Chapter 1
Real estate – the global asset

1.1 The global property investment universe

What proportion of an investment portfolio should be in real estate? What proportion of the real estate portfolio should be invested in the US, or Russia, or continental Europe?

A new investor building a global portfolio might reasonably want to know the composition by value of the 'market portfolio' – the total value of all investable assets, like stocks and bonds, added together. Given this, it is possible to imagine how your portfolio might be constituted, even if you had no views about the future performance of those assets. Assuming there were no 'friction costs', meaning the time and cost involved in accessing certain markets, which makes some less attractive than others, constructing a market portfolio would make some sense, especially given that it appears that we are not as good at forecasting market returns as we think we are.

We can estimate the size of the public equity markets at any time by adding together the market capitalization of the various global stock markets. We can do something similar with publicly-listed bonds. Private equity is more of a challenge, however, and real estate also creates significant difficulties. Many of the real estate assets in the world are never valued. Nobody knows the total value of the agricultural land in central Asia. There is a lack of transparency in many markets, and the generally low levels of information available in Asia and the emerging markets of the world mean that we do not know much about the size of the investable property markets in China,

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India and Pakistan, despite their huge populations and increasingly significant GDP. Even the total value of all US housing is subject to debate.

Nevertheless, we do have something to go on. While it has been estimated that real estate might comprise as much as 50% of the total value of the world's assets, this might not represent the value of the investable stock (after all, we have no intention of selling our homes in North Carolina and Oxfordshire to a sovereign wealth fund). We have no easy way of estimating the *investable* stock either, but we can have a stab at estimating the *invested* stock and adjusting that value upwards. This is the approach typically taken by analysts.

The value of the investable stock of commercial property available to institutional investors around the world has been estimated (by DTZ, 2008 and RREEF, 2007, among others) to be around $16 trillion. This is defined as stock that is of sufficient quality to become the focus of institutional investment. This estimate must be taken as the broadest possible guide. This value can be compared with a global equity market capitalization of close to $46 trillion in January 2010 (World Federation of Exchanges, 2010). Given a typical equity exposure of around 50%, this suggests a market portfolio weight for real estate of around 17%. Institutional exposure (averaging around 8% globally – see Table 1.1) remains below the market portfolio weight, suggesting that something appears to limit institutional investors' commitment to this asset class.

The $16 trillion investable stock of property can be broken down to the regional level. According to similar sources, the global market is split by asset value into 33% North America, 32% Europe, 27% Asia and the remaining 8% in the smaller regions.

The US (at 30%) and Japan (at 17%) are the two largest country markets in the world. The UK constitutes around 25% of all European institutional real estate and around 11% of global institutional real estate, the third-largest global market.

Return performance in the US institutional real estate investment market is measured by the National Council of Real Estate Investment Fiduciaries (NCREIF) whose NCREIF Property Index (NPI) consists of 6,057 investment-grade, income producing properties with a total value of $238 billion at the third quarter of 2010. The breakdown of the portfolio is 34.8% offices,

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Table 1.1: The global property investment universe ($bn)

Asia	Australasia	Europe	Latin America	Africa/ Middle East	North America	Total
4,448	323	5,395	443	468	5,505	16,582

Source: Property Funds Research, IMF, Pramerica REI, Chin and Dziewulska, 2006

25.1% apartments, 23.9% retail, 14.3% industrial and 1.9% hotels. Geographically, the NPI has 34.7% in the East, 32.9% in the West, 21.8% in the South and 10.6% in the Midwest.

In 2005 Key and Law estimated the total value of all commercial property in the UK to exceed £600 billion (a figure which includes the institutional market of £106 billion). Within this £600 billion, they estimate that 33% is retail property, 26% office property and 21% industrial property. The remaining 20% covers a wide range of property including hotels, pubs, leisure, utilities and public service buildings. The universe that was used to compile the IPD UK annual index at the end of 2007 comprised over 12,000 properties worth around €285 billion (£184 billion at the then current exchange rate).

A truly global real estate benchmark is approaching. For example, the IPD Global Property Index measures the combined performance of real estate markets in 23 countries. The Index is based on the IPD indices for Australia, Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Poland, Portugal, South Africa, Spain, Sweden, Switzerland, UK, US and the KTI Index for Finland.

As we shall see in Part Two of this book, ownership of this global universe is financed through equity (some private, and some public, such as that raised by public property companies) and debt (some private, such as mortgages, and some public, such as commercial mortgage-backed securities). This classification is known in the US as the 'capital stack' and breaks down as shown in Table 1.2.

The make-up of the private equity pot has recently changed as direct property ownership has been converted into fund formats, and public equity has grown as the Real Estate Investment Trust (REIT) format has been applied to more and more countries outside its US home.

UK-based consultant Property Funds Research (PFR) estimated in 2009 that 70% of the global property universe is held directly, while 17% is held in listed form and 13.4% is owned by private funds. Surveys suggest that there is a potential for much further growth in funds. In the long run, it is reasonable to suppose that more listed and unlisted property funds will follow to convert the huge pool of government and owner-occupier-held property into an investable form. It is expected that growth in the creation

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Table 1.2: The global real estate 'capital stack' (%)

Private equity	Public equity	Private debt	Public debt
30	6	50	14

Source: DTZ, 2010

of funds will continue. Prior to the crash of 2007–9, investors were taking more risk in search of maintaining attractive return levels, resulting in an increased appetite for what are called 'value-added' (higher risk) funds and growing interest in emerging markets on the fringes of Europe, the Middle East and North Africa, Sub-Saharan Africa, South America and Russia.

1.2 Market players

The property investment market is driven by investors and fund managers, guided by advisory firms.

1.2.1 Investors

The largest global real estate investors are pension funds, insurance companies and sovereign wealth funds (also known as government funds). Tables 1.3 and 1.4 show the world's largest sovereign wealth funds and pension funds and what we know about their property assets. (Many insurance funds are very large but more opaque.)

Insurance companies remain important, as do rich individuals operating through private banks and family offices. This immediately introduces us to the concept of the intermediary or capital aggregator, which is important in real estate because of the large size of the assets involved. Insurance companies, pension funds, private banks and wealth managers are aggregators of retail (individuals') capital, and are seen as investors, largely because they have discretion or control over investment decisions. Meanwhile, aggregators of institutional capital such as fund managers acting for pension funds are seen not as investors but as a particular breed of advisor.

It can be difficult to distinguish between a sovereign wealth fund such as the Abu Dhabi Investment Authority and a national pension fund such as the Japanese Government Pension Investment Fund, but pension funds generally have well defined and immediate liabilities, specifically to pay our pensions, while sovereign wealth funds may have no defined liabilities other than a broad objective to protect the nation's wealth. This is an important distinction in real estate investing, because (as we will see later in this chapter) real estate is regarded as an illiquid, long-term asset class, more suited to the investor without short-term liabilities. Hence it appears to be especially attractive to sovereign wealth funds (see Box 1.1 at the end of this chapter).

Sitting somewhere between the investor and fund manager categories are other aggregators, including real estate fund of funds managers and other advisory firms. Whether through discretionary or advisory (non-discretionary) mandates, these groups act on behalf of smaller investors to access global real estate assets and funds.

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Table 1.3: The largest sovereign wealth funds and their property assets

Domicile	Capital name	Total value of fund (US$m)	Invests in property?	Value of property (US$m)
United Arab Emirates	Abu Dhabi Investment Authority	627,120	Yes	40,763
Norway	Government Pension Fund	483,015	Yes	
Saudi Arabia	Monetary Agency Foreign Holdings	433,787	Yes	
China	SAFE – State Administration of Foreign Exchange	347,067		
China	China Investment Corporation	332,457	Yes	3,989
Singapore	Government Investment Corporation	247,505	Yes	24,414
Kuwait	Kuwait Investment Authority	202,871	Yes	
Hong Kong	Hong Kong Monetary Authority Exchange Fund	140,176	Yes	
Singapore	Temasek Holdings	134,822	Yes	12,134
China	Chinese National Council for Social Security Fund, The Peoples Republic of China	117,481	Yes	
Russia	Russian National Wealth Fund	91,595		
Russia	Russian Reserve Fund	74,027		
Libya	Libyan Investment Authority	65,278	Yes	
Kazakhstan	Samruk-Kazyna National Welfare Fund	63,724	Yes	
Australia	Australian Future Fund	59,330	Yes	2,753

Source: Property Funds Research, November 2010

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1.2.2 Fund managers

Property investment is illiquid and difficult to diversify. An apparently obvious solution to these problems is the use of liquid traded property vehicles in place of the direct asset. A variety of legal structures exist that

Table 1.4: The largest pension funds and their property assets

Domicile	Capital name	Total value of fund (US$m)	Invests in property?	Value of property (US$m)
Japan	Japanese Government Pension Investment Fund	1,266,589		
US	Teachers Insurance and Annuity Association – College Retirement Equities Fund	426,078	Yes	66,012
Netherlands	ABP Stichting Pensioenfonds	295,324	Yes	23,626
Korea	Korean National Pension Scheme	245,070	Yes	6,127
US	Thrift Savings Fund	244,019		
US	California Public Employees Retirement System	212,000	Yes	14,628
Japan	Japanese Local Public Service Employees Mutual Association	175,128		
US	Nationwide NFN Pension Plans	146,700		
US	California State Teachers Retirement System	138,582	Yes	12,869
US	New York State Common Retirement Fund	129,024	Yes	8,258
Canada	Canada Pension Plan Investment Board	125,193	Yes	6,868
Netherlands	Pensioenfonds Zorg en Welzijn (PGGM)	122,363	Yes	17,997
Malaysia	Malaysian Employees Provident Fund	112,405	Yes	899
US	Florida Retirement System	110,020	Yes	7,041
Singapore	Singapore Central Provident Fund	111,941	Yes	

Source: Property Funds Research, November 2010

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are capable of providing a means for investment in domestic or international real estate investment, including REITs and the new generation of unlisted property funds, both open-ended and closed-ended. In addition, work continues on the development of synthetic vehicles (derivatives) to provide solutions to these problems. These vehicles may have the primary objective of reducing tax, of achieving liquidity or of aligning the interests of the investors and the managers. They exist primarily to permit co-mingling of investors and are more fully described in Part Two of this book.

As a result of the boom in funds, there has been a shift in control of the global market away from the insurance companies and pension funds, which were so dominant in 1980, towards fund managers and property companies (the distinctions between which are occasionally blurred). Through the 1980s the institutional investor dominated the industry, controlling the larger transaction business and driving best practice. In the 1990s the effects of privatisation and outsourcing reached down to the institutions. There has consequently been a restructuring of their investment and property divisions, with the result that the power base now lies within specialist fund management operations, which may themselves be owned by what used to be insurance companies and are now financial services groups.

Table 1.5 shows the top 15 global property fund managers and the value of the assets held by those managers in Europe, the Americas, Asia and Australasia. Significantly, there are as yet no large Asia-based managers. Most of these firms are institutional fund managers owned by bank or insurance businesses, but many of the risk takers are property companies. In Asia, this is likely to be where the next phase of growth will come from.

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1.2.3 Advisors

Developments in the investor and fund manager communities have created a more complex industry structure and a confusion of ownership and management. The traditional property service providers have been severely challenged by these changes. Even so, many of these businesses have been successful in creating their own fund management operations (such as LaSalle Investment Management and CBRE Investors).

Other advisors or service providers have become essential to the working of the commercial real estate investment market. These include placement agents and promoters of property funds; lawyers; tax advisors; trustees and custodians; investment brokers and agents; valuers; and property and asset managers, who are most easily found within the traditional service

Table 1.5: The PFR global manager survey, 2010 – top-15 managers by assets under management (AuM) ($m)

	Total AuM	Europe	North America	Latin America	Australasia	Asia	Africa/ Middle East
ING Real Estate Investment Management	92,252.85	35,969.61	44,938.00		7,423.01	3,922.24	
AXA Real Estate Investment Management	55,048.94	54,799.50				249.44	
Morgan Stanley Real Estate	50,544.00	16,396.00	15,343.00	263.00	4,214.00	13,293.00	1,035.01
UBS Global Asset Management	45,186.00	24,789.23	13,026.82		404.27	6,965.70	
RREEF	44,922.23	21,833.21	20,385.31			2,703.71	
AEW Capital Management	42,915.69	24,267.59	17,642.30			1,005.80	
Pramerica Real Estate Investors	42,524.02	8,800.09	24,982.33	2,590.88		6,150.57	
Brookfield Asset Management	40,900.00	1,600.00	26,000.00	5,799.99	7,500.00		
LaSalle Investment Management	39,900.00	14,850.00	16,400.00		700.00	7,950.00	
Hines	35,809.99	3,554.00	26,491.00	2,583.00		3,182.00	
Aberdeen Property Investors Holding AB	35,251.39	33,840.76	705.31			705.31	
CB Richard Ellis Investors	34,700.00	12,700.01	20,900.00			1,100.00	
Aviva Investors	33,471.50	32,263.61	80.85		118.04	1,009.00	
JP Morgan Asset Management (UK) Limited	33,029.99	3,157.00	29,496.00			377.00	
IVG Immobilien AG	32,541.95	30,714.15	1,605.59			222.20	

Source: Property Funds Research, 2010

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providers but have competition in the form of specialist facilities management businesses.

1.3 Property – its character as an asset class

Institutional investors appear to hold less property than would be indicated by its neutral market weighting. This under-weighting can be attributed to several factors. These include the following.

1. The operational difficulties of holding property, including illiquidity, lumpiness (specific risk) and the difficulties involved in aligning the property and securities investment management processes.
2. The introduction of new alternative asset classes, some offering the income security and diversification benefits associated with real estate, including index-linked government bonds and, private equity, infrastructure, and hedge funds.
3. A lack of trust in property data, due to the nature of valuations, suspicions of smoothing in valuation-based indices and the lack of long runs of high frequency return histories.

The result, as we have seen, is a mismatch between the importance of the asset class in value and its weighting in institutional portfolios. Between 1980 and 2000, insurance companies reduced their property holdings from allocations as high as 10% (US) and 20% (UK) to much lower levels. The case for property may have been overstated in the past, but suspicion regarding the asset class has reduced its appeal to institutions.

This is despite the fact that property investment has become better managed and more professionally packaged, and many of the problems associated with property investment appear to have found workable (if imperfect) solutions. The measurement, benchmarking, forecasting and quantitative management techniques applied to property investments has become more comparable with other asset classes. Advances in property research have provided ongoing debates with a foundation of solid evidence and produced a clear formulation of many relevant issues. The result was an early 2000s boom in commercial and residential real estate investment across the globe, accompanied by such excellent returns that by 2005 property had become a high-performance asset class. However, the crash of 2007–9 pointed to cracks in the foundations.

By 2007, inevitably, clear overpricing had become evident in housing and in commercial property of all types in the UK, the US and elsewhere. The ability of property investors and homeowners to take on debt secured on the value of property, coupled with the ability of lenders to securitize and sell those loans, created a wave of capital flows into the asset class and a

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pricing bubble. Professional responsibility took a back seat to the profit motive. Researchers became fund managers, academics became increasingly detached from the product development engine room, and boardrooms lacked the detached yet experienced voice that advances in information and research should have made available.

London and New York had become the main centres for creative property structuring through REITs, unlisted funds, property derivatives and mortgage-backed securities, and became the eye of the financial storm that followed. The technical advances made in information and research and the spreading of risk, made possible by the development of property investment products, did not prevent a global crisis from being incubated in the world of property investing. Worse, the global financial crisis of 2008 had its very roots in property speculation, facilitated by the packaging and repackaging of equity, debt and risk. It is essential, as a result of this noise, to re-examine the fundamental character of real estate as an asset class.

As with all equity-type assets, the performance of property is ultimately linked to some extent to the performance of the economy (see Chapter 3), and like all assets its performance is linked to the capital markets (see Chapter 4). The economy is the basic driver of occupier demand, and, in the long term, investment returns are produced by occupiers who pay rent. However, in the shorter term – say up to 10 years – returns are much more likely to be explained by reference to changes in required returns, or yields. Required returns do not exist in a property vacuum but are instead driven by available or expected returns in other asset classes. As required returns on bonds and stocks move, so will required returns for property, followed by property prices.

Nonetheless, history shows that property is distinctly different from equities and bonds. The direct implication of property being different is its diversification potential, perhaps the strongest justification for holding it within a multi-asset portfolio. Generally, the impact of the real economy and the capital markets on the cash flow and value of real estate is distorted by several factors. It appears to be the case that these distortions contribute to the return diversity that investors crave, leading to inevitable disappointment when they reveal themselves.

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1.3.1 *Property depreciates*

- *Property is a real asset, and it wears out over time, suffering from physical deterioration and obsolescence, together creating depreciation.*

Commodities (say coffee, or oil) are by nature different from paper assets. Commodities will normally depreciate over time; they can have a value in use that sets a floor to minimum value; and they are generally illiquid. Finally, they may have to be valued by experts rather than priced by the market. Examples include property of all types (that is, both real and personal).

Real property is, unlike equities and bonds, a physical asset. While, unlike personal property, it is durable, the physical nature of commercial property means that it is subject to deterioration and obsolescence, and needs regular management and maintenance. Physical deterioration and functional and aesthetic obsolescence go together to create depreciation, defined as a fall in value relative to an index of values of new buildings.

The problem of building depreciation or obsolescence of freehold buildings is often understated. Poorly designed office buildings located in business parks in low land value areas will suffer more deterioration in performance over time than will city centre shops and shopping centres, and even industrial properties, located in high land value areas. A failure to identify the potential impact of depreciation is very dangerous. Before the boom of 2004–7, the UK office sector failed to outperform the UK IPD universe in every year except two since 1981: depreciation was probably one of the major causes.

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1.3.2 *Lease contracts control cash flows*

- *The cash flow delivered by a property asset is controlled or distorted by the lease contract agreed between owner and occupier.*

Unlike equities, property's income stream is governed by lease contracts and, unlike bonds, the income from a freehold is both perpetual and might be expected to increase at rent reviews and to change at lease ends. Property's cash flow and investment character flow from the effects of the customary occupational lease.

In a typical US lease of three to five years, rents will often be linked to the consumer price index or escalated according to a fixed schedule. In continental Europe, leases of between three and ten years will usually be indexed, although the degree of inflation captured by the lease rent will not always be 100%. In the UK, the initial rental income is usually fixed for the first three to five years, with uplifts to market rents at each rent review, sometimes upwards only. This creates a low-risk option or convertible asset. In many markets, turnover or percentage rents are adjusted to top up a base fixed amount with a percentage of the occupier's turnover, another form of option.

In Asia, commercial leases tend to be shorter, between two and three years, given the greater volatility of the markets in the region. As leases are shorter, they are also not normally linked to any index. In Australia the larger-area office leases tend to be for 10 years with the tenant having the right of a 10-year extension, with annual rent increases. For smaller areas, the lease would more typically be for three plus three years, or five plus five years. Rent increases would normally be annual, based on CPI (consumer price inflation) or fixed percentage rises, with market reviews at the beginning of the lease extension.

We deal more fully with leasing in Chapter 6.

1.3.3 The supply side is inelastic

- *The supply side is controlled by zoning or planning regulations, and is highly price inelastic. This means that a boom in the demand for space may be followed by a supply response, but only if permission to build can be obtained and only after a significant lag, which will be governed by the time taken to obtain a permit, prepare a site and construct or refit a property.*

The supply side of property is regulated by local and central government. The control of supply complicates the way in which an economic event (such as a positive or negative demand shock) is translated into return. A loosening of planning policy, such as happened in the mid-1980s, created the conditions for an immediate building boom, which, in the case of the US, was accompanied by tax breaks further distorting supply. Nonetheless, it is difficult to vary the supply of property upwards, and even more difficult to vary it downwards. This is termed inelasticity.

The supply side can be both regulated and inelastic, and will sometimes produce different return characteristics for property from equities – which is otherwise the natural property analogy, because both represent the residual call on returns – in the same economic environment. More elastic supply regimes, such as those pertaining in lo[illegible] planning environments in parts of Texas, or for industrial property in regeneration cities, will produce different cash flow characteristics for property investments than will highly constrained environments, such as the West End of London. The industrial investment will typically deliver less volatile rents and will show less rental growth in times of demand expansion than will the less elastic West End office.

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1.3.4 Valuations influence performance

- *The short-term returns delivered by property are likely to be heavily influenced by appraisals rather than by marginal trading prices.*

In the absence of continuously traded, deep and securitized markets, commercial property valuations perform a vital function in the property market by acting as a surrogate for transaction prices. Property asset valuations are central to the process of performance measurement but within both the professional and academic communities there is considerable scepticism about the ability of appraisals or valuations to fulfil this role in a reliable manner.

There is a consensus that individual valuations are prone to a degree of uncertainty. At the macro level, it is clear that few analysts accept that appraisal-based indices reflect the true underlying performance of the prop-

erty market. It is commonly held, for example, that such indices fail to capture the extent of market volatility and tend to lag underlying performance. As a consequence, issues such as the level and nature of valuation uncertainty and the causes and extent of index smoothing have generated a substantial research literature.

Some of this research indicates that valuations both lag the market and smooth the peaks and troughs of 'real' prices. Valuations can be 'sticky', and, if valuations affect the way investors think, so can prices.

In many jurisdictions, the fiduciary responsibility of the valuer towards the client is an important influence on valuer behaviour. Claims based on accusations of professional negligence are rare but not unknown, and judicial precedent is a powerful influence on the valuation process, as is 'anchoring'. (Anchoring is a general psychological tendency by which individuals overly rely on specific information or a specific value and adjust that value to account for changes. Once the anchor is set, there is a bias toward that value.)

It is not therefore surprising if a valuer, retained to produce a portfolio valuation on a three-year contract, pays attention to the year-end 2010 valuation when undertaking the 2011 equivalent and ensures continuity by limiting the number and size of shocks a client might suffer. This can reduce changes in valuation from one period to the next.

In addition, real estate valuation is founded primarily on the use of comparable sales evidence. Similarity in property characteristics is paramount. The currency of the transaction might not be easy to control. Hence the evidence used to value a property as at 31 December 2011 may use evidence collected over the period July to December. In a rising or falling market, this will again result in a lower variance of prices. Hence valuations will be based upon the previous valuation plus or minus a perception of change. The perceived changes, unless based on very reliable transaction evidence, will be conservative.

The resulting valuation 'smoothing' has been widely analysed. It is generally presumed to reduce the reported volatility – or risk – of real estate investment below the real level of risk suffered by investors who have to sell in a weak market or buy in a strong one.

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1.3.5 *Property is not liquid*

- *Property is highly illiquid. It is expensive to trade property, there is a large risk of abortive expenditure, and the result can be a very wide bid-offer spread (a gap between what buyers will offer and sellers will accept).*

It costs much more to trade property than it costs to trade securities. There are both direct and indirect costs. The direct costs include taxes paid by

buyers on property transactions (real property transfer taxes in the US vary from state to state, but stamp duty in the UK is as much as 4% of the purchase price for transactions worth more than £500,000) and fees paid by both buyers and sellers. In addition to taxes, buyers will incur survey fees, valuation fees and legal fees, totalling (say) 0.75%. The buyers' costs, including tax, can therefore be 4.75% in the UK. Sellers will incur legal fees (say 0.5%) and brokers' fees (say 1%), so that 1.5% can be the total sellers' costs, and a round-trip purchase and sale can cost 6.25%.

These costs, which can be even higher in other jurisdictions, define one cause of the 'bid-offer spread' which inhibits liquidity. It is natural for a seller to wish to recover his total costs, so that having bought a property for £1 m he will wish to get back £1.0625 m in order not to have lost money. But in a flat or falling market buyers will not pay this price, and sellers are tempted to wait until the selling market is stronger. Hence liquidity will be positively related to capital growth in the market.

There are also indirect costs of transacting property. Every property is unique, which means that time and effort have to be expended on researching its physical qualities, its legal title and its supportable market value. In addition, the process by which properties are marketed and sold can be very risky to both parties. In many markets, including England and Wales, there is a large risk of abortive expenditure because buyers and sellers are not committed until contracts are exchanged, and last minute overbids by another buyer, or a price reduction (or 'chip') by the buyer, are common. The role played by professional property advisors, and the integrity of all parties who may wish to do repeat business with each other, create a sensitive balance and risk control in the transaction process. This transaction risk must also be built into a bid-offer spread (the gap between what buyers will offer and sellers will accept).

Finally, the lack of a formal market-clearing mechanism for property, such as is offered by the stock market for securities, means that occasionally there may be few or no transactions, reducing the flow of comparable sales information and further increasing the perceived risk of a transaction, creating a feedback loop and self-sustaining illiquidity. This appeared to be the case, for example, in most global markets in 2007–9.

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1.3.6 *Large lot sizes produce specific risk*

- *Property assets are generally large in terms of capital price. This means that property portfolios cannot easily be diversified, and suffer hugely from specific risk.*

Property is heterogeneous, meaning that an investment can do well when markets do badly, and vice versa. Property is also 'lumpy'. Lumpiness – the large and uneven sizes of individual assets – means that direct property

investment (buying buildings) requires considerably higher levels of capital investment when compared with securities and, even with significant capital investment, diversification within property portfolios may prove to be more challenging than in equity and bond portfolios. As a result, typical property portfolios contain high levels of specific risk.

This fact, coupled with the growing globalization of property portfolios, largely explains the boom in indirect vehicles. There is also some evidence that large lot sizes have been high beta investments (more responsive to the economy and to rises and falls in the investment market). This adds a further risk level.

Specific risk in property, whether measured as a standard deviation or as a tracking error against a benchmark (see Chapters 4 and 17), is a key problem, especially for international investors. Unlike securities, large average property capital values, an uneven distribution of these values and the unique or heterogeneous nature of property assets create very different real estate portfolios across investors. Property funds offer a way to limit this problem, as all three issues are minimized by investing indirectly through diversified funds. But specific risk varies significantly between sectors, and unlisted funds (which add other risks) may be more useful in some sectors and countries than others. This is not simply a function of lot size, but also of 'diversification power' within sectors, defined as the efficiency of specific risk reduction through adding properties (Baum and Struempell, 2006 and Baum, 2007).

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Investors who have targeted property as an asset class will most likely be seeking to replicate the benchmark performance with few surprises; after all, the decision to invest in property is often based on an analysis of historic risk and return characteristics produced from a market index or benchmark. The tracking error of a portfolio is therefore likely to be seen as an additional and unrewarded risk. As a result, managers may be charged with minimizing tracking error – but with limited sums to invest. This is a very difficult challenge: how many properties are needed to reduce tracking error to an acceptable level?

Various studies have suggested that the appropriate number of properties is very large. Relevant sources of comparable work based on equity markets include the seminal work of Markowitz, 1952, Evans and Archer, 1968 and Elton and Gruber, 1977. A limited number of studies have used a similar approach to investigate risk reduction and portfolio size in the property market. They include Brown, 1988, Brown and Matysiak, 2000, Morrell, 1993 and Schuck and Brown, 1997. It is concluded that many assets are needed to reduce risk to the systematic level when value-weighting returns, depending on the degree of skewness of property values in the portfolio.

It is also well known that the necessary level of capital required to replicate the market will be greatly dependent on the segments of property in which one wishes to invest, as different segments of the property market exhibit

vastly different lot sizes. For example, it appears obvious that a very large allocation of cash may be needed to invest in a sufficient number of shopping centres to replicate the performance of that segment with a low tracking error.

In addition, there are significant differences in the performance characteristics of properties within the different segments. Properties in some segments – for example, London offices – may experience higher variations in return than others, resulting in the probability that more properties will be needed to minimize tracking error within the segment. If London offices are also relatively expensive, the problem of assembling a market-tracking portfolio at reasonable cost is magnified.

1.3.7 Leverage is commonly used in real estate investment

- *Leverage is used in the vast majority of property transactions. This distorts the return and risk of a property investment.*

The most common use of the term 'gearing' – the term 'leverage' is equally popular and the terms will be used interchangeably here – is to describe the level of a company's debt compared with its equity capital, and usually it is expressed as a percentage. So a company with gearing (debt to equity) of 60% has levels of debt that are 60% of its equity capital. Alternatively, gearing might be expressed as the level of a company's debt compared with its gross assets (debt plus equity). In that case, the above example would produce a gearing (debt to gross assets, or loan to value) ratio of 37.5%. Throughout this text we use both gearing and leverage to mean the relationship of debt to gross assets.

This concept (or these concepts) translates directly into the world of commercial real estate investment. In the right market conditions, banks have been willing to lend more against the security of property than against other assets such as equities. This is a result of property's income security and the land and bricks-and-mortar salvage value of a non-performing property loan.

Banks have typically been keen to lend against the collateral security offered by real estate assets, especially when the rental income more than covers the interest payments on the loan. But the use of gearing will change the financial mathematics of the real estate investment. It reduces the amount of equity that needs to be invested; it reduces the net cash flow available to the investor by the amount of interest paid; and it reduces the net capital received by the investor on sale of the asset by the amount of the loan still outstanding. This has some complex tax and currency effects in the international context (see Chapter 15) and allows more diversification of specific risk at the asset level, because the investor can buy more properties for the

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Table 1.6: The impact of exit yields on the risk to equity (70% leverage)

Exit yield (%)	IRR (%)	IRR on equity (%)
7.50	12.00	18.77
8.50	10.00	15.10
10.50	6.00	3.90

Source: Baum and Crosby, 2008

same total outlay of equity. It also has two more direct implications, on return and risk.

If the prospective return or IRR on the investment without using leverage is higher than the interest rate charged then, generally speaking, leverage will be return enhancing; and the greater the leverage, the greater will be the return on equity invested. In addition, the risk of the investment will be greater. The chance that the investor will lose his equity is greater the higher is the level of gearing, and the sensitivity or volatility of the prospective return will be greater. This is illustrated by Table 1.6, which shows how changing capitalization rates (yields) on the sale of a specific property (more fully described in Baum and Crosby, 2008) produced a wider range of returns on equity (using 70% debt) than on the unleveraged investment.

The history of ungeared direct property returns, such as is produced by IPD in Europe and NCREIF in the US, disguises the returns that have been available to investors' equity over most sub-periods of the past 25 years. Just as homeowners can, in times of rising house prices and low interest rates, significantly enhance the return on the cash they invest by borrowing, property companies and private commercial property investors use debt finance to increase returns on equity.

By using rents to pay interest and (if possible) some capital repayment (amortization), investors can enjoy a return on their equity investment in excess of the reported total return available to whole-equity investors, such as pension funds. These geared returns are rarely reported, but explain most private capital investments in global commercial property. Leverage is discussed in more detail in Chapter 9.

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1.3.8 *Property appears to be an inflation hedge*

- *Property rents appear to be closely correlated with inflation in the long run, producing an income stream that looks like that produced by an indexed bond.*

For many investors, particularly pension funds that have liabilities linked to future wage levels, the need to achieve gains in money value (in nominal terms) is of less concern than the need to achieve gains in the purchasing power of assets held (in real terms). Data suggests a strong correlation between rents and inflation in the long run, and the cash flow produced by real estate might (although subject to deterioration and obsolescence) be expected to increase in line with inflation over a long period.

There are many academic references to this topic, with varying conclusions, but most find a stronger long-term connection between rents and inflation than between annual returns and annual inflation. In the UK, for example, Baum (2009) found a reasonably strong long-run correlation (37% on an annual basis) between inflation and rental growth.

1.3.9 *Property is a medium-risk asset*

- *The risk of property appears low. Rent is paid before dividends, and as a real asset property will be a store of value even when it is vacant and produces no income. Its volatility of annual return also appears to be lower than that of bonds. But this measure is distorted somewhat by appraisals, and the performance history of real estate suggests a medium return for a medium risk.*

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Property can be described as a medium-risk asset. Its returns should be expected to lie between those produced by equities and those produced by bonds, and its risk profile should be middling.

Rent is a superior claim on a company's assets, and paid before dividends. Property's downside risk is limited, because as a real asset property will be a store of value even when it is vacant and produces no income. In addition, leases determine the delivery of income and produce short-term bond characteristics with longer-term equity performance.

However, on examination the available data does not fully support the idea that real estate is a medium-return, medium-risk asset class. The total returns delivered by UK commercial property over the period 1971–2010 (see Table 1.7) have been less volatile even than the returns from gilts.

Table 1.7: UK assets risk and return, 1971–2010

	Return (%)	Risk (%)
Equities	16.2	29.8
Gilts	10.9	13.3
Property	11.6	11.5

Source: IPD annual index, FTSE all-share index, FTSE 15-year gilt index
Note: 'Gilts' is a UK term for government bonds, akin to US Treasury Bills

Table 1.8: US assets risk and return, 1979–2010

	Return (%)	Risk (%)
Equities	13.1	17.3
Treasuries	8.2	9.9
Property	9.0	8.3

Source: NCREIF property index, S&P 500, Barclays Capital US 10-year treasury 10-year index

This data is supported by the US data shown in Table 1.8, using the period 1979–2010 for US equities (S&P 500), treasuries (US 10-year treasury 10-year index) and real estate (NCREIF NPI). Property again has a slightly lower risk than treasuries.

Despite the UK data, any conclusion to the effect that property returns have been less volatile than the returns from gilts or treasuries is flawed. Low volatility of delivered nominal returns disguises the illiquidity of property, which introduces a risk not reflected in the volatility of notional returns based solely on valuations from period to period. In addition, valuation-based returns are themselves believed to be biased towards lower volatility than typical underlying market conditions support. There are several reasons for this, discussed above, but the effect is serial or auto-correlation between consecutive values. Where this is present, the current valuation (Vt) is a weighted function of the present market value (Vt^*) and the immediate past valuation ($Vt\text{-}1$), so that:

$$Vt = aVt^* + (1-a)Vt-1$$

Using this formula, a series of valuations can be 'unsmoothed' to present a representation of the imagined (unobservable) market values. Given Vt and $Vt\text{-}1$, we need to assign weights (a and $(1\text{-}a)$) to each. If the current valuation (Vt) is \$10 m, last year's valuation ($Vt\text{-}1$) is \$8 m and $a = 0.5$, then the present market value (Vt^*) solves to \$12 m. The unsmoothed series will consequently demonstrate greater volatility.

$$Vt = aVt^* + (1-a)Vt-1$$

$$\$10\text{m} = 0.5(Vt^*) + (1-0.5)\$8\text{m}$$

$$\$10\text{m} - (1-0.5)\$8\text{m} = 0.5(Vt^*)$$

$$\$10\text{m} - \$4\text{m} = 0.5(Vt^*)$$

$$\$6\text{m} / 0.5 = Vt^* = \$12\text{m}$$

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The uncertainty of the nominal dividend income produced by equities over a given holding period compares with the absolute certainty of nominal income produced by a fixed interest security held to redemption. Commercial property falls somewhere between the two in terms of certainty of income.

Where leases are longer, such as the 10 to 15 years typical in the UK for prime or core real estate, and fixed or indexed, the principal return to the investor is an income return that is reasonably certain; and the value of the reversion at the expiry of the lease (while largely uncertain) is of reduced importance. So the risk of commercial property, generally a medium-risk asset, depends on the lease contract, with the result that some markets compare with bonds at the least risky end of the spectrum and others with equities at the most risky.

1.3.10 Real estate cycles control returns

- *Unlike stocks and bonds, real estate returns appear to be controlled by cycles.*

It has been suggested (by, for example, MacGregor, 1994) that repeatable patterns, or cycles, can be seen in the history of development, occupier and investment markets. These are expressed in the form of autocorrelation, or medium term trends, in construction activity, rents and cap rates (initial yields), with these in turn driving capital values and returns.

The inelasticity of property supply in response to price changes is perhaps the most important variable that explains the existence of a cycle of supply, rents, capital values and returns. Empirically, a cycle in property development is apparent, and most obvious in the London office market. Barras, 1994, identified short cycles (four to five years, the classic business cycle operating on occupier demand), long cycles (nine to ten years, a tendency for severe oversupply in one cycle to feed part of the next demand cycle), long swings (20 years, associated with major phases of urban development) and long waves (50 years, technology-based). More recent data suggest cycles of seven to eight years from peak to peak of development activity.

Figure 1.1 illustrates what many would describe as a cycle in UK property returns over the period 1947–2010. The period commencing in 1970 is especially interesting.

Development activity appears to be highly pro-cyclical with GDP growth and property values (rising and falling at the same time), but exhibits sharper rises and falls. As property values rise in a strong economy, developers gain confidence and construction activity increases. Hence, current development profits have been a good explanatory variable for development activity.

There is a strong relationship between office development and changes in rents, suggesting a degree of adaptive behaviour among lenders, investors and developers with a tendency to follow the market, often in an exagger-

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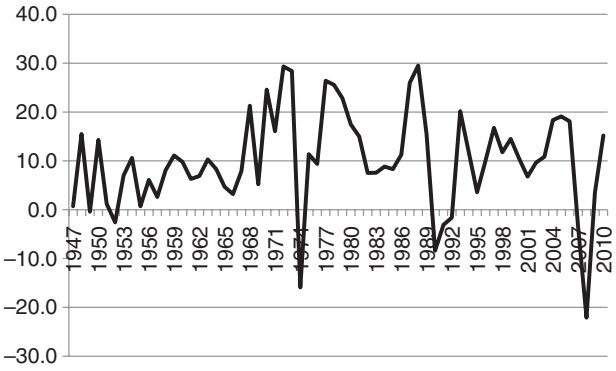

Figure 1.1: UK property returns, 1947–2010 (%)
Source: IPD, 2011, Scott, 1998

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ated fashion. As prices rise, prices are more likely to be expected to continue to rise; development profits are a function of continued price rises; hence price rises lead to ever-increasing supply levels, which create the conditions for lower prices (disaster myopia). The time lag between the inception and completion of developments creates an inevitable supply cycle.

Rents have also been strongly pro-cyclical with GDP (see Chapter 3). Barras, 1994, shows how periods of growth in GDP above the long-term trend rate of growth have been coincident with periods of growth in rents above long-term trend growth. The demand side is pro-cyclical with economic growth indicators, but the inelasticity of supply means that even highly regular demand cycles can generate irregular rental cycles. Hence rents will rise in response to economic growth and a static supply in the short term, and will continue to rise as construction activity gathers momentum; but the peak in construction activity may arrive after the peak in GDP growth, and an oversupply will result.

Some evidence of cyclicality in property yields (or cap rates – see Chapter 2) around a flat (mean-reverting) trend may be discernible over a long period. The long-run flatness of yields results in an extremely strong relationship between rental growth and capital value growth, both strongly pro-cyclical, although some extreme market movements have been strongly yield driven (a good example being many markets in 2004–7).

Work by IPD (drawing on historic data from Scott, 1998) provides the fullest picture of long-term commercial property performance yet available. Data assembled from various sources covering the period 1921–2010 show sixteen 'fairly distinct' peaks and troughs in the market. IPD identify six completed cycles, which ranged in length from four to twelve years, with an average of eight years. The average cycle length of eight years is interesting, as after roughly two more eight-year periods beyond 1989 the next peak of 2006–7 emerged.

1.3.11 Property appears to be a diversifying asset

- *Property returns have been less well correlated with returns on equities and gilts than returns on equities and gilts have been correlated with each other. In other words, while equities and gilts have usually performed well or badly at the same time, property has outperformed or underperformed at different times, thus smoothing out the overall performance of a portfolio with assets of all three classes.*

Mathematical models based on modern portfolio theory (MPT) play an important role in the investment market, especially in the advice on investment strategy and asset allocation given by actuaries and consultants to pension funds and insurance companies (see Chapter 4).

MPT reflects the desire of investors to achieve higher returns, low individual asset risk and (more importantly) a smooth return on the entire portfolio. Asset allocation advice has, since the acceptance of MPT, traditionally required a view on three values: the likely future return on an asset class; its risk (usually defined as volatility and measured in units of standard deviation of return over a given period); and its correlation with other asset classes. This last factor measures the extent to which upward and downward movements in the values of two variables are linked together.

MPT has both led to, and has been further encouraged by, the development of asset allocation models. Strong prospective returns, coupled with low standard deviation of returns and a low correlation with equities and gilts, would provide a very strong argument for holding an asset.

When assets are combined in a portfolio, the expected return of a portfolio is the weighted average of the expected returns of the component assets. However, unless the assets are perfectly correlated, the risk is not the weighted average: it is determined by the correlations of the component assets. The way in which assets co-vary is central to portfolio risk, as low co-variance produces diversification opportunities.

Correlations of 1.0 indicate perfect co-movement, correlations of 0.0 indicate independence among the returns of two assets, and correlations of –1.0 indicate that returns move in exactly opposite directions. Generally, adding assets that exhibit lower – or negative – correlations to a portfolio provides the greatest diversification benefits.

IPD's UK annual index provides the longest-available run of consistent annual data describing the performance of a well-diversified portfolio of real properties. The results show the following:

- Property returns have been below the return on equities but competitive with the return on gilts (see Table 1.7).
- Property volatility has been less than the volatility of equities and comparable to that of gilts (see Table 1.7).

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Table 1.9: UK asset class correlations, 1971–2010

	Gilts	Property
Equities	0.57	0.28
Property	0.02	1.00

Source: IPD annual index, FTSE all-share index, FTSE 15-year gilt index

Table 1.10: US asset class correlations, 1979–2005

	Treasuries	Property
Equities	0.20	0.09
Property	–0.18	1.00

Source: NCREIF property index, S&P 500, Barclays Capital US 10-year treasury 10-year index

Table 1.11: US asset class correlations, 1979–2010

	Treasuries	Property
Equities	–0.03	0.15
Property	0.31	1.00

Source: NCREIF property index, S&P 500, Barclays Capital US 10-year treasury 10-year index

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The diversification benefits of real estate are illustrated by Table 1.9. UK data suggest that property offers portfolio risk reduction to holders of bonds and equities.

Over the period 1979 to 2005, US data supported this broad conclusion. This is illustrated by Table 1.10.

However, the 2006–2010 reported returns on US equities, treasuries and real estate reduced the correlation between equities and treasuries, and changed the correlations between property and treasuries and between property and equities to more positive values, reducing the case for real estate as a diversifier (see Table 1.11).

The result of using UK return, risk and correlation data (see Tables 1.7 and 1.9) in an MPT framework is a high property allocation, as shown by Table 1.12. We constructed the optimal (lowest risk) portfolios for portfolio target returns of 11.5%, 13% and 14.5% respectively. The low return/risk portfolio not surprisingly has plenty of gilts (40%), but the optimizer selects 60% property, as this reduces the portfolio risk even below the risk of a portfolio of 100% gilts. The high return/risk portfolio – not surprisingly,

Table 1.12: Illustrative asset class allocations

Target return	Volatility	UK property	UK stocks	UK gilts
0.115	0.092	0.597	0.000	0.403
0.130	0.140	0.615	0.315	0.070
0.145	0.224	0.345	0.655	0.000

Source: IPD, PFR

Table 1.13: Observed asset class allocations – institutional investors

Country	Real estate as % assets	% direct	% indirect
Australia	11.0	45.0	55.0
Germany	12.0	58.0	42.0
Netherlands	10.0	56.0	42.0
UK	6.0	Not known	Not known
US	3.5	46.0	54.0

Source: PREA, 2006

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again – has plenty of stocks, but the optimizer selects 35% property, as this again reduces the portfolio risk without excessively damaging returns. Property comprises between 35% and 60% of the optimal or efficient portfolio at all target return levels.

Yet the actual allocation for UK institutional investors in 2009 was around 8%, up from around 6% in 2005 (see Table 1.13), but around one-sixth of the optimized level. What explains the huge difference between unconstrained theory and practice?

Valuation smoothing (see Sections 1.6 and 1.11) is a large problem colouring this data. In some years, property yields do not appear to change; and it is clear that this can be the result of a scarcity of transaction evidence and the behaviour of valuers rather than a steadily performing market.

The smoothing problem also affects the correlation numbers. Reported property correlations, such as volatility, may be artificially low. The greater the fixity of the property return series – the greater the amount of smoothing, or serial correlation – the greater will be the tendency of the correlation of that series with returns in efficient markets to be close to zero. (The correlation coefficient is determined by the co-variance of two series divided by the product of their standard deviations. Low volatility depresses both the numerator and denominator of this equation, but the impact of the co-variance is likely to be greater.)

Given that three indicators are needed for assessing the appropriate weight of property in a multi-asset portfolio, two of which present two large problems, it is not surprising that property allocations in practice do not match the MPT solution. Standard deviations of returns from year to year understate true property risk; and correlations between property and the other assets may be unreliable. For this reason, various efforts have been made by academics to improve the position, which usually imply the use of statistical techniques to adjust the data (see, for example, Brown and Matysiak, 2000).

In addition, year-on-year correlations between the asset classes may be said to be of limited interest to pension funds and insurance funds with longer-term liabilities. They are more likely to be concerned with their ability to match long-term liabilities (wage inflation-linked pensions or nominally-fixed endowment mortgages) without increasing the contribution rate of the employer or employee.

However, there are more limitations to this type of optimization analysis that need to be considered, especially in a global context. These are as follows.

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Specific risk

The data used describe the returns available on the universes of asset classes. For stocks and bonds, it is possible for investors to replicate these universes in an investment portfolio, as they are highly divisible assets and index-tracking products are available. For property, the universe used to compile the UK annual index at the end of 2007 comprised over 12,000 properties worth around £215 billion; over 6,000 properties and $238 billion comprise the US NPI universe. These universes are not investable. The investor therefore faces an additional layer of risk, which is the sampling error created by the heterogeneity and specific risk of real estate.

Leverage

The majority of property transactions involve the use of leverage (see Chapter 9). Even where the institutional investor does not use leverage on direct property acquisitions, unlisted funds will commonly be used for specialist or international investments (see Chapters 10 and 11), and these will typically be geared. Hence, ungeared returns may not be fully representative of the risk and return profile of the investment vehicles used by investors.

Illiquidity

Real estate, unlike securities, is not a liquid asset class. This is not reflected in the volatility and correlation data. The introduction of liquidity into a property structure can significantly change the return characteristics of real estate to the point that it ceases to appear to be attractive. Arguably,

therefore, illiquidity is a necessary evil in justifying the role of real estate, but it is an evil that clearly reduces the attraction of the asset class.

Taxes, currency and fees

Property investment may require the services of specialist fund managers who will typically charge *ad valorem* management fees and performance fees. Taxes may be paid, even by tax-exempt investors, when investing internationally, and in such cases unhedged currency risk (see Chapter 16) will colour returns.

These variables all challenge the value of using an index of single-country real estate returns, gross of tax and fees, expressed in domestic currency, and unleveraged, in deciding on an allocation to global commercial property. Adding the operational challenges of investing in real estate alongside faster-moving securities, it is not surprising that allocations do not reflect the outputs of an MPT optimizer.

Alternative approaches to asset allocation do exist. The most popular alternative is the so-called 'equilibrium approach' (Litterman, 2003), which advocates a neutral position determined by the size by value of the asset class (see Chapter 4) with positions taken against that neutral weight determined by the attractiveness of market pricing. This more closely reflects the practice of professional and institutional market participants, but (as we suggested at the beginning of the chapter) still produces a higher weighting to the asset class than is observed in practice.

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1.4 Conclusions

The cult of the equity has dominated western investment strategy in the 1980s and 1990s to the extent that equities now dominate most institutional portfolios, especially in the US, the UK and Hong Kong. On the other hand, in Germany and some other continental European countries, bonds have always been the largest component of the mixed-asset portfolio.

The experience of property investors in the early 1990s was enough to persuade many of them that it was time to abandon the asset class. Several property companies became bankrupt; many banks developed severe shortfalls in their loan books through exposure to property loans; many householders found they owed more than they had borrowed by developing negative equity; and, worst of all, it became acutely apparent that the liquidity of property was not the same as the liquidity of equities and bonds.

Because of the liquidity and management problems associated with direct real estate ownership, the property investment market became mesmerized by the potential for securitization or unitization of real estate. Over the period 1990–8 real estate investment trusts in the US and listed property

trusts in Australia each saw explosive growth in markets where the legal and regulatory framework permits privately-held real estate assets to be transferred into tax-efficient public vehicles. Following a boom in the creation of unlisted funds in the 1999–2006 period (see Chapter 11), the UK and Germany introduced REITs in 2007 (see Chapter 12). Property derivatives became a realized concept in the UK in 2005 and there are now swaps, structured notes and even futures trading globally (see Chapter 14). In addition, the search for return and diversification led to globalization, meaning a transfer of attention from domestic investors and investments to international investors and assets (see Chapters 15 and 16). But we must remember what makes real estate attractive to these investors, which is low volatility and the opportunity to diversify a securities portfolio.

Property is illiquid. This means that its required – and expected – return is higher than it would otherwise be. So introducing liquidity in the form of securitization may damage returns. The largest impact of improved liquidity, however, would be upon risk and diversification. Surveys have consistently shown that diversification is a powerful driver for pension funds and insurance companies to become involved with real estate as an investment. Diversification surely works only as long as the asset is truly different. Property can be a diversifier away from equities because it has bond and commodity characteristics. Taking away the illiquidity and the physical, heterogeneous, commodity nature of real estate would take away a large part of its diversification potential and a large part of its appeal. It appears to be the case that these distortions contribute to the return diversity that investors crave, yet lead to inevitable disappointment when they reveal themselves.

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Box 1.1: Sovereign wealth funds and real estate investment

Sovereign wealth funds (SWFs) have taken on increased importance in global investment markets in recent years, operating as significant long-term investors. SWFs are government investment vehicles funded from government reserves, which are managed separately from the country's central bank. The funding sources for these government reserves come from natural resource reserves (for example, oil and gas), foreign exchange reserves or pension fund reserves where there are no explicit pension liabilities.

The strategic objectives of SWFs include the management of government holdings, wealth optimization through diversification (offsetting possible future declines in the value or stock of the country's natural resources) and supporting the development of the local economy.

SWFs have operated for over 50 years. The Kuwait Investment Authority (KIA) was established in 1953, and the 1970s increase in oil prices saw further SWFs established (for example, the Abu Dhabi Investment Authority or ADIA), with the 1970–90 period seeing SWFs established in growing Asian economies

Box 1.1 *(Continued)*

(such as the Government Investment Corporation of Singapore or GIC.) Since 2000, with further increases in oil prices and significant trade surpluses, a large number of new SWFs were established, over 50% of the current roster of SWFs. The Middle East and Asia now dominate the SWF universe, with several countries (including Singapore and Abu Dhabi) having more than one SWF.

2010 estimates put SWF assets at over $4 trillion, having grown significantly from only $1 trillion in 2001. Commodities-based SWFs account for 60% of SWF assets, while non-commodities-based SWFs account for 40%. The contribution by non-commodities-based SWFs has increased significantly in recent years, reflecting significant transfers from foreign exchange reserves. Despite the major role they played in supporting the financial services sector in several Western economies during the global financial crisis, SWFs account for only 4% of global assets under management, significantly below the asset levels for pension funds. Nonetheless, the larger SWFs constitute the world's most powerful property investors.

Full details are rarely provided regarding SWF total assets, asset allocation plans and detailed investment strategies. However, transparency and disclosure have improved following the agreement of the 2008 'Santiago Principles' which has resulted in several SWFs now producing annual reports and having informative websites.

The more established SWFs such as ADIA and GIC are experienced and sophisticated investors, with institutional maturity, performance-focused objectives, professional investment standards and extensive risk management procedures, and we know that SWFs have increasingly adopted an active management strategy which sees them including property and private equity amongst their mandated asset classes.

Since 2005, SWFs have invested over $360 billion in equity and property transactions. Since 2000, property has accounted for 18% (by number) and 19% (by value) of SWF transactions, only exceeded by the financial sector (22% by number and 46% by value). While around 50% of SWFs invest in property, this figure is dominated by the larger funds. Several of these have very significant property portfolios, the key players including GIC and ADIA, with the Norway fund announcing a 5% allocation in 2010.

The property focus in SWFs is often achieved by using sovereign wealth enterprises (SWEs) or holding companies within the SWF, with 40% of SWFs having separate property arms. Strategies for property investment are sophisticated, covering direct property, REITs, joint ventures and co-investment with other SWFs or pension funds, unlisted property funds, equity stakes in property companies/REITs, as well as debt financing.

ADIA

Arguably the world's biggest property investor, ADIA was established in 1976, with property being one of six investment departments. Property accounts for 5–10% of the ADIA portfolio, using a diversified portfolio of global prop-

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erty assets held through direct investments and the use of external funds. The primary focus is to invest directly in assets through joint ventures with experienced local partners or through external managers who are closely directed by ADIA's in-house property team. The approximate split for property is direct (65%), private equity (30%) and listed (5%). Major property acquisitions have included the Chrysler Building in New York in June 2008, $800 m being invested for a 90% share.

GIC

GIC was established in Singapore in 1981, with a mandate to invest outside Singapore. The property section was established in 1982, creating an important long-term global property investor, now among the top 10 of global property investors. Property accounts for 9% of the portfolio. The property portfolio comprises over 200 major properties in over 30 countries, and GIC employs over 150 property staff in seven offices globally. GIC's property investments have covered all aspects of the property space, including direct property, unlisted property funds, joint ventures, debt financing and private equity.

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Table 1.14: The largest sovereign wealth funds

Country	Sovereign Wealth Fund	Assets ($bn)
Abu Dhabi	Abu Dhabi Investment Authority	627
Norway	Government Pension Fund	483
China	China Investment Corporation	332
Singapore	Government Investment Corporation	248
Kuwait	Kuwait Investment Authority	203
Singapore	Temasek Holdings	133
Qatar	Qatar Investment Authority	65
Australia	Australian Super Fund	59
Korea	Korea Investment Corporation	30

Source: Property Funds Research, 2010