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THE IMPACT OF SEPARATE TAXATION ON THE INTRA-HOUSEHOLD ALLOCATION
OF ASSETS: EVIDENCE FROM THE UK

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ABSTRACT

The income tax system in the United Kingdom moved from joint to independent taxation of husbands' and wives' income in 1990. One interesting aspect of independent taxation is the ability for households to choose the division of household assets between the two spouses. This tax reform therefore creates an opportunity for households to engage in a form of tax avoidance by shifting their investment income to the spouse with the lower marginal tax rate. We use Family Expenditure Survey data to examine the impact of this tax reform on the magnitude of investment income shifting between spouses with different marginal tax rates. We find a sizeable shift in the share and incidence of asset income claimed by wives, who typically have lower marginal tax rates, as well as in the incidence of the wife claiming all the household asset income, indicating that households responded to this policy change by reallocating asset ownership.

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I. Introduction

There is considerable variation among industrialized countries in how income of married persons is taxed. Tax systems are either individual based (independent taxation) or family based (joint taxation). Countries with joint taxation fall into two categories - income aggregation, in which the sum of family income is taxed as a whole (e.g., the U.S. system) or income splitting, in which half of a couple's income is assigned to each spouse for tax purposes. Countries with income splitting or optional income splitting include Germany, Ireland, and Portugal. Many countries have moved to individual rather than family based income tax, due partly to the distortionary effects of joint taxation on labor supply and human capital investments. Countries with individual-based systems of taxation include Australia, Austria, Denmark, Finland, Greece, Sweden, and the UK. Joint taxation with income aggregation is relatively uncommon, found in Luxembourg and the US, and optional in Spain.[1]

In addition to distortionary effects on labor supply in married couples, some research has argued that marriage surpluses and penalties generated by joint taxation, generally benefiting one-earner couples and penalizing two-earner couples, can have distortionary effects on marriage and divorce. Elimination of the "marriage tax penalty" in the U.S. has received considerable discussion in the legislature in recent years. One aim of this paper is to contribute to that discussion by examining behavioral responses to a switch to independent taxation – arguably the most straightforward route to eliminating marriage tax penalties – in how married couples allocate ownership of assets within the family. These responses may have important implications both for tax revenue and for the intrafamily distribution of welfare.

The United Kingdom began taxing the incomes of husbands and wives independently in 1990. Previously, all household income was pooled for the purpose of taxation. Following the

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[1] See OECD (1994) and O'Donoghue and Sutherland (1998) for details of some countries' tax systems.

switch to independent taxation, each spouse is taxed on their own income, both earned and unearned. As with any other tax reform that alters marginal tax rates, separate taxation should affect "real" household behavioral outcomes that are traditionally examined by economists such as labor supply.[2] However, another effect of tax reforms is that they may create incentives for households to exploit opportunities to reduce their tax burden by simply re-categorizing their income without any change in real outcomes. A particularly intriguing aspect of independent taxation in the UK is the potential for intra-household tax avoidance with respect to unearned income. Under the new tax system, each spouse is taxed separately on his or her share of the household investment income. Households therefore have an incentive to re-allocate shares of investment income towards the spouse with the lower marginal tax rate in order to reduce the overall tax burden faced by the household.

Using the UK *Family Expenditure Survey* data, we examine the impact of the aforementioned tax reform on the intra-household allocation of asset income. While households in which the marginal tax rate differs between spouses will find it advantageous to re-allocate their assets, a number of households in which the spousal marginal tax rates are equal face no such incentives. Thus, the identification strategy that we employ is a difference-in-difference methodology in which we use households with no incentive to change their division of assets as a control group to measure the impact of the tax reform for households in which the separate taxation creates an incentive for income shifting. Furthermore, we exploit the fact that the tax rate differential between spouses varies across households to estimate the responsiveness of intra-household allocation of assets to the magnitude of the tax incentive.

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[2] Although they do not isolate the impact of separate taxation, Blundell, Duncan, and Meghir (1998) use separate taxation along with other income tax changes in the UK to estimate labor supply parameters for married women.

We find a significant reallocation of household investment income among households with an incentive to shift their assets. Not only do we find a modest increase in the proportion of wives having any asset income among the most affected groups, but we also find a significant increase in the fraction of household investment income held by wives, and an increase in the fraction of households in which the wife holds all of the asset income. Our analysis indicates that a 10 percentage point differential in the spouses' marginal tax rates leads to a 2.6-3.1 percentage point increase in the share of investment income allocated to the spouse with the lower marginal tax rate. However, we also find evidence that a majority of households do not fully exploit this opportunity to reduce their tax burden.

Although tax avoidance strategies such as those analyzed in this paper are likely more responsive to taxes (Slemrod 1996), only a small body of empirical research has examined tax responses in outcomes other than consumption and labor supply - that is, responses which do not involve real changes.[3] The tax avoidance literature focuses on two types of avoidance strategies. The first, timing responses, occur when households shift income to periods when tax rates are low. Burman and Randolph (1994) find that households' capital gains realizations are very responsive to transitory changes in the tax rate while Randolph (1995) finds similar evidence for charitable contributions. Goolsbee (2000) finds large increases in the taxable income of wealthy individuals in 1992, primarily due to the cashing in of stock options, prior to the 1993 increase in the marginal tax rates for the highest earning Americans. The second type of tax avoidance response is through income shifting where households reclassify income in order to reduce their tax burden. The elimination of consumer debt deductibility as part of the U.S. Tax Reform Act of 1986 led households to reduce their consumer debt but increase their mortgage debt since it remained deductible (Maki 1996). Gordon and Slemrod (1998) find that there has been

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[3] See Slemrod and Yitzhaki (2000) for a survey of the tax avoidance literature.

significant shifting of income between corporate and personal tax bases in the U.S. as the relative tax rates have changed between these two income bases over time. Our examination of investment income shifting between spouses represents a contribution to this latter literature.

This work also has implications that are relevant for tax policy reforms currently being discussed in the United States. The "marriage tax penalty" in the U.S., which recently has been the subject of much debate, is a by-product of the system of joint spousal taxation.[4] Among the proposed reforms to eliminate the marriage penalty is the possibility of changing the U.S. tax law to allow for the separate taxation of spouses (Alm, Dickert-Conlin, and Whittington 1999). Although institutional factors (e.g., divorce laws) differ between the UK and the U.S., this paper provides some evidence on the extent of the intra-household re-allocation of investment income that can be expected in the U.S. following such a proposal. Therefore, in addition to presenting evidence of the extent to which households take advantage of tax avoidance opportunities, the results presented here may be useful in estimating the possible impact of separate taxation in the U.S. on the tax revenues collected assuming households are afforded the same opportunity to shift assets.

The paper is organized as follows: The next section discusses the UK tax reforms in more detail. We then briefly discuss the data used for this study as well as the identification strategy we employ. We next present our empirical results and the final section concludes.

II. The Tax Law Reforms

Prior to April 1990, the UK income tax system was a joint system based on the family.[5] Spousal income was pooled for purposes of calculating the family tax bill. In fact, all family income was

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[4] The penalty (or in some cases, subsidy) is calculated by comparing a household's total tax burden when spouses are taxed jointly with the taxes they would pay if they could be taxed separately.
[5] The tax year begins April 6 and ends April 5.

considered to be the husband's income. Married men received a Married Man's Allowance (MMA, a tax exemption) which was larger than the allowance that could be claimed by an unmarried person, the Single Person's Allowance (SPA). Unlike in the U.S. where all labor income for a secondary earner is subject to taxation (assuming that other household income exceeds the household's exemption level), UK households were eligible for a Wife's Earned Income Allowance (WEIA) which could only be applied to the wife's labor income.[6] Any labor earnings of the wife that exceeded the WEIA was taxed jointly with other household income. Any of the WEIA not used against the wife's labor earnings was forfeited (i.e., any remaining WEIA could not be used against her unearned income or any other household income). In contrast, if the husband's taxable earnings and household unearned income were not large enough to use all of the MMA, the remainder of this allowance could be transferred to the wife and set against her labor earnings.[7]

The independent taxation of spouses began in April 1990.[8] Each spouse is taxed separately on his or her earned and unearned income. Husbands and wives are each eligible for the entire SPA, now renamed the Personal Allowance (PA). One implication of the switch to independent taxation is that since the MMA exceeded the SPA, its elimination would increase the amount of taxable household income for some couples. To offset this effect, a Married Couple's Allowance (MCA) was introduced, which was initially equal to the difference between the SPA and the old MMA. As with the old MMA, the MCA was initially set against the husband's income, and any portion unused by him was transferred to the wife. Beginning in

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[6] The WEIA was always equal to the SPA.

[7] Couples could opt to be taxed separately as single persons, except that all unearned income still had to be claimed by the husband. This option, called the "wife's earnings election" resulted in the husband only being eligible for the SPA rather than the larger MMA. Therefore, the wife's earnings election only benefited very high-income dual-earner couples.

[8] The terms "separate taxation" and "independent taxation" are used interchangeably throughout the paper.

1993, half or all of the married couple's allowance could be transferred to the wife, even if the husband had sufficient income to use all of it. The MCA gradually decreased in real value over the 1990s, due both to erosion from inflation and to a phase-out through limits on the maximum benefit from the allowance. The MCA was finally eliminated for the tax year beginning in April 2000. Appendix Table 1 contains the tax rates and allowances in the years surrounding the introduction of separate taxation.

In this paper we are interested in the implications of separate taxation for the intra-household allocation of asset income.[9] Prior to this tax reform, the allocation of assets within the household did not matter for income taxation purposes since all investment income was considered to belong to the husband. Following the tax reform, however, households could legally shift assets between the spouses. Households have two options available to them in order to shift assets. First, they can entirely shift an asset from one spouse to another by giving the asset as a gift. Although there are transactions costs involved with completely signing over an asset, there are no capital gains taxes incurred at the time when assets are given as a gift between spouses.[10] The second possibility involves jointly owned assets. The default split of joint assets for taxation is an even 50-50 split. However, spouses may legally designate an alternate division of joint assets and each spouse is taxed respectively on his or her share of the income generated by that asset.[11]

Since households are allowed to reallocate asset income between the two spouses, the switch to independent taxation gave couples an incentive to transfer assets to the spouse with the

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[9] Asset income refers to interest and/or dividends from banks, building societies, stocks, and bonds as well as property income.
[10] If the spouse receiving the gift subsequently disposes of the asset, the capital gains tax is calculated based upon the date and value of the asset when the asset was initially acquired by the household.
[11] In order to make a declaration of asset transfer for income tax purposes, including declaring some division of joint ownership other than 50/50, Form 17 must be completed and signed by both spouses and filed with Inland Revenue.

lower marginal tax rate in order to reduce the household's tax burden. In many households, this reform created an incentive to transfer a portion or even all of the household's assets to the wife since she faces the lower marginal tax rate. Furthermore, if she works very little or not at all, then the asset income shifted to her may not be taxed at all. Thus, we expect that following independent taxation, the fraction of wives with investment income as well as the wives' share of investment income will increase.

A minor but important "quirk" occurred during the shift to independent taxation. During the first year of independent taxation, the personal allowance could not be used to offset taxes on some types of asset income.[12] Thus, shifting these assets to a non-working spouse would not have reduced the household's tax burden. This feature of the tax law was estimated to have affected five million married women with income less than their personal allowance (H.M. Treasury 1995). Beginning April 1991, however, all interest income became eligible to be set against the personal allowance. We will return to the importance of this secondary change for identifying the impact of separate taxation.

III. Empirical Methods

III. A. Data

The *Family Expenditure Survey (FES)* is an annual survey of UK households, a repeated cross-section dataset that has been consistently collected across multiple decades.[13] The FES is conducted primarily for the purpose of constructing weights for the Retail Price Index, but the data are also intended for research purposes. The survey is ongoing throughout the year, and the

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[12] Specifically, interest from banks, building societies, and other deposit-takers could not be set against the personal allowance.

[13] The data are collected by the Office of Population Censuses and Surveys Social Survey Division for the Department of Employment and the Central Statistical Office. The data are maintained by the Economic and Social Research Council Data Archive at the University of Essex, http://dawww.essex.ac.uk/.

calendar month (or in some earlier years, week of the year) of the interview is reported. We are therefore able to construct data samples based on the tax year, which as we indicated previously runs from April through March.[14] A random sample of ten thousand households is selected each year, approximately seventy percent of which complete the survey. One or more face-to-face interviews are conducted with at least one household member.[15] Information collected includes household and personal expenditures, household demographics, and individual labor supply along with income and its sources. We use the monthly Retail Price Index, obtained from the Office for National Statistics, to construct an annual price index for each tax year and convert all monetary values in the data to a constant currency, the 1993-94 tax year £.

For our empirical analysis, we use data spanning from April 1984 through March 1998. However, in order to minimize the number of factors unrelated to the tax law change that may confound the time series changes that we use to identify the impact of separate taxation, a majority of our analysis restricts the number of years that we allow to three-year pre- and post-reform periods. The three tax years from April 1987 to March 1990 (inclusive) represent the period before the switch to independent taxation. The three tax years from April 1991 to March 1994 (inclusive) represent the post-reform period. As we mentioned in the previous section, there was a one-year lag before independent taxation was "fully" implemented in the sense that some investment income could not be set against an individual's personal allowance for the first tax year following independent taxation. We therefore consider April 1990 to March 1991 to be a transition period and omit this time frame from our analysis. Finally, since the UK tax system

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[14] The public use data were available on a calendar year basis through calendar year 1993, at which time it began being distributed on a tax year basis.
[15] Through 1993 the FES was collected using paper and pencil interviews. Beginning in April 1994, the collection of these data switched to using a Computer Aided Personal Interviewing (CAPI) method.

has allowances that are based on the age of the husband and wife, we limit our sample to households in which both spouses are between the ages of 20 and 60.

III. B. Identification Strategy

In order to identify the impact of separate taxation on the intra-household investment income allocation, we must first be able to identify the group of households for whom independent taxation presented the opportunity to engage in income shifting. Ideally, a panel dataset that spans the period before and after independent taxation would be available to use for our analysis. Using such a dataset, we could identify households in which the spouses' marginal tax rates differ following separate taxation as well as those households in which the marginal rates are equal. For each of these two groups of households, we could calculate their asset allocations both before and after separate taxation became effective. Under the assumption that no other behaviors (e.g., labor supply) were changed due to the tax reform, causing households to shift between these two groups, the impact of the tax reform could be estimated by comparing the relative magnitudes of the changes in asset allocations for these two groups across the two time periods. Unfortunately, no such dataset is available.

The FES provides us with a repeated cross-section of households before and after the switch to independent taxation. We can easily estimate the marginal tax rates for each spouse in the post-reform period since separate taxation is in effect. We are then able to group households in the post-reform period based upon whether the spouses' marginal tax rates are equal or if they differ. The difficulty we face is constructing groups of households in the pre-reform period to use as the "before" portion in a difference-in-difference estimator. We cannot simply apply the tax code in, say, the 1988-89 tax year in order to calculate separate marginal tax rates for husbands and wives in the 1988-89 tax year. Our approach for overcoming this difficulty is to

take the tax code in the post-reform period and apply it to households in the pre-reform period. In particular, we take the tax code from the 1991-92 tax year (the first year of our post-reform period) and apply it to the pre-reform period.[16] We are then able to estimate marginal tax rates for households in the pre-reform period which in turn allows us to construct the counterfactual "before" groups for our difference-in-difference estimator.[17]

In order for this approach of applying the post-reform code to the pre-reform period to work, we must operate under the assumption that households in the pre-reform period would not have adjusted other dimensions of their behavior, most importantly their labor supply, if they actually faced the post-reform tax code. While this assumption is not innocuous, we do not believe it will have a strong impact upon our results. For the majority of married men in our sample, the switch to separate taxation did not affect their marginal tax rate (under the assumption of a secondary earner model). Also, since only two marginal tax rates exist for most of the time periods analyzed, relatively small changes in labor supply will not cause these men to switch tax brackets. Furthermore, the literature on male labor supply elasticities consistently finds very small wage and income elasticities for men (Blundell and MaCurdy 2000). Thus, the assumption that independent taxation had a negligible effect on male labor supply and, more importantly, the marginal tax rates these men face is likely not far from the truth.

Married women, on the other hand, may have faced larger changes in their marginal tax rates. However, one must remember that prior to independent taxation, married women only faced taxes on their labor income above their own allowance amount (the WEIA) and not on their first pound earned. If there are no fixed costs of work, or if these costs are relatively small,

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[16] We use the appropriate deflator from the RPI to adjust the nominal tax brackets in 1991-92 tax code when we apply the tax code to the pre-reform years.

[17] We also created marginal tax rates in pre-reform years by applying that year's tax system to each spouse as if independent taxation was in effect. Analysis using these marginal rates is very similar to the results presented here.

married women did not face tax disincentives from participating in the labor force prior to independent taxation and the switch to independent taxation would not have increased the incentives to entering the labor force for married women. But even if the fixed costs to entering the labor force are substantial, the switch to independent taxation would have only affected the budget constraint for a small number of women. For women married to men in the 0% or 25% marginal tax bracket, the tax reform did not change their marginal tax rate on their first pound earned above the exemption amount. Women married to men in the 40% marginal tax bracket saw their marginal rate (above the exempt amount) fall from 40% to 25% following independent taxation. Thus, there might have been an incentive for a small group of women to enter the labor force following independent taxation – women married to very high income men and facing substantial fixed costs of work.

The married women who potentially faced the largest incentives to adjust their labor supply were already in the labor force. However, as with the participation margin, the women who faced changes in their marginal tax rates above the exempt amount were those women married to men in the 40% tax bracket. Furthermore, estimates of labor supply elasticities for *working* married women are relatively small (Mroz 1987; Triest 1990). In addition, Blundell, Duncan, and Meghir (1998), using UK tax reforms, including the one examined here, have found relatively small labor supply elasticities for married women in the UK. Overall, any labor supply responses for married women likely were small.

Under the assumption that the labor supply responses by both spouses to separate taxation are small, our strategy for identifying the "before" groups will impart at most a small bias on our estimates of the intra-household shifting of investment income. In an attempt to control for potential biases due to possible labor supply responses that we have outlined above, we also present regression estimates in which we include a variety of demographic controls that

are correlated with labor supply behavior. While these regressions will not capture all of the potential biases due to labor supply changes, they will indicate whether the results are robust to minor compositional changes between the different groups.

The marginal tax rates for each spouse are calculated using his or her own income, both earned and unearned. However, precisely because they are engaging in tax avoidance behavior, households should attempt to equalize the marginal tax rates on their last dollar of income. Thus, the observed marginal tax rate on the last dollar of income will obscure the incentives households have for shifting investment income between spouses. We therefore determine marginal tax rates on all income *except* investment income. Households in which the spouses have equal marginal rates on their own incomes excluding investment income will have no incentive to re-allocate their investment income following independent taxation. Households in which these marginal tax rates differ will be induced to shift investment income between spouses.

III. C. Estimating the Impact of Separate Taxation on the Allocation of Assets

After we have determined the marginal tax rates for households in the pre- and post-reform periods, we are able to examine the impact of separate taxation on the intra-household allocation of assets. However, unlike a standard difference-in-difference approach in which the incentives of the treatment induce similar behavior throughout a single treatment group, our analysis has two treatment groups with exactly opposite incentives due to separate taxation. In households in which the husband's marginal tax rate exceeds the wife's rate, the tax reform will induce a shift of investment income away from husbands and towards wives. However, in households in which the wife's marginal rate exceeds the husband's rate, the switch to separate taxation had the exact opposite effect. These households should shift investment income towards the husbands.

The latter treatment group encompasses only a very small fraction of all households both before and after the tax reform. Thus, while we include these households in all of our empirical analyses, the impact of separate taxation is identified primarily by households in which the husband's marginal rate is higher.

To examine the impact of separate taxation on the intra-household allocation of investment income, we focus on a variety of outcomes related to the distribution of investment income within households. We first examine the impact on the fraction of households in which wives have a non-zero share of investment income as well as the fraction of households in which the husband has a non-zero share. In the predominant case where the husband's marginal rate exceeds the wife's, we not only expect there to be an increase in the fraction of wives having a non-zero share of investment income, but we also anticipate an increase in the fraction of households in which the husband has no investment income.[18] The reason for this latter switch is that in cases where the husband's income excluding investment income greatly exceeds the wife's, there is an incentive to shift all of the investment income to the wife, leaving the husband with none. In addition, we examine the impact of separate taxation on the average share of investment income held by wives. In the predominant case in which the husband's rate is higher, independent taxation induced households to increase the share of investment income held by wives. Finally, we present evidence of the tax reform's impact on the entire distribution of the investment income shares held by wives rather than just focusing on the shift in the mean share of investment income.

Our difference-in-difference methodology proceeds in two phases. First, we form three groups: a control group in which the spouses have equal marginal tax rates, and the two

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[18] We limit our discussion of the expected impacts to the predominant case, where the husband's marginal tax rate exceeds the wife's, for ease of exposition. We expect an exactly opposite set of responses for households in which the wife's marginal tax rate exceeds the husband's.

treatment groups – one in which the husband has the higher marginal tax rate (Treatment Group 1) and another in which the wife has the higher marginal tax rate (Treatment Group 2). We first examine changes in the aforementioned outcome measures for the two treatment groups relative to the changes for the control group. However, we are also able to exploit an additional source of variation. Since the UK tax structure consists of multiple marginal tax bands, the magnitude of the difference in the marginal tax rates will vary across households. The larger the difference in the marginal tax rates, the stronger will be the incentive for households to re-allocate their investment income. We therefore also examine a modified difference-in-difference methodology that incorporates the magnitude of the marginal tax rate differences within the household.[19]

Table 1 presents some summary statistics for households in the pre- and post-reform groups. The top of the panel divides households in the pre-reform period into the control group and the two treatment groups. A similar breakdown is shown at the bottom of the table for households in the post-reform period. The characteristics of the households in each group across the two time periods are very similar.[20] The households in the post-reform period are slightly older and more educated although these differences exist across all three groups and is therefore not indicative of a shifting of households *between* groups. More interesting are the relative stability of the hours of work across the two time periods within each group. While these summary statistics are not definitive, they do suggest that the composition of the groups remained relatively stable over time.

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[19] The 1992 tax year introduction of the lower rate of 20% on the initial amount of income creates a minor difficulty for our construction of the tax difference groups. Also, the basic rate fell to 24% in 1996 and 23% in 1997. For consistency throughout our analysis, we treat anyone with a tax rate between 20% and 25%, inclusive, as having a tax rate of 25%.

[20] Restricting the households in Table 1 to only those with investment income also shows that the characteristics of each of the groups remains stable over time.

IV. Empirical Evidence of the Impact of Separate Taxation on Asset Allocation

IV. A. Long-Run Trends in Intra-Household Asset Allocations

To get a picture of the time-series impacts of independent taxation, we first present time-series evidence to demonstrate that the timing of the shift in investment income occurs when independent taxation is implemented. If there was a long-term demographic trend towards wives possessing a larger fraction of household investment income that differed between the treatment and control groups, then our difference-in-difference strategy may lead us to infer that separate taxation had a causal effect when in fact all we are picking up in our before/after analysis is the trend differences. However, sharp breaks in the time series of our measures of intra-household asset allocation are suggestive of a causal interpretation for our difference-in-difference estimator.

Figure 1 (a) shows the fraction of households in our sample which have some investment income, and the fraction of households in which the wife reports some such income for the tax years ranging from 1984-85 through 1997-98. Over this period, the fraction of households holding investment income slightly increases and then, somewhat surprisingly, declines over this period.[21] However, there are no dramatic shifts that would suggest that the composition of the group of households with investment income changes over this period. The time series for the fraction of wives holding some investment income parallels the fraction of households with investment income. There appears to be a slight closing in the gap between these two lines suggesting that wives are more likely to be holding investment income in households with investment income. However, there is no dramatic shift in the fraction of wives with investment income visible from this figure. Panel (b) of Figure 1 shows the fraction of households having some investment income by tax rate difference groups. The two groups shown are households

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[21] Banks, Dilnot, and Low (1995) find similar evidence of this decline using a separate data set.

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where the spouses' marginal tax rates are equal and those where the husband's rate is higher.[22] This figure reveals that the fraction of households with investment income is similar for these two groups. More importantly, time-series changes in the fraction of households with investment income are in the same direction for both groups. Although Panel (a) finds a decline in the aggregate fraction of households with investment income, Panel (b) indicates that this decline did not differ between the treatment and control groups.

Figure 2 provides some visual evidence that independent taxation caused a shift in the allocation of investment income between spouses. Panel (a) shows the fraction of wives holding any investment income for the tax rate difference groups. Prior to 1991, wives were more likely to have investment income in households in which the spouses' marginal rates were equal. Moreover, this gap was relatively constant. Beginning in 1991, however, the two series are essentially equal and remain that way throughout the remainder of the sample period. This shift is consistent with the prediction that independent taxation caused a shifting of investment income towards wives in households in which her marginal tax rate is lower than that of her husband. Although independent taxation began in 1990, one's tax allowance could not be used to offset some forms of investment income during the first year of the reform. Furthermore, since independent taxation is in effect in 1990, we use the tax structure in that year to determine the marginal tax rates of each spouse. Thus, the shift that occurs between 1990 and 1991 is not related to our procedure of assigning the post-reform tax structure to the pre-reform years. The delay in fully implementing separate taxation, therefore, provides additional leverage in identifying the effect of separate taxation.

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[22] Due to the small size and the resulting sampling variability, time series plots of asset allocations in households where the wife's marginal rate is higher appear to be somewhat erratic. Adding this group does not add any information, but rather it obscures patterns one might see for the other two groups. Therefore, we have omitted this group from the figures in which we plot the asset allocation outcomes. However, this group is included in all of the estimation that we perform.

The exact opposite effect can be seen for husbands in Panel (b) of Figure 2. Prior to 1991, husbands consistently were more likely to have some investment income in households in which they had higher marginal tax rates than their spouses. However, beginning in 1991, the two time series become essentially equal for all subsequent years. These two panels indicate that separate taxation induced households to shift investment income away from husbands and toward wives when there became a tax advantage for doing so.

The incentives for income shifting are only present for households that have some investment income. Therefore in the remainder of our analysis we restrict our attention to this subset of households. Figure 3 presents the same time-series plots as in Figure 2 but with this new restriction imposed upon the sample. Again we find noticeable and consistent gaps in the fraction of spouses having any investment income prior to the tax reform. Once separate taxation begins, these gaps between the treatment and control groups disappear.

Finally, Figure 4 presents the time-series plots for the share of the household's investment income that is held by the wife. Prior to separate taxation, wives consistently held a smaller share of investment income in households where they had the lower marginal tax rate relative to wives in households with marginal tax rates equal to that of their husbands. Beginning in 1991, as would be expected given the evidence in the previous figures, there is an increase in the fraction of investment income held by wives in households who should be induced to shift income following the tax reform. In the post-reform era, there are no differences in the wife's share of investment income between the treatment and control groups.

These time-series plots presented in Figures 1-4 indicate that separate taxation had a causal effect on the intra-household allocation of assets. All of the asset allocation measures show relatively stable differences between the treatment and control groups throughout the pre-

reform period. However, beginning precisely at the time independent taxation becomes effective, these gaps no longer exist.

IV. B. Distributional Effects of Independent Taxation

Another graphical approach to analyze the impact of separate taxation on the intra-household allocations of assets is to directly examine the distributions of investment income before and after the tax reform. We first limit our sample to households in the pre-reform (tax years 1987-1989) and post-reform (tax years 1991-1993) periods. Then, within each of our tax rate difference groups, we examine how independent taxation affected the distribution of the wife's share of investment income among those households with investment income.

Figure 5 (a) presents the cumulative distribution function of the wife's share of investment income for households in which the husband's and wife's marginal rates are equal.[23] Since independent taxation should not have affected the distribution of assets within these households, we expect the CDFs to be equal in the pre- and post-reform periods. As the figure shows, the two CDFs appear to be nearly identical. We can test for the equality of these two CDFs using a Kolmogorov-Smirnov (KS) test. The KS test statistic for the equality of these two distributions is 0.025 with a p-value of 0.242. Confirming our visual evidence, we cannot reject the hypothesis that the CDF did not change following independent taxation for households in which the spouses' marginal rates are equal.

The CDFs for the households in which the husband's marginal tax rate is higher are shown in Figure 5 (b). Since the impact of the tax reform induced these households to shift investment income towards wives, the CDF for the post-reform period should exhibit first-order

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[23] Figures 5 (a) and (b) are derived by plotting the CDF at every .025 along the horizontal axis. Due to the small sample sizes available, Figure 5 (c) is derived by plotting the CDF at every 0.05 along the horizontal axis.

stochastic dominance over the pre-reform CDF. From the Figure, it appears that the results are consistent with this hypothesis. The KS test statistic for the equality of these CDFs is 0.146 with a p-value less than 0.01. Furthermore, the test statistic for first order stochastic dominance is also 0.146 with a p-value less than 0.01. Thus, independent taxation shifted distribution of assets in the expected direction for households in Treatment Group 1.

Finally, for households in which the wife's marginal rate exceeds the husband's, that the pre-reform CDF should stochastically dominate the post-reform CDF. By examining Figure 5 (c), it appears that this hypothesis is true for values of the wife's fraction of investment income exceeding 50%. However, the left-hand side of the distribution exhibits exactly the opposite behavior. The KS test statistic for the equality of these CDFs is 0.067 with a p-value of 0.654 and we are unable to reject the equality of the two distributions for these households.

These cumulative distribution functions further suggest that the switch to independent taxation had the hypothesized effects on the intra-household allocation of investment income. The CDFs shifted in the hypothesized direction for our largest treatment group, the one where the husband has the higher tax rate. Equally as important, the CDFs remain constant over time for the control group, further suggesting that the switch to independent taxation had a causal effect on the intra-household shifts in investment income.

IV. C. Difference-in-Difference Estimates

Table 2 presents difference-in-difference estimates of the impact of separate taxation on the fraction of wives and the fraction of husbands with investment income among the households with any investment income. As we previously mentioned, the pre-reform period is limited to April 1987-March 1990 while the post-reform period is April 1991-March 1994. The top panel of the table presents the impact of separate taxation for the control group in which the spouses'

marginal tax rates are equal. The fraction of wives with investment income increases by less than one percentage point (from 86.4% to 87.4%) and this change is statistically insignificant. Similarly, the change in the fraction of husbands with investment income is roughly one percentage point (from 87.9% to 89.1%) and is also insignificant. We also present changes for sub-groups within our control group by further grouping households by their marginal tax rates. Within these sub-groups, the only (marginally) statistically significant change is found for the fraction of wives with investment income in households where both spouses face a marginal tax rate of 40%. Overall, however, we do not find any evidence that separate taxation impacted the distribution of investment income within the control group.

The middle panel of Table 2 presents the results for households in which the husband's marginal tax rate exceeds the wife's. There is a significant increase in the fraction of wives with any investment income and an even larger decline in the fraction of husbands with investment income following separate taxation. The difference-in-difference estimates at the bottom of the panel compare these changes with the changes in the control group. Both difference-in-difference estimates are statistically significant and are consistent with tax avoidance behavior. Examining the sub-group differences gives an indication of how the tax reform differentially affected households within Treatment Group 1. The most interesting of these sub-group changes is in the fraction of husbands with any investment income in households where the wife has a marginal tax rate of zero. In both of these groups, a significant fraction of households appear to be taking advantage of the opportunity to avoid taxes by shifting all of their investment income to the wife.

The bottom panel of the table presents the results for Treatment Group 2, those households in which the wife's marginal tax rate exceeds the husband's. Although these households are small in number, which makes finding statistically significant results difficult for

this group, we do find evidence which is consistent with income shifting. The fraction of wives with investment income falls while the fraction of husbands with investment income shows an increase, although neither change is significant. Neither of the difference-in-difference results shown at the bottom of the panel is significant although they are both of the hypothesized sign. Furthermore, for two of the three sub-groups, the changes are of the hypothesized sign. The exception is for households in which the wife's marginal rate is 40% while the husband's rate is zero, but these changes are insignificant.

The difference-in-difference results for the wife's share of the household's investment income are presented in Table 3. As the top panel of the table indicates, the reform did not have an effect on the mean distribution of assets within households where the spouses have the same marginal tax rate. The middle panel of the table shows that there is a strongly significant effect within households where the husband's marginal rate is higher. This re-allocation of assets occurs across all three of the sub-groups. Most interestingly, the effect is the strongest for households in which the marginal rates differ the most (the husband's rate is 40% and the wife's rate is zero). The bottom panel shows results consistent with the income shifting hypothesis although the results are insignificant. The share of investment income going to the wife falls within households where the wife's marginal tax rate is higher. Thus, the simple difference-in-difference results in Tables 2 and 3 are consistent with separate taxation causing a re-allocation of the investment income within households where the incentives for shifting investment income exist. Furthermore, households with the largest tax rate differentials are engaging in the most income shifting.

Although the evidence presented thus far is consistent with a causal interpretation for the role separate taxation had on the distribution of investment income within households, our estimates may be affected by underlying demographic trends that potentially plague any

difference-in-difference estimator. Furthermore, our estimates may be affected by labor supply responses to the tax change. Therefore, we also present difference-in-difference regression estimates for the outcomes shown in Tables 2 and 3 that include demographic controls, as well as without these controls in order to ascertain the robustness of the tax-reform estimates.[24]

These regression results are presented in Table 4. For each of the outcomes, we allow the responses to differ for the two treatment groups as we did in simple difference-in-difference results in Tables 2 and 3.[25] For ease of interpretation, we set the dummy variable for membership in the Treatment Group 2 (the wife's marginal rate exceeds the husband's) equal to –1. Thus, all of the difference-in-difference coefficients should have the same sign as the theoretical prediction for the treatment group in which the husband's marginal rate is higher. For example, in column 3 of Table 4, the coefficients in the bottom two rows measure the impact of separate taxation on the fraction of husbands with investment income. The impact for the treatment group in which the husband's marginal rate exceeds the wife's is negative and significant (-0.061) as we also saw in Table 2. The coefficient for the other treatment group is also negative, but it is "correctly-signed" because all of the dummy variables for this group are set equal to –1.

For Treatment Group 1, the results are consistent with the income shifting hypothesis and statistically significant. We find an increase in the fraction of wives with investment income, a decrease in the fraction of husbands with investment income, and an increase in the share of investment income held by the wife. In addition, the results are fairly robust to the inclusion of

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[24] The regressions with demographic controls include a quadratic in the head's age; a quadratic in the wife's age; number of children; number of children under 5; the wife's and husband's years of education; year effects for 1988, 1989, 1992, and 1993; and regional dummies for Greater London, Wales, Scotland, and Ireland.
[25] Although we allow the responses to differ between the two groups, we will not exactly replicate the difference-in-difference results in the prior tables. The reason is that we constrain the "Post-Reform" variable to be the same for both treatment groups. Even so, our baseline results without controls are nearly identical to the previous results.

demographic controls. For Treatment Group 2, the results for the fraction of husbands with investment income and the wife's share of investment income are "correctly-signed" and robust to the inclusion of demographic controls. However, none of the point estimates for this group are statistically significant.

Thus far our regression results have focused on whether the outcomes for each treatment group have change in the hypothesized direction and the statistical significance of the estimated effect. In order to better quantify these outcomes, we estimate how the magnitude of the spouses' tax rate differential affects the magnitude of investment income shifting between the spouses. We replace the dummy variable for treatment group membership with the actual difference in the husband's and the wife's marginal tax rates and re-estimate the regression models for all three outcomes.

Table 5 presents the results that examine the impact of the tax rate differential on the intra-household asset allocation. Notice that the sign of the estimated coefficients in Table 5 is the same as those found for the analogous effects in Table 4.[26] Since the sign of actual tax rate difference is the same as that of the treatment group variables used in Table 4, the estimated coefficients are generally of the same sign as those we previously found. In addition, the estimated coefficients of interest show the same pattern of significance as in Table 4.

We can estimate how much an increase in the tax rate differential between the spouses will cause the household to shift investment income between the spouses using the results shown in Table 5. In column 6, results for households in which the husband's marginal rate exceeds the wife's rate indicate that a 10 percentage point increase in the tax rate differential between the two spouses leads to a 3.1 percentage point increase in the share of investment income held by the

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[26] The coefficients for households in which the wife's marginal rate exceeds the husband's must again be carefully interpreted when the responses for each treatment group are reported separately.

wife. In results not shown here, a comparable estimate in which we pool the estimate for both treatment groups indicates a 2.6 percentage point increase.[27] At the maximum tax rate difference of 40 percentage points, our results imply that the fraction of household investment income shifted to the spouse with the lower marginal rate would be between 10 and 12 percentage points.

IV. D. Robustness Checks

While the results we have presented thus far provide fairly convincing evidence that the switch to independent taxation caused a shift in investment income between spouses, it is possible that other factors may be influencing our results. One possibility is that households could be taking advantage of another opportunity to lower their tax burden by shifting assets, namely through the use of capital gains exemptions. Prior to independent taxation, a household only received one exemption to set against any capital gains. The introduction of independent taxation led to each spouse having their own capital gains exemption. Furthermore, the capital gain exemption is rather sizable; it was 5000£ in tax year 1990 while the personal exemption for income in the same tax year was 3005£. On the one hand, such a sizable exemption may lead households to shift investment to the spouse in order to increase the size of their gain that is exempt for taxation. On the other hand, given such a large exemption, households may not have an incentive to shift assets since the size of one exemption alone may cover their capital gains. However, there still exists the possibility that households shift investment income primarily to take advantage of the capital gains exemption and not to take advantage of the lower marginal tax rate.

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[27] Due to the presence of households in which the wife's fraction of investment is zero or one, we cannot use a log dependent variable to more easily estimate elasticities of income shifting.

To investigate this issue further, we divide our measure of investment income into three components. The first component is savings income (bank deposits), which is only taxable as income and is not subject to taxation as a capital gain. The second component is stocks and bonds. These may generate interest and dividend income that is subject to regular income tax. However, these items may also generate capital gains when sold and therefore may be shifted between spouses to take advantage of the capital gains exemption. The final component is property income. Again, while property income is subject to regular income tax, real property may also generate a capital gain upon its disposal.

Table 6 examines the impact of independent taxation on the wife's share of each of these components using the specification with the magnitude of the difference in the spouses' investment income. The first two columns present the results for savings income.[28] These estimates are roughly identical to those for all investment income shown in Table 5. Furthermore, the results for the group in which the wife's rate exceeds the husband's are now positive although they are insignificant.

The results for stocks and bonds shown in the next two columns are of the expected sign, but all the results are insignificant. Part of the reason that the results are insignificant is the reduction in the sample size for these regressions.[29] Even so, the magnitude of the shift of these assets is far less than the results we find for savings income. For property income, shown in the last two columns, we again find correctly-signed but statistically insignificant results. Thus, while households may be shifting some of their assets to take advantage of the capital gains

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[28] Some types of bank deposits (TESSAs and the first 70 pounds of interest income from ordinary accounts with the National Savings Bank) are not subject to income tax. Results from regressions in which these types of deposits are removed are nearly identical to those presented here.
[29] Only 25% of households in the pre- and post-reform sample have stocks or bonds while 72% have savings income.

exemptions, our results are primarily driven by savings income that is not subject to capital gains tax.

Another concern is the relationship between the household's marginal tax rate differential and the amount of the household's investment income. If households with the largest tax gains from shifting investment income are also those that have the largest amounts of investment income, part of the shifting incentive that we attribute to the tax rate differential may be due to the fact that these households with higher levels are more likely to shift their income. To investigate this issue, we divided households into quartiles based upon the amount of their investment income. We then re-estimated the outcomes in Table 5 for each investment income quartile in a pooled regression.[30]

The results of estimating these models are presented in Table 7. Across investment income quartiles, the increase in wives receiving investment income appears to come in the lower end of the distribution (columns 1 and 2). However, none of the estimated effects are statistically significant. In addition, the Wald test statistic testing the equality of the difference-in-difference regression coefficients cannot reject the hypothesis that the effects are the same across the quartiles. The results in columns 3 and 4 of the table indicate that the tax-differential effect of shifting investment income entirely away from the husband is most prevalent in the lowest investment income quartile. The Wald test statistic rejects the equality of these coefficients across investment income quartiles. As the household's investment income increases, the less likely it is that the household will shift all of the investment income to the wife. The final two columns of Table 7 present results for the wife's share of investment income. These results appear to indicate that the tax differential has a larger effect for

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[30] We also estimated models in which we interacted the tax rate differential with the level of investment income. The results of these models provide similar qualitative results to those found in Table 7.

households with the most investment income. However, the Wald test statistics cannot reject the hypothesis that the effects are the same across quartiles.

Our results suggest that the response to the tax rate differential varies dramatically across the investment income distribution. Households with a small amount of investment income are more likely to respond by shifting assets entirely between spouses. Households with more investment income, on the other hand, do not appear to be taking full advantage of the tax rate differential by shifting assets entirely between spouses. Instead, these households respond to the tax incentives by re-allocating the share of investment income between the two spouses.

As a final robustness check, we examined the fraction of households reporting an even 50-50 split of investment income.[31] In the pre-reform period, the average amount of the wife's fraction of investment income was less than 50 percent, especially for households in which the husband's marginal rate exceeds the wife's. Since the default split of jointly held assets following independent taxation is 50-50, the increase in the wife's share of investment income that we find may be simply due to an increase in households reporting the default split of these assets. However, by examining the CDFs in Figure 5, one can see that the percentage of households in which the wife has 50% of investment income remained constant in the control groups while it appears to fall in the two treatment groups. Furthermore, in results not shown here, using the fraction of households reporting a 50-50 split of investment income as the dependent variable in our difference-in-difference framework, we find that this fraction significantly *decreases* for Treatment Group 1 relative to the control group while there is no relative change for Treatment Group 2. Therefore, this mechanical relationship is not responsible for the results that we find.

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[31] To account for measurement error, we also estimated models where we examined the fraction of households reporting the wife's share of investment income as being between 45% and 55%. The results were very similar.

IV. E. Are Households "Optimally" Re-Allocating Assets?

Although we find evidence that households responded to the incentives for shifting investment income, another question one might be interested in asking is whether households "optimally" respond to these incentives. Of course, the definition of optimal can vary depending upon the model of household structure (e.g., unitary vs. bargaining model) one wishes to impose and institutional factors (e.g. divorce laws) affecting the household's decision processes. For our purposes, we define the optimal allocation of investment income as the one that minimizes the household's tax burden. While the actual optimal allocation may differ due to the reasons listed above, our approach answers a natural baseline question concerning impact of the tax rate differential on the household's investment income allocation.

Before we attempt to answer the question concerning how far households are away from their optimal allocation, it is useful to understand the minimum share of investment income that should be allocated to the spouse with the lower marginal tax rate. In other words, we determine the minimum share of the household's investment income that needs to be allocated to the spouse with the lower marginal tax rate in order for the spouses to just equalize their (final dollar) marginal tax rates. This calculation is useful for two purposes. First, it allows us to estimate the minimum amount of re-allocation that we would expect to see. Second, we are interested in how a household's own efforts can move it closer to its optimal allocation. If the tax brackets are not perfectly indexed over time, then a household could conceivably move closer to (or further away from) its optimal allocation following independent taxation without any changes in its allocation of investment income.

Figure 6 presents the CDFs for the minimum share of investment income that the treatment households would need to shift in order to just equalize marginal tax rates. Panel (a) presents the results for households in which the husband's rate exceeds the wife's in both the

pre- and post-reform periods. Two striking facts can be seen in this figure. The first is that over 90% of these households would need to allocate all of their investment income to the wife in order to take full advantage of the tax incentive. The second is that the minimum share that needs to be shifted in the pre- and post-reform periods is almost identical. This observation is confirmed by the Kolmogorov-Smirnov test statistic for the equality of these two CDFs which is 0.016 with a p-value of 0.806. The results for households in which the wife's marginal rate exceeds the husband's, shown in Panel (b), also show that a large majority of households would optimize by shifting all of their investment income to the spouse with the lower marginal tax rate. However, the K-S test statistic for the pre- and post-reform CDFs can (marginally) reject the equality of these two distributions (p-value = 0.099).

We then calculate the additional share of investment income that needs to be shifted to the spouse with the lower marginal tax rate. These results are shown in Figure 7. For Treatment Group 1 (Panel (a)), a greater percentage of households is closer to their optimal allocation in the post-reform period relative to the pre-reform period. The K-S test statistic for the equality of the CDFs is 0.141 with a p-value less than 0.01. However, although a significant number of households moved closer to the optimal allocation of assets, only 18% of households optimally allocated their assets.

Panel (b) of Figure 7 shows the additional shifting necessary for households in which the wife's rate is higher. The interesting result for these households is that as a group they were closer to their optimal allocations in the pre-reform period. However, as Figure 6 (b) indicates, the minimum re-allocation necessary in the pre-reform period also was smaller. Since our previous results found no significant change in their allocation of investment income, it appears that other changes are moving them further from the optimal allocation. As with the other treatment group, the share of households optimizing their allocation of investment income is

surprising small. In the post-reform period, 30% of these households are choosing the correct allocation.

This last set of results suggests that although households did respond to the incentives present in the tax reform to re-allocate their assets, they are not taking full advantage of their ability to do so. As we previously discussed, the failure of so many households to choose the "optimal" allocation may be due to spouses optimizing along other dimensions other than just minimizing their tax burden. Understanding the reasons why households do not choose the optimal allocation is an interesting area of research although it is beyond the scope of this paper.

V. Conclusion

The switch to separate taxation of spouses in the UK created an incentive for married couples to shift investment assets to the spouse with the lower marginal tax rate, typically the wife. By taking advantage of this form of tax avoidance, households are able to reduce their total tax burden. Our analysis of the impact of separate taxation on the intra-household allocation of investment income provides strong evidence that households did indeed take advantage of this opportunity for tax avoidance through income shifting. In households with an incentive to shift investment income to the wife, we find an increase in the fraction of wives and a reduction in the fraction of husbands with investment income. Furthermore, we find an overall increase in the wives' share of investment income. For those households in which the incentives are reversed, we do not find any statistical evidence confirming the income shifting hypothesis although the small number of these households leads to fairly large standard errors.

We estimate that a 10 percentage point increase in the marginal tax rate differential between spouses leads to a 2.6-3.1 percentage point increase in the share of investment income that is shifted to the spouse with the lower marginal tax rate. Our results are robust to a variety

of influences that may possibly confound our analysis. However, even though many households take advantage of the income shifting incentives due to separate taxation, an overwhelming majority of households do not fully exploit their ability to reduce their tax burden.

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**Figure 1(a) - Percentage of Households with Investment Income
and Percentage of Households Where the Wife has Investment Income**

Legend: —▲— Any Invest Income   —✕— Wife Gets Any Investment Income

X-axis: Tax Year
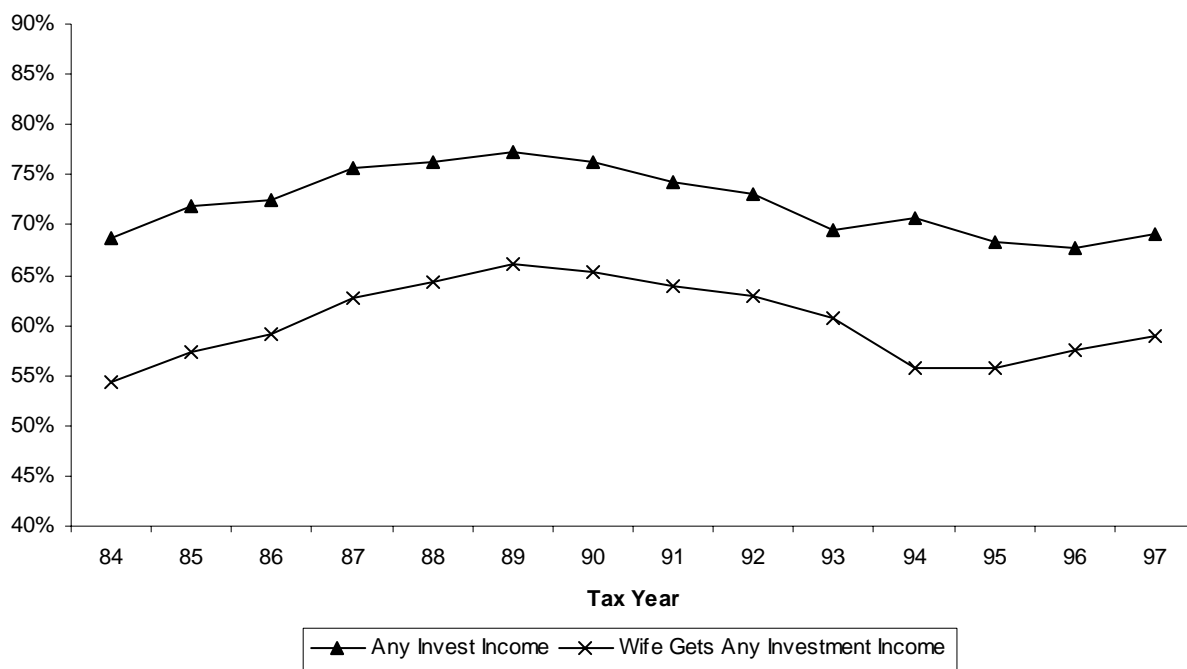
**Figure 1(b) - Percentage of Households with Investment Income
By Tax Rate Difference Group**

Legend: —■— Husband's Rate = Wife's Rate   - -▲- - Husband's Rate > Wife's Rate

X-axis: Tax Year

36
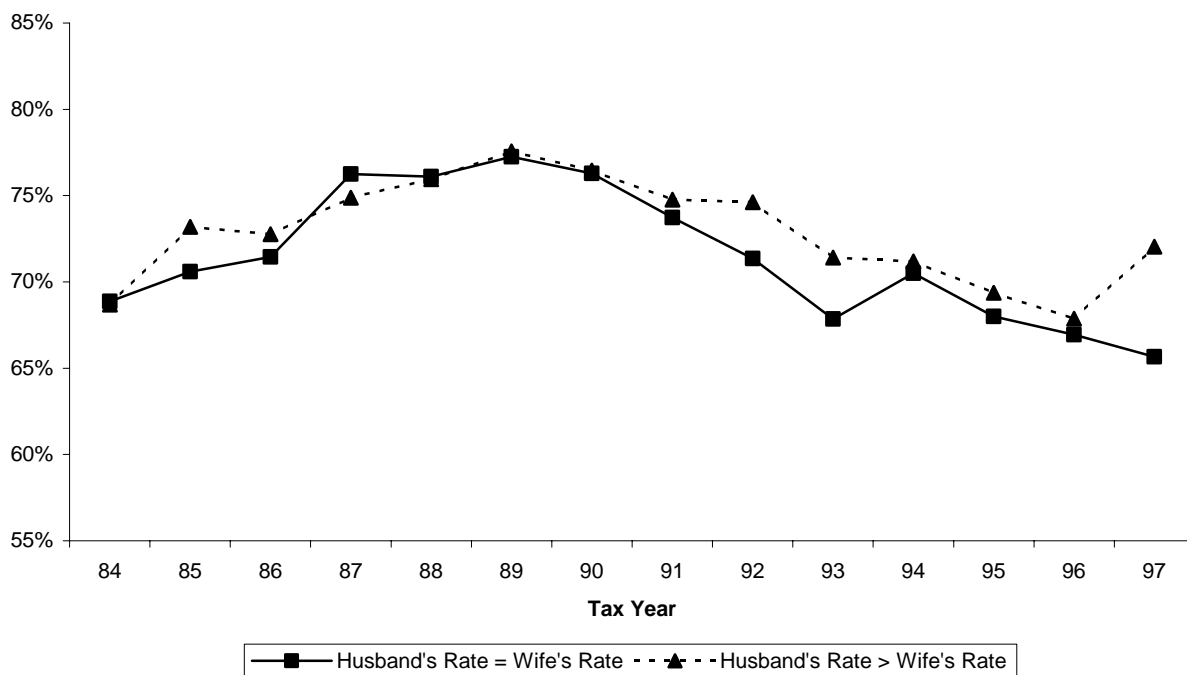
Figure 2(a) - Percentage of Wives with Investment Income
By Tax Rate Difference Group
All Households

Tax Year

—■— Husband's Rate = Wife's Rate ···▲··· Husband's Rate > Wife's Rate
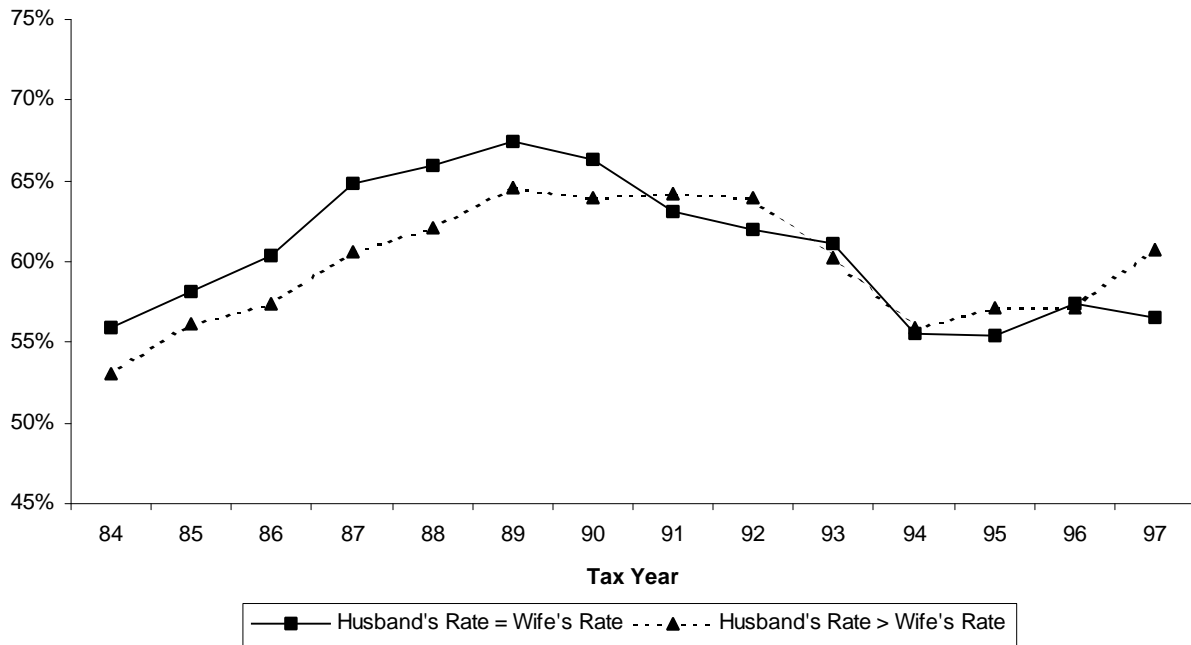
Figure 2(b) - Percentage of Husbands with Investment Income
By Tax Rate Difference Group
All Households

Tax Year

—■— Husband's Rate = Wife's Rate ···▲··· Husband's Rate > Wife's Rate

37
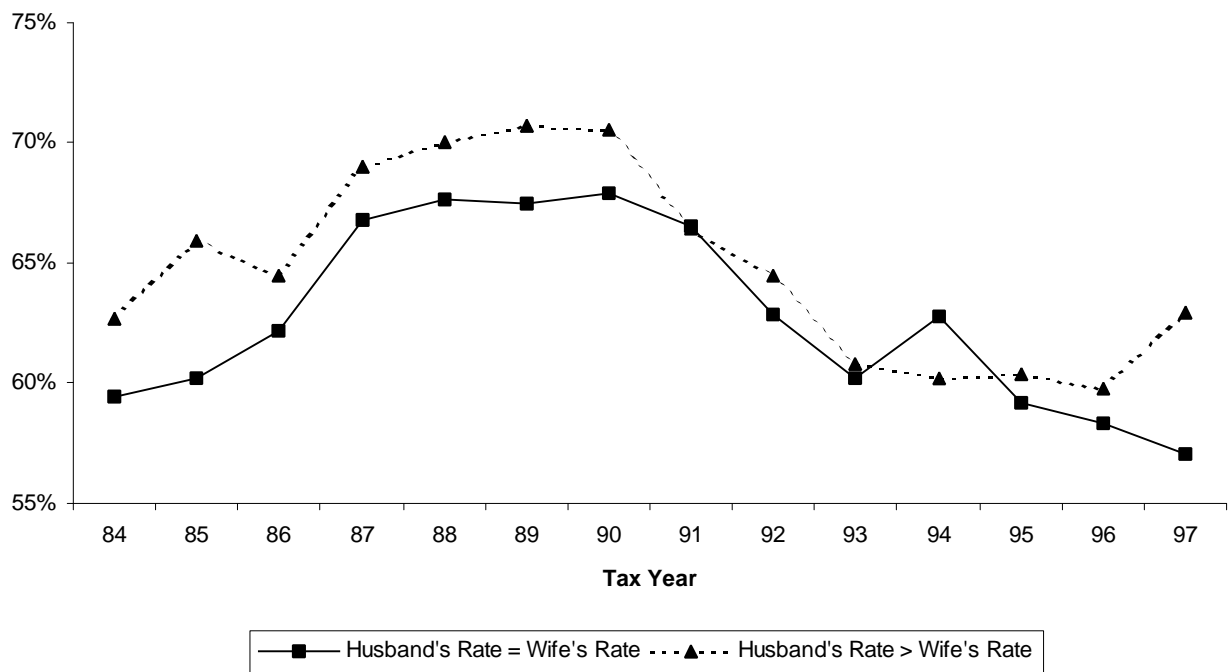
Figure 3(a) - Percentage of Wives with Investment Income
By Tax Rate Difference Group
Among Households With Investment Income

Tax Year

Husband's Rate = Wife's Rate · · ·▲· · · Husband's Rate > Wife's Rate
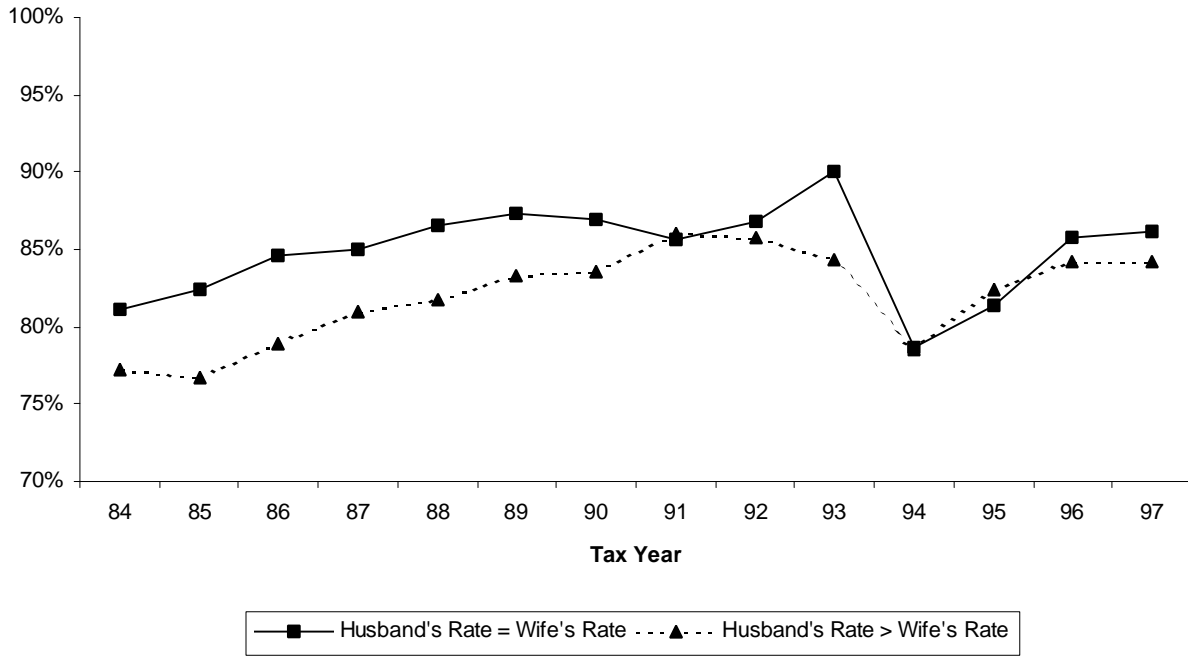
Figure 3(b) - Percentage of Husbands with Investment Income
By Tax Rate Difference Group
Among Households with Investment Income

Tax Year

Husband's Rate = Wife's Rate · · ·▲· · · Husband's Rate > Wife's Rate

38
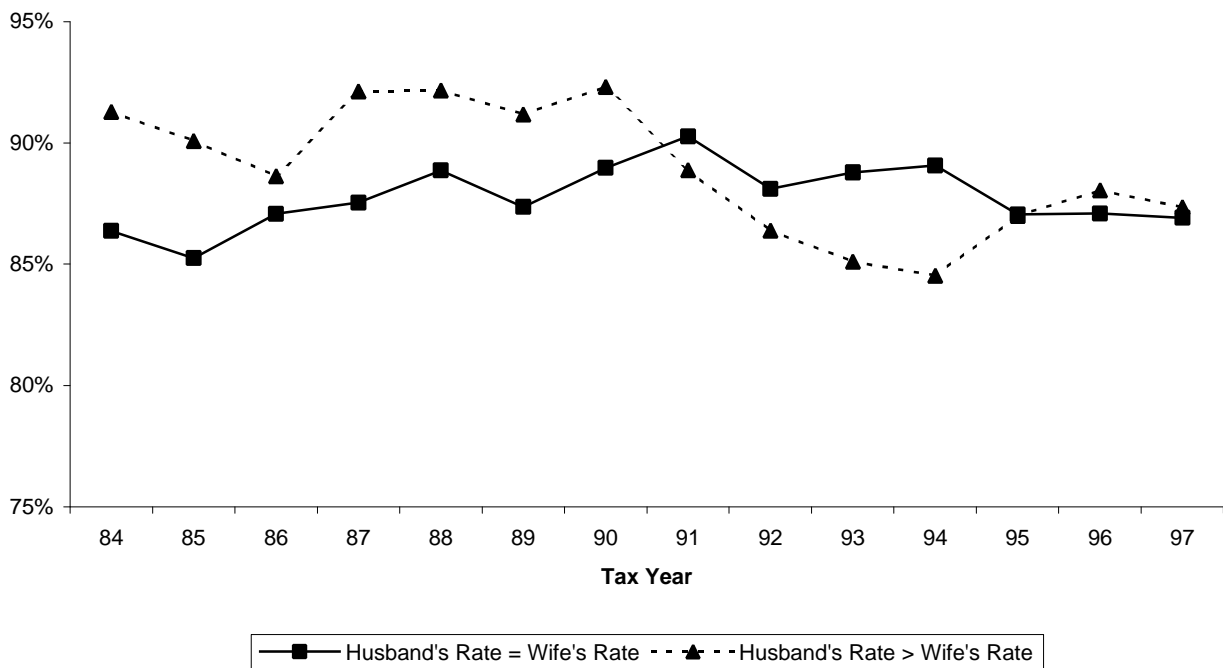
**Figure 4 - Wives' Fraction of Investment Income
By Tax Rate Difference Group
Among Households With Investment Income**

Tax Year

Husband's Rate = Wife's Rate   Husband's Rate > Wife's Rate
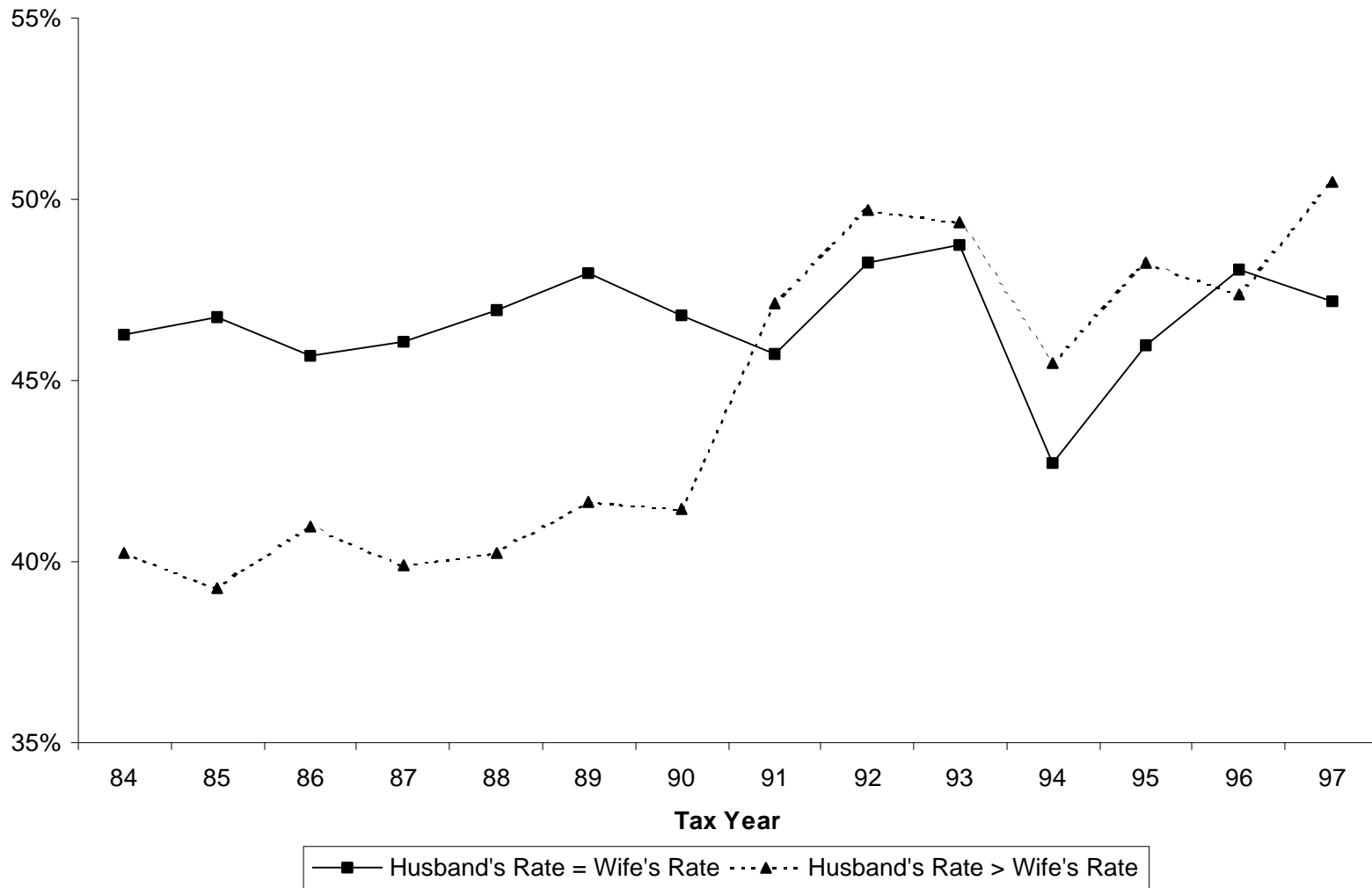
Figure 5 - Cumulative Distribution Functions of Wife's Share of Investment Income
Pre-Reform vs. Post-Reform

(a) Husband's Rate = Wife's Rate
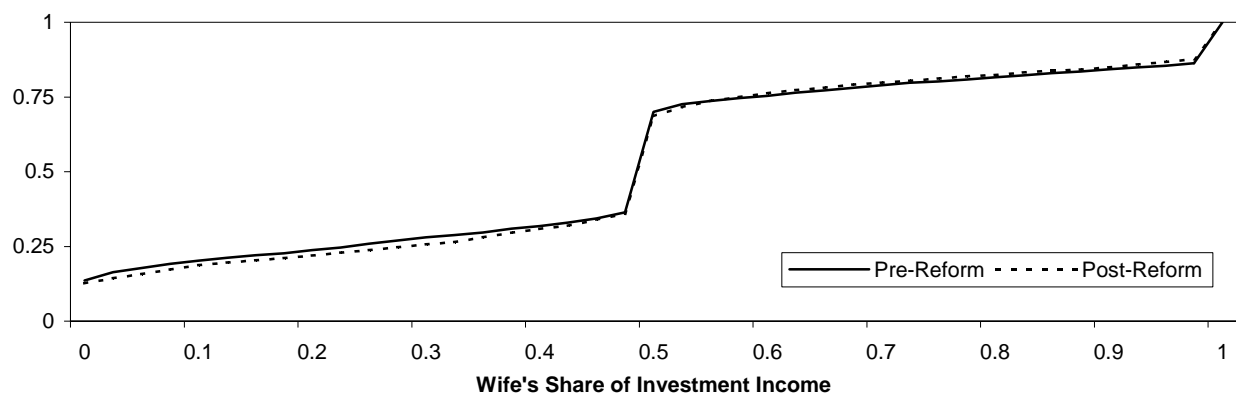
(b) Husband's Rate > Wife's Rate
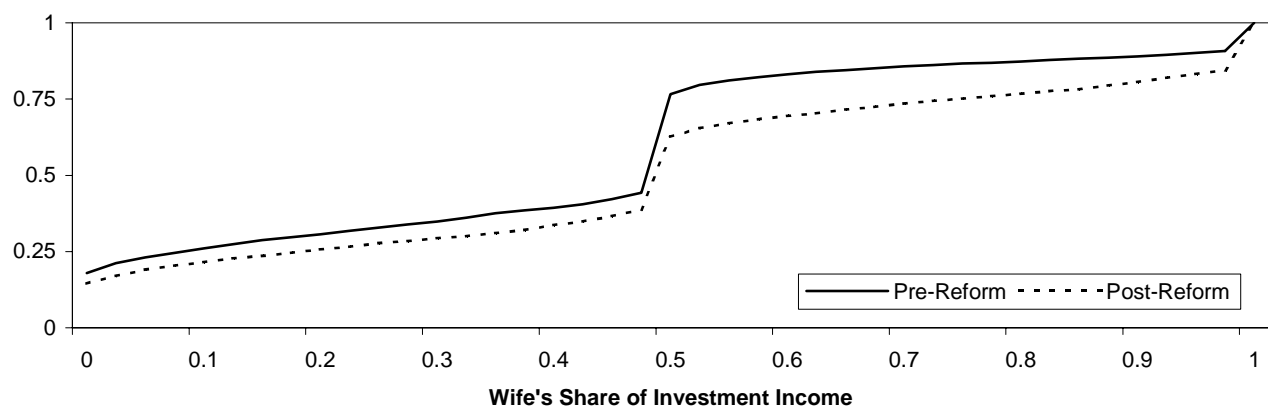
(c) Husband's Rate < Wife's Rate

Figure 6 - Minimum Share to Shift to Just Equalize Rates

(a) Husband's Rate > Wife's Rate

(b) Husband's Rate < Wife's Rate
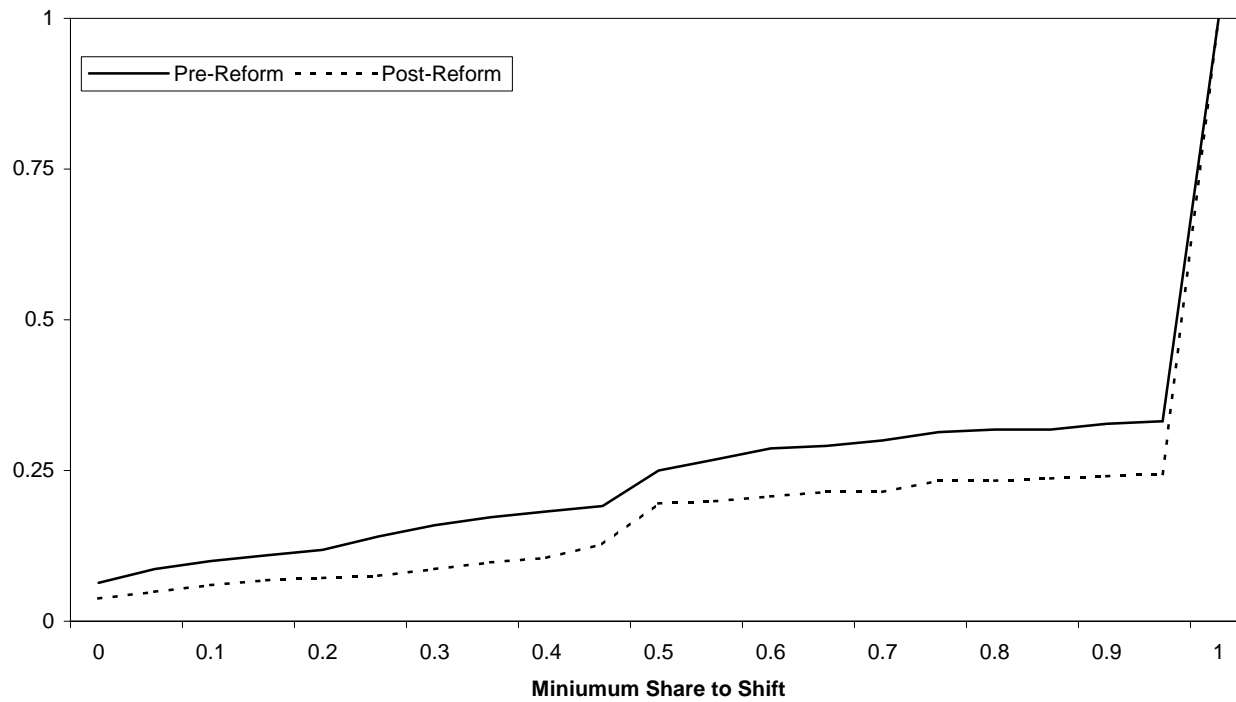
Figure 7 - How Much More to Shift to Just Equalize Rates?

(a) Husband's Rate > Wife's Rate
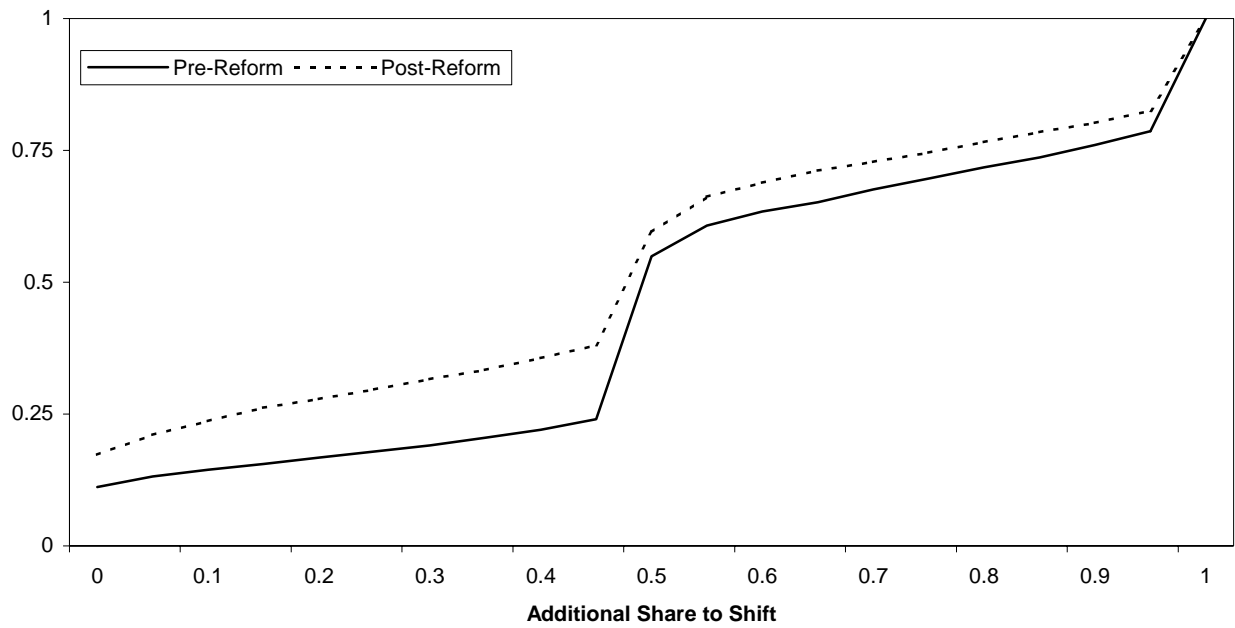
(b) Husband's Rate < Wife's Rate
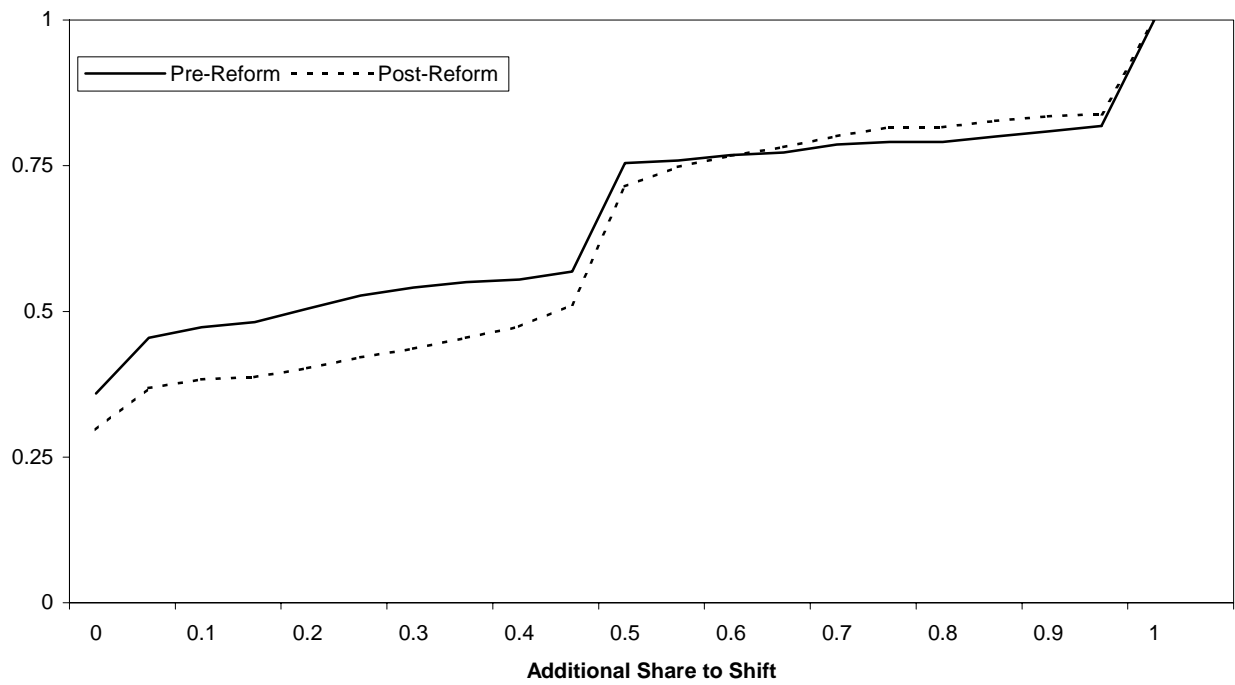
Table 1 - Summary Statistics
All Households

Pre-Reform (Tax Years 1987-88 to 1989-90)

	Husband's Rate = Wife's Rate (N=4694)		Husband's Rate > Wife's Rate (N=4630)		Husband's Rate < Wife's Rate (N=280)	
Husband's Age	41.2	(0.15)	40.5	(0.14)	43.9	(0.64)
Wife's Age	38.7	(0.15)	38.0	(0.14)	41.7	(0.62)
Husband's Years of Education	10.2	(0.03)	10.5	(0.04)	10.4	(0.18)
Wife's Years of Education	10.4	(0.03)	10.2	(0.03)	10.8	(0.17)
Husband's Hours of Work	29.5	(0.28)	33.4	(0.26)	7.2	(1.03)
Wife's Hours of Work	25.4	(0.22)	6.3	(0.15)	26.7	(0.93)

Post-Reform (Tax Years 1991-92 to 1993-94)

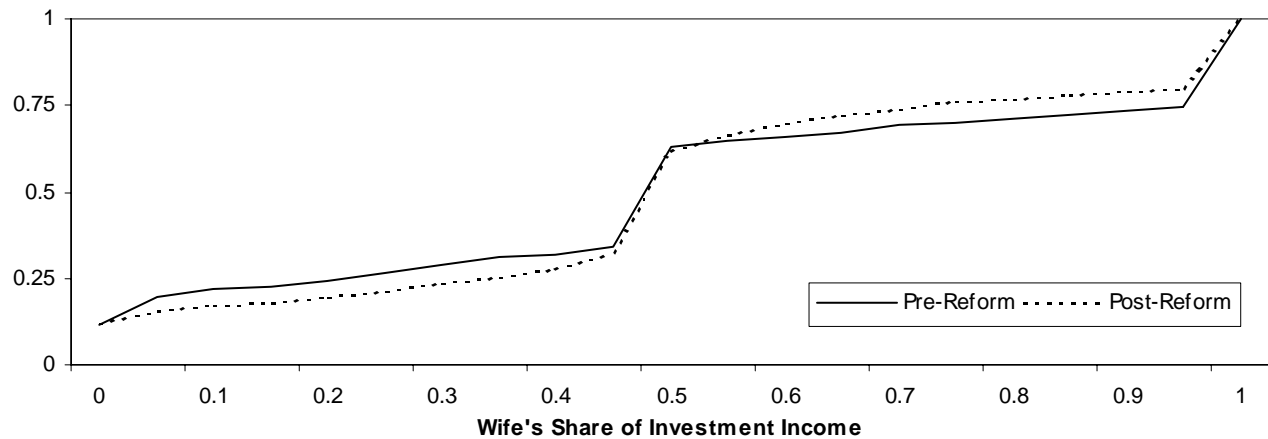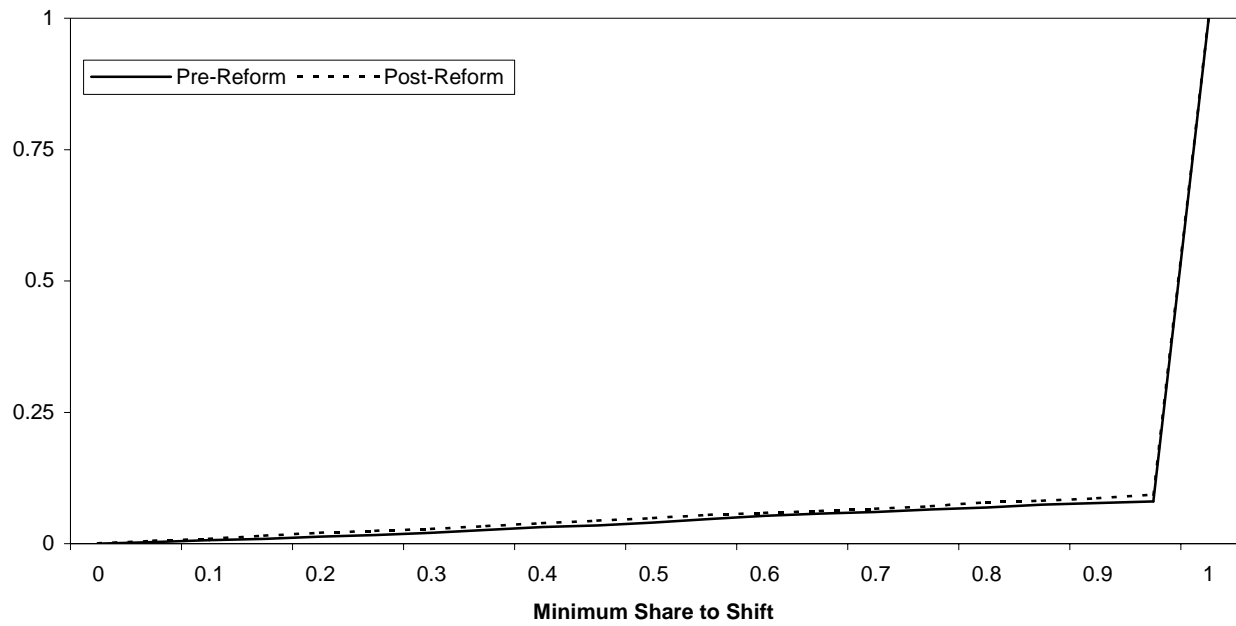|	Husband's Rate = Wife's Rate (N=4266)		Husband's Rate > Wife's Rate (N=3706)		Husband's Rate < Wife's Rate (N=359)	
Husband's Age	42.0	(0.15)	41.3	(0.16)	44.2	(0.53)
Wife's Age	39.6	(0.15)	39.3	(0.16)	41.7	(0.49)
Husband's Years of Education	10.4	(0.04)	10.9	(0.05)	10.4	(0.14)
Wife's Years of Education	10.6	(0.03)	10.6	(0.04)	10.9	(0.13)
Husband's Hours of Work	28.5	(0.30)	33.5	(0.31)	5.7	(0.78)
Wife's Hours of Work	24.4	(0.23)	6.6	(0.17)	29.0	(0.77)

Note: Standard errors in parentheses

Table 2
Fraction of Wives And Husbands Receiving Any Investment Income
Among Households With Any Investment Income

Tax Rate Group	Wife Has Investment Income			Husband Has Investment Income		
	Pre-Reform	Post-Reform	Difference	Pre-Reform	Post-Reform	Difference
Spouses Have Same Rate	0.864	0.874	**0.010**	0.879	0.891	**0.012**
(Control Group)	(0.006)	(0.006)	**(0.008)**	(0.005)	(0.006)	**(0.008)**
Both 0%	0.751	0.779	0.028	0.820	0.823	0.003
	(0.024)	(0.024)	(0.033)	(0.020)	(0.022)	(0.031)
Both 25%	0.875	0.884	0.009	0.885	0.897	0.012
	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.008)
Both 40%	1.000	0.875	-0.125*	1.000	1.000	0.000
	(0.000)	(0.069)	(0.069)	(0.000)	(0.000)	(0.000)
Husband Rate > Wife Rate	0.820	0.854	**0.034*****	0.918	0.869	**-0.049*****
(Treatment Group 1)	(0.006)	(0.007)	**(0.009)**	(0.005)	(0.006)	**(0.008)**
Husband 25% Wife 0%	0.809	0.836	0.027**	0.911	0.854	-0.057***
	(0.007)	(0.008)	(0.011)	(0.005)	(0.008)	(0.010)
Husband 40% Wife 0%	0.867	0.900	0.033	0.956	0.895	-0.061***
	(0.017)	(0.015)	(0.023)	(0.011)	(0.016)	(0.019)
Husband 40% Wife 25%	0.876	0.911	0.035	0.940	0.932	-0.008
	(0.020)	(0.015)	(0.025)	(0.015)	(0.014)	(0.020)
Difference-in-Difference			**0.024***			**-0.061*****
for Treatment Group 1			**(0.013)**			**(0.011)**
Wife Rate > Husband Rate	0.882	0.880	**-0.002**	0.782	0.816	**0.034**
(Treatment Group 2)	(0.022)	(0.020)	**(0.030)**	(0.028)	(0.024)	**(0.037)**
Wife 25% Husband 0%	0.880	0.870	-0.010	0.770	0.812	0.041
	(0.024)	(0.023)	(0.033)	(0.031)	(0.026)	(0.041)
Wife 40% Husband 0%	0.700	0.900	0.200	0.800	0.700	-0.100
	(0.153)	(0.100)	(0.183)	(0.133)	(0.153)	(0.203)
Wife 40% Husband 25%	0.963	0.939	-0.024	0.852	0.879	0.027
	(0.037)	(0.042)	(0.056)	(0.070)	(0.058)	(0.090)
Difference-in-Difference			**-0.012**			**0.022**
for Treatment Group 2			**(0.031)**			**(0.038)**

***, **, * $p \leq$ .01, .05, .10 respectively (shown for differences only).
Standard error of mean or mean difference in parentheses.

Table 3
Wives' Fraction of Investment Income
Among Households With Any Investment Income

Tax Rate Group	Pre-Reform	Post-Reform	Difference
Spouses Have Same Rate **(Control Group)**	0.470 (0.008)	0.475 (0.009)	**0.005** **(0.012)**
Both 0%	0.450 (0.026)	0.467 (0.029)	0.018 (0.039)
Both 25%	0.473 (0.009)	0.476 (0.010)	0.003 (0.013)
Both 40%	0.480 (0.109)	0.468 (0.104)	-0.012 (0.151)
Husband Rate > Wife Rate **(Treatment Group 1)**	0.406 (0.008)	0.487 (0.010)	**0.081***** **(0.013)**
Husband 25% Wife 0%	0.412 (0.009)	0.485 (0.011)	0.073*** (0.014)
Husband 40% Wife 0%	0.355 (0.024)	0.503 (0.025)	0.148*** (0.035)
Husband 40% Wife 25%	0.414 (0.030)	0.476 (0.027)	0.062 (0.041)
Difference-in-Difference **for Treatment Group 1**			**0.076***** **(0.018)**
Wife Rate > Husband Rate **(Treatment Group 2)**	0.518 (0.034)	0.515 (0.031)	**-0.002** **(0.046)**
Wife 25% Husband 0%	0.522 (0.037)	0.513 (0.034)	-0.009 (0.050)
Wife 40% Husband 0%	0.407 (0.164)	0.605 (0.163)	0.197 (0.231)
Wife 40% Husband 25%	0.530 (0.098)	0.508 (0.088)	-0.021 (0.132)
Difference-in-Difference **for Treatment Group 2**			**-0.007** **(0.047)**

***, **, * $p \leq .01, .05, .10$ respectively (shown for differences only).
Standard error of mean or mean difference in parentheses.

Table 4
The Impact of Separate Taxation on the Allocation of Investment Income
Households with Investment Income

	Wife Gets Investment Income		Husband Gets Investment Income		Wife's Share of Investment Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Post-Reform	0.010	0.015	0.012	0.021**	0.005	-0.001
	(0.008)	(0.012)	(0.008)	(0.011)	(0.008)	(0.011)
Husband Rate>Wife Rate	-0.044***	-0.027***	0.039***	0.045***	-0.064***	-0.059***
	(0.009)	(0.009)	(0.007)	(0.007)	(0.007)	(0.008)
Husband Rate<Wife Rate	-0.018	-0.009	0.097***	0.100***	-0.047*	-0.042**
	(0.023)	(0.024)	(0.028)	(0.028)	(0.025)	(0.025)
Husband Rate>Wife Rate **X Post-Reform**	**0.024***	**0.017**	**-0.061***	**-0.065***	**0.076***	**0.075***
	(0.013)	**(0.012)**	**(0.011)**	**(0.011)**	**(0.011)**	**(0.011)**
Husband Rate<Wife Rate **X Post-Reform**	**0.012**	**0.013**	**-0.022**	**-0.024**	**0.007**	**0.007**
	(0.031)	**(0.031)**	**(0.037)**	**(0.039)**	**(0.032)**	**(0.032)**
Demographic controls?	No	Yes	No	Yes	No	Yes
N	13367	13367	13367	13367	13367	13367

***, **, * p ≤ .01, .05, .10 respectively (White standard errors in parentheses) using two-tailed t-tests

Demographic controls include a quadratic in the husband's age; a quadratic in the wife's age; number of children; number of children under 5; the wife's and husband's years of education; year effects for 1988, 1989, 1992, and 1993; and regional dummies for Greater London, Wales, Scotland, and Northern Ireland.

Table 5
The Impact of Separate Taxation on the Allocation of Investment Income
Interactions with the Magnitude of the Tax Rate Differential
Households with Investment Income

	Wife Gets Investment Income		Husband Gets Investment Income		Wife's Share of Investment Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Post-Reform	0.010	0.014	0.011	0.020*	0.003	-0.003
	(0.008)	(0.012)	(0.008)	(0.011)	(0.007)	(0.011)
(Husband Rate-Wife Rate) X Husband Rate>Wife Rate	-0.147***	-0.087***	0.150***	0.168***	-0.253***	-0.232***
	(0.032)	(0.033)	(0.025)	(0.027)	(0.027)	(0.028)
(Husband Rate-Wife Rate) X Husband Rate<Wife Rate	-0.045	-0.008	0.396***	0.402***	-0.170*	-0.145
	(0.096)	(0.098)	(0.115)	(0.114)	(0.102)	(0.102)
(Husband Rate-Wife Rate) X Husband Rate>Wife Rate X Post Reform	**0.090****	**0.067**	**-0.227****	**-0.243****	**0.306****	**0.306****
	(0.045)	**(0.045)**	**(0.040)**	**(0.040)**	**(0.041)**	**(0.041)**
(Husband Rate-Wife Rate) X Husband Rate<Wife Rate X Post Reform	**0.011**	**0.015**	**-0.057**	**-0.059**	**-0.019**	**-0.022**
	(0.129)	**(0.131)**	**(0.155)**	**(0.155)**	**(0.133)**	**(0.134)**
Demographic controls?	No	Yes	No	Yes	No	Yes
N	13367	13367	13367	13367	13367	13367

***, **, * $p \le .01, .05, .10$ respectively (White standard errors in parentheses) using two-tailed t-tests
Demographic controls include a quadratic in the husband's age; a quadratic in the wife's age; number of children; number of children under 5; the wife's and husband's years of education; year effects for 1988, 1989, 1992, and 1993; and regional dummies for Greater London, Wales, Scotland, and Northern Ireland.

Table 6
The Impact of Separate Taxation on the Allocation of Investment Income
Interactions with the Magnitude of the Tax Rate Differential
By Investment Income Category
Households with Investment Income

	Wife's Share of Savings Income		Wife's Share of Stock/Bond Income		Wife's Share of Property Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Post-Reform	0.002	-0.004	0.027*	0.020*	0.061	-0.051
	(0.007)	(0.011)	(0.016)	(0.011)	(0.053)	(0.071)
(Husband Rate-Wife Rate) X Husband Rate>Wife Rate	-0.193***	-0.184***	-0.322***	-0.268***	-0.057	-0.007
	(0.027)	(0.028)	(0.053)	(0.054)	(0.178)	(0.186)
(Husband Rate-Wife Rate) X Husband Rate<Wife Rate	-0.301***	-0.278***	-0.360*	-0.305	0.100	0.186
	(0.099)	(0.099)	(0.200)	(0.200)	(0.364)	(0.329)
(Husband Rate-Wife Rate) X Husband Rate>Wife Rate X Post Reform	**0.319*****	**0.314*****	**0.076**	**0.092**	**0.168**	**0.177**
	(0.042)	**(0.042)**	**(0.077)**	**(0.076)**	**(0.248)**	**(0.247)**
(Husband Rate-Wife Rate) X Husband Rate<Wife Rate X Post Reform	**0.100**	**0.098**	**0.023**	**0.004**	**-0.033**	**0.382**
	(0.132)	**(0.132)**	**(0.275)**	**(0.274)**	**(0.557)**	**(0.535)**
Demographic controls?	No	Yes	No	Yes	No	Yes
N	12925	12925	4524	4524	496	496

***, **, * $p \leq$ .01, .05, .10 respectively (White standard errors in parentheses) using two-tailed t-tests
Demographic controls include a quadratic in the husband's age; a quadratic in the wife's age; number of children; number of children under 5; the wife's and husband's years of education; year effects for 1988, 1989, 1992, and 1993; and regional dummies for Greater London, Wales, Scotland, and Northern Ireland.

Table 7
The Impact of Separate Taxation on the Allocation of Investment Income
Interactions with the Magnitude of the Tax Rate Differential
By Investment Income Quartile
Households with Investment Income

	Wife Gets Investment Income		Husband Gets Investment Income		Wife's Share of Investment Income	
	(1)	(2)	(3)	(4)	(5)	(6)
Husband Rate - Wife Rate	0.091	0.087	-0.360***	-0.366***	0.226**	0.222**
X Post Tax-Reform	(0.101)	(0.101)	(0.107)	(0.107)	(0.089)	(0.089)
X Bottom Quartile						
Husband Rate - Wife Rate	0.120	0.114	-0.277***	-0.281***	0.212***	0.216***
X Post Tax-Reform	(0.084)	(0.083)	(0.084)	(0.084)	(0.075)	(0.075)
X Second Quartile						
Husband Rate - Wife Rate	0.065	0.047	-0.201***	-0.214***	0.283***	0.280***
X Post Tax-Reform	(0.079)	(0.079)	(0.064)	(0.064)	(0.072)	(0.072)
X Third Quartile						
Husband Rate - Wife Rate	-0.002	-0.013	-0.070	-0.080*	0.310***	0.306***
X Post Tax-Reform	(0.060)	(0.060)	(0.043)	(0.043)	(0.063)	(0.063)
X Top Quartile						
Wald Test for Equality	2.73	2.79	12.81	12.72	0.87	0.87
Of Quartile Effects (P-Values)	(0.435)	(0.425)	(0.005)	(0.005)	(0.836)	(0.832)
Demographic controls?	No	Yes	No	Yes	No	Yes
N	13367	13367	13367	13367	13367	13367

***, **, * $p \leq .01, .05, .10$ respectively (White standard errors in parentheses) using two-tailed t-tests

Demographic controls include a quadratic in the husband's age; a quadratic in the wife's age; number of children; number of children under 5; the wife's and husband's years of education; year effects for 1988, 1989, 1992, and 1993; and regional dummies for Greater London, Wales, Scotland, and Northern Ireland.

Appendix Table 1 United Kingdom Tax Rates and Allowances
1987-1993 Tax Years

Tax Year	Lower Rate % / Taxable Income	Basic Rate % / Taxable Income	Higher Rate(s)	Single Person's/ Personal Allowance	Married Man's Allowance	Married Couple's Allowance
1987-88		27% / 1-17,900	40,45,50,55,60	2,425	3,796	
1988-89		25% / 1-19,300	40	2,605	4,095	
1989-90		25% / 1-20,700	40	2,785	4,375	
1990-91		25% / 1-20,700	40	3,005		1,720
1991-92		25% / 1-23,700	40	3,295		1,720
1992-93	20% / 1- 2,000	25% / 2,001-23,700	40	3,445		1,720
1993-94	20% / 1 –2,500	25% / 2,501-23,700	40	3,445		1,720