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Abstract

"In the old days, construction statistics and other important data were closely guarded secrets. Developers can now look at competitors' numbers and tell at a glance if an area is becoming overbuilt."
From a *Wall Street Journal* article about U.S. office markets, January 23, 2004.

Keywords

Cornell, real estate, overbuilding, development, hotels, hotel markets

Is Overbuilding Risk Declining? Evidence From Hotel Markets

John B. Corgel¹

“In the old days, construction statistics and other important data were closely guarded secrets. Developers can now look at competitors’ numbers and tell at a glance if an area is becoming overbuilt.” From a *Wall Street Journal* article about U.S. office markets, January 23, 2004.

I. Introduction

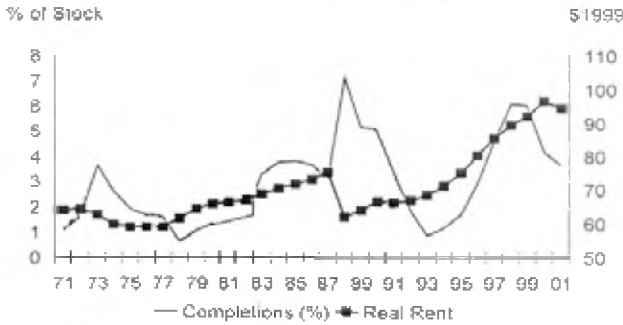
Commercial real estate markets have the tendency to become overbuilt as demonstrated in the U.S and other developed countries during the past three decades and analyzed in many conceptual and empirical real estate economics papers.² Some types of real estate tend to become more overbuilt than others. Again, both theory and evidence support this conclusion.

As a working definition, ‘overbuilding’ occurs when additions to supply, principally from new property construction, accumulate to a point at which the existing supply of space clearly exceeds the current demand for space. Well, so what? – demand for space eventually catches up! But unfortunately, before demand growth eliminates overbuilding conditions two policy issues surface. First, continuing to direct capital to construction of buildings that no one needs is an obvious misallocation of society’s resources. Second, overbuilding imposes financial pressures on existing property owners who may then default on mortgage loans. Overbuilding, therefore, elevates the level of stress in the real estate capital markets that may not subside until well after demand and supply reach a balance.

At certain points over the past three decades, hotels became the most overbuilt among property types, making U.S. hotel markets an excellent candidate for studies of possible future overbuilding problems.³ As shown in Exhibit 1 (on the following page), completions rose sharply as real rent (i.e., real ADR) declined twice during the past three decades – the early 1970s and the late 1980s. The paths of real rents and completions appear more coincidental throughout much of the 1990s. With hotel markets recovering from a four-punch flurry of recession, catastrophic events, war, and human disease, consideration must be given to the question: are hotel investors again exposed to excessive supply growth risk? Fortunately, the answer appears to be no! Strong doses of rational federal policy and care giving combined with an information explosion create an environment going forward for modest hotel market overbuilding, at worst. The same conclusion may apply to other overbuilding-prone property types, such as office real estate.

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Exhibit 1
Hotel Market Completion History



Source: Titus and Wheaton (2002)

This paper reviews the causes of overbuilding and reports on findings from an empirical study of hotel market demand and supply relationships during the most recent 15-year period. The findings support the conclusion that overbuilding risk is declining.

II. Mild Cases and Severe Cases of Overbuilding

Most stories about excessive real estate supply growth begin with the recognition that markets follow cyclical patterns over time. Historically, commercial real estate supply cycles have fallen into two categories according to property type. For some types such as multifamily, industrial, and small retail, the pattern of completions directly followed the business cycle during the past few decades (Mills, 1995 and Wheaton, 1999). Aggregate demand shocks preceded increases in construction activity with a normal response pattern suggesting that real estate cycles for these property types are *exogenous*. The supply additions of office space (Wheaton 1987), regional retail center space (Benjamin, Jud, and Winkler 1998), and hotel rooms (Wheaton and Rossoff, 1998), however, exhibited less conforming patterns relative to those of the general economy. Supply in these cases appears to have a 'mind of its own' and is sometimes referred to as following *endogenous* cycles.

Investment in office, regional shopping centers, and hotels may expose investors to excess overbuilding risk. Yet, fears about overbuilding mainly arise from their experiences during two historical periods; (1) the middle and late-1970s and (2) the late 1980s and early 1990s. The real estate markets operated during the former period in an economic environment characterized by both double-digit inflation and unemployment. The steep drop in nominal interest rates coming out of this period has been directly linked to office overbuilding by Kling and McCue (1987). The U.S. real estate markets during the second of the two periods performed under the influence of over-stimulative tax law and financial institution deregulation. Corcoran (1987) and Hendershott and Kane (1992) document the perverse effects of this early-1980s legislation on the commercial real estate markets.

Furthermore, as the quote from the *Wall Street Journal* at the beginning of this paper suggests, many believe that the substantially lower cost of real estate market information

today- compared to earlier decades when overbuilding occurred- lessens the probability of overbuilding going forward. For the above reasons, it seems unlikely that severe overbuilding will occur following the post- 2001 recovery, and also unlikely that supply growth in any property type will occur irrespective of movements in the economy.

III. Assessing Overbuilding Risks

The real estate cycle imposes credit risk management costs on lenders and regulators (Chinloy 1996). In an effort to control these costs, the Federal Deposit Insurance Corporation (FDIC) (2003) recently began monitoring the level of Metropolitan Statistical Area (MSA) construction activity relative to existing stocks and to current vacancy in remembrance of the real estate crisis of the 1980s and in recognition of the risks that overbuilding imposes on federally chartered intuitions. Institutions located in MSAs that the FDIC deems as overbuilding candidates would come under closer scrutiny in their commercial mortgage lending activities. The FDIC document states that, “The ranking schemes presented are intended to serve as a basis for prioritizing more in-depth analysis of depository institution risk exposures to individual markets and to specific market segments (p.1).” Credit rationing might even occur in the MSAs and property segments for which the FDIC determines that supply is being added at too rapid a rate.

Notwithstanding the substantial costs of overbuilding during the past three decades, overbuilding risk may be somewhat overstated if the effects of excessive supply growth in the space market are not translated directly into the asset market. Mueller (1995) argues that real estate cycles have two forms: (1) a physical cycle that reflects demand, supply, occupancy, and rent, and (2) a financial cycle that relates to the financial flow of capital into new and existing assets. This separation is developed to explain the lag in asset prices from changes in occupancy and rents. Hence, overbuilding may produce debt coverage problems as its effects are felt in the space market, but default probabilities and loan loss severity may not substantially increase if the effects on asset prices are felt with a long lag. The experiences of the recent recession and catastrophic events provide a parallel example. Rents and room rates dropped quickly and dramatically in many local markets, yet property prices remained surprisingly firm.⁴ Just as the decline in demand adversely impacted the space market without translation to the asset market, a surge in construction could produce the same series of outcomes. Sivitanides, Torto, and Wheaton (2003) attribute property price firmness in the face of declining fundamentals to a simultaneous decline in interest rates. Similarly, an upward movement of interest rates would stymie overbuilding.⁵

IV. Why Do Real Estate Markets Become Overbuilt?

A fairly long list of reasons to explain real estate market cycles and overbuilding have accumulated in print over the past two decades. This list follows:

1. *Long Delivery Lags* – It takes considerable time to plan and construct operating properties, and thus supply adjusts quite slowly to demand changes (McDonald

2002). Property types with longer delivery lags are the most prone to overbuilding (Torto and Wheaton 2002).

2. *Mistakes Due to Myopic Expectations* – Given the short-run supply inelasticity of real estate, immediate increases in rents and occupancy may be interpreted as long-run changes, thus triggering development. With myopic expectations, these future rents are capitalized at a constant rate into prices (Wheaton 1999).
3. *Mistakes Because of Unpredictable Demand Growth and Volatility* – Rapid demand growth and volatility create difficult forecasting environments that result in mistakes, especially given that exercise of the development option is difficult to reverse (Grenadier 1995a, Torto and Wheaton 2002, and FDIC 2003).
4. *Mistakes Caused by Prisoner's Dilemma* – Kummerow (1999) argues that market failure in the form of overbuilding occurs because developers involved in the early phases of concurrent projects cannot determine which competing projects will come to completion.
5. *Demand and Supply Elasticity Differences* – Overbuilding occurs when long-run supply price elasticity greatly exceeds the price elasticity of demand (Wheaton 1999).
6. *Federal Legislative Actions* – Two well-known federal acts in the early 1980s created subsequent development frenzy (Corcoran 1987 and Hendershott and Kane 1992).
7. *Interest Rate Volatility* – Rapid downward movements in interest rates overstimulate development (Kling and McCue 1987).
8. *Lease Contract Friction* – Persistence patterns in rents and occupancy occur because of certain landlord behaviors in leased properties, thus creating sub-optimal development option exercise (Grenadier 1995b).
9. *High Cost of Holding Land* – Wang and Zhou (2000) show that developers will oversupply the market at the first sign of opportunity because of the high cost of holding land.
10. *Economic Base Structure* – As basic employment slows, non-basic employment continues to grow giving false signals to developers about opportunities (McNulty 1995 and Gallagher and Wood 1999).
11. *High Rate of Economic Obsolescence* – Property types with high rates of obsolescence experience relatively high frequency cyclical patterns because of persistent replacement demand (Wheaton 1999). This characteristic raises the probability of overbuilding.

V. Why Do Hotel Markets Experience Severe Overbuilding?

In the Wang and Zhou (2000) model, overbuilding occurs as a rational response to development option exercise given that land does not produce periodic income. Because land cost has a central role in the model, the ratio of land-to-building cost becomes a condition that explains why some property types are more inclined to become overbuilt than others. They conclude that office and hotel markets are the most likely to experience development booms not supported by the local economics due to relatively high cost of holding land in inventory for these uses. Yet, these results may be specific to periods when external events cause the relative costs of land and building to deviate from historical norms. For example, property types with historically high capital-to-land ratios became the most favored development targets of real estate syndicates during the 1980s as they sought to maximize depreciation allowances.

During the past ten years, real estate markets operated without significant external influences. Also, information costs declined sharply in recent years due to far superior market data. For example, Smith Travel Research currently supplies RevPAR data for 4 million rooms in the U.S. (about 75 percent of all U.S. hotel rooms) each month and about 1 million each day. The monthly time series begins in 1987.

In light of these changes, important issues related to real estate cycles must be reconsidered. Evidence presented later in this paper suggests that the hotel cycle has become less endogenous during the past decade. Hence, the risks associated with capital allocation to hotel investment should be in decline. Severe overshooting on the supply side of sensitive real estate markets, such as hotels, may happen in the future only after periods of extraordinary demand growth.

VI. Analysis of Hotel Market data through the Most Recent Cycle

An endogenous supply cycle produces excess construction of operating properties without corresponding demand stimuli. As an initial step in the accumulation of evidence about the existence of an endogenous hotel market cycle during the past 15 years, the quarterly hotel market data are examined for overbuilding and associated demand triggers. Following Gallagher and Wood (1999), a simple filter is introduced to identify quarters exhibiting excess supply and excess demand conditions, where excess is defined as

$$E \geq g + \sigma \quad (1)$$

The value of E equals one when the year-over-year growth rate during a quarter exceeds the long-run average growth rate, g , plus one standard deviation, σ . Successive quarters of excess supply not preceded by quarters of excess demand offers prima facie evidence of an endogenous cycle.

Exhibit 2 presents the results from applying the rule in Equation (1). The data come from Smith Travel Research and include all chain-affiliated properties in the 75 large hotel markets in the U.S. Excess supply conditions occurred in two distinct sub-periods since 1988 - the late 1980s and the late 1990s. Demand growth was strong during or immediately following both sub-periods of excessive supply growth. Two potential development triggers, ADR and real personal income also exhibited abnormal growth patterns immediately prior to and continuing through the quarter when supply surged. This evidence suggests that abnormal supply growth in the U.S. hotel market occurred in response to extremely positive signals from the demand side of the market. Hotel developers appeared to have responded early and rationally to fundamental signals.

Exhibit 2: Excess Demand and Supply Using Plus σ Filter

Periods	Excess Supply	Excess ADR	Excess Demand	Excess Personal Income
Sub-Period 1 (Late 1980s)	1988 I-IV		1988 I-IV 1989 II	1988 I, III
Sub-Period 2 (Late 1990s)	1998 I-IV 1999 I-III	1995 IV 1996 II-IV 1997 I-II	2000 II	1995 I 1997 IV 1998 I-IV 2000 II

Source: Smith Travel Research

VII. Elasticity Estimates

The response of demand and supply to changing rents and asset prices provides useful information about the mechanics of real estate markets. In simulations performed by Wheaton (1999), the size of the spread between the elasticity of demand with respect to rent and elasticity of supply with respect to asset price has a strong influence on how much ‘overshooting’ occurs on the supply side. Estimating this relative elasticity, therefore, becomes an empirical question and comparing the relative elasticity during different historical cycles indicates whether risk is changing.

Using hotel market data for 1969 I through 1994 IV, Wheaton and Rossoff (1998) estimate the demand elasticity as -0.48 and the supply elasticity as 2.20 making the absolute value of the spread equal to 1.72. I estimate a spread of 1.10 from a demand elasticity of -0.48 and a supply elasticity of 1.53. By eliminating data from the late 1980s and early 1990s, the spread narrows even more. The demand elasticity in the hotel markets has remained stable since the late 1960s, while the supply elasticity is becoming smaller. Smaller supply elasticity means that construction and other alterations to supply happen at a reduced level as rents and asset prices change. More modest responses on the supply side provide hope that causes of real estate market overbuilding are becoming less pronounced.

Conclusion

The real estate cycle exposes equity investors and lenders to financial risk. The true costs of these risks are not known and little evidence exists regarding the pricing of these risks. An endogenous cycle imposes additional risk on capital providers. Real estate market models indicate that office properties, hotels, and large retail centers have the greatest overbuilding risk. The evidence for these claims, however, comes from periods during which the external influences on real estate markets were extraordinary. During the past ten years, real estate markets operated without significant external influences. Also, information costs declined sharply in recent years due to far superior market data.

In light of these changes, important issues related to real estate cycles must be reconsidered. Evidence presented in this paper suggests that the hotel cycle has become less endogenous during the past decade. Hence, the risks associated with capital allocation to hotel investment may be declining. Other indicators imply that severe overshooting and other irrationalities on the supply side of sensitive real estate markets, such as hotels, may happen in the future only after periods of extraordinary demand growth.

Endnotes

² See Pyhrr, Born, Manning, and Roulac (2003) for a review.

³ A known susceptibility to overbuilding creates another reason not to invest in hotel real estate. Institutional investors and lenders already have at least two good reasons to pass on hotel opportunities – the absence of credit security provided by leases and the management intensity that comes with operating businesses.

⁴ See Corcoran and Iwai (2003) and Sivitanides, Torto, and Wheaton (2003) for different points of view on the causes of these unique market conditions.

⁵ This outcome would be the reverse of what Kling and McCue (1987) found as interest rates declined in the 1970s.

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