The Effects of Tax Software and Paid Preparers on Compliance Costs

John L. Guyton and Adam K. Korobow, IBM Business Consulting Services, Peter S. Lee, Internal Revenue Service, and Eric J. Toder, the Urban Institute

Abstract

In recent years, the percentage of individual taxpayers using paid preparers and software has increased, while the share of taxpayers who self-prepare without software has dropped sharply. Using the Individual Taxpayer Burden Model developed by IBM Business Consulting Services for the IRS, we simulate the effects of preparation method on time and money costs of preparing tax returns. When we correct for self-selection bias, we find that each group on average selects the preparation method that costs the least for them. For example, software costs more than self-preparation for current self-preparers, but costs less than self-preparation for current software users.

INTRODUCTION

In the past decade, there has been a dramatic shift in the way individual income taxpayers prepare and submit tax returns. In 1993, according to data reported in the IRS Taxpayer Usage Study (TPUS), 41 percent of taxpayers prepared their own tax returns without software, while 51 percent used paid preparers and only 8 percent prepared their own returns on a computer. By 2003, the share of self-prepared returns without software had dropped by two-thirds to only 13 percent. The tax software share tripled in a decade to 25 percent in 2003, while paid preparer use – the most common preparation method – rose to 62 percent (Toder 2005).[1]

---

[1] The TPUS data typically under-state the percentage of taxpayers who prepare their own returns by several percentage points, compared with final data drawn from the IRS Master File, but they accurately represent trends in tax preparation methods. In 2003, according to Master File data, 16 percent of taxpayers prepared their own returns without software, while 24 percent used software and 60 percent used paid preparers

Overall, counting both paid preparers and self-preparers, the TPUS data also show

a dramatic rise over time in the share of return prepared on a computer. Over 85 percent

of tax returns were prepared on a computer in 2003 – 97 percent of the 62 percent of

returns paid by preparers and 66 percent of the 38 percent of returns prepared by

taxpayers. In contrast, in 1987, only 13 percent of tax returns were prepared on a

computer.[2]

The increase in computer-prepared returns has been accompanied by an increase

in the proportion of taxpayers who file their returns electronically instead of on paper.

The percentage of returns filed electronically quadrupled over ten years from 12 percent

in 1993 to 48 percent in 2003. The 2004 tax year will be the first year in which over 50

percent of returns are filed electronically. TPUS data show that through May 13, 2005

the share of individual tax returns filed electronically for tax year 2004 was about 54

percent.

This paper summarizes results of research presented at the 2005 National Tax

Association Spring Symposium. The research used the Individual Taxpayer Burden

Model (ITBM), a simulation model developed by IBM Business Consulting Services for

the IRS, to show how tax preparation methods affect compliance costs. The model has

been described previously in Guyton *et al.* 2003. Details of the technical estimation

---

[2] IRS TPUS data for 1987 do not show a breakdown of computer-prepared returns between those submitted by tax preparers and those submitted by taxpayers themselves. Assuming, however, that only preparers used software, the data show that at most 28 percent of returns submitted by preparers were done by computer.

methodology used to generate these results and some further extensions of the analysis

will appear in a forthcoming paper.

Preliminary simulation results suggest that taxpayers selecting each preparation

method are minimizing their costs of tax preparation, under reasonable assumptions about

the value of a taxpayer's time. This means that the availability of more tax preparation

options makes compliance costs lower than they would otherwise be.   Compliance

burdens of the individual income tax remain high, however, because taxpayers cannot

eliminate all major sources of compliance burdens (for example, record-keeping,

gathering tax materials, tax planning) by preparing returns on a computer. Improvements

in technology can only partially offset the effects of an increasingly complex tax code.

BACKGROUND ON INDIVIDUAL TAXPAYER BURDEN MODEL

Compliance burden is a well-known cost of administering a tax system. Research

in this area goes back at least a century, with an extensive international literature on the

measurement of these costs (see Evans 2003). Building on this research, the US Internal

Revenue Service (IRS) is developing simulation models to measure the level of

compliance burden and support analyses of how tax policy changes and IRS

administrative initiatives affect compliance burdens. Initial research has focused on

individual taxpayers (Stavrianos and Greenland 2002, Arena *et al.* 2003, and Guyton *et

al.* 2003), although work is currently underway to simulate the compliance burdens of

small business taxpayers as well (DeLuca *et al.* 2003 and Guyton *et al.* 2004). For the

work at IRS, compliance burden is defined as time and out-of-pocket money costs (beyond that remitted to the IRS) to comply with the tax laws. The definition of compliance burden excludes psychological costs and deadweight losses that occur because of tax-induced changes in work, saving, and other form of economic behavior.[3]

As discussed in Guyton *et al.* 2003, compliance burden was measured via surveys of 6,366 Wage and Investment taxpayers and 9,081 Self-Employed taxpayers.[4] These survey data were matched with corresponding IRS administrative tax return data. Counts of 21 burden attributes organized in three groups (source attributes, operation attributes, and complexity attributes) were assigned to the tax records from the corresponding tax forms and instructions. For example, taxpayers reporting wages and salary were assigned corresponding burden attributes from Form 1040, 1040A, or 1040EZ, as appropriate. The burden attribute counts were then combined into burden indices included on the right hand side of burden estimation equations. The burden attribute assignments and corresponding estimation equations are the core of the burden estimation model and are integrated with a micro-simulation tax calculator to produce the IRS's Individual Taxpayer Burden Model (ITBM).

The compliance burden simulation methodology used at IRS continues to evolve. Recent research on the ITBM has focused on pushing the limits of its simulation

---

[3]Debate continues on the exact definition of compliance burden (see Tran-Nam 2004).

[4] Together, these two groups constitute the entire population of US federal individual income taxpayers. The Self-Employed population is defined as filers of Form 1040 Schedules C, E, or F and filers of Form 2106. The remaining individual income taxpayers are classified as Wage and Investment taxpayers.

functionality (see Lerman and Lee 2004 and Holtzblatt 2004) and further extending the simulation methodology (see IBM report to IRS 2005). Extension of the methodology centered on re-weighting the relative impact of taxpayer compliance attributes in explaining changes in any of seven burden time categories (record keeping, gathering tax materials, using IRS services, working with a paid professional, tax planning, form completion, form submission) and an eighth out-of-pocket money burden category. In particular, the extended methodology expanded the set of attribute indexes used as drivers of compliance burden from three (a general index and specific indices for record keeping and form completion) to 24 (one for each of the eight burden measures crossed with three preparation methods: use of a paid preparer, self-preparation with software, and self-preparation without software). The simulation results reported in the current paper are based on an extension of the burden research at IRS that estimates the drivers of taxpayer preparation method and develops preparation method selection controls for the burden estimation equations.

COSTS OF COMPLIANCE USING ALTERNATIVE PREPARATION METHODS:
SUMMARY DATA

In tax year 2000, individual taxpayers spent on average 26.4 hours and $150 in out-of-pocket expenses in pre-filing and filing activities (Table 1). For all taxpayers, time burden was 3.4 billion hours and out of pocket expenses $19.3 billion. If one assumes a time value of $20 per hour, this means that total annual costs to individual

taxpayers of complying with the individual income tax (excluding any post-filing

contacts with IRS) was about $87 billion.

Compliance costs were much higher for some groups of taxpayers than for others.

Self-Employed (SE) taxpayers incurred much higher expenses than Wage and Investment

(W&I) taxpayers. SE taxpayers spent on average 59 hours and $364 complying with the

tax law, compared with only 15 hours and $74 for W&I taxpayers. Additional results

(see Guyton *et al.* 2003) show, as expected, relatively higher compliance costs for

taxpayers who itemize deductions, are subject to the alternative minimum tax, file

Schedule D (capital gains), and file Form 1040 instead of the simpler Forms 1040A or

1040EZ.

As expected, taxpayers who use software have higher out of pocket costs than

taxpayers who prepare their returns without software and taxpayers who use paid

preparers have by far the largest out of pocket costs (third panel of Table 1). But,

somewhat surprisingly, taxpayers who use paid preparers spend more time on average

than those who prepare their own returns without software (28 hours compared with 18

hours) and taxpayers who prepare their own returns with software spend the most time of

the three groups (37 hours). Because the three groups include taxpayers with very

different characteristics, these results are not necessarily anomalous; they might simply

reflect the fact that taxpayers who use software and paid preparers have more

complicated returns than those who prepare their own returns without software. It is also

possible, however, that software users choose to spend more time than they otherwise

would because of other benefits from software (such as greater accuracy or enhanced ability to do tax planning) because they under-estimate the time involved in using software or because they enjoy working on their computers.

SIMULATING COSTS OF COMPLIANCE USING ALTERNATIVE PREPRATION METHODS WITH CORRECION FOR SELECTION BIAS

This section presents results of research in progress to simulate the results of using alternative preparation methods. For each group of return preparers, we simulate time and money costs of preparing tax returns using both the method they use and the two alternative preparation methods. The three groups of return preparers are self-preparers without software (self-preparers), self-preparers with software (software preparers) and users of paid preparers.

The simulation equations incorporate a correction for self-selection bias. This correction is necessary because each equation can only be estimated for the people who actually use the preparation method in the equation. Thus, for example, the equation for self-preparation costs is estimated on a sample that includes self-preparers only. But if software preparers have systematically different costs of self preparation than self-preparers do, then the coefficients of the self-preparation equation will be biased estimates of the effects of tax system complexity on time and money burdens for the entire taxpaying population. In particular, we cannot use the coefficients of such an equation to make inferences about the hypothetical cost for *software preparers* in a self-

preparation by hand regime.   This is because there may likely be some unobservable

factor of software preparers that is correlated with the level of compliance burden and the

choice of preparation method. The same holds true for the estimates for costs of using

software and paid preparers.

Correcting for self-selection bias requires two steps. First, we estimate discrete

choice equations for preparation method.   Second, we use the predicted probabilities

from the choice model to construct a selectivity parameter that controls for self-selection

in the time and money burden models. (Dubin and McFadden, 1984).

When we estimate the equations for preparation method, we find that taxpayers

are about equally more likely to increase use of paid preparers or software as their returns

become more complex. They are more likely to use paid preparers than software if they

are self-employed and have a high ratio of tax due to tax liability. They are more likely

to choose software than paid preparers if they own a home computer and are highly

educated.

We then apply the results of the preparation methods equations to derive estimates

of the time and money burden under the three preparation methods as a function of tax

complexity, taxpayer demographic variables, and a selectivity parameter. In the

equations for compliance costs, we find that the selectivity parameters are statistically

significant determinants of time burden for all the preparation methods, but are not

statistically significant in the money burden equations for self-preparation and software.

Tables 2 and 3 display the results of simulating time and money costs of preparing tax returns by alternative methods for three groups of taxpayers – those who currently self-prepare returns, those who currently prepare with software, and those who currently use paid preparers. Average time and money spent on filing and pre-filing activities is 17 hours and $24 for self-preparers, 37 hours and $72 for software preparers, and 29 hours and $286 for taxpayers who use paid preparers (*italicized* entries in Table 2). These figures differ slightly from those reported in Table 1 because the data in Table 2 come directly from the surveys of Wage and Investment and Self-Employed taxpayers in 1999 and 2000, while the data in Table 1 were constructed by using equations estimated from the survey data to impute burden values to a larger sample of 2000 tax returns. As previously noted, these differences in actual time and money burdens reflect both differences in preparation methods used and differences in the complexity of tax returns and demographic characteristics among the three groups of taxpayers. Therefore, the raw data along the diagonals in the table cannot be used to assess the relative time costs of using different preparation methods for similar groups of taxpayers.

Without the selection bias correction, the simulations show that current self-preparers would spend on average 5.7 more hours on their tax returns if they used software (top panel of Table 3). Applying the conditional selection control correction increases the estimated increase in time burden of using software for *current self-preparers* from 5.7 to 17.3 hours and their increase in money burden from $12 to $15. Note this is consistent with high costs for them of using software, if they do not own

9

computers or if their returns are so simple that the fixed time investment in software

exceeds any incremental gain from software's ability to handle complex calculations and

form entries.

The correction for selection bias, however, raises the estimated average potential

time saving for self-preparers from switching to paid preparation from 2.9 hours to 8.6

hours and reduces the additional out-of-pocket costs from $80 to $38. This suggests that

some self-preparers may be foregoing a potentially low-cost way of saving time (less

than five dollars per hour) from using paid preparers, either because their income (and

time value) is low or because they have an aversion to using preparers.

Without correcting for self-selection bias, the simulations imply that current

software users would save almost ten hours on average and $15 from switching to self-

preparation (middle panel of Table 3). But with the bias correction, switching to self-

preparation would *increase* their time burden by 7.5 hours and reduce money burden by

only $11. Applying the self-selection correction eliminates the apparent increase in both

time and money burdens of software use (compared with self-preparation) for those

currently using software.

In the case of people who currently use paid preparers, the self-selection

correction also changes the results dramatically (bottom panel of Table 3). Without the

correction, the equations show paid preparer users would spend only a little over an hour

longer on average on their tax returns if they prepared the returns by hand (11 hours more

with software). It would be hard to explain paying the paid preparer fee (averaging $243

for paid preparer users) to save an hour of time. But with the selection control correction,

the estimates show that users of paid preparers would spend on average an additional

23.4 hours if they prepared their own returns without software and an additional 22.8

hours if they used software. The selection control correction, however, has little effect on

the estimated money savings from not using a paid preparer. With selection controls, the

estimates show savings of $223 for switching to self-preparation and $212 for software;

without the selection controls, the savings are $228 for self-preparation and $212 for

using software.

The results in table 3 could be used to estimate the reduction in compliance

burdens from the existence of alternatives to self-preparation without software. Relative

to self-preparation, software users save on average 7.5 hours of time at a cost of $11 and

users of paid preparers save on average 23.4 hours at a cost of $223.   Multiplying these

figures by the ITBM tax year 2000 estimates of 19.989 million software users and 72.611

million users of paid preparers produces an estimated total saving in 2000 of 1.849 billion

hours at a cost of $16.4 billion in additional out of pocket outlays.

The net reduction in compliance burdens depends on how one values taxpayers'

time. If, for example, taxpayers' time is valued at $20 per hour, the net reduction in

resource cost is $20.6 billion. Net compliance cost is lowered as long as taxpayer's time

is worth at least $8.87 per hour (16.4/1.849). Even the $20.6 billion figure based on a

time value of $20 per hour is probably a very conservative estimate because the value of

time for those with the most complex returns who save the most time from paid preparers and software is likely to be considerably above the average time value for the population. Moreover, since Tax Year 2000 when these estimates were made, the share of taxpayers using alternatives to self-preparation, especially those using software, has increased.

CONCLUSION

The use of tax software and paid preparers has been increasing rapidly in recent years and the share of taxpayers who prepare their returns by hand has dropped sharply. Use of software or professional preparers is one way that taxpayers have taken advantage of technological change to adjust to an increasingly complex tax law.

The Individual Taxpayer Burden Model (ITBM) developed by the Internal Revenue Service and IBM Consulting is a useful tool for analyzing compliance burdens that individual taxpayers confront. This paper has used the ITBM to assess the effects of tax software and paid preparers on compliance costs.

The survey data used in the ITBM show that taxpayers who use paid preparers spend more money, but less time on their returns than those who self-prepare without software, but that software users spend both more time and more money on average than those who self-prepare without software. These figures do not measure the effects of paid preparer or software use, however, because the populations who use the three preparation methods have very different demographic characteristics and face very

12

different amounts of tax complexity. When we simulate the use of alternative preparation

methods with equations that adjust for self-selection bias, we find that all groups appear,

on average, to be using the cost preparation method that costs the least for them. In

particular, we estimate that software costs are *higher* for current self-preparers than

preparing without software, but are *lower* than preparing without software for current

software users.

The results we report in this paper are based on survey data from Tax Years 1999

and 2000. Since then, there have been further increases in both tax software use and the

incidence of electronic filing. With the dissemination of newer methods of tax

preparation and submission spreading rapidly across the taxpaying population, any

snapshot data, even from a fairly recent year, should be interpreted with caution. The

findings, however, strongly suggest that changes in preparation methods are contributing

significantly to moderating the growth in taxpayer compliance burdens.

REFERENCES

Arena, Peter, John F. O'Hare, and Michael P. Stavrianos. "Measuring Taxpayer Compliance Burden: A Microsimulation Approach." Proceedings: 95th Annual Conference on Taxation. *National Tax Journal.* 2003, 333-341.

DeLuca, Donald, Arnold Greenland, Audrey Kindlon, Michael Stavrianos. "Challenges in Developing a Small Business Taxpayer Burden Model." Presented at the 2003 IRS Research Conference. Washington, DC. June 2003.

Dubin, Jeffrey A., Daniel L. McFadden. "An Econometric Analysis of Residential Electric Appliance Holdings and Consumption." *Econometrica*: vol. 52. no. 2. (March 1984) 345-362.

Evans, Chris. "Studying the Studies: An Overview of Recent Research into Taxation Operating Costs." *The eJournal of Tax Research* Vol. 1, No. 1 (2003) 64-92.

Guyton, John L., John F. O'Hare, Michael P. Stavrianos, and Eric J. Toder. "Estimating the Compliance Cost of the U.S. Individual Income Tax." *National Tax Journal* LVI-3 (September 2003):673-688.

Guyton, John, Audrey Kindlon, and Jian Zhou. "Recent Research on Small Business Compliance Burden." Presented at the Ninety-Seventh Annual Conference of the National Tax Association. Minneapolis, Minnesota. November 13, 2004.

Holtzblatt, Janet. "Measuring Compliance Burdens: Issues Raised by the Individual Taxpayer Burden." Presented at the Ninety-Seventh Annual Conference of the National Tax Association. Minneapolis, Minnesota. November 13, 2004.

IBM report to IRS. "Individual Taxpayer Burden Model (ITBM) Attribute Re-weighting and Re-estimation." January 21, 2005. Available upon request from the IRS National Headquarters Office of Research.

Lerman, Allen H. and Peter S. Lee. "Evaluating the Ability of the Individual Taxpayer Burden Model to Measure Components of Taxpayer Burden: The Alternative Minimum Tax as a Case Study." Presented at the 2004 IRS Research Conference. Washington D.C, June 2004.

Stavrianos, Michael and Arnold Greenland. "Design and Development of the Wage and Investment Compliance Burden Model." Presented at the 2002 IRS Research Conference. Washington DC, June 2002.

Toder, Eric J. "Changes in Tax Preparation Methods, 1993-2003." *Tax Notes*. May 9, 2005.

Tran-Nam, Binh. "Assessing the Tax Simplification Effect of Tax Reform: Research Methodology and Empirical Evidence from Australia." Presented at the Ninety-Seventh Annual Conference of the National Tax Association. Minneapolis, Minnesota. November 13, 2004.

Table 1 - Compliance Burden of Individual Taxpayers in Tax Year 2000, by Selected Characteristics

	Number of Returns (000s)	Time Burden (000s of Hrs)	Hours per Return	Money Burden (000s of Dollars)	Dollars per Return
All Tax Returns	129,358	3,409,465	26.4	$19,367,232	$150
By Taxpayer Type					
Wage and Investment	95,648	1,428,764	14.9	$7,088,540	$74
Self-Employed	33,710	1,980,701	58.8	$12,278,692	$364
By Preparation Method					
Paid Preparation	72,611	1,999,619	27.5	$17,661,982	$243
Self Preparation w/o Software	36,757	664,035	18.1	$637,029	$17
Software Preparation	19,989	745,811	37.3	$1,068,221	$53
By Submission Method					
Paper	93,779	2,698,976	28.8	$14,441,332	$154
TeleFile	3,342	31,868	9.5	$14,215	$4
Other e-File	32,237	678,620	21.1	$4,911,684	$152

Source: IRS, Individual Tax Burden Model

Table 2. Average Time and Money Burdens Under Alternative Preparation Methods:
With and Without Conditional Selection Control
Simulations Using Data From Taxpayer Interviews, Tax Years 1999 and 2000

			Without Conditional Selection Control				With Conditional Selection Control			
			Total Time (in hours)	Form Completion (in hours)	Record Keeping (in hours)	Money Burden (in $)	Total Time (in hours)	Form Completion (in hours)	Record Keeping (in hours)	Money Burden (in $)
SELF PREPAPERS										
Self Preparation			*17*	*4.5*	*18.9*	*$24*	*17*	*4.5*	*18.9*	*$24*
Software Preparation			22.7	4.6	10.6	$35	34.3	7.6	13.5	$39
Paid Preparation			14.1	2.7	9.4	$103	8.4	2	7.4	$61
SOFTWARE USERS										
Self Preparation			27.5	6.7	15.6	$57	44.8	10	25	$61
Software Preparation			*37.3*	*7.2*	*19.9*	*$72*	*37.3*	*7.2*	*19.9*	*$72*
Paid Preparation			25.4	2.9	17.6	$305	23.1	2.6	16.8	$281
PAID PREPARER USERS										
Self Preparation			30	7.2	18.8	$58	52.3	11.8	31.6	$62
Software Preparation			39.9	7.7	23.9	$69	51.7	10.7	27	$73
Paid Preparation			*28.9*	*3*	*22*	*$286*	*28.9*	*3*	*22*	*$286*
Source: IBM Consulting, Simulations with ITBM Sample File										

Table 3. Change in Average Time and Money Burdens Under Alternative Preparation Methods:
With and Without Conditional Selection Control
Simulations Using Data From Taxpayer Interviews, Tax Years 1999 and 2000

	Without Conditional Selection Control				With Conditional Selection Control			
	Total Time (in hours)	Form Completion (in hours)	Record Keeping (in hours)	Money Burden (in $)	Total Time (in hours)	Form Completion (in hours)	Record Keeping (in hours)	Money Burden (in $)
SELF PREPAPERS								
Self Preparation	-	-	-	-	-	-	-	-
Software Preparation	5.7	0.2	1.8	$12	17.3	3.1	4.7	$15
Paid Preparation	-2.9	-1.7	0.5	$80	-8.6	-2.5	-1.5	$38
SOFTWARE USERS								
Self Preparation	-9.9	-0.6	-4.3	-$15	7.5	2.8	5.1	-$11
Software Preparation	-	-	-	-	-	-	-	-
Paid Preparation	-11.9	-4.3	-2.3	$232	-14.2	-4.7	-3.1	$209
PAID PREPARER USERS								
Self Preparation	1.1	4.2	-3.2	-$228	23.4	8.8	9.6	-$223
Software Preparation	11	4.7	1.9	-$216	22.8	7.7	5	-$212
Paid Preparation	-	-	-	-	-	-	-	-

Source: IBM Consulting, Simulations with ITBM Sample File