UK HOUSEHOLD PORTFOLIOS

James Banks
Sarah Smith

THE INSTITUTE FOR FISCAL STUDIES
WP 00/14

UK Household Portfolios

James Banks and Sarah Smith

Institute for Fiscal Studies[1]

Version: April 2000

Paper prepared for 'Household Portfolios', edited by Luigi Guiso, Michael Haliassos and Tullio Jappelli and presented at an international conference on portfolios in December 1999. To view the other papers that were presented at the conference, see http://www.iue.it/FinConsEU/programme2.htm

.

[1] **Addresses for Correspondence:** Institute for Fiscal Studies, 7 Ridgmount Street, London, WC1E 7AE. Internet: www.ifs.org.uk. E-mail: jbanks@ifs.org.uk ; sarah.smith@ifs.org.uk

Acknowledgements: This study forms part of the IFS research programme into 'The changing distribution of consumption, economic resources and the welfare of households' funded by the Leverhulme Trust, to whom we are very grateful. Co-funding has been provided by the ESRC Centre for the Microeconomic Analysis of Fiscal Policy at IFS. Many thanks are also due to NOP Financial for providing us with the FRS data used in this study and to Nick Watkins and Julia Beaver at NOP for helpful discussions during our subsequent analysis of the survey. Material from the FES made available by the ONS through the ESRC data archive has been used by permission of the controller of HMSO. Neither the ONS, the ESRC Data Archive, the Leverhulme Trust or NOP Financial bear any responsibility for the analysis or interpretation of the data reported here. Any errors are attributable solely to the authors.

Summary

This paper presents a detailed analysis of the composition of household portfolios, using both aggregate and micro-data. Among the key findings are that:

- Most household wealth is held in the form of housing and pensions. Over time, there has been a shift away from housing towards financial assets, driven largely by the growth in life and pension funds.
- Liquid financial wealth (excluding life and pension funds) is not predominantly held in risky form. By far the most commonly held asset is an interest-bearing account at a bank or building society account. Of people with positive (liquid) financial wealth, more than half is held in savings accounts.
- The importance of risky assets in an individual's portfolio varies according to their characteristics. The unconditional portfolio share held in risky assets (i.e. averaged across those with and without any risky assets) rises with both age and total financial wealth. However, most of the variation in unconditional portfolio shares is due to differences in ownership rates as opposed to the proportion of the portfolio held in risky assets. Looking only at the people within each wealth decile who have risky assets, the conditional portfolio share is relatively constant across wealth, suggesting a possible role for entry costs or other fixed costs in explaining portfolio holdings. Multivariate analysis shows that the conditional portfolio share in risky assets actually falls with age as classical portfolio theory would predict.
- Finally, the tax treatment of savings products has an effect on portfolio choice. Separate probit regressions for the ownership of tax-favoured assets and similar assets without the tax exemption, show that, controlling for other factors, marginal tax rates are important

in determining asset ownership. These results are in accordance with those found by Poterba in the US.

I INTRODUCTION

This paper provides empirical evidence on the portfolios of UK households and their evolution in recent years. We argue that household portfolios in the UK share many features with those of many other countries. By far the most important items of household portfolios are housing and private pensions, jointly accounting for nearly two-thirds of total wealth. Within the group of financial assets, there are wide differences in ownership rates between different households and relatively low levels of portfolio diversification, in terms of both the proportion of households holding equity directly and the portfolio share of directly-held equity. Age, income and education are important factors in describing the level of financial wealth that households have, and their degree of portfolio diversification. We estimate age and wealth profiles for the ownership of risky assets and for conditional portfolio shares and show that, as in other countries, and the US and Italy in particular, the ownership profile displays more of a pronounced 'hump shape' across age groups than does the conditional share.

There are several key episodes in the evolution of UK household portfolios that are of particular interest in comparison to other countries. The first is the experience of the UK in the 1980s. This was a decade that saw dramatic, and rapid, changes in the levels of ownership of different assets – private pensions, housing and stocks and shares.[1] In all cases, government 'supply side' policies were fairly critical in driving the changes – through the introduction of personal pensions, through the 'right-to-buy' policy, which sold off public housing to tenants at considerably less than the market rate, and the privatisation of nationalised industries. In the case of share-ownership, for example, the proportion of

households owning shares more than doubled during a four-year period in the mid-1980s coinciding with the privatisation of British Telecom and British Gas. The extensive advertising provided by the government for its privatisation programme appeared to have been successful in attracting new shareowners from younger and less well-educated groups (although not typically from middle or lower-income groups). There is some evidence that the privatisation experience – as well as reductions in transactions costs – had the effect of raising the level of share-ownership more generally. Households who were too young to have experienced privatisation directly are more likely to own shares than older cohorts at the same age. But the argument that the privatisation process may have played an educational role in teaching people about share-ownership is limited by the fact that a large proportion of shareowners at the end of the 1990s only hold shares in privatised industries – or the recently de-mutualised building societies. Section IV discusses this episode in more detail.

A second key feature of the UK is the government's use of tax incentives to try to encourage saving – through private pensions and through designated 'tax-free' savings schemes such as Tax Exempt Special Savings Accounts (TESSAs), Personal Equity Plans (PEPs) and Individual Savings Accounts (ISAs). Section V provides a detailed discussion of the current tax treatment of different assets in the UK and presents some evidence on the importance of tax effects on household portfolios. For reasons of brevity, we do not describe the system or institutional factors in the UK in particular detail apart from where necessary. Useful summaries of these issues include Budd and Campbell (1998) on pensions, and Banks and Blundell (1994) on savings institutions more generally.

II DATA SOURCES

For a country that has been typically at the forefront of micro-data collection there is surprisingly little information on household portfolios. Ideally we would like to know how

much wealth is held in which different assets and by which people. Such an analysis is not possible using any of the official household surveys in the UK. Compared to many other countries, the information available on wealth is poor, a situation which is not the case for, say, income or expenditure.

We can look at *ownership* by exploiting information on spending and income in the *Family Expenditure Survey* (FES) to identify whether or not households have particular assets (although not how much they have).[2] FES data on incomes and expenditures have been used extensively in the analysis of consumption growth, both over time and by different types of households (see Attanasio and Weber (1993) and Banks and Blundell (1994), for example). The FES contains almost no information on individuals' stocks of wealth but information on interest income received from interest-bearing accounts, dividend income from stocks and shares and contributions made to private pensions and life insurance policies can be used to construct indicator variables for whether or not households in the FES have particular assets. This is not as rich a data source as if we had information on the value of each asset, but the big advantage of the FES is that it has been collecting consistent data on income, spending and demographics every year since 1978. Thus it is possible to set up a cohort (or pseudo-panel) dataset to document changes for different generations over the last twenty years — a unique opportunity to study long-term trends in asset ownership using micro data. These pseudo-panel techniques have become common empirical approaches for the analysis of dynamic economic relationships when long panel data is not available (see Deaton (1985)).

To looks at *amounts* of wealth held, we draw on a privately collected survey — the *Financial Research Survey* (FRS) collected by National Opinion Polls. This is an ongoing survey collecting information on around 4,800 individuals per month. Information is obtained on all financial assets and liabilities held, with banded data on balances for most, as well as specific brand and product ownership information for almost all. The survey also

has demographic variables relating to the household of which the individual is a member, some data on incomes and summary information on other financial products, such as pensions, mortgages and insurance. Two earlier years of this survey were used by Banks, Dilnot and Low (1994) to document the distribution of wealth in 1987–88 and 1991–92,[3] but in the majority of the analysis below we use data covering the period January 1997 to June 1998[4] although we also draw on results from earlier years.

It is worth pointing out that the primary unit of observation in the FRS is the individual rather than the household, although some questions do refer to the household in which they reside and the characteristics of other household members. This makes it difficult to draw direct comparisons between the FRS and other surveys such as the FES where the primary unit of analysis is the household.

A further issue is that wealth values in the survey are collected in bands. For the purposes of this paper, we use the mid-points of the bands and an imputed value for top-coded individuals to estimate holdings.[5] In cases where people say they have a particular asset but cannot recall, or refuse to say, the balance, we impute the median value of those of the same age band and education group who hold that asset.[6]

A final issue that arises with any household or individual survey of wealth is the degree to which they accord with aggregate measures. The FRS does not over-sample the wealthy and, given the inequality in the distribution of wealth, this leads to grossed-up totals for total financial wealth, and individual components, substantially under-representing the aggregate wealth of the economy.[7] Banks, Dilnot and Low (1994) and Banks and Tanner (1999) show that the FRS only accounts for around 40% of aggregate financial wealth. The under-representation of the wealthiest UK households in the FRS is confirmed in Table 4 below where it is clear that the top 5% of the FRS wealth distribution look similar to the top quarter of the distribution, a situation unlikely to be the case given the large degree of

inequality of financial wealth holdings. However, asset ownership rates, and estimates of median wealth holdings will be largely unaffected by such under-sampling.

III PORTFOLIO STRUCTURES

III.1Macroeconomic data

Table 1 reports portfolio shares for different assets calculated using aggregate data at five-yearly intervals between 1980 and 1995. It shows the importance of housing and private pensions in household portfolios. In reality, pension wealth will be even more important than these figures indicate, since accrued entitlements to unfunded state pension wealth are not included. These can be substantial for current retiring cohorts, but will decline in the future following reductions in the generosity of the basic state pension and SERPS. As some guide to the potential importance of this component of wealth, the Pension Provision Group (1998) estimated that government liabilities in state unfunded pensions, given announced policy changes, are currently £950 billion — of the same order of magnitude as the amount in funded pensions and life insurance reported in Table 1.

These aggregate statistics also give an insight into some of the key changes that have occurred in wealth-holding in the UK in recent years. As in other countries, there has been a reduction in the importance of cash, transactions and savings accounts in household portfolios and an increase in the importance of pensions and other risky assets during the 1980s.

One category of financial assets, National Savings, is peculiar to the UK. National Savings is a government agency providing savings and investment vehicles that are used to finance national borrowing. But the agency provides a wide range of different assets, most of which do not have the characteristics of traditional government bonds. For example they provide short and medium term deposit accounts paying fixed rates of interest, some instant

access products, and various types of bonds.[8] In the official aggregate statistics reported in Table 1 it is not possible to distinguish between the amount of wealth held in each of these forms, hence this item represents a very heterogeneous part of the portfolio. In the microeconomic analysis that follows we are able to distinguish between different forms of National Savings products and group them with assets of similar characteristics.

Within total wealth there has been a shift towards financial assets – driven largely by the increase in life and pension funds – and a decline in the relative importance of housing wealth. Also noticeable, however, is the cyclicality of real estate wealth, due to large fluctuations in property values. Table 1 also shows an increase in household indebtedness over the period as a whole – from 11% of total assets in 1980 to 14% of total assets in 1995, although all of the increase occurred between 1980 and 1985. Perhaps surprisingly given increased use of credit cards, 'other debt' fell as a proportion of total assets over the period (and remained constant in nominal terms). However, there was an increase in mortgage lending following the deregulation of the mortgage market during the 1980s (see Muellbauer and Murphy (1990)).

However, aggregate portfolio shares do not tell us much about the asset holdings of the majority of people. Given the inequality in the distribution of wealth, only a relatively few people account for most of the total. For example, in 1995 the top 1 per cent of the wealth distribution owned 19 per cent of total personal sector wealth, the wealthiest 5 per cent owned 39 per cent of total marketable wealth and the bottom half of the wealth distribution accounted for only 7 per cent of total wealth (Inland Revenue, 1999).[9] Although this distribution is equalised somewhat by the inclusion of occupational pension rights, it is still the case that the top half of the wealth distribution account for 89%, hence changes in the aggregate statistics could be driven by changes in the behaviour of a very few – and very wealthy – individuals. For a more representative guide to the portfolios of the majority of the population we therefore turn now to micro data sources.

III.2Survey data on asset holding

Table 2 presents ownership rates from the FRS for a variety of detailed asset classes. By far the most commonly held assets are liquid interest-bearing accounts, held by almost 90% of the population. Long term deposit accounts and certificates of deposit[10] are much more rarely held. Government bonds appear to be more widely held, with one quarter of the population reporting ownership, although much of this reflects the prevalence of National Savings bonds, which tend to be held in small quantities for long time periods. Such holdings make up a very small portion of the financing of government debt (typically less than two per cent in any one year), but are held by a wide number of households. Around one fifth of the population holds equities directly, and 11.5% hold unit and investment trusts, intermediated investment vehicles which will almost always have equity components of one form or other. Again, we look at these holdings in more detail in later sections.

In addition to information on stocks of financial assets, the FRS contains limited information on the ownership of other financial products, including life insurance and pension policies. We include measures of these in Table 2. Around 22% of adults have an occupational pension. This represents around one half of employees, as is confirmed in other surveys and official statistics.[11] For personal pensions there is some evidence of under-reporting in the FRS. Table 2 shows that 8% of the FRS sample own personal pensions, whereas other studies estimate ownership rates to be around 25% of employees, corresponding to 11% of adults. Finally, life insurance funds are also one of the more commonly held assets, with 37.6% of the population owning policies in 1997-98. If anything this is an underestimate, particularly in comparison to the figures we present later from the FES data, because the FRS classification does not include life-insurance policies held in association with endowment mortgages, which were particularly popular in the home-ownership boom of the 1980s. As a proxy for the ownership of business wealth we report the proportion of the sample who are self-employed. Similarly, to proxy the

ownership of housing wealth we use a dummy to capture whether the respondent lives in a house that is owner-occupied.

Banks and Tanner (1999) present evidence from the FES to show how the prevalence of broader portfolio items has, on average, changed over time. They show that, for the group of assets encompassing savings and deposit accounts (but excluding transactions accounts), the proportion of the population holding such assets has risen only slowly over the last twenty years (see Table A1 in the Appendix for a summary of their results). In contrast, ownership of life insurance policies has declined slowly over the same period, possibly as a result of the loss of tax relief on contributions in 1984. The biggest trends in households' asset ownership rates over the last twenty years have been in the proportion of households owning stocks, pensions and housing.

Table 2 confirms that, as in other countries, financial wealth is not predominantly held in a risky form. Of people who have positive wealth, more than half of total wealth is held in the form of savings accounts. And although government bonds are widely held (almost solely as a result of ownership of National Savings products), balances are typically low and they represent only a small proportion of total financial wealth. Finally shares represent a fairly small fraction of wealth, just over 13%. Many holdings acquired as a result of privatisation and de-mutualisation are relatively small.

Table 3 presents evidence on the correlation between ownership of different types of assets, where the types are defined according to their risk. The first column considers only financial assets.

- *Completely safe assets* include saving and deposit accounts and fixed return National Savings,
- *Partially safe assets* include diversified portfolios of risky assets (mutual funds, investment trusts and unit trusts and PEPs), and
- *Risky assets* include undiversified holdings of risky assets, i.e. stocks and bonds.

The majority of the population holds either just safe assets or else a combination of completely safe and risky assets. Less than one in ten of the sample hold assets in all three categories.

In column (2) of Table 3 we consider the risk properties of a broader portfolio which adds pensions, life insurance and housing to the *partially safe assets* category since they are, at least in principle, diversified and business assets to the *risky assets* category. This reveals a greater degree of portfolio diversification. The proportion of the population with only safe assets falls from 49.9% to 12.7%. This is important to remember when considering the nature of household financial wealth portfolios. In particular, the degree to which pensions are (considered) to be safe or fairly safe assets, will obviously be an important determinant of other items of UK household portfolios, particularly given that private pension provision now covers around three quarters of employees.

Table A.2 in the Appendix presents evidence on the evolution of portfolios over time using data from the FES and constructing a classification to correspond to the above. There have been large changes in average portfolio types, particularly between 1978 and 1988. The substantial increases are in the proportion of households holding mixed portfolios, predominantly as a result of increasing ownership of shares, housing wealth and pensions.

III.3Variation by age and wealth – univariate analysis

Unconditional population averages conceal important variation in portfolio allocations. Table 4 shows how portfolio shares vary according to total financial wealth (limited information on housing and pension wealth means that we cannot look at portfolio shares out of total wealth[12]). We divide the sample of people with positive financial wealth into wealth quartiles, and also look separately at the portfolios of the wealthiest 5% (who are also included in the column for the top quartile). As one would expect, the concentration in risky assets increases further up the wealth distribution, although in the top quartile risky

assets are more likely to be held in the form of investment trusts, unit trusts and PEPs as opposed to direct holdings of stocks. In the UK the privatisation of previously nationalised utilities and the de-mutualisation of building societies brought share ownership down the wealth distribution into areas of the population who were not previously typically holding other forms of risky financial assets. The prevalence of government bonds in the bottom quartile reflects the importance of National Savings products for lower income or wealth households, possibly as a result of their being sold in post offices. These assets are not so important in the middle of the wealth distribution. What is also striking in Table 4 is the degree to which the portfolios of the top 5% of the wealth distribution resemble those of the top quartile, pointing at the undersampling of the very wealthy in the FRS data. *A priori*, given the inequality in the wealth distribution, and particularly in the distribution of liquid financial wealth, one would expect this group to be holding substantially higher fractions of risky assets.

Table 5 looks in more detail at portfolio shares held in risky assets across the wealth distribution, dividing those with positive financial wealth into deciles. The first column of the table gives the average portfolio share held in risky assets across all households in the decile.[13] This 'unconditional' share rises with wealth, as would be expected. However, such an average compounds two effects — the probability of holding any risky assets at all, and the amount held in risky assets by those who hold them. These two effects are separated out in columns (3) and (4). Column (3) shows that the proportion of each decile holding any risky assets rises with wealth as would be expected. However, looking at the average portfolio share only for the households that have some risky assets (the 'conditional' share) there is little variation by wealth level, indicating that entry costs may be important in determining portfolio choices. On average, those who have any risky assets hold around half of their financial asset portfolio in risky assets, and this fraction does not vary substantially with size of the portfolio.

Table 6 presents the results of a similar analysis of portfolio shares by age. Both the unconditional shares and the ownership rates of risky assets display a hump shaped age profile, at least in cross-section. The proportion of people with positive wealth who hold risky assets rises and peaks at ages 50-70 at almost two-thirds, before falling in the oldest age group. This downturn could be a result of trading out of risky assets as individuals age or could represent a cohort effect, i.e. that these older households were never as likely to own risky assets.[14] The hump shape in unconditional risky asset shares (for those with positive wealth) is more pronounced, with a fall of over 25% between the 50-59 and 70+ groups. Once again, however, looking at the 'conditional' shares, for only those holding risky assets, the profile is to a large extent flat. The one exception here is for the very oldest group of the population, who, if they hold risky assets, tend to hold less of their wealth in this form than their younger counterparts.

Finally, drawing on the analysis of earlier years of the FRS data in Banks, Dilnot and Low (1994) it is possible to look at how this age profile for ownership of risky financial assets has changed over time.[15] Table A3 in the Appendix compares the most recent ownership profiles to those from earlier years of data, (adjusting the group of risky assets slightly to get a definition that is comparable across years). It shows that, if anything the age profile has become slightly less hump shaped (at least in relative terms) as a result of a disproportionate increase in risky asset holdings amongst the youngest individuals in the sample.

III.4 Variation by age and wealth – multivariate analysis

In the final part of this section we estimate age and wealth profiles for the ownership and importance of risky assets conditioning on other covariates, and allowing for time effects. As is well known, interpreting a cross-sectional pattern across groups as an age-profile potentially conflates age, cohort and time effects. Hence some identification strategy

is required for such an interpretation to be valid. When one is considering either the likelihood of risky assets being held, or their relative importance in the portfolio, cyclical asset returns ought to be important, and hence time effects (picking up movements in the profile from one year to the next) will be crucial. We choose to allow unrestricted time effects and are required to assume away cohort effects to interpret differences across age groups as a true 'age-profile'.[16]

Table 7 presents the marginal effects from two Probit regressions relating the probability of ownership of risky assets to age bands and wealth deciles, with a number of other control variables, including income deciles, education, household composition, regional effects, ethnic group and home ownership status.[17] The sample is restricted to individuals with positive financial wealth to facilitate the construction of wealth deciles and portfolio shares for risky assets. The age profile in ownership rates retains its humped shape, whether one controls for wealth levels or not, with the likelihood of ownership of risky assets rising until age 65 and then falling for retired households. The degree of 'hump shape' in the profiles is, however, reduced when one controls for the level of wealth; the difference between someone aged less than 30 and someone aged 60-64 falls from 23 percentage points to around 12 percentage points. The effect of education is also reduced, but remains positive and significant. Ownership of risky assets increases with wealth, even controlling for these other factors, as would be expected.

Turning to the age and wealth profiles for the conditional portfolio share, the profiles look very different. The estimates for selectivity adjusted regressions of the portfolio share on the same variables as above are presented in Table 8. That is, the Probits from Table 7 are used as first stage regression in a two-step Heckman procedure where we omit regional dummies from the conditional share equation to identify the selection term (see Heckman (1979)). When controls for wealth are not included the age profile for the conditional share looks relatively flat (particularly for age 30 and above) with the only significant parameter

being for those aged over 75, who are likely to hold less of their wealth in risky forms. The flatness of the age profile is in keeping with the univariate results in Table 6 and is similar to the findings for other countries, particularly the US and Italy. While the differences by education (particularly higher education) are statistically significant they are small in magnitude, with the most educated only holding 7 percentage points more of their portfolio in risky forms. Controlling for wealth, the conditional share falls more substantially by age (statistically significantly after age 40) and the educational differentials are less substantial, as one would expect. Finally, once one gets above the lowest decile, the conditional share broadly falls as wealth rises. This is in keeping with the simple theoretical predictions of classical portfolio theory.

Taken together these results imply that most of the variation (across age or wealth) in the importance of risky assets in household portfolios measured by the unconditional portfolio shares is due to differences in ownership rates as opposed to the proportion of the portfolio held in risky forms. This would suggest a possible role for entry costs or other fixed costs in explaining portfolio holdings. Were we to have data on conditional shares prior to 1987 we could test this hypothesis more directly, since there is some evidence that such costs fell in the mid-1980s during the period of privatisation of large parts of the public sector industries and the deregulation of financial markets in the UK. It is to this episode that we now turn.

IV Share-Ownership and the Privatisation Episode

The 1980s were a period of enormous change in wealth ownership in the UK. The number of people with shares and private pensions and owning their homes increased dramatically during the decade (see Table A1 in the Appendix). In each case, government policies were important factors driving the changes – in particular the introduction of personal pensions, the ‘right-to-buy’ policy which sold off public sector houses to their

tenants at below-market prices and the privatisation of nationalised industries. In this section we focus on the rise in share-ownership, and make use of FES data to look at ownership rates of stocks and shares since 1978. Although the information on share ownership is imputed (from receipt of dividend income), it matches well to all other sources of information on share ownership in the UK over this period.[18]

Figures from the FES show that at the beginning of the 1980s, fewer than one in 10 households owned shares directly. By the end of the decade, it was more than one in five. Most of the increase occurred during a concentrated four-year period from 1985 to 1988, coinciding with the heavily advertised flotation of a number of public utilities, including British Telecom (1984) and British Gas (1986). Cohort profiles of share-ownership are plotted in Figure 1. Share-ownership increased around the time of privatisation across almost all cohorts, but particularly among people who were in their 30s, 40s and 50s at the time. The cohort born between 1944 and 1948, for example, experienced a rise in the level of share-ownership from 6% in 1984 (when their average age was 38) to 28% in 1988.

As the level of share-ownership has increased, the profile of a typical shareholder has changed over time. Shareholders are, on average, younger and relatively less well-educated than twenty years ago. The average age of heads of households owning stocks and shares fell from 56.5 in 1978 to 51.7 in 1996 (while the average age of all household heads did not change significantly over the same period). And the proportion of share-owners with higher education has fallen. In 1978, 63.7 per cent of households with shares had a head with post-compulsory education, compared with 33.5 per cent of all households. By 1988, the proportion of share-owning households with heads with post-compulsory education had fallen to 61.7 per cent, while the proportion of all household heads with post-compulsory education had actually increased to 41.3 per cent. However, while the differentials in share ownership between age and education groups have fallen, multivariate analysis shows that the differential effect of income actually increased over the period as a whole. These

findings fit the conclusions of Haliassos and Bertaut (1995) in their analysis of low levels of share ownership in the US. They attribute relatively low levels of share ownership, given the size of returns, to a lack of information. They conclude that an increase in share ownership may be brought about by extensive initial advertising plus a continuous flow of information, but that this may not be effective in drawing stockholders from lower income groups. This is exactly what happened in the UK during the 1980s. Extensive initial advertising at the time of privatisation resulted in higher levels of share-ownership among younger and less well-educated households, but share-owners were still predominantly drawn from those at the top of the income distribution.

Clearly a large part of the increase in share-ownership is attributable to privatisation and the fact that a number of people became shareholders for the first time by buying shares in privatised industries. An obvious question is whether people's experience of buying privatisation shares had a knock-on effect raising levels of share-ownership more generally. If relatively low levels of share-ownership reflect high transactions costs – and informational costs – then the increase in share-ownership following privatisation is likely to have resulted in higher levels of ownership of other shares as people learned about share ownership through privatisation. In fact, even in the absence of privatisation, we would expect falling transactions costs since the early 1980s, and in particular the reduction in stamp duty on share purchases,[19] to have meant more widespread share-ownership.

The evidence on this issue is mixed. The cohort profiles show that the very youngest cohorts — those who were too young to experience privatisation first-hand — have levels of share-ownership that are higher than those of older cohorts at the same age. This suggests that the increase in share-ownership since the early 1980s was not restricted simply to those cohorts who could directly buy shares in privatised industries. But evidence on the types of shares that people hold shows that, even by the late 1990s, a large number of share-owners still own shares only in denationalised industries – or in a demutualised building society. In

the latter case, the fact that someone owns shares arises not from any active decision to purchase shares on their part, but is a windfall to anyone with a mortgage/ savings account with a building society at the time that it converts to a bank.[20] This form of share-ownership is fairly widespread. For example, the British Household Panel Survey collected information on whether anyone had received a conversion share windfall in the twelve months prior to September 1997, a period that included the conversion of the UK's largest building society, the Halifax. In total one quarter of the sample reported that they had received shares over this period. Of course, not everyone who received a windfall kept the shares, but only 17% of those who received a windfall said that they spent it (and therefore definitely cashed in their shares).

Table 9 summarizes equity holdings in the 1997-98 FRS according to the type of shares that people have. It highlights the importance of denationalisation – and demutualisation – in explaining relatively high levels of share-ownership in the UK. Nearly two-thirds of all shareholders (64%) own shares in a demutualised building society or a denationalised industry and nearly 40% of shareholders only own shares in this form. The prevalence of mutual funds in share-ownership is likely to reflect relatively high levels of ownership of Personal Equity Plans, which represent a tax-advantaged way to own shares (we discuss these further in the next section).

So what lessons can be drawn from the experience of privatisation in the UK? It clearly had a big effect on levels of share-ownership, causing the number of households owning shares to more than double in the mid-1980s. But, evidence that privatisation played an educational role in encouraging share-ownership more generally is limited. It is true that levels of share-ownership among younger households are higher than they were twenty years ago, possibly reflecting more widespread knowledge about share-ownership and lower transactions costs. But ten years after privatisation, many people with shares have very limited shareholdings, often still holding shares only in denationalised industries – or in

recently demutualised industries. It is worth bearing in mind when considering the degree of portfolio diversification in the UK that a very large proportion of shareholders who acquired shares through privatisation or demutualisation own shares in only one company.

V TAX INCENTIVES AND ASSET HOLDING

The final issue we deal with in this paper is that of potential tax effects on household portfolios. This is an important issue in the UK where the tax treatment of different financial products varies considerably. This is a result of the introduction of several 'designated' tax-free savings schemes introduced over the past twenty years specifically with the intention of promoting saving (either in aggregate or within certain groups) as well as successive reforms to the tax treatment of individual assets, such as housing and pensions.

Jim Poterba (2000) has highlighted six margins at which one might expect tax to matter in portfolio decisions — the selection of assets, the allocation of wealth into the various assets of the portfolio, the location of assets within broader tax ‘envelopes’, the use of borrowing, the frequency or timing of trading and finally, the use of intermediaries to hold portfolios. Of these margins, only the borrowing and frequency of trading margins are likely to be relatively unimportant given the current UK system. With the introduction of Personal Equity Plans in 1986 and Individual Savings Accounts in 1999, both of which allow individuals to earn tax-free returns on assets held within the scheme, the issue of tax envelopes has become a real one in the UK as in the US. Unlike the US, however, there are no restrictions on when, or how often capital can be withdrawn from the plan. Prior to the introduction of PEPs and ISAs, however, the selection and allocation margins will have been the most important, but estimating tax effects in this earlier period is complicated by the fact that there was little variation in tax treatments (over and above the individual’s marginal tax rate) that was not also correlated with variation in the risk, return or liquidity characteristics of the assets in question. Hence we focus on the decision to hold designated

tax-exempt saving products. The incentives to hold savings in this form should be greater for individuals with higher marginal tax rates.

Table 10 presents a summary of the current tax treatment of different classes of assets according to whether tax is imposed on contributions, returns or withdrawals.[21] The form of saving with the least favourable tax treatment is money held in an interest-bearing account. Not only is the income paid into such an account taxed at the marginal rate but the full nominal interest income is also taxed – at either 20% if the individual is a lower or basic-rate tax-payer or 40% if the individual is a higher rate tax-payer.[22] In the case of direct holdings of stocks and shares, both the contributions and returns are also subject to tax, although tax is only payable on capital gains greater than an annual allowance (currently £7,100) which means that, in reality, very few individuals pay capital gains tax. The important exceptions to this treatment of cash and equity are the specially designated tax-free savings schemes – before 1999 a PEP or TESSA and after 1999, an ISA. All three receive the same – pre-paid expenditure – tax treatment. In other words, payments into the scheme are taxed but returns and withdrawals are tax-free (see Box for details).

Clearly, higher-rate tax-payers have the biggest incentive to hold TESSAs and PEPs instead of ordinary interest-bearing accounts or direct holdings of equity. Table 11 shows that, unconditionally, they are much more likely to own TESSAs and PEPs than basic rate tax-payers or non tax-payers. 28% of higher rate tax-payers hold PEPs only, 5% hold TESSAs only and 7% hold both a PEP and a TESSA. The fact that 6% of non tax-payers also hold at least one of these tax-free savings schemes might reflect previous savings decisions made when they were tax-payers. Also, both products do offer rates of return that are competitive with similar non tax-free savings vehicles, and both have been fairly heavily advertised.

PEPs were introduced in 1987. They provided tax relief for limited direct and indirect holdings of equity or certain unit or investment trusts (up to £6,000 a year in a general PEP and £3,600 in a single company PEP). The total amount of money held in PEPs by April 1999 (after which no new PEPs could be taken out) was £58.6 billion[23] and they were held by more than one in 10 individuals.

TESSAs were introduced in 1991. They provided tax relief for interest income on funds held in designated bank and building society accounts, provided that the capital remained untouched for five years. Savers could invest up to £9,000 over the five years — £3,000 during the first year and £1,800 in each of the four subsequent years, up to the maximum. Approximately 2 million TESSAs were opened during the first three months that they were available. By March 1999, the total amount invested in TESSAs was just over £30 billion held in 5.7 million accounts.[24]

ISAs replaced TESSAs and PEPs from April 1999. They provide a single tax-free savings vehicle for holdings of cash, life insurance and stocks and shares. They are subject to an overall annual investment limit of £5,000 (£7,000 in the first year) with separate limits of £1,000 on the amount that can be invested in life insurance and £1,000 (£3,000 in the first year) on the amount that can be invested in cash. This is a lower amount than could have been invested in a TESSA and PEP Also, the rate of the dividend tax credit has been reduced from 20 per cent in a PEP to 10 per cent in an ISA making the total value of the tax relief less generous. However, ISAs offer an opportunity for tax-free saving to people who do not want to hold equity or tie their money up for five years – typically poorer savers.

Of course, the correlation between tax status and take-up of tax-free savings schemes could simply reflect the effect of other factors such as age, income, wealth or education that are correlated with tax status. In Table 12 we pursue an analysis corresponding to that of Poterba and Samwick (1999). The first four columns of the table report the results of a probit regression of PEP ownership on tax status and these other characteristics, both with and without controls for wealth.[25]

As in the US, there is some evidence that tax has an effect on portfolio choices, as would be predicted by the theory. Being a non tax-payer reduces the probability of having a PEP by 6 percentage points (compared to being a basic rate tax-payer), while being a higher rate tax-payer increases the probability of being a PEP holder by 6 percentage points, even conditional on age, education, wealth and other demographic variables. However, there is always the possibility that unobservables, affecting both tax status and portfolio choices, are driving the correlation picked up in the first four columns of Table 12. More striking,

therefore, are the results presented in the fifth to eight columns of the table, where we perform the same analysis for ownership of unit trusts and investment trusts, which are similar investment vehicles to PEPs, but subject to tax.[26]

Although there are still significant effects of tax status on the probability of ownership, suggesting that some of the observed effect of tax status on PEP ownership may have been picking up broader income effects, non-linearities in the effects of other characteristics, or unobservables. However, the coefficients on tax status in the regressions for ownership of unit trusts and investment trusts are far smaller than they are for PEPs, suggesting that tax status has a much bigger effect for tax-free savings products, as we would expect. In particular, when controlling for wealth, individuals with high marginal tax rates are only 0.7 percentage points more likely to hold a unit trust or investment trust, compared with being 6 percentage points more likely to hold a PEP. The estimates, therefore, suggest that there is evidence of tax effects, at least in the selection of assets within household portfolios, as found in the US.

VI Conclusions

This paper provides empirical evidence on the portfolio holdings of UK households. Since household portfolios are diverse, and the inequality in wealth holdings is high, aggregate figures are not necessarily good indicators of the portfolios of the majority of households. Additional data from surveys of individuals and households is therefore also used to look at portfolio patterns. A number of key patterns emerge.

Large amounts of wealth are held in the form of pensions and housing. To get a true measure of the degree of portfolio diversification it is important to take this into account, since pensions and housing are risky assets. Looking only at holdings of financial assets (not including pensions), most households do not hold large fractions of their financial portfolio in risky assets. A possible explanation is that transaction costs or information failures

generate inertia in the demand for risky financial assets. Such a hypothesis is consistent with the finding that conditional portfolio shares of risky assets are typically large, even for those with low levels of wealth or for younger individuals. Even controlling for other characteristics, the conditional portfolio share for risky assets does not display as much variation as the ownership probabilities, nor as much as the classical theory (in the absence of such transaction costs or information failures) would predict.

The UK has experienced growth in holdings of risky financial assets over the last twenty years. During the 1980s, shares in newly privatised industries were taken up by many people who had not previously owned shares. By the end of the 1980s the differentials in share ownership between age and education groups had fallen, although the differential effect of income actually increased over the period. This finding fits the analysis in Haliassos and Bertaut (1995) on the likely effects of increased information on patterns of share-ownership. However, the argument that privatisation played an educational role in teaching people about the process of – and benefits from – shareownership is limited by the fact that even by the 1990s a large number of shareowners owned shares only in privatised (or recently de-mutualised) companies.

Finally, we have analysed the tax treatment of savings products in the UK, and the potential effects on portfolio choice. Probit regressions for the ownership of tax-favoured assets, in comparison to similar assets without the tax exemption, show that, controlling for other factors, marginal tax rates are important in determining asset ownership. These results are in accordance with those found by Poterba in the US.

Although the UK has highly-developed financial markets, a wide variety of financial products available, and considerable variation in the taxation of assets, ultimately we are limited in our ability to test rigorously the predictions of portfolio theory (either neo-classical or otherwise) by a lack of data. As in many countries, there is very little information on household portfolios and none on potential transaction costs, information

failures, or other forms of rigidities that may lead to inertia in household portfolios, although the limited evidence suggests that such issues are important. A high priority for future research is to collect information on such variables, along with more detailed information on portfolios, including housing and pension wealth.

VII REFERENCES

Attanasio, O. and G. Weber, 1993, Consumption growth, the interest rate and aggregation, *Review of Economic Studies.*

Banks, J. and R. Blundell, 1994, 'Taxation and savings incentives in the UK', in *Household Saving and Public Policy*, ed. J. Poterba, University of Chicago Press.

Banks, J., A. Dilnot and H. Low, 1995, 'Patterns of financial wealth holding in the UK', in *New Inequalities: An inquiry into the link between income and wealth* ed. J.Hills, Cambridge University Press.

Banks, J., and S. Tanner, 1999, *Household saving in the UK*, London: IFS.

Budd, A. and Campbell, N. (1998), 'The roles of the Public and Private Sectors in the UK Pension System', in Feldstein, M. (ed), *Privatizing Social Security*, National Bureau of Economic Research, Chicago: Chicago University Press.

Davies, J. and A. Shorrocks, 2000, 'The distribution of wealth', forthcoming in A.B. Atkinson and F. Bourguignon (eds.) *The Handbook of Income Distribution*, North-Holland.

Deaton, A., 1985, 'Panel data from a time-series of cross-sections', *Journal of Econometrics.*

Emmerson, C. and Tanner, S. (2000) 'A note on the tax treatment of pensions and Individual Savings Accounts', *Fiscal Studies*, 21(1) 65-74.

Haliassos, M. and Bertaut, C. (1995), 'Why do so few hold stocks?', *Economic Journal*, 105, 1110–29.

Heckman, J. (1979), 'Sample selection bias as a specification error' *Econometrica*, 47, 153-161.

Inland Revenue, 1999, *Inland Revenue Statistics*, London: HMSO.

Johnson, P. and S. Tanner, 1998, 'Ownership and the Distribution of Wealth' *Political Quarterly*, Vol. 69 (4) 365-377.

Muellbauer, J. and Murphy, A. (1990), 'Is the UK balance of payments sustainable?', *Economic Policy*, 11, 345–83.

Pension Provision Group (1998), *We All Need Pensions: The Prospects for Pension Provision*, London: The Stationary Office.

Poterba, J. (2000), Taxation and portfolio structure: issues and implications, paper prepared for portfolio conference http://www.iue.it/FinConsEU/programme2.htm

Table 1

Composition of household wealth

	1980	1985	1990	1995
Financial assets				
Total financial assets	£273 bn	£646 bn	£1160 bn	£1973 bn
Proportion of total financial assets in:				
Cash, transaction and savings accounts	0.337	0.275	0.286	0.215
National savings	0.040	0.047	0.031	0.028
Bonds	0.046	0.033	0.006	0.008
Stocks	0.139	0.113	0.095	0.171
Unit trusts and investment trusts	0.010	0.015	0.014	0.028
Life and pension funds	0.348	0.450	0.506	0.494
Other	0.080	0.067	0.064	0.056
Total financial assets	1.000	1.000	1.000	1.000
Total assets				
Total assets	£717 bn	£1316 bn	£2512 bn	£3134 bn
Proportion of total assets in:				
Financial assets	0.382	0.464	0.434	0.551
Real estate wealth	0.431	0.395	0.456	0.352
Building trade, assets and land	0.079	0.055	0.041	0.029
Consumer durables	0.107	0.086	0.069	0.068
Total assets	1.000	1.000	1.000	1.000
Debt (as proportion of total assets)				
Mortgages	0.070	0.092	0.109	0.121
Other debts	0.045	0.055	0.030	0.023

Note: Figures for financial assets (given in current prices) are taken from the personal sector balance sheet. Figures for total assets are taken from official wealth statistics compiled by the Inland Revenue Statistics. The personal sector balance sheet includes assets of non-profit organisations and is therefore not strictly comparable with the Inland Revenue Statistics series which are computed for the household sector. This accounts for the discrepancy between total financial assets in row 1 and the product of total assets (row 10) and the share of total assets that are held in financial assets (row 11). We stick to both sources of data here because of the extra detail afforded on financial assets by the personal sector balance sheet.

Table 2

Detailed asset and debt ownership rates: FRS 1997-98

	Proportion with	Mean portfolio share
Transactions accounts	0.778	—
Savings accounts	0.617	0.568
Deposit accounts	0.154	0.128
Government bonds	0.253	0.065
Other bonds	0.036	0.023
Stocks	0.216	0.131
Investment trusts, unit trusts etc.	0.115	0.084
Personal pensions (DC)	0.080	—
Occupational pensions (predominantly DB)	0.223	—
Life insurance policy	0.376	—
Housing wealth	0.598	—
Business wealth	0.046	—
Mortgage/real estate debt	0.318	—
Loan	0.142	—

Note: Mean portfolio share computed for those with positive financial wealth only.
Source: Financial Research Survey, 1997/98

Table 3

Diversification of household portfolios — financial assets only

CS	PS	R	Proportion of sample using narrow definition	Proportion of sample using broad definition
0	0	0	0.0950	0.0579
0	0	1	0.0013	0.0008
0	1	0	0.0003	0.0364
0	1	1	0.0003	0.0019
1	0	0	0.4990	0.1274
1	0	1	0.2901	0.0388
1	1	0	0.0281	0.3768
1	1	1	0.0859	0.3601

Note: Narrow definition: Completely safe(CS): Saving and deposit accounts, fixed return National Savings Products; Partially Safe (PS): Mutual funds and investment trusts; Risky (R): Equity, Bonds. Broad definition: Completely safe(CS): As above; Partially Safe (PS): As above, plus housing, private pensions and life insurance policies, Bonds; Risky (R): As above, plus business assets. Sample includes individuals with positive financial wealth only.
Source: Financial Research Survey 1997/98

Table 4

The composition of household financial assets, by wealth quartile

	Wealth quartile				
	I	II	III	IV	95th percentile
Proportion of total financial wealth held in ….					
Instant access savings accounts	0.793	0.811	0.414	0.255	0.234
Deposit accounts	0.026	0.038	0.181	0.265	0.228
Government bonds	0.130	0.031	0.044	0.055	0.082
Other bonds	0.001	0.002	0.017	0.075	0.088
Stocks	0.042	0.103	0.238	0.142	0.171
Investment trusts, unit trusts etc.	0.007	0.015	0.105	0.208	0.196

Note: Sample includes individuals with positive financial wealth only.
Source: Financial Research Survey 1997/98

Table 5

Importance of risky assets, by wealth

Wealth decile	Unconditional portfolio share in risky assets	Proportion with risky assets	Conditional portfolio share in risky assets
1	0.133	0.228	0.582
2	0.219	0.452	0.484
3	0.127	0.286	0.445
4	0.156	0.399	0.393
5	0.194	0.371	0.523
6	0.418	0.775	0.541
7	0.409	0.758	0.539
8	0.397	0.752	0.528
9	0.457	0.845	0.542
10	0.526	0.925	0.569
All	0.304	0.579	0.525

Note: Sample includes individuals with positive financial wealth only. 'Risky assets' include mutual funds and investment trusts, equity and bonds. The unconditional shares are computed over all households in the decile. The conditional shares are computed only over those households in the decile who hold some risky assets.
Source: Financial Research Survey 1997/98

Table 6

Importance of risky assets, by age

Ageband	Unconditional Share in risky assets	Proportion with risky assets	Conditional Share in risky assets
<30	0.227	0.414	0.549
30-39	0.284	0.517	0.549
40-49	0.324	0.595	0.545
50-59	0.359	0.657	0.548
60-69	0.344	0.659	0.522
70+	0.263	0.586	0.449
All	0.304	0.597	0.525

Note: Sample includes individuals with positive financial wealth only. 'Risky assets' include mutual funds and investment trusts, equity and bonds. The unconditional shares are computed over all households in age group. The conditional shares a re computed only over those households in the age group who hold some risky assets.
Source: Financial Research Survey 1997/98

Table 7
Probit estimation for ownership of risky assets

	Dependent variable = whether individual has risky assets			
Variable	Marginal effect	Standard error	Marginal effect	Standard error
Age				
30-34	0.061	0.010	0.047	0.011
35-39	0.103	0.010	0.068	0.011
40-44	0.118	0.010	0.080	0.011
45-49	0.116	0.010	0.063	0.011
50-54	0.173	0.009	0.088	0.011
55-59	0.201	0.009	0.107	0.011
60-64	0.231	0.009	0.123	0.011
65-69	0.220	0.009	0.074	0.012
70+	0.208	0.008	0.088	0.010
Some post-compulsory schooling	0.075	0.005	0.043	0.005
Some college education	0.149	0.006	0.090	0.007
Wealth Decile 2	—	—	0.202	0.008
Wealth Decile 3	—	—	0.031	0.010
Wealth Decile 4	—	—	0.125	0.009
Wealth Decile 5	—	—	0.095	0.009
Wealth Decile 6	—	—	0.366	0.004
Wealth Decile 7	—	—	0.361	0.005
Wealth Decile 8	—	—	0.350	0.005
Wealth Decile 9	—	—	0.397	0.004
Wealth Decile 10	—	—	0.440	0.003

Note: The base group is a less than 30 year old with only compulsory schooling in the bottom wealth decile. Both specifications also include controls for income decile, number of adults and children in household, ethic group, home ownership, a dummy to capture income non-response, and regional dummies. 'Risky assets' include mutual funds and investment trusts, equity and bonds.
Source: Financial Research Survey 1997/98

Table 8

Age, education and wealth profiles for conditional shares of risky assets

	Dependent variable = portfolio share in risky assets			
Variable	Parameter	Standard error	Parameter	Standard error
Age				
30-34	-0.009	0.017	-0.020	0.017
35-39	0.001	0.018	-0.020	0.017
40-44	-0.010	0.018	-0.034	0.017
45-49	-0.010	0.018	-0.038	0.017
50-54	0.003	0.019	-0.049	0.017
55-59	0.026	0.020	-0.042	0.018
60-64	0.018	0.021	-0.059	0.018
65-69	-0.003	0.021	-0.087	0.018
70+	-0.054	0.019	-0.128	0.017
Some post-compulsory schooling	0.021	0.007	0.010	0.006
Some college education	0.071	0.011	0.044	0.008
Wealth Decile 2	—	—	-0.107	0.029
Wealth Decile 3	—	—	-0.175	0.027
Wealth Decile 4	—	—	-0.215	0.026
Wealth Decile 5	—	—	-0.090	0.025
Wealth Decile 6	—	—	0.003	0.042
Wealth Decile 7	—	—	0.002	0.041
Wealth Decile 8	—	—	-0.007	0.039
Wealth Decile 9	—	—	0.026	0.045
Wealth Decile 10	—	—	0.072	0.049
Mills Ratio	0.133	0.038	0.129	0.049

Note: The base group is a less than 30 year old with only compulsory schooling in the bottom wealth decile. Both specifications also include controls for income decile, number of adults and children in household, ethic group, home ownership and a dummy to capture income non-response. The sample includes only individuals who own risky assets. The Mills ratio term for individual *i* is simply the selection correction term, computed by the ratio $\phi(X_i'\beta)/\Phi(X_i'\beta)$ where β are the Probit parameters from Table 7. 'Risky assets' include mutual funds and investment trusts, equity and bonds.
Source: Financial Research Survey 1997/98

Table 9: Share-ownership

Equity holdings	%
No equity holdings	73.36
Denationalised/ de-mutualised shares only	10.09
Other shares only	3.35
Denationalised/de-mutualised shares and other shares	1.74
Mutual funds only	5.07
Mutual funds and denationalised/de-mutualised shares	3.44
Mutual funds and other shares	1.15
Mutual funds, denationalised/de-mutualised shares and other shares	1.80

Note: Denationalised shares are shares held in former nationalised industries, De-mutualised shares are 'windfall' shares given to savers in building societies when these converted to banks, Other shares refer to direct holdings of equity (i.e. not in mutual funds) other than those in de-mutualised building societies or former nationalised industries, Mutual funds include unit trusts, investment funds and Personal Equity Plans

Source: Financial Research Survey 1997/98

Table 10

Tax treatment of different assets

Asset type	Tax treatment give to			
	Contributions	Income	Capital gain	Withdrawal
Interest-bearing accounts	Taxed	Taxed	—	Exempt
Stocks and shares	Taxed	Taxed	Taxed[1]	Exempt
ISAs, PEPs, TESSAs	Taxed	Exempt[2]	Exempt	Exempt
Owner-occupied housing	Taxed[3]	Exempt	Exempt	Exempt
Private pensions	Exempt[4]	Exempt[5]	Exempt	Taxed[6]

Note:

1. Capital Gains Tax only on realised gains in excess of annual allowance (currently around £7,000 per year). This allowance exceeds the realised gains of the vast majority of households.
2. 10% tax credit repaid on dividend income in ISA and PEP
3. 10% Mortgage Interest Tax Relief on interest on first £30,000
4. Employee contributions are exempt from income tax, but are subject to employer's and employee's National Insurance. Employer contributions are exempt from income tax and from all National Insurance.
5. Repayment of dividend tax credit abolished in 1997
6. Individuals can withdraw 25% of accumulation (over and above NIC contributions) as a tax-free lump sum

Table 11

Ownership rates of PEPs and TESSAs, by tax status

	Proportion of sample with			
	Neither	TESSA only	PEP only	Both PEP and TESSA
Basic rate taxpayer	0.8215	0.0517	0.1014	0.0254
Higher rate taxpayer	0.6016	0.0492	0.2774	0.0718
Non taxpayer	0.9434	0.0209	0.0301	0.0560
Total	0.8643	0.0388	0.0781	0.0188

Source: Financial Research Survey 1997/98

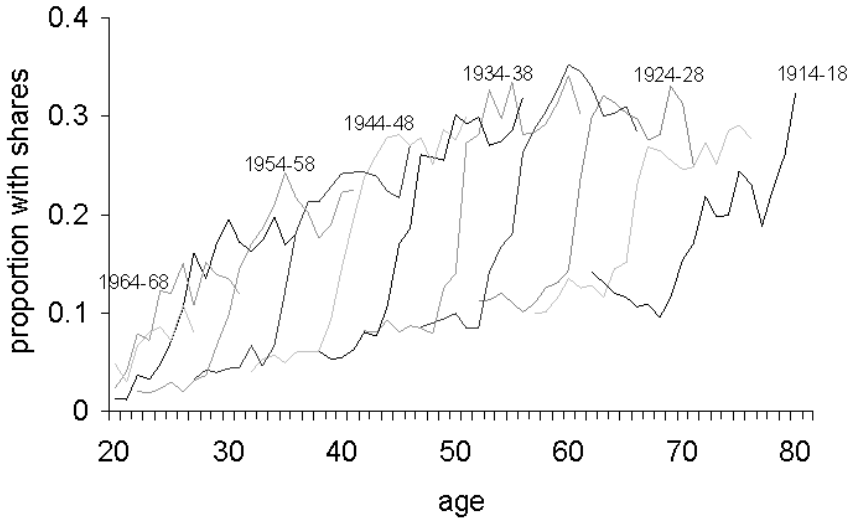
Table 12

Probit results

	Dependent variable = whether individual owns a PEP				Dependent variable = whether individual owns an investment trust or a unit trust			
	Marginal effect	*s.e.*	Marginal effect	*s.e.*	Marginal effect	*s.e.*	Marginal effect	*s.e*
Non taxpayer	-0.080	*0.002*	-0.059	*0.002*	-0.030	*0.001*	-0.021	*0.001*
Higher rate taxpayer	0.123	*0.008*	0.061	*0.006*	0.035	*0.004*	0.007	*0.003*
Wealth	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Other controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Note: All specifications include controls for age, education, income decile, number of adults and children in household, ethic group, home ownership and a dummy to capture income non-response
Source: Financial Research Survey 1997/98

Figure 1: Cohort profiles – share-ownership (FES 1978-96)



Source: Family Expenditure Survey 1978-96

VIII APPENDIX

Table A1

Broad asset ownership rates over time

	Proportion of sample, by year					
	1978	1988	1990	1992	1994	1996
Savings accounts	0.544	0.652	0.611	0.670	0.632	0.604
Bonds	—	0.025	0.017	0.017	0.014	0.012
Stocks	0.091	0.221	0.234	0.236	0.220	0.231
Life insurance	0.781	0.735	0.724	0.708	0.683	0.655
Pension	0.388	0.437	0.471	0.443	0.414	0.419
Housing	0.528	0.661	0.665	0.663	0.682	0.665
Mortgage	0.324	0.433	0.444	0.432	0.450	0.445

Notes: Sample of households with head aged 20-80.
Savings accounts include National Savings Investment and Ordinary accounts. Ownership defined on the basis of receipt of interest income during previous 12 months. **Bonds** cannot be separated from stocks in 1978, and do not include National Savings products. **Stocks** include unit trusts and PEPs. Ownership defined on basis of receipt of dividend income during previous 12 months. **Life insurance** includes fixed-term assurance, mortgage protection policies, death and burial policies, all endowment policies (including house purchase endowments) and annuities. Defined on the basis of current contributions. **Housing** includes ownership with a mortgage as well as outright ownership. **Pensions** include occupational and personal pensions, defined on the basis of receipt of private pension income or contributions made into an occupational or personal pension or payment of contracted-out rate of National Insurance.
Source: Family Expenditure Survey 1978-96

Table A2

Diversification of household portfolios over time, FES Data

Financial and non-financial assets, Broad Definition

			Proportion of the sample, by year					
CS	PS	R	1978	1988	1990	1992	1994	1996
0	0	0	0.0607	0.0722	0.0739	0.0862	0.0964	0.1096
0	0	1	0.0044	0.0054	0.0059	0.0041	0.0057	0.0041
0	1	0	0.3495	0.2172	0.2402	0.1950	0.2144	0.2213
0	1	1	0.0360	0.0477	0.0620	0.0398	0.0456	0.0539
1	0	0	0.0240	0.0277	0.0299	0.0341	0.0372	0.0378
1	0	1	0.0044	0.0055	0.0057	0.0078	0.0052	0.0073
1	1	0	0.4229	0.3783	0.3354	0.3694	0.3561	0.3195
1	1	1	0.0981	0.2459	0.2469	0.2636	0.2393	0.2465

Note: For definitions of CS, PS and R see Table 3. However, since the FES category for 'safe assets' does not include transactions accounts that do not pay interest the incidence of households with safe-only portfolios (1,0,0) is lower, and the proportion of 'none' (0,0,0) is higher than in Table 3.
Source: Family Expenditure Survey 1978-96

Table A3

Importance of risky assets, by age

	Unconditional portfolio shares, by year		
Ageband	1987/88	1991/92	1997/98
<30	0.049	0.078	0.165
30-34	0.082	0.110	0.217
35-39	0.092	0.123	0.264
40-44	0.107	0.138	0.264
45-49	0.112	0.160	0.274
50-54	0.124	0.168	0.299
55-59	0.107	0.181	0.311
60-64	0.096	0.131	0.295
65-69	0.095	0.140	0.257
70+	0.068	0.119	0.181
All	0.085	0.135	0.241

Note: Sample includes individuals with positive financial wealth only. In order to get a consistent definition over time, the definition of risky assets has been adjusted and is not directly comparable with that used in Table 6. The unconditional shares are computed over all households in age group.
Source: Family Research Survey 1987/88, 1991/92 and 1997/98

[1] For further discussion of these changes see Johnson and Tanner (1998)

[2] For a detailed analysis of the information in the FES see Banks and Tanner (1999)

[3] At that time, the survey was being conducted differently and as a result had much smaller sample sizes.

[4] We pool data across the eighteen-month period. In total, there are over 75,000 individuals in the sample, distributed evenly over the 18-month period, with an average of 4,244 observations per month. Our sample excludes people who are aged 21 or under and those in full-time education. For a detailed analysis of the information in the FRS see Banks and Tanner (1999).

[5] One alternative would be to report minima and maxima for each asset or asset group, but, when aggregating across assets, the banded estimates can very quickly become uninformatively wide, so we use mid-points instead. We have tried alternative estimators and confirmed that the results change little when using different assumptions or more flexible techniques such as grouped estimation. Primarily, this is because the bands are very tight (within £10 or £100) wherever there is a large density of data, and the number of assets held is typically low.

[6] All in all, 25% of observations require some imputation, although only 4% of the sample (i.e. less than a fifth of those for whom some imputation is required) refuse all questions on asset values. Of those who refuse some but not all of the value questions they are asked, 52% (11% of the total sample) refuse only one, and a further 19% (4% of the sample) refuse only two.

[7] A further problems arises because of top-coding which is likely to lead to an underestimation of the wealth held by the wealthiest people in the sample, in addition to the problem that the very wealthiest people in the population will not be sampled.

[8] One of these types of bonds, premium bonds, offers a return in the form of a lottery. All premium bond holders are entered into a monthly draw with the chance to win from £50,000 up to £1 million, where the chance of winning depends on total premium bond holdings. Premium bonds are currently held by around one in five households in the UK.

[9] For further discussion of the distribution of wealth in the UK and other countries, see Davies and Shorrocks (2000)

[10] This includes long notice accounts at the bank and building society, Tax Exempt Special Savings Accounts (minimum holding period 5 years) and National Savings Certificates of Deposit.

[11] The 1996 General Household Survey shows that 64% of male adults and 50% of female adults work. Of these, 77% and 88% respectively are employees, of whom around one half have occupational pension plans (Budd and Campbell, 1998). This leads to an estimate of 23% of adults with an occupational scheme, confirmed in the FES data.

[12] Even were such data available, it would be potentially difficult to interpret, particular given conceptual difficulties in the valuation of public and private pension wealth and life insurance funds.

[13] In this case we include the diversified risky assets classed as 'partially safe' in Table 4.

[14] It is worth noting that the effects of wealth related differential mortality will work in the opposite direction to offset this.

[15] Although the survey was very different in structure in these earlier years, and had a much reduced sample (of some 6,500 observations per year) it is possible to get a broad definition of portfolio shares for equities, bonds and unit trusts, investment trusts and PEPs from the earlier years. The definition of risky assets in the final column (for 1997/98) has been adjusted to get comparability across years, and hence differs from that in Table 7.

[16] This is for consistency with the approach for other countries that formed part of the international portfolios project.

[17] We have also estimated ownership probits using FES data pooled over the period 1978 to 1995 using the specification without wealth dummies but including a complete set of time effects which yielded highly comparable results. These results are available from the authors on request.

[18] For example, three other surveys – the 1987/88 General Household Survey, the 1987/88 Financial Research Survey and Proshare (1990) – all show the incidence of share ownership to be around 20% in 1988 for example. See Banks and Tanner (1999) for further information.

[19] Stamp duty was reduced from 2% to 1% in 1984 and from 1% to 0.5% in 1986. Evidence on other costs of owning shares is limited. However, figures for the average annual management charges of pension funds, which are likely to be similar to those for mutual funds, show a fall during the 1990s from 150 basis points in 1989 to 124 basis points in 1998 (Source: Money Management).

[20] In fact, behaviour by investors in anticipation of windfall shares caused many building societies to restrict shares to people who had mortgages/ savings with them several years prior to their conversion.

[21] For a detailed discussion of the taxation of pensions and tax-free savings schemes see Emmerson and Tanner (2000)

[22] Note that the rate of tax on interest income is not the basic marginal rate of tax, but was set at the lower, 20% rate of tax which existed between 1992 and 1999. Since tax is taken off at source, the lower rate was imposed so that lower rate tax-payers would not have to claim back the difference between the basic rate and the lower rate. However, from 1999 a new lower rate of 10% was set. Lower rate tax-payers can claim back the difference between this lower rate and 20%.

[23] Association of Unit Trusts and Investment Funds press release, 28 June 1999.

[24] *Inland Revenue Statistics*, 1999.

[25] Unlike Poterba (2000) we use broad marginal tax rate dummies rather than the precise marginal tax rate. A second important difference is that the marginal tax rates are self-assessed, since there is not enough income information in the survey to compute marginal tax rates.

[26] In many cases, PEPs are just the envelope in which they hold a mutual fund such as a unit or investment trust.