Doing more with less? Using data and analytics to overcome shrinking enforcement budgets and expanding responsibilities*

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*Paper prepared for and first published by Canadian Tax Foundation in *2018 Corporate Tax Management Conference & Live Webcast: Tax and Technology* (Toronto: Canadian Tax Foundation, 2018).

[*] The comments contained in this paper are the opinions of the authors, and do not necessarily represent the positions of the Internal Revenue Service.

Table of Contents

1. Introduction 2
2. Pressures on the IRS 4
   Growing administrative responsibilities 4
   Shrinking IRS budget 6
   Impact of budget constraints on enforcement and staffing 7
3. Improved tools for tax administration 8
   Improved data quality and availability 8
   Expansion of third-party matching programs 8
   Cost basis reporting 9
   Payment card and third-party network transactions 9
   FATCA 10
   Increased self-disclosure requirements 12
4. Efforts to improve enforcement programs 13
   Audit programs 13
   Fraud and ID theft prevention 14
   Nonfiler programs 15
5. The road ahead 15
   Analytics and data improvements 16
   Collection notice redesign 17
   Compliance campaigns 17
6. Concluding remarks 18

1. Introduction

In 2002, the Brookings Institution and the University of Michigan Office of Tax Policy Research held a conference on "*The Crisis in Tax Administration*". In the decade leading up to this event, the Internal Revenue Service (IRS) had been given expanding responsibilities without a compensating increase in resources. IRS responsibilities had increased in part from the growing taxpayer population. Between the 1992 and 2002 fiscal years, the overall number of federal tax returns of all types increased by 11.3 percent, from 204 million to 227 million.[1] Changes in the composition of the population also contributed to the rising administrative burden. Of particular note, the number of flow-through entities, including sole proprietorships, partnerships, S-corporations, and a new type of entity known as a limited liability corporation (LLC), mushroomed by 46 percent over this period, from 18.4 million to 26.9 million.[2] These organizational forms are associated with a multitude of complex tax issues that are relatively difficult for IRS to administer. At the same time, there had been a rapid proliferation of new financial instruments, such as derivatives, which introduced an additional set of challenges for tax administration. Globalization, as well as a rising wave of new tax shelter schemes, created further administrative pressures for IRS. Tax law changes also contributed to rising administrative responsibilities, including provisions that resulted in a substantial increase in compliance issues involving refundable and nonrefundable tax credits.

Keeping pace with all these developments would have required a commensurate increase in IRS resources. Unfortunately, however, IRS came under withering criticism during the 1990s for various perceived administrative failings as well as allegations of taxpayer mistreatment (allegations that the ensuing investigations ultimately found to have been largely unjustified).[3] This led Congress to rein in IRS' budget throughout the 1990s, while also forcing the agency to undergo an extensive restructuring. Since enforcement activities are somewhat discretionary and, by necessity, must take a back seat to mandatory tasks such as processing returns, issuing refunds, and complying with various accounting and administrative requirements, this belt-tightening led to substantial cuts in IRS enforcement programs. While the overall number of IRS full-time equivalent employees dropped by 14.1 percent (from 116,673 to 100,229) between FY1992 and FY2002, the number of IRS Revenue Agents plummeted by nearly 26% over this same period.[4] In turn, the overall audit coverage rate for individual returns fell from 10.6 audits to 5.7 audits per 1,000 returns.[5] This decline in audit coverage was largely achieved through a reduction in face-to-face examinations, which tend to be more costly than correspondence examinations and are geared towards more complex cases, such as those involving businesses and high wealth individuals. Whereas about 62 percent of all individual audits were of the face-to-face variety in FY1992, fewer than 28 percent of the examinations in FY2002 involved face-to-face contact.[6] Corporate audits also

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[1] Internal Revenue Service (1992 Table 2, p.25; 2002, Table 2, p. 8).
[2] Author's calculation from Internal Revenue Service (2019).
[3] Webster (1999) and Crenshaw & Barr (2000).
[4] Internal Revenue Service (1992, Table 30, p. 49; 2002, Table 30, p. 37, and Table 31, p. 38).
[5] Internal Revenue Service (1993-1994, Table 11, p. 16; 2002, Table 10, p. 17).
[6] Author's calculations from Internal Revenue Service (1993-1994, Table 11, p. 16; 2002, Table 10, p. 17).

took a nosedive over this period, with the overall audit coverage rate falling from more than 30 audits per thousand returns filed to less than 10.[7] The impact on the audit coverage rate for very large corporations (with assets exceeding $250 million) was especially severe, dropping from 56.5 percent of all such corporations to only 34.4 percent.[8] IRS also changed its strategy for collecting tax arrears over this period to one that relies much less on liens, levies, and especially seizures. In FY1992, IRS undertook 1.5 million liens, 3.3 million levies, and 11,000 seizures, compared to 492,000 liens, 1.3 million levies, and just 296 seizures in FY2002.[9]

Consistent with the conference title, many of the tax scholars, administrators, and policy-makers at the 2002 event were of the view that a decade of increasing tax administration demands without a compensating change in resources had essentially resulted in a crisis in tax administration. A slightly more nuanced view was expressed by Charles Rossotti, whose five-year term as IRS Commissioner had just ended the day prior to the conference. In his final report to the IRS Oversight Board (p. 20) two months earlier (Rossotti, 1992), he had stated: "Today, we are faced with a growing crisis – in our ability to do our job and the fairness of our tax system." He expounded on this line of reasoning at the conference, explaining that he did not buy into the notion that there was an immediate crisis in tax administration in the sense of the tax system was falling apart. Rather, his view was that if the divergent trends in the demands placed on IRS and the declining level of resources provided to the agency were not addressed, that this would ultimately lead to a full-blown crisis that would compromise IRS' ability to administer the tax laws in a fair and efficient way. In other words, although he felt that a crisis was brewing, he believed there was still time to defuse the problem. Indeed, the former Commissioner went on to say that, "relative to a lot of the really intractable problems in government, this may be one of the cheapest and easiest ones to solve that you could ever think of." In his view, all that was needed to solve the current predicament was a modest sustained infusion of additional resources for improvements to technology as well as operations (modest at least in relation to the revenue stream that those resources would generate), an improved allocation of resources within IRS, and appropriate adjustments to tax legislation and regulations.

Over the 16 years since that conference was held, the divergent trends that Mr. Rossotti had warned about continued largely unabated. In this paper, we explore the degree to which IRS has been able to prevent, or at least postpone, the looming crisis that the former IRS Commissioner had predicted by undertaking initiatives to improve data quality and leverage data analytics to become more productive. The remainder of this paper is organized as follows. Sections 2 through 4 describe continuations of the worrisome trends that had been observed at the time of the 2002 conference on *"The Crisis in Tax Administration."* Section 2 summarizes the increasing pressures on the IRS, while Section 3 documents some improved tools for tax administration that have been implemented in recent years. Section 4 summarizes efforts to improve the performance of its enforcement programs. Section 5 provides an overview of the

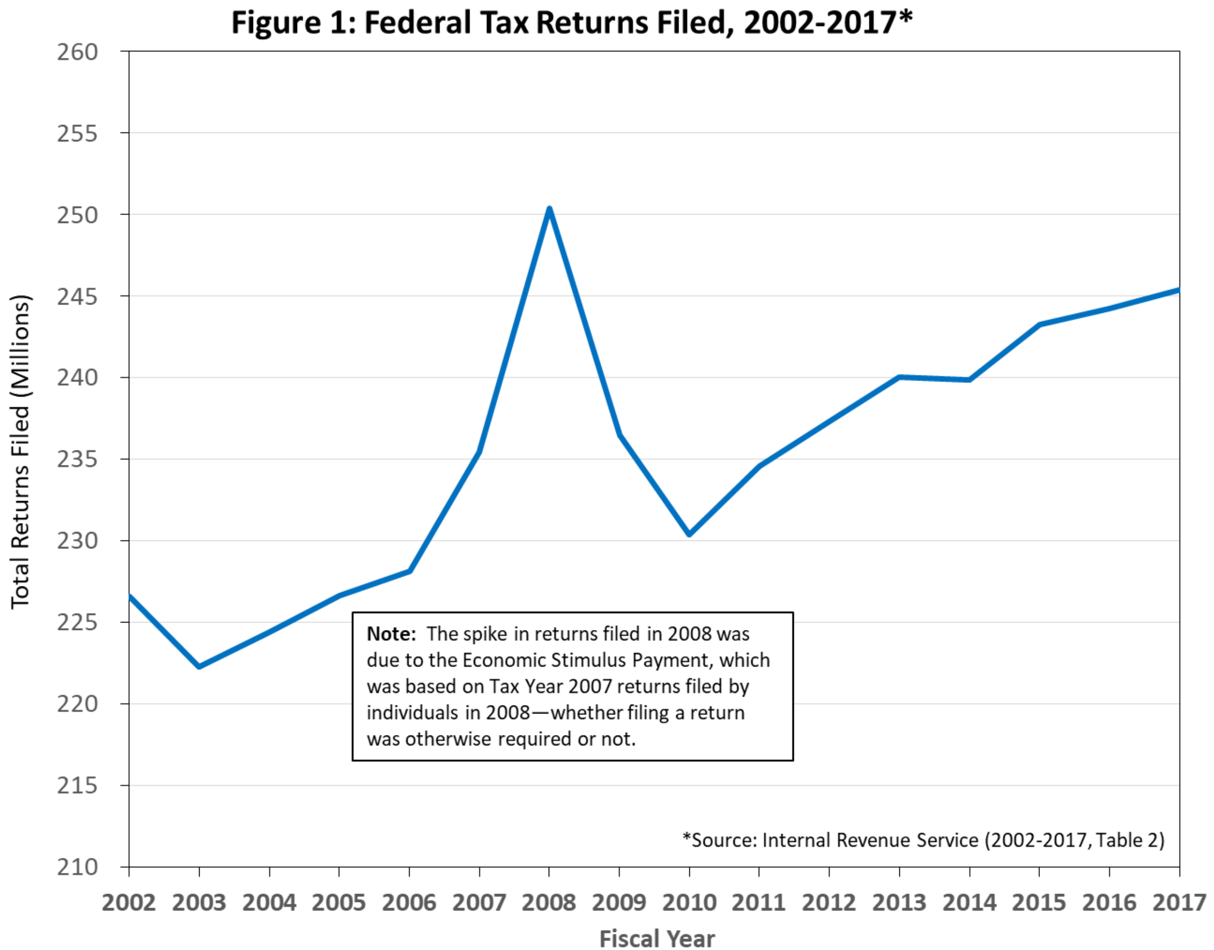
[7] Internal Revenue Service (1993-1994, Table 11, p. 16; 2002, Table 10, p. 17).
[8] Internal Revenue Service (1993-1994, Table 11, p. 16; 2002, Table 10, p. 17).
[9] Internal Revenue Service (1993-1994, Table 19, p. 60; 2002, Table 16, p. 27).

road ahead for IRS in terms of some key ongoing and planned changes to its programs. Some concluding remarks are offered in Section 6.

2. Pressures on the IRS

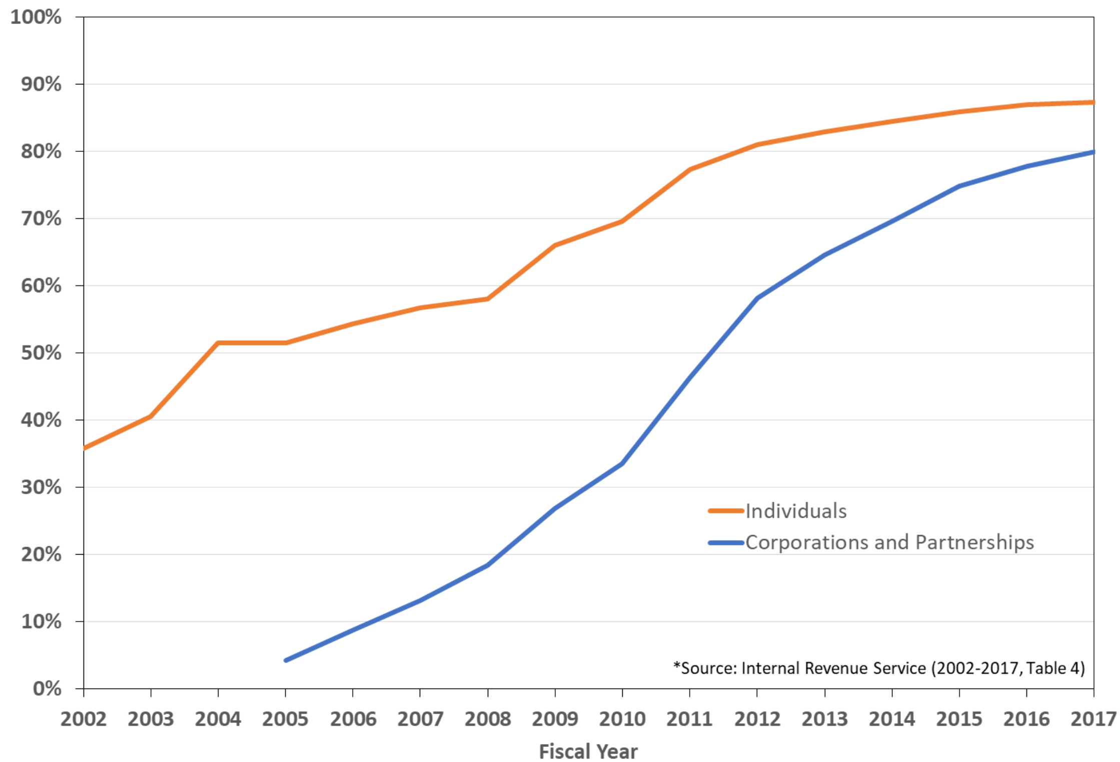
Growing administrative responsibilities

The responsibilities of IRS have continued to expand. As shown in Figure 1, the overall number of federal tax returns filed has grown by 8% between FY2002 and FY2017, from 227 million to 245 million.



A positive development is that many more of these returns are being filed electronically. As illustrated in Figure 2, the e-file rate for individual returns over this period increased from 35.8% in 1992 to 87.4%. The growth in electronic filing for corporations and partnerships was even more dramatic, from 4.2% in FY2005 to 80.0% in FY2017. Electronically filed returns are much less costly for IRS to process, and they are associated with fewer mathematical errors. Consequently, although IRS is now processing many more overall tax returns than it did in FY2002, the aggregate processing cost has decreased. However, as discussed below in

Section 4, electronically filed returns pose a greater risk for fraud and identity theft, so the high rate of electronic filing has made it necessary for IRS to undertake new investments in technology to address these growing risks.



Previously, it was noted that the administrative pressures on IRS grew during the 1990s not just as a result of increases in the size of the taxpayer population, but also due to changes in the composition of the population. These trends have continued. Existing U.S. tax statistics on flow-through entities only go through tax year 2013. Between Tax Year 2002 and Tax Year 2013, the overall number of such entities grew by 27 percent.[10] Globalization also has steadily increased, bringing with it an exponential growth in multinational activities as well as offshore investments by individuals, which further taxes IRS' administrative resources. Tax administrative pressures have been exacerbated by the rising popularity of mutual funds, tax-favored retirement investments, and increasingly sophisticated financial instruments. The explosion of the gig economy is a relatively new development that has introduced its own set of administrative challenges.

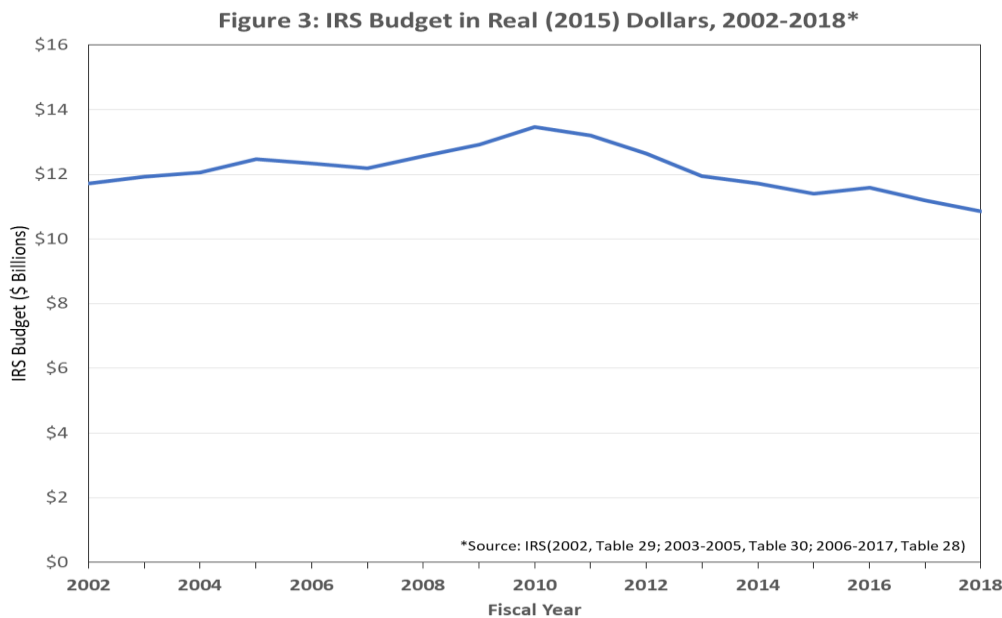
It was noted above that tax law changes during the 1990s also contributed to the growing administrative burden for IRS. Even greater expansions of refundable and nonrefundable credits have taken place in more recent years. In addition, IRS has been assigned major new responsibilities relating to the administration of the 2010 Affordable Care Act,

[10] Author's calculation from Internal Revenue Service (2019).

including verifying that filers are complying with requirements to have health care coverage,[11] administering a substantial refundable tax credit for health insurance premiums, and verifying compliance among large employers that are required to offer health insurance to their workers. At the same time, the 2010 Foreign Account Tax Compliance Act (FATCA) has also imposed significant new administrative responsibilities on the agency. Most recently, IRS has had to adjust its administrative workload to address major revisions to both the individual and corporate tax laws that were enacted under the 2017 Tax Cuts and Jobs Act. Taken together, then, IRS has had to adjust to very substantial increases in its administrative responsibilities.

Shrinking IRS budget

Despite all these additional demands placed on the agency, the IRS budget (in real 2015 dollars) actually declined from $11.7 billion in FY2002 to $11.4 billion in FY2015 (see Figure 3). In fact, FY2015 marked the fourth consecutive year in which the nominal IRS budget was reduced. In response to yet another proposed reduction in the IRS budget for FY2016, Charles Rossotti along with six other former IRS Commissioners sent a letter of concern (Caplin et al., 2015) to the leaders of the House and Senate Appropriations Committees emphasizing the detrimental effects that years of underfunding have had on taxpayer services, the security of electronic taxpayer records, and tax enforcement programs. The letter encouraged Congress to pass a FY2016 budget that would substantially increase IRS resources over their FY2015 level. Ultimately, IRS did receive a modest increase for that year (a 1.6 percent increase in real terms). However, the budget was slashed again in FY2017 to a level that was 1.8 percent below its inflation-adjusted value in FY2015. For FY2018, IRS was allocated an additional $320 million to support its implementation the Tax Cuts and Jobs Act. However, cuts were made to other portions of its budget, leaving the agency with $95 million less overall than in the prior fiscal year.



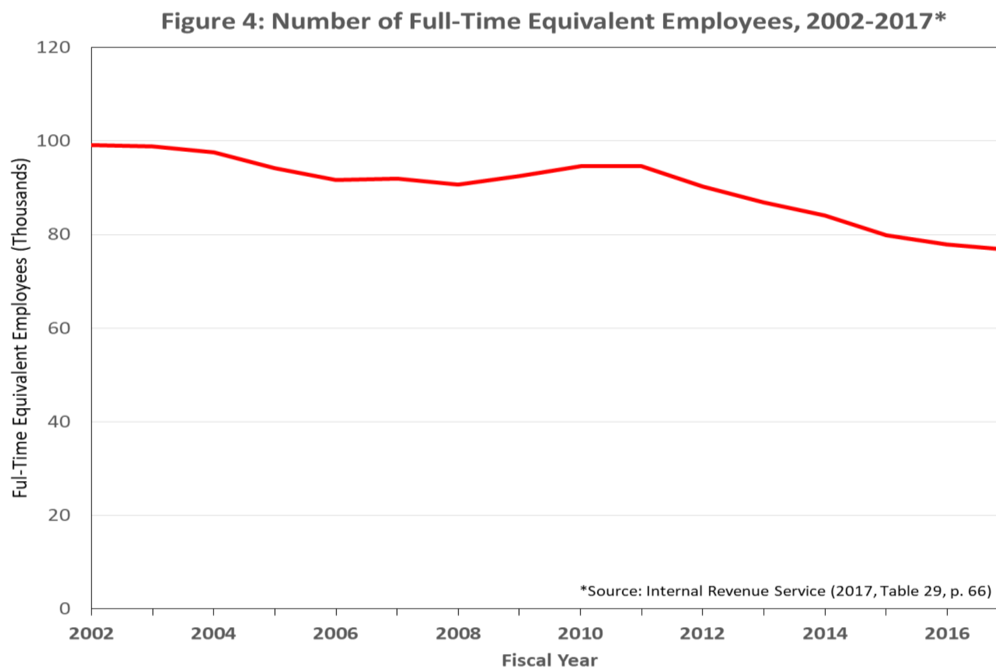
[11] The penalty for individuals who do not have required health insurance coverage was recently repealed.

Impact of budget constraints on enforcement and staffing

Although the IRS budget was 4.5 percent lower in real terms for FY2017 than it had been in FY2002, the audit coverage rate for individuals was roughly comparable to that in the earlier period. However, this was achieved in part through an even greater shift of audit resources towards relatively inexpensive and narrowly scoped correspondence audits. In FY2017, over 40 percent of all individual examinations involved claims for the Earned Income Credit, which were primarily handled through correspondence.[12]

IRS also was able to maintain a similar overall coverage rate for corporations in FY2017 to that in FY2002. However, the coverage rate for very large corporations declined sharply over this period, from 34.4 percent to only 15.2 percent.[13] As discussed below in Section 3, some of this decline is attributable to an increased focus on resolving issues with these taxpayers prior to the filing of a return.

The attrition of personnel accelerated after FY2002. As depicted in Figure 4, IRS was left with 22.5 percent fewer full-time equivalent employees in FY2017 (76,832 in FY2017 compared to 99,181 in FY2002). While online self-help resources reduced staffing needs to some extent, the sheer magnitude of this downsizing adversely impacted services that rely on human interaction. In her 2017 annual report to Congress (Taxpayer Advocate Service, 2017), Nina Olsen, the National Taxpayer advocate, reports that the IRS has been answering only about 60 percent of calls seeking live assistance during the tax season, and it is able to respond only to basic tax questions when it does answer. She also notes that there has been a substantial erosion in the availability of walk-in assistance for taxpayers at IRS taxpayer assistance centers.



[12] Author's calculations from Internal Revenue Service (2017, Table 9a, p. 23).

[13] Author's calculations from Internal Revenue Service (2002, Table 10, p. 17; 2017, Table 9a, p. 23).

3. Improved tools for tax administration

Improved data quality and availability

IRS has long struggled with modernizing its antiquated systems for processing returns. The key systems that receive tax returns and process refunds, the Individual Master File (IMF) and the Business Master File (BMF), continue to rely on outdated hardware and archaic computer languages (such as Assembly Language and COBOL) with which only a small and declining number of programmers are familiar. Progress in replacing these systems has been slow, not only because of the complexity of the tasks, but also because of years of insufficient funding.[14]

Although IRS' legacy systems continue to present risks and challenges for return processing activities, IRS had made huge strides in collecting, managing, and employing data from a wide range of sources to support research and operations. To facilitate data accessibility and analysis, IRS maintains data warehouses that contain a wide range of data, metadata, and tools for investigation. The largest of these is the Compliance Data Warehouse (CDW), a massive data repository that serves as the primary platform for IRS research analysts and other users to undertake a wide range of analytics.

Over the past 20 years, IRS has developed and expanded population datasets containing information from tax returns, third-party information documents, and enforcement and other programs. Maintaining these records at the taxpayer level for each year makes it possible to conduct time-series analyses that were virtually impossible a generation ago. Often, these records have been combined with additional data samples from administrative and external sources. Much of the analysis of such data has focused on aggregate measures of taxpayer noncompliance, but an increasing use has been to support the estimation of taxpayer compliance costs and the impact of taxpayer service initiatives. The capability to merge population or other micro datasets sometimes raises concerns about "big brother" intrusiveness, but access to and use of most of these datasets are tightly restricted—including by law and regulations. For example, IRS employees are subject to heavy fines and even losing their jobs if they access taxpayer information for any purpose other than their official duties.

Expansion of third-party matching programs

IRS has a long history of encouraging and enforcing tax compliance by matching what is reported on tax returns against information provided by third parties. For a tax administration, third-party information matching programs are relatively cost-effective. Not only do they assist with identifying potential cases of misreporting, they also help to promote a high degree of voluntary compliance. However, such programs do sometimes impose significant costs on the parties responsible for making the reports.

Experience has shown that these matching programs are especially successful at promoting compliance when the third-party data provide a reliable indication of the amount that should have been reported for a specific income source, offset, or credit. An example is the

[14] See Government Accountability Office (2018) for more details.

W-2 form that is issued by an employer both to the employee and IRS to inform both parties of the amount of wages that were earned by the employee over the course of the calendar year. Third-party wage reporting is especially effective in promoting compliant reporting because employers are also responsible for withholding taxes on the reported wage earnings.

In recent years, Congress has mandated some new types of reporting, which IRS has begun using. These include the cost basis associated with securities transactions, details on transactions through payment cards (debit, credit, and stored-value cards) and third-party networks (such as Paypal and Etsy), and information on assets held in foreign accounts.

Cost basis reporting

In the U.S., taxpayers are subject to federal income tax on their net capital gains from the sale of an asset. In the case of a security, the gain or loss is computed as the difference between the gross proceeds from the sale and its cost basis (the original purchase price), less any fees or commissions.[15] Although net capital gains on assets that have been held for less than a year ("short-term gains") are taxed at ordinary rates, a preferential tax rate is applied to assets held for a longer period of time ("long-term gains").

In the past, brokerages were required to file information returns that provided details on the type of security sold, the sales date, and the gross proceeds of the transaction. These third-party reports were helpful in that they notified both the taxpayer and IRS that there was a potential capital gain (or loss) associated with the sale. However, the disclosed sales amount was not sufficient to assess the magnitude of the net gain nor to determine whether it should be classified as short-term or long-term. It was the taxpayer's responsibility to figure out the cost basis, classify the type of gain, and report the proper amount on the tax return. So, while these third-party reports presumably helped to promote compliance to an extent, IRS tax gap estimates consistently showed significant compliance issues with taxpayer reports of both types of gains.[16]

To further discourage the underreporting of capital gains, brokerages have been required to provide additional details on their third-party information reports since the 2011 tax season. They now must provide the cost basis for the transaction and identify whether there was a short-term or long-term gain on the sale. Although this imposes additional costs on brokerages, it is expected to result in significant reductions in tax noncompliance.

Payment card and third-party network transactions

In an effort to encourage better compliance among online businesses, gig economy workers, and other taxpayers that rely on third-party payment processing, Congress began requiring in 2012 payment card merchants, such as banks, and third-party settlement organizations (TPSOs), such as Paypal and Etsy, to report details on the annual number of transactions for

[15] Under certain circumstances, such as when there has been a stock split, adjustments to the original cost basis are required.

[16] IRS tax gap estimates for both tax year 2001 and tax years 2008-2010 indicate that the income taxes owed on net capital gains were understated by about $11 billion in each tax year.

their clients as well as the monthly dollar transaction amounts. These third-party reports provide IRS and the taxpayer useful information relating to the revenues of a business or independent contractor. However, the amount reported may fall short of overall revenues for two main reasons. First, the reported payments do not account for cash transactions. Second, in the case of TPSOs, the reporting requirement applies only to clients who receive payments exceeding $20,000 over the course of a year involving more than 200 transactions, thereby excluding transactions associated with many businesses and independent contractors. Another issue is that the reports provide an indication only of revenues, not expenses. Slemrod *et al.* (2017) performed an analysis of the impact of the new third-party reporting requirements on compliance among nonfarm self-employed taxpayers (Schedule C filers). They found a significant increase in year-over-year reporting for two groups of taxpayers: (1) those who used to report less overall revenue than is now shown on the third-party report; and (2) taxpayers who failed to file a Schedule C return in prior years but who now receive a third-party report showing that they received payments. Although reported taxes went up by less than reported gross revenue among these groups owing to increases in reported expenses, the third-party reports did lead to higher overall tax payments.

In addition to improving voluntary compliance among certain groups of businesses and independent contractors, the new information reports provide IRS with information that is potentially useful for audit selection. For instance, if third-party reports show substantially more revenue received by a taxpayer than was reported on the tax return, this would suggest a relatively high risk of substantive noncompliance. In industries where cash transactions are known to represent a significant share of revenue, taxpayers who report revenues that are only modestly higher than the amount shown on third-party reports also might be good audit candidates.[17]

FATCA

In response to growing evidence of substantial tax evasion on offshore earnings, the Foreign Account Tax Compliance Act (FATCA) was enacted in 2010. Under this legislation, foreign financial institutions (FFIs) are required to report details on foreign financial accounts in which a U.S. taxpayer possesses a substantial ownership interest, including taxpayer identifying information, the account balance, and the return on investment (interest, dividends, etc.). The FFIs may either report this information directly to IRS, or they can do so indirectly through an intergovernmental agreement (IGA) between the U.S. and their home jurisdiction. Under a typical IGA, the FFI reports the account information to its local tax authority, which then exchanges the information with IRS on an automatic basis.[18] As discussed below, FATCA also requires taxpayers to self-disclose their foreign account holdings.

[17] A report by the Treasury Inspector General for Tax Administration (2017) provides an analysis of the effectiveness of relying on third-party reports of payment card and payment network transactions for audit selection.

[18] Other OECD countries have implemented similar international reporting arrangements based on the Common Reporting Standard (CRS) and associated Automated Exchange of Information (AEOI) agreements.

FATCA imposes fairly substantial reporting burdens on FFIs that cater to U.S. citizens, and this has led to some challenges for U.S. citizens living abroad in setting up and maintaining local financial accounts. It also imposes additional demands on IRS resources. A report by the Treasury Inspector General for Tax Administration (TIGTA, 2018) estimates that IRS spent $380 million on the implementation and administration of FATCA just through 2017. However, the Act does provide IRS with substantial new tools to discourage and combat offshore tax evasion.

To provide taxpayers with an opportunity to come clean about their prior failures to report and pay tax on their offshore earnings, IRS maintained an Offshore Voluntary Disclosure Program (OVDP) from 2009 through 2018. Although the precise terms of this program varied over this period, the OVDP provided eligible taxpayers with a means to avoid criminal prosecution, obtain more certainty with regard to their civil penalties, and potentially be subjected to lower overall penalties. A news release by the Internal Revenue Service (2018) indicates that more than 56,000 taxpayers participated in this program, and they paid over $11 billion in back taxes, interest, and penalties. Beginning in 2012, IRS also established a set of streamlined procedures to permit eligible taxpayers who have inadvertently failed to report offshore holdings and associated taxes to become compliant. This program is known as the Streamlined Voluntary Compliance Program (SVCP). Participants in this program are subject to substantially reduced (or, in the case of expatriates, the full elimination of) penalties, assuming that IRS accepts that their behavior was not deliberate. However, if a participant is ultimately found to have been willfully noncompliant, the participant is not shielded from additional fraud penalties or prosecution. Over 65,000 taxpayers, including many expatriates have used this program to come into compliance.

Johannesen *et al.* (2018) provide compelling evidence that a large share of the overall impact of FATCA and related enforcement efforts on compliance has taken place outside of these official disclosure programs. In particular, many taxpayers have participated in “quiet disclosures,” whereby they have simply begun declaring foreign account holdings and earnings to IRS without admitting to any prior acts of noncompliance. In some of these cases, taxpayers have simply started declaring foreign accounts and reporting the associated earnings in their current filings. In other cases, they have filed amended returns to correct for past instances of misreporting.

In a study of international asset flows up through 2015, De Simone *et al.* (2019) found that U.S. taxpayers withdrew substantial amounts of assets from tax haven countries that had signed on to FATCA, which points to a significant decrease in reliance on these jurisdictions to facilitate tax evasion. However, the authors also found some evidence of increased investment activity within tax havens that had not signed on to FATCA. Thus, it appears that the compliance-enhancing effects of FATCA were diminished to some extent by countries that continued to resist participating in the exchange of account information required by FATCA. Subsequent to 2015, however, the number of participating countries (including tax havens) has risen considerably.

Third-party reporting under FATCA not only encourages taxpayers to become more compliant in their tax reporting, it also potentially improves IRS’ ability to target noncompliant

taxpayers for enforcement through the matching of third-party reports against taxpayer filings. The report by the Inspector General for Tax Administration (2018) indicates that IRS has experienced difficulties in its matching efforts, due in part to missing taxpayer identification numbers and other data quality issues associated with the third-party reports. IRS has been working to address these issues.

Increased self-disclosure requirements

In addition to expanding requirements for third-party information reporting, IRS has also imposed new self-disclosure requirements upon taxpayers. Taxpayers have long been subject to requirements to disclose their foreign financial accounts through an annual filing of a Foreign Bank and Financial Accounts (FBAR) report (now known as a FinCEN 114 report). In response to poor compliance with this filing requirement, penalties for noncompliance were dramatically increased in 2004. An additional requirement was later implemented under FATCA for self-disclosure of foreign assets. Specifically, individual taxpayers with foreign assets that are valued above a specified threshold are required to file an additional form with their federal income tax returns, Form 8938: *Statement of Specified Foreign Assets*. Certain closely held businesses, including domestic corporations, partnerships, and trusts, also must file Form 8938 with their federal tax returns to report their foreign asset holdings.

To address aggressive tax avoidance strategies by multinational corporations, tax administrations around the world have increasingly expanded their information-sharing activities with other tax jurisdictions. In addition, multinational corporations themselves have faced increasing requirements to self-disclose information on their foreign operations and foreign tax accounting practices to shine more light on their tax avoidance efforts. A key change in recent years has been the introduction of Country-by-Country Reporting (CbCR) requirements. In the U.S., these requirements became effective in 2017. Under the CbCR measures, multinational entities are required to disclose each of the countries in which they operate, the performance and tax charges associated with all subsidiaries and affiliates in each country, and the cost and book valuations of fixed assets as well as other details on gross and net assets in each location. These reports are shared with other countries through automated exchange of information (AEOI) agreements. CbCR is expected to facilitate the identification of aggressive attempts by companies to shift income artificially into tax-advantaged jurisdictions. This increased transparency should improve the ability of tax administrations to identify and rein in base erosion and profit-shifting (BEPS) activities among multinationals.

IRS has also relied on greater self-disclosure of uncertain tax positions (UTPs) by businesses, both to encourage voluntary tax compliance and to improve its capacity to target noncompliant taxpayers for enforcement. In 2004, IRS introduced Schedule M-3, which requires corporations with assets of $10 million or more to provide a detailed reconciliation of their book-tax reporting differences. In June 2006, the Financial Accounting Standards Board (FASB) issued Interpretation 48 of its Financial Accounting Standard No. 109. The FASB is an independent entity that is responsible for generally accepted accounting principles in the U.S. This interpretation, which has come to be known as “FIN 48”, set a higher standard of “more likely than not” for recognizing the benefits of UTPs in a company’s financial statements.

Furthermore, it requires the disclosure of any liability for tax benefits claimed on its income tax return that are not permitted to be recognized in its publicly available financial statements. At least for some companies, the new disclosure requirements under FIN 48 are likely to have discouraged certain transactions that would have resulted in UTPs. In addition, the availability of such disclosures puts IRS in a better position to evaluate and address compliance risks associated with UTPs. In 2010, IRS introduced a new form, Schedule UTP, so that it could learn even more details about a company's UTPs. This new form, which currently must be filed by all companies with assets of at least $10 million, requires the taxpayer to describe and rank its UTPs in terms of the tax reserves that are being held. The company must also indicate whether a given UTP will result in a temporary or permanent tax change. IRS relies on FIN 48 disclosures as well as the detailed information reported on Schedules M-3 and UTP to help it identify companies that are at substantive risk for noncompliance and to select issues for tax enforcement.

4. Efforts to improve enforcement programs

As resources available for enforcement activities have tightened, IRS has worked to find more productive ways to enforce compliance and prevent fraud.

Audit programs

IRS has long relied on data analytics to guide audit selection, particularly in the case of individual taxpayers. From the early 1960s through the early 1990s, IRS periodically conducted random audits of large stratified random samples of individual income tax, corporation income tax, and other returns under its Taxpayer Compliance Measurement Program (TCMP) to identify taxpayer and tax return characteristics that were good predictors of noncompliance. The audited TCMP returns were segmented into various examination classes based on the level and sources of income. Then, within each segment, statistical methods were employed to develop a scoring formula that reflects the predicted likelihood that a return with specified characteristics would require substantial tax assessment. This scoring formula was then applied to the general population of individual income tax returns. Returns with a relatively high "DIF score" would then be reviewed by an experienced IRS examiner known as a "classifier" to assess whether the return was a good audit candidate, and if so, what issues should be examined. A substantial share of all IRS audits of individual returns was based on this selection methodology.

The TCMP program was discontinued in the early 1990s, and the last set of audits conducted under this program pertain to Tax Year 1988. Although IRS continued to rely on these results for audit selection purposes for over a decade after the program had been discontinued, the lack of more current random audit data became an increasing source of concern. In 2000, a new random audit program, the National Research Program (NRP), was approved.

Whereas TCMP had involved line-by-line audits of all sampled returns, the NRP relied on somewhat less intensive examinations. In order to address concerns about the burden imposed by the program on randomly chosen taxpayers, IRS relied on a new strategy to gather more

comprehensive information about taxpayers prior to conducting the audits. Some examples of this “case-building” information include prior year returns, results from previous examinations, third-party information reports, information on real estate transactions, and banking reports on large cash transactions. Armed with this information, IRS classifiers pre-selected what they deemed to be the most relevant issues to be examined for compliance measurement purposes. NRP examiners focused on these issues during the audit, but they also had the freedom to pursue additional issues they might uncover as the examination process unfolded. This new random audit strategy thereby produced a somewhat streamlined and less burdensome experience for taxpayers. Ultimately, IRS began to incorporate a similar case-building strategy into its operational audit program, which has helped not only to improve case selection and foster better detection of noncompliance, but also to reduce the burden of the audit experience for taxpayers.

The first NRP study for individual taxpayers was conducted for returns filed for Tax Year 2001, and a number of subsequent individual studies have been undertaken in more recent tax years. IRS has relied on the data from this program to update its DIF scores to better reflect the current drivers of noncompliant behavior. The statistical methods underlying these scores have also been refined and improved over time.

IRS applies a similar scoring methodology to assist with the selection of certain business returns for examination. However, the methodology has been adapted to account for the need to rely on operational rather than random examinations. In addition, IRS has conducted some special random audit studies under NRP to learn about the drivers of noncompliance among S-Corporations and employers.

The approach IRS uses to promote and enforce compliance among large corporations (with over $10 million in assets) has evolved over time. Prior to 2005, IRS relied heavily on examinations to identify and address potential issues with tax compliance after a return had been filed. Beginning in that year, however, it began piloting a new Compliance Assurance Program (CAP) to identify and resolve potential tax issues prior to a return being filed. After six years of successful testing, the program was made permanent in 2011, and it currently involves 169 large corporations. Under the CAP real-time audit design, participating taxpayers meet regularly with team of IRS examiners to discuss material tax issues and attempt to reach agreement on their proper tax treatment prior to the tax filing. Overall, the program is beneficial to both IRS and taxpayers in that it leads to more timely and certain resolutions of tax issues and streamlines the audit process.

Fraud and ID theft prevention

Technology is a double-edged sword for IRS. On the one hand, it facilitates improvements in tax return processing, the delivery of taxpayer services, and various enforcement functions. On the other hand, it creates new opportunities for criminals to steal taxpayer information and submit fraudulent claims for refunds. To combat fraud and ID theft, IRS has relied on data analytics to develop and implement complex screening processes that are designed to identify and prevent the issuance of fraudulent claims for refunds on electronically filed returns. These efforts are

complemented by manual review activities that seek to validate potentially questionable refund claims.

Refund fraud schemes are often rather sophisticated, and they continually evolve. In the current environment, where so much of a person's affairs are stored in electronic format by banks, health care providers, merchants, and online platforms, ID theft has become a major problem. Often criminals who submit false tax refund claims have substantial information about the income, family status, residential address, and finances of the individuals whose identities they have stolen, which makes it challenging to distinguish legitimate tax returns from illegitimate ones.

When a return has been flagged by the system as potentially fraudulent, a freeze is placed on the refund until the information on the return can be verified. Since this verification process can result in a substantial refund delay as well as significant taxpayer frustration when a return is ultimately found to be compliant, it is essential to limit the number of "false-positives" generated by the system while still successfully flagging a large share of cases involving actual fraud and ID theft. IRS continues to invest in refining and updating its fraud detection methodology to keep pace with technological advances as well as the evolving nature of fraudulent activity. In recent years, the filing of certain third-party information reports (such as W-2 wage reports and 1099-Misc reports of nonemployee compensation) has been accelerated, which has made it possible to incorporate these data into the fraud detection algorithms.

Nonfiler programs

IRS relies on third-party information reports, prior returns, and other data to identify nonfilers who are likely to have unpaid tax liabilities. In cases where the potential unpaid liabilities are substantial, IRS enforces compliance through efforts such as its Automated Substitute for Return (ASFR) program. Under this program, a substitute return is sent to the taxpayer along with a request to either consent to the proposed tax amount (along with any specified interest or penalties) or file a return showing the correct amount that is due. If the taxpayer fails to respond, IRS issues a statutory notice of deficiency, and ultimately pursues collection action as necessary. A TIGTA (2017) report indicates that the AFSR program generated $3.3 billion in revenue collections between July 2010 and June 2011. Unfortunately, however, budget constraints led IRS to drastically scale back the program over the next five years, and it ultimately suspended the program in January 2017.

5. The road ahead

IRS continues to pursue new and more cost-efficient and effective ways to promote compliance and protect the revenue base. The agency continues to invest in analytics and data improvements to enhance the productivity of its programs and reduce costs, it has been conducting pilots to design more effective notices and messaging strategies to collect unpaid tax debts, and it has introduced a new "compliance campaign" strategy for large corporations.

Analytics and data improvements

For many years, tax administration research relied largely on modest data samples from the overall population, because neither computer hardware nor software could handle anything larger. Over the last 20 years, however, advances in computer memory and storage, hardware, networking, and software (including methods for analyzing unstructured data) have combined to create endless possibilities for analyses that were previously unthinkable. But two things are needed to exploit this potential: analytical tools and skilled analysts. The tools are relatively easy to purchase and install. But the analytical skills necessary to use those tools (and to correctly interpret the results) are much harder to assemble, maintain, and expand—particularly since most analysts who were trained over ten years ago have only a limited grasp of "big data" analytical methods, such as machine learning, genetic algorithms, classification tree analysis, social network analysis, and recommender systems. On the other hand, those who have such skills tend not to have much understanding of tax issues, tax data, or tax administration processes. Clearly, the tax research workforce needs to include a broad mix of analytical disciplines and tax administration knowledge.

To leverage these advances in computing hardware, software, and analytical techniques, IRS has substantially increased its annual spending on data systems and infrastructure specifically in support of research, from around $3 million fifteen years ago to approximately $7.5 million in recent years, with roughly two-thirds of those amounts being devoted to support personnel. This has enabled the expansion and modernization of the Compliance Data Warehouse, so that researchers now have virtually instant access to almost 20 years of structured population data from tax returns, information returns, enforcement actions, and other taxpayer transactions, together with the analytical tools necessary to make the most of this rich source of data.

IRS has been working to exploit these data and tools to improve the productivity of its compliance programs and reduce costs. In recent years, it has experimented with a variety of new applications, such as link analysis to gain insights into complex ownership structures within flow-through entities, graph analytics to identify fraud schemes, predictive modeling to automate case selection of tax exempt government entities, and agent-based modeling to develop insights into how social networks and third-parties (such as tax practitioners and employers) influence tax compliance behavior. Plans are underway to experiment with additional applications that make more effective use of unstructured data and to leverage cognitive computing tools.

While it is essential for IRS to leverage the considerable power of big data analytics to improve its programs and reduce costs, it is important not to view this new technology as a panacea, nor to accept new innovations without adequate testing to ensure that they truly represent an advance. Significant risks are sometimes subtle and lost in the allure and promise of high-powered analysis. Frequently, the limitations of all techniques are rooted in the assumptions they make—whether explicitly or implicitly. And if those assumptions are not tested, they are typically taken as true—often resulting in very misleading conclusions. For example, agent-based models of taxpayer behavior rely on many assumptions about the

diversity of taxpayer motives, knowledge, and opportunities. Unless those models are used to prioritize replacing the most sensitive assumptions with real data, they will remain just simulators with little practical value since the "findings" will often be very sensitive to key assumptions. Likewise, statistical matching can be helpful in identifying an ex post control group in a natural experiment, but unless the matching algorithm accounts for all relevant differences between those who experienced the "test" and those who didn't, inferences drawn from the analysis may be very misleading. Perhaps the most common challenge is to resist the temptation to believe that "big data" methods circumvent the need for high quality data. For example, IRS has long invested in gathering somewhat comprehensive data from audits of stratified random samples of tax returns under TCMP and now NRP to understand both the full extent of noncompliance and how best to select returns for regular, operational audits. Gathering such data requires significant costs in the short term, but more than pays for itself over the long term. Nonetheless, it is tempting to avoid those costs by applying new analytic methods to non-representative operational audit data. The reliability of the results from applying such methods, however, will always rest on strong assumptions that may not be satisfied in practice. A straightforward analysis of high quality representative data often trumps a sophisticated and complex analysis of lower quality non-representative data.

Collection notice redesign

IRS has been conducting field experiments to explore potential ways to "nudge" taxpayers to pay their overdue tax balances. These experiments employ insights from economics and behavioral psychology to develop alternative notices that are meant to reach taxpayers more effectively and induce a pro-compliance response. The alternative notices differ in terms of length, visual appearance, and message content. The preliminary results look promising and suggest that appropriately redesigned notices have the potential to accelerate the resolution of tax debts significantly and improve revenue collections.

Compliance campaigns

The IRS Large Business and International (LB&I) Division serves corporations, S-corporations, and partnerships with assets greater than $10 million. Up until its reorganization in 2016, LB&I had a long-standing practice under its Coordinated Industry Case (CIC) program of performing more-or-less continual audits of the largest and most complex corporations (with over $250 million in assets) using IRS examination teams. However, largely as a result revenue constraints and staff reductions, LB&I opted to make substantial changes to its examination strategy. Under its reorganization, LB&I established a set of geographically-based practice areas to develop greater insight into specific compliance challenges associated with each area. This organizational realignment was undertaken to facilitate a shift away from comprehensive enterprise-wide examinations of centrally-identified compliance issues and towards tailored "compliance campaigns." The campaigns involve a mix of strategies (such as soft letters, educational programs, and selective issue-based audits) to address specific tax issues deemed to pose substantive compliance risks. It is too early to assess at this point the efficacy of this new approach.

6. Concluding remarks

IRS has faced enormous challenges in coping with ever-increasing responsibilities in the face of decades of underfunding. Whether the tax system is currently in a crisis, however, is largely in the eye of the beholder. In the preface of her 2017 Annual Report to Congress, Nina Olsen, the National Taxpayer Advocate, wrote:

> "I cede to no one in my advocacy for increased IRS funding. As the National Taxpayer Advocate, I see daily the consequences of reduced funding of the IRS and the choices made by the agency in the face of these funding constraints. These impacts are real and affect everything the IRS does. Funding cuts have rendered the IRS unable to provide acceptable levels of taxpayer service, unable to upgrade its technology to improve its efficiency and effectiveness, and unable to maintain compliance programs that both promote compliance and protect taxpayer rights. "Shortcuts" have become the norm, and "shortcuts" are incompatible with high-quality tax administration. There is no doubt that the IRS needs more funding" (p. vii).

On the other hand, the vast majority of taxpayers do continue to file their returns, and IRS continues to process those returns, issue refunds, collect taxes, and meet its statutory responsibilities. To the extent they can be relied upon as a gauge of compliance trends, IRS tax gap estimates do not point to any dramatic escalation in tax noncompliance over time. Increases in electronic filing, coupled with substantial investments in data and technology, have undoubtedly helped IRS to weather the storm.

Regardless whether one views the current situation as a crisis, what is clear is that IRS needs to continue investing in both technology and people. IRS estimates that its enforcement programs generate $5 in additional revenue for every dollar spent.[19] This figure refers only to the revenue arising directly from these activities. Additional benefits include their indirect effect on voluntary compliance within the overall population and the enhanced fairness of a system that makes it more difficult for cheaters to game the system. With a larger budget, IRS also could provide better services to taxpayers who are often confused and uncertain about their obligations under our complex tax system.

It is not clear whether a continuation of this ongoing trend of requiring IRS to do more with less will ultimately lead to a tipping point where it will be apparent to all that the tax system is in crisis. What is clear, however, is that former Commissioner Rossotti's prescription applies now even more than it did back in 2002: the IRS could do its job better, compliance could be improved, and taxpayers would be better served if the agency were to receive a reasonable and sustained infusion of additional resources.

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[19] Internal Revenue Service (n.d., p. 5).

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