
Asset returns and the investment choices of New Zealanders¹

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This article introduces a new set of estimates of gross nominal returns since 1989 for a broad range of asset classes relevant to New Zealand investors. Risk and return characteristics of the assets are presented, and aggregate trends are discussed. However, many other factors may be relevant to the investment choices of New Zealanders. Investors are interested in realised rather than gross returns, directly determined by a range of factors including tax treatment and the impact of leverage. Attitudes to risk are a key determinant of investor behaviour, given that future returns are highly uncertain – providing grounds for portfolio diversification. Personal circumstances are also important and vary considerably between individuals.

1 Introduction

The Reserve Bank is interested in understanding the behaviour of a broad range of assets from a macroeconomic perspective. In this article, a new set of estimated gross returns is used to contrast the returns seen across a wide range of asset classes over the eventful years since 1989, and to compare New Zealand's experience with Australia.

The gross asset returns presented here have a stylised economy-wide lens – in contrast to the perspective of an individual investor who would probably be interested in the realised risk and return they could actually achieve, which would be determined by a range of additional factors including taxes. Nonetheless, aggregate economic trends provide a useful starting point. The article considers some of the many factors that are likely to influence individual investment decisions – including portfolio replicability, tax treatment, the impact of leverage, uncertainty about future returns, and additional considerations, such as personal circumstances.

2 Measuring gross asset returns

This article uses a new set of estimated gross asset returns compiled from a variety of sources (summarised in table 1) for the period from 1989 to 2011. Data and further methodological information can be found in Watson (2012). This particular time period was chosen due to data availability and to be comparable with a similar analysis for Australia found in Goldman Sachs (2010).² This is a much shorter time period than would typically be used for investment research, which is mostly focused on equities, bonds and cash, but allows us to analyse trends across a wider range of assets. Investment research typically finds that equities generate the highest returns over long periods, but that equity returns are very volatile.

Financial and property assets are considered. However, this is not an exhaustive list of household assets. There are other forms of investment that yield returns for New Zealand investors, but for which data are unavailable or analysis is beyond the scope of this paper – for example, human capital investment is not captured and some of New Zealand's largest businesses are unlisted.

As indicated in table 1, in some places we have had to splice series together or use approximations in the early part of the period. The sources used were chosen to be as comparable as possible to those in the Australian analysis. Of course, the results are highly sensitive to the indices

¹ No aspect of this article should be construed as financial advice. The author would like to thank her team, Phil Briggs, Hamish Pepper, Ian Nield, Jason Wong and Michael Reddell for their assistance. The author would also like to thank Goldman Sachs for allowing their data to be used in this analysis, and Enrique Gonzalez-Macuer from Beef and Lamb NZ for his help in providing farm rental yield calculations.

² In some instances Australian asset returns data from Goldman Sachs (2010) have been used to construct proxies where earlier data for New Zealand are unavailable.

Table 1
Construction of estimates

Asset class	Sources	Time period
Cash/Deposits	NZ 12-month bank bill returns	1996-2011
	Proxied by NZ 12-month government bond yield	1990-1995
New Zealand Bonds	NZ generic government bond index (total returns)	1995-2011
	Proxied by Australian fixed interest returns (from Goldman Sachs), assuming the purchase of a forward contract to eliminate currency risk	1990-1994
Australian Bonds	AU generic government bond index (total returns), calculated including currency effects	2002-2011
	Australian fixed interest returns (from Goldman Sachs), calculated including currency effects	1990-2001
New Zealand Shares	NZX all share price index including dividends	1990-2011
New Zealand Listed Property	NZX property index including dividends	1998-2011
	Proxied by Australian listed property returns (from Goldman Sachs), assuming the purchase of a forward contract to eliminate currency risk	1990-1997
Australian Shares Unhedged	ASX200 share price index including dividends, calculated including currency effects	2001-2011
	Australian share returns (from Goldman Sachs), calculated including currency effects	1990-2000
Australian Shares Hedged	ASX200 share price index including dividends, assuming the purchase of a forward contract to eliminate currency risk	2002-2011
	Australian share returns (from Goldman Sachs), assuming the purchase of a forward contract to eliminate currency risk	1990-2001
International Shares Unhedged	MSCI world equity index including dividends, calculated including currency effects	1990-2011
International Shares Hedged	MSCI world equity index including dividends, assuming the purchase of a forward contract to eliminate currency risk	1990-2011
Residential Property	Capital gains calculated using QV quarterly house price index. Rental yields are given by the median rent for a three bedroom house from the Ministry of Housing (backcast using Statistics New Zealand data prior to 1992) as a percentage of the REINZ median house price, assuming costs equal to 2 percent of the house price per annum	1990-2011
Commercial Property	IPD all property total returns index	1993-2011
	IPD office property total returns index	1990-1992
Farms	Capital gains calculated using REINZ farm price index, with rental yields assumed to be 2.4 percent per annum	2011
	Capital gains calculated using QV rural property price index, with rental yields assumed to be 2.4 percent per annum	1990-2010

Sources: Bloomberg, Reuters, Goldman Sachs, Quotable Value Ltd., REINZ, IPD, Statistics New Zealand, Ministry of Housing, RBNZ, author's calculations.

chosen – for example, a corporate bond index would have suggested higher returns than the government bond index used here. Indicative estimates have also been used in some cases for inputs such as rental returns and costs. We think our assumptions are reasonable, but other analysts who have attempted this sort of comparison have used different assumptions or left rental returns out altogether, which can obviously lead to different conclusions. We hope to periodically update this database, and in further work we may find better historical series for some of the asset classes covered here.

Asset performance is measured in terms of risk and return, with each asset assumed to be held from the end of 1989. Annual returns – comprising income and capital gains – are calculated at year end and expressed in terms of compound annual growth rates (CAGR).³ The risk associated with an asset refers to the volatility of its returns from year to year, measured as the standard deviation of annual returns.

When investing in overseas assets such as international shares, currency movements can be an important determinant of overall returns. To capture these effects, returns have been calculated with and without hedging of currency risk. If an investor does not hedge currency risk, it is assumed that they purchase the asset at the year-end spot exchange rate – NZD/USD for international assets and NZD/AUD for Australian assets – and then revalue the asset at the prevailing spot rate 12 months later. On the other hand, if an investor hedges currency risk, it is assumed that they purchase the asset at the spot exchange rate and, at the same time, also purchase a 12-month forward exchange rate contract. When they revalue the asset 12 months later, the gain or loss on the forward contract can offset any gain or loss associated with movement in the spot exchange rate.

When calculating property returns, estimates of rental returns and associated costs have been used. Residential property returns are calculated as the returns from investing in rental property, rather than the purchase of owner-occupier housing. This is because purchasing

property can have the purpose of both consumption and investment. Purchasing one's own home can be thought of as the purchase of a stream of future housing consumption.

For residential property, costs are assumed to be 2 percent of the property price per annum. This includes direct costs such as insurance and rates, along with depreciation and landlords' time. Landlords' time is assumed to have a monetary value equivalent to the cost of property management fees, which are typically about 8 percent of gross rental payments. This equates to approximately 0.5 percent of the rental property's value on average per annum.

Returns from owning a farm can be overstated by measures of farm profits if the owner also works on the farm (without taking a market-based salary). For this analysis we focus on the return from simply owning the land. To account for this, it is assumed that farm investors purchase farmland and then let it out to others. The rental return of letting out farmland is included in total returns. For farmland, rental returns net of costs are assumed to have been 2.4 percent per annum over the entire sample period on average.⁴

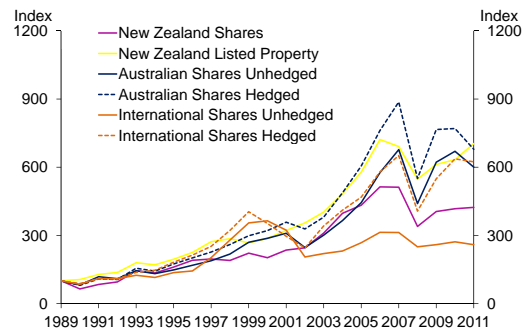
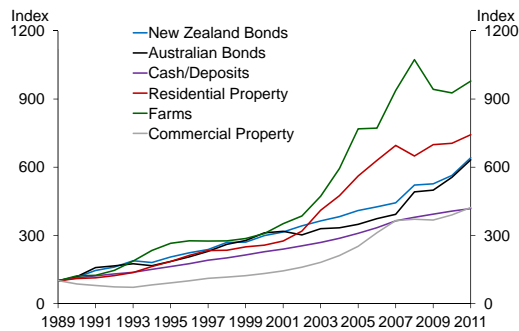
3 Performance of New Zealand assets since 1989

According to these estimates, investment in farms was the highest yielding asset class between 1989 and 2011, followed by residential property (figure 1). Farmland and residential property performed particularly strongly from the early 2000s onwards, with high returns mostly taking the form of strong capital gains. The property boom of the 2000s – boosted by buoyant economic conditions, positive net migration, housing supply constraints, lower real interest rates, and relatively easy credit – resulted in an unprecedented rise in real house prices. Since the property market peak in 2007, returns have been much more subdued. Excess returns from farmland, relative to residential property, are likely to have been partly as

³ This measure of average returns takes total nominal returns and imputes the constant yearly returns required to achieve them.

⁴ This should be treated as approximate only. Calculations are based on data helpfully provided by Beef and Lamb NZ and Dairy NZ. In constructing this estimate, rental returns for all non-dairy farms are assumed to be equivalent to the rental returns calculated for sheep and beef farms.

Figure 1
Relative asset class returns
Dec 1989 = 100



a result of favourable prices for New Zealand's primary export products being capitalised into farm prices. However, when the property cycle turned, farm prices fell quite significantly.

The past two decades were a turbulent time for financial assets like equities and listed property, with markets suffering significant losses in the early 2000s following the bursting of the dotcom bubble and then plummeting in 2008 at the onset of the Global Financial Crisis. On this measure shares exhibited the greatest volatility of annual returns over the sample period (figure 2),

Figure 2
Risk and return of each asset class between 1989 and 2011

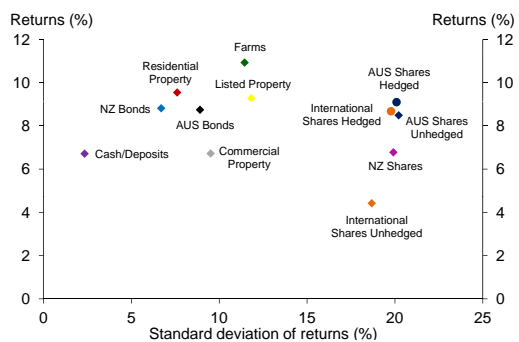
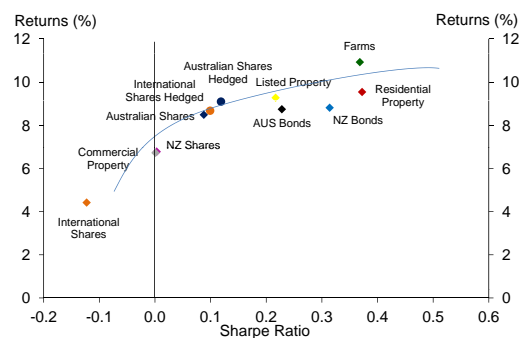


Figure 3 uses Sharpe ratios to compare the overall performance of each type of asset. The Sharpe ratio is a standard metric of risk-adjusted return, which measures excess return (over cash) per unit of risk.⁵ Erratic sharemarket performance in the early 90's, along with

the impact of the dotcom bubble and the financial crisis, saw equities perform poorly on a risk-adjusted basis compared with aggregate property indices and bonds. At an aggregate level, residential property had a marginally higher Sharpe ratio than farmland, due to its lower volatility.

Figure 3
Returns and Sharpe ratios of each asset class between 1989 and 2011



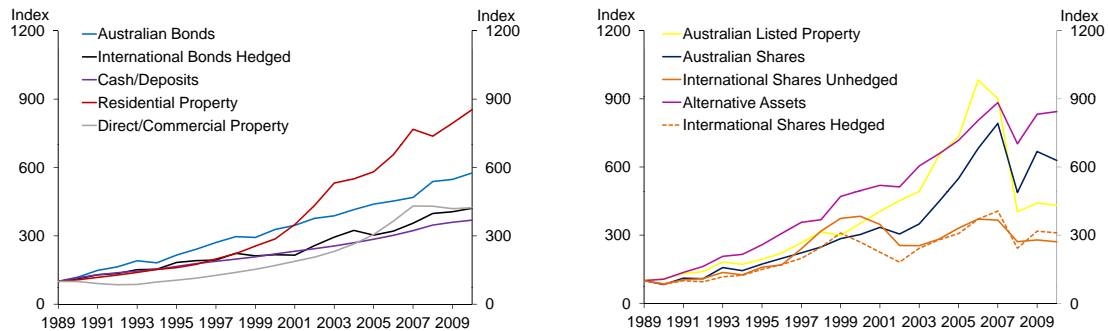
International shares stood out as particularly low-return, high-risk assets. Unhedged international shares had the lowest nominal returns of any of the asset classes we looked at over this particular period (less than cash) and, with the only negative Sharpe ratio, received the lowest risk-adjusted returns. However, hedging back into New Zealand dollars improved the performance of international shares significantly.⁶

New Zealand bonds were an attractive low-risk investment, yielding greater risk-adjusted returns than

⁵ $Sharpe\ ratio_{Asset\ i} = \frac{CAGR_{Asset\ i} - CAGR_{Cash}}{SD_{Asset\ i}}$

⁶ The CAGR differential of 4 percent between unhedged and hedged international shares was largely driven by returns from holding forward contracts. The pricing of forward contracts is determined by interest rate differentials between New Zealand and other countries, so high average New Zealand interest rates provided higher returns to hedged holders of international assets than to those holding unhedged assets.

Figure 4
Relative asset class returns for Australia
Dec 1989 = 100



Source: Goldman Sachs

listed property or any type of shares. Since the financial crisis, bonds have performed very well relative to other investments (most of which suffered significant losses at the height of the crisis). Falling interest rates have generated significant capital gains on holdings of bonds.

Trends in gross asset returns for New Zealand were similar to those seen in Australia over the period from 1989 to 2009, as reported by Goldman Sachs (2010).⁷ Australian residential property was the highest yielding Australian asset between 1989 and 2010 (figure 4).

Table 2
Performance of New Zealand and Australian assets between 1989 and 2009

Asset class	Return (CAGR)		Risk (Standard deviation)		Sharpe ratio (cash as risk-free benchmark)	
	New Zealand investor	Australian investor	New Zealand investor	Australian investor	New Zealand investor	Australian investor
Cash/Deposits	7.1	6.6	2.1	2.8		
Domestic Bonds	8.7	8.9	6.9	7.4	0.2	0.3
Australian Bonds (Unhedged)	8.4	-	9.3	-	0.1	-
International Bonds (Hedged)	-	7.3	-	7.6	-	0.1
Domestic Shares	7.2	10.0	20.8	19.7	0.0	0.2
Australian Shares (Unhedged)	9.6	-	20.7	-	0.1	-
Australian Shares (Hedged)	10.7	-	20.2	-	0.2	-
International Shares (Unhedged)	4.9	5.3	19.5	18.2	-0.1	-0.1
International Shares (Hedged)	8.9	3.7	20.5	19.5	0.1	-0.2
Residential Property	10.2	11.2	7.6	6.8	0.4	0.7
Commercial/Direct Property	6.7	7.7	10.0	7.8	-0.0	0.1
Listed property	9.5	7.7	12.3	19.1	0.2	0.1
Alternative assets	-	11.4	-	11.6	-	0.4
Farms	11.9	-	11.5	-	0.4	-

⁷ The Goldman Sachs analysis includes actual data over the period from 1989 to 2009 and provisional data for 2010 due to the time of publishing.

Shares performed poorly in comparison, while domestic fixed income was an attractive low-risk investment.

Australian aggregate residential property returns only marginally exceeded those from investing in hedge funds ("alternative assets") – an investment option not widely available in New Zealand. In terms of Sharpe ratio, an index basket of Australian residential property was the best performing of all Australian and New Zealand assets (table 2). Owning farmland in New Zealand yielded the greatest nominal returns overall.

4 Towards thinking about investment choices

Knowing gross annual returns across various classes of assets is useful in enriching the Reserve Bank's understanding of economic trends, given that headline returns probably influence the expectations and behaviour of individuals. The relative returns identified here were coincident with the substantial increase in private debt seen over the past 20 years, much of it secured on residential property and farms. High asset prices may also have encouraged owners of assets to increase their consumption on the back of unexpected windfall gains.

Knowing gross historical annual returns for recent periods may also be useful for individual investors thinking about how to allocate their own portfolios, but a range of additional factors are likely to be important. The remainder of the article considers some of the key factors that are likely to influence the investment choices of individuals.

4.1 Portfolio replicability

Not all of the gross asset returns reported here are equally achievable by investors. For an average New Zealander to access some of these products, an investment vehicle is necessary – such as a mutual fund – and these are subject to additional fees. Such funds can replicate aggregate equity or government bond indices at relatively low cost. On the other hand, there is no cost-effective mechanism by which investors can gain exposure to the residential property or farmland markets as a whole.

For assets with returns that are difficult to replicate,

gaining exposure typically entails greater costs, reducing realised returns to the investor. To invest in residential property, investors must buy and sell individual properties, with most investors only able to achieve limited diversification. And acquiring a portfolio of property assets tends to be quite expensive. For example, an investor looking to hold 15 percent of a \$500,000 portfolio in property would have trouble finding an appropriate house to purchase. Rebalancing of the portfolio, by selling the house and buying another one, would involve significant transactions costs, including agency fees, search costs and time. It is particularly difficult for the average New Zealander to gain exposure to farmland, given the high value of the average farm and the limited number of investment vehicles.

Because the farmland and residential property indices are non-replicable, the risk associated with actually investing in these types of assets is also materially understated in the charts presented earlier. Risk-adjusted returns from aggregate property price indices do not take into account idiosyncratic risk – that is, the risk associated with owning an individual property – or the risk of owning properties within one specific region.

The standard deviation for total residential property returns nationwide over the period studied here was 7.6 percent. But if we suppose that an investor can only hold a representative portfolio of, say, Wellington property, then Quotable Value indices imply that regional property returns had a standard deviation of 9.4 percent on average over the sample period.⁸ But even regional indices understate the risk associated with a typical investor's exposure to property. Our estimates suggest that the risk associated with holding an individual property might be as much as 12.6 percent. Thus, while on an economy-wide basis property might appear to have been a low-risk investment option over the past two decades, for real-world individual investors it has exhibited much higher volatility than headline figures might have suggested. If an investor owned only one property, on average, residential property

⁸ This assumes that rental returns are distributed identically across regions, though presumably if there was significant variation in rental returns between regions, the regional volatility could be greater.

would have yielded lower risk-adjusted returns for them than either New Zealand or Australian bonds.

4.2 Tax treatment

Tax is a significant factor influencing realised returns. Because tax treatment has been excluded from the numbers reported here, this probably biases the results in favour of assets that mainly earn interest, which is taxed quite comprehensively. In contrast, investors earn some returns from property and equity investments that are untaxed.

However, it is also important to note that some asset returns considered here have already been taxed at the company level (e.g. shares and listed property investment). For New Zealand and Australian shares, imputation credits are available when dividends are paid to residents from either country, and can offset tax on earnings since tax has already been paid at the company tax rate. Australasian share returns presented here have been taxed; in all other cases, tax treatment is ignored. Consequently, share returns are somewhat understated relative to other assets.

In its submission to the Housing Affordability Inquiry, the Reserve Bank suggested that tax treatment of property may have amplified or extended the housing boom of the 2000s (Reserve Bank of New Zealand, 2011). In 2005 and 2010, rules were tightened for claiming property depreciation as a tax deductible expense – which may serve to dissuade investors from residential rental and commercial property investment at the margin. In Australia, a reduction in the effective capital gains tax rate in 1999 is thought to have contributed to the housing boom experienced there over the same period (Bloxxham, Kent, & Robson, 2010).

For those leveraged investors whose debt servicing and other costs exceeded rental earnings, ring-fencing of rental property losses for the decade prior to 1991 limited the extent to which losses were tax deductible. Currently, rental property losses, like other unincorporated business losses, can be offset against other taxable income. For purchasers expecting tax-free capital gains, this ability to offset operating losses against other taxable income can

make leveraged property investment look attractive.

In 2007, the portfolio investment entity scheme was introduced, allowing many holders of managed investments to be taxed below the investor's general marginal tax rate, potentially encouraging investors to diversify into managed investments, such as equities or fixed interest. New Zealand and most Australian equities are exempt from capital gains tax if invested via a portfolio investment entity. Such tax changes, which have been initiated since the property boom, will have reduced the relative attractiveness of property relative to other assets to some extent.

Tax treatment of overseas portfolio investment opportunities is complicated and has undergone significant changes since 1989. Likewise, the mean marginal tax rate has varied – falls in managed tax rates improve the favourability of investments that are more comprehensively taxed at the margin, and vice versa. Overall, tax treatment is likely to have had a significant, and changing, impact on investment returns over the sample period.

4.3 Leverage

The gross returns data presented here do not directly take into account the possibility of leverage. Leveraged investors are those who borrow to fund their investment, allowing greater exposure to the asset they are investing in. This increases potential returns, but also the risk involved. To illustrate, suppose one residential property investor is unleveraged, while another has an 80 percent mortgage. If house prices rise 20 percent, the unleveraged investor experiences a 20 percent return, while the leveraged investor doubles their money. If house prices fall 20 percent, the unleveraged investor experiences a 20 percent loss, but the leveraged investor loses all of their equity.

Certain investments (e.g. property) can be geared to a greater extent than others, which may be attractive for some investors. However, some of the financial asset returns reported here already have embedded leverage: most firms in an equity index and listed property trusts will have debt. According to our estimates, listed property trusts show higher returns than direct commercial property

returns and also exhibit greater variance. This is likely to reflect the fact that one is a leveraged investment and the other is not.

4.4 Uncertainty

Over the past two decades, investing one's entire portfolio in farmland would have yielded the greatest nominal return, equivalent to compound annual growth of 10.9 percent per annum. However, this portfolio would have suffered considerable losses in some years. And while a diversified portfolio of farmland would clearly have been the best choice of investment over that period in retrospect, actual investors must allocate their portfolios without any great certainty as to what future returns on different classes of assets will be.

Investors looking to maximise risk-adjusted returns would generally want to hold more than one type of asset.⁹ Holding assets with different risk and return profiles can increase the likelihood that an investor will do reasonably well overall, even if one particular asset does poorly. For example, if an investor thought that investing in farmland would be profitable but they wished to achieve reliable returns, then they might also choose to invest in an asset that tends to do well when farmland does poorly.

Diversification can improve risk-adjusted returns, but will not eliminate risk entirely. Hence, how an investor allocates their portfolio under uncertainty depends on their expectations of returns and tolerance for risk, which will vary considerably between individuals.

Investors are likely to at least partly base their expectations of asset returns on historical experience. However, making forward-looking assumptions based on past returns can be dangerous. Once asset booms in individual markets get under way they sometimes appear to develop their own momentum for a time. But rather than suggesting that an asset's returns are reliably strong, high historical returns can sometimes indicate excessive valuation, with low or negative returns following as a consequence. It is not safe to assume that assets' risk and return characteristics in a particular relatively short period will be replicated in the future.

⁹ Portfolio allocation is investigated further in Watson (2012) using mean-variance optimisation techniques.

4.5 Additional considerations

Modern finance recognises that prudent investors will typically consider other factors – in addition to expected returns and the variability of those returns – when choosing their portfolios. Investors are likely to seek investments that pay off in states of the world where they will most appreciate the money, and this will depend crucially on their personal circumstances. For example, a worker employed by the largest company in a town will likely face financial hardship (via unemployment) if that company fails. At the same time, they might find it difficult to sell residential property they owned in the town, and any shares they held in the company would be worthless. While some of this concentration of risk may be unavoidable (and possibly compensated for by a wage premium), it should be a relevant consideration in such an investor's portfolio allocation decision. They might, for example, avoid owning company shares or investment properties in the town, since other investments probably provide much better 'insurance' against the risks arising from the failure of the worker's employer.

In general, Cochrane (1999, 2011) suggests that, when financial planners help investors choose appropriate portfolios, they should do more to help them consider additional sources of risk applying to their personal situations. In addition to risks associated with a person's employment, these additional factors could include regional- or country-specific risks. For example, an investor may wish to hold foreign currency assets as a hedge against an economic shock affecting their own country.

An investor is also likely to want the option to liquidate their investment in times of stress. Property tends to have asymmetric liquidity: it is easy to sell in boom times, but can be very difficult to move during downturns (in the recent downturn this was particularly evident for rural land). As such, investors are wise to give some consideration to the market liquidity of assets, particularly if they are risk-averse or highly leveraged. Such additional considerations might dissuade individuals from investing in markets or regions in which they are already heavily exposed, or in markets that tend to become illiquid in times of stress.

5 Conclusion

The Reserve Bank is interested in asset returns from an economy-wide perspective. On our estimates, property investment in aggregate generated particularly high returns over the relatively short period from 1989 to 2011. Financial assets, on the other hand, performed less well. An individual investor is less likely to be interested in economy-wide headline risk and return metrics. Actual property investments, for example, appear to be considerably more risky than headline risk metrics would suggest – in part, because it is difficult to obtain a diversified portfolio of property. Individual investors are likely to be concerned about the risk and return they can achieve, as determined by a range of additional factors that vary from person to person, such as tax and leverage. Past returns are not a reliable predictor of future returns and this uncertainty provides grounds for portfolio diversification. Additional considerations such as personal circumstances are also likely to be important and vary considerably among individuals.

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