

## ESTIMATES OF HOUSEHOLD SECTOR WEALTH FOR SOUTH AFRICA, 1970–2003

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Market values of components of household sector wealth are important explanatory variables for aggregate consumer expenditure and household debt in macro-econometric models. We construct the first coherent set of the main elements of household-sector balance sheet estimates at market value for South Africa. Our quarterly estimates derive from published data on financial flows, and other capital market data, often at book value. Our methods rely, where relevant, on accumulating flow of funds data using appropriate benchmarks, and, where necessary, converting book to market values using appropriate asset price indices. Relating asset to income ratios for various asset classes to asset price movements and other features of the economic environment, throws light on the changing composition of household sector wealth. Most striking are the relative rise in the value of pension wealth and the trend decline of directly held securities, the decline and recent recovery of housing wealth, and the rise in household debt and concomitant decline of liquid assets from the early 1980s to the late 1990s.

### 1. INTRODUCTION

Neither the central bank nor other government statistical agencies in South Africa publish balance sheet wealth estimates on a market value basis, of the type produced by U.S. Federal Reserve Board, the Bank of England and the Office of National Statistics in the U.K., and now also by a few emerging market countries, such as Hungary, Mexico and Poland (see OECD, 2004).

Without information on the market values of the main components of household sector wealth, it is difficult to understand the evolution of aggregate consumer

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spending and saving and consumer demand for credit in countries with sophisticated financial markets. Behavioral equations for these variables are key components of central banks' macro-econometric models, used in forecasting and policy-making. Indeed, asset price fluctuations, particularly of housing and of equities, have raised wide-spread international interest and controversy in recent years (see Catte *et al.* (2004) for evidence and a discussion of the role of institutional differences between countries). This has led to a heightened international interest in asset data.<sup>1</sup>

As emerging market countries, like South Africa, develop their credit markets, stock markets and other financial institutions, the monetary transmission mechanism will alter and asset price fluctuations will become more relevant (see Coricelli *et al.*, 2005). The macro-econometric models which inform policy for these economies will need to take these behavioral shifts into account. But in the absence of liquid and illiquid household sector wealth measures, the important domestic asset and credit channels of the monetary policy transmission mechanism will be poorly estimated.

It might be thought that South Africa is subject to the limitations on the asset and credit channels of monetary transmission common to many emerging market countries, as outlined by Kamin *et al.* (1998). However, this is not so. Table 1 compares South African indicators of financial development with those of three highly developed economies, France, Spain and Italy, and four emerging market countries, Chile, Hungary and Poland and the relatively affluent African country, Botswana. It can be seen that in ratios of financial deposits to GDP and private credit to GDP, South Africa is comparable to the highly developed industrial economies and above the emerging market countries, despite the high proportion of poor households (see below). The penetration of life-insurance companies, the residential mortgage stock to GDP ratio and the stock market capitalization and turnover to GDP ratio are higher than in all comparison countries (save for Spain), though plausible corrections of stock market capitalization for cross-holdings and off-shore listings brings it roughly into line with the industrial countries.

Furthermore, South Africa is a deeply unequal society. Regrettably this means that the lack of access to assets and credit for a large part of the population counts for little in explaining monetary transmission for aggregate spending. According to the 1995 and 2000 household surveys (Statistics South Africa, 2002), the percentages of total household spending accounted for by the top quintile in 2000 and 1995 (in parenthesis) were 64 percent (63 percent), the top two quintiles 82 percent (82 percent), and the top three quintiles 92 percent (93 percent). If anything, such surveys are likely to understate the share of spending of the most affluent. For monetary transmission on aggregate spending, the undeniable access of the more affluent to assets and credit will therefore dominate behavior.

<sup>1</sup>Three examples of this interest are the Luxembourg Wealth Study (<http://www.lisproject.org/lws.htm>), the efforts of the OECD to improve comparability of balance sheet data (OECD, 2004), and attempts by the Bank for International Settlements to improve comparability of house price data (for an application of these data, see Helbling, 2005).

TABLE 1  
FINANCIAL MARKET INDICATORS FOR SOUTH AFRICA AND SELECTED COUNTRIES FOR 2003

Country	Private Credit by Deposit Money Banks and Other Financial Institutions to GDP	Bank Deposits to GDP	Life Insurance Penetration	Stock Market Capitalization to GDP	Stock Market Total Value Traded to GDP	Mortgage Debt to GDP
<i>Industrialized countries</i>						
France	0.88	1.13	0.06	0.67	0.57	0.23
Italy	0.83	0.68	0.05	0.37	0.45	0.11
Spain	1.11	1.46	0.02	0.71	1.12	0.32
<i>Emerging market countries</i>						
Botswana	0.18	0.26	na	0.26	0.01	na
Chile	0.75	0.35	0.03	0.86	0.09	0.17
Hungary	0.38	0.39	0.01	0.17	0.10	0.05
Poland	0.28	0.36	0.01	0.15	0.04	0.03
South Africa	0.75	0.57	0.13	1.36	0.60	0.24

Source: Data for the year 2003 are from the World Bank's updated database on financial development and structure (see Beck *et al.*, 1999 for definitions). Data on mortgage debt for the year 2002 are from Catta *et al.* (2004) for France, Spain and Italy; the South African Reserve Bank *Quarterly Bulletin*; Dübel (2003) for Hungary; IMF (2004) for Chile; and for Poland, <http://www.housingfinance.org/pdf/storage/Poland.pdf>. Life insurance penetration is measured by premiums/GDP.

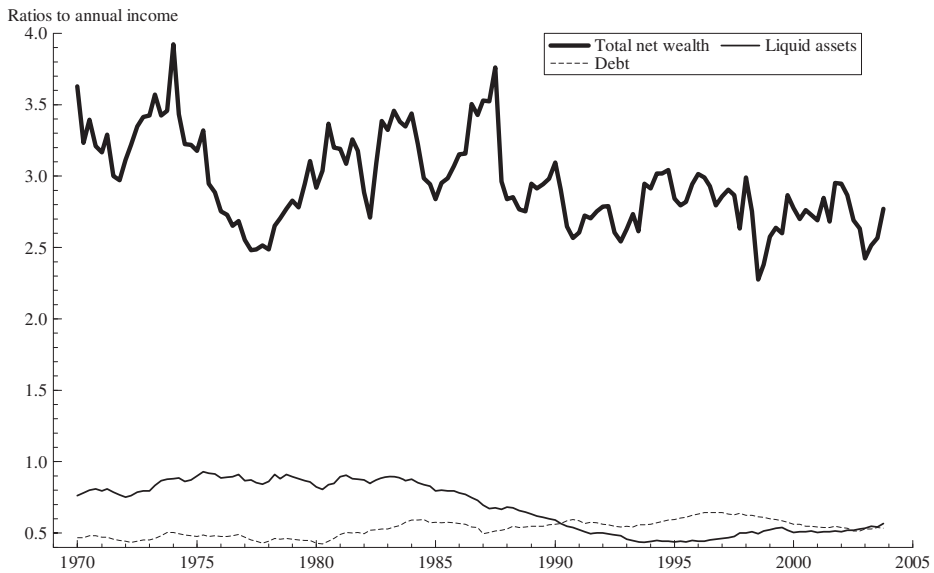


Figure 1. Ratios to Annual Personal Disposable Income of Net Wealth, Liquid Assets and Debt

*Note:* Net wealth excludes durables; and assumes the first of pairs of alternative assumptions (Table 2).

While wealth estimates on a market value basis are not published, the South African Reserve Bank has published flow of funds data back to 1970,<sup>2</sup> as well as information on households' holdings of local authority and public enterprise bonds, unit trusts (mutual funds), pension and long-term insurance funds, using a mix of book values and market values,<sup>3</sup> and household debt data. From these data and other sources described below, it is possible, with some difficulty, to assemble a profile back to 1970 of the main components of household sector assets and debts (Table 2, Figures 1 and 2).

Our measures exclude assets for two important areas. The first is household-sector ownership of foreign assets, the acquisition of which was made difficult or illegal by South Africa's regime of capital controls, progressively relaxed since 1995. The second is some of the assets of unincorporated businesses, and ownership of corporations not publicly quoted on the stock exchange. In common with other countries' published estimates of household wealth, we exclude the value of defined-benefit pension rights (see discussion in Section 3.6). Nevertheless, the assets and debts included in our estimates are measured with reasonable accuracy and are likely to be the main components of wealth relevant for consumer spending and portfolio decisions of South African households.

A persistent problem in South Africa has been a saving rate that is low compared to other countries in its income range (Aron and Muellbauer, 2000a).

<sup>2</sup>In *National Financial Account 1970–91* on an annual basis, and quarterly from 1992 in the *Quarterly Bulletin*, Reserve Bank, South Africa.

<sup>3</sup>In *Capital Market Statistics 1948–92*, and the *Quarterly Bulletin*, Reserve Bank, South Africa.

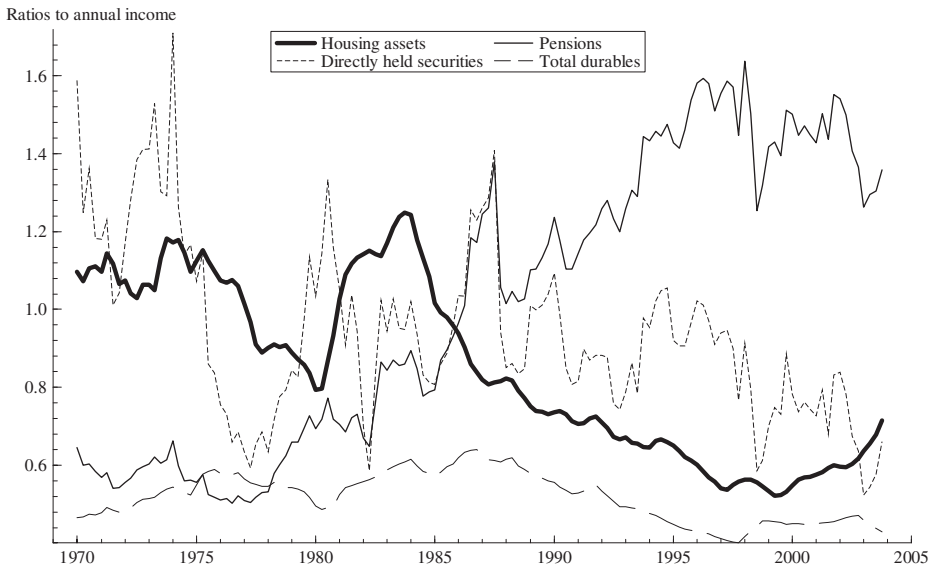


Figure 2. Ratios to Income of Pension Assets, Housing Assets, Directly Held Illiquid Financial Assets and Stocks of Consumer Durables

There has been little formal analysis of saving and consumption in South Africa, except in our previous work based on wealth estimates up to 1997, now revised and extended to 2003. We demonstrated the importance of our liquid and illiquid wealth measures in modeling consumption and household debt in South Africa from 1970 (Aron and Muellbauer, 2000a). We found statistically highly significant long-run propensities to spend of around 0.12 out of liquid assets minus debt, around 0.06 out of illiquid financial assets and around 0.06 for housing wealth.<sup>4</sup> The latter estimates are a little higher than figures for the U.S. (e.g. Poterba, 2000) and the U.K., suggesting some underestimation of assets in South Africa, partly corrected in this paper. The changing composition by asset type from 1970 is of considerable interest and contains clues about saving behavior in South Africa more generally.

The structure of the paper is as follows. Section 2 gives a brief methodological review of the techniques for converting flow of funds and book value asset data into market value estimates, and of the construction of bond price indices. Section 3 summarizes the construction of the estimates for all the different asset classes. Section 4 interprets the estimates, and graphical comparisons with key relative prices and rates of return provide important clues to help account for the changing composition of wealth. Section 5 summarizes and concludes. Two appendices, giving further details of the methodology, can be found in an earlier version of this paper (Aron and Muellbauer, 2004).

<sup>4</sup>To illustrate the significance of the asset effects, the t-ratio for illiquid assets in the consumption equation is 11.1, and for net liquid assets 4.8. In the debt equation, housing wealth has a t-ratio of 8.7, pension wealth a t-ratio of 8.4 and liquid assets a t-ratio of 5.8.

## 2. METHODOLOGY

Over time, each asset balance sheet is linked to the previous period's balance sheet through an identity (e.g. U.K. Central Statistical Office, 1978; Doggett, 1998, p. 139). The stock of assets at the end of the accounting period is equal to the stock at the beginning of the accounting period, plus asset acquisitions and less disposals by transactions taking place during the period, plus other changes in volume (e.g. through destruction or discovery of assets), plus the net gains accruing from holding assets through the period (i.e. capital appreciation). Note that interest or dividend income plays a role only insofar as the reinvestment of such income may be funding asset acquisition.

For those financial assets that are not traded in a secondary market and are thus not subject to revaluation through capital appreciation (e.g. bank and building society deposits), this identity simplifies to the following stock-flow identity:

$$(1) \quad BA_t = BA_{t-1} + NPA_t$$

where  $BA_t$  is the end-of-period stock and  $NPA_t$  is the flow of net purchases of assets in the period.

The identity (1) also governs the evolution of stocks defined *at book value* for financial assets, such as equity and bonds, which are subject to revaluation in a secondary market. To derive the corresponding market values, we have to add the net holding gains by the end of the period on the market value of the stock at the beginning of the period, as well as to add any holding gains on net purchases made during the period.

The revaluation adjustment can be explained as follows. Let  $A_{t-1}$  be the market value of an asset at the end of the period,  $t - 1$ . Let  $\pi_{t-1}$  be the corresponding price index. Let  $NPA_t$  be net purchases of the asset in the period. Then

$$(2) \quad A_t = A_{t-1}(\pi_t/\pi_{t-1}) + (NPA_t)(\pi_t/\tilde{\pi}_t)$$

where  $(\pi_t/\tilde{\pi}_t)$  is the revaluation adjustment of net purchases made in period  $t$ , which would equal 1, if prices remained unchanged over the period, and  $\tilde{\pi}_t$  is the average price paid during the period of purchases, since purchases are spread over the period.<sup>5</sup> Given an asset benchmark at an initial date, data on the net purchases in the period and the corresponding price indices, the revaluation adjustment in equation (2) can be used to convert book to market value data.<sup>6</sup>

Historical data on government bond price indices from the Johannesburg Stock Exchange (JSE)—and more recently from the JSE Securities Exchange—begin in 1980, while the Reserve Bank has published a bond price index only from

<sup>5</sup>A quarterly revaluation adjustment is approximated as follows. Assume that net asset purchases,  $NPA_t$ , are evenly distributed in nominal terms over the three months of the quarter. With monthly price indices, the revaluation adjustment is  $\left(\sum_{i=1,3} \pi_t/\pi_{ti}\right)/3 = \pi_t/H\pi_{ti}$ , where  $H\pi_{ti}$  is the harmonic mean of monthly prices in quarter  $t$ , with  $i$  representing the month of the quarter. Thus,  $\pi_t$  is the index for the first month of the quarter, and  $\pi_3 = \pi_t$  is the end-of-quarter index.

<sup>6</sup>For the 1970–91 period, where the flow of funds is on an annual basis, we assume the quarterly flows are one quarter of the annual flows.

1999. We therefore use standard price-yield relationships to derive price indices for short and long duration government bonds before 1980. We hold coupons and the maturity fixed for quarter-to-quarter comparisons, and chain these indices (see Appendix 1 in Aron and Muellbauer (2004)).

### 3. ASSET DATA FOR SOUTH AFRICA'S HOUSEHOLD SECTOR

In the System of National Accounts (SNA93) the household sector's asset balance sheet is typically divided into financial assets, financial liabilities and tangible assets.<sup>7</sup> Sources for household sector balance sheet data include surveys of liabilities and accounting data of financial institutions, and share registers.

The South African Reserve Bank, responsible for National Accounts data, does not currently produce household sector balance sheets. There are no household surveys of asset ownership; and data on the estates of the deceased have not been used to obtain estimates of personal wealth.<sup>8</sup> However, financial flow of funds data, derived from monthly, quarterly or annual institutional returns, are published in the *National Financial Account*, available annually for 1970–91 and quarterly thereafter. In *Capital Market Statistics*, stock data at book value are published for some items, primarily different types of pension assets and holdings of local authority securities, and market values for unit trusts (mutual funds), from December, 1991 for long-term insurers and from March, 1999 for private pension funds.

We have constructed a balance sheet for the main elements of the household-sector holdings of asset and debts, and for selected years, the various components of wealth and total net wealth, scaled by income, are shown in Table 2. The main asset categories are liquid assets, household debt and various categories of illiquid financial and physical assets, including pension wealth, directly held shares and bonds and housing. The stock of consumer durables, less marketable than the above assets, is shown as a memorandum item, as in the U.K. and the U.S.

For a few categories, asset stocks at market value are published, or can be fairly easily derived. For instance, estimates of household debt are compiled by the Reserve Bank and published from 1991 (we obtained unpublished data for earlier years). Estimates of gross housing assets can be made from constant price stock estimates for the household sector (unpublished data from the Reserve Bank) and house prices data. Market values of the stock of consumer durables can be estimated using the perpetual inventory method from constant price purchase data and durables price indices (Appendix 2; Aron and Muellbauer, 2004).

For the remaining assets in Table 2, plausible stock benchmarks are assumed in a base year, and equations (1) or (2) are used to cumulate components of the published flow of funds data into stock estimates. Of these assets, only household sector liquid asset stocks, other deposits, participation bonds and debt are not traded. All the other assets are traded, and hence are subject to revaluation. In

<sup>7</sup>U.S. Federal Reserve Board statistical releases No. B.100: "Balance Sheets of the Household Sector," and *Guide to the Flow of Funds Accounts* (2000). "Studies in Official Statistics No. 35," U.K. Central Statistical Office (1978), Doggett (1998), chapters 9 and 22, and OECD Statistics, *Financial Balance Sheets*, vol IIIb, 2004.

<sup>8</sup>There are two single province studies using data on estates in South Africa, but they give little information on the amounts of wealth held in different asset classes (McGrath (1982) for the Natal province in 1972; and Van Heerden (1996) for the Transvaal province in 1985).

TABLE 2  
HOUSEHOLD BALANCE SHEET OF ASSETS AND LIABILITIES RELATIVE TO PERSONAL DISPOSABLE INCOME FOR SELECTED YEARS

Selected Dates	Sensitivity Analysis	1969	1970	1975	1980	1985	1990	1995	2000	2003
Liquid assets <sup>1</sup>										
Liquid assets total		0.787	0.812	0.917	0.851	0.797	0.539	0.448	0.515	0.568
	$\theta = 80\%$	0.837	0.857	0.937	0.860	0.800	0.539	0.448	0.515	0.568
	$\theta = 85\%$	0.007	0.007	0.004	0.004	0.004	0.003	0.002	0.003	0.004
Other deposits <sup>2</sup>		0.069	0.065	0.055	0.028	0.030	0.018	0.012	0.006	0.004
Participation bonds										
Government and public enterprise assets <sup>3</sup>										
(19) Short-term government stock		0.003	0.003	0.003	0.006	0.002	0.002	0.002	0.002	0.000
(20) Long-term government stock		0.027	0.022	0.009	0.004	0.007	0.006	0.005	0.002	0.001
(22) Securities of local authorities		0.005	0.005	0.003	0.002	0.000	0.000	0.000	0.000	0.000
(23) Securities of public enterprises		0.003	0.003	0.003	0.004	0.017	0.014	0.008	0.005	0.005
Corporate bonds and equities										
(24) Other loan stock and preference shares	25-fold	0.082	0.062	0.038	0.024	0.012	0.011	0.008	0.008	0.005
	15-fold	0.050	0.038	0.025	0.015	0.007	0.008	0.006	0.006	0.004
	25-fold	1.632	1.018	0.722	1.087	0.886	0.754	0.930	0.718	0.661
(25) Ordinary shares	15-fold	1.004	0.622	0.443	0.664	0.542	0.464	0.593	0.457	0.420
Equity in unincorporated businesses		—	—	—	—	—	—	—	—	—
Equity in other unlisted securities		—	—	—	—	—	—	—	—	—
Pension funds <sup>4</sup>										
Private self-administered pension funds		0.252	0.223	0.215	0.311	0.383	0.405	0.597	0.440	0.358
Pensions with long-term insurers	{0, 0.15, 0.30}	0.192	0.171	0.156	0.268	0.371	0.468	0.536	0.499	0.437
	{0, 0.25, 0.50}	0.192	0.171	0.156	0.268	0.361	0.454	0.536	0.499	0.437
Official pension funds		0.207	0.191	0.146	0.140	0.176	0.229	0.405	0.509	0.570
Foreign assets <sup>5</sup>		—	—	—	—	—	—	—	—	—
Liabilities <sup>6</sup>										
Total household debt		0.458	0.482	0.482	0.466	0.574	0.595	0.624	0.552	0.533
Consumer credit		0.166	0.169	0.176	0.183	0.263	0.270	0.248	0.211	0.207
Mortgage debt		0.252	0.269	0.269	0.249	0.250	0.279	0.342	0.301	0.296
Tangible assets <sup>7</sup>										
Residential buildings		1.064	1.111	1.098	0.933	0.959	0.713	0.613	0.570	0.714
Tangible assets in unincorporated businesses		—	—	—	—	—	—	—	—	—
Consumer durables (total) <sup>8</sup>		0.458	0.472	0.590	0.494	0.603	0.526	0.433	0.448	0.428



Total net wealth (incl. consumer durables) <sup>9</sup>	25-fold ord. shares	4.331	3.681	3.477	3.691	3.673	3.094	3.374	3.174	3.223
Total net wealth (excl. consumer durables)	25-fold ord. shares	3.873	3.209	2.887	3.197	3.070	2.568	2.941	2.726	2.794
Total net wealth (excl. consumer durables)	1.5-fold ord. shares	3.214	2.790	2.595	2.722	2.726	2.275	2.602	2.464	2.553
Personal disposable income		7490	8309	16857	35860	76213	181531	349183	587724	796349

Source: Household debt data (published from 1991) and income data from the *Quarterly Bulletin*, South African Reserve Bank. Pensions with long-term insurers from *Capital Market Statistics*, South African Reserve Bank (market value data reported from 1991). Unit trusts data from *Capital Market Statistics*, South African Reserve Bank. Unpublished data on total household debt (pre-1991), household mortgage debt, consumer credit (after 1992)—see also Prinsloo (2002), and constant price housing stock, were kindly provided by the South African Reserve Bank. All other data: authors' calculations, as explained in the text.

#### Notes:

<sup>1</sup>Liquid assets up to 1991 comprise categories: (10) Cash and demand monetary deposits, (11) Short/medium-term monetary deposits, (12) Long-term monetary deposits, and (13) Deposits with other financial institutions, where numbers in parentheses refer to flow-of-funds categories from the *National Financial Account*, South African Reserve Bank. A correction was made for missing data on unincorporated businesses (see Section 3.1). After 1991, stock data on bank deposits are used directly to construct liquid assets.

<sup>2</sup>Other deposits comprise the category: (14) Deposits with other institutions.

<sup>3</sup>Government and public enterprise assets also include categories: (15) Treasury bills, (16) Other bills and (21) Non-marketable government bonds. Category (21) became negative and the series was omitted. Categories (15) and (16) are omitted because the flow of funds record zero transactions for the household sector.

<sup>4</sup>Pension funds comprises category: (29) Interest in retirement and life funds, from *Capital Market Statistics*, South African Reserve Bank, which combines private self-administered pension funds (reported at book values until 1998Q4), pensions with long-term insurers (reported at book values before 1985, at a mix of book values and market values between 1985 and 1991, and at market values from the end of 1991), and official pension funds (still reported at book values). The assumptions in column 2 refer to the proportions of funds (prop) reporting at market value in the following periods:

(i) 1961:4 1985:2: prop = 0; (ii) 1985:3 1986:4: prop = 0.15; (iii) 1987:1 1987:3: prop = 0.3; and (iv) 1987:4 1991:3: prop = 0.15.

<sup>5</sup>The following data were unavailable: foreign assets, equity in unincorporated businesses and in other unlisted securities, and tangible assets in unincorporated businesses.

<sup>6</sup>Liabilities categories are: (17) Bank loans and advances, (18) Trade credit and short-term loans, (27) Long-term loans, and (28) Mortgage loans, from estimates for total household liabilities and private sector loans, *Quarterly Bulletin*, South African Reserve Bank.

<sup>7</sup>Tangible assets employ private housing stock estimates, *Quarterly Bulletin*, South African Reserve Bank, and the ABSA Bank Ltd, South Africa, house price index. There are no available data on the other tangible assets categories: agricultural land holdings, commercial, industrial and other buildings, plant and machinery, vehicles (excluding personal transport), and stocks and work in progress.

<sup>8</sup>Consumer durables comprise categories: (A) furniture, household appliances, etc; (B) personal transport equipment; (C) recreational and entertainment goods; (D) other durable goods (jewellery etc). There are published figures for consumer semi-durable goods.

<sup>9</sup>Total net wealth sums the above categories (assuming the first of each pair of assumptions listed in column 2).

<sup>10</sup>Quarterly data are available from 1970.

what follows, for each type of asset, a summary is given of the stock benchmarks assumed, the price indices used and methods for constructing quarterly market value wealth stocks from available data for 1970 to the end of 2003. The benchmarks are given in the 1969 column of Table 2. Technical details are given in Appendix 2 (Aron and Muellbauer, 2004).

### 3.1. Household Sector Liquid Asset Stocks

The Reserve Bank's *Quarterly Bulletin* publishes a quarterly analysis of bank deposits by type of depositor, from 1991Q3. Summing the components for the household sector<sup>9</sup> provides a series for personal broad money holdings and a benchmark for 1991Q3. Prior to 1991Q3, we cumulate the flow of funds using equation (1)—with an adjustment for missing data—to construct personal broad money holdings, with a second benchmark for 1969Q4. Before 1991Q3, the flow of funds understated the growth of broad money because flows for unincorporated businesses were omitted from the household sector. We assume that a proportion  $\theta_2$  of M3 was left out of the household sector total assets. We combine the two benchmarks to estimate  $\theta_2$  from the following expression for the adjusted stock of liquid assets assumed to hold for 1969Q4 to 1991Q3:

$$(3) \quad stock_t^{adj} = stock_{t-1}^{adj} + FOF_t + \theta_2 \Delta M3_t$$

where FOF refers to the net flow of deposits from the flow of funds, and  $\Delta M3_t$  is the change in broad money, M3. In the absence of other information on the 1969Q4 benchmark, we draw on U.S. and U.K. experience. In 1969, in the U.S. around 80 percent of broad money was held by households, and in the U.K., the comparable figure was 85 percent, figures that remained stable into the mid-1970s.<sup>10</sup> Prior to 1992, only annual flows are available for South Africa. To obtain quarterly FOF data for this period, we assume the ratio of the quarterly flow to the annual flow is the same for household M3 and for total M3, so scaling the annual changes for households by the ratio of the quarterly to annual changes for M3. Table 2 presents estimates of personal broad money holdings based on 80 and 85 percent benchmarks for 1969.

### 3.2. Other Household Sector Deposits

In the flow of funds, another type of deposits is listed: “deposits with other financial institutions” (item 13). This includes deposits with pension funds and life insurance companies not yet credited as pension assets. There is some difficulty about whether to categorize these deposits as liquid assets, directly held illiquid financial assets, or as pension wealth. Fortunately, until the mid-1990s, the flows

<sup>9</sup>These categories are individuals, unincorporated enterprises and non-profit organizations, deposits in mutual banks, the Postbank, the Landbank (35 percent of call money deposits is included, attributed to unincorporated agricultural businesses), and notes and coins (70 percent of which we attributed to the household sector). To this total we add the cumulated “Deposits with other financial institutions” (item 13) for the household sector element of the National Financial Account.

<sup>10</sup>The sources for these figures are the Federal Reserve Balance Sheets and the National Income and Expenditure Balance Sheets in *The Blue Book*, U.K. National Accounts.

are small relative to all three of the alternative categories. We have chosen to group them with directly held illiquid financial assets.<sup>11</sup>

### 3.3. *Participation Mortgage Bonds*

These are long-term investment vehicles, used mainly by private individuals, providing pooled mortgages for commercial and other real estate investment. The outstanding assets owned by individuals are reported in *Capital Market Statistics*.

### 3.4. *Government and Public Enterprise Asset Stocks*

Government and public enterprise components of the flow of funds comprise short-term and long-term government stock, and the securities of local authorities and public enterprises. We omitted non-marketable government debt, due to data inconsistencies;<sup>12</sup> but the holdings fortunately are small (for instance, relative to liquid assets).

The benchmarks for short-term and long-term government stocks come from data on the ownership of end-1969 stocks<sup>13</sup> in *Public Finance Statistics*; while quarterly figures on the household sector ownership of the securities of local authorities and public enterprises are available from 1970 in *Capital Market Statistics*.

All these figures are on a book value rather than on a current market value basis, and require the revaluation adjustment using equation (2) (see Section 2 on the sources for the bond price indices).<sup>14</sup> Since short-term yields are roughly constant during 1965–69, we take the 1969 book values as reasonable approximations to the market values.

### 3.5. *Equities and Other Corporate Securities*

Data at market prices of household sector holdings of unit trusts (mutual funds) published in *Capital Market Statistics* go back to 1965. The flow of funds measure corporate “loan stock and preference shares,” and “ordinary shares,” including unit trusts and directly held shares. No data are available on ownership by the household sector, since surveys of share registers carried out in the U.S. and U.K. are not carried out in South Africa. In the U.K., household sector ownership

<sup>11</sup>To choose a benchmark in 1969Q4, we proceed as follows. If from 1969Q4 to 1991Q4, the cumulative flow in this category is denoted X, while the change in our constructed household broad money measure is denoted Y, the ratio of X to Y is 0.038. A similar figure holds for cumulative flows up to 1980Q4 and 1985Q4. We take 0.038 of M3 to be the benchmark for 1969Q4.

<sup>12</sup>For non-marketable government debt, largely of short duration, asset revaluation is not relevant, suggesting cumulating the book value data. However, with any plausible assumptions on a 1969 benchmark asset figure, the cumulated asset totals obtained using equation (1) become negative after 1991, suggesting serious underestimation of net acquisitions in earlier years. This inconsistency would have come to light if the Reserve Bank had constructed regular balance sheets as well as the flow of funds data. (Note that Treasury bills and other bills are also omitted because the flow of funds record zero transactions for the household sector—see Table 2.)

<sup>13</sup>We take the category “other owners” to refer to the household sector for the 1969Q4 benchmark, and use the flow of funds to generate the later data.

<sup>14</sup>To match a second benchmark based on a recent Treasury estimate of household sector holdings of long-term government bonds, we modify the revaluation adjustment slightly. We suspect that investment by individuals in bond funds on an accumulation basis, where interest is automatically re-invested in more units, leads to underestimates of bond holdings, which our modification corrects.

of the “loan stock and preference share” category in 1969 was estimated to be around 5 percent of the total of its ordinary shares, unit trust and investment trust holdings (U.K. Central Statistical Office, 1978). We adopt the same percentage for the 1969 benchmark for South Africa. This category is a mix of corporate bonds and equities, and we use a weighted average of an index of corporate bond prices and of equities for the revaluations in equation (2) (see Appendices 1 and 2 in Aron and Muellbauer, 2004).

For ordinary shares, finding the appropriate benchmark for 1969 is controversial. In South Africa, the proportion of equities held directly by the household sector could be expected to be at least as large as those in the U.K. and the U.S., given a similar culture of share ownership but greater inequality in share ownership<sup>15</sup> in South Africa. We consider two sources for calibrations: the ratio of directly held equities to equities held in mutual funds, and the fraction of total market capitalization attributable to the household sector. In the U.S., the ratio of holdings of directly held equities to equities held in mutual funds in 1969 was around 10 : 1. In the U.K., the corresponding ratio to unit trusts was 16 : 1, but was closer to 10 : 1 if investment trusts (closed-end mutual funds) are added to unit trusts. We compare two alternative benchmarks for South Africa in 1969, of 15 : 1 and 25 : 1 to unit trusts. These imply that the total value of equities (including unit trusts) held by the household sector were respectively, 41 percent and 68 percent, of the market capitalization of equities quoted on the JSE at the end of 1969.<sup>16</sup> Equation (2) is used to calculate market values stocks using the JSE all share index,<sup>17</sup> but we adjust this for assumed trading costs of 0.6 percent per annum. The two 1969 benchmarks imply 1997 proportions of market capitalization of quoted equities of respectively 18 and 29 percent.<sup>18</sup>

### 3.6. Pension Stocks

The largest financial asset class from the flow of funds is “interest in retirement and life funds.” However, we take the more useful stock data in *Capital Market Statistics* on asset holdings of private self-administered pension and provident funds,<sup>19</sup> official pension funds (pensions for government and parastatal employees), and also long-term insurers.

<sup>15</sup>The ratio of directly-held shares to those held by mutual funds is likely to be greater in South Africa, where wealth is highly concentrated and the very wealthy have less need of mutual funds to achieve diversification.

<sup>16</sup>The corresponding figure for the U.K. in 2002 was 25 percent, but was substantially higher in the 1970s.

<sup>17</sup>Spliced in 2002 to the new FTSE South Africa all share index.

<sup>18</sup>One can obtain a rough estimate of the household sector’s equity holdings by subtracting estimated foreign ownership (from foreign liabilities of South Africa) and domestic holdings by other institutions such as long term insurers, from total market capitalization, and make a number of book to market value adjustments. This still leaves some unresolved issues due to cross-holdings and holdings by unlisted companies of listed equities. Such calculations suggest households should account for under 41 percent of the 1997 market capitalization, and probably significantly under this figure. We are very grateful to Michael Kock of the Reserve Bank for advice on these calculations.

<sup>19</sup>This category includes privately-administered funds registered in terms of the Pension Funds Act (includes funds similar to Individual Retirement Accounts in the U.S.), foreign funds registered in South Africa, funds established in terms of industrial agreements (typically both employees and employers contribute), and state controlled funds exempted from the requirements of the Act. Funds covered by long-term insurers are excluded.

Some general remarks on pensions are in order. Even in countries where pensions tend to be funded rather than pay-as-you-go, there is a problem matching assets recorded in pension funds (whether public or private) and the obligations or promises made to future pensioners. This affects the expectations of pensioners, and hence the consumer expenditure implications of recorded pension assets. Bulow (1982) discusses the considerable difficulties in valuing such rights or liabilities. Nevertheless, sharp declines in recorded pension assets to income are liable to be followed by higher household contributions, and, in some cases, by dilution of benefits and reduced confidence in the value of previously expected benefits. In the U.K., government statisticians have, on occasion, produced estimates of corporate occupational and state pension rights back to the late 1970s, using demographic information, detailed Inland Revenue information about pension contributions and payments, and company information (Stewart, 1991). A similar exercise might be worth carrying out for South Africa, but is far beyond the scope of this paper.<sup>20</sup>

- (1) *Private self-administered pension and provident funds.* For private self-administered pension and provident funds, there are quarterly data on the portfolio composition of assets back to 1963, and annual data back to 1958, both on a book value basis. There are seven groups of assets subject to revaluation. We apply equation (2), with 1961Q4 benchmarks, to adjust the book values of the assets to market value, after constructing price indices for each group (details in Appendix 2, Aron and Muellbauer, 2004). In 1999Q1, these funds were required to shift to a market valuation basis, an important check on our methods of adjusting book to market values.
- (2) *Long-term insurers.* Around half the liabilities of long-term insurers represent household sector pension assets. For long-term insurers, quarterly data on the portfolio composition begin in 1963, and annual data in 1946. The procedure outlined above can be followed using 1961Q4 benchmarks. However, there is one quite serious difficulty. Between the third quarter of 1985 and the third quarter of 1991, some insurers reported at market values and others at book values, while from the fourth quarter of 1991, all insurers were required to switch to the market value basis. Unfortunately, we do not know the proportions, which reported on either basis, and the proportions appeared to alter after the October, 1987 stock market crash. Appendix 2 in Aron and Muellbauer (2004) gives details of the assumptions made which give the most plausible outcomes. In Table 2, we report two variants of these assumptions for 1985 and 1990. Sensitivity to the alternative assumptions is small and only affects the 1985–91 period.
- (3) *Official pension funds.* For official pension funds, which provide pensions for public sector employees, the annual book value portfolio composition data back to 1974. Prior to 1974, there are annual data for total assets at

<sup>20</sup>Pensions paid out by official pension funds tend to be of the defined benefit form (e.g. linked to salaries in the pre-retirement years). Before the early 1990s, according to the Mouton Report (1992), significant under-funding was common. In a series of reforms since 1989, state pension rights, providing a minimum of income support for those over retirement age, have been extended from the white population only, to all races. State pensions are means-tested, and in 1993 were around thrice median adult income for the black population (see Case and Deaton, 1998). The majority of black South Africans of pensionable age are eligible for these benefits.

book value, going back to 1948. These funds started investing in ordinary shares, other company securities and fixed property only in 1990, when quarterly data begin. Prior to 1990, government, local authority and public enterprise bonds accounted for more than 85 percent of total assets invested. We use 1961Q4 benchmarks with equation (2) to convert book to market values, but unlike the previous two pension categories, have no market value data to check our assumption.

### 3.7. *Private Housing Stocks*

The Reserve Bank provided unpublished annual estimates of the gross private housing stock for households in constant prices dating from 1960. The constant price stocks require adjustment for the value of the associated land, and conversion to current prices using an appropriate house price series. We assume that in 2000 the underlying land value of a typical home is 25 percent of the value of the building,<sup>21</sup> so that land accounts for 20 percent of the total value including land. Thus, the stock estimates are scaled by 1.25, multiplied by the average price of a medium-sized housing unit, and then divided by the average house price in the base year of 2000.

We tested the sensitivity of the housing wealth estimates to the medium house price index (from ABSA Bank Ltd, South Africa, one of the larger mortgage providers). Since 1990, there has been a small rise in the relative price of small houses to medium and large houses. However, a weighted average of small, medium and large houses, using plausible weights, moves very similarly to the medium house price index, so this is unlikely to be a significant source of bias.

Valuation practices for housing wealth differ internationally. The U.K. uses local authority tax records. Applying the above method to U.K. data, gives estimates close to the official ones for plausible assumptions for the land-value proportions. Italy and Spain use the census, which has data on square meters of space per dwelling, and regional data on house prices per square meter (Cannari and Faiella, 2005; and for Spain, the Bank of Spain weblink: <http://www.bde.es/infoest/s15-nme.pdf>).

### 3.8. *Consumer Durables*

The Reserve Bank provides annual data on purchases of four different kinds of durables back to 1946.<sup>22</sup> Following the most recent practice in the U.S. (Katz and Herman, 1997) and U.K. (U.K. Central Statistical Office, 1998), we have

<sup>21</sup>This is consistent with figures from an annual survey by ABSA Bank, which suggest an average ratio for the period 1966 to 2003 of 32.7 percent, but lower figures around 2000.

<sup>22</sup>Categories are given in Table 2. Van der Walt and Prinsloo (1993) assume service lives of 10, 8 and 5 years for categories A, B and D, respectively. Recent U.S. practice (Katz and Herman, 1997) assumes the following service lives: 10–14 years for category A, 8–10 years for durables comparable to South Africa's in category B (excluding tires and other accessories), 9 years for category C, and 6–11 years for category D. In the U.K. (U.K. Central Statistical Office, 1978), the service lives are assumed to be 10–25 years for category A, 10 years for category B and 8–10 years for category C. We assume service lives of 12, 9, 8 and 8 years for the categories A–D, respectively, for South Africa.

assumed different geometric depreciation rates for different durables categories.<sup>23</sup> For the durables categories, only annual price indices and annual investment flows are available, though quarterly data are published for total durables. Constant price stocks were computed from the constant price purchases using the perpetual inventory method, and converted to current prices using the fourth quarter deflator for total consumer durables.

### 3.9. *Total Net Wealth*

Two measures, corresponding to different benchmarks for directly held equities, for total net wealth excluding durables, scaled by income, are shown in Table 2. The alternative benchmarks result in substantial differences in the estimate of net wealth. Total net personal wealth is defined as the sum of liquid assets minus household debt; plus gross housing assets; plus illiquid financial assets—comprising other deposits, participation mortgage bonds, short-term, long-term and other government bonds, local authority and public enterprise bonds, and ordinary shares and other corporate securities held by the public; plus pension assets—comprising private and official pension assets and long-term insurer pension assets.

Current United Nations SNA93 guidelines recommend that consumer durables should be shown only as a memorandum item, and not be included in household sector net wealth estimates. However, we also present an alternative net wealth total that includes durables. This adds of the order of one sixth to the net wealth total, and produces a slightly more stable series overall.

Foreign assets are largely omitted from our net wealth measures. Long-term insurers' and pension fund assets include elements of foreign assets, which have been increasing in recent years, but there are no reliable estimates of household sector ownership of foreign assets. Despite stringent domestic exchange controls, there were inevitable loopholes. Several authors have attempted to estimate the extent of capital flight from South Africa (Smit and Mocke, 1991; Fedderke and Liu, 2002). Even if such estimates were accurate, they would need to be converted into stocks without knowing their portfolio composition. Yet more difficult would be to apportion the household sector share of these assets. We have not attempted such estimates.

As mentioned above, there is no coverage of assets of unincorporated businesses in our measures of household sector assets, except for their inclusion in liquid assets and to some extent, in housing. Neither capital formation estimates nor profit figures are published which separate out the unincorporated business sector from private enterprises as a whole. Yet, given South Africa's large farming sector, one might expect this sector to be of significant size, and the exclusion of most of the tangible assets owned by this sector therefore to lead to a significant

<sup>23</sup>The geometric depreciation rates are:  $(1/\text{servicelife}) \times \gamma$ , where  $\gamma$  is 1.65 or 1.853, for longer or shorter service life series, respectively. This implies annual depreciation rates respectively of 0.1375, 0.1833, 0.2063 and 0.2063 for categories A–D (see Table 2). We exclude semi-durables, though a service life of 3 years would seem appropriate.

underestimation of household sector net wealth.<sup>24</sup> However, it seems likely, given changes in corporate and personal tax systems during the 1970s and 1980s, that there has been a tendency towards the incorporation of previously unincorporated businesses. Thus, the share of the assets of unincorporated businesses in total assets of the household sector may have fallen in this period.

There is probably some overlap between this category and that of unquoted securities. For comparability, in the U.K. in 2002, household sector ownership of unquoted securities was estimated at around 4 percent of its gross financial assets, close in value to the household sector's ownership of unit trusts (mutual funds).

#### 4. THE CHANGING COMPOSITION OF PERSONAL WEALTH

The considerable fluctuations in total net personal wealth (excluding consumer durables) are shown in Figure 1, relative to a four quarter moving average of personal disposable income.<sup>25</sup> The relatively high wealth-to-income ratio in the early 1970s, associated with strong economic growth and high gold prices, declined in the mid to late 1970s as the world economy faltered and as domestic political difficulties increased (e.g. the schools boycott in 1976). The ratio rose following a large gold price boom around 1980, when high share values were followed by house price and investment booms. When economic and political difficulties increased in the 1980s, and the debt crisis of 1985 and international trade and financial sanctions severely constrained access to capital and trade, growth weakened and real house prices began a long-term decline. A gold price recovery in the late 1980s brought a temporary rise in the wealth-to-income ratio; but since 1988, the ratio has fluctuated in a relatively narrow range, despite the positive political changes in South Africa.

We now turn to some of the compositional changes in wealth. Figure 1 also shows debt and liquid asset to income ratios, while Figure 2 shows pension assets, gross housing assets, directly held financial assets and consumer durables, relative to income.

##### 4.1. *The Debt to Income Ratio*

Total household debt data have been published by the Reserve Bank since 1991Q3. Van der Walt and Prinsloo (1995) and Prinsloo (2002) publish detailed charts of total household debt and its main components, and information on the institutional framework, data sources and determination of household debt. Table 2 includes entries on consumer credit and mortgage debt.

<sup>24</sup>One indication is given by the size of bank deposits by unincorporated businesses. At the end of 1997, the ratio of these deposits to those of individuals was around 18 percent, while the ratio to total bank deposits was around 6 percent.

<sup>25</sup>In modeling household expenditure or portfolio decisions in the current quarter, one would normally use asset data at the end of the previous quarter, and current quarter personal disposable *non-property* income rather than the moving average of personal disposable income (PDI) (see Aron and Muellbauer, 2000a, 2000b). However, PDI is more comparable internationally, while its non-property variant is subject to approximations of varying complexity (see Blinder and Deaton, 1985).



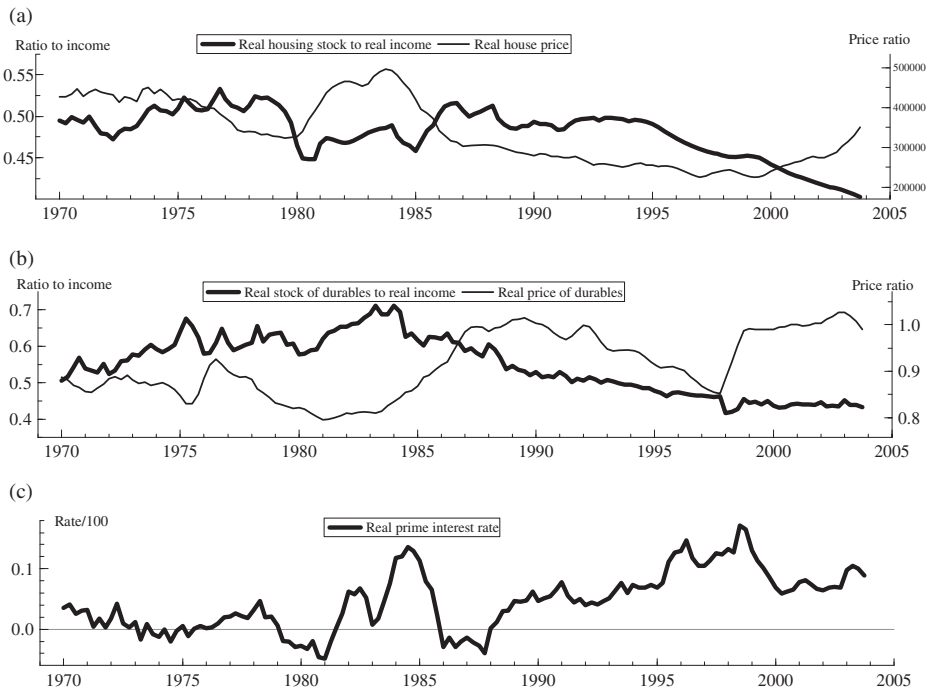


Figure 3. Ratios to Income of Stocks of Housing and Consumer Durables versus Relative Prices and Real Interest Rates

Figure 3c displays the real prime interest rate, followed closely by mortgage rates.<sup>26</sup> The *positive* correlation between the real interest rate on borrowing and the debt to income ratio (Figure 1), particularly since 1980, with a correlation coefficient of 0.75 for 1980–2003, contradicts conventional expectations. This is likely to be the result of two factors. The first factor is inflation, which tended to be correlated with negative real returns until monetary policy shifted, and also with a fall in the value of nominal debt outstanding relative to nominal income. The correlation coefficient between annual inflation and the debt to income ratio for 1980–97 is  $-0.52$ . The second factor is financial liberalization. The removal of quantitative controls over credit in the early 1980s, associated with a move to controlling credit expansion via higher interest rates, induces a positive correlation between a supply-driven credit expansion and higher interest rates. This phenomenon has also been observed in other countries, such as the U.K., and in Scandinavia, which underwent financial liberalization in the 1980s (see Lehmusaari, 1990; Berg, 1994).

The determination of the debt to income ratio in South Africa was the subject of a detailed econometric investigation by Aron and Muellbauer (2000a, 2000b). Interest rates, financial liberalization and the housing, pension and liquid assets components of wealth were the key determinants, and the role of gross housing

<sup>26</sup>The ex-post real interest rate is measured by  $r - \Delta_4 \ln pc$  where  $r$  is the four quarter moving average of the nominal prime interest rate and  $pc$  is the consumer expenditure deflator.

assets increased with financial liberalization. The rise in the debt to income ratio occurred despite the decline after 1983 in the ratio of housing assets to income, and high real interest rates in the mid-1980s and the 1990s.

#### 4.2. *The Liquid Asset to Income Ratio*

The decline in the ratio of liquid assets to income is probably also partly accounted for by financial liberalization from 1983, extending into the 1990s. As access to credit improved, the precautionary, buffer-stock and consumption smoothing motives for holding liquid assets (see Deaton, 1992), declined. It is likely that there was also an overall wealth effect, with the net wealth to income ratio influencing the liquid asset ratio (see Thomas (1997) for such an effect in the U.K.).

Political credibility effects, inducing currency substitution away from domestic assets and toward illegal foreign assets, may also have been a factor in the declining liquid asset to income ratio from 1976, and again after the debt crisis of September 1985, reversing with the successful democratic elections of 1994.

However, the main factor is likely to have been that for an average tax-payer, the real after-tax return on liquid assets has been negative from the early 1970s to the early 1990s—apart from a brief spell in 1984–85 (see Prinsloo, 2000, p. 17). The weighted average of marginal tax rates rose from around 10 percent to over 30 percent from 1970 to the 1990s, before declining again in recent years. Higher returns help explain the renewed rise in the liquid asset to income ratio from the late 1990s.

#### 4.3. *The Gross Housing Assets to Income Ratio*

The ratio of housing wealth to income can be decomposed into the ratio of the constant price housing stock to real income and the ratio of house prices to the consumer price deflator. These ratios are shown in Figure 3a. Since the housing stock evolves only very slowly, poor income growth between the early 1980s and 1990s is reflected in a rise in the real stock to real income ratio, while stronger growth since 1994 has seen a fall in the ratio. However, most of the rise in the early 1980s and subsequent decline in the value of housing assets relative to income is due to the rise and then decline in the real house price index (Figure 3a).

Fluctuations in the real price of South Africa's principal mining export, gold, between 1970 and the late 1980s, probably explain some of these changes. It is well-known that positive temporary terms of trade shocks raise with a lag the relative prices of non-traded goods to tradables (Collier *et al.*, 1999). Housing assets experienced a boom and then bust in the early 1980s, after gold prices rose temporarily from around \$300 to over \$800 dollars per ounce.

Borrowing costs obviously also have an impact on the housing market, in part because they are such an important ingredient in the user cost of housing. The latter depends on the interest rate minus the expected rate of house price appreciation. Figure 3c shows the prime rate of interest to which mortgage and other borrowing rates are closely linked.

Our econometric work on house prices in South Africa (Aron *et al.*, 2003), suggests plausible long-run income effects on house prices, in line with interna-

tional evidence, with an elasticity in the range 1.5 to 2. We confirm the importance of interest rate effects and also find credit growth and inflation volatility (linked to interest rate uncertainty) to be important in explaining house prices.

#### 4.4. *The Durables to Income Ratio*

Figure 3b shows the real stock of consumer durables relative to real income and the relative price of durables.<sup>27</sup> The stock obviously lags behind purchases. It seems likely that income growth, a declining relative price, net wealth and relatively low real interest rates help to explain the relatively strong accumulation of durable stocks between the mid 1970s early 1980s. The temporary decline in 1980 is largely explained by the surge in disposable income given the gold price boom, and the lagged response of stocks to durable purchases. Stocks rose strongly subsequently relative to income, with low real interest rates in 1981–82 a contributing factor. From the early 1980s, real stocks of durables declined relative to real income until the late 1990s.

Trade sanctions between 1985 and 1990, help to account for the rise in the relative price of durables, raising the valuation of the existing stock seen in Figure 2, but also contributing to the rapid fall in the real stock to real income ratio. This began to be reversed from 1990, when the economy was opened to international competition. Real *per capita* household income in the 1990s and net wealth to income ratios show no sustained increases, while real interest rates rose, peaking in 1997–98, so providing little stimulus for rises in real purchases. Since 2000, stronger income growth and lower interest rates have contributed to stabilizing the real stock to real income ratio, though the relative prices of durables remain at high levels.

#### 4.5. *The Ratio to Income of Pension Assets and Directly Held Securities*

The rise in the pension assets to income ratio relative to that of directly held securities to income, was illustrated in Figure 2. In Figure 4, the log pension ratio is plotted against the log total return indices in equities and long bonds.<sup>28</sup> It also shows the rising proportion of pension assets invested in equities—from 20 percent in the early 1970s to over 50 percent by the 1990s.

The correlation between the pension to income ratio and the total returns index for equities is high throughout (the decade by decade correlation coefficient exceeds 0.87 for all three decades from 1970). A substantial part of the rise in the log ratio of pension assets to income can be explained by a weighted average of the total returns indices for equities and bonds. This correlation is likely to be even greater for a more sophisticated weighted total returns measure, giving cash, short term bonds, real estate and other asset classes their due. Thus, a fairly passive

<sup>27</sup>This is measured as the durables deflator relative to the deflator for total consumer expenditure.

<sup>28</sup>The quarterly total return index is defined as  $(P_i/P_{i-1}) \times (1 + QY_i)$ , where  $P_i$  is the price index of an asset,  $i$ , and the per-quarter yield is  $QY_i$ . Cumulating quarterly log return indices gives cumulative log total return indices. While the equity and bond yields are assumed free of tax in the case of pensions, this would not be the case for private households holding these assets directly.

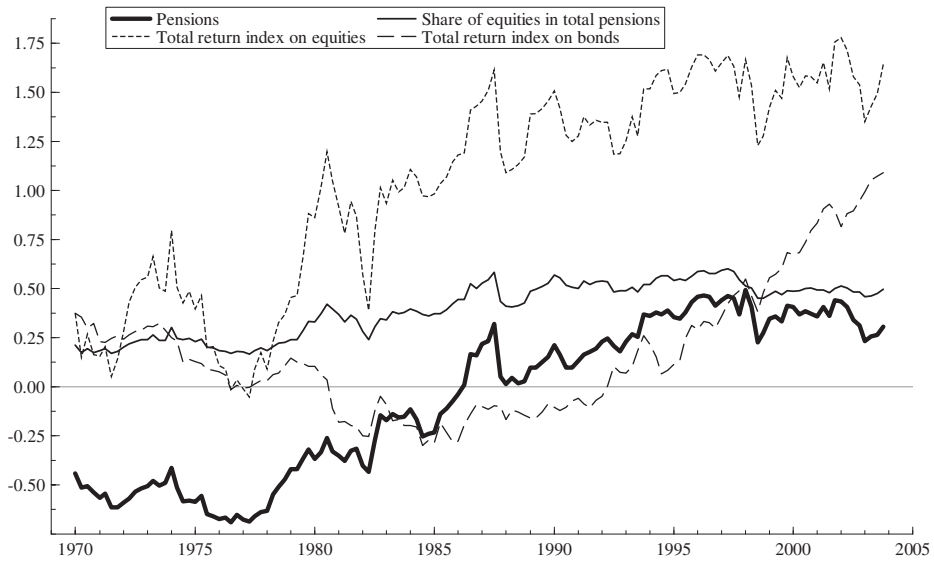


Figure 4. Ratios to Income of Pension Assets versus Total Return Indices for Equities and Bonds and Proportion of Equities in Pension Assets

*Note:* Pensions and the return indices are in logs. The share of equities is a proportion between 0 and 1.

investment strategy of holding securities and reinvesting the income in the same securities could account for a considerable part of trends in the pension ratio, and its short-term fluctuations.

Regulatory changes have also played an important role, however. The early 1980s saw a relaxation of government-prescribed asset ratios applying to private pension funds and pensions invested with insurance companies, making it possible to expand the proportion invested in equities, on which rates of return were higher. From 1990, official pension funds were no longer restricted to invest only in public fixed interest securities. And, the concern to move official pension funds to an approximately fully funded basis, raised contribution rates into these funds.

Relative, after-tax returns in alternative assets—directly-held financial securities, liquid assets and housing—are probably also part of the explanation for the rise in pension wealth relative to income. Tax incentives favored investment in pensions over directly held financial securities. The tax-disadvantage of directly-held securities is shown in Figure 5, where the pensions and the directly held securities ratios are plotted against the differentials between taxed and untaxed total return indices for bonds and for equities. For pensions there were no taxes on dividends or interest,<sup>29</sup> while for directly held securities, dividend income was

<sup>29</sup>Following the Katz Commission (1996), pension fund income began to be taxed. Pension payments are taxed at the respective tax rates of the individuals in receipt of pensions. These tend to be low since other income is usually low during retirement. Also, a substantial part of the pension is paid out as a tax-free lump sum at retirement.

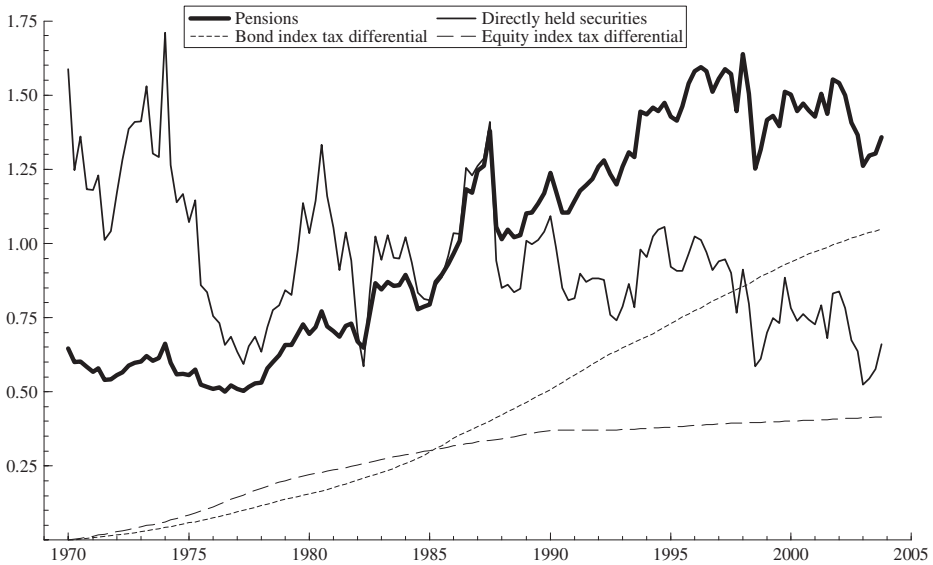


Figure 5. Ratio to Income of Pension Assets and Directly held Illiquid Financial Assets versus the Difference between Taxed and Untaxed Log Total Return Indices

*Note:* The return index differentials are in logs. Pensions and directly held securities are shown as ratios to income.

taxed.<sup>30</sup> Real returns on liquid assets, particularly after tax, were poor until the 1990s (with a brief exception in the mid-1980s). Returns in the housing market were weak between 1983 and 1999.

## 5. CONCLUSIONS

We have constructed the first set of reasonably comprehensive estimates at market values of aggregate household sector wealth holdings in South Africa. Our estimates play an important role in explaining variations in consumer expenditure and debt in South Africa from 1970, as demonstrated in Aron and Muellbauer (2000a, 2000b).

We have discussed changes in the main asset to income ratios. Most striking are the rise in pension wealth and the decline in the gross housing asset ratio since the early 1980s, though the latter has risen strongly again since 1999. The rise in the household debt ratio, accompanied by a decline in the liquid asset ratio, between the early 1980s and the late 1990s is another notable feature. Directly held securities (including unit trusts or mutual funds) have been on a downward trend relative to income, with cyclical behavior driven by fluctuations in real share prices. Our analysis in Section 4 suggests that variations in pension assets and in directly held securities relative to income can be understood in terms of the total

<sup>30</sup>For equities, we apply the tax factor  $(1 - \text{mtd})$ , where  $\text{mtd}$  is the tax rate on dividends, 12.5 percent in recent years; and for bonds, the factor  $(1 - \text{mt})$ , where  $\text{mt}$  is the average of marginal income tax rates. South Africa had no capital gains tax until after the Budget of 2000.

return indices primarily on equities and bonds, relative after-tax returns and regulatory changes. Variations in housing assets relative to income are driven mainly by variations in real house prices. In turn, these are very sensitive to interest rates, income, credit expansion, inflation volatility and longer run forces likely to include housing supply, demography, the terms of trade, the economy's access to foreign capital, income distribution, the tax regime, crime and political factors. Many of these forces are also likely to have influenced returns on equities and bonds. Variations in the market value of durables relative to income are also sensitive to the relative price of durables, driven largely by trade openness and technology, while the ratio of real stocks to real incomes is also sensitive to interest rates, income and wealth. Both debt and liquid asset to income ratios are interest rate sensitive, as well as responding to wealth and credit market liberalization, and buffer-stock motives linked to uncertainty.

The biggest lacunae in the household sector wealth estimates concern ownership of foreign assets—made difficult or illegal by capital controls, the assets of unincorporated business enterprises, and of companies not officially quoted on the stock market. More work is needed in these areas, as well as in improving estimates of directly held securities from surveys of share registers.

It would be highly desirable for the Reserve Bank to construct and publish market value wealth estimates, improving some primary data collection in the process. The effort is likely, for some assets, also to improve the accuracy of the flow of funds estimates. It should also focus the attention of policy-makers on the macroeconomic wealth effects of both interest rate policy and fiscal policy, which in the past, may not have been given their full due. In turn, this will improve understanding of South Africa's low household sector saving rate and policy options for raising it. A project is now under way at the Reserve Bank to apply and extend the methodologies explained here to fill in some of the gaps in the data with a view to future publication of the household balance sheets.

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