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Are Bank Deposits and Bank-affiliated Managed Funds Close Substitutes?

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Abstract

This study tests the hypothesis that bank liabilities and managed funds are close substitutes. Some literature associates the alleged decline in banking business with the disintermediation of banks' traditional deposit-taking business in favour of investment management. A comparative assessment of managed fund and bank deposit qualitative attributes fails to support substitutability. Using data on Australian bank-affiliated funds and a nine-year record of bank liability balances, this study finds that, empirically, managed funds do not displace bank liabilities. Prudential capital adequacy requirements dissuade banks from using in-house managed investments as indirect conduits for raising funds in the same manner as deposit taking.

Keywords: Bank deposits; managed funds; disintermediation

JEL Classification No: G12, C13, C32, C51

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1. Introduction

The phenomenal growth of the mutual and pension fund sectors has led to premature claims of a considerable decline in the role of banks in financial intermediation. Consensus appears to be settling around a new theory of intermediation that recognises that banks have simply rearranged their business to offer new forms of intermediation that have emerged out of financial markets' demand for additional services beyond the asset transformation aspect of intermediation. Allen and Santomero (1998 and 2001) have led the recent debate on the need to take risk management and the cutting of participation costs, for example, as important factors to consider in determining what intermediaries do. Adopting this understanding of intermediation allows for the acceptance of the notion that the business of banking, under a strong challenge from financial market participants such as mutual funds, is being redefined to encompass such non-traditional activities.

The motivation for this paper is that in the current era of the transformation of intermediation, no explicit microeconomic evidence has been produced on the substitutability of bank liabilities and mutual fund products. Yet banking literature is strewn with indirect references to the existence of the phenomenon. Gallo et al (1996) contend, with reference to the late 1980s and early 1990s in the US, that declining interest rate levels prompted a shift in household savings from traditional bank deposits to mutual funds. This shift is alleged to have pushed banks, fearful of disintermediation, into the mutual fund business.¹ Commenting on the question of the indispensability or otherwise of commercial banks, Scott (1998) asserts that savings and time deposits at banks might be under threat as mutual funds become an alternative for the current payment system. This view extends a trend, triggered off by the rapid growth of alternatives to traditional intermediaries, that associates investment managers with "banks of the future" (Gorton and Pennacchi, 1993).

Kane (1995) stands out in challenging the market-centric cliché of the disintermediation of bank deposits by querying why banks, faced with competition for deposits from mutual funds, have not simply structured products that offer mutual fund-like payoffs instead of establishing costly fully-fledged mutual fund subsidiaries. Kane concludes that it is the inapplicability of deposit insurance requirements to bank-affiliated mutual funds in the US, notwithstanding the credit enhancement implied in their association with the banks, that has provided banks with an incentive to form mutual fund operations instead of index-linked deposit products. Kane points to Australia where, by the mid-1990s, at least one major bank was developing such an index-linked offering against a background of the non-existence of deposit insurance. However, as it has turned out since then, although more banks have developed index-linked deposit products, they have also taken part in the frenetic mergers and acquisition activity in the second half of the 1990s that has given the major banks large exposures to funds management business.

These market developments have, however, not marked the death of Kane's (1995) argument. In a case that might suggest that banks favour a definition of managed fund products as being close substitutes for bank deposits, Commonwealth Bank, one of the four largest banks in Australia, in its application for the approval of its merger with Colonial, a dominant funds management group, was reported to have unsuccessfully applied to the Australian Competition and Consumer Authority (ACCC) to have managed funds and trusts included in the market definition encompassing term deposits and transaction accounts

(Goddard and Walker, 2001). The ACCC subsequently maintained separate definitions for the two product classes in the spirit of its traditional market definition process that identifies “all sources and potential sources of close substitutes for the merged firm’s products” as a prelude to a ruling on a merger proposal.²

The apparent willingness by practitioners to treat bank products and mutual fund offerings as substitutes, compounded by a possible similar perception by depositors, may lead to funding problems for banking institutions. Mutual funds may be profitable business lines for banks, but the prudentially enforced principle of separation between the banking and funds management activities housed under a single corporate entity dictates funds raised this way are not equivalent to other forms of liabilities such as deposits. The seriousness of the issue is illustrated by the issuance of a warning in November 2001 by Standard and Poor’s that the funding pressures being faced by banks due, in part, to the waning of the traditional low-cost deposit base as customers increasingly shift towards higher yielding investment options such as managed funds, “could contribute incrementally to negative ratings sentiment in the Australian banking market”.³

Contrary to the view encouraged by apparent investor shifts towards market based investment vehicles, the physical attributes of managed funds do not fully conform to their substitutability for bank products. Pilloff (1999) observes that, in spite of similarities in safety, liquidity, accessibility and convenience, the lack of absolute capital preservation guarantees, liquidity constraints and the continued dominance of bank accounts in household finances preclude a verdict of substitutability.

This paper uses panel data on monthly bank liability balances over nine years and a dataset of managed funds covering nine years to quantitatively document the displacement or otherwise of bank investment-type liabilities by managed fund products. The paper that is closest to the present one in addressing the question of the closeness of money market oriented managed funds is Farinella and Koch (1999) that differentiates from a macroeconomic standpoint transactions and yield-based incentives for households to hold money market funds. The work conjectures that if the former incentives exceed the latter, and this is exhibited in actual household preferences, then money market funds would be considered close to money, and hence deposits and other savings products offered by banks. To this end, an analysis of the demand for taxable money market funds shows that the demand is positively related to fund yields but negatively related to the demand for competing, tax-exempt, funds and the long-term government bond yield. On the basis of this indirect evidence Farinella and Koch’s (1999) findings are mixed; they conclude that both transactions and yield motives exist.

The rest of this paper is arranged as follows. The next section performs Pilloff’s (1999) descriptive analysis in the Australian context and develops a testable model for the displacement of banking products by managed fund products. Section 3 describes the data used in this paper and Section 4 presents the empirical results. Section 5 summarises and concludes the paper.

2. Managed Fund—Bank Liability Substitutability

2.1 A descriptive analysis

This section assesses the substitutability of Australian bank-managed funds for bank liabilities in the context Pilloff's (1999) descriptive framework, paraphrased here to consist of three main elements: (1) liquidity and accessibility, (2) safety and price stability, and (3) demand trends. Whilst Pilloff (1999) restricts the analysis to money market mutual funds (MMMFs), this paper adopts a broader scope by considering cash and fixed income funds in addition to cash management trusts (CMTs), the Australian equivalent of MMMFs. Figure 1 summarises Pilloff's major conclusions under the subheadings applied in this section.

(i) Liquidity and Accessibility

Although fund managers' promotional literature routinely claims that they offer the convenience of bank-offered savings products, it is on this issue that Pilloff's (1999) findings of the lack of substitution effects are found to most directly apply to the Australian context.

Whilst liquidity and accessibility are available to a degree to managed fund investors, there are discrepancies that vary with fund types. For example, cash management trusts generally include access to deposit, cheque and online transactions offered by the parent bank but these will not be directly via the fund account. In fact CMTs are prohibited from accepting direct cash deposits and withdrawals, all transactions being by cheques drawn on an account held by the fund operator at a deposit-taking institution. Funds that offer a chequebook restrict the denomination of the transaction amounts, usually to \$500 lots.

Ease of entry is a major convenience issue for investors. Banks are believed to be able to exercise a "second-degree price discrimination" of customers based on income and wealth by offering accounts that have different minimum balances and interest rates. Pennacchi (1998) points out that US mutual funds face legal constraints on the types of accounts they can offer, precluding clientele segmentation of this nature. However, Australian managed funds are allowed reserve the right to vary the fees, minimum investment amounts and other account operating conditions specified in the fund prospectus across customers.⁴

Having ready access to invested monies is an important facet of the liquidity and, therefore, the convenience of investment products. Managed funds generally allow redemptions on demand, although this is generally taken to mean they will be processed within five working days. In addition, fund managers are allowed to withhold redemptions for up to sixty days depending on the cash position of the funds and market conditions. Some funds specifically warn that such delays may be exacerbated "if investment markets were disrupted or suspended".⁵

(ii) Safety and Price Stability

Unlike in the US where deposit insurance is the major differentiating factor between investments held with banks and mutual fund shareholding, the absence of a deposit protection scheme in Australia may be taken as precluding the notion that the respective product classes are substitutes. However, some market participants hold the belief that the major banks are “too big to fail” in that the Reserve Bank of Australia cannot permit these banks to fail because their collapse would have devastating effects on the economy. Australia’s rigidly enforced competition policy that precludes mergers amongst the four largest banks has only served to fuel the perception of the sanctity of their guaranteed immunity from bankruptcy. From the perspective of this study it is instructive to note that it is these major banks that dominate the participation of banks in funds management business, a factor that may potentially exacerbate the proliferation of the belief in implied government protection amongst the clientele of bank-affiliated fund managers.

In addition, Australian bank prudential requirements apparently imply that bank-affiliated managed funds offer protection to their investors that exceed that of other funds. After analysing the portfolio composition of institutional investment managers, Del Guercio (1996) finds that amongst US mutual fund operators, “bank managers are more sensitive to prudent-man laws”.⁶ In the Australian context, the equivalent of prudent-man laws are the fiduciary responsibilities imposed on fund managers by the Managed Investments Act. It can be argued that over and above the due care and diligence measures imposed on fund managers in general, bank-affiliated fund managers are laden with additional oversight from the regulator of deposit-taking institutions, the Australian Prudential Regulatory Authority (APRA). This oversight is established by APRA’s prudential standard APS 120 (Funds Management and Securitisation) that “*aims to ensure that ADIs adopt prudent practices to manage the risks arising out of their involvement in funds management and securitisation activities, and to ensure that appropriate capital is held against them*”. The main thrust of the guideline is to unambiguously set funds management as an activity that is separate from the banking business of the institution.⁷ Conceivably, this separation may be taken to allow bank-affiliated fund managers to carry out their business like any other manager without being curtailed by the institutional affiliation. However, when taken within the context of the regulator’s apparent determination to preserve the reputation of the parent bank and the potential capital requirements that imprudent actions within the funds management arm may entail, bank-owned fund managers can be construed by investors to be under pressure to behave somewhat more prudently than other managers.

If there is downside in respect of the prudential requirements imposed on fund managers by virtue of their affiliation to a bank, it arises if the association hobbles the performance of bank-managed funds in comparison to non-bank funds. Del Guercio (1996) suggests that prudent-man laws may force bank-managed funds to tilt their portfolio compositions in ways that may, over time, explain the performance differences between them and non-bank funds. Kopenhagenver (1999) examines money market mutual funds and, finding that funds affiliated with banks outperform those sponsored by other financial institutions, advances the argument that the abnormal performance may be due to bank expertise in dealing with money market securities and issuers. However, Frye (2001) explicitly tests for the existence of the performance discrepancy predicted by Del Guercio (2000) and, despite finding evidence of

more conservative investment practices by bank-managed funds, cannot observe a significant difference in return profiles.

An aspect of investor protection in which the funds management industry is uniquely subject to legal uncertainty is the liability of investors. Intuitively, it would be expected that investors should not be personally liable in the event that a managed fund to which they subscribe goes insolvent and fails to meet its obligations. However, as a result of past legal precedent that did not fully address the issue of whether investors enjoy limited liability and the decision of the federal government not to clarify the situation by legislation, fund managers cannot explicitly guarantee their investors' equivalence of the corporate veil⁸. Fund investor protection is governed by the Corporations Law and general law. Internally, in addition to the constitution which outlines the responsible entity's fiduciary responsibilities and investors' rights, the Compliance Plan, audited by the Australian Securities and Investments Commission (ASIC), sets out guidelines on how the fund manager is to ensure compliance with the law and the fund constitution. The fund constitution generally provides that unit holders cannot be called upon to indemnify the responsible entity or its creditors for liabilities in excess of the assets of the fund. In spite of this layer of protection, it is conceivable that in certain instances, depending on the particular wording of the constitution, liability can be excluded, a possibility that has compelled ASIC to require that all prospectuses should carry a statement to the effect that the limited liability cannot be guaranteed owing to the uncertainty of the legal position⁹. Therefore, despite the apparent additional protection accorded to investors of bank-affiliated managed funds by the prudential requirements imposed on their parents, the enforcement of the separation dictum appears to decisively expose bank-managed fund investors to the same uncertainty concerning the liability of investors that pervades non-bank funds. When compared to investments in conventional bank products, this uncertainty marks a wide rift between the perceived safety of bank deposits, for instance, and that of managed fund offerings.

An important safety attribute of investment products concerns capital guarantees that Australian money market oriented managed funds do not offer. Whilst some will state that they seek to maintain their unit price at one dollar, almost all carry disclaimers to the effect that investors are not guaranteed the full return of the money originally invested, as would be the case with a solvent bank's savings products.¹⁰

On balance, the foregoing discussion on safety and price stability appears to establish managed funds as being less than perfect substitutes for bank savings products in terms of safety and price stability. That managed funds are generally riskier than savings accounts at banks is perhaps emphasised by the fact that they pay higher returns, the differential signifying a risk premium on the former according to Pilloff (1999).¹¹

(iii) Demand trends

Finally, it is important to consider whether, on the basis of trends in the demand for bank liabilities and managed funds, the two respective investment avenues can be said to be substitutes for one another. Pilloff (1999) observes that only 5.7% of households in the US held money market funds compared to 84.4% that held cheque-operating or money market deposit accounts in 1995. Of the percentage that held MMMF investments, 98.6% also had a

cheque operating account or money market deposit account, a clear indication of the lack of substitutability between the two. This general balance is indicated for the year 1992 as well.

From the Australian viewpoint, despite the trend towards increased household preference for market-oriented investments, the available data show a somewhat diminished role for traditional deposits but do not lend direct support for the idea that this has been a result of the shift of depositors to managed funds. Figure 2 carries two graphs of the market share enjoyed by bank deposits relative to cash management trusts, superannuation funds and unit trusts (mutual funds). Figure 2A depicts the market share in terms of economic importance by expressing the funds under management in the four investment classes as a percentage of the gross domestic product. The domineering position held by bank deposits is challenged by the phenomenal growth in investments held in superannuation owing largely to the introduction of a compulsory pension scheme with the promulgation of the Superannuation Guarantee (Administration) Act in 1992 which was projected to increase employer contributions alone to 9% of total income earned by 2002-3.¹² Indeed superannuation assets rise from A\$60 billion, or 14% of GDP, in 1988, to A\$368 billion, 58% of GDP, in 2001. CMTs and unit trusts have also risen to 4% (from 1%) and 22% (from 5%) of GDP, respectively. In comparison, however, deposits have increased from A\$123 billion, 29% of GDP, in 1988, to A\$975 billion, 69% of GDP, in 2001.

Figure 2B graphs the results of adding up all the assets held in the four investment classes and calculating market share ratios for each based on this total. The share held by bank deposits has fallen from its peak of 62% in 1990 to 45% in 2001 whilst that of superannuation assets has risen from 27% to 38% over the same period. CMTs have increased their share by just a percentage point to 3% whilst unit trust assets have recovered from a slight fall in popularity in the mid-nineties in which they attracted 8-9% of market share to 14% in 2001.

Regarding what the trends described above represent in terms of ownership distribution, the dearth of data precludes an analysis over a reasonable history. Perhaps the most authoritative survey on this issue is the Australian Stock Exchange's 2000 Australian Shareownership Study. According to this survey, 61% of adult Australians own "cash related products such as bank deposits". 34% indicated they invest in fixed interest products and 22% in managed funds. By total funds invested, superannuation topped the list with 35%, followed by cash related products (20%), investment property (15%), shares (13%), fixed interest products (11%), managed funds (5%) and derivatives (1%).

Undoubtedly the demand for alternatives to bank deposits is sizeable. Whether the trends that have culminated in the observed position of the alternatives in the economy, and the popularity and ownership distribution of financial products are indicative of a direct displacement of bank liabilities, in particular by products offered by banks' own funds management divisions, is the empirical question the rest of this paper attempts to answer.

2.2 Development of a testable model

The nascent literature on the disintermediation of bank deposits in favour of managed funds suggests that mutual funds and bank liabilities are substitutes. Taken to its extreme, this prediction implies that an increase in managed fund (*MF*) balances should lead to a decrease

in bank liabilities (BL). This phenomenon could be described by the following BL to MF displacement ratio:

$$BLRNMF = BLRMF + \alpha MFRMF, \quad (1)$$

where BLR is the ratio of total bank liabilities to total assets defined as the assets held by the bank; MFR is the ratio of bank subsidiary managed fund aggregate balances to bank total assets; NMF and MF denote a bank without managed fund operations and one that has funds management operations, respectively; and α is the MF - BL substitution coefficient¹³.

One view holds that the existence of bank-affiliated managed funds reduces the banking sector's reliance on traditional liabilities, implies that $\alpha > 0$ and conforms to three arguments that correspond to α values of exactly 1; $0 < \alpha < 1$; and $\alpha > 1$. A value of 1 implies that a dollar of managed fund balances reduces potential bank liabilities by a dollar. Intuitively it appears more reasonable to assume that since a bank may rely on indirect means of offering managed-fund-like products to its customers, such as index-linked deposits, the more likely value to be observed is $0 < \alpha > 1$. Imperfect substitution may also arise if, owing to the comparative illiquidity of managed fund products, savings in banking products are not reduced one-to-one for an increase in fund balances. Observing a value of $\alpha > 1$ would confirm that, indeed, banks are on a precipitous course towards the total delegation of the deposit-taking function to their managed fund operations. Complementarity between MF and BL corresponds to a negative α .

Assuming that the BLR of a non-funds managing bank is a function of a number of control variables which reflect the characteristics that determine the banks' BLR , then the BL to FM displacement ratio can be rewritten as:

$$C(\text{Control Variables}) = BLRMF + \alpha MFRMF = BLRNMF. \quad (2)$$

Rearranging the above, it follows that the MF ratio of a bank is:

$$MFRMF = -1/\alpha BLRMF + 1/\alpha C(\text{Control Variables}). \quad (3)$$

To operationalise the equation, assuming that control variables can be identified, the following linear model can be estimated:

$$MFR = \lambda_0 + \lambda_1(BLR) + \lambda_{i+1}(\text{Control Variables}). \quad (4)$$

Turning now to potential control variables, this paper adopts the following:

- BL liquidity measured by the ratio of current deposits to total bank liabilities, henceforth denoted BLQ . This variable reflects the portion of a bank's liabilities that can easily migrate to competitors or competing intra-group products.
- BL size measured as the natural logarithm of total BL , denoted $BLSIZE$, and included because size may reflect the bank's ability to attract depositors who believe in the "too-big-to-fail" phenomenon or associate size with superior reputation. $BLSIZE$ may also be partially indicative of the bank's capacity to increase its liabilities in relation to both prudentially and internally-imposed capital adequacy constraints.

- Variability of BL calculated as the coefficient of variation of BL over the past year, $BLVA$. A recent high variability history may be associated with a bank's instituting of measures to establish greater stability.
- ASIC retirement savings account (RSA) approval status, assigned the dummy variable $RSAD$. This dummy variable is included since there was a strong expectation that retirement savings accounts would slow down the movement of savings from traditional deposits into managed fund products.¹⁴ As customers can maintain RSAs as part of the compulsory superannuation required by law, the market's expectation that their introduction would slow down the growth of other deposits would appear to contradict Hubbard (1986) who suggests that the liquidity constraints that characterise pension assets in general preclude the forced saving from displacing discretionary saving or encouraging increased borrowings.

Having determined the potential explanatory variables for the level of managed fund balances preferred by a bank, the model utilised to examine the relationship between bank-managed funds and other bank liabilities is:

$$MFR = \lambda_0 + \lambda_1(BLR) + \lambda_2(BLVA) + \lambda_3(BLSIZE) + \lambda_4(BLQ) + \lambda_5(RSAD) + \varepsilon \quad (5)$$

If MF and BL are substitutes, irrespective of the degree, α will be greater than 0 and consequently λ_1 , the BLR coefficient, will be negative.¹⁵

3. Data

In order to test the model developed in Section 2 this section utilises asset and liability data provided by APRA on all the banks that operated funds management entities directly under the banking entity, as opposed to a subsidiary in a holding company structure, and that were, therefore, subject to Prudential Standard APS 120.¹⁶ The APRA dataset itemises for each bank the different components of liabilities. This study treats the aggregation of interest bearing current deposits, term and call deposits, certificates of deposit and "other" liabilities (including statement savings, savings investment, passbook and school savings accounts) as the investment-type liabilities that are likely to be displaced by managed fund products. The liabilities that are excluded are non-interest-bearing deposits, "other borrowings" (not defined), bill acceptances and foreign currency liabilities. On the asset side, the APRA dataset distinguishes domestic from foreign currency denominated assets. This paper uses Australian dollar denominated assets to normalise the managed fund assets and bank investment-type liabilities in estimating the displacement model to avoid introducing the influence of currency fluctuations.

Individual managed fund data were provided by ASSIRT Research, Australia's largest fund ratings agency. The ASSIRT database identifies the institutional affiliation of the fund managers and details the total funds under management on a monthly basis for the period 1992-2000 covered by the bank asset and liability data. As cash management trusts, the equivalent of the money market mutual funds studied by Pilloff (1999), account for only 3% of the assets under management in Australia, this study also includes cash and fixed interest funds. The number of the funds used in this paper increases from 89 in 1992 to 190 in 2000,

in tandem with the phenomenal growth in managed fund assets over the period. The funds represent 69% or A\$29.4 billion of the A\$43.3 billion in assets under management held by bank-affiliated funds at the end of 2000.

4. Empirical Results

Since the banks that form the basis of this study are easily identifiable this paper estimates the managed-fund – bank-liability displacement model using a sample that excludes banks that do not operate funds-management divisions.¹⁷ Table 1 reports the estimates obtained from OLS regressions of the model. Because of well-known autocorrelation and heteroskedasticity problems associated with models estimated with cross-sectional and time-series data two provisions are made in coming up with the results. Firstly, to ameliorate autocorrelation, models are estimated for each of the years in the 1992-2000 analysis period. Secondly, each estimation is repeated to correct for heteroskedasticity using White's (1980) procedure and the results reported separately for each instance in Panels A and B of Table 1, respectively. Two-tailed *t*-Statistics are reported in parentheses.

The main finding of this paper is that the coefficient estimates on *BLR* are positive and highly significant in the majority of the years with the only negative coefficient being statistically insignificant. This result appears to rule out the substitutability of managed funds for bank products and is strongly suggestive of complementarity instead. On the basis of this evidence, it would appear the Australian antitrust authorities are correct in maintaining that bank deposits and managed funds do not occupy the same market definition.

Clearly, the observed complementarity is not exclusively strong. It could be conjectured that some substitution effects occur at the margin as a result of banks' indirect usage of managed fund divisions as capital raising conduits. Prudential guidelines normally require banks to set aside capital against any exposure to funds management operations in a trusteeship or custodial role. However, in practice, banks are known to "reclaim" the lost capacity to raise funds for lending via the funds management operations. For example, observing that financial institutions fund their loans with both equity and wholesale debt, primarily commercial paper, Pennacchi (1998) notes the commercial paper is sold to money market funds that, in turn, invite investors to open transaction accounts with them. Indeed, in Australia it is common for a bank-affiliated fixed interest fund, for example, to invest its assets in financial securities originated by, or accounts operated by, the parent bank. Additionally, as noted earlier in this paper, banks have been structuring index-linked products that would appear to be close substitutes for managed funds; however, directly investigating this issue is impeded by the lack of data on balances in such accounts.

The coefficient on *BLSIZE* is negative in all the years except 1999, an indication bank liability size is negatively related to *MFR*. This is not surprising in light of anecdotal evidence from market commentators that the biggest banks have been generally slow in growing their funds management businesses, whether generic or acquisitive.¹⁸ The negative relationship between *MFR* and *BLSIZE* also shows that although the investment classes are complementary, the growth of funds under management does not play a significant role in increasing bank liability balances.

Assuming that an increased inflow of depositors' funds into the most liquid bank liabilities is a proxy for a certain sentiment against long term investments amongst the suite of bank products, the existence of substitution effects between managed funds and bank liabilities could be expected to be accompanied by a positive relationship between *MFR* and the ratio of call deposits to total bank liabilities. Similarly, banks would be observed to react to increased volatility in liabilities with increased managed fund balances to compensate for the variability of its liability base. The results reflected by the *BLQ* coefficient are mixed, with positive, statistically coefficients almost being matched by negative ones. However, the majority of the *BLVA* coefficients are negative, indicating that unstable deposit balances do not necessarily lead banks to secure managed fund subscriptions as substitutes, further diminishing the substitutability argument.

Retirement savings accounts are direct competitors of funds operated by the same banking entity. It is, therefore, not surprising that in Table 1 the *RSAD* dummy indicating the authority granted to operate the accounts is negatively related to *MFR* in the latter three of the four years that banks have been allowed to offer them. This implies that banks that offer retirement savings have been able to reduce their reliance on managed fund operations in their quest to participate in funds management activities. Whether this trend will continue is a subject for future research.

The results in Table 1 are predominantly similar for both the heteroskedasticity-adjusted and non-adjusted estimates. The only difference of note is in the form of marginally lower *t*-statistics for the heteroskedasticity-consistent results. The explanatory power of the regressions is high, as depicted by adjusted *R*-squared ranging from 48% to 93% on an increasing profile that reflects the inclusion of *RSAD* as an additional variable in 1997, when the account was first authorised, onwards.

The managed fund data include wholesale (institutional) funds numbering 21 in 2000 compared to 169 retail funds. To check whether the presence of wholesale funds influences the results, the model is re-estimated on data that excludes the wholesale funds. The results are not altered in any significant way in terms of the signs, magnitude and statistical significance of the coefficients and are therefore not reported here.

With substitution effects ruled out, it is noteworthy that treating managed funds and deposits as complements is costly for banks in relation to capital adequacy requirements. This is because banks are required to set aside capital as they increase their direct exposure to managed fund activities. Furthermore, there is a strong suggestion that banks may use managed fund operations to indirectly raise funds for the asset side of their business. Therefore, as a further test of the robustness of the results reported here, this study repeats the regressions based on the substitution model tested on data for the individual banks spanning 1992-2000. Instead of the *RSAD* dummy variable, each bank's capital adequacy ratio (*CAR*), reported in the annual reports, is included. If regulatory intentions that are premised on capital provision for incremental managed fund business taken up have a dominant effect, a negative relationship between *MFR* and *CAR* should be observed.

The coefficient estimates for the individual bank pooled regressions are reported in Table 2. The number of banks is reduced to five as two of the banks were not publicly listed and, as such, did not report *CAR* histories, and *CAR* data on one bank is rendered noisy by its takeover of a large bank during the analysis period. The results decisively rule out substitutability as all the banks' *BLR* coefficients are positive and highly statistically

significant. Caution should be exercised though in interpreting the high *t*-Statistics owing to the statistical problems associated with pooled panel data noted earlier on. *BLQ*, the measure of the proportion of liquid deposits held, and *BLSIZE* are confirmed to be negatively related to *MFR*, although the results on *BLVA* are still mixed. Most interestingly, as predicted, *CAR* is negatively related to *MFR* in all but one positive but statistically insignificant case.

Substitutability is dominated by complementarity and bank prudential regulations successfully compel banks to set aside capital against managed fund exposure at the exclusion of most of Pennacchi's (1998) indirect capital adequacy recoupment effects.

5. Conclusion

Managed funds that are run by banks may intuitively appear to be substitutes for bank deposits. However, this study finds suggestive evidence that, empirically, managed fund assets under management and bank liability balances complement rather than displace each other. This corroborates descriptive evidence that the liquidity, accessibility, safety, price stability and popularity attributes of bank-affiliated managed funds are not, on strict analysis, consistent with similar characteristics of bank deposits. The complementarity is not exclusive though - in two out of the nine years constituting the analysis period a negative but statistically insignificant relationship is observed between bank liabilities and managed fund balance normalised by total bank assets. Some weak substitution effects may be emanating from such factors as the ability of bank-affiliated funds to invest in parent bank deposits, thus indirectly replacing the banks' capacity to raise liabilities that is lost to prudential capital provisioning. To directly verify this issue, running the substitution model on individual banks after including the capital adequacy ratio variable shows that the measure is negatively related to the volume managed fund business. Prudential regulatory requirements successfully dissuade banks from using in-house investment management operations as an indirect conduit for raising funds in the same manner as deposit taking.

This paper also documents a predominantly negative relationship between managed funds and the aggregate size of a bank's liabilities, reflecting that despite that evidence largely supports complementarity, there are factors other than the existence of a managed fund undertaking within a banking entity that strongly influence the growth of the bank's liabilities. Observed high variability in bank liabilities is negatively related to funds under management, negating the prediction based on the assumption of substitutability that such variability may induce banks to increase their reliance on managed funds for raising monies to on-lend on the asset side. Not surprisingly, the authorisation of banks to operate retirement savings accounts, that are essentially managed funds in nature and tax treatment, results in a reduced reliance on managed funds.

The results of this paper may be instructive to bank managers, regulators and researchers. Banks and regulators would be right to continue to regard bank deposits and managed funds as belonging to different market definitions. The results also speak to the academic debate on financial intermediation – the empirical behaviour of bank deposits and managed funds suggests complementarity rather than substitutability and, as such, claims that the observed reduction in traditional deposit-taking business is a direct result of the advent of managed funds are likely premature. Bank participation in investment management activities is perhaps better explained by theories that acknowledge that the intermediation landscape has

been altered by the quest for banks to directly counter competition from such institutions as managed funds.

Notes

1. Other reasons offered by Gallo et al (1996), quoting Kaufman and Mote (1994), for bank participation in mutual fund activity are 1) the deregulation of bank mutual fund activities past 1986; 2) the need to boost non-interest income to offset the decline in net interest margins, a factor linked to the decline in deposits; 3) to reduce bank unsystematic risk through diversification into new lines of business, citing Brewer, 1989; 4) to lock in scale economies by adapting the existing infrastructure to mutual fund activities.
2. See ACCC Merger Guidelines (ACCC Procedural Guidelines Series).
3. See www.standardandpoors.com/ratingsdirect .
4. The Australian Securities and Investments Commission's Class Order (CO 01/0050) of 22 January 2000 allows differential fee arrangements to be negotiated separately with institutional (sophisticated) investors.
5. For example, Australian fund managers suspended all redemptions in internationally-oriented managed funds for ten days following the September 11 2001 terrorist attacks on US targets.
6. The so-called prudent-man rule was established in US courts in *Harvard College v Amory* where it was held that "Trustees shall act in a manner as other trustees [later referred to as 'a prudent man'] would act under like circumstances". See Del Guercio (1996) and Cabot (1998) for historical accounts.
7. The separation concept is also associated with the authorities attempts at dealing with the "too big to fail" phenomenon.
8. The discussion on the liability of managed fund investors in this paper is largely based on various submissions to the Australian Treasury in respect of the Managed Investments Act Review, in particular submissions by the Companies and Securities Advisory Committee (March 2000) and Mr D E Routley (5 September 2001), available online at <http://miareview.treasury.gov.au> .
9. Specifically the legal precedent was set in *JW Broomhead Pty Ltd (in liquidation) v JW Broomhead Pty Ltd* (1985) 3 ACLC 355, 9 ACLR 593, in which the court held that the unit holders in a unit trust were liable to indemnify the trustee against liabilities incurred in carrying on a business. In this case the court applied the principle of the proportionate liability of trust beneficiaries. Similarly, *Mcleon v Burns Philp Trustee Company Pty Ltd* (1985) 9 ACLR 926 confirmed that the potential personal liability of trust beneficiaries could be limited to the extent of the assets of the trust by a clause that restricted the trustee's recourse to those assets. However, such restriction would only be valid if it was not contrary to public policy, as was held by the court to subsist in the particular case. The situation is similar in the US where, under state law, the shareholders of a trust (fund) may, in certain circumstances generally believed to be remote, be held personally liable for the trust's obligations. However, the Declaration of Trust disclaims liability of shareholders and the trust's trustees and officers for acts or

obligations of the trust and requires that notice of such disclaimer be given in each agreement, obligation, or contract entered into or executed by the trust or the Board of Trustees. The Declaration of Trust provides for indemnification out of the assets of the trust of all losses and expenses of any shareholder held personally liable for the obligations of the trust. Thus, the risk of a shareholder incurring financial loss on account of shareholder liability is considered remote, since it is limited to circumstances in which the disclaimer is inoperative and the trust itself is unable to meet its obligations.

10. This aspect differs from the US where a combination of established market practice and legislation has firmly established the maintenance of a price of one dollar on MMMFs as the norm. In addition private insurance schemes that guarantee investors' capital are gaining in popularity. Pilloff (1999) and Farinella and Koch (1999) carry detailed accounts of the issues surrounding capital preservation in US MMMFs.
11. A safety issue that this study does not consider owing to data limitations is that of the riskiness of the assets held by money-market oriented managed funds compared to bank-operated money market deposits. This issue is important in light of the well-documented principal-agent problem occasioned by the asymmetric nature of the performance-based compensation of fund managers wherein the managers are incentivised to alter their preference for risk to the detriment of investors. (See, for example Brown, Harlow and Starks, 1996, and Chevalier and Ellison, 1997).
12. See FSI 1997.
13. The logic applied in this section is based on the non-structural model popularised by Ang and Peterson (1984) in the case of debt-lease substitution in firms.
14. See Financial System Inquiry (FSI) (1997), page 119. The Australian Taxation Office definition of an RSA is an account offered by banks, building societies, credit unions, life insurance companies and prescribed financial institutions (RSA providers) used for retirement savings and similar to a superannuation fund.
15. The value of λ_1 , however, is a measure of the *MF* to *BL* displacement ratio rather than the *BL* to *MF* displacement ratio, α . Alpha cannot be determined by simply taking the inverse of λ_1 due to the presence of a constant and other independent variables in the regression model. However, should a substitutability relationship arise α can easily be determined by swapping the *MFR* and *BLR* in the above equation to treat the *BL* as the dependent variable, describing the following partial derivative: $\frac{\partial BLR}{\partial MLR} = BL, MF$ displacement ratio.
16. ABN-AMRO Asset Management, Advance Funds Management (acquired by St George Bank in 1997), ANZ Managed Investments Ltd, Barclays Global Investors, Commonwealth Financial Services, Macquarie Investment Management Ltd, National Australia Financial Management, Westpac Financial Services.
17. This is useful in avoiding using a truncated dataset.

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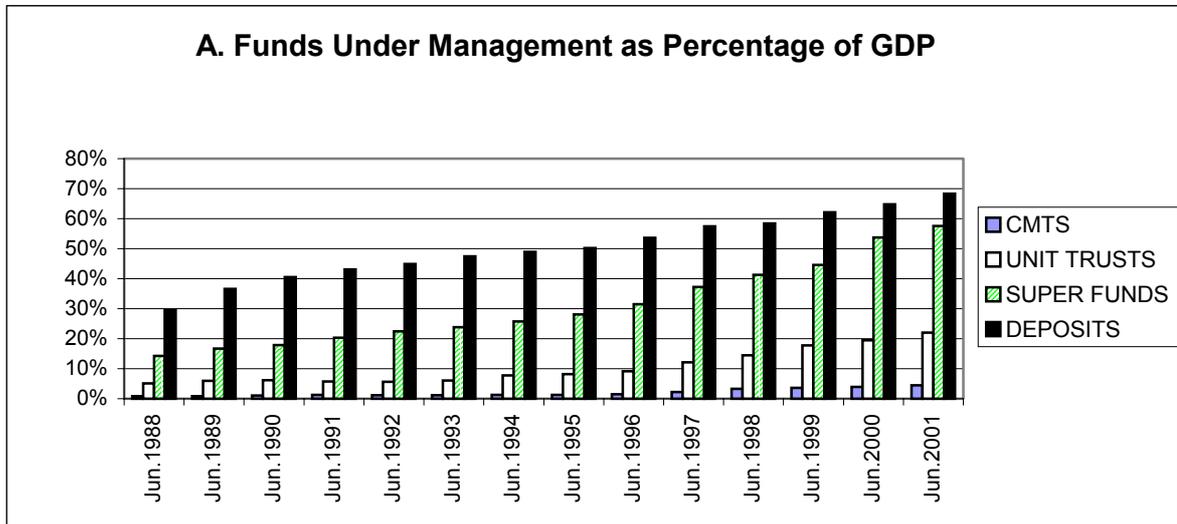
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Fig. 1: Summary of Pilloff's (1999) Main Findings

Attribute	Accounts at Insured Depository Institutions	Money Market Mutual Funds
<i>A Liquidity Accessibility and Convenience</i>		
• Cheque and withdrawal facilities	Full access	Restricted access
• Maturity	No maturity (withdrawal at any time)	No maturity (withdrawal at any time with limited restrictions)
• ATM, telephone and internet access	Full access	ATM access generally absent
• Low account opening/maintenance balances	Generally applicable	Generally applicable
• Convenient locations and access to branch networks	Access to bank branch network	Access to bank branch network plus advisor network
<i>B Safety and price stability</i>		
• Federal deposit insurance	Mostly applicable	Not applicable
• Diversified asset holdings	Applicable to money market deposit accounts*	Applicable to most products
• Price maintained at \$1	Applicable automatically	Maintenance of \$1 price sometimes requires parent intervention and private insurance
<i>B Demand behaviour</i>		
• Popularity	Held by majority of households	Held by minority of households

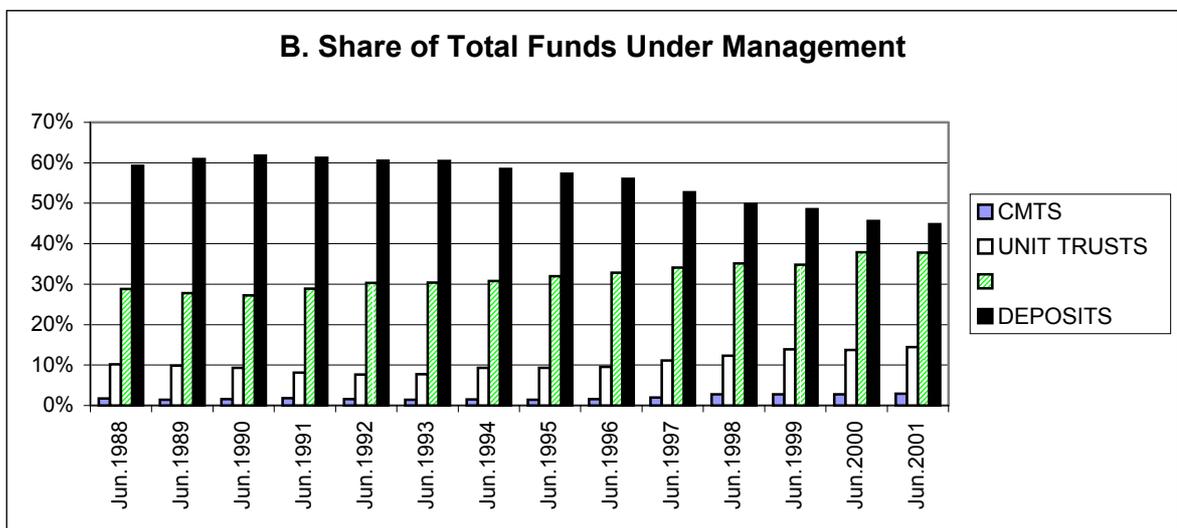
* Similar to and treated as deposits but invested by banks in short-term low-risk money market assets (Treasury bills, bank CDs, commercial paper, etc.) and usually require a minimum balance and set limits on the number of monthly transactions (deposits and withdrawals by cheque).

Fig. 2A: Market-Share Held by Australian Fund Managers



Sources: Australian Bureau of Statistics and Australian Prudential Regulatory Authority.

Fig. 2A: Market-Share Held by Australian Fund Managers



Sources: Australian Bureau of Statistics and Australian Prudential Regulatory Authority.

Table 1: Annual OLS Coefficient Estimates of Mutual Funds–Bank
Liabilities Substitutability

PANEL A – heteroskedasticity-inconsistent results

Variable	2000	1999	1998	1997	1996	1995	1994	1993	1992
Constant	2.08 (7.34)** *	-3.49 (-7.51)** *	4.27 (10.89)** *	5.86 (6.54)** *	4.79 (22.12)** *	6.15 (5.76)** *	2.95 (10.56)** *	0.97 (4.15)** *	1.56 (3.02)** *
<i>BLR</i>	-0.21 (-1.01)	0.22 (1.19)	0.18 (7.28)** *	0.22 (6.25)** *	-0.08 (-0.37)	0.07 (16.64)** *	0.09 (5.44)** *	1.29 (4.20)** *	0.08 (4.05)** *
<i>BLQ</i>	2.25 (1.44)	12.23 (11.85)** *	0.52 (2.07)** *	-1.33 (-1.21)	0.51 (1.32)	-1.41 (-1.40)	-1.17 (-3.92)** *	-2.06 (-2.79)** *	1.61 (2.62)** *
<i>BLSIZE</i>	-0.20 (-6.34)** *	0.13 (3.07)** *	-0.39 (-10.99)** *	-0.51 (-6.97)** *	-0.44 (-21.35)** *	-0.50 (-6.00)** *	-0.23 (-11.20)** *	-0.10 (-5.01)** *	-0.21 (-5.38)** *
<i>BLVA</i>	-0.49 (-3.21)** *	5.08 (12.59)** *	-3.26 (-6.83)** *	-2.26 (-0.95)	-6.37 (-14.78)** *	-8.87 (-4.67)** *	-2.09 (-6.63)** *	5.89 (6.98)** *	-1.54 (-1.87)* *
<i>RSAD</i>	-0.09 (-1.52)	-0.37 (-7.34)** *	-0.19 (-2.47)** *	0.24 (2.80)** *	-	-	-	-	-
Adjusted R2	0.75	0.93	0.75	0.72	0.87	0.78	0.65	0.64	0.48
Number of Banks	7	7	6	6	7	7	7	7	7
Number of Funds	190	182	160	164	149	144	129	110	89

PANEL B – White (1980) heteroskedasticity-consistent results

Variable	2000	1999	1998	1997	1996	1995	1994	1993	1992
Constant	2.08 (4.09)** *	-3.49 (-4.07)** *	4.27 (5.32)** *	5.86 (2.07)** *	4.79 (21.15)** *	6.15 (3.69)** *	2.95 (5.32)** *	0.97 (4.17)** *	1.56 (3.33)** *
<i>BLR</i>	-0.21 (-1.17)	0.22 (1.54)	0.18 (15.03)** *	0.22 (3.60)** *	-0.08 (-0.45)	0.07 (4.62)** *	0.09 (16.73)** *	1.29 (4.72)** *	0.08 (2.05)** *
<i>BLQ</i>	2.25 1.16	12.23 9.78** *	0.52 2.03** *	-1.33 -1.59	0.51 1.42	-1.41 -3.12** *	-1.17 -3.71** *	-2.06 -3.27** *	1.61 3.31** *
<i>BLSIZE</i>	-0.20 (-4.11)** *	0.13 (1.84)*	-0.39 (-5.74)** *	-0.51 (-2.08)** *	-0.44 (-20.34)** *	-0.50 (-3.66)** *	-0.23 (-5.33)** *	-0.10 (-5.38)** *	-0.21 (-5.11)** *
<i>BLVA</i>	-0.49 (-1.97)*	5.08 (6.81)** *	-3.26 (-3.59)** *	-2.26 (-0.39)	-6.37 (-15.59)** *	-8.87 (-3.29)** *	-2.09 (-3.60)** *	5.89 (6.49)** *	-1.54 (-2.72)* *
<i>RSAD</i>	-0.09 (-1.26)	-0.37 (-5.98)** *	-0.19 (-2.20)** *	0.24 (1.65)	-	-	-	-	-
Adjusted R2	0.75	0.93	0.75	0.72	0.87	0.78	0.65	0.64	0.48
Number of Banks	7	7	6	6	7	7	7	7	7
Number of Funds	190	182	160	164	149	144	129	110	89

Notes: The dependent variable is the ratio of bank-affiliated managed funds' assets under management to total Australian-dollar denominated bank assets. *BLR* is the ratio of aggregated selected investment-type bank liabilities to total Australian dollar denominated bank assets; *BLQ* is a measure of the liquidity of all bank liabilities calculated as the ratio of current deposits to total bank liabilities; *BLSIZE* is the size of the bank's total liability exposure measured as the natural logarithm of total bank liabilities, *BLVA* is variability of bank liabilities calculated as the coefficient of variation of bank liabilities in the analysis year, *RSAD* is a dummy variable denoting whether the bank had approval to operate retirement savings accounts. The expected sign for the *BLR* coefficient is negative if managed fund assets under management and bank investment-type liabilities are substitutes and positive if they are complements. Two-tailed *t*-statistics are in parentheses and ***, **, and * indicate significance at 1, 5 and 10% levels.

Table 2: Pooled OLS Coefficient Estimates of Mutual Funds–Bank
Liabilities Substitutability for Individual Banks

Variable	ANZ	CBA	MBL	NAB	WBL
C	0.14 (4.68)***	0.78 (1.70)*	6.68 (2.54)**	0.24 (4.45)***	0.20 (5.81)***
BLR	0.03 (131.74)***	0.09 (55.76)***	0.33 (2.04)**	0.15 (4.04)***	0.06 (235.48)***
BLQ	-0.02 (-3.26)***	0.04 (0.42)	-0.31 (-0.50)	-0.06 (-4.56)***	-0.03 (-2.85)***
BLSIZE	-0.01 (-4.57)***	-0.04 (-1.26)	-0.92 (-2.05)**	-0.02 (-4.08)***	-0.01 (-4.69)***
BLVA	-0.03 (-1.91)*	0.49 (3.38)***	2.10 (4.41)***	0.01 (0.64)	-0.07 (-2.22)**
CAR	0.00 (-2.30)**	-0.03 (-1.78)*	0.10 (1.17)	0.00 (-2.47)**	0.00 (-4.88)***
Adjusted R2	0.83	0.99	0.28	0.25	0.91

Notes: The dependent variable is the ratio of bank-affiliated managed funds' assets under management to total Australian-dollar denominated bank assets. *BLR* is the ratio of aggregated selected investment-type bank liabilities to total Australian dollar denominated bank assets; *BLQ* is a measure of the liquidity of all bank liabilities calculated as the ratio of current deposits to total bank liabilities; *BLSIZE* is the size of the bank's total liability exposure measured as the natural logarithm of total bank liabilities, *BLVA* is variability of bank liabilities calculated as the coefficient of variation of bank liabilities in the analysis year, *CAR* is the total capital adequacy ratio for the bank. The expected sign for the *BLR* coefficient is negative if managed fund assets under management and bank investment-type liabilities are substitutes and positive if they are complements. Two-tailed *t*-statistics in parentheses are adjusted for heteroskedasticity (White's correction). ***, **, and * indicate significance at 1, 5 and 10% levels.