		+							
Mortgage Activity		+							
Economic Activity			+						
Demographics		+		+					

These models are far from perfect. Nevertheless, and based on this literature, one could would expect that, in a market economy, a model which accounts for price, and controls for income and interest rates, should explain a significant proportion of the variance in sales. We refer to such a model as the standard model. And if China's market reforms created a truly/largely market based system, and then we would expect that such a model should explain a significant proportion of the variance in Chinese property sales. Thus, we hypothesize:

Hypo 1: The free-market "Standard Model" will best explain the variance in Chinese property sales. Price is (1) significant and (2) positively related to sales.

2.2.2 The Regulated Market Model

At the other end of the spectrum, and in a planned economy, a central government — guided by the objective

of satisfying human need — is the visible hand that controls industry (von Mises, 1920). And in a planned economy, government decides on the allocation of resources.

Few economies today are "planned", although the levels of intervention varies. In some cases, intervention can be a positive influence on the markets operation; in fact, market failures — which occur when the private pursuits of the individual lead to an inefficient public outcome (Mueller, 2003) — and externalities — which occur when a cost or benefit is not transmitted through the price system (Arrow, 1969) — are two oft quoted justifications for the existence of the state in a market economy. In other cases, however, the government intervenes not to support the market, but to control it. Or worse still, because a central government believes that it can allocate resources more efficiently than the free-market price mechanism. By consolidating economic resources, by harness land, labor, and capital, such governments hope to enjoy more perfect information, to make better decisions regarding investment and production.

In its current incarnation, the Chinese is referred to as the "socialist market economy". At best, it has been described as a "form of [controlled] capitalism but one in which the state acts as the dominant economic player and uses markets primarily for political gain" (Bremmer, 2010). To the best of our knowledge, few — if any — studies have attempted to modify the standard model to accurately describe variation in the property market in such a regulated system. But clearly, the free market models, which the literature has focused on, cannot be used in such a setting. A restriction in supply will stifle demand, alter prices, and will drastically alter the normal operation of the market. Arguably, and depending on the level of regulation, intervention may so distort the price system that the price system collapses, and only government matters.

Either way, and because government intervention in the Chinese property restricts supply, and upwardly distorts prices, we suggest that intervention will be negatively related to sales. And so, to better understand the Chinese property market, it will be necessary to supplement the existing literature, and the current market model described in Section 2.2.1. Thus:

Hypo 2: The Regulated Model, which controls for the influence of a central government will better explain the variance in Chinese property sales. Price will (1) lose its significance, or (2) government intervention will dominate.

2.2.3 The G-Factor

If the Chinese property market were a free market, and subject only to market forces, then a model based on *Hypothesis 1* would explain the vast majority of the variation in the property sales. If the Chinese property market is free in nothing but name, however, it will be necessary to account for the role of governmental intervention. Because in the extreme, government can blot out the effects of normal market forces. In this case, a model based on *Hypothesis 2* will better explain variations in the market. The difference between the two models is a measure of government intervention, which we refer to as the *G-Factor*. The significance of this factor will not only serve to supplement the property market models described in Section 2.2.1, and will help us to better understand the role of regulation in China, in general, but can be used too to chart the so-called "socialist market economy of China's" progress on the road to capitalism.

3. Methodology

3.1 Data

The data, against which our hypotheses are tested, was made available by an independent consulting firm, which operates in the international arena. It includes data — collected at the monthly level in the period

2000–2010— on a number of general economic indicators, as well as information on the performance of the Chinese property market, at both the city and national levels. Table 2 identifies these and the other variables employed in our research. Appendix A provides a descriptive overview of the dataset, and reports the correlation coefficients.

Variable	Description	Details
HS	Housing Sales	Cumulative Real Estate Sales in Square Meters
INC	Income Levels	National Average Income
HSV	Housing Sales Volumes	Cumulative Real Estate Sales Volume
IOH	Investment in Housing	Monthly Investment in Real Estate Development
NHP	New Housing Projects	Cumulative new Real Estate Project in Square Meters
SINTR	Short Term Interest Rates	Current Short Term Interest Rates
LINTR	Long Term Interest Rates	Current Long Term Interest Rates
HP	Housing Price	Current Real Estate Prices
RP	Real Property Supply	Current Cumulative Amount of Land for Real Estate Development, Under License by the Government, in Square Meters

Table 2Data Descriptions

3.2 Dependent Variable

We use property sales as the dependent variable. Three measures can be employed to measure sales in the market: cumulative real estate investment (IOH), cumulative real estate sales volume (HSV) and current real estate sales in square meter (HS). The first two of these reflect investments (IOH and HSV) in real estate, in financial terms, and include all niche market investment levels as a whole. HSV can, in additions, also be used as a proxy for total current market demand for real estate. Current real estate sales in square meter (HS), by contrast, describes the total supply of real estate, in real terms, and because of the nature of the questions asked in this research, we move forward with HS as our dependent variable of choice.

3.3 Independent Variable

In our model, government intervention is measured in terms of the volume of land that the government adds or withdraws from circulation. Two forces play a role in the Chinese property market: the intervening forces of the government, which licenses, in square meters, the amount of land available for real estate development by the government (RP), and the real-estate business, which responds to government intervention, with new housing project, measured in square meter area (NHP). As a direct result of intervention, property market players decide on how to invest. Hence, it is reasonable to assume that property investment by market player will be a function of the strength of government regulation. Here we express this relationship as

Eq(1a)

We assume that $\partial = G_t > 0$, which suggests that more land issued by the government, the more housing projects that will be initiated by industry. Based on this assumption, we suggest that a constant, which we refer to as the "G-factor" (G > 0), can be used to illustrate this relationship. This factor indicates the strength of government regulation. When it is large, it shows the elasticity of government regulation is high enough, therefore, market players follows its signal more significantly, otherwise, government will have to take larger effort to regulator marker players in terms of investment responsiveness. In short, the strength of the relationship between market players' response to government regulation can be expressed with G_t . Thus:

Eq(1b)

This ratio projects, mathematically, how many square meters the Governments will use to leverage the

real-estate business in the next round, as a result of its current levels of intervention. Thus, the interaction between government and business can be described numerically. The game played can be either a larger or lesser ratio: the former displays a stronger market-oriented power by real estate business and the latter the strength of government's direct intervention. The trend, illustrated in Figure 1, shows us that, actually the G-factor is not linear. It changes in a yearly cycle. The beginning of the year sees a strong G factor, which indicates a high elasticity of regulation power, as reflected in terms of a larger ratio. However, this regulation power decreases towards the end of every year, and come back at a higher level the very next year (Figure 1) — the most recent year, i.e., 2010 appeared to show the strongest Government determination to bring down the market oriented real estate business projecting efforts.



We co-integrated the ratio when entering this factor into the model with all model fit indicators as shown below. An Augmented Dicky-Fuller (ADF) test showed a unit root for RP, but NHP was found to be stationary. We construct a variable for the total supply-and-demand of the real estate market at time t (t). We define this as the log ratio of the current level of real-estate sales, to the level of monthly investment in real estate development. That is:

Eq(2)

Finally, we control for the short- and long-term interest rates (SINTR and LINTR respectively), house price (HP), and average income levels (INC).

3.4 Models

Next, and following from Hypothesis 1, we model the Chinese property market as Equation 3, which suggests that the variation in real estate sales (HP) can be explained by the current real estate price (HP), the total supply-and-demand of the real estate market (DS), the current short-term (SINTR) and long-terms (LINTR) interest rates, as well as the average income levels (INC). To this, and in line with the discussions in Section 2.2 on the role of the regulation, we add the levels of government intervention (G) to test Hypothesis 2, with Equation 4.

Equation 3:

 $\delta(\ln(HS_t)) = \beta_0 + \beta_1 \ln(HP_t) + \beta_2 \delta(DS_t) + \beta_3 \ln(SINTR_t) + \beta_4 \ln(LINTR_t) + \beta_5 \ln(INC_t) + \epsilon Equation 4$

 $\delta(\ln(HS_t)) = \beta_0 + \beta_1 \ln(HP_t) + \beta_2 \delta(DS_t) + \beta_3 \delta(G_t) + \beta_4 \ln(SINTR_t) + \beta_5 \ln(LINTR_t) + \beta_6 \ln(INC_t) + \epsilon$

We estimate Equation 3 and 4 using both the OLS and GARCH (General Autoregressive Conditional Heteroskedasticity) methods. After comparing the results (not reported), we find that the former behaves better in terms of fit: the GARCH provides a higher R-squared, an information criteria value (AIC) closer to zero, and a Drubin-Watson closer to 2. Consequently, we move forward with the GARCH, and report the results of our analysis below.

4. Results

To test our hypotheses, we estimate two variants of *Equations 3* and *4*. Models 1 and 2 are estimated test *Equation 3*, in accordance with the discussion in Section 2.1, and as such consider the appropriateness of a standard market specification which does not include the effect of government intervention. Models 3 and 4, by contrast, are estimated in accordance with Equation 4, and in line with the discussion in Section 2.2, and as such explicitly account for government regulation in a controlled economy. Models 1 and 2, and Models 3 and 4 differ only in their inclusion/exclusion of the DS variable. The results of all four models are presented on Table 3.

	100100 10091000					
]	Market Model	Regulated Market Models				
Model 1	Model 2	Model 3	Model 4			
-5.64***	-5.72***	-0.39	-0.60			
[-26197.80]	[-3.24]	[-0.48]	[-0.70]			
-	-	-4.66***	-4.61***			
-	-	[-31.53]	[-10.73]			
-	0.33	-	0.89			
-	[0.31]	-	[2.05]			
34.87***	34.61***	2.90***	1.93			
[4.79]	[225.94]	[137.10]	[0.30]			
-31.75***	-31.53***	-3.03***	-1.99			
[-4.29]	[-443.10]	[-1572.36]	[-0.34]			
3.44***	3.55*	0.17	-0.45			
[41.68]	[1.65]	[0.20]	[0.45]			
4.31***	3.96	1.66	0.44			
[3.58]	[0.45]	[0.66]	[0.12]			
1050	1050	1050	1050			
0.06	0.10	0.88	0.87			
0.01	0.06	0.87	0.86			
1.99	1.95	0.36	1.95			
2.09	2.09	2.14	2.27			
	Model 1 -5.64*** [-26197.80] - <tr< td=""><td>Market Model Model 1 Model 2 -5.64^{***} -5.72^{***} $[-26197.80]$ $[-3.24]$ 0.33 $[0.31]$ 34.87^{***} 34.61^{***} $[4.79]$ $[225.94]$ -31.75^{***} -31.53^{***} $[-4.29]$ $[-443.10]$ 3.44^{***} 3.55^* $[41.68]$ $[1.65]$ 4.31^{***} 3.96 $[3.58]$ $[0.45]$ 1050 1050 0.06 0.10 0.01 0.06 1.99 1.95 2.09 2.09</td><td>Market Model Regu Model 1 Model 2 Model 3 -5.64^{***} -5.72^{***} -0.39 $[-26197.80]$ $[-3.24]$ $[-0.48]$ -4.66^{***} $[-31.53]$ 0.33 $[0.31]$ $[1.770]$ $[14.79]$ $[225.94]$ $[137.10]$ $[-1572.36]$ 3.44^{***} 3.55^*</td><td>Market Model Regulated Market Models Model 1 Model 2 Model 3 Model 4 -5.64*** -5.72*** -0.39 -0.60 [-26197.80] [-3.24] [-0.48] [-0.70] - - -4.66*** -4.61*** - - [-31.53] [-10.73] - 0.33 - 0.89 - [0.31] - [2.05] 34.87*** 34.61*** 2.90*** 1.93 [4.79] [225.94] [137.10] [0.30] -31.75*** -31.53*** -3.03*** -1.99 [4.29] [-443.10] [-1572.36] [-0.34] 3.44*** 3.55* 0.17 -0.45 [41.68] [1.65] [0.20] [0.45] [3.58] [0.45] [0.66] [0.12] 1050 1050 1050 1050 1050 1050 1050 1050 1050 1050 0.88 0.87 0.01</td></tr<>	Market Model Model 1 Model 2 -5.64^{***} -5.72^{***} $[-26197.80]$ $[-3.24]$ $ 0.33$ $ [0.31]$ 34.87^{***} 34.61^{***} $[4.79]$ $[225.94]$ -31.75^{***} -31.53^{***} $[-4.29]$ $[-443.10]$ 3.44^{***} 3.55^* $[41.68]$ $[1.65]$ 4.31^{***} 3.96 $[3.58]$ $[0.45]$ 1050 1050 0.06 0.10 0.01 0.06 1.99 1.95 2.09 2.09	Market Model Regu Model 1 Model 2 Model 3 -5.64^{***} -5.72^{***} -0.39 $[-26197.80]$ $[-3.24]$ $[-0.48]$ $ -4.66^{***}$ $ [-31.53]$ $ 0.33$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [0.31]$ $ [1.770]$ $[14.79]$ $[225.94]$ $[137.10]$ $[-1572.36]$ 3.44^{***} 3.55^*	Market Model Regulated Market Models Model 1 Model 2 Model 3 Model 4 -5.64*** -5.72*** -0.39 -0.60 [-26197.80] [-3.24] [-0.48] [-0.70] - - -4.66*** -4.61*** - - [-31.53] [-10.73] - 0.33 - 0.89 - [0.31] - [2.05] 34.87*** 34.61*** 2.90*** 1.93 [4.79] [225.94] [137.10] [0.30] -31.75*** -31.53*** -3.03*** -1.99 [4.29] [-443.10] [-1572.36] [-0.34] 3.44*** 3.55* 0.17 -0.45 [41.68] [1.65] [0.20] [0.45] [3.58] [0.45] [0.66] [0.12] 1050 1050 1050 1050 1050 1050 1050 1050 1050 1050 0.88 0.87 0.01		

Table 3 Regression Results

4.1 On the Invisible Hand of the Price System

Of the results reported on Table 3, Models 1 and 2 — the standard market models described in section 2.2.1 — consider the impact of price (HP), supply-and-demand (DS), short- and long-term interest rates (SINTR and LINTR), as well as average incomes (INC) on sales.

Model 1 shows, effectively, that the invisible hand of the price system works: price is negatively and significantly related (at the 1% level) to real estate sales, to the point that a 1% rise in price results in almost a 6%

reduction in the level of real-estate sales. Long-term interest rates are positively and significantly related (at the 1% level) with property rates, while short-term interest rates have a negative and significant (at the 1% level) effect. This is because of the fact that short-term interest rates reflect the current price of money, whereas long-term interest rates can be viewed as an expectation of growth (Hirschleifer, 1958). An increase in short-term interest rates thus makes borrowing more expensive, and lowers the rates of investment in property, while a rise in long-term interest rates suggests a positive outlook, rising property prices, and economic growth, and this attractiveness of current investment. Finally, we observe that the average income level is positively related with property sale, and that a 1% rise in the former causes a 3.5% expansion in the latter. This, again, is an intuitive finding, and taken together the results of Model 1 provides evidence in support of Hypothesis 1, on the natural and familiar operation of a free-market price system, in the presence of Hayekian "spontaneous order". Finally, and to account for the relatedness between price, and supply-and-demand, Model 2 estimates Equation 4, without controlling for supply-and-demand. In it, the effects observed in Model 1 hold, and are shown to be robust. The price system in China, it seems, works.

The "goodness of fit" of Models 1 and 2 is, however, extremely low: an R-Squared of 0.06 and 0.10, and an Adj R-Squared of 0.01 and 0.06 respectively, suggests that our models explain as little 1% of the variance in property sales. The free market models therefore, we suggest, quite clearly misses some important explanatory variables in understanding the market.

4.2 On the Visible Hand of the Chinese Government

Of the results reported on Table 3, Models 3 and 4 — the regulated market models described in 2.2.2 — attempt to correct for the obvious omission of governmental intervention in Models 1 and 2, by adding the G-Factor to the free market specification. In doing so, we move to explicitly consider the effects of the "visible hand" on the variance in the Chinese property market.

Model 3 shows that governmental action is negatively and significantly related (at the 1% level) with property sales, and suggests that a 1% rise in government activities causes a 4.6% drop in the level of property sales. This, we suggests, supports Hypothesis 2, on the existence of a significantly negative relation between governmental intervention and property sales. The other variables — namely supply and demand, short- and long-term interest rates, housing price, and average income — are not significantly related any more. Again, to account for the possible relatedness of the supply-and-demand variable (DS) with price (HP), Model 4 re-estimates Model 3, but this time without controlling for the effects of supply-and-demand. In it, the insignificant effects of price — observed in Model 3 — hold, and are shown to be consistent — thus supporting our conclusions on the effects of governmental intervention on the market — although then the significance of short- and long-term interest rates are re-established.

Finally, and turning to the "goodness of fit", we see that adding government intervention to the equation, in Models 3 and 4 drastically improves our understanding of the variance in the market. An R-squared of 0.88 and 0.87, and an Adj R-squared of 0.87 and 0.86 respectively suggest that property models which include the G-Factor explain as much as 88% of the variance in sales. In contrast to the results of Models 1 and 2, this is an impressive finding.

4.3 On the Significance of the G-Factor

Taken together these results suggest that, in the absence of government intervention, the price system works, and the market functions as well. Low R-Squared in both Models 1 and 2, however, suggest that the free market models fail to explain much of the variation in the Chinese market. Adding government intervention to the equation in Models 3 and 4 improve the predictive power of the model; an R-Squared of 0.88 and 0.87, and an Adj R-Squared

of 0.87 and 0.86 respectively suggest that the G-Factor models explain as much as 88% of the variance in sales. We can therefore suggest that not only can the results of the G-Factor models be relied upon, but see that intervention plays a significant — of not the most significant — role in the Chinese market. In fact, because price (HP) becomes insignificant in Models 3 and 4, we can suggest that, when utilized, the "visible hand" of an interventionist government can neutralize the "invisible hand" of the market mechanism. This is an important finding, we suggest, with a number of important implications, both in general, and for China, which are discussed below.

5. Discussion

5.1 Key Findings

(1) The property market is ruled by the invisible hand...

The results presented on Table 3 suggest that, in the "base case", and using standard market models, the property market operates under normal market conditions. Our results show that property price negatively impacts sales, as do short-term interest rates. Long-term interest rates, which we interpret as an expectation of future growth, and average incomes positively, impact sales. All are, we suggest, intuitive results, and evidence the natural operation of the 'invisible hand' in the property market. In doing so, we replicate the findings of numerous authors on the operation of the property market; papers and findings which we summarize on Table 1.

(2) ... until the visible hand of government intervenes

The results of Models 3 and 4—on the significance of the G-Factor–suggest, however, that when we account for the "visible hand" of an interventionist government, the "invisible hand" of the market mechanism dissolves. Our results show that the G-Factor negatively and significantly impacts the volume of sales, and that in the presence of the G-Factor the price system fails to significantly impact the volume of sales. Long- and short-term interest rates, and average incomes, report the expected results. But the significance of the G-Factor evidences the dominance of the visible hand in the property market. For property market models in general, and for the case of China road to capitalism in particular, this is an important finding. It suggests not only that scholars looking to explain Chinese market movements should account for the role of the government. But also suggests that, although much progress has been made, the Chinese property market is not free, or market-oriented, but still very much state controlled.

(3) Property market models must include government intervention

Low R-Squares in base case of the standard model suggest that the free-market price system fails to explain much of the variation in the Chinese property market. An R-Square of 0.06 and 0.10, and an Adj R of 0.01 and 0.06 respectively, suggests that these models explain as little 1% of the variance in property sales. Adding government intervention to the equation in Models 3 and 4, however, drastically improve the predictive power of the models. An R-Square of 0.88 and 0.87, and an Adj R of 0.87 and 0.86 respectively suggests that the G-Factor models explain as much as 88% of the variance in sales. We can therefore suggest that not only can the results of the G-Factor models be relied upon, but that intervention plays a significant role in our data-set, and must be included in future analyses of the Chinese property market. This is an important finding for authors working to better describe property market movements, in general.

(4) Chinese property market depends on government supply

In our model, government intervention is measured in terms of the volume of land that the government adds or withdraws from circulation. The implication from our findings is that, from the supply side, it the Government, and the decisions that government make on the quantity and quality of land available which effects market demand, and not the price system. Government intervention is therefore the bottle-neck in property sales, we suggest, and this raises questions as to what level an equilibrium would have been achieved in the absence of an interventionist government. We can speculate that a free-market would lower prices, and would perhaps fuel a boom, and maybe government intervention may be rationalized as a measure to slow the property boom. The literature on transaction costs economics, however, draws the logic of this conclusion into question: if the purpose of intervention is to slow demand, the creation of a monopoly on the supply of land is not the optimal approach for achieving these ends.

(5) The Chinese economy remains a controlled economy

Finally, and in terms of classification, it is clear that while the "socialist market economy of China" has made much progress on the road to capitalism, much work still needs to be done. It is clear from our analysis of the property market that China remains a controlled economy. In spite of the recent discussions on the opening up of China, the market-based economic reforms it has instigated since the 1970s, and the emergence of a consumerist middle-class, it is clear from our results that the government remains the first and foremost power, at least in terms of the Chinese property market. Whether this is to be welcomed, or worried about remains unclear. But for now our results suggest that the "visible hand" of government remains predominant.

5.3 Future Research

Owing to the richness of the data, and the fact that we have observations too at the city level, we invested the role of government regulation in each of the 10 cities; namely, Shanghai, Beijing, Guangzhou, Shenzheng, Tianjing, Wuhan, Hangzhou, Chongqing, and Nanjing. In each case we estimated Equation 4, and our results (not reported) show variation in the significance of government intervention across regions. In eight of the ten cases government influence had a negative and significant impact (at the 1% level), with beta estimates ranging from -0.24 to -1.18. The cause of the variance is, however, outside the scope of this particular project, and so the picture of government intervention that emerges from our study — at least at the local level — remains unclear. In a future research project, it might be interesting to consider policy differences, at the city level, not only in order to better explain variance across regions, but in an effort to better profile the differences in the visible hands of the Chinese government.

6. Conclusions

The Chinese property market has undergone major reforms in recent years. And so profound were the changes that prominent scholars suggest that, at least in terms of the property market, China has completely moved from a centrally planned public housing system to a market-based system, with competition in both production and consumption (Ye and Wu, 2008; Deng et al., 2009). At the same time, however, it is said that the new market-based system has its own particularly Chinese characteristics. With the local governments decided what can be built, when, and by whom. The aim of this research is to describe how market-based China's new market-based property system really is. And to do so, we test the applicability of a number of standard, property market models, calibrated to market-orientated property systems.

We used a straightforward empirical model, and employ data, collected in the period 2000–2010, on the market performance of the real estate industry, along with a number of important macroeconomic controls variables. We tested the standard "market model", and in doing so found that markets work, in general. However,

such models explain as little as 1% of the variance in property sales. And clearly therefore, a huge amount of variance remains unexplained. By adding a variable that accounts for government intervention to the "market model", we create a "regulated market model". And with this specification, the predictive power of the model soars to 87%. In the "regulated market model", however, the significance of the price system disintegrates. In these models, it is government supply, and not price, which dominate sales.

The implications of our study are significant. In terms of property market models, we show that those models calibrated to Western markets do not necessarily fit developing ones. Secondly, and more importantly, we not only evidence the important role of government's "visible hand" in the Chinese property market but, by implication, illustrate that, despite the progress, China remains a controlled economy. This leads us to wonder if China is still on the road of capitalism. Or if the goal of the government is to have a free market in nothing but name.

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Still on the Road to Capitalism? Weighing the Visible Hand of Government Intervention in the Chinese Property Market

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Table A1 Data Descriptives											
	HS	HP	NHP	RP	SINTR	LNHS	INC	IOH	HSV		
Median	23610.44	3518.73	35860.10	18739.10	5.58	0.20	21989.00	6954.87	8429.68		
Maximum	85294.42	4586.50	92463.47	40609.18	7.47	0.79	26738.00	25618.74	38157.21		
Minimum	2345.80	2437.00	6094.20	2288.07	5.31	-2.71	15637.80	802.87	687.36		
Skewness	0.82	0.24	0.47	0.16	0.80	-2.91	0.03	0.91	1.27		
Kurtosis	3.15	1.99	2.56	2.07	2.11	10.22	1.70	3.10	4.55		
Jarque-Bera	7.27	3.37	2.89	2.65	9.02	232.72	4.58	9.01	24.06		
Probability	0.03	0.19	0.24	0.27	0.01	0.00	0.10	0.01	0.00		
Observations	1050	1050	1050	1050	1050	1050	1050	1050	1050		

Appendix A							
ble A1	Data Descriptive						

	Table A2 Correlations										
	Mean	SD	1	2	3	4	5	6	7	8	9
HS	27008.020	18990.520	1.000								
HP	3409.677	652.435	0.441	1.000							
NHP	38016.400	20515.870	0.960	0.372	1.000						
RP	19256.470	10365.660	0.807	-0.062	0.869	1.000					
SINTR	6.072	0.784	0.016	0.130	0.059	0.027	1.000				
LNHS	0.058	0.772	0.233	-0.122	0.290	0.323	-0.042	1.000			
INC	21204.480	3842.794	0.391	0.975	0.363	0.075	0.152	-0.081	1.000		
IOH	8319.119	6042.721	0.949	0.511	0.972	0.756	-0.048	0.217	0.500	1.000	
HSV	9812.721	8059.441	0.974	0.584	0.917	0.670	-0.019	0.193	0.526	0.952	1.000