

## Chapter 1: Australian Household Deleveraging

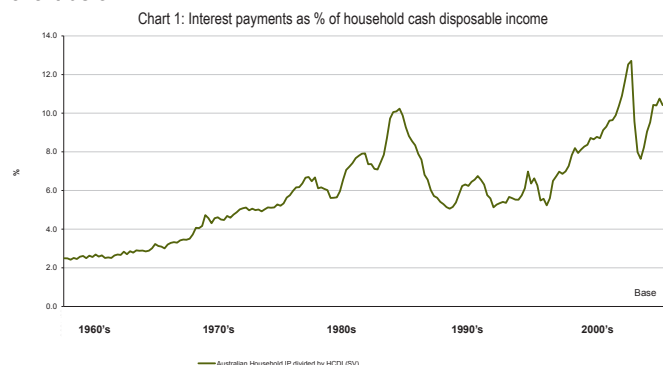
### Introduction

Australia's household sector is one of the most highly levered household sectors in the world. Measured using a ratio of total household sector liabilities to GDP, Australian household leverage was 110% [as at 30 June 2010], higher than any other developed country.

At JCP Investment Partners [JCP] our contention for some time has been that the Australian household sector has too much leverage and will need to delever over the next decade or so. This report articulates our forecast scenarios for this deleveraging process; and the probabilities we currently ascribe to each of these scenarios. These scenarios are the main exogenous input to our credit growth forecasts – a key value driver [KVD] for our bank valuation models. Two follow-up reports will consider what impact this deleveraging process will have on: (1) Australian house prices; and (2) household consumption and retail sales.

### A 'Cash-flow' Based Perspective

While we do use the ratio of household sector liabilities to GDP for international comparative purposes, our preferred method of measuring household leverage is to look at the ratio of interest payments to household cash disposable income. This 'cash flow' based ratio is more philosophically aligned with JCP's investment process, and we believe that when it comes to forecasting, it is an easier ratio by which to characterise debt repayment capacity within the household sector [i.e. as we all know, it's much easier to increase our debt levels than it is to repay our debts, especially over a short period of time]. The historic path of this ratio can be seen on the chart below.



From this chart you can see that, although we are below the peak of this ratio [12.7% for the quarter ended 30/09/2008], this peak was reached when household lending rates were 25% higher than they are at present [8.6% versus 6.9%]. If we were to adjust this ratio to an equivalent level of interest rates to that which existed in September 2008, then the ratio would be at an all time high of 14.1%, some 11% above its previous high.

Some people would argue that such an adjustment is academic, but it does highlight the vulnerability of the Australian household sector to an eventual rising global inflation and interest rate environment. It also highlights the sensitivity of the household sector to relatively small changes in interest rates – something that has become apparent in the last year or so.

### The Deleveraging Mechanisms

Before looking at our forecast scenarios of household leverage, it is worth considering the mechanisms for achieving deleverage. Excluding inflation there are only two ways for the household sector to delever: (1) repaying debt via household income growth, i.e. stronger employment or higher incomes; or (2) default, i.e. transferring wealth from bank shareholders [and potentially the government if things get really bad] and savers [i.e. bond holders] to borrowers.

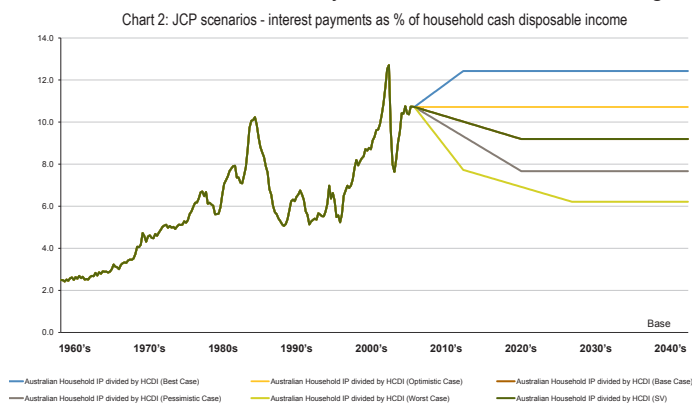
The speed at which the deleveraging process needs to occur [i.e. refinancing pressures, unemployment, etc.]; and the income growth potential of the borrowers will ultimately determine which deleveraging mechanism transpires. We expect that it will probably be mechanism one [repayment via higher growth] for the Australia household sector, but mechanism two is still a real possibility [see section below *Probabilities of Deleveraging*].

### Forecast Scenarios

When building forecast scenarios of household leverage, there are a couple of factors that need to be taken into account, including:

- the target level of household interest payments relative to household cash disposable income; and
- the number of years it will take to reach this target.

We have forecast five scenarios [best, optimistic, base, pessimistic, and worst] to characterise our expectations of the target level of household interest payments relative to household cash disposable income; and also the number of years it will take to reach this target.



#### 1. The Best Case

Our best case scenario assumes a target ratio of 12.50%. This scenario is based on analysis of annual Melbourne Institute's Household, Income and Labour Dynamics in Australia [HILDA] surveys between 2001 and 2009 by age and income cohort. Higher leverage over the period from 2001 to 2009 was predominantly the result of: (1) increases in the number of mortgages [including for rental properties] held by households; and (2) because households committed more of their disposable income to mortgage servicing. Combining this analysis and ABS forecasts of household composition, our best case scenario assumes a continuation of the trend observed over the 2001 to 2009 period, taking account of the capacity for households to meet debt service payments, calibrated to their ability to absorb rate rises similar to those experienced in 2008. This scenario assumes continued higher mortgage debt levels in the 50-64yo and 65-79yo cohorts and recognises the limits on the under 35yo cohort given current housing affordability issues.

#### 2. The Optimistic Case

Our optimistic case scenario assumes that the ratio of household interest payments relative to household cash disposable income reaches an equilibrium level [10.72%] over the next four quarters [based on current trend estimates], and is then forecast to stay at this level going forward.

#### 3. The Worst Case

Our worst case scenario is a two-stage process with an initial sharp drop to 7.62%; and then a period of below zero household credit growth to a level of 6.21%. This is broadly consistent with the past two episodes of sudden deleverage in the Australian household sector [in the 1890s and 1930s].

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These cycles have been characterised by a sharp [30% to 50%] fall in leverage over a relatively short period [6 to 8 years] – largely via borrower defaults. This initial period of adjustment is then followed by an extended period of a much more gradual deleveraging [10% to 30%], over a much longer period [14 to 16 years].

### 4. The Pessimistic Case

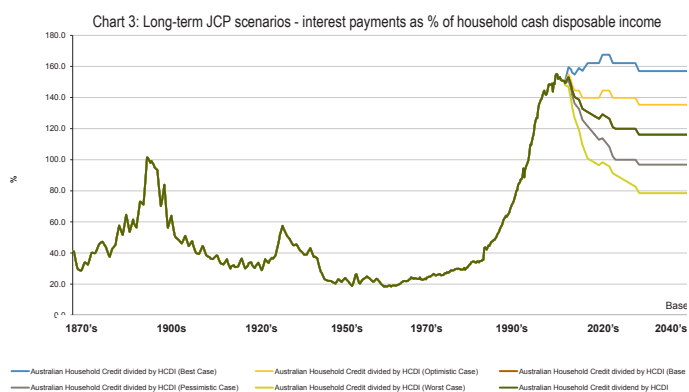
Our pessimistic case scenario is similar to our worst case scenario, but with the initial drop in the target ratio occurring over a much longer and more manageable time period [15 years], thereby avoiding the defaults implicit in the worst case scenario. We call this scenario the “growing into our debt” scenario.

### 5. The Base Case

Unusually our base case scenario is simply a derivation of our optimistic and pessimistic scenarios. That is, the target ratio of 9.18% is simply the mid-point between the optimistic target ratio of 10.73% and the pessimistic case scenario of 7.62%. We took this approach because we found it easier to define the outer boundaries of the target ratio, than to directly determine a base case from the historic data that has not only been characterised by an unstable average, but has also been on what to us looks like an unsustainable trend.

### A Long-term Perspective of our Forecast Scenarios

Using our longer term data series of household credit to household cash disposable income, we can look at our scenarios within a longer-term context. From the chart below, you can see that even our worst case scenario only takes this ratio back to a level that existed in the second quarter of 1998, thereby retracing about half the rapid build-up of household credit that occurred between 1989 and 2010 household credit binge.



### Implications for Household Credit Growth

Combining our forecast scenarios of the target ratio of household interest payments relative to household cash disposable income with our expected [and stochastic] forecasts of household cash disposable income and the overnight cash rates plus a bank lending margin [i.e. to calculate the household lending rate] we can calculate the level of household credit using the formula below:

$$\text{Household credit} = (\text{Household cash disposable income} \times \text{Household interest payments to disposable income ratio}) \div \text{Household lending rate}$$

So what does all this mean for our household credit growth forecasts [a key value driver for our major Australian bank valuations]?

Australian household credit has historically grown at a fairly rapid rate of 12.80%pa [CAGR from 30/09/1977 to 31/03/2010]. All our scenarios have this rate of growth falling to much lower levels – ranging from our best case scenario of 5.37%pa down to our worst case scenario of 3.10%pa over our combined forecast horizon [detailed fully in table under JCIPI's Forecast Scenario Probabilities].

### The Probabilities of Deleveraging

In January 2010, The McKinsey Global Institute [McKinsey] published a research report titled “Debt and deleveraging: The global credit bubble and its economic consequences”. This report compared the leverage of a number of sectors [households, corporate, commercial real estate, government, and financial institutions] in a number of developed and developing countries, and established a framework to predict the likelihood of deleveraging based on a number of different criteria.

In their original report, McKinsey did not include Australia in their analysis, so JCP commissioned McKinsey to update their research report to include Australia. This updated version was completed in January 2011.

The McKinsey framework uses five sets of ratios to predict the likelihood of deleveraging in the household sector. The weightings attributed to each ratio are estimated by JCP based on background information provided by McKinsey Australia. The relevant ratios, and relative weightings of each ratio, are listed below:

#### Absolute Level of Leverage

$$\text{Absolute leverage score} = (\text{Household credit} \div \text{Household disposable income}) \div 225\% \times 22.2\% + (\text{Household credit} \div \text{Gross domestic product}) \div 195\% \times 11.1\%$$

Household debt relative to disposable income is the main metric. This metric is preferable to household debt relative to assets, which may obscure leverage because of asset appreciated [which is related to increases in debt] and to debt relative to GDP, which does not take differing household income shares into account.

#### Growth in Debt and Leverage

$$\text{Leverage growth score} = (((\text{Household credit} \div \text{Household disposable income})_{t+40}) \div (\text{Household credit} \div \text{Household disposable income})_{t-40})^{(1+40)} - 1) \div 7\% \times 33.3\%$$

Rapid growth in leverage can be a proxy for declining debt quality due to deteriorating underwriting standards, and it is one indicator of higher potential defaults in the future. Rapid leverage growth can also indicate asset booms, which are empirically linked to historical deleveraging episodes and crises.

#### Debt Service Capacity

$$\text{Debt service capacity} = (\text{Household interest payments} \div \text{Household disposable income}) \div 14.5\% \times 16.7\%$$

The ideal metric to use would be a debt service ratio, which includes both the interest payments and the principal repayment. However, this metric is publically available only in select countries (e.g. the United States) and therefore would not allow for a comparison across countries.

#### Vulnerability to Income Shocks

$$\text{Income shock vulnerability} = (\text{Household credit} \div \text{Household financial assets}) \div 140\% \times 16.7\%$$

Household debt relative to financial assets is used to assess the vulnerability of households in case of income disruption. The lower the ratio, the greater amount of financial assets relative to debt can be drawn down to service interest payments if the borrower becomes unemployed.

#### Vulnerability to Funding and Interest Rate Shocks

$$\text{Interest rate vulnerability} = (\text{Variable-rate mortgages} \div \text{Housing credit}) \div 140\% \times 0.0\%$$

Although variable-rate mortgages typically lower debt service payments, they also make borrowers more vulnerable to interest rate rises. Note JCP's weighting on this variable is currently 0% because of the differing views within our investment team as to whether

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variable interest rates lower or increase vulnerability, and also the difficulty of obtaining this data in Australia.

### The McKinsey Conclusion

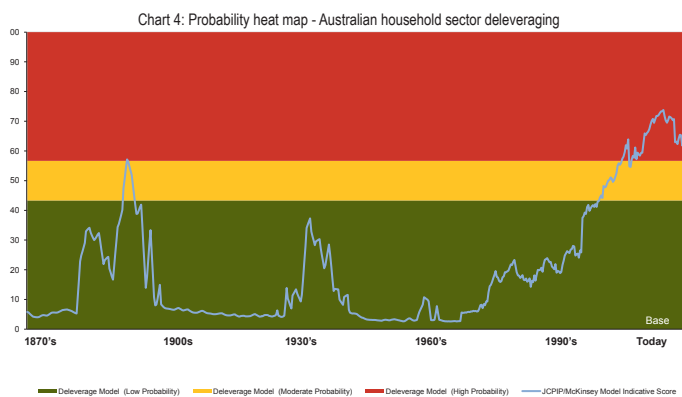
McKinsey's conclusion from their analysis of the Australian household sector [using their analytical framework described above] was as follows:

"Australia's absolute leverage and rates of growth [the primary risk metrics used in this framework] leave little doubt that Australia's risk ranking is 'high'. Secondary metrics [e.g. debt service capacity] further support the high risk ranking. This significant leverage combined with a heavy reliance on variable rate loans suggests that the household sector is particularly at risk in a rising rate environment."

### The Probability Path to Where We Are Today

Using the ratios and weightings JCP applied to the McKinsey framework, we have calculated a time series of the probability of the Australian household sector deleveraging. This time series is illustrated on the chart below using a heat map [where the red section represents a high, the yellow section a moderate probability, and the green section a low probability, of deleveraging].

Although the sections on the chart below are drawn as horizontal sections [for ease of understanding], we put forward the proposition that, because of financial innovations and the globalisation of capital markets that has occurred over the last 50-100 years, the sections should probably move up as gradients so that the 1890s and 1930s periods were in the red sections.



### JCP's Forecast Scenario Probabilities

Based on the analysis outlined, it became apparent to us that at this stage of Australia's household debt cycle, more than 60% of our probability needed to be allocated to our deleveraging scenarios [i.e. a high likelihood of deleveraging].

The following table shows how we have allocated our probabilities to the deleveraging scenarios [worst, pessimistic, and base], with the remainder allocated to our optimistic and best case scenarios. The bottom line of the table also shows our current probability-weighted credit growth forecasts.

Table 1: JCP probability allocation - deleveraging scenarios

Scenario	JCP Probability (%pa)	Historic (%pa)	Forecast Figures (%pa)			
			Short-term	Medium-term	Long-term	Combined
Best	10	12.80	8.77	6.32	4.89	5.37
Optimistic	25	12.80	6.60	3.83	4.88	4.88
Base	30	12.80	5.69	2.54	4.54	4.37
Pessimistic	20	12.80	4.76	1.13	4.11	3.77
Worst	15	12.80	2.57	-2.19	4.02	3.10
<b>Total*</b>	<b>100</b>	<b>12.80</b>	<b>5.57</b>	<b>2.25</b>	<b>4.50</b>	<b>4.29</b>

\*Probability Weighted

### JCP's Credit Growth Forecasts vs. Market Expectations

How do the probability-weighted figures [at the bottom of the previous table] compare to current 'market' forecasts?

Over 2011-2015, our Australian household credit growth assumptions are 3.9% – significantly below both broker analysts [ranging from 5.1% to 7.4%, average 6.3%] and the four major bank economists [ranging from 6.2% to 10.0%, average at 8.3%] over a comparable period.

### What this Means for Client Portfolios

Australian household lending represents about 51% of major domestic banks Australian total assets and 73% of their Australian gross loans and advances. Given that the major Australian banks have the vast majority of their assets domiciled in Australia, it is clear that a key value driver to the fundamental value of these companies is market's growth rate expectations of their Australian household lending books.

Despite some recent downgrades to market expectations for household credit growth, we still think the market has more downgrades [on a probability-weighted basis] to come. This will put downward pressure on market bank valuations, especially those banks heavily exposed to the Australian household sector [i.e. CBA 57% and WBC 58%, of total assets in Australia] versus those banks relatively less exposed [i.e. ANZ 51% and NAB 47%, of total assets in Australia].

This is a part of the reason for our large overweight portfolio position in NAB relative to our weightings in the other major domestic banks, and our [for most clients] underweight position held in the Australian bank sector over the past six months.

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