Agency Theory and Financial Planning Practice

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100-word abstract

We extend an influential contribution to the literature on agency theory and then use this extension, along with other theoretical contributions, to shed light on agency problems affecting funds management and financial planning in Australia. The case for pure fee for service in actively managed funds and plans turns out to be weak. The amount of money exposed to risk by an active manager should be less than the entire investible wealth of the client, especially in the case of investors on the cusp of retirement. Asset-based fees on actively managed funds should include a fulcrum component.

30-word abstract

Extending an influential contribution to agency theory helps to structure our financial planning debate. For example, the case for pure fee for service turns out to be weak.

1. Introduction

This paper compares and contrasts mainstream agency theory with financial planning practice in Australia. It appears to be the first attempt to do so. It extends an influential mainstream contribution to the literature on agency theory and then uses this extension, in conjunction with other theoretical contributions, to shed light on actual contracts between investors, financial planners, licensees and product providers. The case for pure fee for service in actively managed funds and plans turns out to be weak. The amount of money exposed to risk by an active manager should be less than the entire investible wealth of the client, especially in the case of investors on the cusp of retirement. Asset-based fees on actively managed funds should include a fulcrum component, contrary to current practice.

The background to this paper is the continued growth in financial planning and funds management as the baby boomers move towards retirement. At present only 13 per cent of Australians are at least 65 years of age, and 7 out of 10 retired households rely principally on the Age Pension. Only 15 to 20 per cent of Australians have received financial advice from planners at some point during their lives. However, the 65-plus population is projected to hit 23 per cent of the population by 2050 and self-funded retirements are becoming more widespread, so the number of Australians receiving advice from financial planners should rise. Funds under advice in Australia stand at $519 billion (Rainmaker Group 2013). There are 760 advisory groups, 8,300 financial planning practices, and 18,200 financial planners. There has been ongoing vertical integration within the industry, as small practices enter into 'sponsorship' relationships, primarily with the big-four banks and the major insurance companies. At least 80 per cent of financial planners are sponsored. On the other hand, self-managed superannuation funds account for 31 per cent of total superannuation assets of $1.4 trillion (Australian Prudential Regulation Authority 2012). This alone suggests that the market for advice is contestable, as a consequence of a substantial competitive fringe of comparatively self-reliant investors.

The financial planning industry has come under scrutiny in the wake of the global financial crisis centred on 2008 and the collapse of Storm Financial in 2009. The 2007 budget had abolished taxes on the earnings of superannuation funds in drawdown mode and allowed higher personal contributions. As a consequence there were strong inflows into superannuation during the 2007 financial year – decisions which worked out badly for many investors in the wake of the global financial crisis. The year 2009 saw two official inquiries into industry practices. The Ripoll inquiry reported in 2009 and the Cooper inquiry reported in 2010. These served as inputs to the government's Future of Financial Advice (FoFA) and MySuper reforms. Questions raised in the Australian debate on financial planning include these:

1. Should fee-for-service supplant asset-based fees?

2. Should commissions from product providers to planners be banned?

3. Do recommended asset allocations tend to be too risky for clients on the cusp of retirement?

4. Do financial plans tend to be 'cookie cutter' ones rather than customised to the particular circumstances of clients?

5. Do typical fee structures encourage 'closet indexing' by fund managers?

6. Is there inadequate disclosure of dollar (rather than percentage) amounts charged in fees?

We arrive at affirmative answers to all these questions except the first one.

Section 2 sheds light on the first, third, fourth and fifth questions by extending the model of Dybvig et al. (2010). That model is a direct descendent of the classic agency model due to Ross (1973). It derives optimal contracts in financial plans when both the investor-principal and the planner-agent have log utility. It does not distinguish between planners and managers, and this is useful to the extent that the managed funds industry shows strong vertical integration, as is the case in Australia. Efficient

fee structures always involve asset fees, and generally tie a component of remuneration to portfolio performance relative to a suitable passive benchmark to discourage closet indexing.

We introduce generalised log utility[1] into the setup of Dybvig et al. Generalised log utility has the realistic implication that relative risk aversion is a declining function of wealth, unlike its log, quadratic, power and exponential competitors.[2] It is the simplest way to capture habit-dependent utility whereby a retiree is concerned to prevent her living standard falling below some pre-determined level, and is also consistent with a desire to 'keep up with the Joneses'. It can rationalise conservative asset allocations on the cusp of retirement whereas simple log utility generates aggressive allocations. Generalised log utility captures the concern of some investors with preventing shortfalls in wealth below some subjective reference level, and the present value of protected future consumption is the natural interpretation of that level. In this way it sheds light on the important question of excessively risky allocations for people on the cusp of retirement.

Section 3 examines Australian industry practice. Unsurprisingly, typical contracts set out in actual Statements of Advice and Product Disclosure Statements turn to be much richer than could be captured by a single theory. Accordingly, Section 3 draws informally on the results of Stoughton et al. (2011), Bateman et al. (2007) and Grossman and Stiglitz (1976), in addition to the formal theory of Section 2. These contributions shed light on the agency problems raised by intermediated investment management, multiple time periods, and general equilibrium. Put another way, Section 2 does not shed light on all six questions, and therefore needs to be beefed up by other theories, at least informally.

Take our second question, on commissions. It presupposes a three-way split between investors, advisers and investment managers (notwithstanding the considerable vertical integration in Australia.) Stoughton et al. (2011) do introduce such a split (in contrast to Dybvig et al.) and it sheds light on commissions. Investors can engage an adviser, or pay a fixed cost to access actively managed funds

without intermediation by advisers, analogous to Australia's self-managed funds. Investors divide into sophisticated or unsophisticated ones, depending on whether they anticipate equilibrium outcomes in the financial planning industry and are impervious to promotional material. Commissions from managers to advisers can take the form of cash or soft-dollar compensation such as conferences in resort locations. All this helps explain Australian practice.

2. Agency Theory

This section extends the theory of fee structures for actively managed funds that mitigate agency problems when both the principal and the agent have generalised-log utility functions. One new result is that efficient fees include a fixed component reflecting the agent's protected consumption. This generates a new rationale for a flat component of fees, analogous to fee-for-service. But the optimal contract retains roles for asset-based fees. Another new result is that, from both an investor and manager standpoint, the participation decision is not all-or-nothing; the amount placed with the active manager is equal to the investor's wealth less the present value of the total protected consumption of the investor and the manager. Remaining wealth is allocated to safe assets. In practice, this suggests that an investor should place part of her retirement money in term deposits rather than entrust all of it to a financial planner.

Our setup retains some features of Dybvig et al. (2010). Notably, the asset-based fees derived there are retained here as a component of the overall fee structure, including a symmetrical asset-based fee for performance relative to a passive benchmark.

Dybvig et al. (2010) consider three optimization problems corresponding to increasingly severe agency problems. In the first-best case, agency problems are absent. In the second-best case the manager reveals truthfully the observed signal to the investor but has private information about her

effort level. In the third-best case the adverse-selection problem and the moral-hazard problem are both present. It is the second-best case which yields the most interesting results, so we disregard the third-best case, and comment only briefly on the first-best case. Our main result is this:

2.1 Proposition

The optimal contract between an investor and an active manager whose effort level cannot be verified by the investor first carves out the total protected wealth of the investor and the agent. It then subjects the remaining wealth of the investor to a fee structure with a flat component and two asset-based components. One asset fee is a standard proportional fee on fund earnings. The other is a symmetrical fulcrum-style performance fee:

$$\phi(s,\omega) \;=\; \underline{C}_m + \frac{(w_0 - \underline{w})\lambda_R}{1+\lambda_R}[R^P + \left(\frac{\lambda_\varepsilon}{\varepsilon\lambda_R}\right)(R^P - R^B)] \,. \tag{1}$$

On the left-hand side of equation (1), $\phi(s,\omega)$ is the fee paid by an investor when the manager's unobserved effort ε ($0 \le \varepsilon \le 1$) generates a private signal $s \in S$ about future returns, and the state of the world is $\omega \in \Omega$. On the right-hand side, $\underline{C}_m$ is the protected consumption of the manager, w_0 is investible wealth, $\underline{w}$ is the present value of the total protected consumption of the investor and the manager, λ_R is a Lagrange multiplier on a participation constraint, R^P is the return to the actively managed portfolio, λ_ε is a Lagrange multiplier on an incentive-compatibility constraint, and R^B is the return to a passively-managed (zero-effort) benchmark portfolio.

2.2 Proof

See Appendix 1

3. Financial Planning Practice

This section compares and contrasts our claimed optimal structure (1) with actual fee structures and associated advice documented by the Financial Planning Association and Morningstar. Consistent with (1), actual fees contain both flat and proportional components. On the other hand (and as one might expect) there appears to be little or no advice to the effect that investors set aside part of their wealth in safe assets. Rather, the plan discussed here recommends that investors elevate their pre-existing exposures to growth assets. Moreover, there appears to be little or no use of fulcrum fees by either planners or fund managers. Performance fees exist and are mostly set in practice by managers rather than planners. They are not of the fulcrum variety, as they are neither symmetrical nor based on the natural benchmark, i.e. the best passively managed allocation for investors with age and wealth comparable to that of the actual client. Consistent with these gaps between theory and practice, there is evidence of the kind of index-hugging behaviour that fulcrum fees would discourage.

The Financial Planning Association is the dominant industry association for Australian financial planners. Roughly two thirds of licensed planners belong to it. The FPA has promulgated an 'Example' Statement of Advice on behalf of a hypothetical couple aged 57 and with a dependent teenage daughter (FPA 2008). The couple's accumulated superannuation is $550,000. The associated model plan places the breadwinner into salary sacrifice and a transition to retirement pension, thereby reducing the couple's short-term annual tax bill from $38,975 to $22,941.[3] It makes persuasive recommendations for retaining life insurance associated with the client's pre-existing superannuation fund at work. It says: 'The FPA liaised with the Australian Securities and Investment Commission regularly during the development process to arrive at this final version' (FPA 2008, p2).

3.1 Fee structure

'Initial' advice is charged out at $8,277, after tax and on a fee-for-service basis. This initial fee appears to be primarily in exchange for receiving the tax benefits of salary sacrifice and a TTR pension. There may be scope to unbundle the initial fee from ongoing fees (in exchange for asset-management services) in the event the couple decides to stick with their pre-existing superannuation fund while adopting the planner's recommendations concerning salary sacrifice and a TTR pension structure. This fee is paid in the first instance to the licensee, who retains 2 per cent of it. If the couple does switch its superannuation balances into the fund recommended by the model plan, several 'ongoing' or asset-based annual fees become payable. The investor pays 1.89 per cent pa of assets under management to the product provider. The provider pays 0.6 per cent pa of assets under management to the licensee, 'from their management fees,' and 'to pay the cost of ongoing advice.' The licensee passes on .98 x 0.6 per cent of this fee to the planner. [4] The provider 'may' also pay an additional 0.2 per cent to the licensee, 'for recommending their products,' along with soft-dollar benefits, 'typically between $10,000 and $20,000' pa. Figure 1 summarises these payments.

[Figure 1 here]

Judging by the FPA's model plan, fee-for-service in practice appears to be confined to initial tax advice and does not extend to portfolio formation, apart from possible requirements of minimum investible amounts. Mainstream agency theory − our Section 2 model included − typically does not prescribe pure fee-for-service for an actively-managed portfolio, and this accords with industry practice.

The acknowledged commissions of 0.6 and 0.2 per cent pa, along with the soft-dollar benefits, accord with the theory of Stoughton et al. (2011). Commissions have been contentious on the argument that an agent should not try to serve two principals simultaneously – they create the possibility of a conflict of interest between adviser and client. Moreover, the model plan does not mention any requirement that investors periodically 'opt in,' leaving it open to the criticism of inertia selling. Elderly couples could be particularly susceptible. For example, if the person responsible for managing

household finances passes away before her partner, it could take considerable time before the surviving partner becomes aware of trail fees in the family's financial plan.

Regulatory Guide 246, promulgated by ASIC (2013), generally bans 'conflicted remuneration' in plans written from July 1 2013 onwards. This would seem to ban future use of the commissions of 0.6 and 0.2 per cent, as well as the soft-dollar payments. The FoFA reforms initially proposed requiring clients to 'opt in' every two years. In March 2012, however, this was watered down; membership of an industry association with an ASIC-approved code of ethics now exempts a planner from opt-in.

3.2 Asset allocation and asset fees

Table 1 summarises the plan's proposed asset allocation and part of its proposed fee structure. It itemises and breaks down the figure of 1.89 per cent shown in Figure 1.

[Table 1 here]

Table 1 shows the model plan recommends a fund-of-funds portfolio in which each individual fund carries an asset-based fee. The riskier funds on the menu generally carry higher fees. This is on the face of it an incentive to recommend risky products. The generally sizeable fees suggest that most sub-funds envisage adding value via active management. The FPA's model says that the exposure of the elderly couple's superannuation to 'growth' assets (shares plus commercial property) is too low in their pre-existing superannuation fund. It recommends that at least 70 per cent of couple's portfolio, and possibly as much as 95 per cent, be invested in growth assets.[5] The reason is to 'take advantage of market opportunities and your investment time horizon' (p4). By contrast the average Self-Managed Superannuation Fund allocates 30 per cent to safe interest-bearing assets, typically term deposits.

The long investment horizon faced by the elderly couple is actually a reason for caution, and the FPA's advice is at odds with indications that financial plans are fragile around the point of retirement.

Bengen (2001) appears to have initiated this line of research, basing his fragility finding on historical simulations with actual returns data for the United States. He noticed that, once you are retired, the sequence of investment returns becomes critical: a market down followed by a market up tends to do more damage than it would have done during working life. The reason is that if you suffer a big hit early on, you still need to draw down your account balance for living expenses, further depleting it. So even if markets do eventually bounce back you cannot expect to recoup your losses.

Theory based on the notion of a 'protected' consumption level (see e.g. our Section 2 model) supports this fragility argument: if your annual expenditure over an expected lifetime cannot fall below some minimum standard, then your asset allocation initially needs to be conservative, reflecting a high present value of protected lifetime expenditure. In practice, protected consumption corresponds to 'ultra' necessities such as electricity, gas and timely medical procedures. The longer your expected time in retirement, the more conservative your initial allocation needs to be. The present value of your protected consumption falls as your remaining years run out, but only to the extent that portfolio returns have met or exceeded expectations in the early part of retirement should your proportionate allocation to risky investments be lifted. Another argument for planning an upward-sloping equity-age profile comes from the fact that bequests tend to be luxury expenditures, implying that they can increasingly perform a shock-absorber role, towards the end of retirement.[6]

Another reason for caution in the case of the FPA's hypothetical couple is that the FPA's model plan does not address the couple's apparent lack of retirement flexibility. The plan assumes that the couple's sole breadwinner will continue to work until age 65, or for 3 or 4 years past the recent average retirement age for males. As a consequence, the hypothetical household cannot count on being able to work for longer if investment markets fall before the planned retirement date. Moreover, a setback in health or employment could see the breadwinner forced into retirement before age 65.

Section 2 is consistent with a 'shortfall' notion of risk whereby potential investor losses are capped by placing some wealth in passively-managed safe assets.[7] The FPA's plan appears to recommend that only 5 per cent of the investor's superannuation be unambiguously invested in this way.

FoFA should help discourage highly risky allocations. It bans asset-based fees on the borrowed component of sums invested by geared investors, which should help avoid a repetition of the Storm Financial affair. It also seeks to reduce operational and counterparty risks in the managed funds industry, by setting up compensation schemes for investors.

1.3 Performance fees

Theory and practice diverge on the question of performance fees. Our Section 2 theory retained a key feature of Dybvig et al. (2010): the performance component of an asset-based fee should be symmetrical in the outperformance of the actively managed portfolio over the zero-effort benchmark portfolio. This symmetry is the defining feature of so-called fulcrum fees. Figure 2 portrays a fulcrum fee.[8] Current regulatory practice in the United States towards managed funds is that fulcrum fees have become the only legal performance fees outside hedge funds. However, the associated regulatory change saw a big switch by fund managers, away from conventional structures for managed funds and towards hedge-fund structures in that country.

Fee schedules for hedge funds offered in the US are instead tend to be the '2-20' variety: managers do not pay clients if they underperform the agreed benchmark, always receive a fixed asset-based fee of 2 per cent and, in addition, receive an additional fee of 20 per cent whenever the portfolio outperforms the benchmark (Cochrane 2012). Cochrane observes that the corresponding payoff profile resembles the payoff profile for a long position in a call option. The value of a call is an increasing function of the value of the underlying asset, so an option-style payoff motivates managers to exert more effort. But the value of an option is generally an increasing function of the volatility of the underlying asset,

so that an option-style payoff introduces an agency problem whereby the manager is tempted to form an excessively risky portfolio, unless sufficiently deterred by a concern for reputation.[9]

Eighteen performance fees used in Australian managed funds are analysed by Whitelaw et al. (2011a).[10] Seventeen of the funds define the benchmark return as returns to the Standard and Poors/Australian Stock Exchange's accumulation indices for its largest 200 or 300 stocks, plus a hurdle rate ranging from zero to five percentage points. No fund offers a fulcrum–style performance fee. On the other hand, all but two offer some variant or other of a 'high watermark' feature. This means performance fees cannot be collected until some or all of any underperformance relative to the benchmark has been recovered. Partially offsetting high watermarks are resets whereby about half the funds in the sample allow their pre-existing high watermarks to be cancelled periodically, putting the manager back in a position to receive fees for outperformance relative to an agreed benchmark without having to make good previous losses.

The heavy solid line in Figure 2 is a stylised portrayal of the performance fee structure of 'fund number 9' in the sample of Whitelaw et al. The figure is stylized because it does not portray the short-run dynamics of high-watermark and reset features. Fund number 9 can be viewed as typical. Its fee for outperforming the benchmark is 20 per cent, its benchmark is one plus annualised growth in the S&P/ASX 200, and its base fee is 0.75 per cent, calculated before extracting the performance fee. The heavy solid line shows fund number 9's performance fee before allowing for high watermarks and resets. The heavy dashed line is a stylised portrayal of the average performance fee after allowing for high watermarks and resets. The combined effect of these two features is to push the manager's embedded call option towards being out-of-the-money. This will tend to weaken incentives both for exerting effort and recommending a risky portfolio.

[Figure 2 here]

The sample of Whitelaw et al. (2011a) suggests that the agency problems affecting performance fee schedules in US hedge funds are also present in performance fee schedules for Australian actively-managed funds. Active managers in both countries apparently prefer to rule out downside rather than submit to fulcrum contracts, notwithstanding the relevant prediction (or prescription) of agency theory. In fairness to product providers, one reason for the absence of fulcrum contracts could be investor resistance to the higher fees that might be required. Also, an institution offering fulcrum contracts would need to hold capital against the contingency of having to compensate investors for underperforming.

FoFA does not address the question of performance fees, including fulcrum ones. Worth investigating are compromises which would see underperforming managers reimburse investors up to a cap.

1.4 Active versus passive management

Theory and practice diverge on the question of the relative merits of active and passive management (paralleling the question of performance fee design.) Grossman and Stiglitz (1976) model an economy in which the expected returns to active and passive management are equalised. Grossman and Stiglitz assume (like Section 2 above) that information acquisition is costly and research investments are rewarded. Active investors drive asset prices towards fair value, and just cover costs in doing so. Yet the international evidence is that active managers perform about 100 basis points pa less well on average than this parity condition suggests.

The FPA's model quotes a management expense ratio of 1.89 per cent pa of funds under advice-cum-management (Table 1). Internationally, Vanguard is the best-known provider of index funds. Its Australian Growth Index Fund quotes a management expense ratio of 0.36 per cent. The FPA's recommended fund-of-funds therefore suggests a considerable degree of active management. This inference is consistent with this finding of Whitelaw et al. (2011b), based on their study of 75 large-

cap Australian share strategies: 'There is a discernible relationship between active share score and fees' (p2). By the same token, 'a number of vehicles' have 'relatively high fees and low active share scores' (p2). Moreover, the problem of closet indexing appears to be particularly acute in the case of large-cap Australian share funds, which are 'are among the least active globally' (p2).

Whitelaw et al. point out that the ASX/S&P Accumulation index is 'tightly constrained and top-heavy' (p4). Notably, the top 10 holdings in the Australian index accounting for 52 per cent of index capitalisation. This creates an unfortunate interaction with the strong home bias of the FPA's model plan, which allocates only 10 per cent to international shares (Table 1). If you want both an active management style and strong diversification then you would probably be better off with a more internationally diversified portfolio than that proposed by the FPA's model plan.

This problem − of active managers who are actually among the least active internationally − may well derive from our unusual approach of compulsory pre-funded superannuation. MySuper seeks to mitigate the problem. It seeks to ensure that low-cost and diversified funds are available to people who are not actively engaged with their superannuation. It also proposes designing workplace forms and procedures that nudge inactive investors into ticking a box that steers them into low-cost and diversified funds.

1.5 Disclosure

The FPA's 'Example SOA' discloses dollar amounts payable during the first year of the contract. Not disclosed, however, are dollar amounts projected after the first year. For example, the projected total dollar amount payable in the first year of the breadwinner's projected retirement at age 65 can be estimated at $36,181. That amounts to more than half of the couple's 'target' retirement income of $70,000 pa (Kingston 2009).[11] The trail fees include annual asset-based commissions from the

product provider. Thus, the projected $36,181 fee payable in the client's retirement year includes a commission of $2,906 from the fund-of-funds to the financial planner (and the licensee.)

The model plan puts a figure on a 'target' level of retirement income, namely $70,000 pa. But it gives no numeric indication of the possible dispersion of actual incomes around this target. An argument for plans based on the notion of 'protected' consumption is that they do address this question of 'lifestyle' risk. For example, Kingston (2009) examines strategies for putting a floor of $50,000 pa in real terms under the couple's spending in retirement, based on the couple's average life expectancy.[12]

Noted earlier was the terse and (in our view) flawed justification for reweighting the portfolio to a comparatively aggressive one with at least 70 per cent in growth assets. The possible incentive effects of asymmetric performance fees are not mentioned at all. The FPA's 'Example SOA' instead refers to a Product Disclosure Statement (access restricted) for details of performance fees.

FoFA does not address questions of disclosure of risks and does not seek to restrict portfolio allocations. On the other hand, it does mandate annual disclosure of dollar amounts payable in fees.

In its submission to the Cooper review, the FPA argued against portfolio restrictions, particularly in the case of investors on the cusp of retirement: 'Lifestyle options per se are not necessarily an appropriate strategy for super fund members to adopt. For example, the 10/30/60 rule indicates that the majority of the growth of an investment portfolio occurs during the retirement stage' (FPA 2009, p12). According to this rule, 10 per cent of your nominal investment earnings in retirement come from contributions, 30 per cent comes from investment earnings before retirement, and 60 per cent comes from investment earnings after retirement.[13] The FPA evidently interprets this rule as reinforcing the case for a comparatively aggressive allocation on the cusp of retirement.

There are problems with both the 10/30/60 rule and the FPA's application of it. First, it appears to be based on comparisons of nominal (rather than real) contributions and investment earnings at widely different times, whereas neither nominal contributions nor nominal investment earnings are commensurate across different dates. Second, an allocation's potential for generating high expected nominal earnings at retirement is far from being a sufficient statistic for evaluating it. The extra information needed includes an appropriate forward-looking adjustment for inflation, the risk aversion of the client (which could be time-varying), and the price of risk (the ratio of the equity premium to the variance of returns to risky assets). Finally, a comfortable retirement generally relies on running down superannuation balances to some extent rather than attempting to maintain them intact.

4. Conclusion

Our extension of the model of Dybvig et al. (2010) shed light on the tension between agency theory and financial-planning practice. To the extent that investors on the cusp of retirement have concerns about their wealth falling short of some predetermined value, they should simply allocate their wealth partly to safe interest-bearing assets before contracting with the active manager/financial planner. In practice, however, this appears not to be the norm. Rather, planners are entrusted with the bulk of the superannuation balances of their clients and derive most of their income from asset-based fees. As a consequence, fee income from a given client tends to hit a maximum at the outset of the client's retirement. This tempts planners to overweight high-fee growth assets at that particular point of the client's life cycle. By contrast, theory suggests that the case for a high weight on growth assets applies at ages well before retirement and, possibly, late in retirement as well, depending on how the client's investments have performed.

Likewise, theory suggests that fulcrum contracts are the right type of performance fee. In practice, however, we typically see option-type payoff profiles, which promote excessive exposure to growth assets, at least at the outset of a client's retirement.

There is a public interest in financial plans with less aggressive asset allocations for elderly clients, in particular, the taxpayer interest. The Age Pension is indexed to the maximum of wage and price inflation, and is payable for the remaining life of the pensioner, subject to means tests. It can be viewed as public retirement income insurance. It tempts advisers to recommend aggressive asset allocations, since the taxpayer becomes in effect a part guarantor of the client's core retirement income stream. In this way, the Age Pension fall-back promotes moral hazard in advice on asset allocations, with taxpayers picking part of the tab for unsound or unlucky advice. Thus, Harmer (2009, p15) noted that 'Age Pension applications in December 2008 were around 50 per cent higher than the number recorded in October of the same year.'

Between June 2007 and June 2012 the share of self-managed funds in total superannuation balances rose from 27 per cent to 31 per cent. Our Section 2 theory suggests that part of the explanation may be contract designs that were always suboptimal from the standpoint of investors but with weaknesses that reamined latent until the financial crisis hit.

The next review of financial advice should examine ways of requiring financial advisers to disclose and respond to the fragility of financial plans for investors on the cusp of retirement. A good start would be this: require Statements of Advice for clients aged over 55 to disclose the percentage allocation to Australian-dollar-denominated interest-bearing securities rated at least 'high quality' by one of the major credit rating agencies.

Appendix 1: Proof of Section 2 Proposition

Proof of Section 2's equation (1) begins with a mixture model of the joint density of s and ω conditional on effort ε:

$$f(s,\omega;\varepsilon) = \varepsilon f^I(s,\omega) + (1-\varepsilon) f^U(s,\omega) \tag{2}$$

where f^I is the informed (effort-conditioned) distribution of portfolio returns, and f^ω and f^s are the marginal distributions of the uninformed density f^U with respect to ω and s, with $f^U(s,\omega) = f^s(s)f^\omega(\omega)$.

The agency problem here is simultaneously to choose (i) the utility of the investor, $u_i(s,\omega) = \ell n(C_i(s,\omega)-\underline{C}_i)$, where $C_i(s,\omega)$ is the consumption of the investor and $\underline{C}_i$ is the protected consumption of the investor, (ii) the utility of the manager $u_m(s,\omega) = \ell n(C_m(s,\omega)-\underline{C}_m)$, where $C_m(s,\omega)$ is the consumption of the manager, and (iii) the manager's effort level ε, to maximise the investor's expected utility,

$$\max_{u_i(s,\omega),\, u_m(s,\omega),\, \varepsilon} \iint u_i(s,\omega)(\varepsilon f^I(\omega|s) + (1-\varepsilon)f^\omega(\omega))f^s(s)d\omega ds, \tag{3}$$

subject to a budget constraint (for mathematical convenience we use the Dybvig *et al.* transformation of consumption levels into exponential functions of utility levels),

$$(\forall s \in S) \quad \int (\exp(u_i(s,\omega)) + \exp(u_m(s,\omega)))p(\omega)d\omega = w_0 - \underline{w}, \tag{4}$$

a constraint ensuring participation by the manager,

$$\iint u_m(s,\omega)(f^I(\omega|s) - f^\omega(\omega))f^s(s)d\omega ds - c'(\varepsilon) = 0, \tag{5}$$

and a constraint ensuring the incentive-compatibility of effort,

$$\varepsilon = \arg\max_{\varepsilon'} \iint u_m(s,\omega)(\varepsilon' f^I(\omega|s) + (1-\varepsilon') f^\omega(\omega)) f^s(s) d\omega ds - c(\varepsilon'), \tag{6}$$

where the new notation is $p(\omega)$ pricing density for a claim that pays a dollar in state ω,

$\underline{w} \equiv \int (\underline{C}_i + \underline{C}_m) p(\omega) d\omega$ present value of total protected consumption, and $c(\varepsilon)$ cost of manager

effort.[i]

Dybvig et al. come up with a lemma that enables replacement of $u_i(s,\omega)$ in the above problem by the

investor's indirect utility. We need a minor extension of it to the case of protected consumptions: the

expected utility conditional on *s* for the investor will be shown to equal

$$\log\left(B_i(s) \frac{f^\omega(\omega) + \varepsilon(f^I(\omega|s) - f^\omega(\omega))}{p(\omega)} \right), \tag{7}$$

where

$$B_i(s) \equiv w_0 - \underline{w} - \int \exp(u_m(s,\omega) p(\omega) d\omega \tag{8}$$

is the investor's share of the budget net of the present value of total protected consumption.

Proof of equation (7) follows Dybvig et al. The optimal solution must satisfy the sub-problem of

maximizing (3) subject to (4). Differentiating the Lagrangean for this problem with respect to

$u_i(s,\omega)$ gives

$$[\varepsilon f^I(s,\omega) + (1-\varepsilon) f^\omega(\omega)] f^s(s) = \lambda_B(s) p(\omega) \exp(u_i(s,\omega)) \tag{9}$$

where $\lambda_B(s)$ is the multiplier to the budget constraint. Integrate equation (9) with respect to ω and

rearrange to get

$$\lambda_B(s) = \frac{f^s(s)}{B_i(s)}.$$

Substitute this into equation (9) to get equation (7).

Following Dybvig et al. we set out three definitions of equilibrium returns. The gross portfolio return conditional on observing s is

$$R^P \equiv \frac{\varepsilon f^I(\omega|s) + (1-\varepsilon) f^\omega(\omega)}{p(\omega)}. \tag{10}$$

The gross portfolio return without observing s is termed the benchmark return and is given by

$$R^B \equiv \frac{f^\omega(\omega)}{p(\omega)}. \tag{11}$$

Finally, the return under maximum effort $(\varepsilon = 1)$ is

$$R^I \equiv \frac{f^I(\omega|s)}{p(\omega)}. \tag{12}$$

These definitions give the intuitive decomposition $R^P = \varepsilon R^I + (1-\varepsilon)R^B$.

Equation (7) enables computation of the investor's expected utility, namely

$$\int \log\left(w_0 - \underline{C} - \int \exp(u_m(s,\omega)p(\omega)d\omega\right)f^s(s)ds$$

$$+ \iint \log\left(\frac{\varepsilon(f^I(\omega|s) + (1-\varepsilon) f^\omega(\omega))}{p(\omega)}\right)\left(\varepsilon f^I(s,\omega) + (1-\varepsilon) f^\omega(\omega) f^s(s)\right)dsd\omega. \tag{13}$$

Differentiate the Langrangean associated with the problem of maximising equation (13) with respect to $u_m(s,\omega)$ and subject to equations (5) and (6). This gives the first-order condition

$$
\begin{aligned}
\frac{\exp\left(u_m(s,\omega)\right)p(\omega)}{B_i(s)} &= \lambda_R(f^\omega(\omega)+\varepsilon(f^I(\omega|s)-f^\omega(\omega)))\\
&\quad + \lambda_\varepsilon\left(f^I(\omega|s)-f^\omega(\omega)\right)
\end{aligned}
\tag{14}
$$

where λ_R and λ_ε are the Lagrange multipliers to (5) and (6). Multiply both sides by $B_i(s)$ and integrate both sides with respect to ω to get an expression for the manager's share of the budget net of the present value of total protected consumption, namely, $B_m(s) \equiv w_0 - \underline{w} - B_i(s)$:

$$
B_m(s) = \lambda_R B_i(s).
\tag{15}
$$

Apply equations (4) and (15) to get

$$
B_i(s) = \frac{w_0 - \underline{w}}{1 + \lambda_R}.
\tag{16}
$$

Equations (14) and (16) together imply

$$
u_m(s,\omega) = \log\left(\frac{(w_0-\underline{w})\lambda_R}{1+\lambda_R}\frac{f^\omega(\omega)+\left(\varepsilon+\dfrac{\lambda_\varepsilon}{\lambda_R}\right)(f^I(\omega|s)-f^\omega(\omega))}{p(\omega)}\right).
\tag{17}
$$

Taking exponentials of both sides gives equation (1), as required.

A.1 Discussion

Moving from simple to generalised log utility changes the optimal contract in two ways. First, the efficient fee structure incorporates a flat component $\underline{C}_m$. Second, the proportional component

$\lambda_R / (1 + \lambda_R) R_P$ is not based on the investor's entire wealth w_0 but on an amount net of the present value of total protected consumption $\underline{w}$.

The first-best case arises as we let λ_ε tend towards zero in Equation (1). Because effort can be observed in this case, there is a zero shadow price of tightening the incentive-compatibility constraint.

The concept of protected manager consumption $\underline{C}_m$ is vague, and this lack of specificity is a source of strength as well as weakness. Notably, it facilitates alternative interpretations. For example, $\underline{C}_m$ might take the indirect form of a minimum investible amount stipulated by the manager, in conjunction with a proportional asset fee. We typically see such minima in the prospectuses of actively managed funds. In this way, the flat component could be interpreted as the fixed cost of operating an account. Alternatively, $\underline{C}_m$ could represent the wage costs of providing ancillary services such as tax minimisation, which could be more 'commoditised' than skilful active management.

The benchmark portfolio return R^B is also usefully flexible. It can be interpreted as the return to an index portfolio of equities, or as the return to an equities-plus-cash portfolio that has had no value added via efforts to time the market. In the same way, the risks entailed by active management can be interpreted as originating solely from investment risk, or also from operational and other non-investment risks specific to active management. We can interpret the uninformed distribution $f^U(s, \omega)$ as including such risks and the effort level ε as including efforts to reduce them.

Endnotes

1. Aka the Stone-Geary utility function.

2. See *e.g.* Wachter and Yogo (2010) for a review of the evidence on relative risk aversion falling with wealth (which they rationalise by a distinction between necessities and luxuries rather than 'protected' consumption − a device which can be interpreted as playing the role of necessities without the complication of a relative price between necessities and luxuries.)

3. There is currently a cap of $25,000 p.a. on concessional contributions by people with over $500,000 in super, so tax benefits on this scale are not currently available.

4. Routing payments via the licensee in this way presumably mitigates operational risks.

5. 'It's my understanding you are willing to implement a less conservative strategy to meet your objectives...I have allocated approximately 30% to cash and income funds to cover pension payments'– FPA (2008, p4). The generic assets in 'income' funds are not disclosed.

6. See Bateman et al. (2007), Ding et al. (2013) and Kingston (2009). Constant-mix allocations, through time and across the major asset classes, are associated with constant relative risk aversion (aka 'power' utility). Actual proportionate allocations to risky assets tend to rise with an investor's wealth (recall Section 1).

7. More precisely, funds placed under active management were given by the investor's initial investment 'cushion', namely $w_0 - \underline{w}$.

8. In terms of our Section 2 theory, the slope of the ray in the figure is given by $\lambda_\varepsilon / \varepsilon \lambda_R$ and outperformance is given by $R^P - R^B$.

9. In terms of options analysis, if a call has a knockout feature and the value of the underlying asset is sufficiently close to the knockout price, then increases in volatility will reduce the value of a call. The real-options analogue here is that an investor might switch to a different fund if the value of the original fund has fallen sufficiently. There is a substantial literature on these considerations, which we ignore, to save space.

10. Whitelaw et al. are concerned with the comparative expense of performance fee structures rather than the implications for incentives (i.e. the concerns here.)

11. Financial planning practices have typically sold on multiples of three or four times annual revenues. By contrast, accounting practices have typically sold on multiples of two.

12. Kingston builds on estimates in Bateman et al. (2007). In the terminology of dynamic asset allocation the overall approach is one of constant-proportion portfolio insurance with a finite horizon. He emphasises the case of generalised log utility, corresponding in practice to a multiple of about one. This is conservative compared to typical infinite-horizon CPPI strategies, which typically have multiples in the range of 3 to 5.

13. For an exposition, see e.g. Russell (2008). Ironically, this influential exposition also endorses a 'glide path' approach whereby your asset allocation is conservative by the time you are on the cusp of retirement – the FPA treats the 10/30/60 rule as an argument against the glide path.

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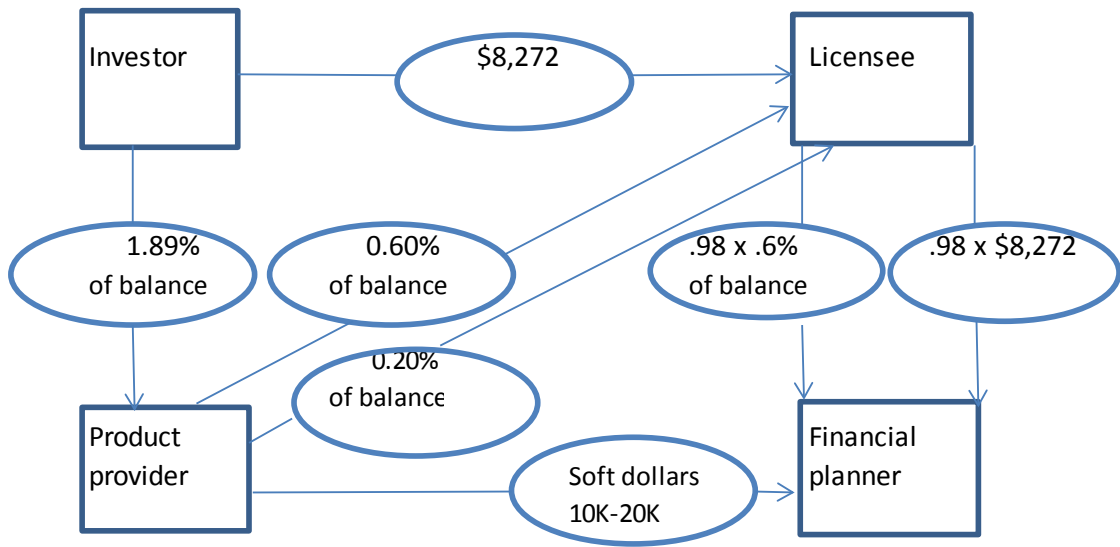
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Table 1 Asset Allocation and Product Fees in the 'Example SOA'

Portfolio share (per cent)	Investment sector	Investment options	Management fee (per cent)
5	Cash	Cash	1.13
5	Income	Income extra	1.77
20	Income	Income fund	1.92
5	Listed property securities	Property securities fund	1.66
10	Australian shares	Australian active equity	1.86
17	Australian shares	Boutique Australian shares	1.96
8	Australian shares	Australian equity long/short	2.24
20	Australian shares	Australian small companies	1.91
10	International shares	Global value equity	2.01
100 per cent			*1.89 per cent*

Source: FPA (2008).

Figure 1   **Fee Structure in the 'Example SOA'**

Source: constructed from data in FPA (2008).

Figure 2   Alternative Performance Fee Structures