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Investment patterns in Singapore's Central Provident Fund System

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Abstract

Rising elderly life expectancies imply the need to accumulate sufficient savings for retirement. This paper investigates the role of recent changes in the investment menu of the Singaporean Central Provident Fund (CPF) system. Our research explores the investment patterns of CPF participants and articulates their implications for policymakers. We find that most investors use their money for housing purchase and default the remainder to the CPF investment pool. The bulk of non-housing saving sits in bank accounts paying a low return. A fraction of workers does elect outside investment products, with high-income earners and males taking more risk than low-income earners and females. Since workers who default their money to the CPF fund receive a guaranteed 2.5% return on the Ordinary Account and 4% on the Special Account, hurdle rates for money market and equity funds are substantial. These high hurdle rates help explain why few CPF account holders invest outside the default government investment pool, though inertia probably explains why many employees let their funds sit in bank accounts earning low interest rates. More attention could be devoted to lowering fund expenses and commissions, including the myriad of fees, expenses, loads, and wrap charges; it might also be beneficial to streamline and rationalize the investment menu offered to participants.

In the four short decades between 1990 and 2030, the global tally of persons age 60+ will burgeon from 500 million to almost 1.5 billion individuals. As much of this demographic aging will take place in Asia, it follows that retirement systems in Asia

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will come under substantial pressure. This paper focuses on one of Asia's most famous retirement programs, Singapore's national defined contribution program known as the Central Provident Fund (CPF). Our goal is to review how workers are allocating their retirement savings across the various investment options made available under the CPF, and to assess whether alternative investment choices might enhance retirement saving. In particular, we address four questions:

- What fund choices are currently available for workers covered by the CPF, and how do people allocate their retirement saving?
- How do these investment patterns vary according to participant characteristics, and how do they compare to those in other countries?
- How do investment options outside the government default investment pool compare, in terms of fees and charges?
- What policy conclusions may be derived regarding the current investment mix provided for retirement saving?

In what follows, we first outline the structure of Singapore's retirement system, focusing on the links between the national mandatory provident fund structure and other types of asset accumulation in the nation. Next, we show how government policy has influenced asset accumulation and investment patterns.[1] Subsequently, we explore several questions about asset allocation patterns by demographic attributes. Last, we assess how the fees and charges associated with investing in a CPF unit trust can impact on the investment return over various time horizons.[2] Since workers who default their money to the CPF fund receive a guaranteed 2.5% return on the Ordinary Account and 4% on the Special Account, this means that hurdle rates for money market and equity funds are rather substantial. These high hurdle rates help explain why few CPF account holders invest outside the default government investment pool. On the other hand, inertia probably explains why many employees let their funds sit in bank accounts earning low interest rates, rather than opting for either the CPF fund or other permitted investments.

Investment patterns in Singapore's Central Provident Fund (CPF)

The CPF in Singapore was first established in 1955 as a forced savings program; half a century later, it has evolved into a wide-ranging social security system covering 3.1 million CPF members, of whom 1.46 million are active (as of December 2006).[3,4] Since its inception, the CPF has been a defined contribution plan financed by mandatory levies on employees' regular monthly earnings up to an earnings cap. Contribution rates and caps have varied over time, with current rates amounting to between 8.5% and 33% of salary depending on the employee's age, and the ceiling is

[1] This paper does not focus on decumulation patterns; these have been studied by Chen *et al.* (1997, 1998); Doyle *et al.* (2004), and Fong (2002).

[2] In the United States, a unit investment trust generally refers to a fixed, unmanaged portfolio of income-producing securities. Shares in the trust are sold to investors who receive capital gains, dividend payments and interest at regular periods. A unit investment trust is typically considered a low-risk, low-return investment. Unit trusts in Singapore are more comparable to mutual funds in the US.

[3] Low and Aw (1997) trace the historical roots of the Singaporean CPF; see also Low and Aw (2004).

[4] Active CPF members are persons with at least one contribution in the current or preceding three months.

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Table 1. *Annual earnings ceiling for Central Provident Fund (CPF) contributions*

Year	Salary ceiling
2006	$4,500
2005	$5,000
2004	$5,500
2003	$6,000
2002	$6,000
2001	$6,000
2000	$6,000
1999	$6,000
1998	$6,000
1997	$6,000

Source: CPF Annual reports, various years.

set at $4,500 per month[5] (in 2006; see Table 1). Initially all contributions were held in a single account, but over time, additional accounts were created. Of most interest for our purposes, the Ordinary Account (OA) and Special Account (SA) concepts were introduced in the late 1970s; the former is intended for financing of home purchases, insurance premiums, education expenses, and other saving, while the Special Account, created in 1977, is mainly targeted toward old-age saving. The Medisave account, introduced in 1984, is designed to be spent on medical care expenses and catastrophic illness insurance (see Figure 1).

Total CPF contributions vary with age, and so too does the breakdown of the allocations across accounts. Currently young workers ($\leqslant$35 years old) have 6% of their total contributions dedicated to the Medisave account, 22% of their totals to the Ordinary Account, and 5% to the Special Account. By contrast, older workers (age $>$ 55–60) contribute 18.5% of covered pay split 8%, 10.5%, and 0%, respectively, across the three accounts. Figure 2 and Table 2 depict the time pattern of OA and SA contribution rates for a 'prime-age worker' in the 35–45 age range. Such an individual would have had to contribute 10% of covered earnings in the 1950s to the single pooled account, with the rate rising steadily to 37% by 1979 when the Special Account was created. Thereafter, the non-medical savings portion of the CPF for this prime-age group of workers – that is, just the OA and SA combined elements – rose to 46% of covered pay by 1983, and then fell to the mid-to-low 30s over the 1990s. By the end of the 1990s, in response to the Asian financial crisis, the CPF savings contribution for OA and SA combined was slashed to 23%, and it now stands at 26% of covered pay.

The flow of funds into the CPF over time has resulted in substantial asset accumulation by scheme participants. Contributions to the OA, SA, and Medisave accounts total S$16.1B, and CPF balances stand at S$119.8B (December 2005), or

[5] The exchange rate as of December 2006 was S$1 = US$0.64.

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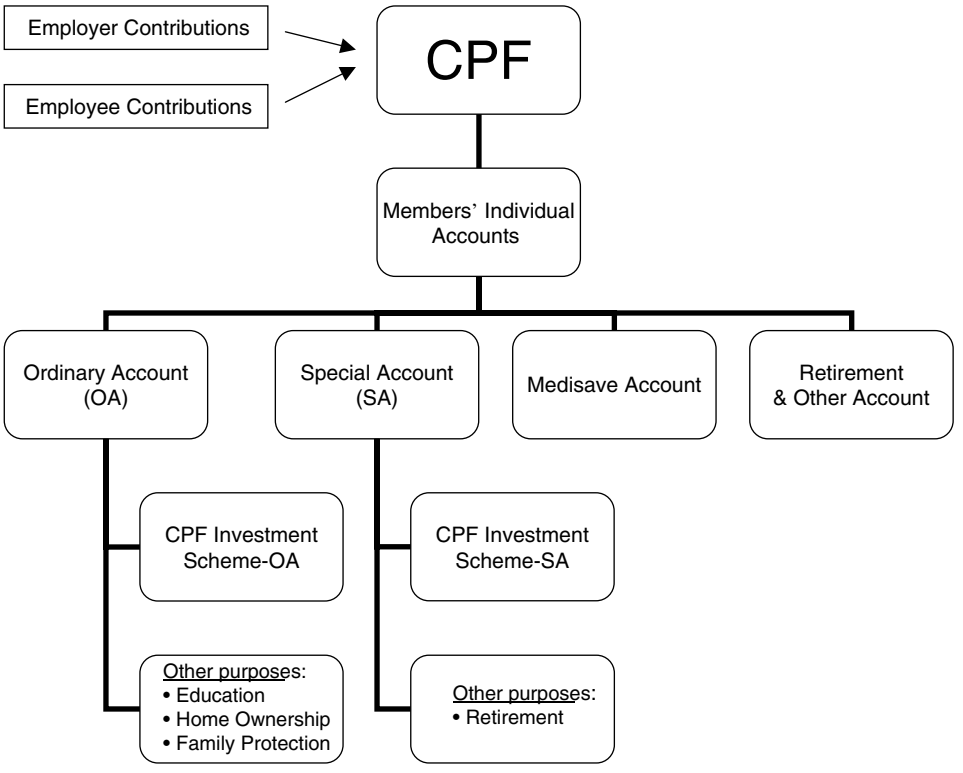


Figure 1. Central Provident Fund (CPF) overview
Source: Adapted from Low and Aw (2004).

about three-fifths of Singapore's GDP that year.[6] As shown in Table 3, the growth rate of the CPF asset pool has averaged over 7% per annum since 2003.

When the CPF was first established, the Provident Fund Board centrally directed all investible funds and a government-set rate of return was paid on the assets. This annual percentage return was set in 1955 at 2.5%, a figure that rose to 5% in 1963, and peaked at 6.5% in the mid-1980s (see Table 4). Thereafter, the return was gradually reduced to around 2.5–3% through the mid-1990s. The SA rate was set at 1.25 percentage points above the OA/Medisave rate in mid 1995, and raised to 1.5 percentage points in July 1998. There has been no change in the OA and SA rates since mid-1999; the annual OA rate is 2.5% and the SA return is 4%. As explained by the CPF Board, the actual return paid for the Ordinary Account is the higher of this floor, or the 'market-related interest rate (based on the 12-month fixed deposit and month-end savings rates of the major local banks)'.[7] For the Special and Retirement Accounts, members earn additional interest of 1.5 percentage points

[6] Singapore's 2005 GDP at current market prices was S$194.2B (*Source*: http://www.singstat.gov.sg/keystats/mqstats/indicators.html).
[7] See http://mycpf.cpf.gov.sg/Members/Gen-Info/Int-Rates/Int-Rates.htm.

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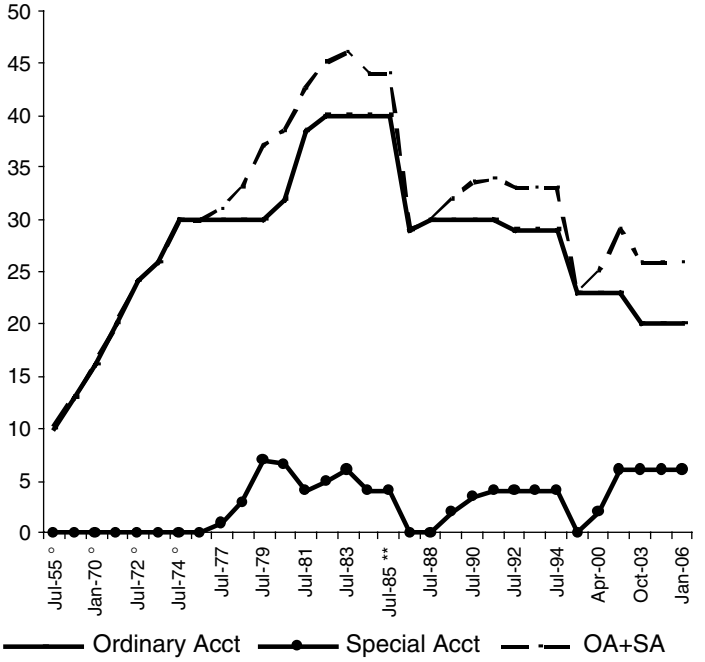


Figure 2. Contribution Shares to CPF OA and SA accounts over time: % of covered earnings (workers age 35–45)
Source: Table 2.

above the normal CPF interest rate.[8] In other words, the Board guarantees a relatively safe minimum nominal return, and it also offers participants the possibility of upside potential should the bank rate rise. As shown in Table 4 (Panel B), the Medisave account return was raised in October 2001 to the SA rate, to help members build up the Medisave balance faster.

Since the system's inception 50 years ago, the 'default' investment under the Provident Scheme has always been the CPF fund, so that workers would earn whatever rate of return was set by the CPF Board as explained above. Nevertheless, over time, participants have been permitted to use some of their OA and SA assets for other purposes. In 1968, then Prime Minister Lee Kuan Yew introduced the Home Ownership Scheme (HOS), which permitted workers to borrow against CPF accumulations for the purchase of public housing built under the auspices of the Housing Development Board (the government authority controlling most of the island's housing stock).[9] In 1978, CPF savers were permitted to purchase shares in the Singapore Bus Service Scheme, and in 1981, private home purchase was permitted

[8] Asher (2004) and Asher and Nandy (2006) suggest that actual CPF returns probably averaged 5% on an internationally invested asset pool of about S$60B over the last decade. Hard data on the investment mix and returns of the CPF portfolio are not publicly available.
[9] See McCarthy *et al.* (2002), CPF (2005e), and Low and Aw (1997) for further discussion of the housing loan arrangements.

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Table 2. *Contribution rates to CPF Ordinary and Special Accounts over time: % of covered earnings* (*workers age 35–45*)

As of:	Ordinary Account (OA)	Special Account (SA)	OA + SA Together
July 55°	10	0	10
Sept. 68°	13	0	13
Jan. 70°	16	0	16
Jan. 71°	20	0	20
July 72°	24	0	24
July 73°	26	0	26
July 74°	30	0	30
July 75°*	30	0	30
July 77	30	1	31
July 78	30	3	33
July 79	30	7	37
July 80	32	6.5	38.5
July 81	38.5	4	42.5
July 82	40	5	45
July 83	40	6	46
July 84	40	4	44
July 85**	40	4	44
April 86	29	0	29
July 88	30	0	30
July 89	30	2	32
July 90	30	3.5	33.5
July 91	30	4	34
July 92	29	4	33
July 93	29	4	33
July 94	29	4	33
Jan. 99	23	0	23
April 00	23	2	25
Jan. 01	23	6	29
Oct. 03	20	6	26
Jan. 05	20	6	26
Jan. 06	20	6	26

Notes:
° Single pooled account.
* Maximum contribution increased from $450 to $600 per month.
** Maximum contribution increased from $2,500 to $3,000 per month.
Source: CPF Annual Report 2005 Annex A (http://mycpf.cpf.gov.sg/cpf/about-us/ann-rpt/ann_report.htm) and http://mycpf.cpf.gov.sg/Members/Gen-Info/Con-Rates/ContriRa.htm

with CPF funds. As of 1986, members were allowed to purchase commercial properties with their CPF savings and also to move into the Approved Investment Scheme arrangement (CPF Board, 2005e). Subsequently, in 1993, the Board instituted an Investment Schemes (IS) approach, which further widened the range of permissible assets in which CPF savers could invest. At first members were permitted

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Table 3. *Contributions and balances in the CPF*

(A) Member CPF Annual Contributions and year-end account balances through time (S$ billions)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Contri-butions	$10.4	$11.3	$13.5	$14.6	$15.9	$16.0	$12.8	$14.1	$18.3	$16.2	$15.9	$15.3	$16.1
Account balances	$52.3	$57.6	$66.0	$72.6	$79.7	$85.3	$88.4	$90.3	$92.2	$96.4	$103.5	$111.9	$119.8

Source: CPF Annual Report 2005 (http://mycpf.cpf.gov.sg/cpf/about-us/ann-rpt/ann_report.htm).

(B) Member balances by account: 2005

	S$B	%
Ordinary Account	$58.6	49 %
Special Account	$20.1	17 %
Medisave Account	$34.8	29 %
Retirement Account & Others	$6.4	5 %
Total Members' Balance	$119.8	100 %

Source: CPF Quarterly Statistics 2005Q4 (http://mycpf.cpf.gov.sg/CPF/About-Us/CPF-Stats/CPF_Stats2005q4.htm).

to invest only a portion of their OA and SA savings in approved assets, but the portion was raised to 100 % for the SA as of 2001.[10]

The range of products in which CPF members can invest is quite diverse. In 2006, for instance, OA funds could be invested in fixed deposits, corporate bonds, property funds and equities traded on the Singapore stock exchange, bonds guaranteed by the Singapore government, Statutory Board bonds, annuities and endowments, investment-linked insurance products, unit trusts, exchange traded funds, fund management accounts, and gold. Portfolio limits apply to specific asset families; for instance, as noted in Table 5, a participant can invest only up to 10 % of his investible saving in gold, and only up to 35 % of his investible saving in shares, property funds/REITs, and corporate bonds. A slightly narrower set of investment products has been allowed for Special Account monies; the list most notably excludes fund management accounts, shares, property funds/REITS, corporate bonds, gold, investment-linked insurance products, unit trusts, and exchange-traded funds in the Higher Risk category of the CPFIS Risk Classification System. The list of financial service providers currently allowed under the CPF Investment Scheme appears in Table 6. Mandatory savings are made to three accounts, namely the Ordinary, Special, and Medisave funds. At year-end 2005,

[10] For details see http://mycpf.cpf.gov.sg/Members/Gen-Info/FAQ/investment/CPF-Invscheme.htm.

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Table 4. *CPF interest rates over time*

(A) CPF interest rate paid on all accounts, 1955–1995

Year	Interest rate per annum (%)
1955–1962	2.5
1963	5
1964–1966	5.25
1967–1969	5.5
1970–1973	5.75
1974–Feb. 1986	6.5
Mar.–June 1986	5.78
July–Dec. 1986	5.38
Jan.–June 1987	4.34
July 1987–Dec. 1987	3.31
Jan.–June 1988	3.19
July–Dec. 1988	2.96
Jan.–June 1989	3.1
July–Dec. 1989	3.39
Jan.–June 1990	3.77
July–Dec. 1990	3.88
Jan.–June 1991	4.85
July–Dec. 1991	4.54
Jan.–June 1992	4.59
July–Dec. 1992	3.31
Jan.–June 1993	2.62
July 1993–Dec. 1994	2.5
Jan.–June 1995	3.1

(B) Higher CPF interest rates paid mid-1995 onwards for Special, Retirement, and Medisave Accounts

Year	Interest rate per annum (%)	
From 1 July 1995		
	Ordinary and Medisave Accounts	Special and Retirement Accounts
July–Dec. 1995	3.82	5.07
Jan.–June 1996	3.52	4.77
July 1996–June 1998	3.48	4.73
July–Dec. 1998	4.29	5.79
Jan.–June 1999	4.41	5.91
July 1999–Sept. 2001	2.5	4
From 1 October 2001		
	Ordinary Account	Medisave, Special and Retirement Accounts
Oct. 2001–Dec. 2006	2.5	4

Notes:
1. The Special Account, Medisave Account and Retirement Account were introduced in July 1977, April 1984, and January 1987 respectively.

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CPF members held some S$120B (or about US$74B) allocated roughly half to the Ordinary Account, 17% in the Special Account, 29% in a medical care savings account, and the rest in 'Retirement and Other' (see Figure 3). Total cumulative contributions to the CPF scheme since inception stood at S$268.8B (as of 2005 Financial Year End).

Table 7 and Figure 4 show, on a cumulative basis, that some 59% of OA savings have been utilized for housing and 12% for investment. This implies that about 29% of cumulative contributions have remained in the OA fund, where they currently earn 2.5% annual (nominal) interest. The reverse is true for the funds in the SA, where account holders have left the bulk of their saving (80%) deposited with the CPF. A possible explanation for the strong tendency of investors to leave their SA money with the CPF is that the SA has traditionally paid a higher return compared to the OA. In addition, account holders may be less willing to assume higher risk for their retirement accounts. Further detail on how CPF members deployed their funds over the years is provided in Figure 5. It shows that the bulk of the CPF saving (44%) has gone to the purchase of residential and investment properties. A sizeable portion (29% of cumulative CPF funds) remains in the OA and SA earning guaranteed interest.

Currently, about 55% of active members invest in the CPFIS scheme in their OA accounts, though only about 10% of total accumulated saving has thus far been devoted to investment instruments and insurance-linked products. Panel A in Figure 6 shows that, of funds in the CPFIS-OA investment scheme, 63% is held in insurance products, 25% is invested in shares, and 11% is in unit trusts. Interestingly, the negligible 0.64% held in other instruments such as fixed deposits, bonds, Exchange Traded Funds (ETFs), gold, property funds, and fund management accounts, suggests that most investors do not fully utilize the menu of investment options they have been offered. Panel B in Figure 6 shows that in the CPFIS-SA investment scheme, on the other hand, most participants held insurance products to the tune of 86% of their saving. Remaining funds (14%) were invested primarily in unit trusts. In other words, the asset allocation patterns of OA and SA monies have been starkly different to date: participants seem prepared to take more risk with their

Table 4. *Footnotes* (*cont.*)
2. From 1955 to 1976, CPF interests were credited and compounded annually.
3. From 1977 to 1985, CPF interests were credited quarterly and compounded annually.
4. From 1986 to present, CPF interests are computed monthly and compounded and credited annually.
5. From 1 July 1999, CPF interests are reviewed quarterly.
Source: http://mycpf.cpf.gov.sg/Members/Gen-Info/Int-Rates/Int-Rates_Arc.asp

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Table 5. *Financial instruments available for investment in the CPF Ordinary and Special Accounts*

CPFIS-OA	CPFIS-SA
Full Ordinary Account savings can be invested in:	*Full Special Account savings can be invested in:*
Fixed Deposits	Fixed Deposits
Singapore Government Bonds	Singapore Government Bonds
Statutory Board Bonds	Statutory Board Bonds (Secondary Market only)
Bonds Guaranteed by Singapore Government	Bonds Guaranteed by Singapore Government
Annuities	Annuities
Endowment Insurance Policies	Endowment Insurance Policies
Investment-linked Insurance Products	Selected Investment-Linked Insurance Products*
Unit Trusts	Selected Unit Trusts*
Exchange Traded Funds	Selected Exchange Traded Funds*
Fund Management Accounts	
Up to 35% of investible savings[#] can be invested in:	
Shares	
Property Funds (or real estate investment trusts)	
Corporate Bonds	
Up to 10% of investible savings[#] can be invested in:	
Gold (currently only UOB offers new gold investments)	

Notes:
[#] Investible savings refer to the net Ordinary Account balance after withdrawals for education and investment.
* Those found in the lowest three tiers of the CPFIS Risk Classification System Table unless otherwise stated. The risk classification tables for unit trusts, investment-linked insurance products, and exchange traded funds can be found at www.cpf.gov.sg/cpf_info/Benefits/Asset/Assetenh.asp.
1. Annuities, endowment insurance policies, investment-linked insurance products must be offered by insurance companies included under CPFIS. For endowment policies, maturity date must not be later than the member's 62nd birthday.
2. Unit trusts and investment-linked insurance products must be managed by Fund Management Companies included under CPFIS. Fund managers are required to invest according to the Investment Guidelines set by CPF Board.
3. Exchange traded funds must meet guidelines set by CPF Board and be listed on the Singapore Exchange-Securities Trading (SGX-ST).
4. Fund managers of fund management accounts are required to invest according to the Investment Guidelines set by CPF Board.
5. Shares of Companies, Units of Property Funds or Property Trusts and Corporate Bonds (CPFIS-OA only) must be offered by companies incorporated in Singapore. Also, they must be fully paid ordinary or preference shares or corporate bonds listed on the Singapore Exchange-Securities Trading (SGX-ST).
Source: http://mycpf.cpf.gov.sg/Members/Gen-Info/FAQ/Investment/INV.htm

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Table 6. *Service/product providers included under the CPFIS*

Fixed deposit banks	Fund management companies
1. DBS Bank Ltd	1. Aberdeen Asset Management Asia Ltd
2. Oversea-Chinese Banking Corporation Ltd	2. ABN AMRO Asset Management (Singapore) Ltd
3. United Overseas Bank Ltd	3. AIG Global Investment Corporation (Singapore) Ltd
	4. Alliance Capital Management (Singapore) Ltd
	5. Allianz Global Investors Singapore Limited
Insurance Companies	6. APS Asset Management Pte Ltd
1. American International Assurance Co Ltd	7. AXA Rosenberg Investment Mgmt Asia Pacific Ltd
2. Asia Life Assurance Society Ltd	8. Capital International Research & Management Inc
3. Aviva Ltd	9. Commerzbank Asset Management Asia Ltd
4. AXA Life Insurance Singapore Pte Ltd	10. Credit Agricole Asset Management Singapore Ltd
5. Great Eastern Life Assurance Co Ltd	11. DBS Asset Management Ltd[2]
6. HSBC Insurance (Singapore) Pte Ltd	12. Deutsche Asset Management (Asia) Ltd
7. Manulife (Singapore) Pte Ltd	13. Fidelity Investments (Singapore) Limited
8. NTUC Income Insurance Co-operative Ltd	14. First State Investments (Singapore)[2]
9. Overseas Assurance Corporation Ltd	15. Goldman Sachs (Singapore) Pte Ltd
10. Prudential Assurance Co Singapore Pte Ltd	16. Henderson Global Investors (Singapore) Ltd
11. UOB Life Assurance Ltd	17. HSBC Investments (Singapore) Ltd[2]
	18. ING Investment Mgmt Asia Pacific (Singapore) Pte Ltd
	19. INVESCO Asset Management Singapore Ltd
	20. Legg Mason Asset Management (Asia) Pte Ltd
	21. Lion Capital Management Ltd
	22. NTUC Income Insurance Co-operative Ltd[1]
	23. Prudential Asset Management (Singapore) Ltd
	24. Schroder Investment Management (Singapore) Ltd[2]
	25. SG Asset Management (Singapore) Ltd
	26. State Street Global Advisors Singapore Ltd
	27. Templeton Asset Management Ltd
	28. UBS Global Asset Management (Singapore) Ltd
	29. UOB Asset Management Ltd[2]

Investment Administrators
1. dollarDEX Investments Pte Ltd
2. iFAST Financial Pte Ltd
3. Navigator Investment Services Ltd

Notes:
[1] Can only manage investment-linked insurance sub-funds under CPFIS unlike the rest of the FMCs, which can manage unit trusts, ILP funds/sub-funds, exchange traded funds, and fund management accounts under CPFIS.
[2] FMCs, which offer Fund Management Account services.
Source: http://mycpf.cpf.gov.sg/Members/Gen-Info/FAQ/Investment/INV-Asset-Enhance.htm

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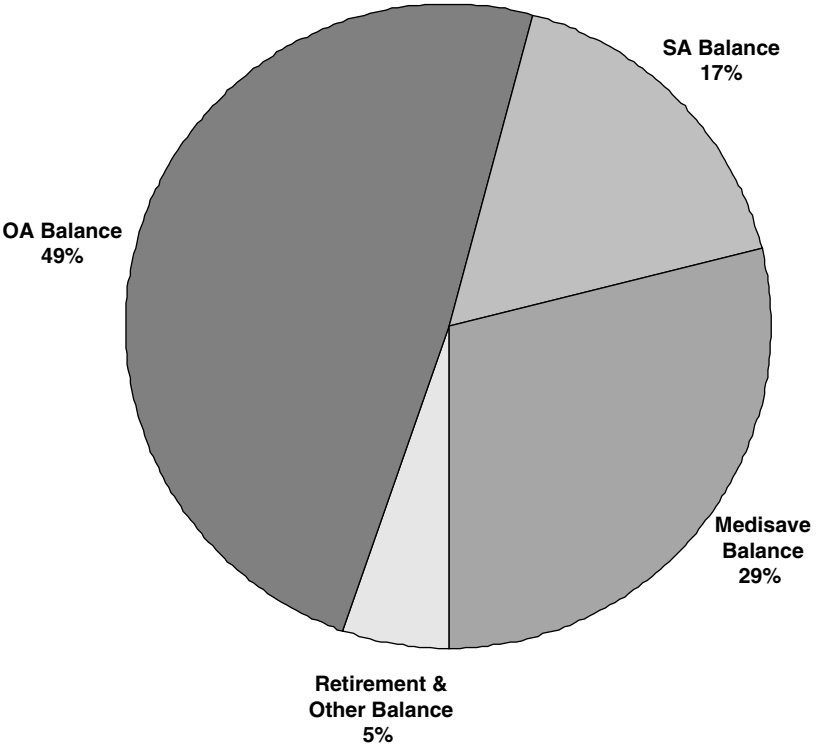


Figure 3. Balances in specified CPF accounts (%)
Source: Table 7.

OA funds compared to their SA saving. It would appear that the SA funds are put in a separate 'mental account' targeted to retirement and are not generally actively managed.[11]

Asset allocation patterns in Singapore's CPF Investment Scheme (CPFIS)

Next we develop a more detailed view of CPFIS asset allocation patterns, focusing on age, sex, and income patterns; the analysis is based on aggregate data as individual account records are not available for research.[12] Figure 7 shows that participants who elected to invest outside the CPF default fund committed most of their funds to three investment instruments, namely insurance products, shares, and unit trusts. Both men and women devoted similar percentages of their money to unit trusts, and both

[11] The data in Figures 7–9 refer to a September year-end, which differs from the December year-end data given in CPF Annual Reports.

[12] These tabulations as of 2004 were kindly provided by the CPF Board. To date no data have been made available on the broader investment portfolios of individual investors; accordingly we can report asset allocation of investors in the CPF-IS scheme but we cannot link the IS accounts to CPF holdings to ascertain workers' overall portfolios. Future research will attempt to match individual records to evaluate the larger picture of IS versus non-IS holdings.

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Table 7. *Cumulative use of CPF funds as of end 2005*

Fund balances and total withdrawals	Amount (S$B)	
Fund balance:		119.78
OA	58.57	
SA	20.05	
Medisave	34.76	
Retirement & others	6.40	
Education scheme withdrawal		0.50
Investment schemes withdrawal		27.90
CPFIS-OA	22.91	
CPFIS-SA	4.99	
Special discounted shares scheme		1.92
Property scheme withdrawal (public, residential and non-residential properties schemes)		117.38

Note: Net amount withdrawn under Medishield, Medisave, Home Protection, Dependent Protection, Minimum Sum, Section 15 & 25 withdrawals not included.
Source: Data provided by the CPF Board.

invested less in instruments such as gold, bonds, fixed deposits, ETFs, and property funds. Yet men tended to be slightly more proactive in their investments: they invested 28% of their funds in shares, compared to 21% for women. Conversely, women were more likely to opt for insurance products (68%), compared to men (60%). This is similar to US research on retirement account holders, which finds that higher income men tend to seek riskier investments and trade more in their accounts (Mitchell *et al*., 2005).

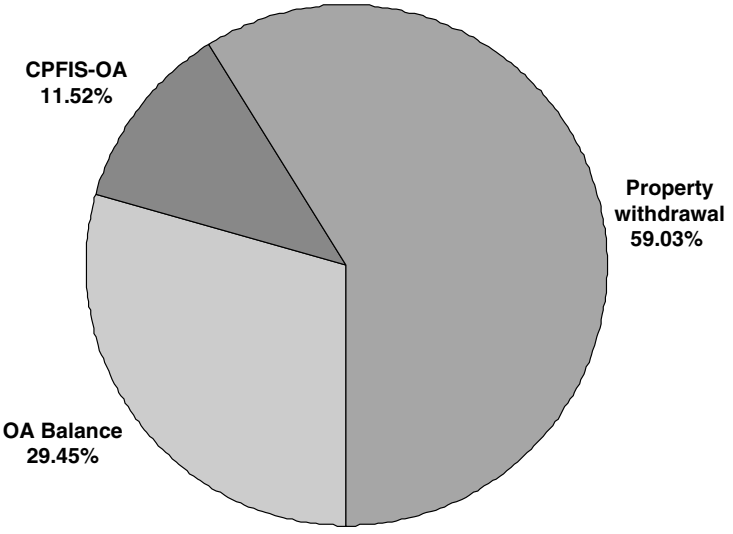
It is also of interest to ask whether investment behavior becomes less risky as workers age. Only a partial picture is available as we have information only on the CPFIS-OA accounts but not participants' entire portfolios. Nevertheless, Figure 8 shows that CPF investors appear more rather than less devoted to risky investments as they age. Thus, the mature (56+) age group commits a higher proportion to stock investments and less to insurance products, compared to younger age-groups. We also find that the youngest workers are more likely to delegate portions of their saving accounts to investments managed by professionals, as seen from their higher holdings of unit trusts (14%); by contrast, the mature group tends to invest more heavily in shares on their own. In data not shown, older women prove slightly more conservative, investing more in insurance products than men. These general patterns again conform to US findings, where higher income, older men are more likely to hold riskier portfolios as compared their female and younger counterparts – and trade more, as well, often to their detriment (Mitchell *et al*., 2006).

Another perspective is offered in Figure 9, which displays investment scheme asset allocation patterns by risk category and participant salary levels. We group the CPFIS products into three, namely *insurance products*, *relatively less risky* products

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(A) Portion of balance remaining in OA account vs portion used for investment



(B) Portion of balance remaining in SA account vs portion used for investment

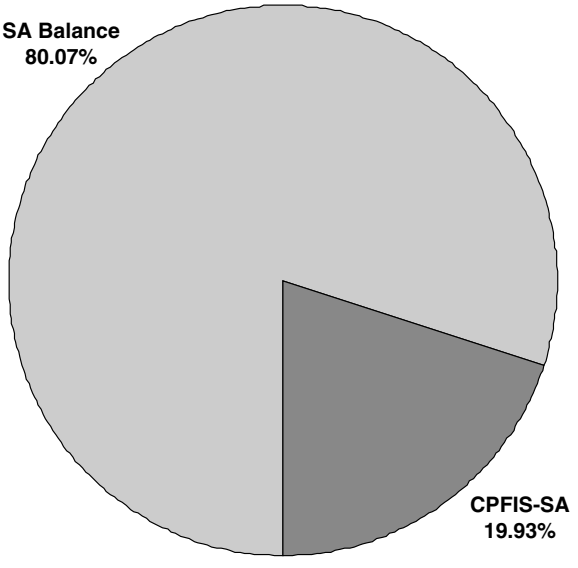


Figure 4. Portion invested and balance remaining in CPF ordinary and special accounts
Source: Table 7.

(bond and fixed deposits), and *relatively more risky* products (which include shares, unit trusts, exchange traded funds, gold, and property funds).[13] The income categories we tabulate focus on low earners (earning less than S$1,500/mo.), low-middle

[13] In future work we hope to disaggregate the insurance products into investment-linked products, which are likely more risky than endowment funds.

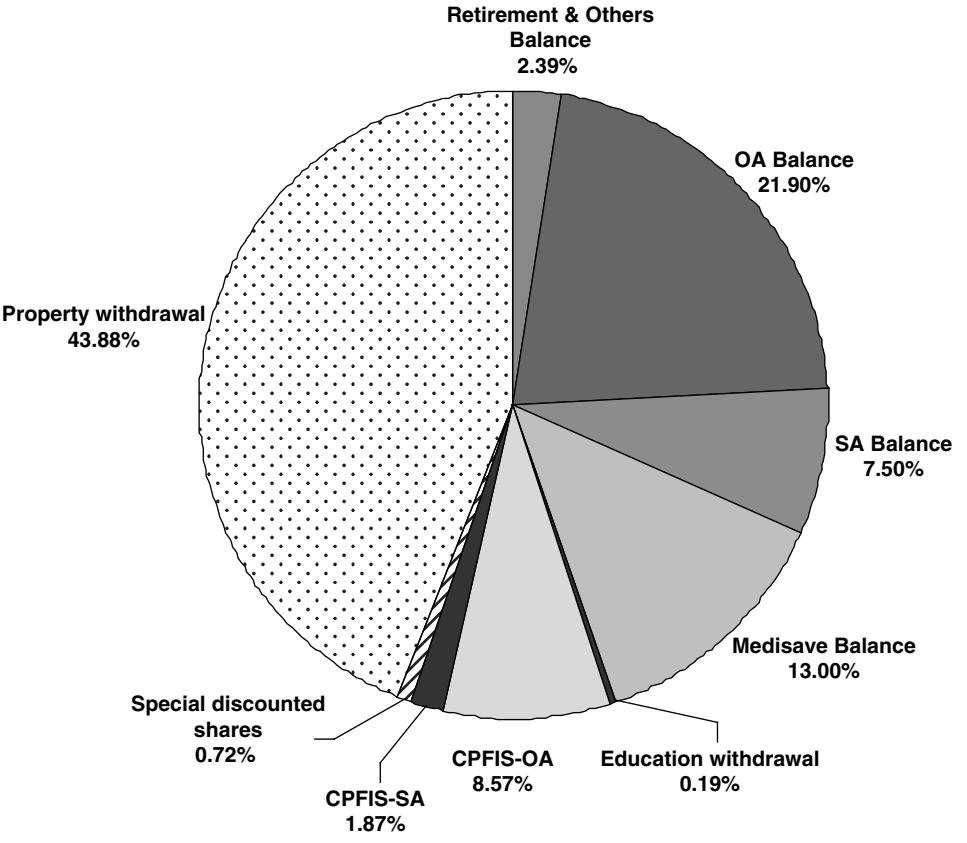


Figure 5. Cumulative use of CPF funds (OA and SA combined)
Source: Derived from Table 7.

(S$1,500–3,500/mo.), high-middle (S$3,500–6,000/mo.), and high (S$6,000+/mo).[14] Here we see that low and lower-middle earners are less likely to hold risky investments, with at least 70% of their CPFIS portfolios held in insurance products. As salary levels rise, the fraction in insurance products falls, first to 63%, and then to under 50% for the highest earners. Conversely, higher-earners hold between one-third and half of their investment accounts in risky forms, a finding consistent with international research (Mitchell *et al*., 2005).

Overall, the observed regularity is that people who move their funds to the CPFIS system tend to buy insurance products, and this holds across age, sex, and income groups. This is not due to preferential tax treatment on income received from insurance products, since investment profits and interest earned from investments, most dividends, and income received from CPFIS annuities paid directly as cash, are

[14] Retirees and non-retirees with no monthly earnings are excluded as the data do not allow us to distinguish between these two groups.

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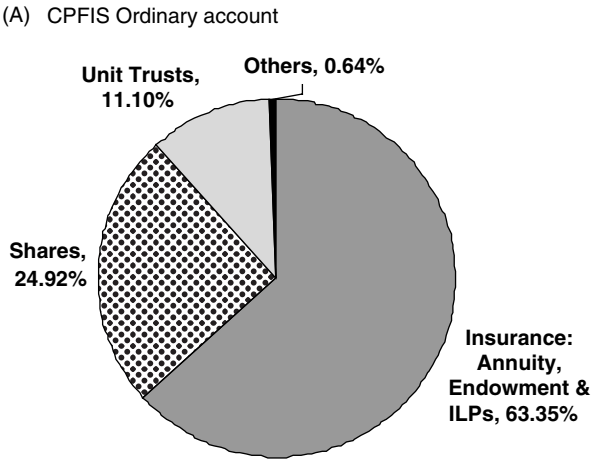


Figure 6. Allocation of investments across CPFIS accounts
Source: CPF (2005c).

currently not taxable.[15] Rather, it may be that in Singapore as elsewhere, insurance agents are successfully able to emphasize the joint appeal of protection and investment (especially for investment-linked insurance products), which seems particularly attractive for CPF money that cannot be accessed until the age of 55.

Analyzing the impact of fees and charges for CPFIS options

As noted above, additional investment choices have been added over the years, to the menu of funds into which CPF participants may invest their mandatory savings.

[15] As per mycpf.cpf.gov.sg/Members/Gen-Info/FAQ/Investment/INV.htm

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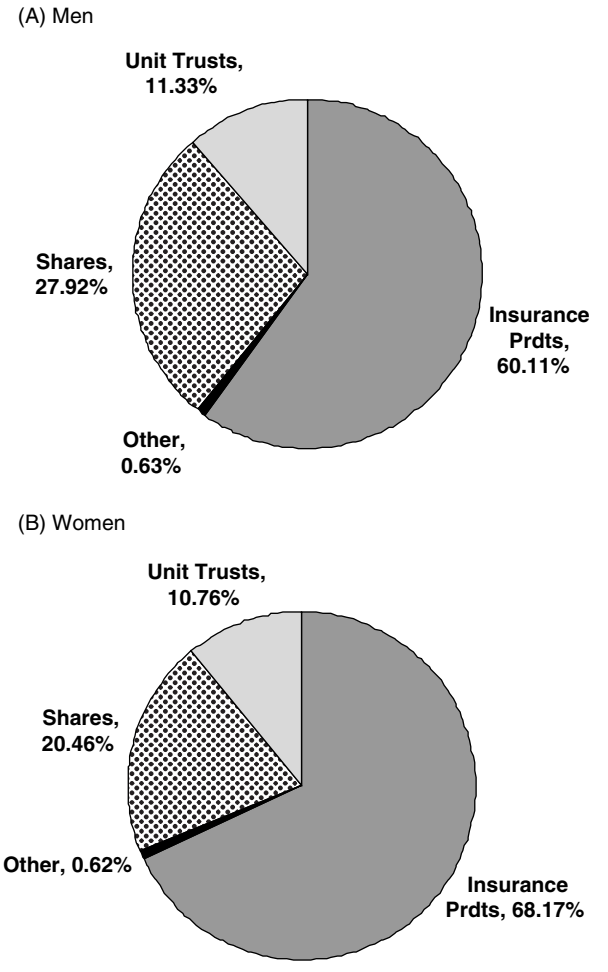


Figure 7. Investment patterns in CPF ordinary accounts by sex
Note: 'Other' include ETFs, gold, fixed deposits, bonds, and property funds.
Source: Data provided by CPF Board; values as of 30 September 2005.

As of 2006, there were some 400 investment portfolios on offer to CPF participants. Naturally, this additional diversity of fund choices imposes on participants the responsibility to devote more attention to the risks and benefits of diversifying outside the traditional CPF fund managed by the government. Diversification into other assets outside the traditional CPF portfolio also brings with it the potential for high management fees and commissions associated with having many small funds.

With such a rich offering of investment options, it is of interest to inquire whether CPFIS participants have been successful in increasing their retirement savings. Recently the story has not been an encouraging one, as shown in Table 8 (for Fiscal

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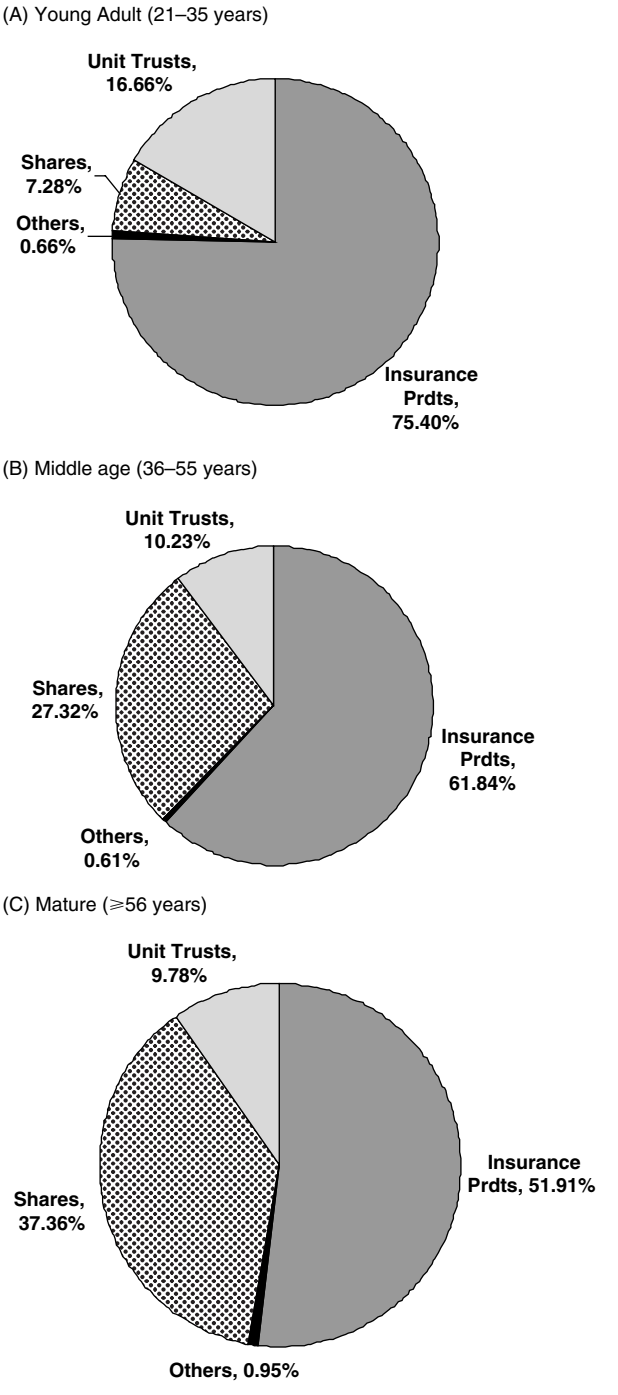


Figure 8. Investment patterns in CPF ordinary accounts by age
Notes: 'Others' include ETFs, gold, fixed deposits, bonds, and property funds.
Source: Data kindly provided by CPF Board; values are as of Sept. 30, 2005.

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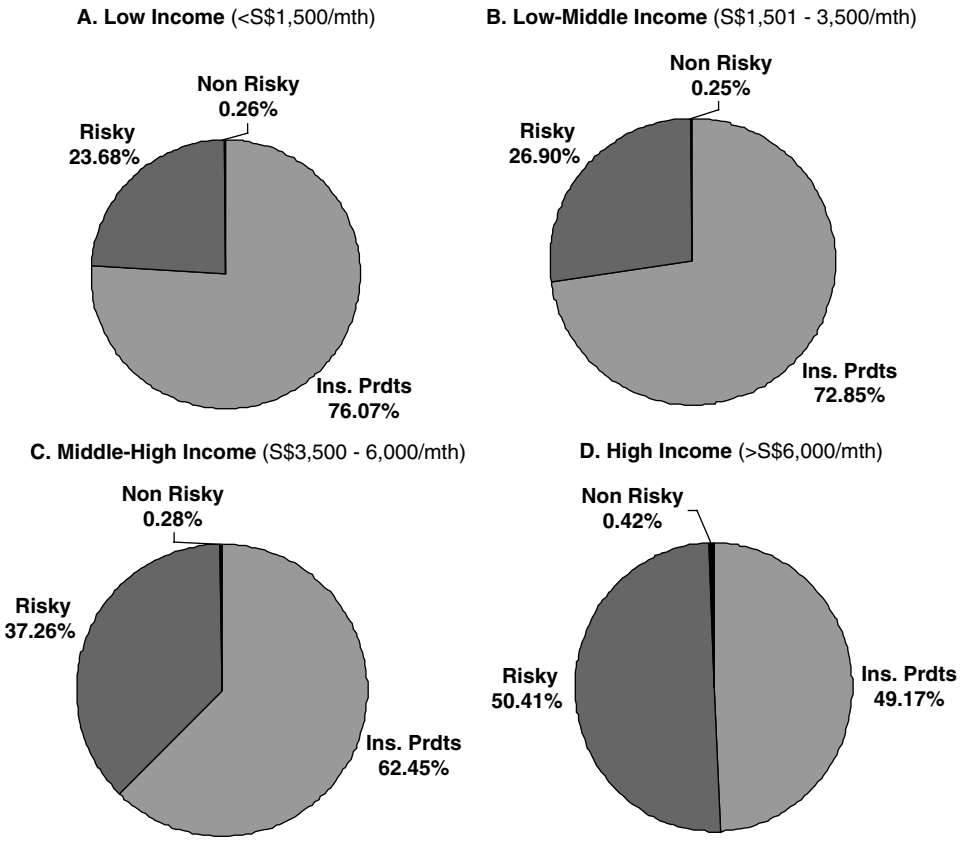


Figure 9. Investment patterns in CPF ordinary accounts by risk type and income
Note: Participants with positive income only are included. Risk level of insurance products cannot be evaluated.
Source: Data kindly provided by CPF Board; values as of 30 September 2005.

Years 2004–2006). Here almost half of CPFIS-OA investors (48%) incurred losses from investing on average, while one-third realized profits equal to or less than the default OA rate of 2.5%. Only one-fifth of the investors made net realized profits in excess of the OA interest rate. This poor investment performance has not gone unnoticed by policymakers. Indeed Prime Minister Lee Hsien Long expressed concern in 2005 regarding the CPFIS scheme, pointing to high investment fees and expenses as an explanation for low returns:[16]

> [W]e must help CPF members to earn better long-term returns on their savings. Over the years, we have opened up the CPF Investment Scheme (CPFIS) and given members considerable latitude to invest their CPF savings as they judge best. However, this has not always worked out as well as we hoped, because the options available to the members are not well tailored to their needs, and it is difficult to educate members adequately on how to plan for their long-term needs. *Almost three-quarters of the members who invested under CPFIS from 1993 to 2004 would*

[16] Emphasis added; see mycpf.cpf.gov.sg/CPF/News/News-Release/NR_25Sept2005.htm.

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Table 8. *Realized profits/losses for investments held under the CPF investment scheme ordinary account (CPFIS-OA): FY04-06*

	FY 2006 *1 Oct. 05– 30 Sept. 06*	FY 2005 *1 Oct. 04– 30 Sept. 05*	FY 2004 *1 Oct. 03– 30 Sept. 04*	3-year average
Members who made net realized profits *in excess of* the OA interest rate of 2.5%	180,000	147,000	128,000	
%	23%	19%	17%	20%
Members who made realized profits, but *equal to or less than* OA rate	257,000	250,000	240,000	
%	32%	33%	33%	33%
Members who made realized losses	362,000	363,000	370,000	
%	45%	48%	50%	48%

Source: Constructed from CPFIS Profits/Losses for the Financial Year ended 31 September 2005 and 2006. www.cpf.gov.sg/cpf_info/ie/IE_reportpl.pdf
mycpf.cpf.gov.sg/ NR/rdonlyres/ D324F161-1F6A-4699-A6BA-C5ACA0E11C5F/0/ IE_reportpl.pdf

have been better off leaving their savings with the Board. In particular, those who invested in unit trusts and investment-linked products (ILPs) have generally received mediocre returns. One important reason why CPFIS returns have been mediocre is the high cost of investing. For example, the annual cost to investors in a retail unit trust in Singapore is typically double that of the US. This is because the market is fragmented, many of the unit trusts and ILPs are small, and the overheads and fees are high.

To explore the range of charges levied under the CPF investment schemes, we have assembled Table 9 from the CPF Board's website, which presents a rather bewildering array of fees for different investments and a wide diversity of front-end commissions, back-end loads, and annual service charges. For instance, the holder of a unit trust may pay sales charges, transaction fees, service charges, annual fund operations fees, performance fees, and sometimes redemption charges. Purchasers of investment-linked insurance products also pay transaction and service fees as well as sales charges, expense ratios, performance fees, and redemption charges. Compared to the US institutional market, there would appear to be far more diversity and complexity in the Singapore case (Mitchell, 1998).

As these may be perplexing to many participants, we next turn to an evaluation of how such costs can impact the return of retirement saving for a typical CPF-IS unit trust investor over different time horizons. Our strategy is to isolate the impact of costs from returns, allowing us to compute the rate of return that an investor requires so as to 'cost-recover' the expenses over different time horizons. Accordingly, in what follows, we develop a hurdle rate notion which asks what the investor's net return would have to be, after costs, so the investor would do better than simply defaulting his money into the government-run fund. Specifically, we simulate the effect of transaction costs on an investment of $1 held for one year (short term), five years (medium term), and 10–20 years (long-term), after subtracting the cost components

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of the unit trust investments. In the simulation, we assume that the prices of unit trusts remain unchanged so the change in the fund position reflects solely cost impacts; we also assume that management fee and other annual operating costs are fixed at the current average rates relevant to the four fund types appearing in Table 10: equity, balanced, income, and money market funds (based on Mercer's risk classification system).[17]Average costs by fund types are presented in Table 10 from a sample of 235 unit trusts representing 97% of the CPFIS unit trust universe (as of 30 June 2006).

These average transaction costs by fund type are applied to a $1 investment held for various time periods assuming the fund earns a zero rate of return.[18] For year 1, we apply both the one-off sales load and annual operating costs, where the sales load comprises both front-end and back-end sales charges, operating costs include fees for management, custodian, trustee, administration, and other major fees paid by the unit trust out of the fund's net asset value; the performance fee is excluded.[19] Thereafter annual charges are subtracted as relevant. Table 11 (Panel A) summarizes the results, where we see that the $1 investment was steadily eroded by annual operating costs assuming zero returns. For the ten-year holding period, the $1 invested in the average equity fund would be predicted to shrink to $0.772, sliding further to $0.626 by year 20. Expenses are lower for income funds: the same $1 invested there would be worth $0.874 in year 10 and $0.781 by year 20. Using these results, we next compute the annual rate of return required for the investor to 'cost-recover' for each fund type which appear in Table 11 (Panel B). Not surprisingly, a longer holding period is beneficial in that a lower rate of return is needed to 'cost-recover'. This is mainly because the one-off sales loads are spread over a longer period.

To complete the picture, we then compute the minimum hurdle rate of return that a fund must generate if it is to beat the guaranteed returns attainable by leaving one's money in the government-managed account, currently, 2.5% and 4% for OA and SA monies, respectively. Results for CPFIS unit trusts are provided in Table 11 (Panel C), where over a 1-year period, the OA hurdle rate ranges from 3.3% for money market funds to 9.4% for equity funds. Over a 20-year period they range from 3.2% for the money market funds to 4.8% for equity funds. For SA account holders over the same one-year period, the hurdle rate is 4.8% for money market funds and 10.9% for equity funds. Over a 20-year time frame, it is 4.7% for the money market

[17] Different unit trusts may have different investment objectives, different styles of management, and different levels of equity risk depending on their portfolio allocation. This is recognized by Mercer Investment Consulting, CPF Board's consultant, which has developed a risk classification system for the CPFIS that assigns various risk levels to permitted investments. The unit trust or ILP with a greater proportion of its assets invested in the more volatile stock market will have a higher equity risk. Based on its level of equity risk, a unit trust or Investment Linked Product is assigned one of the four risk categories.

[18] Of course investors may consider both fund performance and costs simultaneously, though doing so may be distortive since fund performance is uncertain and fluctuates widely, while transaction costs can be estimated with a fair amount of certainty.

[19] These are estimated using the total expense ratio publicly reported by the Investment Management Association of Singapore (IMAS). Expense ratios are supposed to be calculated according to IMAS guidelines (see IMAS, 2005), and they are furnished by fund management companies and insurers and made available to the public through the quarterly Performance and Risk Monitoring Reports for CPFIS-included funds published by Standard & Poor/CPF and found on IMAS website.

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Table 9. *Charges incurred for investments under the CPF investment scheme*

Type of investments	Agent bank's charges (under CPFIS-OA)	Other charges[1] (under CPFIS-OA & CPFIS-SA)
Fixed Deposit (FD)	*Transaction fee* $2/FD placement/refund of proceeds upon FD maturity or termination. *Service charge* $2/FD/quarter, min. charge between $2–$5.	*Other charges* NA
Shares, Bonds (incl. Statutory Board Bonds) & Listed Property Trusts/ Funds traded on SGX	*Transaction fee* $2–$2.50 per lot, max of $20–$25/ transaction. *Service charge* $2.00/counter/quarter, w. min. charge between $2–$5.	*Broker's commission*[2] 0.4–0.5 % of trade contract value, st min of $40/trade. *Central Depository (Pte) Ltd's fees* (1) Clearing fee of 0.05 % on trade contract value, st max of $200 (2) $0.50/transaction.
Singapore Government Bonds & Statutory Board Bonds traded through bond-dealers	*Transaction fee* $2–$2.50/lot, max of $20–$25/ transaction. *Service charge* $2.00/counter/quarter, w. min. charge $2–$5.	*Bond-dealer's charges* $0–$50 per transaction.
Investment-linked Insurance Products	*Transaction fee* Between $2–$2.50/transaction. *Service charge* $2.00/policy/quarter, w. min. charge $2–$5.	*Sales charge* Between 0–5 % (reflected in bid-offer spread[3]) and 1–5.75 % of premium paid and/or $0–$150/single premium policy. *Annual fund operations charges or expense ratio*[4] 0.3–4.4 % of Net Asset Value (NAV[5]). *Redemption charge* 0–7 % of NAV and/or $0–$42.75. *Annual performance fees* 0–20 % of excess returns over benchmark for underlying fund. *Insurance administration/coverage charges* $0–$5/month per policy. *Surrender charges* 0–4 % of the surrender value.

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Endowment Policies and Annuities (Single Premium Type)	*Transaction fee* $2–$2.50/transaction. *Service charge* $2/policy/quarter, min. charge of $2–$5.	*Total distribution cost (TDC)*[6] 1–6.2% of Single Premium.
Unit Trusts[7]	*Transaction fee* $2–$2.50/lot, max of $20–$25/transaction. *Service charge* $2.00/unit trust fund/quarter, min. charge between $2–$5.	*Sales charge* 0–5% (reflected in the bid offer spread) of initial amount invested. *Annual fund operations charges or expense ratio*[8] 0–7.1% of NAV. *Redemption charge* 0–6% of NAV. *Annual performance fees* 0–30% of excess returns over benchmark for unit trust.

Notes:
[1] These charges are estimates only and may not be exhaustive. CPF members are advised to check with the product providers on the full range of charges payable. Charges also exclude GST, unless otherwise stated.
[2] Broking fees are fully liberalized now and the charges depend on the broking houses. The broker's commission mentioned is the range that the majority of the broking houses are charging.
[3] Bid–offer spread is the difference between the price at which the product is offered for sale ('offer') and the price at which the product provider will redeem the product ('bid').
[4] Includes annual management fees which range from 0.10% to 1.85% of NAV.
[5] Net asset value (NAV) is the total market value of the securities in a funds portfolio divided by the number of units currently outstanding.
[6] Total distribution cost (TDC) refers to the total costs that an insurance company is expected to incur and includes commissions and cost of benefits and services paid to the distribution channel.
[7] Generally, online fund distributors charge lower front-end fees than brick-and-mortar distributors like banks and brokerages.
[8] Includes annual management fees which may range from 0% to 3% of NAV.
Source: http://mycpf.cpf.gov.sg/Members/Gen-Info/FAQ/Investment/INV.htm

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Table 10. *Sales loads and expense ratios for CPF investment scheme unit trusts*

Risk category	Type of fund	# Funds	Average sales load	Average expense ratios
Higher risk	Equity	167	4.9%	2.07%
Medium–high risk	Balanced	26	4.8%	1.93%
Low–medium risk	Income	39	2.1%	1.12%
Lower risk	Cash	3	0.1%	0.71%
Total N Funds		235		

Note: The sales load comprises both front-end and back-end sales charges. Annual operating costs comprise fees for management, custodian, trustee, administration, and other major fees paid by the unit trust out of the fund's net asset value, and is estimated using the total expense ratio publicly reported by Investment Management Association of Singapore (IMAS) under its Fund Information Service website (http://www.fundsingapore.com).
Source: Authors' computations using fund prospectuses and IMAS-reported expense ratios as at 30 June 2006.

and 6.3% for equity funds. Such high threshold returns may rationalize why so many CPF accountholders leave their investible funds in the default OA and SA accounts.

Lowering costs for CPFIS investors

In recent years, steps have been taken to better inform members about investment options and expense ratios. For instance, the Investment Management Association of Singapore (IMAS) recently published standardized cost formulae across funds (www.fundsingapore.com). Nevertheless CPF members must still factor in additional investment costs not commonly wrapped into expense ratios, including back- and/or front-end loads, annual asset-based and fixed charges, and wrap fees; these have yet to be collated into an easy-to-understand format.

In late 2005, the CPF Board announced several requirements for funds seeking to be newly included in the CPFIS menu; one change was such funds would be required to meet a higher relative performance standard than previously required, such that the fund had to have a minimum of a three-year performance record that could not fall below the top 25 percentile of funds in a global peer group.[20] As this standard exceeds the older benchmark of the top 50 percentile, it is likely to represent an improvement over past practice. Nevertheless, some degree of subjectivity remains as the evaluators take into account the fund managers' capabilities, the fund's investment philosophy, the quality of the fund's research and analysis, and the way the fund constructs and implements its portfolio. Furthermore, funds already on the CPFIS permitted list are not held to these new standards. A second change adopted by the Board in late 2005 was the explicit introduction of expense ratio targets for the

[20] See mycpf.cpf.gov.sg/CPF/News/News-Release/N_29Dec2005.htm, though it is not easy to determine which specific funds constitute each global peer group by asset class/strategy.

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Table 11. *Simulation study of impact of fund expenses by fund type for alternative holding periods*

(A) Percent of value remaining after expenses assuming zero investment return, by fund type and holding period

Fund type	Year 1	Year 5	Year 10	Year 20
Equity	0.931	0.857	0.772	0.626
Balanced	0.934	0.864	0.784	0.645
Income	0.968	0.925	0.874	0.781
Money market	0.992	0.964	0.930	0.866

(B) Percentage of $1 investment eroded by expenses assuming zero investment return, by fund type and holding period (%)

Fund type	Year 1	Year 5	Year 10	Year 20
Equity	−6.9%	−3.0%	−2.6%	−2.3%
Balanced	−6.6%	−2.9%	−2.4%	−2.2%
Income	−3.2%	−1.5%	−1.3%	−1.2%
Money market	−0.8%	−0.7%	−0.7%	−0.7%

(C) Minimum investment return (hurdle rate) required to beat CPF default interest rate on ordinary account (OA) and special account (SA), by fund type and holding period (%)

	Hurdle rates for OA				Hurdle rates for SA			
Fund type	Year 1	Year 5	Year 10	Year 20	Year 1	Year 5	Year 10	Year 20
Equity	9.4%	5.5%	5.1%	4.8%	10.9%	7.0%	6.6%	6.3%
Balanced	9.1%	5.4%	4.9%	4.7%	10.6%	6.9%	6.4%	6.2%
Income	5.7%	4.0%	3.8%	3.7%	7.2%	5.5%	5.3%	5.2%
Money market	3.3%	3.2%	3.2%	3.2%	4.8%	4.7%	4.7%	4.7%

Notes: This simulation study assumes that the prices of unit trusts remain unchanged so the change in the fund position solely reflects cost impacts on a $1 investment over 1 year, 5 years, 10 years, and 20 years. Costs include the one-off sales load and the annual operating costs for each of the four fund types as presented in Table 10. The sales load comprises both front-end and back-end sales charges. Annual operating costs comprise fees for management, custodian, trustee, administration, and other major fees paid by the unit trust out of the fund's net asset value, and are estimated using the total expense ratio publicly reported by Investment Management Association of Singapore (IMAS) under its Fund Information Service website (www.fundsingapore.com). The performance fee is excluded from the total expense ratio.
Source: Authors' computations using fund prospectuses and CPF (2006).

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first time. The expectation is that: '[t]he CPF Board will therefore … (induce) lower cost ratios, enhance transparency to help members make informed choices, and encourage consolidation among the funds to achieve greater economies of scale.'[21] Specifically, any new fund must have an expense ratio below the median of existing CPFIS funds in its risk category. In practice this implies that so-called 'higher risk' funds investing mainly in equities will be held to a cap of 1.95% of assets per year; 'medium to high' risk funds holding both equities and bonds must charge less than 1.75% of assets; 'low to medium' risk funds investing in bonds or fixed income must charge less than 1.15% pa; and 'lower risk' funds (money market funds) cannot exceed an annual expense ratio of 0.65%.[22] While a full-scale comparison of these expense ratios with international charges is beyond the purview of this paper, it is clear that the CPF costs are still not on the low side. For instance, a recent review of US fund expenses found that the asset-weighted average expense ratio for stock funds was 1.13%, and for bond funds at 0.9% in 2005 (ICI, 2006) – and these figures include a pro-rata share of front-end loads. Furthermore, most US investors held their money in lower-cost funds. Consequently, adopting an expense target as in Singapore is a positive step, though focusing on the median fund charge in Singapore, exclusive of front-end loads, may still produce costs that are high by developed-country standards.

The issue of fees and charges remains one of national concern, as evidenced by a recent CPF Board statement that, in the future, front load charges will be capped at 3% (as of 7/1/07) in addition to the already announced expense ratio caps (from 1/1/08).[23] This is a significant reduction from the 5% front load often charged by CPFIS funds in the past, and these changes represent positive steps to bring the cost of the CPF Investment Scheme nearer to developed country standards.

Discussion and conclusions

Singapore has one of the world's lowest fertility rates (at around 1.2 per 1,000),[24] and longest life expectancies (over age 80 at birth),[25] so this nation is aging quickly. Indeed, in the next two decades, it will overtake all but Japan in its fraction of population elderly. Accordingly, it is valuable to assess how the Singaporean Central Provident Fund (CPF) might become more effective in building retiree wealth. Thus far, it appears that the bulk of workers' saving (44%) has gone to purchase homes, leading to an asset-rich, cash-poor phenomenon (McCarthy *et al*., 2002). We have also shown that contributors tend to default their remaining saving to the CPF government-managed investment pool. The few participants who elect outside investment products tend to be high-income males rather than

[21] mycpf.cpf.gov.sg/CPF/News/News-Release/NR_25Sept2005.htm.
[22] mycpf.cpf.gov.sg/CPF/News/News-Release/N_29Dec2005.htm
[23] Announcement of 28 December 2006; see mycpf.cpf.gov.sg/CPF/News/News-Release/N_28December2006.htm
[24] The Singapore fertility rate in 2000 was reported as 1.2 by the US Census Bureau (www.census.gov). Singaporean sources (Singapore Department of Statistics 2006) place it a little higher, at around 1.6, but declining.
[25] See for instance, Clark (1999).

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lower-paid workers and women. High expenses and fees, as well as inertia, explain why few CPF account holders invest outside the default government investment pool.

More attention could be devoted to lowering fund expenses and commissions in the CPFIS system. It would be useful to aggregate the myriad of data on fees, expenses, loads, wrap fees, and other charges as they are dispersed across numerous websites and expressed in different terms, depending on the specific product in question. It could be helpful for the CPF to develop a single easy-to-use web calculator making these comparisons simpler. For instance, a drop list could illustrate for each fund the component costs over a range of holding periods. It would be useful to show itemized costs as well as an all-in annualized cost, for the various products projected over various periods (e.g. 1, 5, 10, 20 years).

It might also be beneficial to streamline and rationalize the investment menu offered to participants. Currently more than 400 funds are offered to CPF investors, but this list includes few index-linked funds, ETFs, or life-cycle funds, and no inflation protected instruments are currently on offer.[26] Furthermore, while new funds are screened for cost efficiency, more stringent criteria might be adopted to screen out under-performing existing funds at regular intervals.

It might be useful to consider consolidating participants' investments to bring about more competition to drive down costs. One interesting development in this context is the advent of low-cost Life Cycle funds which might be adopted as the 'default' investment mix for otherwise naïve or underconfident investors. Employees could then be automatically defaulted into a balanced fund based on their age, unless they actively select some other investment portfolio. In Chile, for instance, pension managers offer up to five funds, ranging from 'Fund A', which holds 80% of the portfolio in equities, to 'Fund E', which holds 100% fixed income; 'Funds B-D' hold intermediate percentages in equities. Active workers may elect up to two funds at a time, offered by a single money manager, and they will be automatically transitioned to more conservative portfolios as they age, unless they elect otherwise (Arenas de Mesa *et al*. forthcoming). A low-cost Life Cycle approach might be useful in the Singaporean case, in view of many affiliates' inertia regarding investment choices.

It could also be useful and important to educate CPF investors regarding capital market risk and return, as the government seeks to streamline the range of investment choices and bring down expenses. The US experience with investment education suggests that even relatively well-educated subjects can have a hard time understanding and acting on information regarding mutual fund charges (Choi *et al*., 2005; Lusardi and Mitchell, 2006). To the extent that individual investors are poorly equipped to make investment choices in their retirement accounts, this places more burden on policymakers' shoulders to fashion the best possible environment for strengthening retirement security.

Finally, policymakers may seek to restrain the amount of retirement saving going into property purchases so that CPF participants have sufficient funds to finance their

[26] It would also be of interest to offer inflation-indexed bonds, as these make good sense for the retirement decumulation phase (Brown *et al*., 2000).

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retirement years. An alternative may be for the financial sector to spur the growth of reverse mortgages permitting homes to be pledged to financial institutions, in return for a retirement annuity; this is made complex by the fact that most (85%) homeowners purchase housing development flats (public housing) on leasehold from the government. Another option might be to allow homeowners to freely rent out their apartments for income; while steps are being taken in this direction, numerous restrictions remain on the use of these apartments, including rental. Removing these restrictions may alleviate the asset-rich, cash-poor syndrome.

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