

# Projections of Returns to be Filed in Calendar Years 1997-2003

by Philip Cormany

**T**he grand total of tax returns filed with the Internal Revenue Service (IRS), the sum of all major return categories is projected to reach 211.4 million in Calendar Year (CY) 1997. The average annual growth in total return volume from CY 1997 through CY 2003 is expected to be about 1.1 percent, increasing to 226.7 million total returns by CY 2003.

Projections of tax returns to be filed by major form type are prepared annually by IRS Research Division [1]. The actual and forecasted return counts are used in IRS budgeting, planning, and resource optimization decisions, and to meet broader management information and analysis needs. These forecasts reflect changes in filing patterns, in economic and demographic trends, and in legislation and certain IRS administrative procedures. Calendar year projections reflect the year in which the returns are processed, rather than the tax year covered by the information reported on the return [2].

## Individual Form 1040 Return Series

The U.S. projection for the Individual Form 1040 Return Series (i.e., sum of "paper" Forms 1040, 1040A, 1040EZ, 1040PC plus total electronically-filed returns), in CY 1997 is 119.5 million, up from the estimated 117.8 million filed in CY 1996. This is an increase of 1.4 percent, as shown in the Figure A summary of 1997 projections. The average annual growth rate for the individual Form 1040 return series from CY 1997 through CY 2003 is projected at 1.3 percent.

## Expansion of TeleFile

TeleFile is a technology that gives certain taxpayers, who file short Form 1040EZ, the option to file their returns using touch-tone telephones. In 1995, TeleFile was only available to taxpayers residing in the following IRS district office areas: Cincinnati (Ohio), Cleveland (Ohio), Detroit (Michigan), Indianapolis (Indiana), Louisville (Kentucky), Parkersburg (West Virginia), Columbia (South Carolina), Jacksonville (Florida), Fort Lauderdale (Florida), Austin (Texas), Denver (Colorado), and Sacramento (California). Starting in CY 1996, TeleFile became available nationwide. The system now accommodates qualifying Form 1040EZ filers, including those who claim the earned income tax credit. In general, Form 1040EZ is used by taxpayers with no dependents; taxable income less than \$50,000; and no "unearned income," such as interest or dividends more than \$400. Those

Figure A

## Projections for Calendar Year 1997

[Number of returns is in thousands]

Type of return	1997 Projections	Percentage change from 1996 <sup>1</sup> (estimated)
<b>Grand total</b> .....	<b>211,391</b>	<b>0.74</b>
<b>Primary returns, total</b> .....	<b>197,960</b>	<b>-1.03</b>
Individual income tax, total.....	119,918	1.40
Total paper and electronic returns .....	119,472	1.38
Paper returns, total.....	99,779	-3.04
Paper Form 1040.....	60,088	-0.13
Paper Form 1040A.....	18,362	-2.20
Paper Form 1040EZ.....	14,271	-16.07
Paper Form 1040PC.....	7,057	1.39
Electronic returns, total.....	19,693	31.83
Standard electronic filing.....	13,445	11.14
TeleFile.....	6,248	119.92
Forms 1040NR, 1040-PR, 1040-SS.....	446	6.09
Individual estimated tax, Form 1040-ES.....	35,347	-0.29
Fiduciary income tax, Form 1041.....	3,447	2.01
Fiduciary estimated tax, Form 1041-ES.....	645	2.01
Partnership, Form 1065.....	1,636	1.39
Corporation income tax, total.....	5,141	2.44
Estate tax, Forms 706 and 706NA.....	90	4.05
Gift tax, Form 709.....	224	1.50
Employment tax, total.....	28,753	0.70
Form 941-TEL (TeleFile).....	214,800	(2)
Form 1042.....	26	4.03
Tax-exempt organization.....	614	3.35
Employee plans.....	1,248	-0.37
Excise tax.....	817	1.95
Form 8752 .....	56	-4.93
<b>Supplemental documents, total</b> .....	<b>13,431</b>	<b>1.78</b>
Form 1040X.....	2,270	1.39
Form 4868.....	6,435	1.38
Form 2688 .....	2,276	3.23
Form 1120X.....	18	-4.37
Form 7004.....	2,433	1.91

<sup>1</sup>Based on estimated final counts of returns filed in Calendar Year 1996; complete information for 1996 was unavailable at the time this table was compiled.

<sup>2</sup>Form 941 TEL was new in Calendar Year 1997.

NOTES: For an explanation of form numbers, see footnotes to Table 1, at the end of article. Detail may not add to totals because of rounding.

Form 1040EZ filers reporting unemployment compensation, using the filing status 'married filing jointly,' or receiving dividends from the special Alaska Permanent Fund, can use TeleFile for the first time, beginning with the CY 1997 filing season [3]. Direct deposit of refunds into taxpayers' savings or checking accounts also will become available.

Taxpayers filed 2.8 million returns in CY 1996 using TeleFile, more than the expected 2.5 million returns projected a year ago. With nationwide implementation in 1996, TeleFile increased more than 300 percent from the 0.7 million returns filed in CY 1995. In addition, with further expanded use of TeleFile, and new promotional strategies, the IRS is projecting 6.2 million individual income tax TeleFile returns in CY 1997.

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### **Other Electronic Filing Initiatives**

In pursuit of its "business vision" of increasing the number of electronically-filed (ELF) returns, the IRS plans several other new initiatives and program changes for CY 1997. One of those initiatives is expanding the TeleFile program into the business tax area. Using a gradual phase-in based on the filing periods, IRS regions, and certain return filing criteria, the IRS will implement a new "Form 941-TEL" program for employment tax returns. A total of 214,800 Forms 941-TEL are projected for CY 1997, rising to approximately 2.2 million by CY 2003. However, these forecasts come with a higher degree of uncertainty than most other return projections, given the novelty and uniqueness of this new program.

### **Household Employment Taxes**

As a consequence of the *Social Security Domestic Employment Reform Act of 1994*, Form 942, the *Employer's Quarterly Tax Return for Household Employees*, is no longer required, starting with filing periods after December 1994. Individuals who were previously required to file Form 942 now file for the fully year (instead of quarterly) on Schedule H, *Household Employment Taxes*, which is attached to their Form 1040 individual income tax return. Form 942 volumes are part of the "employment tax" category in Table 1; the termination of these returns accounts for the drop in this return series between 1995 and 1996.

### **Tax Withholding on Non-Payroll Income.**

Beginning with last year's filing season, the Form 945, *Annual Return of Withheld Federal Income Tax*, has been used to report non-payroll tax withholding now been used to report nonpayroll tax withholding, "backup" withholding on interest and dividends, and withholding on pensions, annuities, and gambling winnings. Based on partial year figures for CY 1996, it is estimated that roughly 183,700 returns will be filed that year. This is lower than earlier estimates, which were made before the initial experience measured during the first half of 1996.

### **Alternative to Electronically-Filed Returns**

It is important to note that projections of electronically filed (ELF) returns prepared by the IRS Compliance Research Division only reflect extrapolations of existing trends in electronic filing and recent legislative and IRS administrative changes, including the expansion of the TeleFile program into the business tax return area. In general, ELF forecasts assume that the past relationships between electronic filing initiatives and taxpayer filing behavior will hold true in the future. While this is a common practice in statistical forecasting, it should not be

interpreted as precluding a future change in the direction of electronic filing. The IRS envisions more efficient methods of return filing, ones which allow significantly more returns to be filed electronically. Figure B depicts the long-term change in the mix between the "paper" and electronically-filed individual returns, as currently forecast.

### **Projection Methodology**

Regression techniques, time series models, and growth rates were the basic methods used to project tax return filings through CY 2003. These projections reflect initiatives, assumptions, and strategies as of their date of calculation (approximately July 1996), and on that account do not reflect any later adjustments that result from shifts in IRS resources or from their considerations..

### **Regression Analysis**

Regression techniques were selected when statistically sound relationships existed between tax return filings and economic or demographic independent indicators. Key economic and demographic variables that significantly affect return filings include personal income, Gross Domestic Product (GDP), civilian employment and total population [4]. These variables were used selectively in regression models to project individual, employment, estate and trust, and various corporation returns. Frequently, these economic or demographic variables were lagged by one year to correspond more directly with the specific tax. Also, "dummy variables" were occasionally used to account for the effects of legislative changes, return count aberrations, and other unusual conditions not reflected by the economic or demographic variables [5].

The regression models that were used incorporated the actual CY 1995 return counts into the base period. Some "counts" also included 1996 estimates (actual data for CY 1996 were incomplete). In such instances, 6-month return counts were typically used to estimate the 1996 total for the year, based on the proportion of returns filed in 1996 relative to the same period in the prior year.

### **Time Series Analysis**

Some return counts were projected using time series analysis techniques when no statistically-sound relationship existed between the economic and demographic variables and the number of returns filed. These techniques include finite moving averages, and exponential smoothing.

### **Growth Rates**

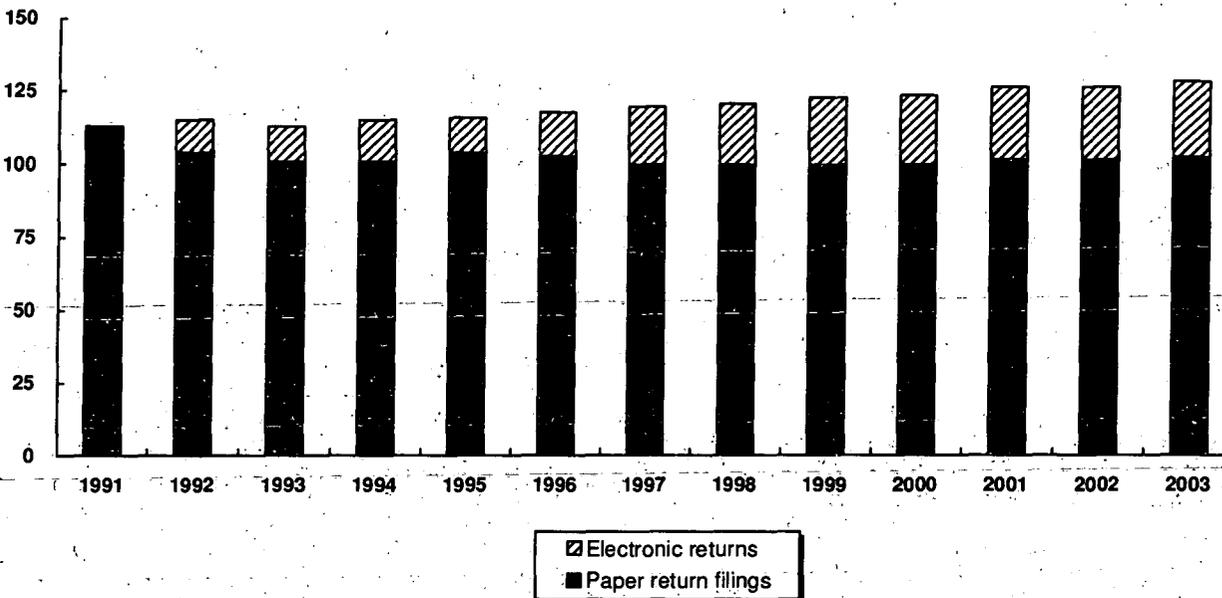
Simple growth rates were used for forecasting where return series have very short, or even no, historical base

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Figure B

## Number of Individual Income Tax Returns by Method of Filing, Calendar Years 1991-2003

Millions of returns



periods. This method generally assumes that a prior growth pattern for a limited set of years for a given form will continue in the future, or that a new return type will grow at a rate similar to a related return with an established pattern.

### Off-Model Adjustments

“Off-model adjustments” (i.e., adjustments to the initial forecasts based on the above techniques) are sometimes necessary when return filings are directly impacted by legislative or administrative changes which the techniques described above cannot take into account. For example, certain off-model adjustments were necessary in the TeleFile area. The IRS projections typically reflect the impact of legislative and administrative changes only to the extent that laws or administrative initiatives have been enacted or IRS programs officially approved.

In the case of the 1996 welfare reform legislation, provisions of this new legislation are intended to move welfare parents into the work force. Such provisions could conceivably increase the volume of individual returns filed above the currently projected trend. However, no explicit adjustments for this new law have been made to the projections in this article as a result of the 1996 law, pending further analysis and experience.

### Projection Highlights

#### Grand Total Returns, Primary Returns, Supplemental Documents

The “grand total” is the sum of the “primary returns, total” and the “supplemental documents, total” [6]. “Primary returns,” particularly individual and employment tax returns (which account for 70 percent of the total filings), generate most of the IRS document processing workload. “Supplemental documents” consist mainly of amended returns and documents requesting filing extensions by both individuals and corporations [7].

In CY 1997 through CY 2003, primary returns and supplemental documents filed with the IRS are projected to increase each year by averages of 1.1 percent and 2.0 percent respectively (Figure C). For CY 1997, about 198.0 million primary returns and 13.4 million supplemental documents are projected to be filed. The complete set of projections for CY 1997 through 2003 by form type is presented in Table 1.

#### Individual Income Tax Returns

Nearly 119.1 million individual income tax returns are expected to be filed in CY 1997, with an annual growth rate of over 1.3 percent anticipated through CY 2003. Total individual returns include the individual return

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**Figure C**

## Projected Average Annual Percentage Change in the Number of Returns Filed, by Type of Return, Calendar Years 1997-2003

Type of return	Projected annual average percentage change
<b>Grand total</b> .....	1.16
<b>Primary returns, total</b> .....	1.10
Individual income tax, total.....	1.33
Total paper and electronic returns .....	1.31
Paper returns, total.....	0.02
Paper Form 1040.....	-0.04
Paper Form 1040A.....	-0.86
Paper Form 1040EZ.....	0.84
Paper Form 1040PC.....	1.31
Electronic returns, total.....	8.69
Standard electronic filing.....	6.31
TeleFile.....	19.99
Forms 1040NR, 1040-PR, 1040-SS.....	6.13
Individual estimated tax, Form 1040-ES.....	-0.08
Fiduciary income tax, Form 1041.....	2.94
Fiduciary estimated tax, Form 1041-ES.....	2.94
Partnership, Form 1065.....	1.40
Corporation income tax, total.....	2.73
Estate tax, Forms 706 and 706NA.....	3.21
Gift tax, Form 709.....	1.57
Employment tax, total.....	0.88
Form 94-TEL (TeleFile).....	13.72
Form 1042.....	3.14
Tax-exempt organization.....	3.18
Employee plans.....	0.86
Excise tax.....	2.35
Form 8752 .....	-5.29
<b>Supplemental documents, total</b> .....	1.99
Form 1040X.....	1.31
Form 4868.....	1.31
Form 2688 .....	3.07
Form 1120X .....	-2.89
Form 7004.....	3.32

series of electronically-filed and "paper" Forms 1040, 1040A, 1040EZ, and 1040PC, and Form 1040NR, *U.S. Nonresident Alien Income Tax Return*; Form 1040-PR, *Planilla Para La Declaracion De La Contribucion Federal Sobre el Trabajo Por Cuenta Propia—Puerto Rico*; and Form 1040-SS, *U.S. Self-Employment Tax Return - U.S. Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), or Puerto Rico*.

■ **Total "Paper" and Electronic Returns**

In CY 1997, a total of 119.5 million Forms 1040, 1040A, 1040EZ, and 1040PC returns are projected to be filed with the IRS, a 1.4 percent increase over the estimated CY 1996 volume (Figures A). The individual return series includes both "paper" and

returns filed electronically. As previously indicated, volumes are expected to grow annually at an average rate of 1.3 percent, reaching 129.1 million filings in CY 2003 (Table 1).

■ **Total Paper Returns**

A total of 99.8 million paper returns of Forms 1040, 1040A, 1040EZ and 1040PC are projected to be filed in CY 1997, a decrease of 3.0 percent from the estimated CY 1996 volume. The volume is expected to grow at only an average annual rate of 0.2 percent and reach 103.0 million returns in CY 2003 (Table 1). Based upon current projections under existing trends, "paper" individual return filings, as a percentage of the total Form 1040 series, will decrease from 89.8 percent in 1995 to 83.5 percent in CY 1997 and to 79.8 percent in CY 2003. The long-term decrease is in accord with IRS strategies to increase the level of electronic filing.

■ **Paper Form 1040**

Historically, the "long" Form 1040 represents the lion's share of total "paper" returns and this is expected to continue. While the "paper" Form 1040 is still expected to dominate total "paper" return volumes, its historic trend in recent years is projected to drop by 0.10 percent in CY 1997 and then to continue decreasing, overall, at an average annual rate of 0.04 percent through CY 2003. The estimated decline stems from the offsetting growth in the volume of electronically-filed returns along with the expected increase in the use of Form 1040PC (defined below).

■ **Paper Form 1040A**

Form 1040A returns are projected to decline 2.2 percent to 18.4 million in CY 1997. This drop is in response to a change in the Form 1040EZ filing requirements, allowing certain married taxpayers to use this simpler form instead of Form 1040A, and in the projected growth in both Form 1040PC (see below) and "standard" electronic filings. These effects are reflected in the continued, overall, average decline in "paper" Forms 1040A of 0.9 percent each year over the projection period CY 1997 through CY 2003.

■ **Form 1040EZ**

Beginning with CY 1996 qualified taxpayers can report unemployment compensation as an income source on "paper" Form 1040EZ. It is estimated that

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this change increased volumes of Form 1040EZ in CY 1995 by approximately 1.0 million returns above what would otherwise have been expected. Despite this impact, the "paper" Form 1040EZ is predicted to continue declining in CY1997 due to the expansion of TeleFile and the continued growth in "standard" electronic filing (described below). From CY 1997 on, the volume of "paper" Form 1040EZ is projected to grow, on average, at about 0.84 percent annually.

### ■ Form 1040PC

"Form" 1040PC is somewhat a misnomer, in that it actually represents "paper" tax returns filed by taxpayers using an IRS approved, computer software-generated *format*, rather than a specific tax form. This compressed format allows taxpayers to file a computer-generated return using only one or two sheets of paper, without regard to the number of schedules that would normally have been filed to report the same information. Form 1040PC has been available nationwide since 1992, as an alternative for taxpayers who file traditional "paper" returns - Forms 1040, 1040A, or 1040EZ.

Based on volumes to date, CY 1996 filings of the computer-generated Form 1040PC format increased dramatically. The IRS estimates that 7.0 million returns will be filed using this format in CY 1996, up from 2.9 million filed in CY 1995. This 139 percent increase is due to a noticeable return to the use of the Form 1040PC format by professional tax-preparers who had suspended their use of the format in the prior filing season. The Form 1040PC filing volume is now expected to continue at a projected average annual rate of 1.3 percent through CY 2003.

### ■ Forms 1040NR, 1040-PR, and 1040-SS

The combined volumes of the following returns are projected to increase at an average annual rate of 6.1 percent from CY 1997 through CY 2003; From 1040NR, *U.S. Nonresident Alien Income Tax Return*; Form 1040-PR, *Planilla Para La Declaracion De La Contribucion Federal Sobre El Trabajo Por Cuenta Propia—Puerto Rico*; and Form 1040-SS, *U.S. Self-Employment Tax Return - U.S. Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), or Puerto Rico*. Approximately 87 percent of the total of these forms reflects Form 1040NR. Typically, but not exclusively, Form 1040NR is filed by nonresident aliens who have invested in U.S. limited partnerships.

### ■ Total Individual Electronic Returns

The most recent projections of electronically-filed (ELF) individual income tax returns call for 19.7 million to be transmitted in CY 1997 and 21.2 million to be transmitted in CY 1998. These figures include 6.2 million TeleFile returns (discussed below) in CY 1997 and 6.7 million in CY 1998, reflecting expansion of IRS promotional efforts and the offering of TeleFile to ever wider sectors of the taxpaying public. A total of 26.1 million individual income tax returns is projected to be filed electronically in CY 2003, with 70.9 percent, or 18.5 million expected to be "standard" electronic filings, i.e., non-TeleFile returns. As the electronically-filed return volume increases, the volume of traditional "paper" returns filed declines.

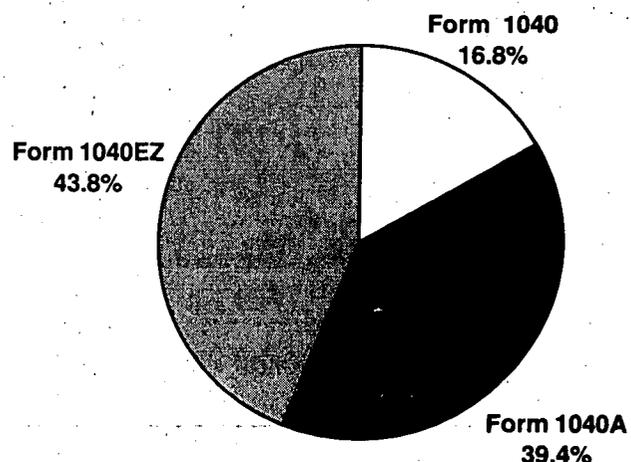
Figure D presents insights into the return characteristics of electronic filings. Of the 19.7 million returns projected to be filed electronically in CY 1997, 16.8 percent or 3.3 million would otherwise have been filed with paper Form 1040, about 39.4 percent or 7.8 million on "paper" Form 1040A; and the remaining 43.8 percent, 8.6 million, on "paper" Form 1040EZ [8].

### ■ "Standard" Electronic Returns

"Standard" electronic (ELF) returns are nonTeleFile returns typically transmitted through an authorized third party, termed by the IRS an "electronic return

Figure D

### Electronically-Filed Individual Income Tax Returns by Type of Form, Calendar Year 1997



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originator." In CY 1997, about 13.4 million of these tax returns are expected. In general, these projections were based on time-series techniques that extrapolated the growth in participation rates (i.e., the proportion of standard ELF returns to the individual series return total) geographically, at the IRS district office level.

### ■ TeleFile

Beginning with the 1997 filing season, the individual TeleFile program (the technology enabling taxpayers to file returns via a touch-tone telephone) is being expanded to allow both the reporting of unemployment compensation and the use of the filing status, "married filing jointly." Also beginning in 1997, taxpayers electing direct deposit of their refunds to their checking or savings accounts can use TeleFile as well. Due to these expansions plus new promotional strategies, the IRS projects that there will be 6.2 million TeleFile returns filed in CY 1997. This is a sizable increase over the CY 1997 projection made a year ago, an increase of nearly 3.4 million returns. This growth will continue, reaching a projected 7.6 million returns filed using TeleFile by CY 2003.

### Partnership Returns

*U.S. Partnership Return of Income*, Form 1065, is used to report income, deductions, tax credits, and losses from operation of a partnership. A major purpose of this form is to show each partner's distributive share, to be reported on the individual (or some other) income tax return. Partnership projections are expected to increase by 1.4 percent overall through CY 2003. This forecast is based on a time trend model which assumes a resumption of a gradual long-term growth pattern following several years of decline reflecting from the Tax Reform Act of 1986, which curbed the use of limited partnerships as "tax shelters."

### Corporation Income Tax Returns

Corporation income tax returns are the aggregate of the *U.S. Corporation Income Tax Return* (Form 1120), *U.S. Short-Form Corporation Income Tax Return* (Form 1120A), *U.S. Income Tax Return for an S-Corporation* (Form 1120S), and various other forms filed by such entities as investment and insurance companies, homeowners' associations, and real estate investment trusts. Approximately 5.1 million corporation returns are projected to be filed in CY 1997. The projected average annual percentage change in the number of returns filed through CY 2003 is 2.7 percent, reflecting the results of a combination of econometric regression models using GDP

and time series techniques. In CY 1997, Forms 1120, 1120S, and 1120A are projected to represent 43.4 percent, 47.6 percent, and 6.0 percent, respectively, of total corporation returns filed.

### Estate Tax Returns

*U.S. Estate Tax Return* (Form 706) is filed to report transfers of property at death. Presently, Form 706 is required for those estates whose gross assets exceed \$600,000. Between CY 1997 and CY 2003, the number of estate tax returns filed is expected to grow at an average annual rate of 3.2 percent. Total estate forecasts are based on the summation of forecasts for three gross asset size classes: less than \$1 million, \$1 million to \$5 million, and more than \$5 million. Forecasting models were based on regression, stepwise autoregression, finite moving averages, and exponential smoothing techniques.

### Gift Tax Returns

*United States Gift Tax Return* (Form 709) is required for the gratuitous transfer of real or personal property which exceeds a certain dollar amount. Generally, the individual making the gift (i.e., the donor) must file Form 709 in order to pay the tax. The projected average annual growth rate in gift tax return filing between CY 1997 and CY 2003 is 1.6 percent. These projections are based on regression techniques.

### Employment Tax Returns

Total employment tax return forecasts are based on summation of five forms: (1) *Employer's Annual Federal Unemployment (FUTA) Tax Return* (Form 940 and 940EZ); (2) *Employer's Quarterly Federal Tax Return* (Form 941), Form 941PR for employees in Puerto Rico, Form 941SS for employees in the U.S. Virgin Islands, Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands (CNMI), and Form 941E for State and Local Government Employees; the former *Employer's Quarterly Tax Return for Household Employees* (Forms 942 and 942PR); (3) *Employer's Annual Tax Return for Agricultural Employees* (Forms 943 and 943PR); (4) *Annual Return of Federal Withheld Income Tax* (Form 945); and (5) *Employer's Annual Railroad Tax Return* (Form CT-1).

Form 945 was introduced in CY 1995, and is discussed above, under "Withholding on Non-payroll Income." As already mentioned, Form 942 was eliminated in CY 1995 to reflect provisions in the *Social Security Domestic Employment Reform Act of 1994*.

Current projections for total employment returns to be filed in CY 1997 and CY 1998 are 28.8 and 29.0 million, respectively, with an annual growth rate of 0.9 percent

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from CY 1997 through CY 2003. Form 941 generates nearly 79 percent of the employment tax return totals each year, with 22.7 million Forms 941 expected in CY 1997.

The IRS is currently expanding the TeleFile program into the employment tax area. Using a gradual phase-in approach involving certain time periods, IRS regions, and return conditions, the Service will implement a new "Form 941-TEL" program starting in 1997. Forecasts of these new Form 941-TEL returns are presented in Table 1.

Projections for the various employment tax forms used regression, weighted moving average, exponential smoothing, and similar growth rate techniques.

### Excise Tax Returns

Total excise tax returns are the sum of the following four categories of returns: (1) *Special Tax Return and Application for Registry-Wagering* (Form 11C); (2) *Quarterly Federal Excise Tax Return* (Form 720); (3) *Tax on Wagering* (Form 730); and (4) *Heavy Vehicle Use Tax Return* (Form 2290). Form 720 and Form 2290 together represent almost 92 percent of the IRS excise tax return total for CY 1997. The average annual growth rate of these returns is 2.4 percent from CY 1997 through CY 2003.

### Supplemental Documents

The total number of supplemental documents includes amended corporate and individual returns (Forms 1120X and 1040X) and requests for filing extensions. In CY 1997 and CY 1998, over 13.4 million and 13.7 million supplemental documents, in that order, are expected to be filed. The average annual growth rate through CY 2003 is nearly 2.0 percent.

### Projection Accuracy

It is often helpful to consider the historical accuracy of past projections when evaluating future forecasts. Using

the actual return counts from CY 1993 through CY 1995, and past forecasts, two key measures of accuracy have been calculated: the "mean absolute error" (MAE) and the "mean absolute percentage error" (MAPE). MAE is the average of the relevant "projection errors," regardless of whether the forecasts were over projected or under projected. The projection error is simply the actual result minus the projected volume. The MAPE is a similar measure, but based on percentages. The MAE and MAPE values are grouped by time horizons. The time horizon is determined by when the forecast was made and for what future year it was made. For example, a forecast for CY 1993 made in CY 1990 would be part of the "3-years ahead" time horizon. The number of observations at each time horizon is held constant at three (i.e., forecasts made for CY 1993, CY 1994, and CY 1995 [9]).

As shown in Figure E, for the "grand total" and the "primary returns, total" categories, the one-year ahead MAPE's are just over 2 percent. The one-year ahead MAPE for the individual, income tax return series is 1.75 percent. On the whole, forecast error increases with the time horizon, (e.g., one-year MAPE's are generally lower than two-year MAPE's). Also, forecast errors arise from both statistical modeling reasons and from unforeseen program or law changes.

### Notes and References

- [1] The number of returns filed (as used in this article) represents returns processed at IRS service centers and recorded in the IRS Master File system during a calendar year. The Master File system includes the Individual Master File (IMF), the Business Master File (BMF), and the Employee Plans Master File (EPMF). These figures do *not* include the 1.1 billion information and withholding documents processed by the IRS, such as interest and dividend statements on

Figure E

### Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE) Accuracy of U.S. Level Projections Based on Actual Return Counts for Calendar Years 1993 through 1995

Type of return	Mean absolute error (number of returns)				Mean absolute percentage error			
	1 year ahead	2 years ahead	3 years ahead	4 years ahead	1 year ahead	2 years ahead	3 years ahead	4 years ahead
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Grand total.....	4,475,178	7,216,878	4,426,478	6,193,445	2.18	3.51	2.15	3.02
Selected primary returns, total.....	4,520,959	8,314,259	8,613,793	9,327,093	2.34	4.29	4.45	4.82
Individual income tax.....	2,007,625	3,521,658	3,336,525	2,291,325	1.75	3.05	2.89	1.98
Partnership, Form 1065.....	44,451	85,182	92,849	326,015	2.83	5.43	5.94	20.80
Corporation income tax.....	116,209	90,809	116,476	353,842	2.49	1.94	2.56	7.74
Employment tax.....	119,618	692,316	491,080	646,046	0.41	2.41	1.70	2.24
Supplemental documents.....	1,280,120	1,500,680	4,187,280	5,824,329	10.67	13.66	37.56	49.32

NOTE: Number of returns is based on three observations at each horizon and is not additive.

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Forms 1099 and wage and tax withholding statements on Form W-2. Information and withholding documents provide data for use in the IRS' "information matching" programs (in which amounts reported by payers on their information statements are compared with the amounts actually reported by taxpayers on their income tax returns), but they are *not* considered to be tax returns. Most information documents are received on magnetic tape and processed at the IRS Martinsburg, West Virginia, Computing Center. For additional information, see Internal Revenue Service, Compliance Research, *Calendar Year Projections of Information and Withholding Documents for the United States and Service Centers: 1996-2003*, Documents 6961 (Revision 5-96).

- [2] All statistics, unless otherwise noted, are for the calendar year (CY) in which the tax return was processed by the Internal Revenue Service. The principal projections discussed in this article are presented in Table 1; they are based on figures produced by the IRS Compliance Research Division (see *Calendar Year Return Projections for the United States and Service Centers: 1997-2003*, Document 6186 (Revision 10-96). Final counts for all of CY 1996 were incomplete at the time this article was written. Final CY 1995 counts, unavailable in projections published in the *Statistics of Income Bulletin*, Winter 1995-1996, Volume 15, Number 3, are reflected in all statistics.
- [3] The Alaska Permanent Fund Corporation was created by the voters in the 1976 General Election through an amendment to the State Constitution to make sure that, in the future, Alaskans benefited from the development of Alaska's natural resources. The Fund created an investment base from which future income is being generated to pay the costs of basic government services. The Fund removed the oil revenues generated from the development of Alaska's North slope oil field, from the legislative spending stream. The Fund prudently is transforming some of the non-renewable oil wealth into a *renewable* source of wealth for future generations of Alaskans. The permanent Fund is made up of two parts; principal

and income. The principal is invested permanently. Fund income, however, can be distributed as dividends to each permanent resident of the State of Alaska, and decisions about its use are made each year by the people's elected representatives - the legislature and the Governor.

- [4] The economic and demographic variables are from U.S. Government sources and were also published by Data Resources, Incorporated, June 1996.
- [5] "Dummy variables" are specially-constructed artificial variables with the value of "unity" whenever the qualitative phenomenon it represents in a regression occurs, and "zero" otherwise. See Kennedy, P.(1993) *Dummy Variables, A Guide to Econometrics*, Cambridge, MA:MIT Press, 216.
- [6] Supplemental documents include Forms 1040X, *Individual Amended Return*; 4868, *Individual Request for Automatic Filing Extension*; 2688, *Individual Request for Additional Filing Extension*; 1120X, *Corporation Amended Return*; and 7004, *Application for Automatic Extension of Time to File Corporation Income Tax Return*.
- [7] See U.S. Department of the Treasury, Internal Revenue Service, Compliance Research, *Calendar Year Return Projections for the United States and Service Centers: 1996-2003*, Document 6186 (Revision 10-96) for further explanation of return types.
- [8] U.S. Department of the Treasury, Internal Revenue Service, Compliance Research, *Calendar Year Projections of Individual Returns by Major Processing Categories*, Document 6187 (Revision 9-96).
- [9] For a further discussion of projection accuracy, see U.S. Department of the Treasury, Internal Revenue Service, Compliance Research, *Calendar Year Projections of Individual Returns by Major Processing Categories*, Document 6187 (Revision 9-96) and Geiman, Russell R.; Nichols, Bonnie L.; De Wilde, Carolyn D. "How Are We Doing? An Analysis of Projection Accuracy," *The IRS Research Bulletin* (9-91) Internal Revenue Service, U.S. Department of the Treasury.

# Projections of Returns to be Filed in Calendar Years 1997-2003

**Table 1.--Number of Returns Filed, or to be Filed, with the Internal Revenue Service, Calendar Years 1995-2003**

[Numbers of returns are in thousands]

Type of return	Actual 1995	Estimated 1996 <sup>1</sup>	Projected						
			1997	1998	1999	2000	2001	2002	2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Grand total</b> <sup>2</sup> .....	<b>206,710</b>	<b>209,135</b>	<b>211,391</b>	<b>213,833</b>	<b>216,337</b>	<b>218,903</b>	<b>221,497</b>	<b>224,080</b>	<b>226,651</b>
<b>Primary returns, total</b> .....	<b>194,204</b>	<b>195,939</b>	<b>197,960</b>	<b>200,119</b>	<b>202,335</b>	<b>201,613</b>	<b>206,926</b>	<b>209,227</b>	<b>211,507</b>
Individual income tax, total.....	116,467	118,263	119,918	121,528	123,135	124,755	126,394	128,055	129,742
Total paper and electronic individual returns <sup>3</sup> .....	116,060	117,843	119,472	121,057	122,634	124,221	125,827	127,455	129,106
Paper returns, total.....	104,253	102,904	99,779	99,834	100,009	100,176	100,986	101,976	102,997
Paper Form 1040.....	62,797	60,167	60,088	60,002	59,911	59,803	59,691	59,835	59,996
Paper Form 1040A.....	20,461	18,775	18,362	18,042	17,721	17,363	17,468	17,556	17,669
Paper Form 1040EZ.....	18,088	17,002	14,271	14,640	15,134	15,672	16,394	17,058	17,707
Paper Form 1040PC.....	2,907	6,960	7,057	7,151	7,244	7,337	7,432	7,528	7,625
Electronic returns, total.....	11,807	14,938	19,693	21,223	22,625	24,046	24,841	25,478	26,109
Standard electronic filing.....	11,127	12,097	13,445	14,554	15,687	16,918	17,561	18,041	18,509
TeleFile.....	680	2,841	6,248	6,669	6,939	7,128	7,129	7,438	7,599
Forms 1040NR, 1040-PR, and 1040-SS <sup>4</sup> .....	407	420	446	471	501	533	567	600	637
Individual estimated tax, Form 1040-ES.....	35,944	35,450	35,347	35,296	35,270	35,258	35,251	35,248	35,246
Fiduciary income tax, Form 1041 <sup>5</sup> .....	3,191	3,379	3,447	3,558	3,674	3,793	3,914	4,029	4,139
Fiduciary estimated tax, Form 1041-ES.....	591	632	645	665	687	709	732	753	774
Partnership, Form 1065.....	1,580	1,613	1,636	1,659	1,682	1,705	1,729	1,753	1,778
Corporation income tax, total <sup>6</sup> .....	4,818	5,018	5,141	5,293	5,444	5,595	5,475	5,896	6,046
Estate tax: Forms 706 and 706NA.....	81	87	90	93	97	100	102	105	108
Gift tax, Form 709.....	216	220	224	227	231	234	238	242	246
Employment tax, total <sup>7</sup> .....	28,655	28,554	28,753	28,993	29,258	29,553	29,856	30,127	30,355
Form 941-TEL (TeleFile).....	--	--	215	1,210	1,673	1,786	1,853	2,142	2,232
Form 1042 <sup>8</sup> .....	24	25	26	27	28	28	29	30	31
Tax-exempt organization <sup>9</sup> .....	573	594	614	634	654	675	696	717	739
Employee plans <sup>10</sup> .....	1,213	1,243	1,248	1,259	1,272	1,284	1,296	1,307	1,320
Excise tax <sup>11</sup> .....	789	802	817	835	854	876	899	921	943
Form 8752 <sup>12</sup> .....	62	59	56	53	50	48	45	43	40
<b>Supplemental documents, total</b> .....	<b>12,507</b>	<b>13,196</b>	<b>13,431</b>	<b>13,714</b>	<b>14,002</b>	<b>14,290</b>	<b>14,571</b>	<b>14,853</b>	<b>15,145</b>
Form 1040X <sup>13</sup> .....	2,208	2,239	2,270	2,300	2,330	2,360	2,391	2,422	2,453
Form 4868 <sup>14</sup> .....	5,891	6,347	6,435	6,520	6,605	6,691	6,777	6,865	6,954
Form 2688 <sup>15</sup> .....	2,131	2,204	2,276	2,347	2,420	2,493	2,568	2,645	2,724
Form 1120X <sup>16</sup> .....	18	18	18	17	17	16	16	15	15
Form 7004 <sup>17</sup> .....	2,259	2,388	2,433	2,530	2,631	2,730	2,819	2,906	3,000

<sup>1</sup> Estimate, including that for some corporations, is based on returns processed through part of 1996. The actual number filed in CY 1996 was unavailable when this table was compiled.

<sup>2</sup> Excluded from all totals are the following "Non-Master File" returns: Form CT-2, 941M, 990BL, and 1120-IC-DISC. Also excluded are withholding and information documents, including forms such as W-2 and the 1099 series and related forms.

<sup>3</sup> Total paper and electronic individual returns does not include Forms 1040NR, 1040-PR, and 1040-SS.

<sup>4</sup> Form 1040X is included under "Supplemental documents, total."

<sup>5</sup> Includes Forms 1041 and 1041S.

<sup>6</sup> Includes Forms 1120, 1120A, 1120F, 1120H, 1120L, 1120POL, 1120S, 1120DF, 1120FSC, 1120PC, 1120REIT, and 1120RIC; Form 1120X is included under "Supplemental documents, total."

<sup>7</sup> Includes Forms 940, 940EZ, 940PR, 941, 941E, 941PR, 941SS, 941-TEL, 942, 942PR, 943, 943PR, 945 and CT-1.

<sup>8</sup> Annual Withholding Tax Return for U.S. Source Income of Foreign Persons, and related form 1042-S.

<sup>9</sup> Includes Forms 990, 990EZ, 990C, 990PF, 990T, 4720, and 5227.

<sup>10</sup> Includes Forms 5500, 5500C, 5500EZ, and 5500R.

<sup>11</sup> Includes Forms 11C, 720, 730, and 2290.

<sup>12</sup> Form 8752 is filed by all Partnerships and S-Corporations electing either to maintain or establish any taxable year other than the required calendar year.

<sup>13</sup> Amended U.S. Individual Income Tax Return.

<sup>14</sup> Application for Automatic Extension of Time to File U.S. Individual Income Tax Return. (4 additional months to file only; tax payment date unchanged.)

<sup>15</sup> Application for Additional Extension of Time to File U.S. Individual Income Tax Return. (6 additional months to file only; tax payment date unchanged.)

<sup>16</sup> Amended U.S. Corporation Income Tax Return.

<sup>17</sup> Application for Automatic Extension of Time to File Corporation Income Tax Return.

NOTE: Detail may not add to totals because of rounding.