

## **Impact of Electronic Fiscal Device on Perceived Transparency in Tax Audit: A Case of Arusha-Tanzania**

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## Abstract

In recent years, the application of Electronic Fiscal devices (EFDs) in developing countries has significantly increased. This increase in use resulted from an increase in awareness of its perceived benefits such as efficiency of tax collection, reduction of tax evasion and improvement of tax audit transparency. This study assessed the effect of EFD use on the tax audit effectiveness and the perceived degree of transparency in tax audit processes among small entrepreneurs in the Arusha region of Tanzania. The study was conducted on small businesses because of their significance in driving the economy of developing countries. Primary data was collected using a close-ended questionnaire distributed to 279 small business owners. An interview was also conducted to supplement the data collected from the questionnaire. Based on the outcomes of one-way analysis of variance (ANOVA) and ordinal regression, this study found that the use of EFDs affected the perceived degree of transparency in the tax audit. The authors recommend that the revenue authority should create more awareness of EFDs and extend its use to other businesses not currently covered. This is necessary to enhance the effectiveness of the tax audit, given its positive impact on transparency.

**Keywords:** *Electronic fiscal devices, transparency, audit, taxation, small businesses, Tanzania*

**JEL:** E62, H25, H26, L63, L86

## 1. Introduction and background

Small businesses contribute over 70% of employment and 60% of the gross national output in developing countries (Muriithi, 2017; Bartik, et al., 2020). Findings from studies conducted in five African countries indicated that the employment offered by small business activities is more than twice that offered by the public and other large, registered organisations (Muriithi, 2017). Moreover, the rate of increase in small business employment is estimated to be 17% every year (Endris & Kassegn, 2022). Tanzania is among the developing countries where small businesses contribute significantly to the economy, with more than 60% of its GDP being contributed by small business owners (Lema, 2013). As far as tax revenue collection is concerned, knowing the behaviour of the taxpayers is necessary to establish appropriate methods of tax collection.

In many tax jurisdictions, tax compliance is voluntary, and enforcement is applied as the last option (Slemrod, 2019; Hassan, Naeem, & Gulzar, 2021). The tax revenue authorities have instituted techniques that encourage taxpayers to voluntarily declare their business affairs for tax establishment. For instance, in the self-assessment system, the taxpayer voluntarily declares their business profit and makes a self-establishment of the tax liabilities (Hutauruk, Ghozali, Sutarmo, & Mushofa, 2020). Thereafter, through audits, the tax officers will verify payment and ascertain the accuracy of the tax paid (Dauda & Oyedokun, 2018; Belnap, Hoopes, Maydew, & Turk, 2022). However, the self-assessment method is not practical for small business owners because they lack bookkeeping knowledge (Paco, A., & Quezon, 2022; Peprah, et al., 2022). Most of the revenue authorities, through interviews, are willing to assist the taxpayers in ascertaining their tax liability (Haji, 2015; Bucci, 2020). It does however seem that the voluntary compliance of this category of taxpayers (small businesses) is seemingly somewhat biased (Peprah, et al., 2022).

EFDs are computerised devices employed by tax-generating authorities to monitor the commercial transactions of each registered business (Eilu, 2018). The use of EFDs has been perceived to overcome the challenge of record keeping and biased tax decisions for small business owners (Eilu, 2018; Shao & Dida, 2020; Magese & Chindengwike, 2021). The special feature of this device is that it contains memory that cannot be easily deleted or manipulated (Bostan, Popescu, Istrate, Robu, & Hurjui, 2017; Tanzania Revenue Authority, 2020). This is an important feature as it provides assurance of the accuracy of the tax established because the input data are self-entered by the taxpayers and can be stored for a long time (Casey & Castro, 2018). Therefore, it reduces arguments with tax officers during tax audits (Magese & Chindengwike, 2021).

The use of EFDs was first applied in Japan and the European countries in the 1980s (Eilu, 2018). Kenya was among the first in the league of emerging African nations to implement the EFD followed by Tanzania in 2012 (Eilu, 2018). It is indisputable that the adoption of EFDs was easily accepted by large businesses since they already have a foundation and experience with complex automated business systems and therefore they require little operation knowledge (Mandari, Koloseni, & Nguridada, 2017; Mnyawi, Chusi, & Lumenyela, 2022). Small business owners, however, perceived that EFD use would increase the risk of

openness of their business affairs which would eventually subject them to high taxes (Mnyawi, Chusi, & Lumenyela, 2022).

Like other revenue authorities, Tanzania Revenue Authority adopted the use of EFDs as part of the strategy of enhancing the tax compliance of taxpayers (Landry, Fulgence, & Sophia, 2021). The special features within the device include retention of the memory of business records for a long time, highly accurate and secured, and maximum transparency of information (Tanzania Revenue Authority, 2020). Despite the huge investment by the Tanzania Revenue Authority in the adoption of automated systems, it remains to be seen whether the EFD use enhances the degree of transparency of the tax audit or how it impacts the effectiveness of the tax audit. The audit effectiveness relates to how well a tax audit exercise achieves its objective. In the current study, the researchers investigated how the application of EFDs influences audit effectiveness. Audit effectiveness constitutes an essential factor of accountability in taxation (Kasper & Alm, 2022). Additionally, the research evaluated the influence of EFD use on the perceived degree of transparency<sup>1</sup> in a tax audit while also determining the effect of a tax audit on the perceived degree of transparency in the tax audit.

## **2. Literature review**

In this section, empirical studies which support the main theme are discussed to provide more insight into the underlying problem.

### ***2.1 EFD use and transparency***

There are numerous studies which discuss the significance of EFD applications in business. For instance, Landry et al. (2021) and Magese and Chindengwike (2021) mentioned minimisation of fraud and corruption, security and accuracy improvement and timely generation of sales reports as key functions of the EFD. Generally, the functional design of EFDs makes it special and of great importance in tax compliance. First, the device comprises storage memory which stores data for a long time (Tanzania Revenue Authority, 2020). This assures the accuracy of business information. Second, the security level of EFDs

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<sup>1</sup> Raw transparency relates to proper declaration of business financial data, which is a necessary condition for efficient auditing; however, auditing procedure produces advanced transparency, creating an avenue for accountability (Licht, 2019).

is high and therefore data cannot be easily erased and manipulated (Landry, Fulgnce, & Sophia, 2021). Generally, an EFD is said to improve the transparency of business affairs (Masau & Nfuka, 2022). In taxation, transparency of taxpayers' affairs is important as it assures the accuracy of the tax established (Al-Maghrebi, Sapiei, & Abdullah, 2022). Moreover, it reduces disputes with taxpayers because the reports that are generated from the taxpayers' inputs are more genuine and reliable than manual paperwork.

There are also various technological theories that explain the factors that motivate users to adopt new technology. This research incorporated two theories that are relevant, namely the *Technology Acceptance Model (TAM)* and the *Diffusion of Innovation (DOI)*. The TAM model depicts that users are influenced by supposed usefulness, supposed ease of use and disposition towards use in adopting new technology (Taherdoost, 2018). Generally, most of the small businesses are less complex and require little knowledge of operation (Ribeiro-Soriano, 2017). Mayr et al. (2021) pointed out that most of the small business owners are either illiterate or have no or little formal education. Having inadequate formal education increases the perceived fear of how to operate the device (Mayr, Mitter, Kucher, & Duller, 2021). The peer influence is another factor which hinders the adoption the EFD. In Tanzania, the resistance to EFD use was initiated by small traders in 2014 claiming that they feared the use may result in an increase in taxes (Landry, Fulgnce, & Sophia, 2021). Overall, the TAM model suits the behaviour of small business traders in relation to the adoption of EFDs.

On the other hand, the DOI explains several factors which influence the decision of users in adopting new technology. The current study extracted the following factors which are relevant: relative advantage, complexity, and compatibility (Taherdoost, 2018). Regarding the adoption of EFDs, the small businesses will prefer technology which maximises their returns (relative advantage) (Pillay, Obalade, & Malima, 2020). Generally, the adoption of EFDs is costly in terms of acquisition, operation and maintenance, and the operational and maintenance costs vary depending on the rate of use. Therefore, the small business owners are challenged in adopting technology that reduces the income generated by their business. Small business owners would be motivated to use EFDs if the operation is less complex and easily understood. They have however anticipated that the use of EFDs may relate to and form part of their normal co-existing ways of conducting their businesses. In general,

therefore, it appears that the use of EFDs by small business traders is influenced by perceptions that the EFDs might put them at risk of losing their income. These perceptions are due to an increase in transparency of the information of their businesses.

## ***2.2 The impact of EFD use in tax audit***

EFDs play a significant role in tax audits. Empirical studies have identified EFD reports as reliable evidence in verification of tax affairs and the establishment of taxes. For example, Shao and Dida (2020) discussed the use of sales reports generated by EFDs in establishing tax liabilities for various taxes. It is inarguable that the EFD reports have a great impact on the effectiveness of tax audits (Belnap, Hoopes, Maydew, & Turk, 2022). Traditionally, manual evidence submitted by taxpayers was the only source of information to rely on during tax audits (Grigoris, Maria, Alkiviadis, & Dimitra, 2022). The manual system was risky for the efficiency of the tax audit because it provided a loophole for the taxpayers to manipulate data (Grigoris, Maria, Alkiviadis, & Dimitra, 2022). Therefore, the adoption of EFDs was expected to minimise this risk of inaccurate data used for tax decisions (Irefe-Esema & Akinmade, 2020).

Accordingly, the present study has deployed the *Standard Model of Tax Evasion* in the literature discussion in order to widen the knowledge of EFD use in relation to tax audits. In this model, the degree of tax evasion is relative to the likelihood of fraud detection and the degree of punishment due to non-compliance. Practically, during tax audits, EFD reports form part of the reliable evidence to the tax auditors on the accuracy of taxpayers' business affairs. Therefore, it is inarguable that they are essential in minimising the risk of tax evasion. The current study thus aimed to establish the impact of EFDs in tax audits.

## ***2.3 The role of the tax audit in enhancing transparency***

Tax audit and transparency are inseparable elements (Tjondro, Fernando, Soegihono, & Wanandi, 2019). This is because tax decisions depend on the availability of business information. Enofe, Embele, and Obazee (2019) argued that there are certain circumstances whereby the tax officers cannot access business information directly from the taxpayer for tax establishment. In such a scenario, it is necessary for the tax

officers to invest extra efforts in obtaining the information (Enofe, Embele, & Obazee, 2019; Kasper & Alm, 2022). Through the tax audit, various strategies are deployed to obtain relevant information for tax decisions. Grigoris et al. (2022) suggested interviews, physical visitation to the business premises and the use of third-party information among strategies which are commonly used. The application of these strategies varies depending on the nature and behaviour of the taxpayer. At this point, familiarisation with the taxpayer’s business cannot be avoided. The current study examined function of the tax audit in the EFD-enabled environment and how it can enhance the transparency of business information.

### **2.4 Conceptual framework**

The conceptual framework of this study was formulated from the literature review. According to Irefe-Esema and Akinmade (2020) and Kunze and Summerskill (2019), the effectiveness of the tax audit is influenced by automation of tax systems. The more transparent the system is perceived to be, the more effective the tax audit is perceived to be. The EFD contains features that support the transparency of the business information. That is the reason why the revenue authorities emphasise the use of EFD – as it improves the accuracy of the taxes established. However, small businesses are making rational decisions in adopting EFDs due to the influence of motivational factors. This is supported by studies conducted by Eilu (2018) and Mustafa and Yaakub (2018). Generally, the study was able to extract three variables which formulated the conceptual framework of the study. Figure 1 below illustrates the relationship between the three variables.

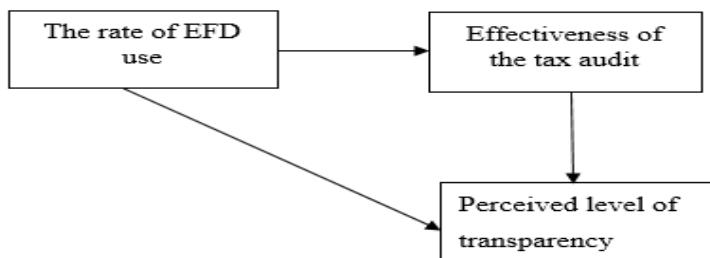


Figure 1: Conceptual framework

The figure shows that EFD use is expected to enhance both the perceived degree of transparency as well as the effectiveness of a tax audit. Additionally, an effective audit system is expected to enhance transparency.

### **3. Methodology**

This study followed the quantitative approach as the method for conducting the research. In this approach, the research knowledge is independent from the researcher to require verification of facts (Apuke, 2017). To collect verifiable information, the study adopted the survey method for data collection (Aliyu, Singhry, Adam, & Abubakar, 2015), using a close-ended questionnaire. The qualitative approach was also adopted through the use of interviews to seek more clarification of quantitative results.

#### ***3.1 Population and sampling***

Generally, this study aimed to benefit African countries who are still in a developing economy. A common feature of this economy comprises the activities of small businesses who are in the informal sector. Statistically, over 80% of the economic growth in African countries is from small-informal business activities (International Labour Organization, 2018). In Tanzania, 70% of employment is offered by small businesses (Keshiganga, Sungur, & Kigunda, 2010). This study was conducted in the Arusha region of Tanzania as the chosen population of the study. This region was chosen because of the following factors: firstly, it was easily managed by the researchers in terms of time and financial resources. Second, Arusha region has a good mixture of small business owners from various sectors such as agriculture, tourism and mining. Moreover, it is the region with the second highest number of tax revenue collections which indicates it has many registered taxpayers. The researchers used systematic sampling in establishing the sampling frame, using the taxpayers' register available in all tax revenue centres of the Arusha region. According to the Bartlett, Kotlik and Higgins (2001) model, a minimum of 278 units are required to represent a sampling frame of 1000 units of the entire population at the standard error of 0.05. The chosen sample for this study comprised 279 participants.

### ***3.2 The research instrument***

A closed-ended questionnaire developed based on variables and the related hypotheses was employed to generate data. A closed-ended questionnaire is easy to understand and it minimises ambiguity for the participants (Bowling, 2005). The instrument contains relevant components comprising the respondents' characteristics, use of EFDs in commercial dealings, the perceived degree of transparency of the tax arrangement and audit effectiveness.

Pre-testing of the questionnaire was necessary to ensure the questions were appropriate with respect to the suggested hypotheses. Different stakeholders, namely two PhD holders in taxation and experts in EFDs, were required to authenticate the content. Furthermore, the instrument was subjected to a group discussion involving assesses who are familiar with EFDs, and staff of the tax collecting authority, and their feedback<sup>2</sup> was taking into consideration. This method has been applied in relevant literature (Sobh & Perry, 2006; Walsham, 2006). Additionally, the clarity of the question was tested using a pilot study. The ultimate instrument was distributed and completed through face-to-face interactions, which enable respondents to seek clarification on any area of vagueness before submitting completed questionnaire (Bahari, 2010; Chowdhury, 2014). In terms of the internal reliability of variables, the Cronbach's alpha was 0.74, 0.75, and 0.73 for each of extent of EFD use, perception of tax audit effectiveness and degree of transparency, correspondingly.

An interview was conducted to complement the quantitative approach. This is done particularly to explain and clarify the notable research pattern in quantitative study (Gialdino, 2009). Based on their availability and readiness, ten interviewees selected among small business owners who used EFDs were asked questions which were not necessarily uniform.

### ***3.3 Data analyses***

The collected data was estimated with the aid of Statistical Package for Social Sciences (SPSS). The categorical relationship between the

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<sup>2</sup> The major feedback was an improvement of proper translation of the English questionnaire to Swahili as the main language in Tanzania is Swahili.

interdependent variables was tested using the one-way ANOVA. Moreover, the relationship between the variables was tested using the linear regression technique. Specifically, the connexion between EFD use (RATE) and two other variables was evaluated separately as demonstrate in equations 1 to 3.

$$ETA = \beta_0 + \beta_1(RATE) \quad (1)$$

$$LT = \beta_0 + \beta_1(RATE) \quad (2)$$

$$LT = \beta_0 + \beta_1(ETA) \quad (3)$$

In equations 1 and 2 the rate of EFD use was the explanatory variable while the perception of the effectiveness of tax audit (ETA) and degree of transparency (LT) respectively, are the explained variables. ETA was regressed on the LT in equation 3. The identified explanatory variables constitute the common causes of tax compliance in literature (Fagariba, 2016; Innocenti & Rablen, 2017)

## 4. Results and discussion

### 4.1 Demographic characteristics

This section provides a discussion of the output of this study. The study collected data from 279 participants who were the sample of the research population following the procedure described in the previous section. The sample was characterised with the following demographic characteristics: age, gender and education. Analysis was conducted to gain a better understanding of how demographic characteristics influence the transparency perception of small business owners on a tax audit conducted in the EFD environment.

Table 1: Characteristics of respondents

| Input variable | Descriptive information |           |         |
|----------------|-------------------------|-----------|---------|
|                | Scale                   | Frequency | Percent |
| Age            | 18-30                   | 98        | 35.1%   |
|                | 31-40                   | 96        | 34.4%   |
|                | 41-50                   | 68        | 24.4%   |
|                | 51 and above            | 17        | 6.1%    |
|                | Overall                 | 279       | 100%    |
| Gender         | Female                  | 173       | 62.0%   |
|                | Male                    | 106       | 38.0%   |
|                | Overall                 | 279       | 100%    |

|           |                        |     |       |
|-----------|------------------------|-----|-------|
| Education | Primary Education      | 79  | 28.3% |
|           | Secondary Education    | 90  | 32.3% |
|           | Certificate or Diploma | 88  | 31.5% |
|           | Degree and above       | 22  | 7.9%  |
|           | Overall                | 279 | 100%  |

Source: *Authors' computation based on primary data (2020)*

The results of Table 1 indicate that 69.5% of participants with a high perception of the transparency are in the age categories below 41 years old. A study conducted by Charness and Boot (2009) observed similar results and suggested that taxpayers in the low age category are less anxious about adopting new technology than older ones. In addition, young people can be easily educated in technological issues; hence the transparency geared by EFD during an audit may be of great interest to them. On other hand, the older category participants are slower in learning and adopting the new systems in the business. Olphert and Damodaran (2013) identified poor vision face, frustration with user interface and fear of losing income as the barriers to new technology adoption.

Apart from age, results in Table 1 indicate that 60.1% of the participants with education below Certificate and Diploma level have a high perception of the level of transparency in the tax audits due to EFD use. This is consistent with Baker, Al-Gahtani and Hubona (2007) who found that education had a low impact on the perception of the transparency of the technology adopted. However, the finding differs from that of Attar and Sweiss (2010) who found that participants with a higher education have a higher perception of transparency of the technology adopted.

Further analysis was conducted to test the categorical relationship between the demographic variables and the level of audit transparency using ANOVA. Analysis between age and perceived level of transparency indicated a p-value of 0.014 which is less than the value of the threshold (See Table 2). This observation indicates that there is a significant relationship between the age of the participants and their perception of transparency of the audit process. Another variable which indicated a significant categorical relationship with one-way ANOVA testing was education ( $p= 0.001$ ). In the descriptive analysis, 60.3% of the participants possessed primary and secondary education. A similar rate of education level was observed in the findings of Matama (2016) who concluded that most of the small business owners fall under this education category because the nature of their businesses requires few

educational skills. Apart from these observations, this study observed an insignificant categorical relationship for the gender variable ( $p= 0.368$ ).

Table 2: Categorical relationships testing

| <i>Input variable</i> | <i>Output variable</i>                | <i>P-value</i> | <i>Analytical model</i> |
|-----------------------|---------------------------------------|----------------|-------------------------|
| Age                   | Perceived level of audit transparency | 0.014          | One-way ANOVA           |
| Gender                | Perceived level of audit transparency | 0.368          | One-way ANOVA           |
| Education             | Perceived level of audit transparency | 0.001          | One-way ANOVA           |

Source: Authors' computation based on *primary data* (2020)

#### ***4.2 Determination of the perceived level of transparency in the tax audit***

The main objective of this study was to determine the impact of EFD use in enhancing the perception of transparency of the tax audit of small entrepreneurs. The study applied the ordinal regression model to do the analysis. Results of the first regression analysis (equation 1) presented in Table 3 below show the  $r$ -value of 0.026 and the  $p$ -value of 0.186. These results indicate an insignificant relationship between the use of EFD and audit effectiveness because the  $p$ -value (0.186) is above the threshold of 0.05. The results from the ordinal regression analysis (equation 2) indicated a  $p$ -value of 0.001 and  $r$  value of 0.050. Therefore, the use of EFD influences the perceived degree of transparency in the tax audit process. The last ordinal regression analysis (equation 3) resulted in a  $p$ -value of 0.002 and  $r$  value of 0.032. These results indicate a significant relationship between the effectiveness of the tax audit and the supposed degree of transparency.

Table 3: Summarised regression analysis table

| <i>Independent variables</i> | <i>Dependent variable</i>       | <i>Model fitting information</i> | <i>Nagelkerke r-square</i> |
|------------------------------|---------------------------------|----------------------------------|----------------------------|
| The use of EFD               | Audit effectiveness             | 0.186                            | 0.026                      |
| The use of EFD               | Perceived level of transparency | 0.001                            | 0.050                      |
| Audit effectiveness          | Perceived level of transparency | 0.002                            | 0.032                      |

Source: Authors computation based on *primary data* (2020)

From the above analysis, this study's findings follow the model as illustrated in Figure 2 and analysed below.

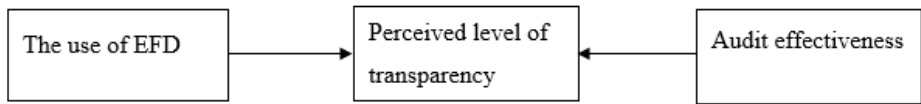


Figure 2: Revised conceptual framework

Figure 2 suggests that both the rate of the use of EFDs and audit effectiveness impact the degree level of transparency. In other words, the perceived level of transparency is influenced by the use of EFD and the effectiveness of tax audits.

### **4.3 Discussion of findings**

The first specific objective focused on determining the effect of the frequency of using EFDs on audit effectiveness. This is required to justify the implementation of EFDs by the Tanzanian tax collecting agency, the key among which is to streamline the audit process by making information freely available to the agency and assessee alike. This study revealed that the perception of effectiveness of tax audits is not significantly influenced by the frequency of EFD use among entrepreneurs. This outcome does not support the findings of similar literature (Ikasu, 2014 and Eilu, 2018) from East Africa which showed that EFD use has positive implications for the audit process; however, the samples for these studies were drawn from the revenue generation agency. Drawing information from the discussion with respondents, the taxpayers' ignorance of audit procedures and dishonesty may have contributed to the findings of this study. In this context, a corrupt system makes nonsense of the audit process in the in the opinion of the assesseees by creating a loophole for bribery (Chege, Kiragu, Lagat & Muthoni, 2015).

Secondly, the study evaluated the effect of using EFDs on the perception of transparency. This objective was informed by the general belief that using electronic devices in conducting business transactions guaranteed openness. For example, it ensures that the assessor and assessee have access to relevant information. It is generally believed that transparency in taxation spurs taxpayers' compliance (Grimmelikhuijsen, Porumbescu, Hong & Im, 2013). Based on the result of the analysis, this study showed that the perception of transparency among assesseees

improves when EFDs are used. This outcome supports the findings of Kosack and Fung (2013) and Al-Maghrebi, Ahmad and Palil (2016) who demonstrated that the level of transparency in audit and business activities is determined by EFD use. They argued that electronic systems must be encouraged because it improves data accessibility and tracking of business activities.

## **5. Conclusion and recommendations**

This study explored the impact of EFD use on the effectiveness of the tax audit; evaluated the effect of EFD use on the supposed degree of transparency in the tax audit while also determining the effect of tax audits on the perceived degree of transparency in the tax audit of small business owners. The study concludes that the application of EFDs and the effectiveness of the tax audit have an effect on the perceived degree of transparency in the tax audit. Based on the results of the analysis, it is evident that a large number of the participants are not satisfied with the audit process and the ability of EFDs to support it. Based on this finding, it is imperative for tax collecting authority to enhance perceived effectiveness through sensitisation and technical demonstrations. Also, the study concludes that a substantial categorical and causal association exists between the perception of transparency and the frequency of EFD use. In other words, a higher frequency of EFD use is accompanied by an increase in the perceived degree of transparency. As a result, it is recommended that revenue authorities should create more awareness and extend the use of EFDs to other businesses not currently covered. This is necessary to enhance the effectiveness of the tax audit, given its positive impact on transparency. Lastly, the study recommends engaging other socio-economic factors which can influence the perceived level of transparency of small business taxpayers from a broader perspective.

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