



## Understanding human behavior in financial decision-making: Some insights from behavioral economics

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### Summary:

The discipline of behavioral economics provides insights into the ways we make financial decisions. While we are all subject to biases which systematically lead us away from “rational” decision-making, those with limited resources bear the most serious consequences of poor decisions.

Financial education, and the development of an awareness of our biases, can help in improving our decision-making. But it is possible that cultural norms relating to debt and investment have a greater influence on our behavior.

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## Introduction

Understandably, people at this conference will be most concerned for those who are struggling to provide for themselves. People for whom a small no interest loan can make a huge difference. People who, without the encouragement of schemes like the Adds Up matched savings plan, would have trouble saving \$300. People who may be facing personal bankruptcy if they cannot extricate themselves from debt.

There is a tendency to see people in such circumstances in a distinct social class. In their chatter in Lygon Street restaurants, those on the left will see the problems in social terms – the sociology of poverty, and the predatory practices of the more unethical lenders. In the chatter in the Melbourne Club discussions are more likely to be about a lack of individual discipline, and an incapacity for delayed gratification. From both polarities there will be a strong belief that financial education can benefit people in such circumstances.

Both perspectives have some validity, but both are limited in that they tend to assume poor financial decision-making is confined to those who are not so well off. And there will be many who place too much faith in financial education as a sole path to better decision-making.

The main point I want to make today, drawing largely from the findings of behavioral economics, is that we all find “rational” financial decision-making difficult.

A little explanation is warranted, for the word “rational” has many shades of meaning. In economics and finance a decision is “rational” if there has been a logical process in arriving at it (including an assessment of risks) and if it aligns with our interests.

Empirical work by academics such as Eldar Shafir finds that poor financial decision-making is widespread.<sup>1</sup> Classifications such as income, education and social class provide little guidance on the quality of our financial decision-making.

We all make the same mistakes in financial decision-making, but the main difference between the rich and poor is that, generally, the well-off have sufficient buffers to bear the consequences of poor decisions. Their main pain may be a little humiliation when they have to sell the yacht, or trade down from a BMW M6<sup>2</sup> to a more modest conveyance. By contrast the consequences for a shift worker in the city or a person living in a remote settlement losing their only vehicle can be catastrophic, and for many there is the crushing cost of losing one’s house.

This pervasiveness of poor financial decision-making is an important point, for it suggests we all need to improve our practices. It is not as if we have some generally held wisdom or norms of good practice which we can pass on to those who are struggling to save or to repay loans. We may all have a great deal of learning to do.

In making this claim I don’t want to downplay the value of NILS, Adds Up. For reasons I will elaborate further on, I believe these are very useful, for they operate in a social context.

So I will illustrate (with some participative exercises) our common biases in financial decision-making. Then a little speculation, suggesting that in terms of human history we are still at an early stage of learning about finance, particularly credit and personal investment. We all need to learn, and perhaps the current economic events provide an opportunity to change our behavior. We should never let a good catastrophe go to waste.

## Smart people, dumb decisions

The last twelve months have provided examples of poor financial decision-making on a scale that exceeds all experience since the '30s – I refer to the 1630s Dutch tulip boom. We now know that people with degrees from the best business schools – Harvard and Wharton included – have behaved recklessly. Who among us would buy a used car sight unseen, or invest in shares in a company without having any idea of where it's located, what its business is, or what its debt ratio looks like? But that's exactly what very clever and well-educated people were doing when they traded in collateralized debt obligations and similar opaque instruments. A used car dealer would say they didn't even kick the wheels.

Consider the confession of an insider, Michael Lewis:

I was 24 years old, with no experience of, or particular interest in, guessing which stocks and bonds would rise and which would fall. The essential function of Wall Street is to allocate capital—to decide who should get it and who should not. Believe me when I tell you that I hadn't the first clue.<sup>3</sup>

Closer to home, and more relevant to issues of microfinance, consider an everyday decision we might make when replacing a light bulb. Do we buy an incandescent bulb or a low energy bulb?

A "rational" calculation may go something like the one below:

Data:

Purchase price	60 W incandescent bulb	\$1.20
	13 W equivalent florescent	\$6.00
Electricity price		\$0.15 per KWH
Daily use		5 hours

Analysis:

Difference in purchase price	= \$4.80
Difference in power	= 47 Watts
Difference in energy used a year = $(47 \times 5 \times 365)/1000$	= 86 KWH
Annual saving using florescent = $86 \times 0.15$	= \$12.90

The result gives a clear guidance; not even the most unethical financial spruikers of the boom times were offering an assured 270 percent return on investment (12.90/4.80).

Admittedly, if we're desperate and that \$4.80 is the difference between eating tonight and not eating, then it's quite rational to buy the incandescent bulb. But this exercise is about the majority who can afford \$4.80. If the financial case for investing \$4.80 in a better light bulb is so compelling, why has our government (and some other governments) considered it necessary to prohibit the sale of incandescent bulbs?

And remember, that when small amounts of money are involved, there is really no difference between foregoing an investment opportunity of 270 percent and borrowing money at 270 percent. Or, in another frame, a decision to buy an incandescent bulb for a \$4.80 saving, in terms of cash flow, is identical to a decision to borrow \$4.80 at an annual interest rate of 270 percent. Even payday lenders, I suspect, can offer better terms.

Some people may suggest the reason we forego such an opportunity is that we find the calculations a little difficult, but there is no shortage of trusted sources, such as Choice and state government consumer agencies who provide consumer advice.

Even when calculations are easy, consider one of the classic experiments, developed by Shane Frederick, the "bat and ball test":

A bat and ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?

If your quick answer is ten cents, you are in the majority, in fact in a well-educated majority, for "smarter" people (by measures such as IQ) tend to handle such problems faster than others, and are more likely therefore to fall into the ten cent trap.<sup>4</sup> A more deliberative approach, using either trial and error or simultaneous equations, leads to the correct answer that the ball costs five cents.

We fall into such traps because fast decision-making is almost always beneficial to us. It's a sensible ingrained habit, but sometimes it lets us down.

## How we make decisions - heuristics and biases

In making decisions we generally rely on heuristics, or simple rules of thumb.

Over a million years of evolution these heuristics have served us well. If we come across a shiny, long reptile in our path, a quick analysis ("snake or lizard?") with an appropriate response ("if snake, get out of the way") gives us more chance to pass on our genes than a slow process of consideration of toxicology and construction of a probability tree modelling the reptile's likely behavior.

Even in our modern world heuristics help us to make sound decisions. We make hundreds of decisions every day – what lane will I choose when I turn into St Kilda Road, what temperature will I set the thermostat, how often will I back-up my computer? We did not inherit heuristics to cope with these situations, but we have developed them (“use the lane with least traffic unless it has a heavy vehicle”).

For the most part these heuristics work. They economize on our search costs and allow us to make sound and efficient decisions most of the time. In financial decisions our departures from optimality are usually random and are often self-cancelling. In some markets, for example, we may sometimes pay too much because of inadequate search, and sometimes come across a bargain through good luck. Quite often, in the case of experience goods (low cost goods with repeat purchases) we refine and improve our decision-making over time.

It is probably because these heuristics serve us well that they are so entrenched. We can contemplate a life without these heuristics, and it is the life of the savant, the Raymond Babbitt character in the 1988 movie *Rain Man*.

Sometimes, however, our heuristics consistently lead us away from sound decision-making; those departures from rationality are biased one way or another. We are often hasty in our decision-making when we should use a more considered process.

Daniel Kahneman, who won the 2002 Nobel Prize in economics for his work on behavioral economics, suggests that we have two modes of decision-making, intuition and reasoning, and that our decision-making mistakes often result from use of the wrong mode.<sup>5</sup> That theory is now the subject of studies in an emerging field known as “neuroeconomics”, which posits the notion that parts of our brain devoted to planning and carefully considered problem-solving are relatively modern in the evolutionary time scale.

These departures from rationality are often of little material consequence. For example, in supermarket shopping we may consistently pass over opportunities to buy cheaper house brands of certain foods – with little consequence for those who can afford to neglect the occasional bargain. But, for some large transactions, and for people with limited financial buffers, these departures from rationality may have significant and costly consequences, often delayed (as in the case of retirement saving products). These are what are known as *costly biases*.

They are known as “biases” because they are not random departures from rationality, clustered around some rational mean. Rather, they show consistent patterns of departure from rationality.

In a paper I delivered last year to the Australian Bankers’ Association I described many such biases that affect our financial decision-making.<sup>6</sup> Here I will focus on

those biases which may be of most relevance to those involved with microfinance and related programs.

One set of biases relates to *anchoring*. In finance an anchor is the first figure (a price, an interest rate) to lodge in our mind. As with a ship's anchor it doesn't hold fast, there can be some swinging on the anchor chain and some drift, but the ship doesn't wander far from the anchor point.

### ***Anchoring – insufficient adjustment***

Consider one of the following questions about unemployment in European countries. Then consider the other question and contemplate whether you would have given a different answer.

- (A) The latest (May 2009) reported unemployment rate in Spain is 17.4 percent. What is it in Germany?
- (B) The latest (May 2009) reported unemployment rate in Denmark is 2.9 percent. What is it in Germany?

Those who start with (A) tend to overshoot the correct answer, while those who start with (B) undershoot. (The correct answer is 8.1 percent.) The initial given rate is an anchor, and although we may know it is too high or too low, we tend to be too conservative in our adjustment.

Salespeople are well aware of this bias (although they may not give it the same name as economists use). One practice is to offer consumers an expensive product which they do not expect to sell, but which will help establish in the consumer the notion of a reasonable price for other products. For example, the \$7000 barbeque makes the \$5000 barbeque look like a reasonable deal and the \$1300 barbeque look like a bargain.<sup>7</sup> Ideally, the anchor for the price of a barbeque should be the cost of a few bricks and an old stove shelf.

### ***Anchoring – what I can afford***

Think of one of those open-ended purchases with a huge range of prices on offer, such as buying a house or a car. What is your starting point in dealing with a salesperson:

what you can afford?

or

what you consider you need?

Many salespeople use “affordability”, usually the absolute limit of one’s resources, as an anchor point. Quite often we do so ourselves, even before being prompted by the sales person with the question “how much can you pay?”

Negotiation trainers, such as Roger Fisher and William Ury, warn us never to reveal our resources in financial negotiations.<sup>8</sup> We should reveal our interests, but not our limits. Unfortunately, guides on housing affordability, such as X% of income to service a mortgage, have become benchmarks of what we should expect to pay for a house rather than a guide to our upper limit.

### ***Anchoring – overconfidence***

Estimate the following quantities, such that you are 95 percent confident that you have bracketed the actual result within your upper and lower bounds.

- (A) The population of Victoria.
- (B) Fidel Castro’s age in years.
- (C) NAB’s dividend per share for the half year to March 2009.
- (D) The elevation above sea level of Mt Kosciusko.
- (E) Cathy Freeman’s winning time in the Sydney Olympics 400 metre race.

The correct answers are in the endnotes.<sup>9</sup>

Most of us fail this exercise dismally. And we often do worst on those questions where we perceive there to be an expectation that we should know the answer. But it would be easy for anyone to get all of these right, by placing wild upper and lower bounds. Fidel Castro looks older than 10, but he must be less than 200 ...

The reason we fail to adopt such a simple approach is that we are generally overconfident in our (fallible) memories and powers of estimation. We can become overconfident in our ability to repay a loan, to accumulate an adequate superannuation balance because we are sure to get those two promotions, and so on. A survey by the Australian Financial Literacy Foundation found widespread overconfidence among consumers, manifest as a large gap between people’s self-assessment of their financial management skills and their revealed abilities.<sup>10</sup>

University lecturers run surveys in their classes, along the lines “Comparing yourself with others in this class, consider your skills in field X. Are yours below, at, or above the mean for the group.” “X” is sometimes a generic skill, such as cooking or driving a car. In financial classes it is usually about investing. No matter what context is used, the vast majority are self-rated as above average – a phenomenon Garrison Keilor has dubbed “the Lake Woebegone Effect”, where all the kids are above average.



And another short exercise on overconfidence:

When giving an estimate for the time taken to complete a task:

- I usually overestimate the time I will take
- I usually make a very accurate estimate of the time I will take
- I usually underestimate the time I will take

### ***Anchoring – disjunctive bias***

This bias is closely related to the overconfidence bias.

We are apt to underestimate the probability of disjunctive events. Consider the following thought process:

“I will be able to repay this loan, provided I keep my job, provided I don’t get sick in the next three years, provided my spouse doesn’t quit work, and provided I don’t need major car repairs”.

Imagine that each of these four misfortunes has a probability of only 20 percent. What is the probability that none will occur?

In fact, the probability of none of them occurring is only 41 percent<sup>11</sup>. But most people would guess a far higher probability of plain sailing.

The disjunctive bias may explain why we can be influenced by the way in which probabilities are presented. The jackpotting “Powerball” lottery may appear less attractive if the probability of winning were represented as 1 in 6 597 498 600, rather than as a combination of six numbers between 1 and 45.<sup>12</sup>

### ***Biases in handling risk – prospect theory***

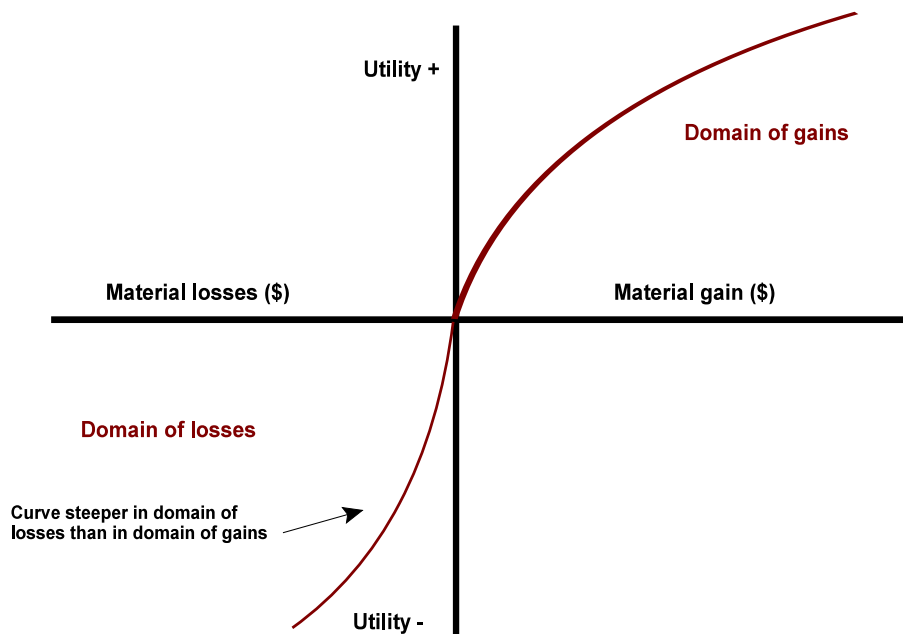
That leads to a consideration of another set of biases which come to play in decisions involving risk. The casual observer may gain the impression that those least able to bear risk are most likely to expose themselves to risk. There is some empirical support for such a proposition, particularly in relation to gambling.<sup>13</sup> A body of theory known as *prospect theory* provides some explanation for such behavior.

Most of us are familiar, at least intuitively, with the concept of diminishing marginal utility. The more cans of beer, square metres of house or Mercedes cars we have, the less is our utility (enjoyment) from each additional can of beer, square metre of house, or Mercedes Benz.

Similarly, though slightly harder to imagine, the more we lose the less painful is each additional increment of loss. We may be upset when we lose \$10 or \$1000, but we will not be doubly upset when we lose \$20 or \$2000.

Also, as a general proposition, we feel a loss more painfully than the enjoyment of an equivalent material gain.

These properties can be represented graphically. See Figure 1 below which shows positive and negative utilities associated with gains and losses.



**Figure 1. Prospect theory utility curves**

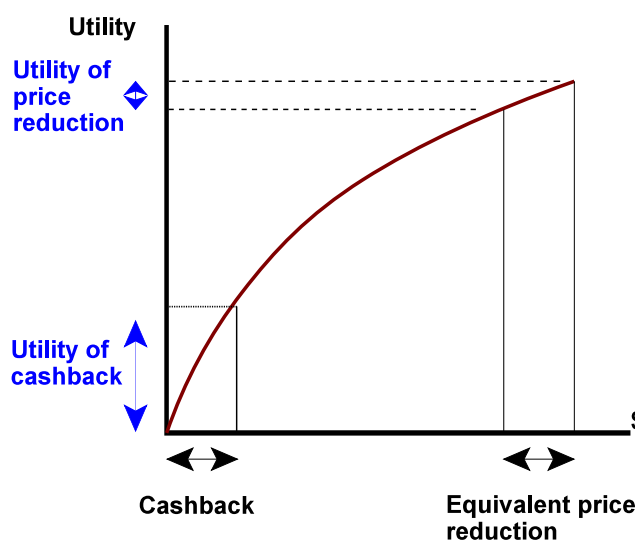
Those simple propositions, which align with most people's experiences and preferences, form the basis of *prospect theory*, a framework developed by Kahneman and his colleague Amos Tversky to explain how we behave in situations of tradeoffs, particularly where uncertainty is involved.

Our financial decisions are often determined by the way choices are framed – either by salespeople or ourselves in envisaging our choices. These frames can be understood by example.

### ***Framing – cashback offers and gifts***

Rather than posting a single price, some companies offer a “cashback” to customers. Prospect theory helps explain its attraction. The difference between a price reduction and a cashback is shown in Figure 2. The price reduction occurs in the higher, flatter, part of the utility curve, while the cashback occurs down at the origin, where the curve is steeper. A “gift” of \$100 feels more beneficial than a price reduction from \$900 to \$800.

Similarly, as most parents understand, a series of small gifts will have more utility than one large gift of equivalent monetary outlay, because the small gifts have their influence at the steep part of the utility curve. (Politicians also know this: in spite of high administrative costs it is much more politically attractive to keep many small programs running than to consolidate them.)



**Figure 2 Utility of cashback offer**

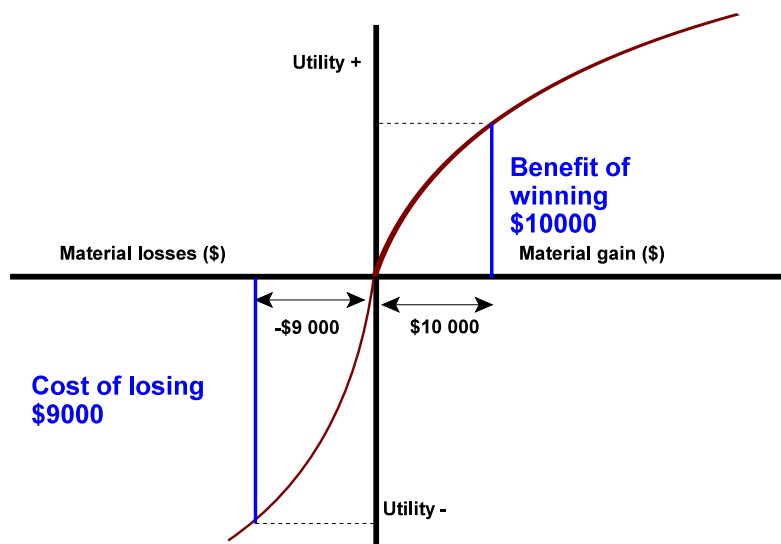
### ***Framing – gambling***

Consider the following situations. What would you do in these situations?

- (A) There is a lottery with a single prize of \$1.0 million. There are 1 000 000 tickets to be sold for \$1.00 each. Would you buy a ticket?
- (B) There is a lottery with a single prize of \$0.8 million. There are 1 000 000 tickets to be sold for \$1.00 each. Would you buy a ticket?
- (C) You are a guest in a TV show. The compere offers you the choice of a certain prize of \$9 000, or, on the roll of a dice (standard six sided), the chance to win \$60 000. Do you take the roll of the die?
- (D) You are at a roulette table, and have lost \$400. You have another \$400, and can put it on odd/even, or black/red. If you lose you are down \$800, and cleaned out; if you win you can go home no better or worse off than when you started. Do you make the bet?

Typical behavior for most people is to accept the gambles in (A) and (B). Even though the expected value of the gamble (B) is a small loss (the weighted probability of outcomes is a loss of 20 cents), many people, including statisticians and economists, get some enjoyment out of the game.

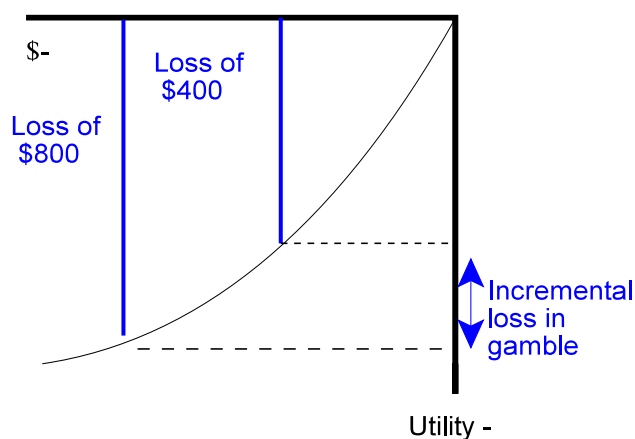
Situations (C) and (D) are more relevant to financial decision-making. Note that in (C), while the expected value of the gamble is \$10 000 (= 60 000/6), most people opt for the sure \$9 000. That is typical risk-aversion. See Figure 3: in terms of utility the cost of a loss of \$9 000 (below the axis) is far greater than the benefit of a gain of \$10 000 (above the axis) because of that steeper curve below the axis.



**Figure 3. Explanation of risk aversion**

In situation (D), however, many people prefer the gamble. Given the odds against winning in roulette (the house has a small bias), the general rule of risk aversion would suggest we will avoid the gamble, but the attraction of the gamble lies in the shape of the utility curve in the domain of losses.

The reason is that there has already been pain in losing \$400, and, because of the shape of the utility curve (or, rather, because of human nature represented by the curve), the additional pain of losing another \$400 is much less than the alleviation of pain (the gain) of getting back to a zero balance for the evening. (See Figure 4.)



**Figure 4. Risk-seeking behavior in domain of losses**

As our ancestors said before they came to New South Wales, “as well be hang’d for a sheep as for a lamb”.

This helps explain the phenomenon of “throwing good money after bad”. Note, however, that if the gambler is not keeping a careful tab, or is insouciant about the loss so far, the gambler’s viewpoint shifts from a position of minus \$400 to the axis. In effect this is a sensible re-framing to ignore the sunk cost. Such cool, calculating characters may be commonplace in James Bond movies, but they are seldom found in real life.

A consideration of such framing gives us some insight into the way some people, already heavily committed in debt, incur further debt – perhaps by taking up another credit card – or incurring high risk gambles – such as blowing money on poker machines. As financial counsellors know, the notion that there is only a small or zero chance of moving oneself out of debt is very disheartening, and generally must be dispelled before any practical progress can be made.

### ***Framing – shifting viewpoint on the utility curve***

Would you accept this gamble:

A 50 percent chance to lose \$6000, a 50 percent chance to win \$9000.

Now make a crude estimate of your wealth  $W$ . (Bank accounts, shares, equity in your house.) Which situation is more attractive to you:

(A) Your own wealth  $W$  or

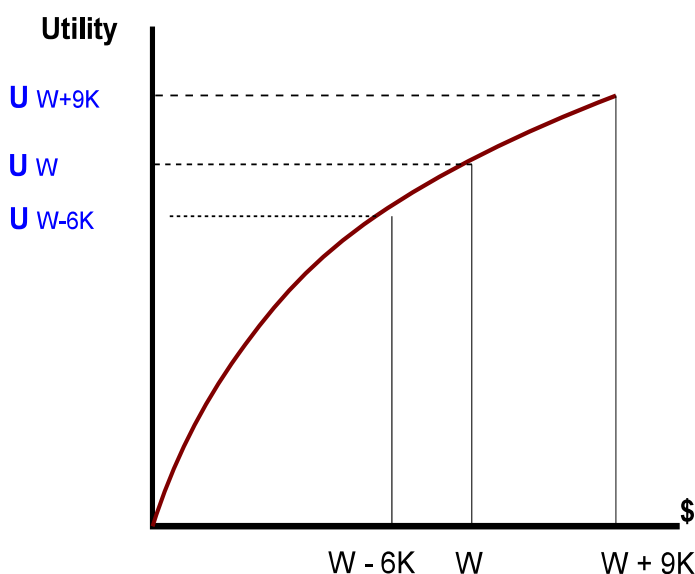
(B) A 50/50 chance of you owning either  $W - \$6000$ , or  $W + 9000$ .

These two gambles are identical, but many people who initially show risk aversion in the first instance change their mind when they are pushed into a different frame once they bring their wealth to account.

In the first instance the frame is around the origin of the axes, and the logic of risk aversion to avoid a loss holds (the quiz show scenario above), even though the gamble has an expected value of \$1500.

When the point of reference is shifted, however, the gamble looks more attractive, because it is centered on a flat portion of the utility curve (assuming  $W \gg \$9,000$ ).

**Figure 5. Re-framing to domain of gains**



This tendency to frame gambles around the origin has implications for insurance markets. It helps explain why insurance, in economists' terms, is a "superior" good; that is, the greater our means (income or wealth) the more insurance we take, even though, rationally, the greater our means the more we should be able to self-insure, thus saving transaction costs and the cost of moral hazard of being in a pool of people with little incentive to exercise care.

Justin Sydnor finds what he calls "abundant risk-aversion" among household insurance policy holders, who could enjoy significantly cheaper insurance if they opted for policies with higher deductibles.<sup>14</sup> In Australia we find similar patterns in health insurance, and in household and motor vehicle insurance companies do not offer products with significant risk-sharing for retail customers. The highest retail deductibles for houses are around \$1000, while, in the more "rational" commercial markets, insurers sensibly offer significant discounts for risk-sharing. (Part of the problem in retail insurance may relate to commission-based selling, which encourages sales agents to maximize the value of policies rather than the profitability of policies.)

The very poorest tend to be under-insured. But there are many others who could profitably review their insurance policies. If they can be encouraged to save \$1000 or so, held aside for contingencies, they may be able to renew their insurance policies choosing higher deductibles, with significant savings.

### ***The endowment bias***

As financial counsellors know, reviewing one's patterns of expenditure is a crucial aspect of financial planning. But another bias gets in the way – the *endowment bias*.

Have you ever held on to an ornament or painting which you would not buy if you did not already own it? Have you ever found it hard to throw out an old computer which is no longer useful but for which you paid a lot of money? Have you ever held on to a share which you wouldn't buy if you did not already hold it?

If you answered yes, you are subject to the pull of the endowment bias. Perhaps paintings and ornaments have some sentimental value, but not so shares or old computers.

Some examples of the bias include:

- the person who holds money in an interest-bearing account, while accumulating interest on a credit card;
- the person who holds health insurance because he or she has always had health insurance;<sup>15</sup>
- the person who is reluctant to give up little-used subscriptions such as gym club membership.

### ***Short term biases***

Of most relevance to those involved in microfinance are those biases which make it difficult for us to save and which lead us into debt at levels we come later to regret.

Consider the two situations below:

(A) What is your preference between receiving:

\$1600 now or

\$1700 in a month's time?

(B) What is your preference between receiving:

\$1600 in twelve months time or

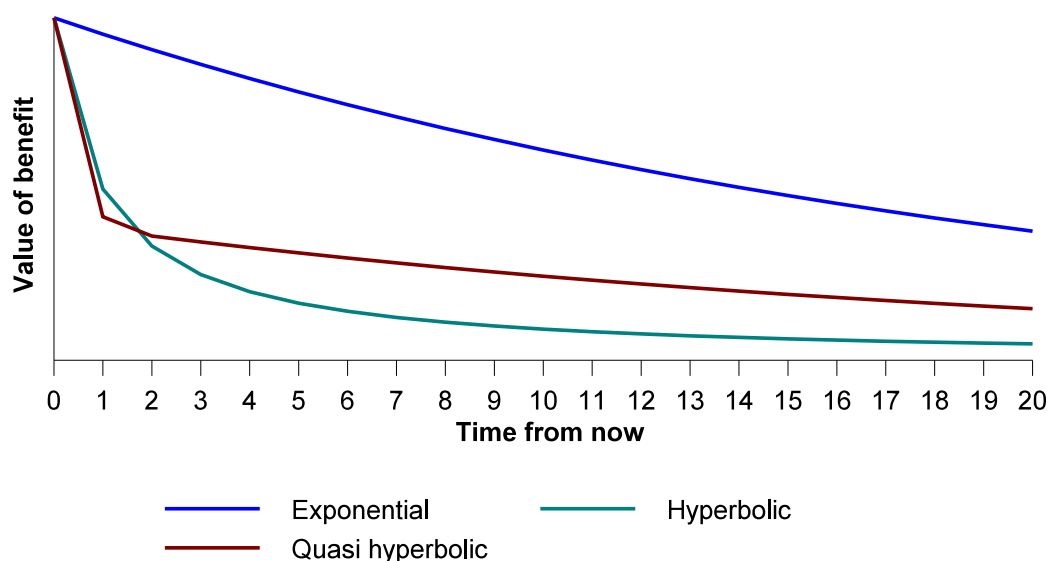
\$1700 in thirteen month's time?

In (A), many people opt for immediate payment, even though the implicit discount rate (the discount we put on future benefits or costs) in choosing immediate payment is greater than 100 percent a year. But in (B), we find more “rational” responses in line with the textbook model of “exponential discounting”. It is as if we say to ourselves “I’ll be impulsive today but rational tomorrow”, but, as the song goes, tomorrow never comes. In its 2005 survey of the causes of financial difficulty, the ANZ identified “living for today” as a cause of financial stress.<sup>16</sup>

There is nothing novel in the observation that we are short-sighted. In 1739 the philosopher David Hume wrote:

There is no quality in human nature, which causes more fatal errors in our conduct, than that which leads us to prefer whatever is present to the distant and remote<sup>17</sup>.

Some researchers say our observed discount function is “hyperbolic”. David Laibson of Harvard University uses a more precise model he calls “quasi hyperbolic discounting”.<sup>18</sup> This places a very high discount rate on the very short term, but then reverts to a “rational” exponential function.



**Figure 6. Discounting functions**

Whatever the precise shape of the curve (which may not conform to any well-defined mathematical function), the point is that we are generally myopic in decision-making. We tend to under-invest in retirement savings and to incur high credit card debts even though our intention may have been to make that voluntary superannuation contribution before June 30 or to pay off our credit card.



There are two possible sources of myopic behavior. One is that we may lack the mathematical sophistication to undertake projections of future costs and benefits. A store offer, for example, giving 60 months to pay, even when all payments are exposed, requires some basic knowledge of financial math to allow the consumer to calculate an equivalent interest rate. (In reality the schedule of payments is not always clearly exposed.)

More commonly, however, the problem is one of self-control, or frailty of will. For example, most of us know credit card interest rates are high and we have every intention of paying the balance in the interest-free period. We know hotel mini-bars are expensive, and do not intend using them when we check in. But we often break these contracts with ourselves.

This is not to suggest that impulsiveness, or frailty of will, reveals some personal failing. For most of our evolutionary history short-term thinking has made a great deal of sense. Until we moved to higher latitudes with distinct seasons there was nothing to be gained from storing food, for example, and everything to be lost through hoarding. Another evolutionary inheritance relates to our behavior when we are in a state of anxiety. Anxiety tends to focus our mind on the immediate, which means we defer thinking about the long term. Paradoxically, this means if we are anxious about our long-term financial situation, such as our income in retirement, that very anxiety is likely to reduce our capacity to do anything about it.<sup>19</sup>

Neurological research suggests that our capacity to think beyond the immediate is limited. As pointed out earlier, Kahneman refers to separate “intuition” and “reasoning” functions. When our mental faculties are committed to moderately difficult tasks, our capacities for long-term thinking are diminished because our reasoning functions are fully committed.<sup>20</sup> This means, for example, that in a complex financial transaction involving many elements, such as a mortgage or superannuation plan, our thinking about important long-term options can be impaired by our need to attend to points of moderately complex detail; in such situations we are likely to make all decisions, including the important ones, on impulse. Unscrupulous salespeople can use this temporary impairment to trick us into making unconsidered choices.

Consumer education may have some benefits for those who lack mathematical skills to compare financial products with different streams of benefits and costs over time. What once required mastery of university level financial mathematics now can be done with spreadsheets, using simple difference equations<sup>21</sup>, and there are many web-based calculators for standard product choices, such as superannuation. But education does not overcome our frailty of will.

There is some speculation, however, that early childhood education can help instil saving habits. (Some banks have children’s savings accounts; the transaction costs of

these accounts are probably very high, but, possibly, they lay down some patterns of behavior.)

Whatever the cause, we do know that discretionary household savings have been falling until recently, and this has implications for many people living without any slack between income and expenditure, for they lack the financial autonomy enjoyed by those with modest liquid assets. One of the more startling findings on financial behavior came not from universities or from the financial sector, but from the Wesley Mission, which found that four in ten Sydney households would be unable to draw on savings or their mortgages if faced with an unexpected once-off debt of \$2000.<sup>22</sup> Once people are cash-poor, either through frailty of will or force of circumstance, they have no option but to take out a loan for a car, to take out maximum insurance, and to rely on expensive credit such as credit cards or even payday lenders for contingencies.

Xavier Gabaix and David Laibson point to some essential market failures resulting from frailty of will.<sup>23</sup> They use hotel mini-bars as an example. We know that mini-bars are an expensive source of drinks, and that disciplined consumers do not use them, enjoying the benefit of a lower room price cross-subsidized by mini-bar users. Why, they ask, in such a competitive market do not these cross-subsidies get eliminated with some hotels leading with slightly higher room prices and lower mini-bar prices? After all, in economic theory, competitive markets generally do not sustain cross-subsidies for very long.

Consider a hotel that adopts such a business model, reducing the price of mini-bar drinks and increasing its room prices. It will lose business from the savvy, disciplined consumers, influenced by room prices alone. Will it make up business from others? It will not, because even the undisciplined consumers will prefer the cheaper hotels with expensive mini-bars, because they do not expect to use the mini-bars. Their frailty of will comes into play later when they crave that bottle of Shiraz. The more “rational” business model is never adopted, and the cross-subsidies remain in an equilibrium condition.

The same holds for credit card markets.<sup>24</sup> Many consumers, on taking out a credit card, expect to pay it off, but fail to do so when the time comes. There is no incentive for a bank to drop its credit card interest rate, presumably at the cost of raising some other fee or shortening the interest-free period, for the only new customers it will attract will be those who *know* they will not pay in time and are attracted by the cheaper rates; many such customers will probably finish up on the bad debtors’ books. However, it will not attract those who believe they will pay off their card in the interest-free period but do not; these are generally very profitable customers. And it will lose disciplined customers who are turned off by higher fees. Hence, as Gabaix and Laibson explain, the cross-subsidies remain.

Sometimes, in response to our known lack of self-control, we choose binding mechanisms that overcome our impulsiveness. We may join a Christmas saving club, even though its interest rate is low. Some taxpayers, subject to periodic deductions from their payroll, opt for a high rate of deduction to avoid the risk of having a liability at the end of the year, even though that represents an interest-free loan to the tax authority. Many people opt for up-front gym membership over paying per session, in the hope that when the time comes to use the gym they will have to endure only the muscular pain rather than the combination of muscular and financial pain, thus easing the decision.

We often appoint external agents to operate binding mechanisms. We elect governments which require us to contribute to our superannuation and to wear seat belts, and which prohibit us from consuming (some) addictive products. It is a domain of our lives where we opt for regulation as a choice. It contrasts with any paternalistic notion of regulation, for paternalism, by definition, is imposed without the consent of the regulated. Note that in Australia no political party seriously competing for office proposes abolishing seat belt laws or compulsory superannuation, for these measures are reasonably popular across a large proportion of the population.

The main point for financial counsellors is to identify the mechanisms which lead people into getting into excessive debt. It can be naivety or a lack of discipline. Louise Sylvan, when she was CEO of the Australian Consumers' Association, developed a neat four way classification of behavior in relation to credit cards:

The sophisticated and disciplined person uses her credit card and pays it off at the end of each month.

The sophisticated and undisciplined person uses her credit card, believing she will pay it off, but gets into debt.

The naive and disciplined person will get into debt, but will learn in time and extricate herself or cut up her credit card (thus losing a lot of convenience).

The naive and undisciplined person will get heavily into debt – will “max out” – and will need external help.

### ***Mortgage stress and the money illusion***

When looking to the future we are often subject to another bias, the *money illusion*.

One aspect of the money illusion is that we find it difficult to deal with inflation. (Children, however, seem to have an innate knowledge of inflation, when parents try to use their own childhood allowance as an anchor for setting their children's allowance.)

The short-term and optimism biases help explain why we find attractive deals such as offered by finance companies involving repayment holidays, followed by usurious interest rates. Even if we are aware of the huge penalties for default (and often we are unaware), we are optimistic enough to believe we will never be in such a situation.

These two biases – short termism and optimism – have conspired with our misunderstanding of inflation to aggravate mortgage stress.

When we take a mortgage our main consideration is usually the burden of immediate repayment, rather than the outlays over time. That's our short-term bias at work. And because we are optimistic we don't take into account risks such as illness or unemployment. Reinforcing these biases is the knowledge that our parents and grandparents had mortgages and they got through. And, over most of the last fifteen years, we had a federal treasurer telling us that interest rates had never been so low.

What we forget is that in the 1970s and 1980s, there was comparatively high inflation, in the order of ten percent. Interest rates – what are referred to as “nominal interest rates” – are usually about five percent higher than inflation. Housing interest rates did indeed hit 15 to 17 percent in that period. But these were nominal rates that built in an inflationary component.

When people took out a mortgage at high nominal interest rates, they faced very high initial repayments, but, because of inflation, their (nominal) wages rose, while the mortgage remained frozen. For example, a \$200 000 mortgage at 15 percent over 20 years involves an initial payment of \$32 000, a high burden on a household with an income of \$100 000. But, if inflation is 10 percent, and is fully paid out in wages, after a year that income has risen to \$110 000, and after two years to \$121 000, and so on, while the mortgage repayments remain at \$32 000. Inflation helps compensate for the biases towards over-commitment.

In a low-inflation environment, however, while nominal interest rates are lower, there is not the offsetting benefit of increasing nominal incomes. The burden of repayment remains high. In fact, if there is a bout of deflation, as happened in Japan in its earlier crisis, the burden of loan repayment actually increases. That is one reason governments are now so concerned about the risk of deflation.

**Understanding the difference between real and nominal rates.**

The equation is most easily understood by example. Imagine a university receives a \$1 000 000 bequest to fund scholarships in perpetuity. The posted (nominal) interest rate is 7 percent, and inflation is 3 percent. How much can the university draw to fund the scholarships?

In the first year, the million dollars will pay out \$70 000. But there has been 3 percent inflation, which means \$30 000 must be paid back to the fund to sustain its real value. That leaves \$40 000 for the scholarships.

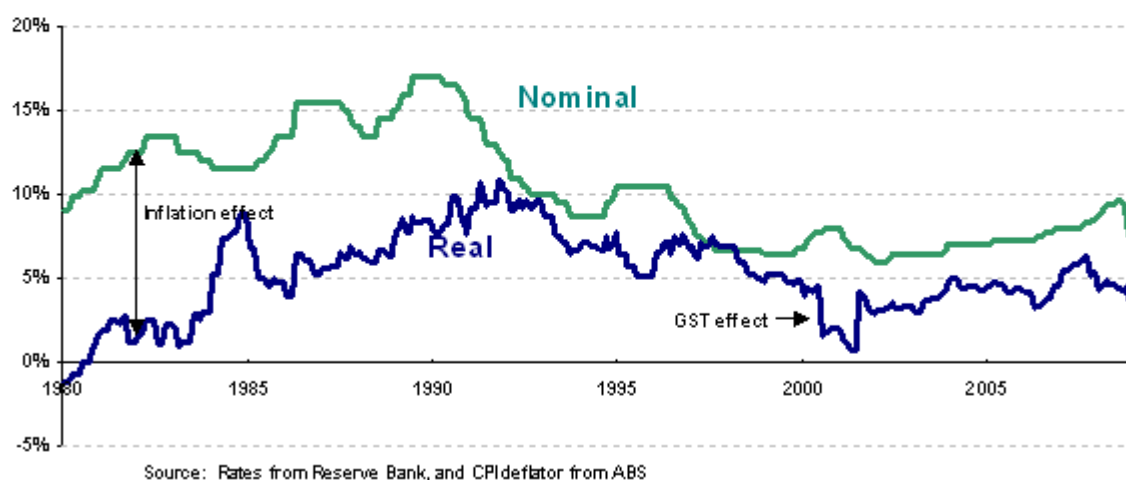
Or, more simply:

$$7\% \text{ (nominal)} - 3\% \text{ (inflation)} = 4\% \text{ (real)}$$

It is unfortunate that people do not understand the difference between nominal interest rates (the rates posted) and real interest rates (the rates after inflation). The simple formula is:

$$\text{real rate} = \text{nominal rate} - \text{inflation}$$

Figure 7: Nominal and real standard bank housing interest rates



As the graph shows, real rates have fallen somewhat over the 1990s, before starting to rise again in the 2000s and falling over the last year as the financial crisis has set in, but in recent decades they have generally been more stable than in earlier times, when our Reserve Bank was less independent. (Note, particularly, the very low and even negative real rates of the early 1980s, which help explain the privileged position of baby boomers who have had little difficulty in paying off their mortgages.)

### ***Misunderstanding wealth and the money illusion***

We are prone to confuse wealth and money. Indeed, in the financial sector there are many people employed as “wealth managers”, when, in reality, they are “money managers”.

Until recently, when housing prices started to flatten, many people came to see rising prices of their houses as increasing wealth. In fact, for the most part, such price rises are simply asset price inflation. In reality, in terms of real value, most houses

deteriorate over time, and require injections of capital to cope with the ravages of children, pets and guests who spill red wine.

That illusion has contributed to heavy reliance on mechanisms such as mortgage re-draw, thus prolonging the burden of mortgage payments and the heightening the risk people face in becoming dependent on drawing from a finite source of funds to pay for recurrent expenses. And, when house prices fall in nominal terms as has happened in some regions, the illusion of a loss of wealth may result in a pessimism bias. (If the combination of earlier mortgage re-draw and declining house prices leads to negative equity, then there the illusory problem becomes a real one.)

### ***Mental accounts***

Consider the two following situations

- (A) You have gone to a theater and discover that you have lost your ticket, costing \$50. There are plenty of seats available, and because you have a credit card you can buy another. Do you buy one?
- (B) You have gone to a theater to buy a \$50 seat for a play and discover that you have lost \$50 from your wallet. You can use your credit card, however, to buy a seat. Do you buy one?

Many more people choose to buy a ticket in situation (B) than (A). In situation (A) it's as if the loss is from an account called "entertainment", while in (B) it's from an account called "consolidated revenue".

We tend to compartmentalize some areas of income and expenditure, which means economic notions such as the "marginal propensity to save" are of limited use in predicting individual behavior. Our behavior in relation to bonus payments, tax refunds, lottery winnings and inheritances may be quite different from our behavior in relation to our "normal" income. We may choose to spend our windfalls much more carelessly than we spend other money, or, on the other hand, may place them entirely into our superannuation accounts.

Over the last few months there has been a great deal of political argument over people's handling of the stimulus cash handouts. There are reasonably robust economic theories on the way we handle permanent increases in income, but there is no theory which can predict how we will perceive a once off \$900 handout. Perhaps the word "bonus" may have had an affect on people's behavior, but in reality it was something of a leap of faith by the Commonwealth.

## Towards better financial behavior

Knowing these biases, the question confronting policymakers, bankers and financial counsellors is how to overcome them. They are certainly known, if not by name, to the less ethical lenders, insurers and investment advisors.

### *Financial literacy*

Our first approach is often to try to improve people's financial literacy.

To draw a language analogy, literacy is vital for our survival, but it cannot guarantee wise decision-making. A diplomat fluent in the language of his or her host country can still be quite incompetent. So it is with financial literacy, for behavioral economics demonstrates that our propensity for making poor choices is largely independent of our education.

We have tended to take a technical view of financial literacy. One definition in common use has been "The ability to make informed judgements and to take effective decisions regarding the use and management of money".<sup>25</sup> The Australia Institute, in a recent survey on financial choice overload, uses a broader definition, which includes the technical aspects of knowledge and skills, but which adds "using that knowledge and understanding to plan and implement financial decisions".<sup>26</sup> That definition acknowledges the behavioral problem of recognizing those situations when we need to apply those technical skills.

Even at a technical level there are some adjustments which can be made to financial literacy programs. One specific suggestion relates to improving people's understanding of inflation and the related distinction between real and nominal interest rates. Another avenue to explore (one I have personally explored with students fearful of numbers) is the use of simple spreadsheet modelling. And there are suggestions that computer games, with randomized variations, can help people develop a feel of how markets behave.

There is unlikely to be one best means of improving financial skills, however, because different people have different learning pathways. The Australian Bureau of Statistics skills survey finds that people achieve competence through many different means. The ABS asked people how they acquired their skills. Among those with the highest quintile rankings in mathematical and problem-solving skills, sources such as "manuals and reference books", "computer or internet", "watching, getting help or advice" and "trying things out or practice" all scored more highly than "undertook an education qualification and/or course".<sup>27</sup> Any education campaign has to be multi-faceted.

One particular but unsurprising finding of behavioral economics is that learning rapidly depreciates.<sup>28</sup> The timing of education must be relevant. (As a case in point,

most Australians have passed high school exams covering compound interest, but recall is difficult.)

The same ABS skills survey finds pockets of deficits in mathematics and problem-solving. In relation to age, our capabilities in these fields follow an inverted “U” shape: younger and older people are less skilled than people in their middle age. This aligns to an extent with UK research which shows older and younger people are more likely to be victims of scams than middle-aged people.<sup>29</sup> Another finding of the ABS survey is that skills in mathematics and problem-solving vary strongly, even among graduates: surprisingly engineers, who we would expect to have developed these skills in their formal education, score quite poorly.

Financial literacy education, by definition, has specific content, but there are broad skills which help us make better financial (and other) decisions. For example, implicit in ASIC’s message “if it is too good to be true it probably is” is a need for healthy skepticism rather than any specific financial skill. Possibly the most valuable quality we can draw from education, particularly early education, is skepticism, not only of the claims of salespeople, but also of our own impulsiveness. Behavioral research shows that when we stop and think our decision-making generally improves. The exercises in this paper all involve simple problems: our errors arise not from ignorance, but, rather, from haste or more generally from using the wrong decision-making processes. Once financial and general education has laid down the basic skills, the next priority should be to help people identify those situations when they need to apply those skills.

The question of how to improve behavior, therefore, remains largely unanswered, but at least we are coming to learn that some things (such as ever more onerous disclosure requirements) do not work, we are learning more about how choices can be framed so as to help wise decision-making, and we are realizing that our actions in markets must be understood to be fair.

### ***Financial decision-making in a social context***

I will conclude by entering into a little speculation, and in doing so will suggest why programs such as NILS, Adds Up and Step Up are soundly based schemes.

One finding from behavioral economics is about the power of defaults.

Countries with assumed consent for organ donation, with allowance for opting out, have much higher rates of organ donation than similar countries with “opt in” provisions, where one has to make a definite election to donate organs.<sup>30</sup> Consent rates in Denmark, Netherlands, UK and Germany, all “opt in” countries, are all below 30 percent, while in Austria, Belgium, France and Hungary they are all above 90 percent.



The most clear financial application in Australia relates to choice of superannuation fund. Most people go along with the fund offered by their employer. Many superannuation policies come bundled with life insurance, and the uptake of insurance is likely to be influenced by the presentation of the insurance option as “opt in” or “opt out”.

In Australia there is recurrent discussion of increasing the compulsory superannuation contribution from 9 percent to 12 percent or even 15 percent. For some people, however, such higher contributions may unduly skew lifetime income towards their retirement years. An “opt out” scheme would give them a choice. New Zealand has the “Kiwisaver” scheme, in which workers are automatically enrolled in a pension scheme when they start a new job and have six weeks to opt out.

Conscious use of defaults is sometimes referred to as “soft compulsion”. There has been a great deal of public debate about use of defaults not just in relation to organ donations and superannuation, but also in relation to environmental and health choices, such as “green power” and choices in school cafeterias. The popular book *Nudge* (i.e. nudging, but not forcing, people to wise choices), by Richard Thaler and Cass Sunstein, has contributed to this debate.<sup>31</sup>

For all the evidence of the success of defaults and similar nudge approaches, the mechanism whereby they work is unclear. It may be that defaults make use of our tendency to procrastinate, for behavioral research finds that not only do we put off unpleasant tasks, like getting dental checkups, but we also put off enjoyable activities.<sup>32</sup> For example, the shorter time we have to redeem a gift voucher, the more likely we are to use it. Or it may be that defaults work because they minimize our transaction costs.

Another possible explanation is that the presence of a default implies the existence of a strong norm, to donate organs, to save in superannuation, to buy green energy.

Sociologists stress that our actions are influenced strongly by social norms. We are generally herd animals, and if we believe that others are behaving in a certain way, then we do too. In the table below are some contrasting financial norms, one set relating to a culture of financial autonomy (to the extent such autonomy is practical), the other relating to a culture of dependence.

Financial autonomy behaviors	Dependency behaviors
Paying off full credit card balance monthly	“Maxing out” on credit cards
Saving to buy a car	Borrowing to buy a car
Keeping \$X 000 liquidity for contingencies	Keeping zero liquidity
Using debit cards	Using credit cards
Taking a mortgage adequate to housing needs	Taking the maximum mortgage available

From what I have seen of the microfinance plans, they fit well with sociological theory, and even though they involve dependency at first, they seem to be aimed at shifting people's behavior to the left in the above table.

At first sight improving people's autonomy may not appear to be a sound practice for a financial institution. Consumer loans, mortgages and credit card debts appear to be good assets on a bank's balance sheet. But, as we are now learning, particularly in the US and UK, many such assets are "impaired" to put it politely. I suspect that one positive outcome of the current problems will be that banks and other lenders become more conservative in lending.

There is some evidence of shifting norms. For the last two years, well before there was talk of a financial crisis, household saving has been on the rise. Possibly we are learning, and it will be interesting to see what we learn from the experience of a severe financial crisis.

Writing in 2006, at the height of the boom, the economist Avner Offer suggest prosperity itself and the fading memory of the hardship of the 1930s had diminished our capacity for self-control.<sup>33</sup> Perhaps with refreshed experience we will revert to the practices of an earlier generation. It is worthwhile for us to ask whether those with low income who get heavily into debt are picking up their behavioral norms from those who buy shares with margin loans and lease luxury vehicles.

## Conclusion

In our million years of evolution we have developed behavioral habits which, while generally functional, do not always serve us well in financial decision-making.

In terms of our evolutionary history, money is a very recent development. Niall Ferguson finds the earliest uses of money were a mere five thousand years ago<sup>34</sup>. Aristotle is the earliest known writer on a theory of money.<sup>35</sup>

From the time of the collapse of the Roman Empire until the sixteenth century, Europe suffered a shortage of money. When the conquistadors returned from South America with hoards of stolen gold, however, there was history's first recorded bout of destructive deflation. The conquistadors obviously didn't understand money.

Since then there have been booms and busts – tulips, railroads, colonial developments – and, in spite of two major depressions in the last 120 years, we still have not learned how to stabilize money – to match the financial economy to the real economy.

Widespread consumer credit and consumer investing are very new phenomena. Until the growth accompanying the Industrial Revolution, most people, apart from a few who were very well off, spent as they received. They neither borrowed or invested. In

fact, it was only in the great Depression that Keynes exposed the fallacy in Say's Law – a law which stated that supply always creates its own demand, because people will spend whatever they earn.

Now we are witnessing what may be the demise of another economic law, the notion of “efficient markets”, particularly as it applies to the finance sector and by extension to borrowers and investors.

This peek into history is more than a curiosity-driven diversion. Rather, I want to open up the possibility that we all have a great deal to learn about money, and that from such learning are likely to emerge new norms of behavior. It isn't as if we, who are fortunate, have some pearls of wisdom to give to the poor; rather it is that we all need to change our behavior.

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## Notes

1. There are not many studies on the relationship between education and the quality of financial decision-making, but those which are available do not suggest that individuals with high education or high IQ are free from biased decision-making. See, for example, Marianne Bertrand, Dean S. Karlan, Sendhil Mullainathan, Eldar Shafir, Jonathan Zinman "What's psychology worth?: A field experiment in the consumer credit market" Economic Growth Center, Yale University, 2005 <http://ssrn.com/abstract=770389>.
2. RRP = \$314 000.
3. Portfolio.com "The end", December 2008:  
  
<http://www.portfolio.com/news-markets/national-news/portfolio/2008/11/11/The-End-of-Wall-Streets-Boom>
4. Shane Frederick "Cognitive Reflection and Decision Making" *Journal of Economic Perspectives* Vol 19, Number 4 Fall 2005 pp 25–42.
5. Daniel Kahneman "Maps of bounded rationality: A perspective on intuitive judgment and choice" Nobel Prize lecture, December 8, 2002.
6. You can see a lot by just looking: Understanding human judgement in financial decision-making. Paper accompanying presentation to Australian Bankers' Association financial literacy summit July 2008, available on: <http://www.home.netspeed.com.au/mcau/academic/Default.htm>
7. This example is provided by Clive Hamilton in *Overconsumption in Australia: The rise of the middle-class battler* The Australia Institute Discussion Paper Number 49 November 2002.
8. See, for example, the longstanding negotiation guide by Roger Fisher and William Ury *Getting to Yes* (several editions, several publications).
9. Estimation answers: (A) 5 340 000 (Sept 2008), (B) 82 years (born August 1926), (C) 73 cents, (D) 2 228 metres, (E) 49.11 seconds.
10. Australian [Commonwealth] Government Financial Literacy Foundation *Financial Literacy: Australians understanding money 2007*.
11. Probability of none occurring is  $0.8^4 = 0.4096$ .
12. The number of combinations is  $45 \times 44 \times 43 \times 42 \times 41 \times 40 = 6\,597\,498\,600$ .
13. See The Productivity Commission *Australia's Gambling Industries Inquiry Report*, December 1999. Another inquiry by the Commission is now in progress.

14. Justin Sydnor “Abundant Aversion to Moderate Risk: Evidence from Homeowners Insurance” <http://wsomfaculty.case.edu/sydnor/deductibles.pdf> presented to US Federal Trade Commission Behavioral Economics Conference April 2007.
15. According to the ABS survey of private health insurance (*Health Insurance Survey* Cat 4335.0 June 1998), one third of people hold private insurance because they or their parents have always had it.
16. ANZ 2005 *op cit*.
17. David Hume *A treatise of human nature*, Book 3, Part II, Sect. vii. “Of the Origin of Government” 1739.
18. David Laibson “Golden eggs and hyperbolic discounting” *Quarterly Journal of Economics*, May 1997.
19. Presentation by Marilyn Clark-Murphy, Edith Cowan University, to ASIC seminar on consumer policy, 10 August 2007 (unpublished).
20. Baba Shiv and Alexander Fedorikhin “Heart and mind in conflict: the interplay of affect and cognition in consumer decision making” *Journal of Consumer Research* # 3, December 1999.
21. In the 1980s Edith Stokey and Richard Zeckhauser developed teaching methods using Basic programming, using simple difference equations, for students who lacked the mathematical background for handling financial mathematics. Borrowing their method I have taken advantage of computing progress and have done the same using spreadsheets, with considerable success.
22. “Many Sydneysiders ‘lack emergency funds’” *Sydney Morning Herald* 13 Nov 2006.
23. Xavier Gabaix and David Laibson “Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets” MIT Working paper 2005.
24. Oren Bar-Gill “Seduction by plastic” American Law & Economics Association Annual Meetings Paper 12 2004.
25. ANZ Bank/AC Nielsen *ANZ Survey of Financial Literacy in Australia* ANZ Bank 2005.
26. The Australia Institute 2008 *op cit*.
27. Australian Bureau of Statistics *Adult Literacy and Life Skills Survey, Summary Results* (Cat 4228.0, 2008, re-issued from 2006).
28. Sumit Agarwal, John C. Driscoll, Xavier Gabaix, and David Laibson “Stimulus and Response: The Path from Naïveté to Sophistication in the Credit Card Market” –

- paper presented to Federal Trade Commission conference on behavioral economics, Washington, April 2007.
29. Peter Lunt, Laura Miller, Johanna Körting, Joseph Ungemah *The psychology of consumer detriment: A conceptual review* Office of Fair Trading, UK, January 2006.
  30. Alberto Abadie and Sebastien Gay. “The Impact of Presumed Consent Legislation on Cadaveric Organ Donation: A Cross Country Study” Kennedy School of Government Faculty Research Working Paper Series RWPO4-024, June 2004.
  31. Richard Thaler and Cass Sunstein *Nudge: Improving decisions about health, wealth and happiness* (Yale University Press 2008).
  32. Virginia Postrel “The Gift Card Economy” *Atlantic Monthly* May 2009.
  33. Avner Offer *The Challenge of Affluence: Self-control and well-being in the United States and Britain since 1950* (Oxford 2006).
  34. Niall Ferguson *The Ascent of Money: A financial history of the world* (Penguin 2008).
  35. James Buchanan *Frozen desire: The meaning of money* (Farrar Straus Giroux 1997).