Regulatory Exemptions and Item Nonresponse

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The regulations referred to in the title are those governing the filing of tax returns with the Internal Revenue Service. Some of the rules for filing the various forms permit item nonresponse if some set of conditions is met. For example, one need not report itemized deductions when claiming the Standard Deduction on the Individual Income Tax Return.

These regulations affect all of the electronic records derived from the tax filings; so, other Federal agencies that use extracts from the Service's Master Files to enhance, for example, their sampling frames are also affected. The impact of such regulations is more pronounced for the Statistics of Income programs, because they use these administrative records both for a sampling frame and as the source questionnaires for the studies. Thus, rules that permit nonreporting of various data may affect not only the sample design but the sample's estimates as well.

We will examine one such exemption that applies to partnerships, and, as with the itemized deductions, the exemption applies only to certain schedules, on asset holdings. This is an issue because a similar exemption has just been introduced for corporations.

▶ Background

The Statistics of Income Partnership study focuses on businesses that can have limited liability, like corporations, and be traded on the stock exchanges, like corporations, but are not corporations. One reason a firm might not incorporate is that, in its line of business, the State prohibits that form of organization. The States, after all, hold domain over the rules for incorporation, not the Federal Government. This leaves us with only a very general description of the population, beyond the requirement that they file a Form 1065, *Partnership Return on Income*, with the Internal Revenue Service.

That form is not a tax return, however, for partnerships are rarely taxed as an entity. Rather, the earnings, deductions, and tax credits flow through to the owners who are taxed. This might not be a direct linkage, though, for the owners can be other partnerships.

The chaining of groups of partnerships and corporations, trusts and individuals, and the allocation of the incomes, credits, and deductions raises interesting tax administration issues. The Department of the Treasury's Office of Tax Analysis and Congress's Joint Committee on Taxation use the microdata from the various Statistics of Income studies to evaluate the laws and revisions; so, these data from the tax forms are irreplaceable for their purposes. However, the Service does not provide, nor have these sponsors requested, imputed values for missing items on those microdata files.

The published tabulations[1] from this series of studies have two different audiences: advocates for various tax law modifications, and economic analysts. In the first case, there is a need to ensure that the advocates have the same benchmarks as our sponsors. This leads us to publish data that are uncorrected for missing data.

When the data are used in economic analysis, where only summary data are available, the pattern of missing information can be disruptive. When the magnitude of the unreported data, for example, varies over the years or is a large proportion of the "true" amount, estimates of rates of change or financial ratios can be mistaken. In this case, the filing rule allows companies that meet certain conditions to avoid reporting their assets on their balance sheets.

The original version of the balance sheet exemption, 20 years ago, had seven conditions to be met, including being in a selected industry, having 10 or fewer partners, and the relationships among the partners (both with respect to interest in the firm and its profits, and as family). This complicated and constrained balance sheet filing exemption led to only a relative handful of firms responding that they met all the various tests. Thus, the effect on the resultant statistics was too small to even

get a reliable measure of its size for Tax Years 1983 through 1990.

This exemption was relaxed and simplified for Tax Year 1991, requiring only that both receipts and assets were less than $250,000 (and that the Schedule K-1's were filed timely). Then, 2 years later, the current version, labeled Question 5 on Schedule B of the return, was introduced:

> ***"5.*** *Does this partnership meet* ***ALL THREE*** *of the following requirements?*
>
> ***a.*** *The partnership's total receipts for the tax year were less than $250,000;*
>
> ***b.*** *The partnership's total assets at the end of the tax year were less than $600,000;* ***AND***
>
> ***c.*** *Schedules K-1 are filed with the return and furnished to the partners on or before the due date (including extensions) for the partnership return."*

While "total assets" is well defined (at least five places on the form have a total assets value), there is no single reference to "total receipts." For Tax Years 1991 through 2001, no definition of this amount was provided, either on the form or in the instructions. The current edition of the instructions for Form 1065, though, provides a detailed computation[2] that requires 17 amounts from three schedules, which in turn reference still other forms and schedules. When this definition of total receipts is retroactively applied to the records in Tax Year 1998 through 2001 Studies, as shown in Figure 1 below, 65 percent to 70 percent of those who appear to meet the conditions for the exemption file a completed balance sheet anyway. Thus, there is sufficient response for us to estimate the difference between the published estimates and one adjusted for nonresponse.

Figure 1. Partnerships With Total Receipts Less Than $250,000 and Assets Less Than $600,000, Tax Years 1998-2001

	Tax Year			
	1998	1999	2000	2001
Exempt and Assets 0	356	342	359	348
Reported Assets	686	726	772	787
Assets 0, Nonexempt	39	34	34	34
Final Filings	150	157	152	155

(All estimates in thousands of returns filed.)

If one were to look only at the presence or absence of the balance sheet information among those records that meet the criteria for the exemption, then about half would be without those data. But about 12 percent are final reports (the companies ceasing business); so, their assets are zero by definition. Moreover, another 2.5 percent to 3 percent did not claim the exemption, yet reported no assets. We are inclined to believe that these reports are true, for there are cases where the partners bring their own tools to the job, and there are no jointly-owned properties in those companies.

In adjusting the estimates for the missing asset information, the final filings are considered to be outside the adjustment classes, the same as firms with large assets or receipts. Firms that did not claim the exemption yet had no assets were placed with those reporting balance sheet amounts.

There are a handful of records that do not meet the requirements for the balance sheet exemption, using the definition for Total Receipts found in the Tax Year 2002 instructions booklet. These cases are believed to be coding errors that occurred during data abstraction because, in all cases, the balance sheets were reported. This suggests that there are those in the adjustment classes who reported assets and answered Question 5, "yes." In these cases, we simply ignored that false "yes." (The verification procedures were modified, and this sort of error should now cease to appear.)

▶ Effect on Strata

The goal in creating strata is to form groups that are relatively homogeneous. This reporting regulation creates implicit boundaries within the population that, if ignored, could create heterogeneous strata with respect to a key set of data. Unfortunately, not all of the items needed to compute "total receipts" are available on the sampling frame, though all of the major components are present. To the extent possible, then, a proxy for that total receipts amount is computed, and the limits set by Question 5 are explicitly incorporated as strata boundaries.

The outline of the strata is shown in Figure 12 (after the footnotes). This design has strata below the boundaries of the area defined by the exemption. Those lower receipts categories are incorporated in the creation of the adjustment cells. Real Estate firms, more than a third of the population, are separately stratified, and, since there is a connection between industry and the allocation of assets among the balance sheet categories, this classification is also respected in choosing the cells.

This outline can only be followed so far, however, because the change to the North American Industry Classification System (NAICS) required a change in the industry groups used in the design,[3] starting with the Tax Year 2001 study. For non-real estate returns, NAICS industry divisions were used, even though they sometimes crossed the major stratification boundaries for the studies of Tax Years 1998 through 2000.

▶ Adjustment Procedure

The balance sheet exemption nears the border between item and unit nonresponse, in that while we are concerned with records that are mostly complete (with all the income and expense items reported), the items missing are contained on a schedule that is separable from the rest of the report. That is, few of the asset items are the results of computations reported on other parts of the return, and the calculations on the balance sheet affects no other schedule.

The goal is to assess the magnitude of the understatement caused by the reporting exemption in the published tables. Thus, viewing the balance sheets as a separate sample, the appropriate nonresponse correction policy is a weight adjustment strategy:

$$\hat{Y} = \sum w_i a_c x_{ijc}$$

where $w_i = N_i/n_i$, is the sampling weight, and a_c is the item nonresponse adjustment factor for class "c." This factor is:

$$a_c = \begin{cases} 0 & \text{if exempt and assets } 0 \\ 1 & \text{if not in an adjustment class} \\ \hat{N}_c / \hat{N}_{cr} & \text{otherwise} \end{cases}$$

An adjustment factor of 1 is assigned to final filings and those companies with total receipts or asset values that exceed the regulation's limits. The rest were divided into classes depending on the size of total receipts, using the strata boundaries to the extent possible, and the NAICS industry division, as noted above.

The operating assumption is that the exemption claimants have the same distribution as the respondents within the adjustment cells, with respect to their assets; so, we used the estimated populations ($\hat{N}_c$ and $\hat{N}_{cr}$ for the cell total and respondent populations, respectively) in computing the adjustment factors. Within the various adjustment cells, the sampling weights varied considerably, in one case from a low of near 5 to a maximum of over 250 (with the weights approximately equal to the inverse of the probability of selection).

Figure 2. Weight Adjustments for Balance Sheet Data

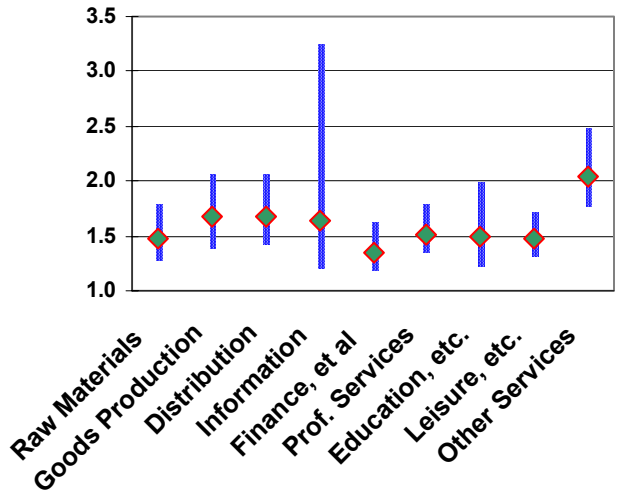
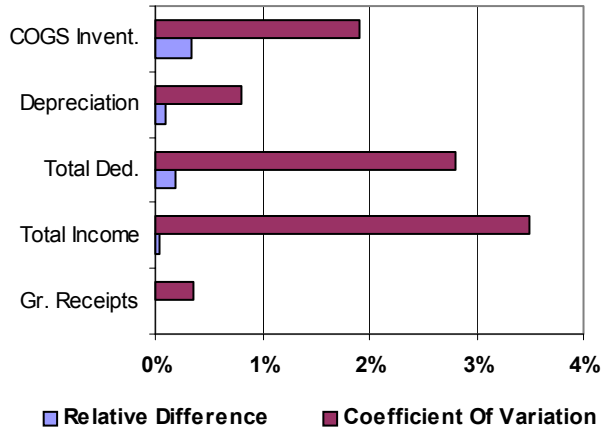


Figure 2 combines the adjustments for the 4 years to give a feel for the distribution of the factors. The factor for the Information Industry Division stands out, even though the average for that group (indicated by the lozenge) is quite reasonable because of the wide spread of the factors over the years. This is a small sample-size effect in the years after the conversion to NAICS, for, at the time the design was set, we had no usable data on the industry distributions.

▶ Validation of Adjustments

Do these adjustment factors provide reasonable estimates? The rule on not reporting selected data applies only to the Balance Sheet items; so, by computing alternate estimates for, say, income statement data, one can get a good measure on the reliability of this procedure, particularly if the items are somewhat related to balance sheet data.

Figure 3. Selected Estimates, Tax Year 2001

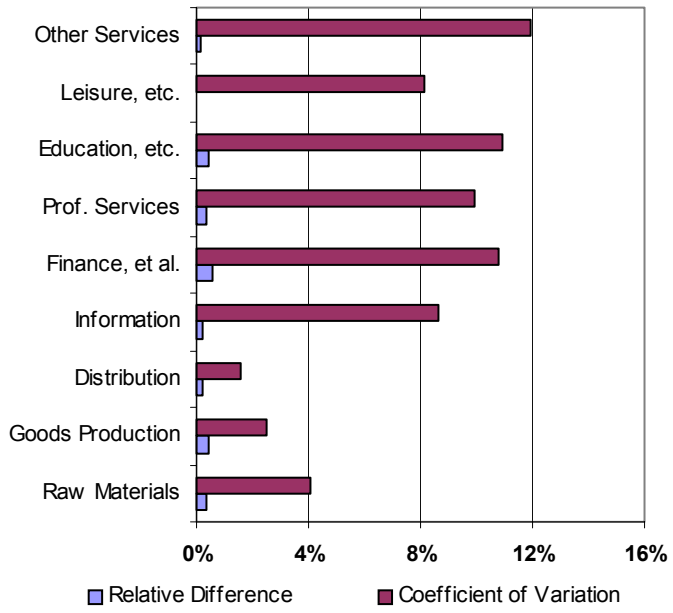


As seen in Figure 3, the absolute value of the ratio of the estimates under the adjustment procedure to the full sample estimates compares favorably to the relative errors at the national level. Cost of Goods Sold (COGS) Inventory and the Depreciation Expense are related to Inventory and Accumulated Depreciation on the balance sheet, respectively, but only comprise a part of those assets.

National comparisons can hide significant problems in critical subpopulations. Yet Figure 4 demonstrates, that, for COGS Inventory at least, the adjustments are very close to the full sample estimates for each of the industry divisions.

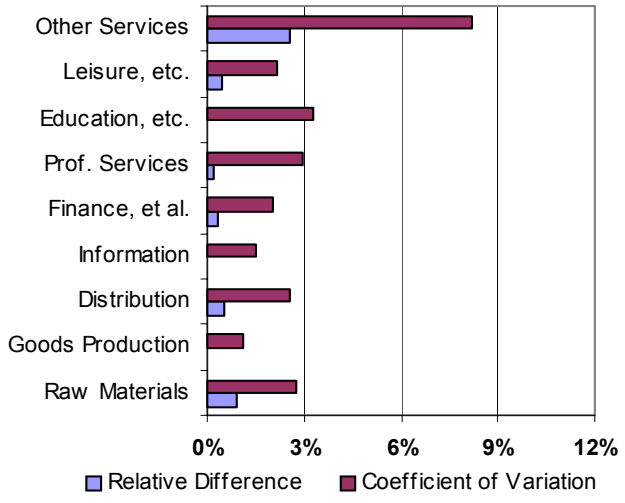
The scale for the Depreciation Expense, in Figure 5, is set to agree with that for Inventory, above. The Coefficients of Variation here are generally smaller because there is a greater dominance effect on the estimates by firms in the certainty strata. This effect is also apparent on the relative differences between the original figures

Figure 4. Cost of Goods Sold Inventory by Industry Division, Tax Year 2001



and the adjusted data. The exception is the division "Other Services," which has a small population and sample, as well as generally lesser amounts of total assets on average. These factors also affect the differences between the adjusted estimates from the respondents and the full sample estimates.

Figure 5. Depreciation by Industry Division, Tax Year 2001



Since the adjusted estimate for Other Services is still within 3 percent of the full sample estimate (and all the other data fall much closer to the mark), this method appears viable for the purpose of getting some measure of the size of the balance sheet estimates' understatement.

▶ Question 5's Impact

The Balance Sheet, shown in Figure 6, has two sections: the upper portion, which details the Asset holdings, and a smaller part on Liabilities and Equity. In the first part, there are four items that, though they are presented as positive values in the table, are subtractions from the total. These amounts, indicated by parenthesis, are: Bad Debts, Accumulated Depreciation, Accumulated Depletion, and Accumulated Amortization.

The two sections are, by accounting definition, equal, which is why we show the amount "Total Assets" in the break between them. The columns labeled "Relative Change" show the amount of the difference between the original and adjusted estimates as a percentage of the original estimate.

Although the size of the relative change is fairly small, particularly for Total Assets, there is little doubt that it is significant, as Figure 7 demonstrates. The increase in the coefficient of variation for Tax Year 2001 is the re-

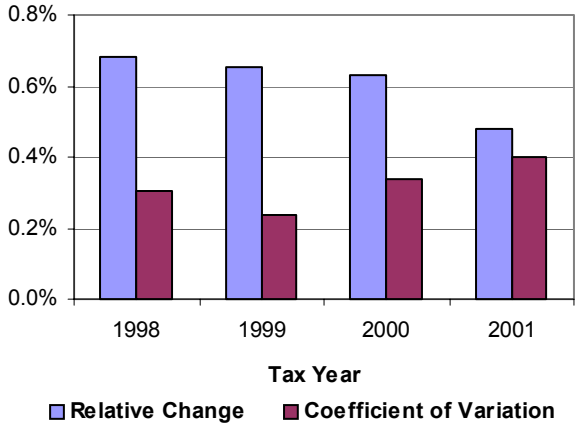
Figure 6. Adjusted Balance Sheet Estimates, Tax Years 1998 – 2001

	Tax Year 1998		Tax Year 1999		Tax Year 2000		Tax Year 2001	
	Adjusted Estimate	Relative Change	Adjusted Estimate	Relative Change	Adjusted Estimate	Relative Change	Adjusted Estimate	Relative Change
Assets								
Cash	185,162	1.82%	221,250	1.67%	267,031	1.64%	345,715	1.10%
Accounts Receivable	343,538	0.21	392,844	0.20	432,881	0.17	544,377	0.20
(Bad Debts)	6,194	0.75	7,478	0.01	9,494	0.06	12,027	0.39
Inventories	177,405	0.82	175,762	0.97	151,509	1.09	209,615	0.70
U.S. Obligations	95,784	0.03	79,280	0.05	72,952	0.14	156,399	0.04
Tax-Exempt Securities	28,132	0.03	23,158	0.04	26,304	0.08	33,500	0.01
Other Current Assets	700,299	0.30	828,183	0.27	837,555	0.26	1,261,821	0.18
Mortgages & Loans	52,239	1.86	48,798	1.82	61,052	1.11	71,778	0.84
Other Investments	1,586,214	0.26	1,980,991	0.26	2,281,339	0.26	2,890,034	0.20
Depreciable Assets	1,755,731	1.42	1,986,825	1.33	2,216,418	1.22	2,443,007	1.07
(Accum. Depreciation)	610,346	2.12	659,283	1.97	715,152	1.80	782,651	1.57
Depletable Assets	43,673	0.97	44,911	0.88	53,898	0.66	57,061	0.44
(Accum. Depletion)	18,308	0.92	14,790	1.51	16,146	0.97	17,182	0.76
Land	298,916	2.66	335,320	2.74	368,214	2.67	400,417	2.12
Intangible Assets	193,942	0.50	240,672	0.41	309,273	0.37	354,341	0.34
(Accum. Amortization)	52,522	0.66	55,676	0.66	66,971	0.45	81,126	0.52
Other Assets	367,838	0.42	417,278	0.42	465,767	0.41	593,507	0.35
Total Assets	5,161,503	0.68%	6,038,045	0.65%	6,736,429	0.63%	8,468,455	0.48%
Liabilities and Capital								
Accounts Payable	191,709	0.53%	245,213	0.59%	230,843	0.41%	362,413	0.18%
Short- Term Debt	233,044	1.36	235,057	1.40	255,593	1.33	292,238	1.03
Other Cur. Liabilities	935,377	0.46	966,930	0.46	927,837	0.43	1,578,613	0.20
Nonrecourse Loans	524,503	0.21	583,553	0.24	640,878	0.23	701,254	0.20
Long-Term Debt	896,685	1.38	1,000,853	1.23	1,144,654	1.10	1,298,752	0.96
Other Liabilities	399,503	2.09	449,410	1.15	522,613	0.91	630,073	1.22
Partners Cap. Accts.	1,980,682	0.25	2,557,030	0.44	3,014,010	0.51	3,605,113	0.33

(Amounts are in millions of dollars.)

sult of a smaller sample size arising from resource constraints. The change in the adjustment does not have an obvious source, on the other hand, though it seems connected to late filing firms of the sort that usually report losses.

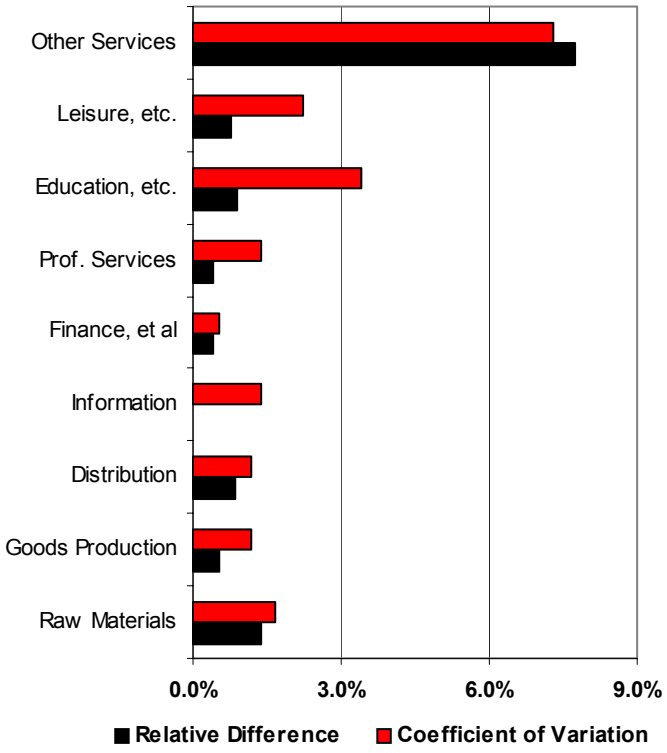
Figure 7. Relative Adjustment and Coefficients of Variation for Total Assets, Tax Years 1998-2001



At the same time, the general sizes of the relative adjustment and coefficient of variation are quite close, and small. This pattern of the close sizes appears to continue in the industry division estimates, as shown in Figure 8. The reason for this lies in the dominance of the largest firms. Such companies are selected with certainty for the sample and, hence, contribute nothing to the sampling error while reducing the coefficient of variation. Similarly, all of these firms have attributes that mean they do not meet the conditions set forth in Question 5; so again, the dominance reduces the effect.

The clearest example of this is in the Other Services and Finance Divisions. In the first case, Other Services, we have a small division without large firms. As a result, both the sampling error and adjustment are large compared to the estimate. The Finance Division, on the other hand, is dominated by firms with large amounts of assets and contains most of the partnership population. As a result of that dominance and size, the data for the Finance Division appear to have little significance in Figure 8. The values for both the adjustment and the coefficient, however, are very close to that for the all industries coefficient of variation and adjustment for Total Assets, demonstrating the inverse relationship in these data between the nominal size of the ratios presented and the importance of the underlying data.

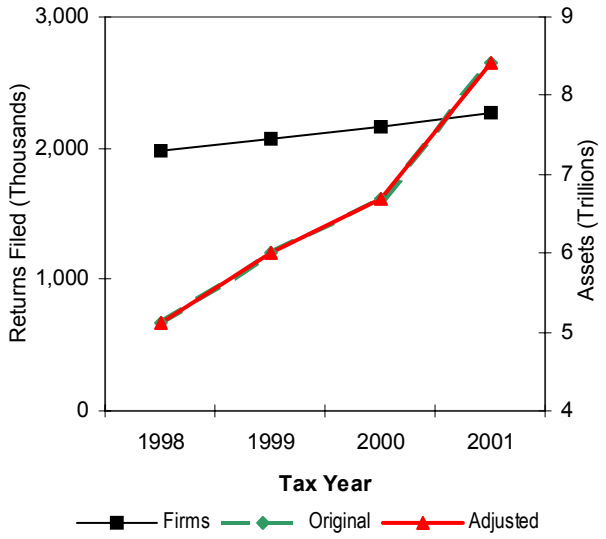
Figure 8. Adjusted Total Assets, by Industry Division, Tax Year 2001



Figures 6, 7, and 8, address the relative size of the adjustments. The size has an impact on ratios of estimates within a tax year, as is sometimes used in financial and accounting environments. The main purpose of the Statistics of Income data series, however, is to provide economic information, particularly on the effect of changes to the tax laws. In this situation, it is not the size of the adjustment itself that matters, but whether there is a large effect on the estimates of change.

When considering the estimates of change, one must bear in mind that the number of partnership returns filed, our population, has increased by a nearly constant 5 percent per year. The amount of total assets, on the other hand, has increased even faster, between 12 percent and 25 percent per year, as illustrated by Figure 9.

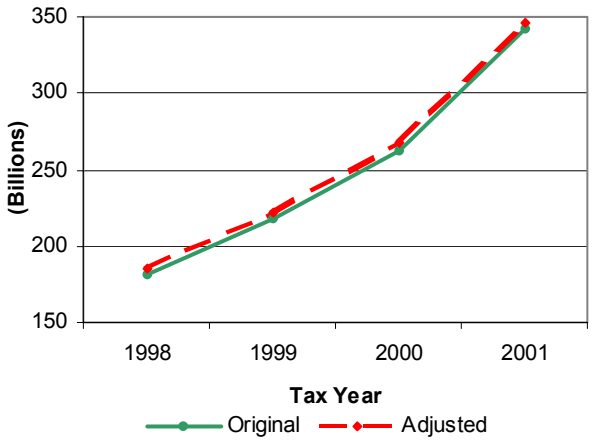
Figure 9. Change in Assets and Population, Tax Years 1998-2001



That figure, above, also shows the difference, or rather the lack thereof, between the original and adjusted estimates. On this scale, the difference between the two is barely discernible. This is not unexpected, for the relative differences are quite small and in the same direction (always greater).

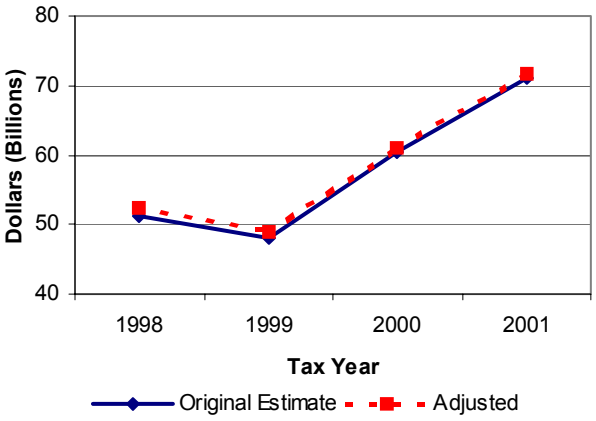
Both the scale required and the relative nearness of the two sets of estimates conspire to make the differences appear as they do. Perhaps better resolution could be obtained with smaller estimates where the departures are the greatest.

Figure 10. Cash, Original and Adjusted Estimates, Tax Years 1998-2001



Yet with the estimates for Cash, in Figure 10, we again see no real differentiation.

Figure 11. Estimated Mortgages and Loans, Original and Adjusted Estimates, Tax Years 1998-2001



This also holds true for the most extreme case, Mortgages and Loans, as seen in Figure 11.

▶ Conclusions

The method of weighting the balance sheet respondents is a reasonable procedure, given the response rate and the constrained circumstances of Question 5. The adjusted estimates of nonbalance sheet items from exempted firms, when compared to those from the full sample, lend credence to this adjustment strategy by the close agreement of those figures.

The adjusted balance sheet estimates are not greatly different from the original data, largely due to the dominance effect of the largest firms, but the differences do indicate a significant bias, as they are at least the size of the coefficients of variation. This bias is relatively constant; so, trends do not appear to be affected. However, the few years for which data are available suggest that this issue bears watching.

There are no plans to adjust the estimates the Service publishes to correct for these understatements, both

because the adjustment amounts for each item appear to be reasonably constant, and because the uncorrected totals provide a benchmark to external users of the data who review estimates from either the Office of Tax Analysis or the Joint Committee.

Nevertheless, we are considering adding a table to the annual publication comparing the full sample estimates to the adjusted results, mostly for the use of those researchers who focus on investment type ratios.

It is clear that, while the administrative systems do provide a very good source for population data, one has to be cautious about the existence of filing rules that can affect both sample designs and subsequent analysis.

▶ Footnotes

[1] Internal Revenue Service, *Statistics of Income Bulletin*, Fall 2002 (or other Fall editions), Washington, DC.

[2] Total receipts is the sum of:

Form 1065, pg .1: Gross Receipts, Ordinary Income From Other Partnerships, Net Farm Profit, Net Gain or Loss From the Sale of Business Property, and Other Income;

Schedule K: Non Real Estate Rents, Interest Income, Ordinary Dividends, Royalty Income, Short Term Capital Gains, Long Term Capital Gains (Taxed at the 28 Percent Rate), Other Portfolio Income, Income Under Section 1231, and Other Income;

Form 8825: Gross Real Estate Rents, Net Gain or Loss From the Sale of Business Property, and Income From Other Real Estate Partnerships.

[3] McMahon, Paul (2000), "Changing Industry Code Systems: The Impact on the Statistics of Income Partnership Studies," *Proceedings of the Second International Conference on Establishment Surveys*, American Statistical Association.

Figure 12. Partnership Sample Design and Sampling Rates, Tax Year 2001

Extreme and Special Cases:

Total Assets $250,000,000 or more, or Receipts or Net Income $50,000,000 or more 100%

Publicly Traded Partnerships or Firms With 100 or more Partners 100%

Total Assets 100,000,000 Under 250,000,000 and Receipts or Net Income Under 50,000,000, or
Total Assets Under 100,000,000 and Receipts or Net Income 25,000,000 Under 50,000,000 . . . 35%

Real Estate

	Absolute Value of Receipts/Income ($)						
Assets ($)	Under 50,000	50,000 under 100,000	100,000 under 250,000	250,000 under 500,000	500,000 under 1,000,000	1,000,000 under 5,000,000	5,000,000 under 25,000,000
Under 250,000	0.12%	0.20%	0.30%	{	1.50%	}	
250,000 under 600,000	0.17	0.19	0.30	{	1.10	→	}
600,000 under 2,500,000	{ 0.27 }		0.35	0.50	{ 1.50 }		10%
2,500,000 under 5,000,000	{	0.50	}	0.80	0.90	1.90	
5,000,000 under 25,000,000	{	1.00	}	1.00	1.70	2.50	____
25,000,000 under 100,000,000	{			7.0%		}	15%

All Other Industries

	Under 40,000	40,000 under 100,000	100,000 under 250,000	250,000 under 1,000,000	1,000,000 under 2,500,000	2,500,000 under 5,000,000	5,000,00 under 25,000,000
Assets ($)							
Under 200,000	0.35%	0.50%	0.75%	0.12%	{ 3.8%	}	
200,000 under 600,000	0.40	0.80	0.95	1.40	{ 2.50	}	
600,000 under 2,000,000	{ 0.65 }		0.95	1.80	3.00	4.50	14.%
2,000,000 under 5,000,000	{ 1.50 }		2.50	3.00	{ 6.00	}	
5,000,000 under 10,000,000	{	2.50	}	3.00	5.00	6.50	
10,000,000 under 25,000,000	{	5.00	}	{ 6.00	}	10.00	____
25,000,000 under 100,000,000	{			14.%		}	30.%

Information, and Health, Education and Social Services

	Under 40,000	40,000 under 100,000	100,000 under 250,000	250,000 under 500,000	500,000 under 1,000,000	1,000,000 under 5,000,000	5,000,000 under 25,000,000
Assets ($)							
Under 150,000	0.35%	0.90%	1.50%	1.50%	{ 3.50%	}	
150,000 under 600,000	{ 3.00 }		20.0	{ 3.00 }		4.00	
600,000 under 5,000,000	{ 4.00 }		12.0	{ 3.00 }		7.00	13.%
5,000,000 under 25,000,000	{	25.0	}	{ 20.0 }		7.00	
25,000,000 under 100,000,000	{			40.%		}	30.%