

**Joel Slemrod, Brett Collins, Jeffrey L. Hoopes, Daniel Reck
and Michael Sebastiani**

Does credit-card information reporting improve small-business tax compliance?

**Article (Accepted version)
(Refereed)**

Original citation:

Slemrod, Joel and Collins, Brett and Hoopes, Jeffrey L. and Reck, Daniel and Sebastiani, Michael (2017) *Does credit-card information reporting improve small-business tax compliance?* [Journal of Public Economics](#), 149. pp. 1-19. ISSN 0047-2727
DOI: [10.1016/j.jpubeco.2017.02.010](https://doi.org/10.1016/j.jpubeco.2017.02.010)

© 2017 Elsevier B.V.

This version available at: <http://eprints.lse.ac.uk/88183/>

Available in LSE Research Online: June 2018

LSE has developed LSE Research Online so that users may access research output of the School. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LSE Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain. You may freely distribute the URL (<http://eprints.lse.ac.uk>) of the LSE Research Online website.

This document is the author's final accepted version of the journal article. There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

Does credit-card information reporting improve small-business tax compliance?

Joel Slemrod, University of Michigan, jslemrod@umich.edu
Brett Collins, Internal Revenue Service, Brett.Collins@irs.gov
Jeffrey L. Hoopes, University of North Carolina, hoopes@unc.edu
Daniel Reck, University of California Berkeley, dreck@berkeley.edu
Michael Sebastiani, Internal Revenue Service, michael.sebastiani@irs.gov

March 12, 2017

Abstract. We investigate the response of small businesses operating as sole proprietorships to Form 1099-K, an information report introduced in 2011 which provides the Internal Revenue Service with information about electronic sales (e.g., credit card sales). The overall impact of the policy appears to be relatively small. However, theory and distributional analysis isolates a subset of taxpayers expected to be especially sensitive to reporting, who report receipts equal to or slightly exceeding the receipts reported on 1099-K. Among this set of taxpayers, information reporting induced more tax filing--30 percent of sensitive taxpayers filed a return declaring business income for the first time, and among those that were already filing, we estimate an increase in reported receipts by up to 24 percent. These taxpayers largely offset increased reported receipts with increased reported expenses, which do not face information reporting, diminishing the impact on reported net taxable income.

JEL Codes: H20, H23, H25, H26

Keywords: Tax evasion, information reporting, small businesses, tax enforcement, administrative data

We thank Ilan Benshalom, George Contos, John Guyton, Ron Hodge, Drew Johns, Barry Johnson, Patrick Langetieg, Mark Payne, Mary-Helen Risler and Lisa Rupert of the Research, Applied Analytics, and Statistics Division of the Internal Revenue Service (IRS) for helping us use the IRS administrative data. The views expressed here are those of the authors alone, and do not reflect the views of the IRS. We also thank James Alm, Roger Gordon, Michelle Hanlon, Justin Marion, Philipp Meyer-Brauns, and Shawn Novak for thoughtful discussion of an earlier draft of the paper, as well as seminar participants at the University of Michigan, the University of Warwick, the University of Copenhagen, the University of Oslo, Nanyang Technological University, National University of Singapore, Hertie School of Governance (Berlin), CERGE-EI (Prague), the Michigan Tax Invitational Conference, Oxford University's Academic Symposium 2014, the 2014 International Institute of Public Finance Congress, the Oxford 2014 Tax Systems Conference, and the 2014 NTA meetings for helpful feedback and comments. Any remaining errors are our own.

Data from randomized audits suggest that, in 2006, \$385 billion in taxes legally owed to the United States government were not remitted, amounting to about 14.5 percent of total tax payments required by the law (Internal Revenue Service 2012). To combat tax evasion, Congress has historically subjected various types of income to third-party information reporting, which dramatically increases compliance for those income types. In 2006, for example, 99 percent of wage and salary income subject to information reporting and withholding was, according to the IRS, properly reported and taxed, compared to an estimated 44 percent compliance rate for taxable income subject to little or no information reporting (Internal Revenue Service 2012). While subjecting individual wage and salary income to information reporting by employers has proved successful at sustaining very high rates of compliance, tax enforcement for small businesses is more challenging. Small businesses often collect receipts in cash, keep poor or no records, have no external financial reporting requirements, and are closely held—all factors that can facilitate under-reporting of tax liability.¹

In this paper, we study a recent attempt to curb small-business tax evasion in the United States. Beginning in 2011, electronic payments received by businesses (for example, credit card payments) were reported to the IRS and businesses by the firms processing these payments, via the new Form 1099-K—“Payment Card and Third Party Network Transactions”.

There is good reason to suspect the effect of the Form 1099-K might differ from that of existing

¹ Throughout the paper we use the terms “taxpayer,” “small business”, and “firm” to refer to the taxpayers receiving the 1099-K. Schedule C – “Profit of Loss From Business (Sole Proprietorship)” filers are traditionally thought of as owners of small businesses, but in reality the income of some rather large entities is reported on Schedule C. There are a variety of definitions for “small business” in the literature, and not all taxpayers in our sample will fit these definitions. Throughout our paper, our entities of study can most accurately be called “Schedule C Filers.”

information reporting. Taxpayers can still be noncompliant by under-reporting their cash receipts, and they can substitute expense over-reporting for receipt under-reporting.² Economic theory predicts that businesses affected by Form 1099-K should report their receipts close to the amount reported on Form 1099-K. These firms should have (1) a high propensity to under-report receipts prior to the introduction of information reporting, and/or (2) a high share of true receipts subjected to information reporting. When a firm reports very little to the IRS before the Form 1099-K appears (the first trait), and the 1099-K then informs the IRS about a large amount of their receipts (the second trait), that firm is likely to increase its reported receipts in response to the policy change. These two firm-level traits are likely to be closely linked in our setting, due to the paper trail created by electronic payments: firms that are noncompliant because their sales are predominantly transacted in cash will also have a small share of their receipts subjected to information reporting.

We test these predictions using newly available confidential data from the Internal Revenue Service (IRS), consisting of the universe of sole proprietors' tax returns (Form 1040, Schedule C) and the information reports about these sole proprietors from tax years 2004 to 2012.³ The empirical analysis suggests that the aggregate effect of the Form 1099-K on reported receipts was small, but also confirms the prediction of the theory: approximately 10 percent of Schedule C firms report their gross receipts within 5 percent of the gross amount on the 1099-K's they receive. We

² Firms could also stop accepting payment cards, incent cash payments by offering discounts for using cash, or take action to avoid certain thresholds that trigger 1099-K reporting. We are limited by our data in our ability to detect these responses. However, any such actions taken by firms would limit the impact of 1099-K on reported receipts and net incomes, and they would have an ambiguous effect on the tendency to report receipts equal to 1099-K amounts.

³ Note that a more complete analysis of the initiative's impact would require a review of audit data, but such audit data will not be available in the near future. Note also that many non-Schedule C entities also receive the 1099-K, and these are absent from our analysis. In total, 34 percent of the 7.4 million valid, non-duplicate 1099-K's are matched to a Schedule C.

estimate that Form 1099-K caused up to 30 percent of taxpayers in this particular group to start filing Schedule C. For firms in this group that had already been filing Schedule C, 1099-K caused increases in reported receipts of up to 24 percent, although these firms also increased their reported expenses by as much as 13 percent.

We conduct additional analysis to deepen our understanding of the results. First, we examine different reasons a firm might bunch where reported receipts are equal to or just above the 1099-K amount. Bunching may occur because firms believe that reporting receipts above the 1099-K amount avoids triggering an audit by contradicting third-party information, or because all or virtually all of a firm's receipts are subjected to credit-card information reporting (as may be the case with exclusively online businesses). However, for various reasons we would expect it to be unusual to observe reported receipts equal *exactly* to the 1099-K amount.⁴ Based on their reported sectors (which isolates firms that are likely accepting some cash) and the types of entities issuing their 1099-K's (which isolates firms that are likely online-only), we conclude that both of these potential drivers of bunching in response to Form 1099-K are supported by the data. Businesses that were previously subjected to information reporting under Form 1099-MISC⁵ were less likely to bunch where receipts approximately equal 1099-K amounts, but those that did bunch displayed

⁴ For example, if firms allow customers to include sales taxes with their payment card, the sales tax amount will be reported on 1099-K, but, will not be included in gross receipts. Similarly, if firms allow customers to return goods purchased with a payment card, it may also cause a discrepancy making it so the 1099-K amount cannot equal true receipts exactly. Finally, the purchase of gift cards by payment card that are not ultimately redeemed, redeemed in a different period than purchased, or purchased at a store other than where redeemed, can result in a discrepancy between 1099-K receipts and true receipts.

⁵ Form 1099-MISC is provided to independent contractors providing a service, and requires that payments of \$600 or more for services provided in a given year be reported to the IRS by the entity purchasing the service.

similar increases in their reported receipts and expenses. We fail to find any substantive differences based on whether the taxpayer used a paid preparer, and no evidence that the Form 1099-K caused firms to begin using a paid preparer.

Taxpayers also bunch where reported receipts are exactly equal to reported expenses, and firms bunching at where receipts equal the gross 1099-K amount are disproportionately likely to do so. We also find that the subset of taxpayers that received Form 1099-K but did not file in previous years were much more likely to report expenses exactly equal to receipts, consistent with our claim that increased reporting of receipts (on the intensive and extensive margin) was accompanied by offsetting increases in expenses. Finally, we examine the composition of expenses to see precisely where taxpayers increased expense reporting to offset increased receipts reporting, and find increases occurred primarily in the “Other Expenses” line item.

This paper contributes to the academic literature examining tax administration, enforcement and compliance, as detailed in Slemrod and Gillitzer (2013), and expands this literature to investigate the effects of information reporting on sole proprietors. The paper also contributes to a nascent but rapidly growing empirical literature on tax systems, especially that considering the role of information in business taxation (e.g., Pomeranz 2013; Almunia et al. 2014; Carrillo et al. 2014; Naritomi 2014; Best et al. 2015; Bachas and Soto 2015). A common theme in much of this work and in our own findings is that it is important to consider a business’s decision to report receipts and expenses jointly. In addition, policymakers are likely to find these results useful when considering a further expansion of information reports or changing the requirements around existing returns. Finally, the results can be used by the IRS to better target audits toward taxpayers receiving 1099-K who are relatively unlikely to be reporting truthfully.

II. Background and Institutional Details

The tax authority's lack of information is a ubiquitous problem in tax enforcement, and one that is especially pervasive for smaller businesses where formal records of financial transactions are often not well maintained. They also frequently accept payments in difficult-to-monitor cash, exacerbating the tax enforcement problem (Gordon and Li 2009). Indeed, Morse et al. (2009, 39) assert, based on extensive interviews with small business owners and their accountants, that income source is "by far the most important determinant of tax compliance...Taxpayers report cash income less accurately than income subject to third party reporting."

The introduction of Form 1099-K is part of a recent trend in the United States and elsewhere towards expanding third-party information reporting, providing tax authorities with relatively objective information from a third party, thereby increasing the likelihood of detecting evasion and therefore, through a deterrence effect, increasing compliance at low cost to tax authorities (Lederman 2010). There is a strong association between the amount of information reporting associated with a type of income or deduction and the reporting compliance for that item (Internal Revenue Service 2012; Kleven et al. 2011). Past increases in information reporting requirements caused dramatic improvements in compliance: the introduction of the requirement that dependent exemption claims be accompanied by a Social Security number of the dependent was followed by a decline of 7 million (mostly fraudulent) claims (Szilagyi 1991).

The Housing Assistance Act of 2008 required that payment settlement entities (PSEs) who make payments in settlement of payment card transactions (e.g. Visa) and third-party-settlement entities (TPSEs, e.g. PayPal) file a Form 1099-K on behalf of their customers, effective for

payments made beginning on January 1, 2011.⁶ The first information returns for tax year 2011 were provided in early 2012.⁷ The law mandates that the taxpayer, the IRS, and, in some cases, the state tax agency, receive a 1099-K containing the gross value of transactions, the value of transactions for each month of the tax year, the gross number of payment transactions as well as any federal or state income tax withheld.

Some transactions are exempt from the 1099-K filing requirement, including payments to parties outside the United States. Payments made through TPSEs such as PayPal are only required to be reported on Form 1099-K when the annual gross amount of transactions of a business is greater than \$20,000 and the total number of transactions is greater than 200. The Form 1099-K was an addition to, and in some cases a replacement for, other third-party reports. For example, Form 1099-K reporting directly replaced Form 1099-MISC reporting for some payments, most notably payments by a business to an independent contractor exceeding \$600 and transacted via payment card or TPNE.

⁶ The introduction of Form 1099-K led to some initial confusion regarding how payers and payees should comply with the new reporting requirements. In response, in November 2011 the IRS notified taxpayers that for 2011, taxpayers who demonstrated a “good faith effort” to comply would receive penalty relief for failure to accurately report information required by the new form. To the extent this was widely known, it might explain a delayed response until 2012 to the 1099-K initiative.

⁷ Throughout the paper, we assume that taxpayer’s behavioral response to the 1099-K occurred, at the earliest, in 2011. It is possible that taxpayers may have anticipated the 1099-K and increased receipts in 2010. Such action by taxpayers would work against our finding a response to the 1099-K in 2011. Given the taxpayers we are examining (relatively unsophisticated Schedule C taxpayers), we consider it most likely that any response was a reporting response starting in 2011. Incidentally, Google-related 1099-K searches and searches on IRS.gov for the 1099-K increased dramatically starting in January of 2012. This attention to the 1099-K is mirrored in page view data provided by the IRS—indeed, there were over 850,000 page views on IRS.gov of 1099-K related web pages during the time period January-April, 2012 (see Hoopes, Reck and Slemrod (2013) for a discussion regarding inferring taxpayer information sets from Google Trends and IRS.gov data).

Table 1, Panel A provides statistics on taxpayers that file Schedule C and the gross receipts from Form 1099-K. We provide summary statistics for the year before and the year of the introduction of Form 1099-K. Of the 23 million Schedule C filers, about 1 million, or 5.1 percent, received at least one 1099-K. According to income reported on returns, those that received a Form 1099-K were roughly three times larger than those that did not, both before and after the introduction of the form. Between 60 and 84 percent of Schedule C filers e-file their return and about 70 percent of these taxpayers engage a paid preparer to assist with the filing of their return.

About 10.3 million 1099-K's were filed in tax year 2011. We limit our analysis to 7.4 million 1099-K's, due to duplicate filings and other issues.⁸ Of these 7.4 million information returns, 2.5 million (34 percent) were matched to Schedule C taxpayers appearing in our data, representing \$160 billion (3 percent) of the total \$5.3 trillion of receipts reported to the IRS on all 10.3 million 1099-K's through this new information reporting program. Unmatched 1099-K's report information for other types of business entities, such as partnerships. Table 1, Panel A, also provides summary data for the group of taxpayers receiving 1099-K who filed in every year from 2004 to 2012. These taxpayers form the balanced panel used throughout in the paper to study intensive margin effects, and they tend to report slightly higher receipts than the typical 1099-K recipient. There are 6.6 million taxpayers filing in every year from 2004 to 2012, 644,000 of whom received a 1099-K.

⁸ The 7.4 million figure excludes 1099-K's where the same payer TIN-payee TIN combination appears more than once, which usually occurs due to the presence of corrected or amended 1099s, but can also be due to a payee filing multiple Schedule Cs for different businesses. It also excludes returns filed with invalid payee TINs, which cannot be matched to Schedule Cs, as well as returns filed with an employer identification number (EIN) as the payee TIN for a non-sole proprietorship business, which should not be matched to Schedule C returns that are intended for sole proprietorships only. We apply these filters to the full population of 1099-K's as part of the Schedule C matching process. Refer to the Online Appendix of this paper for further details.

Table 1, Panel B provides details on the different sectors represented by Schedule C taxpayers. The first column lists the percentage of all Schedule C taxpayers in a sector that receive a 1099-K at any time (i.e., in 2011 or 2012) during our sample period. For example, 3.2 percent of independent artists and 38.8 percent of grocery stores in our sample received a 1099-K sometime during our sample period. The second column tabulates the percentage of all taxpayers in the sector that receive the much more common 1099-MISC any time in our sample period. Form 1099-MISC requires that payments of \$600 or more for services provided in a given year be reported to the IRS by the entity purchasing the service. The final column tabulates the percentage of all Schedule C taxpayers in each sector. In this table, the first 10 sectors (those above the bold line) represent the 10 highest populated North American Industry Classification System (NAICS) codes among all Schedule C taxpayers. The second 10 sectors represent those sectors with the highest percentage of 1099-K recipients, conditional upon having at least 0.10 percent of all Schedule C taxpayers in the sector.

III. Conceptual Framework

In this section we describe a model of the firm's decision to report receipts and deductible expenses to a tax authority, based on the seminal theoretical work of Allingham and Sandmo (1972) and Srinivasan (1973). We only briefly summarize the theory to motivate our empirical analysis; the Online Appendix contains more nuanced discussion and exposition. Several of these results are similar to those of Carrillo et al. (2014), who use a related model to motivate their analysis of the effects of expanded information reporting in Ecuador.⁹

⁹ The two approaches were developed independently of one another.

Consider the reporting of receipts and deductible expenses by a risk-neutral business.¹⁰ Firm i chooses the level of receipts R_i and expenses E_i to report to the tax authority, given true receipts Q_i , true expenses D_i and the amount of receipts reported to the tax authority by third parties, K_i . The firm's problem is:

$$\max_{R_i \geq 0, E_i \geq 0} Q_i - D_i - t(R_i - E_i) - p_i(R_i, Q_i, E_i, D_i, K_i)s[(Q_i - D_i) - (R_i - E_i)] \quad (1)$$

where t is the income tax rate, assumed to be constant for simplicity, and $p_i(\cdot)$ is the probability of detection and punishment of evasion. In the event that the firm reports $R_i - E_i < Q_i - D_i$ and is detected, it is subject to a fine equal to the fraction $s > t$ on its unreported income.

We will focus on the case where the firm has positive true profits for simplicity, so $Q_i \geq D_i$. Using an approach similar to Phillips (2014), we specify a probability of detection as follows:

$$p_i(R_i, Q_i, E_i, D_i, K_i) = \begin{cases} 1, & \text{if } R_i < K_i \\ q_i(R_i, Q_i, E_i, D_i), & \text{if } R_i \geq K_i \end{cases} \quad (2)$$

where $q_{iR} \leq 0$ and $q_{iE} \geq 0$ for relevant values of other variables. In words, contradicting third-party information results in immediate detection of any evasion, and otherwise reporting greater receipts and/or less expenses decreases the probability of detection. As the firm

We will assume the existence of an interior solution with positive receipts and expenses reported to the tax authority. Solving the firm's problem and considering an increase in K_i yields the following three predictions:

1. All firms affected by an increase in third-party reported receipts K_i , along the intensive or

¹⁰ The important predictions of the model discussed here would all obtain if we assumed the firm were risk-averse rather than risk-neutral. We will not consider real but unobservable decisions, such as output responses or firms' attempts to influence the share of receipts subject to information reporting by, for example, offering discounts for cash payments. While interesting, our data do not provide us a means of examining them.

extensive margin, report $R_i = K_i$ after the increase.

2. A firm's propensity to report $R_i = K_i$ is increasing in K_i/Q_i and q_{iR} .
3. When $q_{iER} \leq 0$, increases in receipts due to increases in K_i will be at least partially offset by increases in E_i .¹¹

These are the three main empirical predictions we test in Section VI. Further analysis within this conceptual framework suggests that the impact of Form 1099-K is likely to be heterogeneous, depending on two key factors: a firm's tendency to comply prior to the policy change, and the fraction of a firm's receipts subjected to information reporting. Factors causing firm-specific variation in prior compliance include the size of the business, how much income the business owner has from other sources, the salience of tax enforcement, intrinsic preferences for compliance (Erard and Feinstein 1994), and, importantly, the share of transactions conducted in cash, which are more easily hidden from the tax authority than payment card transactions. The last of these is important because it can cause prior noncompliance to be correlated with the other key determinant of the impact of Form 1099-K, the fraction of receipts subjected to information reporting, in a way that limits the overall impact of Form 1099-K on compliance. The fraction of receipts subjected to information reporting may also vary by how much business the firm conducts online and/or with individual consumers (rather than businesses). Notably for our empirical analysis, online-only

¹¹ The assumption that $q_{iER} \leq 0$ is satisfied when, for example, the probability of detection depends on the reported rate of profit, i.e. $q_i = q \left(\frac{R_i - E_i}{R_i} \right)$, with $q' < 0$, $q'' > 0$, as in Carrillo et al (2014), or when the probability of detection depends only on reported profits i.e. $q_{iER} = q(R_i - E_i)$ with $q' < 0$, $q'' > 0$. In the latter case, increases in receipts are offset by expense increases exactly one-for-one, a prediction we are unable to test in our data because we do not observe offsetting behavior cleanly at the individual level: fully compliant firms that have true receipts increases will also tend to have expense increases. Even if $q_{iER} > 0$, the model predicts that some offsetting will occur so long as q_{iER} is sufficiently small. See the Online Appendix for further discussion.

businesses will have all of their receipts subjected to information reporting, and they are likely to receive 1099-K's from TPSE's (such as PayPal) only, rather than payment card entities. In Section VI we shed some empirical light on heterogeneous responses to 1099-K using the sectoral composition of the 1099-K recipients that bunch where reported receipts are close to the gross 1099-K amount, and whether 1099-K's came from payment card entities or TPSEs.

The predictions described above do not rely heavily on the sharp features of the model. For example, allowing for the possibility that firms in sectors with high rates of cash use may not wish to report receipts too close to the 1099-K amount would lead to the prediction that firms affected by 1099-K report receipts slightly in excess of the 1099-K amount but not exactly equal to it. We could also allow for the possibility that firms could decrease K_i at some cost, either by incentivizing cash payments or by declining to accept some payment methods subject to information reporting. Our data do not provide a credible means of examining whether firms respond to the Form 1099-K in this way. If they do, however, its effect would be smaller than predicted in the model presented here, but qualitatively similar.¹² Finally, we could incorporate into the model the notion that a firm that does not submit a Schedule C may face a lower probability of detection than a firm filing a Schedule C and declaring arbitrarily small receipts and expenses, because the tax authority may be unaware of the existence of firms that do not report anything.¹³

¹² We find no "hole" in the distribution of 1099-K amounts around the *de minimis* restrictions applying to third-party network vendors. This fact suggests that firms are not willing and/or able to decrease their receipts from third-party network transactions to avoid information reporting from third-party network vendors, at least along the intensive margin. This finding is consistent with the findings of Arango and Taylor (2008) and Jonker (2011), whose work suggests that many firms have limited capacity to manipulate the share of receipts from various transactions types.

¹³ This extension does weaken the result that *every* firm affected by Form 1099-K will report receipts equal to the 1099-K amount. Instead, only some fraction of affected firms will do this.

Several possible additions could yield the prediction that some firms report $R_i = E_i$ when they would otherwise report $R_i < E_i$. For example, we could include in the model aspects of the tax code that limit businesses' ability to claim losses (such as hobby loss rules or which expenses are "above-the-line"), an increase in the perceived detection probability where reported net income becomes negative in the presence of true profits, or reference dependence in income reporting, as in Rees-Jones (2014). In every case, these alterations would yield the prediction that an increase in information reporting increases firms' propensity to report receipts exactly equal to expenses.

IV. Data and Empirical Strategy

A. Data

We examine data from the universe of tax returns and information reports filed with the IRS, accessed via the Compliance Data Warehouse (CDW), the IRS's research repository of tax return data. Specifically, we use data from taxpayers' Form 1040 Schedule C from 2004 to 2012, as well as Form 1099-K and Form 1099-MISC. All identifying information is masked to the researchers to protect taxpayer privacy. The information reports from the payment card and other payment processing companies can be matched to the businesses whose income details are on the Schedule C. Details on the matching and data gathering process are in the Online Appendix.

We mainly analyze datasets containing 1) *all Schedule C filers* in each year, and 2) a *balanced panel* of taxpayers filing Schedule C in every year from 2004 to 2012. Broadly speaking, we use the first of these to examine overall effects of 1099-K and extensive margin effects, while we use the balanced panel to look for intensive margin effects within particular subgroups. We also select at times on other taxpayer characteristics for the purposes of achieving compelling identification of the effects of Form 1099-K and the potential mechanisms behind these effects, as described below.

B. Empirical Strategy

Our main analysis has four components: an examination of overall aggregate trends in the outcomes of interest, a difference-in-differences analysis using 1099-MISC recipients, a bunching analysis of the ratio of 1099-K amounts to reported receipts (K/R), and an analysis of heterogeneous treatment effects using this same ratio.

We begin by simply plotting the evolution of total net income and the growth of receipts and expenses reported by 1099-K recipients and other Schedule C filers over time. The calculation of these overall trends is methodologically straightforward, but the trends should not be interpreted causally. The Form 1099-K was not assigned to a random subset of sole proprietors. Consequently, those Schedule C filers who do not receive a 1099-K may not be a valid control group, especially if recipients and non-recipients of the Form 1099-K have receipts and expenses that grow at different rates prior to treatment (they do). Nevertheless, the aggregate analysis provides a starting point, establishing, for example, useful facts about how receipts and expenses grow over time on average in these groups.

Our next strategy for estimating a causal effect of Form 1099-K uses as a control group 1099-K recipients who received a Form 1099-MISC prior to the introduction of Form 1099-K. This research design is motivated by the idea that firms already subject to (some) information reporting may be less affected by new information reporting. In fact, as mentioned above, Form 1099-K reporting directly replaced Form 1099-MISC reporting for some payments.¹⁴ We conduct a

¹⁴ We focus only on 1099-K recipients who received a Form 1099-MISC prior to receiving a Form 1099-K, not requiring that the taxpayer stopped receiving the 1099-MISC the year their 1099-K appeared. We do not directly use 1099-K's that appear to directly replace 1099-MISC empirically because many relevant taxpayers receiving 1099-K may still receive 1099-MISC (e.g. from cash

difference-in-differences analysis on the balanced panel, comparing taxpayers receiving Form 1099-MISC consistently from 2004-2010 to taxpayers who never received a Form 1099-MISC.¹⁵ To facilitate comparison of the results with our later results, we conduct this analysis by graphically depicting the evolution of the mean growth rate of reported receipts. In this analysis and elsewhere in this paper, we calculate a mean growth rate as the mean of the difference in log receipts¹⁶ from tax year $t-1$ to t (which mechanically equals the difference in the mean of log receipts).

Our third empirical strategy tests the prediction from the model in Section III that the 1099-K initiative should cause affected firms to report receipts near the 1099-K amount. We take this prediction to data by analyzing the distribution of the ratio of the 1099-K amount to reported receipts, K/R . We also examine the rates of sharp bunching (i.e., where $K/R = 1$ exactly) and diffuse bunching (K/R between 0.95 and 1.05) in several subpopulations of interest, to help shed light on what motivates taxpayers to bunch in this fashion. Specifically, we wish to examine the possibility that (1) firms report close to the 1099-K amount because their true receipts are close to the amount reported to the tax authority, or that (2) firms report close to the 1099-K amount in response to a perceived audit threat triggered by reporting less receipts than receipts reported to the IRS. Because exact measures of the share of true receipts subject to information reporting are not available in the data, we take two indirect approaches, one based on the firm's self-reported sector and the other based on the nature of the entity issuing the 1099-K. First, we select firms in sectors that are likely to have a substantial fraction of receipts in cash. In one specification we

payments), and anecdotal evidence suggests that there was some confusion that caused taxpayers to receive both the Form 1099-K and the Form 1099-MISC for a given receipt.

¹⁵ We obtain similar results if we use taxpayers that received 1099-MISC in some but not all years, with the exception that these taxpayers tend to have much lower receipts in the years they did not receive 1099-MISC, for obvious reasons.

¹⁶ Recall that the construction of the balanced panel requires strictly positive receipts in every year, so this logarithm will exist.

restrict our analysis to firms that prior work by Frisch (2005) suggests have either an especially high or especially low rate of payment-card acceptance.¹⁷ In another specification, we focus on firms in sectors where the overall share of firms receiving Form 1099-K is especially high or low. Second, we utilize additional information captured from 1099-K's in 2012 only, which tells us whether the reporting entity was a payment-card entity or a TPSE. We use this to compare firms receiving 1099-K's from payment-card entities only with those receiving 1099-K's from TPSEs only. The latter are much more likely to be remote-only businesses with a high share of sales, perhaps 100 percent of sales, done via transactions subject to 1099-K reporting.

The model makes the stark prediction that no firms should *ever* report $R < K$, but one can imagine several reasons why this strong prediction may not obtain in the empirical data (see, for example, Footnote 4). First, some credit-card charges reported on Form 1099-K, such as chargebacks for returned items or state sales taxes, are not taxable receipts. Second, some individuals may fail to pay attention to the 1099-K they receive, not understand its ramifications, or they may never receive it due to some administrative failure. As we document below, about 10 percent of firms report receipts less than the 1099-K amount, and only about 2.5 percent of firms report receipts more than 5 percent below their 1099-K amount. As such, we will not focus on the few firms reporting receipts well below the 1099-K amount, and we will use our diffuse bunching concept to account for firms reporting receipts less than 5 percent below their 1099-K amount.¹⁸

Building on the bunching analysis, our fourth empirical strategy looks for evidence that the effect of the Form 1099-K was concentrated among firms reporting receipts near the 1099-K

¹⁷ We thank Fumiko Hayashi for providing us this data.

¹⁸ Relatedly, for situations in which not all receipts are taxable, it is possible that some firms report receipts over the 1099-K amount and then deduct the portion that are not actually taxable as business expenses.

amount, in accordance with the theory above. We present descriptive evidence for this hypothesis by plotting growth rates for receipts and expenses, along with rates at which firms previously filed Schedule C, for firms with K/R in different ranges. Building on the results of this descriptive evidence, we then conduct a formal analysis that tests for heterogeneous treatment effects by K/R. We primarily focus on heterogeneity by K/R in 2011, the year of the policy change; the results using K/R in 2012 are qualitatively similar, but the effect on firms with K/R near one is diffused across 2011 and 2012.

In essence, we treat the firm's K/R as revealing its type. Our theory suggests that, based on prior noncompliance and the share of true receipts subject to information reporting, some types of firms are more affected by 1099-K than others, and that once the policy is in place, this type is revealed by whether the firm reports receipts at or near the 1099-K amount.

When we interpret K/R in this fashion, however, it is important to keep in mind that K/R is itself an outcome variable.¹⁹ Creating treatment groups based in part on firms' reporting of receipts requires caution: we must ensure that what we interpret as the effect of Form 1099-K on reported receipts (or expenses) is not an artefact of the selection mechanism. With a typical "selection on dependent variables" problem, for example, assigning firms that report higher receipts than other firms to a treatment group will mechanically bias the estimated effect upwards. In contrast, this research design conditions on reporting receipts *relative to the 1099-K amount* at particular values,

¹⁹ It might be tempting to use 1099-K amounts in 2011 compared to receipts in 2010 to perform a similar analysis, based on the idea that receipts in 2010 are not endogenous to 1099-K amounts. However, such an analysis would not be credible: firms with receipts well in excess of their 2011 1099-K amount might be the firms more likely to be affected by 1099-K, as our model would suggest, *but they could also be firms that experienced large actual real receipts growth for idiosyncratic reasons*. Analyzing the receipts growth of firms with 1099-K's in 2011 well in excess of receipts in 2010 would therefore introduce problematic selection bias.

especially the point where receipts and the 1099-K amount are nearly equal. The only reason firms' choices would affect the estimates employing this conditioning would be if the firm deliberately increased its receipts report to match the amount on the 1099-K, which is precisely the type of heterogeneity in the treatment effect we are attempting to identify.

Using this conceptual framework, we estimate treatment effect heterogeneity relative to a “baseline” treatment group of firms reporting K/R less than 0.5. Strictly speaking, this design allows us to estimate the average treatment effect for a given treatment group (e.g., firms with K/R = 1) *relative to the baseline group*. However, theory and the earlier evidence we present suggests that the treatment effect in the baseline group was near zero. As such, we may actually interpret these relative treatment effects as group-specific average treatment effects.

To estimate intensive margin effects, we use a random growth model (Heckman and Hotz 1989). We estimate the parameters of the following regression equation on the balanced panel:²⁰

$$y_{it} = \sum_{b \in B} 1 \left\{ \frac{K_{i2011}}{R_{i2011}} \in b \right\} \alpha_{bt} + \eta_t + \gamma_i + \epsilon_{it}, \quad (3)$$

where y_{it} is one of three outcome variables (either logged receipts, logged expenses,²¹ or (the level of) net income), b is a set of binned values of K/R and B is the set of bins with K/R > 0.5. This model implies that we can estimate the effect of Form 1099-K on firms in group b on y_{it} relative to the baseline group as:

$$\hat{D}_b = [(\alpha_{bt} - \alpha_{bt'}) - (t - t')(\alpha_{bt'} - \alpha_{bt'-1})], \quad (4)$$

where t is a post-treatment year (2011 or 2012) and t' is a pre-treatment year, which will be 2010

²⁰ We obtain similar results if we run the analysis on the full sample and drop missing and zero observations.

²¹ Cases in which a firm filed in every year but did not report positive expenses in a given year were dropped from the estimation of Equation (4) when examining log expenses. This restriction eliminates just under 1 percent of the observations for the expenses specification of Equation (4). Very few firms receiving 1099-K report receipts but no expenses.

in our preferred specification. The first term of Equation (4) captures how receipts grew for firms in a given K/R bin before and after treatment, and the second term compares this growth to how much faster these firms were growing relative to the baseline group prior to treatment.

The identifying assumption for this analysis is that the counterfactual deviations from the group-specific trend—those occurring if 1099-K had not been introduced—were the same in the K/R bin group(s) and in the baseline group. To validate this assumption, we also report the results of several placebo tests, in which t is some pre-treatment year and $t' = t - 1$.²² The placebo tests cannot ensure that our estimates using these identifying assumptions are entirely free of bias, but they do provide a sense of the magnitude of the bias, suggesting it is quite small relative to the estimated effects. Importantly, this identification strategy does not require that firms in treatment and control groups grow at the same rate prior to the policy change—in fact we shall see that they did not. Differing prior trends could arise, for example, due to Internet-based firms, which naturally feature a higher proportion of sales using electronic payment, growing faster than others. They could also arise out of anticipation of the 1099-K initiative as firms anticipating the policy might have increased their reported receipts (and expenses) in 2009 and/or 2010 to avoid a large (and suspicious) increase in 2011. If this anticipatory response occurred, our specification underestimates the total effect of Form 1099-K.

Similarly, to estimate the extensive margin effect, i.e. the fraction of firms with K/R near one induced to file by the policy change, we compare the new filer rates by K/R before and after the policy. We define a new filer as an individual who files Schedule C in year t but did not file Schedule C in year $t - 1$. We obtain similar results using a more stringent definition, such as not

²² It is the results of these placebo tests that led us to prefer the random growth model specification to a difference-in-differences design (Heckman and Hotz 1989).

filing Schedule C in the previous two years. We estimate the extensive margin effect as the change in the new filer rate from 2010 to 2011 for firms with K/R near 1, relative to the same change for firms with low K/R. The identifying assumption is that in the absence of the policy change, the *change* in the new filer rate from 2010 to 2011 would have been the same in the K/R near 1 group as in the low K/R group. One caveat to this approach is that our analysis of new filer rates must always condition on filing Schedule C in 2011, as only then do we observe K/R. However, the changes in new filer rates for low K/R firms and for firms with K/R near 1 in prior years (both essentially zero) suggest that this additional conditioning does not introduce bias into the results, and that the identifying assumption is satisfied to a reasonable approximation.

Our analysis concludes with two pieces of supplementary evidence, using similar methodology to our earlier analysis. First, we examine the tendency of firms to report receipts equal to expenses in various groups. Second, we examine effects on specific line items of reported expenses.

V. Aggregated Time-Series Analyses

A. Overall Aggregates

As a first pass we examine the population micro-data in order to focus on the firms actually subject to 1099-K reporting. Figure 1, Panel A demonstrates that the aggregate reporting of net income by Schedule C taxpayers did not increase suddenly with the introduction of the form. Next we focus on receipts growth in more detail. We restrict our attention to taxpayers filing a Schedule C in each year of 2004-2012, and focus on receipts growth. We graph the mean growth rates over time in Figure 1 Panel B.²³ It is evident that the reported receipts of firms that received a 1099-K

²³ Those receiving a Form 1099-K in either 2011 or 2012, but not in both years, are excluded from this graph. There is a large negative growth rate from 2011 to 2012 for the 2011-only 1099-K recipients that is attributable to selection out of the 1099-K population. This negative growth rate obscures the more important patterns in Figure 1 when we include these firms in the analysis.

grew more quickly from 2010 to 2011 on average than non-recipients. However, they also grew at a similar rate between each pair of years from 2004 to 2010. Firms not receiving the Form 1099-K cannot therefore be used as a control group in a difference-in-differences analysis. Nevertheless, it is apparent that there is no strong break from trend in the treatment group (firms that received the Form 1099-K), as we would expect if the counterfactual deviation from trend were sufficiently small and the treatment effect sufficiently large. Absent reason to believe that there would have been a large *negative* break from trend in the counterfactual, we may therefore rule out a large positive impact of the 1099-K initiative on reported receipts.

B. Firms Previously Receiving 1099-MISC as a Control Group

We next define treatment and control groups based on whether firms were previously subject to some information reporting. For reasons described above, firms that received 1099-MISC in each year of the sample period prior to 2011 are a natural control group for such an analysis. Panel C of Figure 1 depicts the evolution of log receipts and the corresponding receipts growth rates, based on whether the firm received a 1099-MISC prior to 2011, and whether the firm received a 1099-K. The growth rates for 1099-MISC recipients and non-1099-MISC recipients co-move closely prior to the introduction of Form 1099-K especially for firms receiving 1099-K, so that growth rates are nearly identical.

Given that the common-trend assumption is satisfied, we can more confidently interpret any divergence in trends occurring in or after 2011 as rising from the differential impact of 1099-K on the two groups. However, no such divergence occurs: post-1099-K receipts growth is very similar between the two groups. The high levels of growth observed in Figure 1 Panel C occur in both

Selection out of the 1099-K recipient population could be driven by the payment substitution responses alluded to above, but it is difficult to separate these types of response from real decreases in receipts that could coincide with no longer receiving a 1099-K.

groups, and the very high growth from 2010 to 2011 also occurs in both groups—as well as the low growth rates in 2012 for both groups. The group of taxpayers subjected to information reporting for the first time under 1099-K behave no differently, on average, than the group of taxpayers subject to information reporting prior to 1099-K due to 1099-MISC, suggesting that the overall initial effect of the new form on aggregate reporting was small. In unreported analysis, we observe very similar trends in expense and net income reporting.

VI. Bunching in the Reporting of Receipts and Expenses

For taxpayers that bunch or report receipts near the bunching threshold, we examine changes in receipts, expenses, and Schedule C filing behavior to examine the differential impact of 1099-K on these specific groups. A secondary bunching analysis concerns taxpayers' tendency to report receipts exactly or nearly equal to expenses.

A. The Cross-sectional Relationship between Receipts and 1099-K Amounts

Figure 2 depicts the distribution of the ratio of 1099-K amounts to reported receipts, in the top panel among all 1099-K recipients and then in Panel B zooming in around where the ratio is equal to 1. About 8 percent of the overall population bunches at a K/R value between 0.9975 and 1.0025 (the bin width in Panel B is 0.005). The amount of bunching increased from 2011 to 2012: nine percent of firms have a ratio between 0.95 and 1.05 in 2011, while in 2012 the corresponding figure is 11 percent.²⁴ That this type of bunching increased from 2011 to 2012 is notable because the IRS was presumed to be more heavily relying on 1099-K reporting for audit allocation decisions in 2012 than in 2011, and therefore we might expect to see the behavioral responses to 1099-K reporting increase in 2012.

Given that we will use the value of K/R in 2011 to construct comparison groups for estimating

²⁴ In 2011, 88 percent of firms with K/R between 0.95 and 1.05 had K weakly below R. In 2012, this number was 91 percent.

the heterogeneous effect of Form 1099-K, it is useful to know whether firms' K/R moved significantly from year to year. Table 2 reports a transition matrix for several bins of K/R between 2011 and 2012. Examining the entries on and around the diagonal of the table, we can see that among firms filing Schedule C and receiving a Form 1099-K in 2011 and 2012, most firms had similar values of K/R in both years. Note, however, that there is substantial movement into and out of filing a Schedule C and receiving a 1099-K, and that the rate of churn is especially high for firms reporting their receipts just above or exactly equal to their 1099-K amount in 2011. We use this last fact in our interpretation of our extensive margin analysis in Section VI.B.

Recall that bunching may occur for two distinct reasons—firms may manipulate receipts to line up with 1099-K receipts, or, they may actually receive all—or nearly all—of their receipts in forms reported on the 1099-K. To shed some light on the relative likelihood of these possibilities, we examine the rate of bunching in several subpopulations. Table 3 tabulates the rate of sharp bunching (bunching exactly at $R=K$) and diffuse bunching (reporting receipts within 5 percent of the 1099-K amount) for 2011 and 2012 in these subpopulations.

Column 1 of Table 3 indicates that 3 to 4 percent of firms report receipts exactly equal to the 1099-K amount, and 9 to 11 percent report receipts very close to the 1099-K amount. Columns 2 and 3 show that both types of bunching are significantly more pronounced for new Schedule C filers than for firms filing Schedule C in every year. About 10 to 12 percent of Schedule C filers who did not file in the previous year report receipts exactly equal to their 1099-K amount, compared to just 1 percent of firms who filed in each year covered by our data. This finding foreshadows the results on extensive margin effects in the next section, suggesting that the Form 1099-K caused many firms reporting receipts near the 1099-K amount to file Schedule C. In Columns 4 to 6 of Table 3, we select on whether firms are in sectors that have high or low rates of

cash use according to Frisch's (2005) data. A high degree of bunching persists near where receipts equal the gross 1099-K amount. For firms in sectors that have lower-than-average payment card acceptance rates (Column 6), we observe slightly less sharp bunching (2-3 percent) and about the same amount of diffuse bunching (12-14 percent) compared to the population. Relatedly, the two most common sectors (according to the 6-digit NAICS classification system) in the bunching population are nail salons (5,756 sharp bunchers, 8,564 diffuse bunchers), and beauty salons (3,555 sharp bunchers, 6,296 diffuse bunchers). Firms in these sectors likely receive a substantial fraction of their receipts in cash.

Columns 7 and 8 present rates of bunching for firms receiving 1099-K's from payment cards only or TPSEs only, respectively. Bunching is slightly less common for firms receiving 1099-K from payment-card-only firms. Strikingly, bunching is extremely common for firms receiving 1099-K from TPSEs only, with 17 percent reporting receipts exactly equal to the 1099-K amount and 42 percent reporting receipts very close to the 1099-K amount. We observe nearly identical results if we perform multivariate probit or logit regression on a binary dependent variable indicating whether a firm was a sharp or diffuse buncher.

Theory suggests that firms should bunch at $K = R$ if (1) the fraction of true receipts subjected to information reporting is very high, or (2) compliance in absence of information reporting is low. The results in Table 3 suggest that both factors matter. Seeing TPSE's bunch at very high rates implies that firms with a large fraction of true receipts bunch. Seeing that firms in sectors with high rates of cash also bunch at high rates suggests that prior noncompliance also matters. Note that these two do not directly contradict one another: noncompliance is typically presumed to be especially high in sectors with high cash use due to the lack of any paper trail for cash transactions, so these firms may bunch at $K = R$ even though (mechanically) not all their receipts are subject to

information reporting.

It thus appears that Form 1099-K induces some firms to change their reported receipts, although the effect we can detect is limited to the roughly 10 percent of Schedule C filers who receive Form 1099-K and report receipts very close to the amount reported on the 1099-K. Summary statistics for bunching firms are provided in Table 4. These firms tend to be significantly smaller than the typical 1099-K recipient. In the next section we reconcile the observation that these firms' reporting behavior was affected by Form 1099-K with a difficult-to-detect aggregate effect.

B. Trends Based on Percent of Reported Receipts Subject to 1099-K Reporting

In the previous section, we documented a large amount of firms bunching at or near where reported receipts exactly equal the total dollar amount of receipts reported on Form 1099-K. This section analyzes differential post-2010 trends among 1099-K recipients based on the value of the ratio of the gross amount from a taxpayer's 1099-K's and reported receipts, denoted K/R . If the observed bunching is an indication that firms respond to Form 1099-K by increasing their reported receipts, as suggested by the theoretical model in Section III and the evidence in the previous section, then firms with K/R close to one should be the most likely to have been affected by Form 1099-K.

Figure 3 depicts annual growth trends of reported receipts, expenses, and net income, as well as Schedule C filing behavior, based on the value of K/R in 2011. Note that for firms not receiving a 1099-K, K/R equals zero. The first three panels analyze trends in reporting for taxpayers filing Schedule C in all years 2004-2012, and Panel D analyzes the extensive margin of Schedule C filing

behavior.²⁵

For firms with a total 1099-K amount less than 75 percent of reported receipts we observe similar growth in receipts in Panels A to those documented above: growth rates of 3 to 7 percent both before and after the introduction of 1099-K. In stark contrast, firms with K/R close to 1 report large increases in their receipts and expenses from 2010 to 2011. In Panel A, we observe 10 to 18 percent growth in reported receipts for firms with K/R between 0.8 and 1, and almost 30 percent receipts growth for firms with K=R exactly. These increases are not plausibly attributable to differing pre-trends, which we should observe if, for example, the patterns in the 2010-2011 line in the figure were driven by the rapid growth of (compliant) credit-card only or TPSE-only firms. We plotted receipts growth rates prior to 2010-2011 for comparison; firms with K/R close to but less than 1 were growing slightly faster (about 7-11 percent) before the introduction of 1099-K, but the changes from 2010 to 2011 still represent an enormous deviation from trend. Firms with K=R exactly actually had a *lower* growth rate than other firms prior to the introduction of Form 1099-K.

Thus, the introduction of the Form 1099-K appears to have had a sizable causal impact on the subset of firms that reported receipts close to the amount reported on the new form. However, this finding is not the end of the story. While rapid growth in receipts among these firms suggests the possibility that the Form 1099-K increased reported sole proprietorship income, Panel B of Figure 3 documents a markedly similar pattern in growth rates of reported expenses. Putting receipts and

²⁵ As mentioned above, we obtain very similar results for the intensive margin analysis in here and in Section VI.C if we condition on K/R in 2012 instead of K/R in 2011. We also obtain nearly identical intensive margin results if we restrict our analysis to firms filing Schedule C in 2004-2011 instead of 2004-2012, so we conclude that the potential endogeneity of filing Schedule C in 2012 is not confounding the results.

expenses together, in Panel C we observe little to no growth in median net incomes attributable to Form 1099-K for firms with K/R close to 1.²⁶ We interpret these findings as support for the predictions of the theoretical model suggesting that, when induced to increase their reported receipts in response to new information reporting, many taxpayers also increased their reported expenses, leaving net income largely unaffected.²⁷ In large part because of the increase in reported expenses, the percent change in median net income was only about 2.5 percent higher than the percent change from the previous year for firms with K/R close to one, and this is difficult to distinguish from idiosyncratic variation in median incomes.

We also find evidence of a large extensive margin response among the same class of firms—those with K/R close to one—that is consistent with the theoretical model. Figure 3, Panel D shows that firms with K/R close to one in 2011 are much more likely to be new Schedule C filers. For most values of K/R significantly below one, just under 10 percent of 1099-K recipients in 2011 had not filed in 2010, compared to 49 percent—five times as high—of firms reporting K=R. Just as these firms had slightly different receipts growth rates before the policy change, prior to 2011, firms with K/R near one also had a slightly higher new filer rate (about 18 percent) than low K/R firms. However, this difference is small compared to the difference in 2011 and is fairly constant from 2008 to 2010. We account for this difference in our estimate of the extensive margin effects in the next subsection.

²⁶ We report median rather than average income in Panel C because large outliers frequently occur in the level of net income. The logarithmic transformation largely eliminates this concern for receipts and expenses on their own, but we cannot use the logarithmic transformation for net income due to the presence of negative values of the variable. We observe a qualitatively similar pattern to the one in Figure 3, Panel C if we instead plot the change in median income instead of the percent change.

²⁷ This behavior was also found by Pomeranz (2013) in a very different setting.

We next explore differences in these trends among subgroups of interest. Figure 4 reports patterns in receipts growth, as in Panel A of the previous figure, based on characteristics of interest.²⁸ First, motivated by the reasoning in Section V, we examine firms receiving 1099-MISC from 2004 to 2010 and compare them to firms never receiving a 1099-MISC. Firms receiving 1099-MISC were far less likely to report $K=R$ (the second graph in Panel A), but the few hundred firms that did report $K=R$ after receiving a 1099-MISC actually reported higher receipts growth from 2010 to 2011 than the firms that did not receive a 1099-MISC. These are likely firms for whom the 1099-MISC previously only reported some small fraction of their receipts, while 1099-K reports a larger fraction. Receipts growth for firms with K/R significantly less than one are very similar for 1099-MISC and non-1099-MISC firms, which we should expect given the results shown in Figure 1, Panel C.

Panels B and C of Figure 4 report the same estimates for payment-card-only and TPSE-only recipients of 1099-K, respectively. We plot these patterns using a coarser binning of K/R because the latter groups are smaller in the sample of firms filing Schedule C in all years. The qualitative pattern is the same as before for both groups: firms with $K/R=1$ (in 2012, when we have data on entities issuing 1099-K) experience large receipts growth when 1099-K is introduced in 2011. Other firms grow only very slightly faster from 2010-2011. Perhaps unsurprisingly given the stark differences in bunching rates between these groups, however, TPSE-only firms appear much more strongly affected by Form 1099-K than payment-card only firms.

We also examine the role of paid preparers in the response to Form 1099-K. In unreported analysis, we examine receipts growth by K/R bin separately for firms that do and do not use a paid

²⁸ In all cases, the patterns in expenses resemble the pattern for receipts, and median income changes very little with the introduction of 1099-K, even for firms with K/R close to 1.

preparer in 2011. We observe little difference in the impact of 1099-K by preparer use. We might expect differences along these lines if taxpayers with paid preparers were more or less likely to be compliant, but we find no evidence of this. We also examine whether the increased complexity of preparing a tax return caused affected taxpayers to seek out a tax preparer; once again we obtain a null result, suggesting that Form 1099-K had little effect on preparer use.

C. Estimating Heterogeneous Treatment Effects Using Receipts Relative to 1099-K Amounts

The results in the previous section suggest that firms with low values of K/R behaved similarly to firms with high K/R prior to the introduction of the Form 1099-K, but only the latter were noticeably affected by the introduction of 1099-K. Here we report the results from analysis that uses firms with K/R below 0.5 as a baseline group and explicitly tests for such heterogeneous effects. We divide other treated firms—those with $K/R > 0.5$ —further into bins based on K/R to reflect that treatment intensity should be weaker for firms with K/R just above 0.5 than for firms with K/R equal to or very close to one. As discussed in Section IV, estimating the heterogeneous treatment effects relative to the baseline group effectively identifies the magnitudes of the causal effect of 1099-K on firms with high K/R, because Figures 1C through 4 all suggest that the effect on the baseline group was likely quite small.

Table 5 reports the results of the random growth model analysis described in detail in Section IV, along with p-values for the test that the estimates constructed using Equation 4 are zero. Figure 5 illustrates these same results visually, reporting for several K/R bins the log deviation from trend relative to the baseline group in 2007 to 2012.²⁹ In Panel A we see that the effect of 1099-K on receipts is rapidly increasing as K/R moves close to one, reaching 0.203 (i.e., a 20.3 percent

²⁹ We omit some bins with K/R only slightly above 0.5 for clarity; the estimated effect on these bins is very small. We also omit the results for firms with $K/R > 1$.

increase in receipts) for firms with $K=R$ in 2011. The increase in receipts due to 1099-K for diffuse bunchers (those with $0.95 < K/R < 1$) was 15.6 percent in 2011. Panel B of Figure 5 depicts a very similar pattern for expenses, with slightly smaller effect sizes of 16.7 percent for the sharp bunchers and 15.0 percent for the diffuse bunchers. All of these effects are statistically significant at well beyond the conventional 5 percent level; in fact, the p-values are less than 0.0001. The p-values for lower K/R groups are generally less than 0.05 until we reach the point where K/R is around 0.75, at which point some effects are not statistically significant from zero at the 5 percent level, all of which is unsurprising given that the point estimates shrink in size as K/R decreases. The placebo tests universally result in a small and statistically insignificant estimated effect relative to the estimated effect of the policy change, as we should expect if the identifying assumption is satisfied to a reasonable approximation. In Panel C, we see there is little discernible effect on net income.

Panel D of Figure 5 reports our estimates of extensive margin effects. We estimate that 30 percent of firms with $K=R$ filed Schedule C because of the policy, while 16 percent of firms with K within 5 percent of R did so. Although these results compare the change in new filer rates from 2010 to 2011 in the $K=R$ group minus the change in the new filer rate in the baseline, $K/R < 0.5$ group, the latter group saw no change in the new filer rate (see Figure 3 Panel D). As a result, the results are virtually identical to the results we would obtain if we simply calculated the change in the new filer rate in the K/R near 1 groups. For all groups, between 2006 and 2010 the new filer rates were essentially constant, suggesting that, despite the fact that the new filer rate is slightly

higher in the K=R group, our identifying assumption is satisfied to a reasonable approximation.³⁰

We perform several robustness checks for this analysis. First, the intensive margin analysis was limited to firms filing Schedule C in every year from 2004 to 2012 to alleviate concerns about firms endogenously selecting into and out of the population of Schedule C filers during the sample period. If we ignore the selection issue and estimate Equation (3) on all firms filing Schedule C at least once in 2004-2012, we obtain similar results. Second, our estimate of Equation (3) included firms filing Schedule C and receiving 1099-K in 2011. A few firms receive 1099-K in 2011 but not 2012, and removing them from the analysis changes very little. Third, although our preferred specification includes all firms with $K/R < 0.5$ in the control group, we obtain very similar results when designating firms with $K/R < 0.3$ or $K/R < 0.7$ as the control group. Finally, we obtain similar results if for 2011 and the placebo years we let $t' = t - 2$ in Equation (4), instead of $t' = t - 1$.

D. Receipts and Expenses

Schedule C filers have a tendency to report receipts exactly equal to expenses, compared to having reported receipts just above or below expenses. There are two potential reasons this may occur. First, taxpayers may target zero business tax liability when under-reporting receipts and/or overstating expenses.³¹ Second, for various reasons, taxpayers may not claim legitimate expenses

³⁰ We obtain similar results if we use an alternate estimation strategy based on the transition matrix in Table 2. In Table 2, the rate of entry and exit into the Schedule C filing population in the low K/R groups is equal (at about 10 percent). Supposing that counterfactual rate of entry also equals the rate of exit in the K=R group gives a counterfactual rate of entry of about 24.6 percent in the K=R population. This counterfactual would imply that about 25 percent of firms reporting K=R in 2011 were induced to file Schedule C by Form 1099-K, which is similar to the estimate above.

³¹ Overstating expenses may result in some expenses getting disallowed under audit. As a result, the response of net income we document may represent a lower bound given that, under audit, some improperly claimed expenses may be disallowed. Some

in excess of receipts, resulting in reported expenses exactly equaling receipts.³² If taxpayers fail to report all valid expenses, preferring instead to merely report no (as opposed to negative) business income, then an increase in reported receipts induced by 1099-K may merely be met with an increase in the reporting of *valid* expenses.

Figure 6 shows that firms receiving a Form 1099-K in 2011 became substantially more likely to report receipts almost exactly equal to expenses ($R/E=1$) in 2011 than in 2010. Of all 1099-K recipients in 2011, 0.47 percent report receipts exactly equal to expenses in 2010, and 1 percent do so in 2011. Of 1099-K recipients in 2012, 0.45 percent report receipts exactly equal to expenses in 2010, 0.64 percent do so in 2011, and 1 percent do so in 2012. This finding corroborates the evidence in Sections VI suggesting that those taxpayers whose reported receipts rose due to Form 1099-K also increased expense reporting, substantially diminishing its effect on overall tax revenues, and possibly diminishing the effect on reporting compliance by offsetting more accurate receipts reporting with less accurate expense reporting. It also corroborates the findings of Carrillo et al. (2014), who uncover evidence of a similar kind of evasion substitution in response to expanded information reporting in Ecuador (see also Pomeranz 2013; Morse et al. 2009).

Table 6 reports rates of expenses-equal-to-receipts bunching in several subpopulations.³³ Of

taxpayers may also accelerate real expenses into a year with otherwise positive profits in order to zero out tax liability from the business.

³² For example, taxpayers may not deduct expenses in order to meet the presumptive rule of IRC §183(d), under which firms that show profit three out of five years are deemed not to be subject to the hobby loss rules (they can still deduct business losses against ordinary income). Further, some expenses, such as for a home office, may not be deducted in excess of gross income (IRC §280A(c)(5)). Other items, such as the carrying forward or back of net operating losses, may also simply be too complex for unassisted taxpayers to understand and claim (Mahon and Zwick 2014).

³³ For selection criteria appearing in Table 3 but not Table 6, such as whether the firm is in a high-cash sector or received 1099-K from TPSEs only, we do not observe any stark differences in the rate of bunching where receipts equal expenses between groups.

particular interest are the results related to new Schedule C filers. Overall, new Schedule C filers are not disproportionately likely to report receipts equal to expenses: Column 1 indicates that about 1 percent of these Schedule C filers report receipts equal to expenses. This proportion is similar to the value for all 1099-K recipients—in 2011, 1 percent of 1099-K recipients have R=E. This is not markedly different from the proportion of new Schedule C filers with R=E, 1.4 percent, in Column 3. However, in Column 4, we see that about 4.3 percent of new Schedule C filers receiving a Form 1099-K in 2011 report receipts equal to expenses —four times as many as typical Schedule C filers. In contrast, firms filing Schedule C in every year of 2004-2012 were unlikely to report receipts equal to expenses, even if they got a 1099-K (Columns 4 and 5). This finding suggests that new Schedule C filers induced to file by 1099-K were disproportionately likely to offset their receipts with expenses.

In the final two columns of Table 6, we focus specifically on firms reporting receipts exactly near the 1099-K amount, as we have seen in earlier sections that these firms appear especially likely to have been affected by increased information reporting. These firms are much more likely to bunch than any others we observe: about 7 percent of firms reporting receipts equal to the 1099-K amount *also* report expenses equal to receipts, while 4 percent of firms with receipts within 5 percent of the 1099-K amount report receipts equal to expenses. Much of this is driven by payment-card-only firms: 9 percent of payment-card-only 1099-K recipients with receipts equal to the 1099-K amount also report receipts equal to expenses, while only 4 percent of TPSE-only 1099-K recipients with receipts equal to the 1099-K amount do so. To summarize, when we focus on those firms we believe to have been especially strongly affected by 1099-K, we see more bunching at where receipts equal expenses, which suggests that expense offsetting did occur in response to the policy change.

E. Which Expenses Increased?

Our analysis suggests that firms that increased their reported receipts as a result of 1099-K reporting may have simultaneously increased reported expenses.³⁴ There are several reasons a taxpayer might increase reported expenses upon receiving a Form 1099-K. First, taxpayers may want to minimize their tax liability through any means necessary, and take expenses to which they are not legally entitled. As tax liabilities and marginal tax rates increase as a result of 1099-K, the marginal benefit of overstating expenses increases. Second, taxpayers may have previously not reported all valid expenses.³⁵ The logic described in Section III.B suggests that higher reported receipts make reporting those expenses more desirable on the margin. Third, for certain expenses, such as Section 179 expenses and home office expenses, expense deductions statutorily cannot be so large as to create negative net business losses. Fourth, and finally, there is anecdotal evidence that in some instances inconsistencies between true receipts and what is reported on 1099-K may have induced increased expenses. The first two explanations are consistent with our theoretical model explaining expense offsetting; the others are institutional nuances not present in our model.

In this section we examine which expenses increased as a result of 1099-K reporting. In doing so, we are able to reject that the third explanation discussed above contributed substantially to the increase in expense reporting. Specifically, we examine the average ratio of particular expense line items on the Schedule C, as a fraction of total expenses, for firms in different binned values of K/R. We do this by year, and look for specific expenses that increased in 2011 and 2012 for K/R-

³⁴ Given that the burden of proof for suspected expense misreporting is on the taxpayer, who must typically provide receipts justifying expenses on audit, a shift from receipts under-reporting to expense over-reporting may actually result in the detection of more noncompliance on audit for affected 1099-K recipients.

³⁵ For example, the firm may wish to avoid reporting a suspiciously low rate of profit (Carrillo et al. 2014).

close-to-one firms. We began by examining all expense line items available to us—wage expense, cost of goods sold, home office deduction, other expenses (Line 27a on Form 1040 Schedule C), depreciation expense, insurance expense, legal expense, meals and entertainment, mortgage expense, office expense, repairs and maintenance, travel expense, utilities, automobile expense, and the aggregate of all other expenses not individually examined. Of these, only “other expenses,” (Line 27a on Form 1040 Schedule C) increased as a percentage of total expenses in 2011 and 2012 for K/R-close-to-one firms.

Figure 7, Panel A, illustrates the share of income devoted to “other expenses,” averaged by K/R bin, and then differenced by year. Panel B depicts the share of taxpayers reporting at least some other expenses. Panel C depicts the change over time in the ratio of expenses devoted to other expenses, from Panel A. In the graph, for K/R=1 firms, it is clear that the change in 2010-2011 was the most dramatic of all the other years. Panel B suggests that an increase in other expense reporting happened not only at the intensive margin, but, also at the extensive margin. For K/R=1 firms, the percentage of firms claiming other expenses increases dramatically in 2011 and 2012. In Panel D, we show that taxpayers’ use of the home office deduction, the most likely candidate for the third explanation above, reveals no discernible trend from 2010-2011 for K/R=1 firms that is different from other years.

This analysis suggests that as taxpayers reported additional revenue in response to 1099-K reporting, they increased expenses to offset some of the increase, specifically opting to increase “other expenses.” We cannot rule out that some of the expense increases occur because some taxpayers are now forced to declare new expenses such as commissions to reconcile their receipts with the Form 1099-K—the fourth explanation above. Commissions could be claimed in the “other” category where the increases occurred. However, the pattern of reported sectors of

bunching firms, discussed in Section VI.A, suggests that explanations involving commissions and the like are unlikely to account for most of the observed offsetting behavior: many bunching firms exist in sectors where commissions and the like should not be common. The remaining explanations for expense offsetting are consistent with our theory, so we conclude that much of the observed expense offsetting results from taxpayers taking calculated risks in tax compliance.

VII. Conclusions

U.S. tax policy has made expanded third-party information reporting a centerpiece of its enforcement policy, with a prime example being the new Form 1099-K that applies to business receipts processed through payment cards and third-party payments. At first blush this would seem to increase compliance, as the IRS would more easily learn when the reported receipts of a business fell short of now-known receipts. However, both because Form 1099-K does not apply to cash transactions and because business expenses are not currently subject to third-party information reporting, there could be leakage in the impact on tax revenue.

We first document that aggregate trends in the behavior of Schedule C filers do not reveal a sharp break in 2011, even among 1099-K recipients. We then focus on the type of firms that theory suggests are most likely to be affected by Form 1099-K: those reporting receipts close to the amount reported on 1099-K's. The analysis shows clearly that taxpayers were disproportionately likely to self-report receipts very close to the amount reported to the IRS on 1099-K forms, even in sectors where substantial cash use should be typical. We estimate that the introduction of the Form 1099-K prompted a 24 percent increase in reported receipts on average for firms reporting receipts exactly equal to the 1099-K amount. Strikingly, this group of firms also increased reported expenses by 13 percent. This offsetting moderated the impact of 1099-K on total tax liability, even in groups strongly affected by 1099-K. Finally, we estimate a sizable extensive margin effect for

bunching firms, with 30 percent of firms with receipts exactly equal to the 1099-K amount filing Schedule C because of the 1099-K initiative. In sum, we find evidence suggesting that this group of firms increased their reporting of revenues dramatically, along both intensive (reporting compliance) and extensive margins (Schedule C filing compliance), in response to the introduction of Form 1099-K. One can reconcile this finding with the small average effect of the form: the affected group was small enough—only about 10 percent of the population of 1099-K recipients—that the effect the policy had on their reporting is lost in the noise when examining all 1099-K recipients.

For information reporting to have a strong effect on tax compliance, it must target a noncompliant group of taxpayers and it must subject a large share of their income to information reporting. The subset of firms we identify as being affected by 1099-K constitutes about 10 percent of all sole proprietorships receiving 1099-K. After all, much noncompliance among small businesses is related to cash use, which the 1099-K initiative does not address. Even for affected firms, expenses are subject to no information reporting. As a result, the overall change in reported tax liability through this channel is small. Future research should examine the impact of the 1099-K initiative on small partnerships and corporations, and consider what other initiatives could consolidate its compliance gains. Further, as audit data from the National Research Program become available, the net effects from the 1099-K may be better understood.

References

- Allingham, M. G., and A. Sandmo. 1972. Income Tax Evasion: A Theoretical Analysis. *Journal of Public Economics* 1 (3–4): 323–338.
- Almunia, M., and D. Lopez Rodriguez. 2014. Heterogeneous Responses to Effective Tax Enforcement: Evidence from Spanish Firms.
- Arango, C. A., and V. Taylor. 2008. Merchant Acceptance, Costs, and Perceptions of Retail Payments: A Canadian Survey. Bank of Canada.
- Bachas, P., and M. Soto. 2015. Not(ch) Your Average Tax System: Corporate Taxation Under Weak Enforcement. Working Paper.
- Best, M. C., A. Brockmeyer, H. Kleven, J. Spinnewijn, and M. Waseem. 2015. Production vs Revenue Efficiency with Limited Tax Capacity: Theory and Evidence from Pakistan. *Journal of Political Economy* 123 (6): 1311–1355.
- Carrillo, P., D. D. Pomeranz, and M. Singhal. 2014. Tax Me if You Can: Evidence on Firm Misreporting Behavior and Evasion Substitution. Working Paper.
- Dharmapala, D., J. Slemrod, and J. D. Wilson. 2011. Tax Policy and the Missing Middle: Optimal Tax Remittance with Firm-level Administrative Costs. *Journal of Public Economics* 95 (9–10): 1036–1047.
- Erard, B., and J. S. Feinstein. 1994. Honesty and Evasion in the Tax Compliance Game. *The RAND Journal of Economics* 25 (1): 1–19.
- Frisch, A. B. 2005. Visa 101: Overview of a Payments Company. *UBS Investment Research*, June 15.
- Gordon, R., and W. Li. 2009. Tax Structures in Developing Countries: Many Puzzles and a Possible Explanation. *Journal of Public Economics* 93 (7): 855–866.
- Heckman, J. J., and V. J. Hotz. 1989. Choosing among Alternative Nonexperimental Methods for Estimating the Impact of Social Programs: The Case of Manpower Training. *Journal of the American Statistical Association* 84 (408): 862–874.
- Hoopes, J., D. Reck, and J. Slemrod. 2015. Taxpayer Search for Information: Implications for Rational Attention. *American Economic Journal: Economic Policy* 7 (3): 177–208.
- Internal Revenue Service. 2012. *Tax Gap for Tax Year 2006: Overview*.
- Jonker, N. 2011. Card Acceptance and Surcharging: The Role of Costs and Competition. *Review of Network Economics* 10 (2): 1–35.
- Kleven, H. J., M. B. Knudsen, C. T. Kreiner, S. Pedersen, and E. Saez. 2011. Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark. *Econometrica* 79 (3): 651–692.
- Lederman, L. 2010. Reducing Information Gaps to Reduce the Tax Gap: When Is Information Reporting Warranted? *Fordham Law Review* 78: 1733.
- Mahon, J., and E. Zwick. 2014. The Role of Experts in Fiscal Policy Transmission. Working Paper.
- Morse, S. C., S. Karlinsky, and J. Bankman. 2009. Cash Businesses and Tax Evasion. *Stanford Law & Policy Review* 20 (1): 37–68.
- Naritomi, J. 2014. Consumers as Tax Auditors. Working paper.
- Phillips, M. D. 2014. Deterrence vs. Gamesmanship: Taxpayer Response to Targeted Audits and Endogenous Penalties. *Journal of Economic Behavior & Organization* 100: 81–98.
- Pomeranz, D. D. 2015. No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax. *American Economic Review* 105 (8): 2539–2569.
- Rees-Jones, A. 2014. Loss Aversion Motivates Tax Sheltering: Evidence from U.S. Tax Returns. Working Paper.
- Slemrod, J., and C. Gillitzer. 2013. *Tax Systems*. Cambridge, MA: MIT Press.
- Srinivasan, T. N. 1973. Tax Evasion: A Model. *Journal of Public Economics* 2 (4): 339–346.
- Szilagyi, J. A. 1991. Whatever Happened to Child Care in 1989? *IRS Research Bulletin*: 33.

Table 1. Descriptive Statistics and Sample Composition
Panel A. Descriptive Statistics on Sole Proprietorships and 1099-K Recipients, 2010-2011

	Tax Year 2010						Tax Year 2011					
	Mean	STD	p25	Median	p75	Obs	Mean	STD	p25	Median	p75	Obs
All taxpayers												
1099-K amounts by tax year							116126.17	3567810.1	6937	25769	73386	1192249
Gross receipts by tax year	49056.53	795774.5	2500	9891	29960	23238458	51209.62	955726.06	2500	10000	30030	23437174
Cost of Goods Sold Deduction	14718.44	626055.74	0	0	0	23238458	15270.47	578174.59	0	0	0	23437174
Total Deductions	38157.67	969252.84	681	4795	17640	23238458	38945.02	777722.62	681	4812	17837	23437174
Depreciation Deduction	1460.67	224389.78	0	0	45	23238458	1424.55	77355.24	0	0	0	23437174
1099-K amount / total reported receipts							250.61	102832.14	0.15	0.4	0.78	1181094
Percentage using a paid preparer	0.71	0.46	0	1	1	23238458	0.7	0.46	0	1	1	23437174
Wages Deduction	3029.96	81974.28	0	0	0	23238458	3071.34	86048.93	0	0	0	23437174
All taxpayers that ever got a 1099-K												
1099-K amounts by tax year							116126.17	3567810.1	6937	25769	73386	1192249
Gross receipts by tax year	203083.45	981348.82	21788	63372	184300	1252027	204141.69	1393254.3	21891	60862	176839	1423862
Cost of Goods Sold Deduction	87310.72	756542.68	0	2000	46469	1252027	90117.11	1104443.6	0	2261	45053	1423862
Total Deductions	180836.08	1502074.4	16078	50019	156362	1252027	181252.86	1486692	16725	48821	150797	1423862
Depreciation Deduction	5164.88	378829.8	0	99	2942	1252027	4709.16	106608.76	0	0	2503	1423862
1099-K amount / total reported receipts							250.61	102832.14	0.15	0.4	0.78	1181094
Percentage using a paid preparer	0.78	0.41	1	1	1	1252027	0.78	0.42	1	1	1	1423862
Wages Deduction	21593.13	131860.81	0	0	2300	1252027	20809.84	236982.74	0	0	0	1423862
All taxpayers that ever got a 1099-K and file Schedule C 2004-2012												
1099-K amounts by tax year							106666.97	1386932	9728	32054	90782.5	558280
Gross receipts by tax year	268848.9	1063049.3	38060	98846	265702	644307	285428.32	1213257.3	39773	102384	274590	644307
Cost of Goods Sold Deduction	113861.73	844632.39	0	7860	71438	644307	124050.59	908539.96	0	8700	74680	644307
Total Deductions	233028.94	1356843.6	27435	77973	218241	644307	246712.79	1212256.4	29233	81137	225460	644307
Depreciation Deduction	6605.45	527521.03	0	514	4000	644307	5984.23	76940.57	0	433	3864	644307
1099-K amount / total reported receipts							5.89	1037.62	0.12	0.33	0.63	555984
Percentage using a paid preparer	0.82	0.39	1	1	1	644307	0.82	0.39	1	1	1	644307
Wages Deduction	30578.15	164072.58	0	0	19960	644307	31519.85	141673.83	0	0	20580	644307

Panel B. Information Reporting of Schedule C Filers, by NAICS Code, for Common NAICS Codes

	Percentage of all taxpayers in sector that ever received a 1099-K	Percentage of all taxpayers in sector that ever received a 1099-MISC	Percentage of C filers in this sector
All Other Personal Services	4.00%	71.89%	6.87%
Independent Artists, Writers, & Performers	3.19%	85.67%	4.52%
Offices of Real Estate Agents & Brokers	1.12%	94.72%	4.08%
All Other Professional, Scientific, & Technical Services	2.85%	88.33%	4.35%
Other Direct Selling Establishments	5.11%	66.17%	4.33%
Educational Services	1.95%	85.61%	3.06%
Management, Scientific, & Technical Consulting Services	1.68%	88.89%	2.79%
Child Day Care Services	1.27%	57.02%	3.79%
Janitorial Services	0.80%	66.49%	3.04%
Legal Services	6.25%	90.40%	1.80%
Grocery Stores	38.78%	70.08%	0.22%
Offices of Chiropractors	36.61%	93.00%	0.21%
Offices of Optometrists	36.12%	95.59%	0.11%
Drycleaning & Laundry Services	35.04%	53.24%	0.13%
Florists	31.43%	60.11%	0.15%
Sporting Goods Stores	29.91%	58.28%	0.12%
Other Amusement & Recreation Industries	10.79%	70.55%	0.24%
Travel Accommodation	24.76%	71.66%	0.22%
Other Clothing Stores	24.55%	53.41%	0.14%
Jewelry Stores	24.44%	55.56%	0.18%

Notes: Panel A provides some descriptive statistics on Schedule C filers in our sample. In Panel B, the first column lists the percentage of all Schedule C taxpayers in a sector that ever receive a 1099-K at any time during our sample period. The second column tabulates the percentage of all taxpayers in the sector that receive the 1099-MISC any time in our sample period. The final column tabulates the percentage of all Schedule C taxpayers in each sector. The first 10 sectors (above the bold line) represent the 10 highest populated NAICS codes among all Schedule C taxpayers. The second 10 sectors represent the 10 sectors with the highest percentage of 1099-K recipients, conditional upon having at least 0.10 percent of all Schedule C taxpayers in the sector.

Table 2. Transition Matrix from 2011 to 2012 in Bins of K/R

Number of Observations in K/R Bin in 2012

		Did not file Schedule C in 2012	Did not receive 1099-K in 2012	K/R in 2012 in (0, .25]	K/R in 2012 in (.25-.50]	K/R in 2012 in (.50-.75]	K/R in 2012 in (.75-.95]	K/R in 2012 in (.95-1)	K/R in 2012 = 1.0	K/R in 2012 in (1-1.05]	K/R in 2012 ≥1.05	Total
Number of Observations in K/R Bin in 2011	Did not file Schedule C in 2011		97.52%	0.65%	0.39%	0.34%	0.24%	0.27%	0.25%	0.04%	0.31%	5,722,517
	Did not receive 1099-K in 2011	26.30%	72.66%	0.50%	0.17%	0.13%	0.08%	0.05%	0.03%	0.01%	0.08%	22,143,039
	K/R in 2011 in (0, .25]	97.63%	73.67%	25.97%	14.72%	13.75%	13.14%	13.43%	14.50%	14.53%	21.00%	
	K/R in 2011 in (.25-.50]	9.94%	20.68%	53.57%	10.52%	2.75%	1.13%	0.42%	0.25%	0.12%	0.62%	425,687
	K/R in 2011 in (.50-.75]	0.71%	0.40%	53.02%	17.57%	5.64%	3.69%	2.33%	2.36%	3.37%	3.23%	
	K/R in 2011 in (.75-.95]	10.03%	10.76%	13.61%	45.69%	14.44%	2.74%	0.84%	0.49%	0.21%	1.19%	254,760
	K/R in 2011 in (.95-1)	0.43%	0.13%	8.06%	45.67%	17.73%	5.33%	2.80%	2.75%	3.50%	3.70%	
	K/R in 2011 = 1.0	10.29%	8.84%	5.16%	12.45%	45.08%	12.54%	2.07%	0.86%	0.50%	2.20%	188,416
	K/R in 2011 in (1-1.05]	0.33%	0.08%	2.26%	9.20%	40.94%	18.07%	5.12%	3.55%	6.28%	5.05%	
	K/R in 2011 ≥1.05	10.73%	8.74%	3.46%	4.62%	14.81%	41.02%	8.61%	1.97%	1.76%	4.27%	113,257
	Total	0.20%	0.05%	0.91%	2.05%	8.08%	35.53%	12.78%	4.91%	13.28%	5.88%	
		15.94%	11.14%	2.07%	2.25%	4.82%	13.75%	28.82%	12.32%	3.93%	4.96%	61,716
	0.16%	0.03%	0.30%	0.55%	1.44%	6.49%	23.31%	16.74%	16.12%	3.72%		
	24.56%	14.10%	2.15%	2.03%	3.56%	5.45%	21.13%	21.56%	1.97%	3.48%	36,043	
	0.15%	0.02%	0.18%	0.29%	0.62%	1.50%	9.98%	17.11%	4.73%	1.52%		
	13.27%	9.87%	2.79%	3.18%	6.45%	14.87%	20.74%	6.31%	11.23%	11.27%	15,399	
	0.03%	0.01%	0.10%	0.19%	0.48%	1.75%	4.19%	2.14%	11.50%	2.11%		
	24.66%	17.79%	2.83%	2.95%	4.72%	6.31%	5.42%	2.43%	2.14%	30.74%	85,819	
	0.35%	0.07%	0.57%	0.99%	1.95%	4.14%	6.10%	4.60%	12.21%	32.10%		
Total	5,964,500	21,839,998	430,094	254,898	207,455	130,770	76,300	45,418	15,039	82,181	29,046,653	

Notes: This table shows the relative frequencies with which firms had particular values of K/R (the ratio of 1099-K amounts to reported receipts) in 2011, relative to their value of K/R in 2012. The sample is all taxpayers filing Schedule C in either 2011 or 2012. The value in the top right corner of each cell is the number of taxpayers with a given value of K/R in 2012 as a fraction of total taxpayers with a given value of K/R in 2011. The value in the bottom left corner of each cell is the number of taxpayers with a given value of K/R in 2011 as a fraction of total taxpayers with a given value of K/R in 2012. The diagonal of the table highlights that conditional on filing Schedule C and receiving a Form 1099-K in both years, values of K/R were relatively stable over the two years.

Table 3. Rates of Bunching Where Reported Receipts Equal the 1099-K Amount in Select Subpopulations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Tax year	All 1099-K recipients in the given tax year	New Schedule C filers receiving Form 1099-K	1099-K recipients filing in every year of 2004-2008	1099-K recipients in sectors where we have Visa data on credit-card use	1099-K recipients in sectors with above-average credit card use	1099-K recipients in sectors with below-average credit card use	Firms receiving 1099-K from payment cards only	Firms receiving 1099-K from TPSEs only
Percent with R=K	2011	0.030	0.119	0.011	0.019	0.016	0.021	--	--
		(0.00016)	(0.00085)	(0.00014)	(0.00028)	(0.00039)	(0.00040)		
	2012	0.036	0.100	0.013	0.025	0.020	0.029	0.018	0.171
		(0.00017)	(0.00081)	(0.00015)	(0.00032)	(0.00043)	(0.00045)	(0.00013)	(0.00101)
Percent with R within 5 percent of K	2011	0.094	0.260	0.052	0.093	0.063	0.118	--	--
		(0.00027)	(0.00115)	(0.00030)	(0.00060)	(0.00075)	(0.00090)		
	2012	0.109	0.223	0.060	0.110	0.072	0.140	0.063	0.423
		(0.00028)	(0.00112)	(0.00032)	(0.00065)	(0.00079)	(0.00094)	(0.00024)	(0.00133)
Number of Taxpayers	2011	1,184,359	146,182	546,601	232,600	104,721	127,979	--	--
	2012	1,225,694	139,152	557,299	232,600	106,019	137,621	1,008,507	138,585

Notes: Rates of bunching where reported receipts equal the 1099-K amount, as a fraction of all Schedule C filers in the given tax year, are provided in the first four rows of the table. We denote reported receipts by R and the gross amount from 1099-K's by K. By R=K in the first row, we mean firms reporting a dollar amount of receipts *exactly* equal to the gross amount from Form 1099-K's. In column (2), "new filers" refers to firms not filing Schedule C in the previous tax year. Columns (4) through (6) are constructed with data on Visa acceptance rates by sector from Frisch (2005). Standard errors for the rates of bunching are provided in parentheses below point estimates.

Table 4. Summary Statistics For Bunching Firms, 2010-2011

	Tax Year 2010						Tax Year 2011					
	Mean	STD	p25	Median	p75	Obs	Mean	STD	p25	Median	p75	Obs
All taxpayers in sample every year with R within 5 percent of K in 2011												
1099-K amounts by tax year							159272.5	599050	33068	159340	72798	29814
Gross receipts by tax year	137619.3	490323.8	25065	138431	59966	29814	160550.7	602977.2	33257	161125	73543	29814
Cost of Goods Sold Deduction	52719.37	361579	0	33596	4303	29814	61724.06	469768.7	0	42600	8777.5	29814
Total Deductions	120282	477741.8	19503	116186	48097.5	29814	140470	581929.6	27150	135058	59987.5	29814
Depreciation Deduction	2950.39	21646.68	0	1856	0	29814	3261.37	36048.65	0	1832	0	29814
1099-K amount / total reported receipts							0.99	0.02	0.98	1	1	29814
Percentage using a paid preparer	0.75	0.44	0	1	1	29814	0.75	0.43	0	1	1	29814
Wages Deduction	8779.8	53209.11	0	0	0	29814	9279.52	50817.93	0	0	0	29814
All taxpayers in sample every year that had R exactly equal to K in 2011												
1099-K amounts by tax year							79193.51	140422.8	22855	86655	41330	6058
Gross receipts by tax year	59708.47	106564.9	13000	67435	31129.5	6058	79193.51	140422.8	22855	86655	41330	6058
Cost of Goods Sold Deduction	20751.78	76035.43	0	14825	0	6058	29069.73	97662.53	0	24685	5045	6058
Total Deductions	50549.6	96439.18	10167	54622	24995.5	6058	68438.8	128571.9	18578	71901	34855	6058
Depreciation Deduction	1178.11	4186.09	0	639	0	6058	1169.12	3980.43	0	501	0	6058
1099-K amount / total reported receipts							1	0	1	1	1	6058
Percentage using a paid preparer	0.7	0.46	0	1	1	6058	0.71	0.45	0	1	1	6058
Wages Deduction	991.26	7486.91	0	0	0	6058	1076.97	8236.96	0	0	0	6058

Notes: This table presents summary statistics, similar to Table 1, for firms in the balanced panel with receipts equal to the 1099-K amount either approximately (in the top panel) or exactly (in the bottom panel).

Table 5. The Heterogeneous Impact of Form 1099-K, by the Ratio of 1099-K Amounts to Reported Receipts

Tax year:	Receipts						Expenses					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
K=R	-0.0146	0.0114	-0.0158	-0.0193	0.2030	0.2547	-0.0356	-0.0171	-0.0040	0.0164	0.1673	0.2278
<i>p value</i>	<i>0.6910</i>	<i>0.7558</i>	<i>0.6666</i>	<i>0.6004</i>	<i><.0001</i>	<i><.0001</i>	<i>0.2145</i>	<i>0.5493</i>	<i>0.8901</i>	<i>0.5667</i>	<i><.0001</i>	<i><.0001</i>
K/R in [0.95,1.0)	-0.0161	-0.0033	-0.0049	0.0274	0.1551	0.1981	-0.0067	-0.0002	-0.0053	0.0321	0.1497	0.2473
<i>p value</i>	<i>0.4342</i>	<i>0.8712</i>	<i>0.8111</i>	<i>0.1840</i>	<i><.0001</i>	<i><.0001</i>	<i>0.7537</i>	<i>0.9923</i>	<i>0.8036</i>	<i>0.1319</i>	<i><.0001</i>	<i><.0001</i>
K/R in [0.9,0.95)	-0.0225	-0.0042	-0.0008	0.0137	0.0821	0.1350	-0.0168	0.0018	0.0039	0.0118	0.0714	0.1650
<i>p value</i>	<i>0.3856</i>	<i>0.8704</i>	<i>0.9756</i>	<i>0.5976</i>	<i>0.0015</i>	<i><.0001</i>	<i>0.5321</i>	<i>0.9467</i>	<i>0.8845</i>	<i>0.6602</i>	<i>0.0077</i>	<i><.0001</i>
K/R in [0.85,0.9)	-0.0024	-0.0112	-0.0118	0.0151	0.0803	0.1403	0.0114	-0.0262	-0.0149	0.0200	0.0735	0.1737
<i>p value</i>	<i>0.9261</i>	<i>0.6605</i>	<i>0.6440</i>	<i>0.5542</i>	<i>0.0016</i>	<i><.0001</i>	<i>0.6671</i>	<i>0.3216</i>	<i>0.5716</i>	<i>0.4480</i>	<i>0.0053</i>	<i><.0001</i>
K/R in [0.80,0.85)	-0.0219	-0.0166	0.0093	0.0276	0.0521	0.1135	-0.0201	-0.0028	0.0007	0.0142	0.0544	0.1398
<i>p value</i>	<i>0.3791</i>	<i>0.5055</i>	<i>0.7073</i>	<i>0.2669</i>	<i>0.0362</i>	<i><.0001</i>	<i>0.4351</i>	<i>0.9119</i>	<i>0.9787</i>	<i>0.5817</i>	<i>0.0342</i>	<i><.0001</i>
K/R in [0.75,0.80)	-0.0159	-0.0022	0.0116	0.0042	0.0491	0.0935	-0.0019	0.0067	0.0070	0.0004	0.0386	0.1143
<i>p value</i>	<i>0.5078</i>	<i>0.9281</i>	<i>0.6306</i>	<i>0.8616</i>	<i>0.0407</i>	<i><.0001</i>	<i>0.9384</i>	<i>0.7873</i>	<i>0.7787</i>	<i>0.9865</i>	<i>0.1197</i>	<i><.0001</i>
K/R in [0.70,0.75)	-0.0033	-0.0052	0.0107	0.0113	0.0304	0.0915	0.0067	0.0032	-0.0025	0.0110	0.0309	0.1177
<i>p value</i>	<i>0.8865</i>	<i>0.8238</i>	<i>0.6450</i>	<i>0.6263</i>	<i>0.1885</i>	<i><.0001</i>	<i>0.7803</i>	<i>0.8927</i>	<i>0.9153</i>	<i>0.6442</i>	<i>0.1958</i>	<i><.0001</i>
K/R in [0.65,0.70)	0.0020	0.0019	0.0057	0.0167	0.0394	0.0925	0.0032	-0.0011	0.0115	0.0147	0.0345	0.1186
<i>p value</i>	<i>0.9279</i>	<i>0.9313</i>	<i>0.7988</i>	<i>0.4569</i>	<i>0.0786</i>	<i><.0001</i>	<i>0.8897</i>	<i>0.9618</i>	<i>0.6186</i>	<i>0.5262</i>	<i>0.1354</i>	<i><.0001</i>

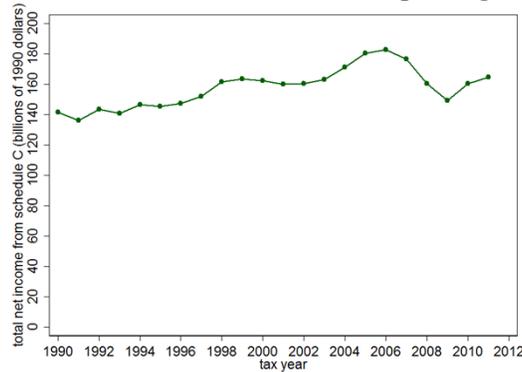
Notes: This table presents estimates of the heterogeneous impact of Form 1099-K on reporting using a random growth model specification (see Equations 3 and 4), as well as placebo tests of the identification strategy. The baseline group for this analysis consists of firms receiving 1099-K but with $K/R < 0.5$. We estimate a differential impact for higher values of K/R . The sample for this analysis consists of businesses filing Schedule C in every year of 2004-2012. We report the estimated effect in 2011 and 2012 of Form 1099-K on firms with a given set of values of K/R in 2011, along with placebo results for pre-2011. The p-values for the hypothesis test that each effect is zero is provided in italics below the point estimates. The 2011 effect and placebo effects are calculated using Equation (4) with the pre-trend calculated using the one- and two-year lags of the variable. The pre-trend for the 2012 effect is calculated using the two- and three-year lags of the variable. See Section 4 of the paper for further details.

Table 6. Rates of Bunching Where Reported Receipts Equal Reported Expenses in Select Subpopulations

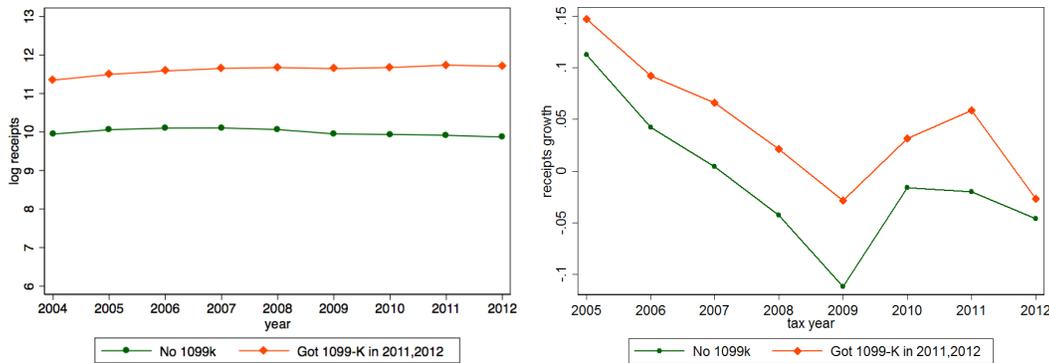
	(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	
	Tax year	All firms	All 1099-K recipients in the given tax year	New Schedule C Filers	New Schedule C filers receiving 1099-K in the given tax year	Firms filing in every year of 2004-2012	1099-K recipients filing in every year of 2004-2012	Firms reporting R=K	Firms reporting R within 5 percent of K
Percent with R=E	2009	0.011	--	0.015	--	0.007	--	--	--
		(0.000022)		(0.000050)		(0.000032)			
	2010	0.011	--	0.014	--	0.007	--	--	--
		(0.000022)		(0.000049)		(0.000033)			
	2011	0.011	0.010	0.014	0.043	0.008	0.004	0.069	0.042
		(0.000022)	(0.000091)	(0.000049)	(0.000524)	(0.000034)	(0.000084)	(0.001339)	(0.000602)
2012	0.011	0.010	0.014	0.032	0.009	0.005	0.066	0.042	
	(0.000022)	(0.000091)	(0.000050)	(0.000494)	(0.000037)	(0.000092)	(0.001174)	(0.000551)	
Number of Taxpayers*	2010	22,896,179	--	5,645,463	--	6,454,500	--	--	--
	2011	23,083,651	--	5,717,308	--	6,454,500	--	--	--
	2011	23,181,066	1,184,359	5,785,811	149,152	6,454,500	546,601	35,720	111,639
	2012	22,622,981	1,225,694	5,598,704	127,242	6,454,500	557,299	44,508	133,108

Notes: We denote receipts by R, expenses by E, and receipts by K. By R=E in the first row, we mean the fraction of firms reporting receipts exactly equal to expenses. The selection criteria in columns (6) and (7) are exactly the same as those used to calculate the percentages in Table 3. *Number of taxpayers here refers to taxpayers reporting either positive expenses or positive receipts. A small number of Schedule C filers report either zero expenses or zero receipts. If we limit the study of R=E bunching to firms reporting both positive receipts and positive expenses, the percentages in the top half of the table all increase mechanically, but the qualitative patterns are unaffected. Standard errors for the rates of bunching are provided in parentheses below point estimates.

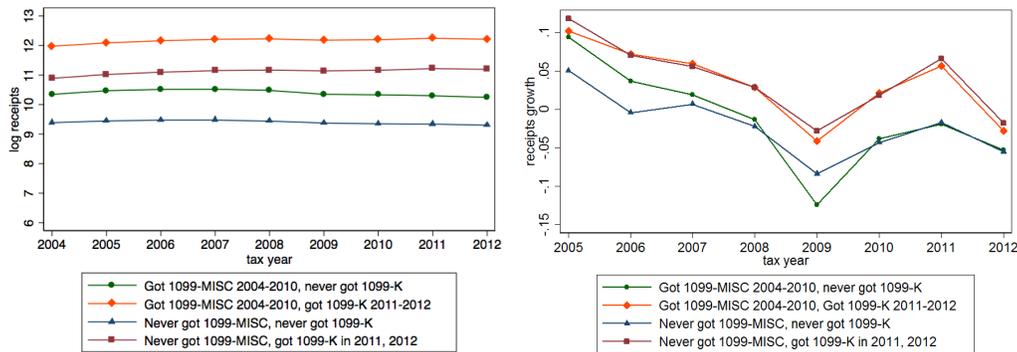
Figure 1. Aggregate Trends for Schedule C Taxpayers
Panel A. Total net income reporting



Panel B. Aggregate log receipts and receipts growth by whether the taxpayer received 1099-K



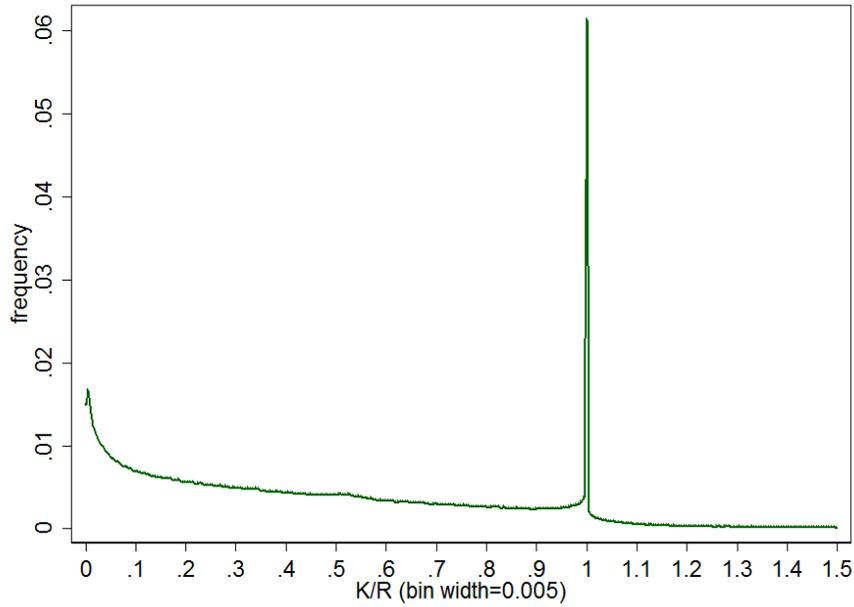
Panel C. Aggregate log receipts and receipts growth by whether 1099-K recipients received 1099-MISC prior to 2011



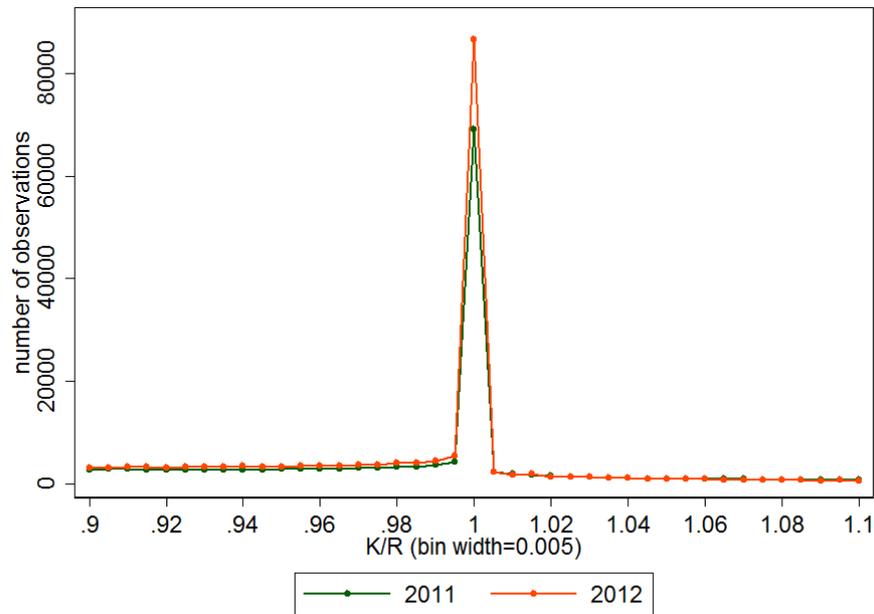
Notes. This figure presents aggregate comparisons suggesting that the aggregate impact of the Form 1099-K on sole proprietors was limited. Panel A depicts total income reported on Schedule C, using aggregate data from the IRS Statistics of Income Division. Panel B depicts the trends in receipts growth reported on Schedule C by whether the taxpayer received a 1099-K in 2011 and 2012. We restrict our analysis in Panels B and C to firms filing Schedule C in every year from 2004 to 2012, and we exclude firms receiving a 1099-K in 2011 but not 2012, or in 2012 but not 2011. Growth rates of a variable are calculated as the first difference of the mean of logged receipts within a group. Panel C shows trends in receipts growth for firms that did, or did not, receive a Form 1099-MISC prior to 2011. We restrict the comparison in Panel C to firms that received 1099-MISC continuously from 2004 to 2010 and firms that never received 1099-MISC in that period.

Figure 2: Distribution of 1099-K Amount Scaled by Reported Receipts

Panel A. Distribution of the ratio of 1099-K amounts and reported receipts in 2011

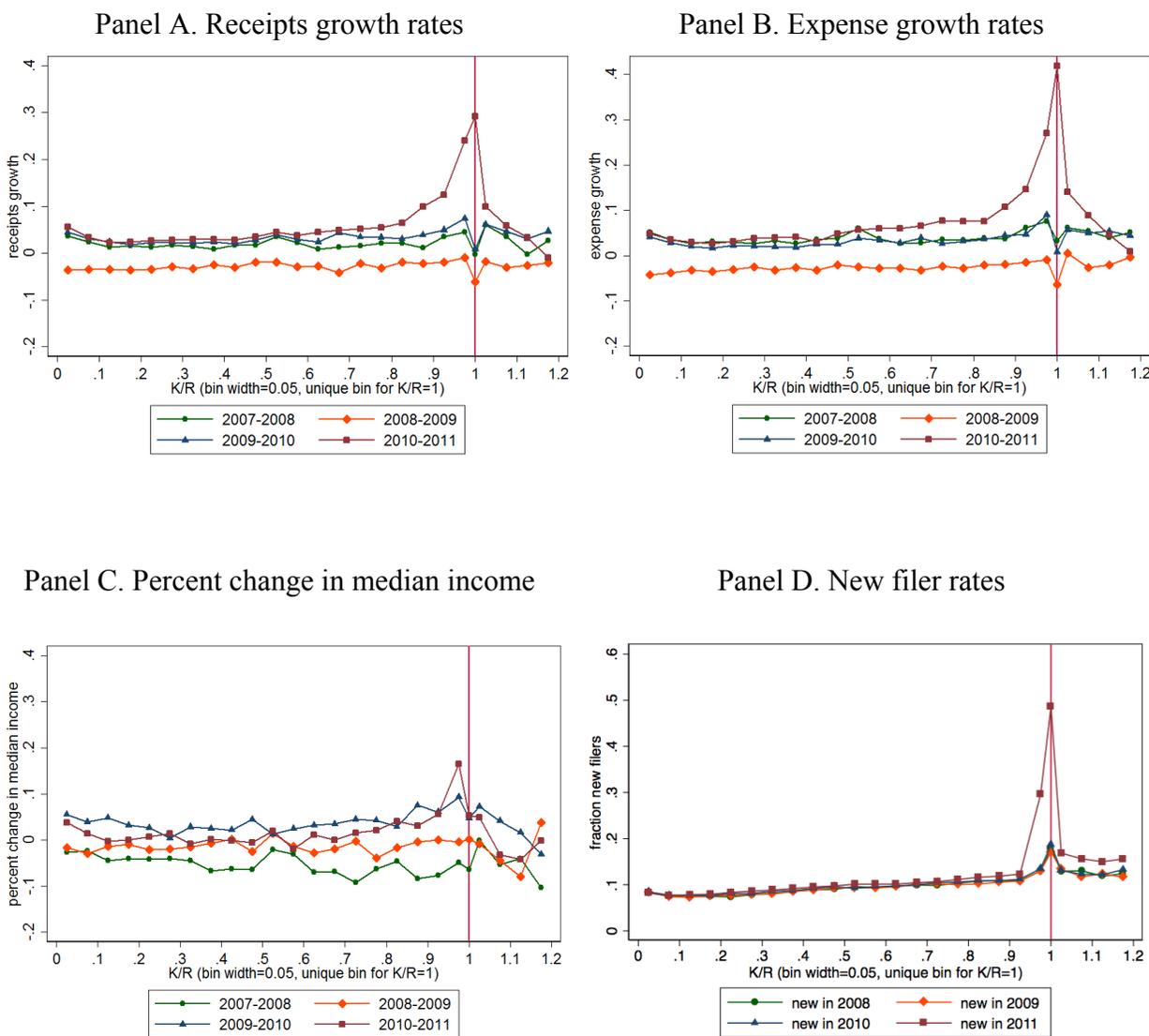


Panel B. Distribution of the ratio of 1099-K amounts and reported receipts around 1 in 2011 and 2012



Notes. This figure provides evidence that firms were disproportionately likely to report their receipts exactly equal to their gross 1099-K receipts. Panel A depicts the ratio of 1099-K receipts to reported receipts, in 2011. The shape of this distribution in 2012 is very similar. Panel B focuses on bunching in this distribution around the point where receipts exactly equal the 1099-K amount, for both 2011 and 2012.

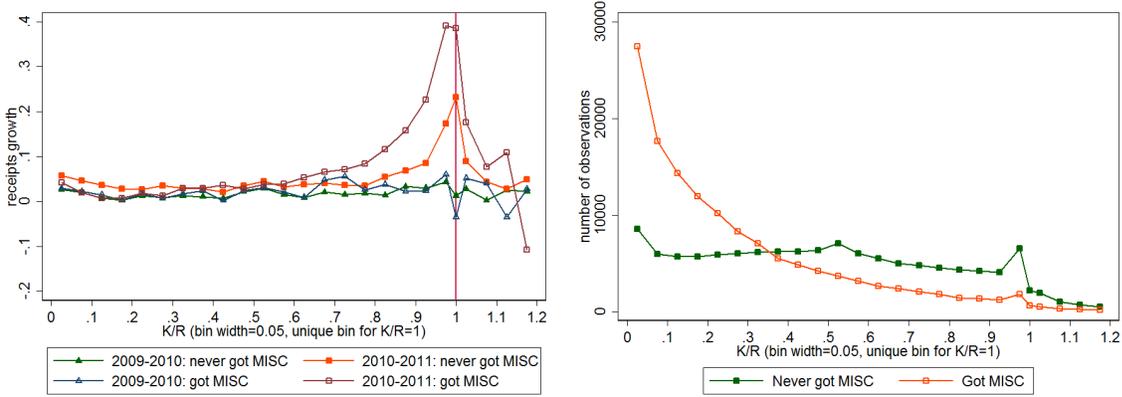
Figure 3. Trends in Reporting by Binned Values of the Ratio of Receipts Subject to Reporting by Form 1099-K in 2011



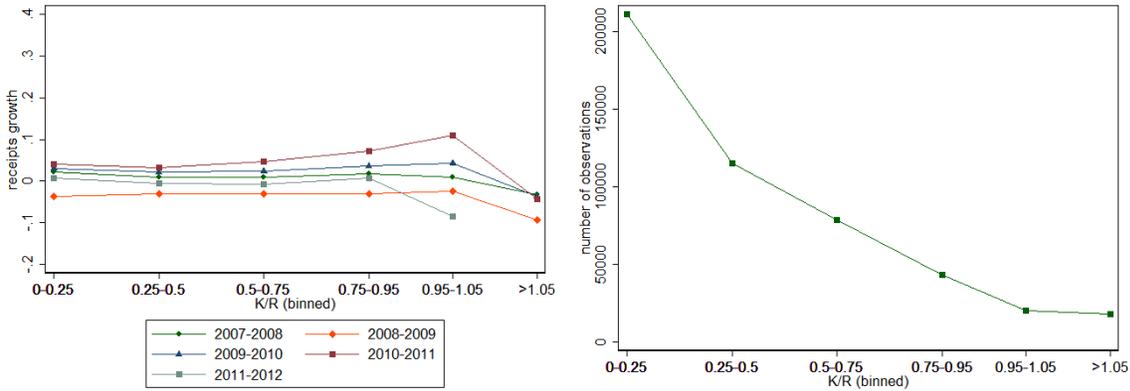
Notes: This panel depicts the large effects of Form 1099-K for firms reporting receipts equal to their 1099-K amount. Vertical red lines in all figures highlights the bin where receipts exactly equal the 1099-K amount. The sample for Panels A-C is those filing Schedule C in every year of 2004-2012; the sample for Panel D is all Schedule C filers in 2011. Growth rates of a variable are calculated as the first difference of the mean of logged receipts within a group. New filer rates are defined as the share filing Schedule C in a given year who did not do so in the previous year.

Figure 4. Trends by the 1099-K-Amount-Receipts Ratio in Select Subpopulations

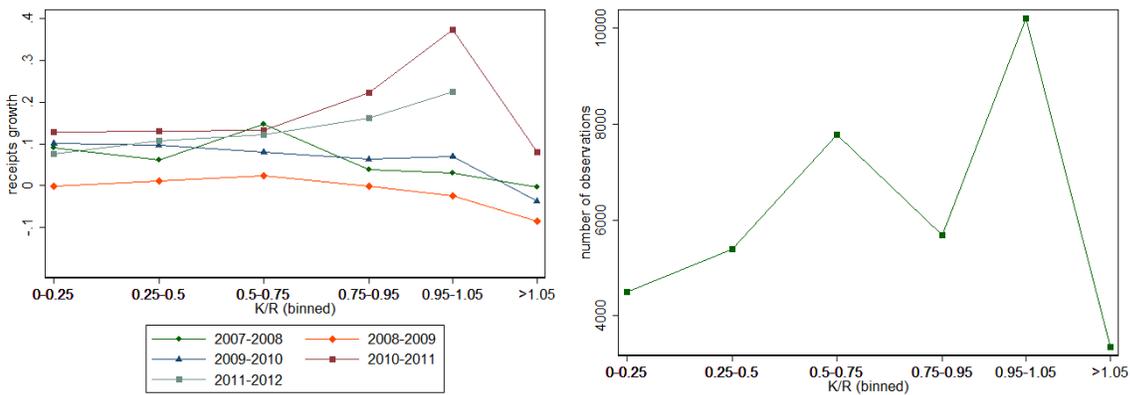
Panel A. 1099-MISC recipients in 2004-2010 compared to firms never receiving 1099-MISC



Panel B. Firms receiving 1099-K from payment-card entities only

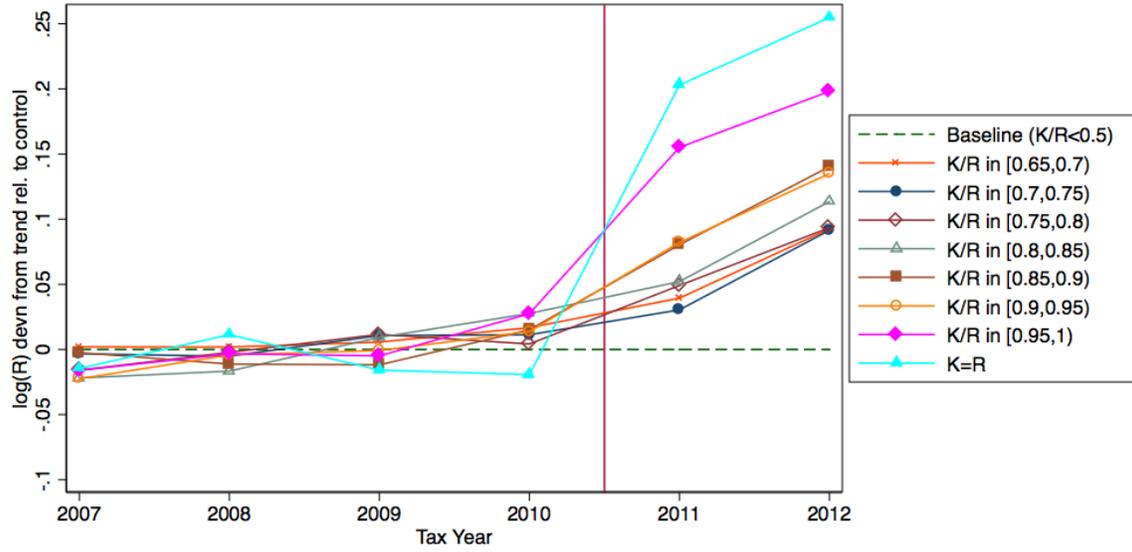


Panel C. Firms receiving 1099-K from third-party settlement entities only

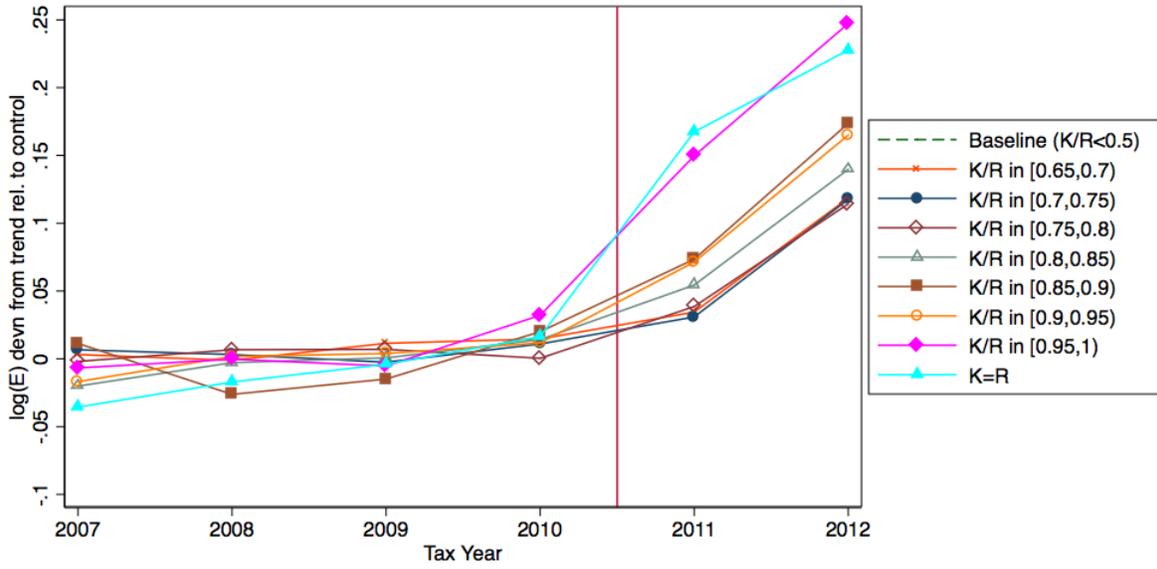


Notes: This figure examines the impact of Form 1099-K within in three subgroups of interest. Growth rates of receipts are calculated as the first difference of the mean of logged receipts within a group. The right-hand side depicts the distribution of K/R in 2011 in each subgroup. The sample consists of individuals filing Schedule C in every year of 2004-2012.

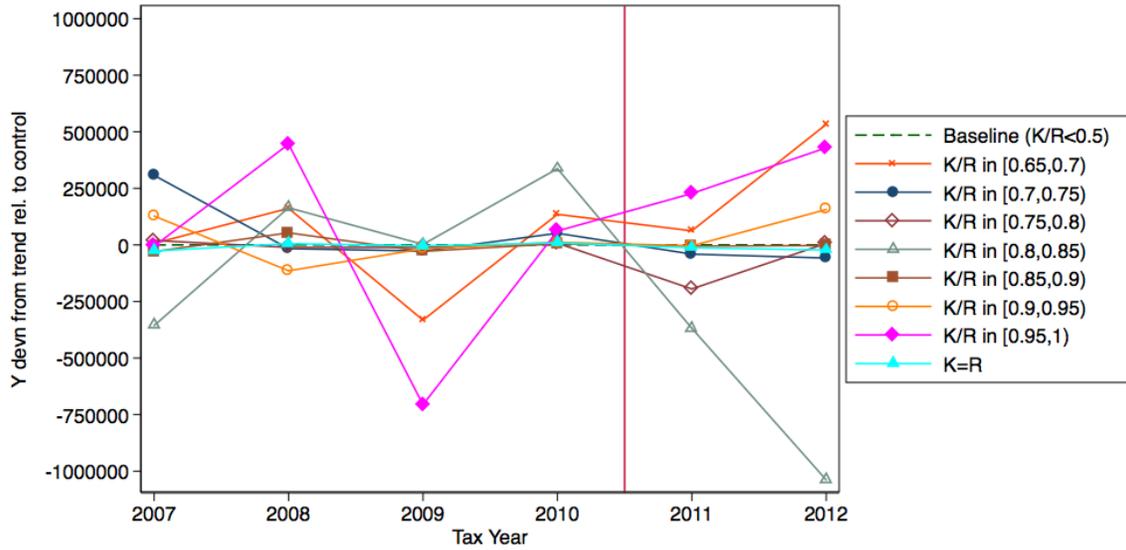
Figure 5. Random Growth Model Estimates
 Panel A: Receipts



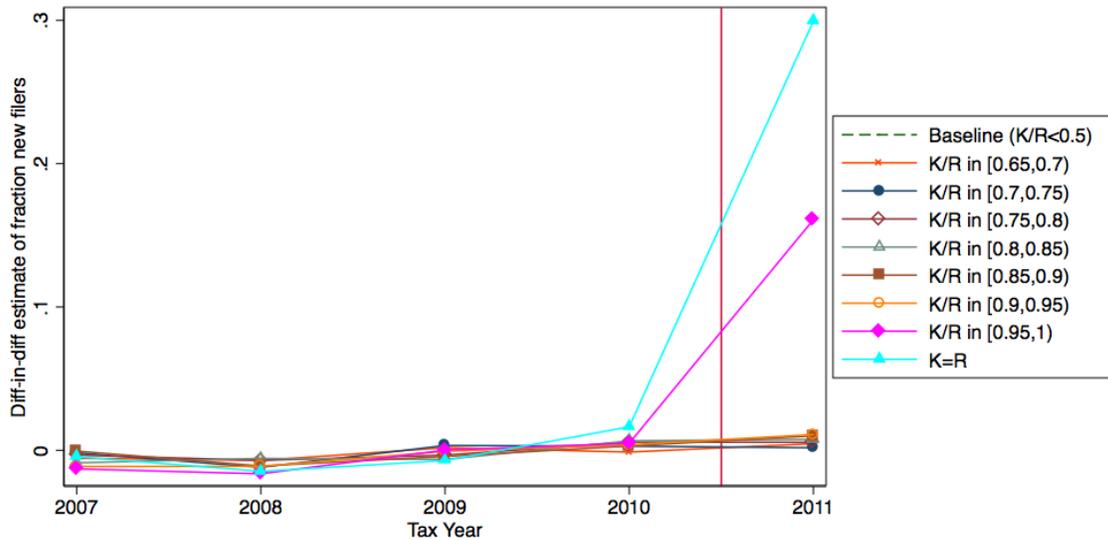
Panel B: Expenses



Panel C. Net income



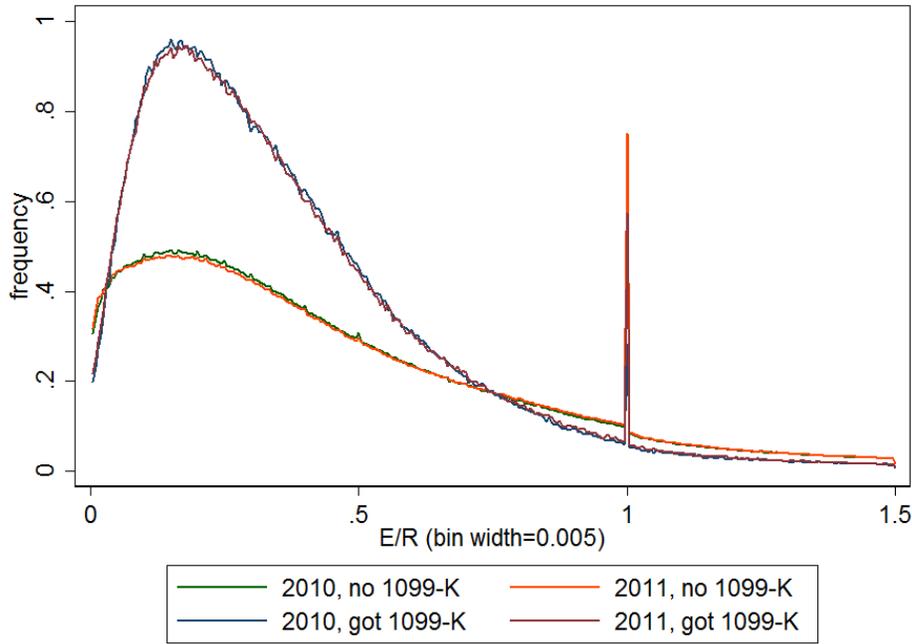
Panel D. Fraction New Filers



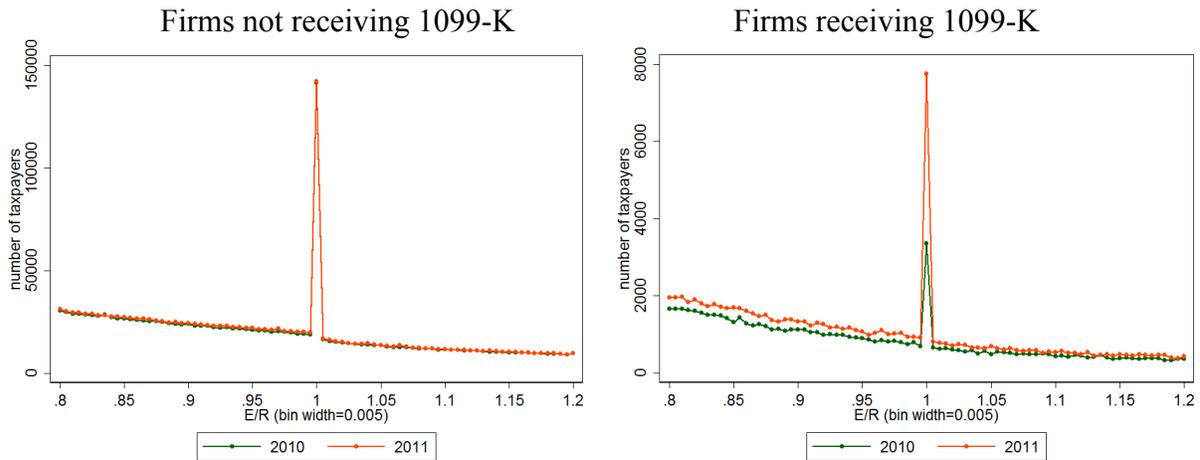
Notes: This figure presents estimates of the heterogeneous impact of Form 1099-K. The baseline group for all estimates analysis consists of firms receiving 1099-K but with $K/R < 0.5$. We estimate a differential impact for higher values of K/R . Panels A through C present the intensive margin results on reporting using a random growth model specification (see Equations 3 and 4), as well as placebo tests of the identification strategy. The sample for this analysis consists of businesses filing Schedule C in every year of 2004-2012. Plotted is the estimated effect in 2011 and 2012 of Form 1099-K on firms with a given set of values of K/R in 2011, along with placebo results for pre-2011. The 2011 effect and placebo effects are calculated using Equation (4) with the pre-trend calculated using the one- and two-year lags of the variable. The pre-trend for the 2012 effect is calculated using the two- and three-year lags of the variable. Panel D reports the extensive margin estimates of the fraction of the given K/R group that were new filers, calculated as the change in the new filer rate in that group relative to the baseline group. Tax year 2012 is omitted from Panel D because the estimation strategy, using whether a taxpayer filed in the previous year, is inapplicable once the policy has been in place for two years. See Section 4 of the paper for further details.

Figure 6. Distribution of Reported Expenses Divided by Reported Receipts, by 1099-K Receipt in 2011

Panel A. Distribution of the ratio of expenses to receipts



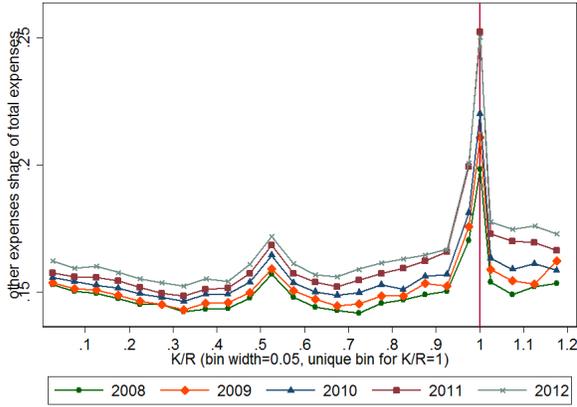
Panel B. Distribution of the ratio of expenses and receipts around unity



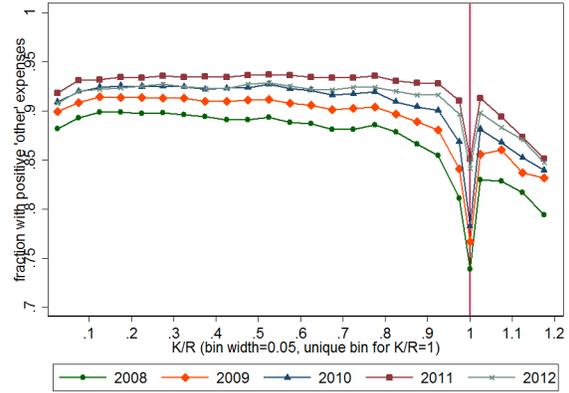
Note: This figure documents the large number of firms reporting receipts equal to expenses, and shows that firms receiving 1099-K in 2011 became more likely to do so in that year. The sample consists of anyone filing Schedule C in 2010 and 2011. Panel A depicts the distributions over a broad range, and Panel B focuses on firms reporting expenses very close to their reported receipts.

Figure 7. Examining Specific Expense Line Items

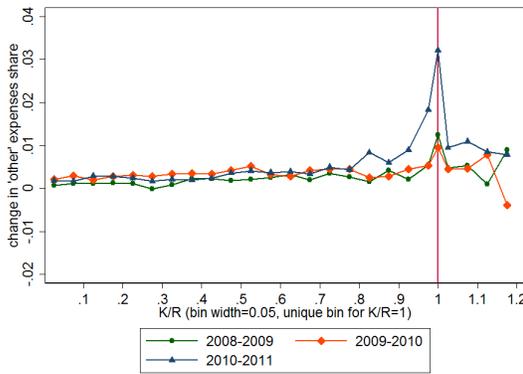
Panel A. Ratio of other expenses to total expenses by year and K/R



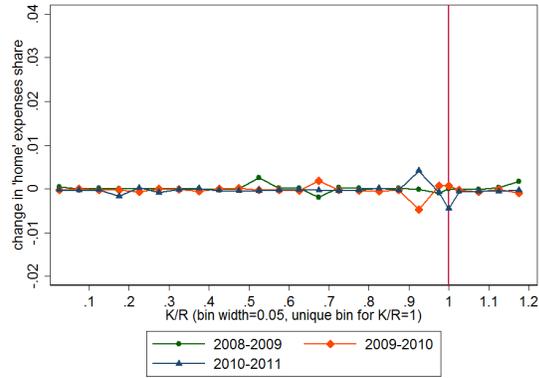
Panel B. Percentage of taxpayers claiming other expenses, by year and K/R bin



Panel C. Changes in the share of expenses devoted to the Other Expenses line by K/R bin



Panel D. Change in the share of expenses devoted to the business use of home expense



Notes. This panel highlights that we observe expense offsetting primarily through the “Other Expenses” line on the Schedule C (line 27a), and not through below-the-line deductions like the one for business use of one’s home (line 30). Panel A depicts the ratio of Other Expenses to total expenses (line 28 plus line 30) of Schedule C, by year and bins of the firms reported value of receipts on 1099-K in 2011 divided by reported receipts on Schedule C in 2011. Panel B depicts the percentage of firms in each bin of K/R that had a non-zero value of Other Expenses on their Schedule C. Panel C depicts the change in the average share of receipts appearing as Other Expenses, from one year to the next, by K/R. Panel D depicts first differences in the share of expenses appearing as business use of home expenses, calculated in the same way as Panel C.

For Online Publication

Appendix A. Data Construction

This Appendix details the construction of the dataset we use to study the Form 109-K. We rely on data from the Compliance Data Warehouse (CDW), the IRS's primary research database, and in particular on two CDW databases: the Individual Returns Transaction File (IRTF) and the Information Returns Master File (IRMF), which contain transcribed tax return data from key IRS forms, including Form 1040, Form 1040 Schedule C, Form 1099-MISC, and Form 1099-K. Because our analysis requires taxpayer level data and most CDW information is provided at the tax form level, a major part of constructing our analysis dataset involves converting form-level data to taxpayer-level data and addressing related problems, such as choosing which filing to use when a taxpayer has multiple filings of the same form for a single tax year. These duplicate filings are usually the result of a taxpayer filing an amended or corrected return, but they can also be caused by errors, for example by a taxpayer mistakenly mailing multiple copies of the same return to the IRS. In general, when duplicates exist, we attempt to select the most recently posted return for a given tax year, or the one that appears to reflect the greatest amount of business activity in the case of multiple returns processed in the same time period.

Schedule C data

Our dataset begins with all Form 1040 Schedule C filings from tax year 2004 through tax year 2012 from the CDW IRTF_SCHEDULE_C table. Most Schedule C filers only need to file one Schedule C for their primary business, but those running multiple businesses are required to file a separate Schedule C for each one. In order to simplify our analysis and allow for the use of return information that cannot easily be aggregated, such as industry codes, we target only the one primary Schedule C for each taxpayer identification number (TIN) for inclusion in our analysis dataset, rather than attempting to combine all Schedule C activity for each TIN by summing fields across primary, secondary, and any additional Schedule C filings. To select only the primary Schedule C for each taxpayer, we start by restricting the initial pool of Schedule C filings to include only those returns with the most recent posting date for each TIN in each tax year, since more recent postings are likely to reflect amended or corrected returns that are more accurate than the original, earlier filings. If multiple Schedule Cs remain after restricting the data to only the most recent filings, we select only the form with the highest reported gross receipts from line 1 of the Schedule C for each TIN and tax year as a method to identify the taxpayer's primary Schedule C business activity. At this point, any additional duplicates represent Schedule C filings for the same TIN in the same tax year posted at the same time with the same gross receipts, and with no further basis to prefer one duplicate over another, we aim for consistency, in most cases selecting the largest value available on any of the duplicates on a field-by-field basis (the exceptions are the categorical fields for accounting method and TIN type, for which we take the minimum value).

Form 1040 data

Once we have constructed observations for a single Schedule C for each TIN-tax year combination, we add additional taxpayer-level data from the IRTF_ENTITY table, which is already structured this way, with one observation per taxpayer per tax year. This table allows us to bring in fields for the TIN of the taxpayer's spouse in cases where the filing status of the taxpayer's Form 1040 is married filing jointly and the spouse's TIN is derived from a Social Security Number (SSN), rather than an Employer Identification Number (EIN), which can help

match the taxpayer's primary returns to the relevant information returns. We also rely on the IRTF_ENTITY table for some filing information from the taxpayer's Form 1040 which can be assumed to also be true of the Schedule C, including whether or not the return was electronically filed and whether or not a professional tax preparer was involved in the preparation of the return, which we infer by the presence of a preparer TIN and/or a preparer EIN on the Form 1040.

Information returns, Form 1099-K and Form 1099-MISC

With primary return data in place, we follow a similar process with information returns, using data from both the IRMF_F1099MISC and IRMF_F1099K tables. Since we can only use information return records that can be matched to Schedule C filers, we eliminate all information returns with invalid payee TINs. Because some payee TINs represent SSNs and some represent EINs, information returns must be matched to the primary returns in stages, and we ensure we capture all of a payee's returns whether the filer used an SSN or an EIN for the payee TIN by aggregating all payees' information returns across payers separately for returns with payee SSNs and payee EINs, only calculating the total across all information returns once each piece is matched to the primary returns. To help reduce the number of potential mismatches, we also take advantage of another CDW field, the TIN Association Key Code, to restrict the pool of information returns with an EIN payee TIN to those with the EIN of a sole proprietorship. Errors are common on the payee TINs of information returns, but, while common, they are also difficult to detect. However, since Schedule C is filed only by sole proprietorships, eliminating EINs associated with non-sole proprietorship businesses can prevent cases in which an information return that belongs to a large business but is incorrectly filed with the TIN of a small Schedule C business results in a large discrepancy between reported Schedule C income and information return income.

In aggregating Form 1099-K and 1099-MISC income, we allow one of each return for each payee TIN-tax year-payer TIN combination. As CDW IRMF tables code whether a return was filed as original, corrected, or amended, if we have multiple filings by the same payer for the same payee in the same tax year, we prioritize the amended return if available, then the corrected, then the original, assuming amended returns are more accurate than the original filings. If duplicates remain, we usually select the largest value available on a field-by-field basis, as we do with Schedule C, with the exception being the type of transaction reported field from Form 1099-K, for which we use the minimum value. For Form 1099-K, we calculate total 1099-K receipts from the gross payment amount in box 1, splitting payment card income and third-party-network payment income where possible. Form 1099-MISC income is calculated as the sum of rents (box 1), royalties (box 2), other income (box 3), fishing boat proceeds (box 5), medical and health care payments (box 6), nonemployee compensation (box 7), substitute payments in lieu of dividends or interest (box 8), crop insurance proceeds (box 10), and gross proceeds paid to an attorney (box 14).

Merging primary returns and information returns

Having calculated total 1099-MISC and 1099-K income for each taxpayer by TIN type (SSN or EIN), we use a multi-stage process to match the information return data to Schedule C data. Information returns with EIN payee TINs have these payee TINs matched to the EIN reported on the Schedule C if one is available. Schedule C EINs are reported in a separate field from the Schedule C TIN, which is always an SSN. For returns with an SSN payee TIN, we start with the full population of Schedule C returns and SSN TIN information returns, and match as many as possible with the primary TIN. Any returns that were matched are then removed from the pool of Schedule C returns and Forms 1099-K/1099-MISC, and an additional match is conducted on the

remaining returns using the TIN of the spouse of the primary filer of the Schedule C, when available (from the taxpayer's Form 1040). This process allows us to match as many information returns as possible to each taxpayer's Schedule C, whether they are filed with an EIN, primary SSN, or spouse SSN as the payee TIN. Once all possible matches are made, we sum income fields derived from all payee TIN types for each TIN to calculate total 1099-K and 1099-MISC income for each Schedule C filer. Due to errors with filing, transcription, or incorrect TINs, we observe numerous cases where total income reported on information returns greatly exceeds that reported on the Schedule C, with extreme cases reporting over \$1 billion in receipts, which are unlikely to reflect the true income of a sole proprietorship filing a Schedule C. We attempt to reduce the impact of these extreme observations on our analysis by removing observations with dollar values over \$1 billion, applying this restriction not only to income reported on information returns, but also key variables from the Schedule C, such as receipts and expenses, for consistency.

Appendix B. Discussion of Conceptual Framework

This Appendix contains a more detailed theoretical discussion of firm's reporting decisions, to deepen the intuition behind the main theoretical predictions described and taken to data in the body of the paper. (2) when expenses are not subject to information reporting, any increases in receipts from an increase in information reporting will be offset by increases in expenses. As mentioned in the body of the paper, our theoretical work is based on the work of Allingham and Sandmo (1972) and Srinivasan (1973), and contains similar insights to that in independent work by Carrillo et al. (2014). As in the body of the paper, we consider only reporting decisions, taking as given real decisions such as how much output to produce and sell and whether to accept payment cards.

A simple model of receipts reporting

We begin with a model of a risk-neutral business that has no deductible expenses. This model is far simpler than necessary to derive the interesting predictions of the model, but it illustrates the reasoning behind the first major prediction of the model, that taxpayers most affected by an increase in information reporting will report receipts approximately equal to the gross amount reported by third parties. In the next section, we introduce expenses into the model.

Firm i chooses the level of receipts R_i to report to the tax authority, given true receipts Q_i and the amount of receipts reported to the tax authority by third parties, K_i . The firm's problem is:

$$\max_{R_i} Q_i - tR_i - p_i(R_i, Q_i, K_i)s(Q_i - R_i), \quad (\text{A1})$$

where t is the income tax rate, assumed to be constant for simplicity, and $p_i(\cdot)$ is the probability of detection and punishment of evasion. In the event that the firm reports $R_i < Q_i$ and is detected, it must remit the fraction $s > t$ on its unreported receipts.

We specify a probability of detection with two intuitive properties: first, the probability of detection is decreasing in the fraction of true receipts the firm reports to the IRS, and, second, the probability of detection increases discontinuously to one when the taxpayer reports receipts below the amount reported to the tax authority. In other words, we suppose taxpayers believe that more compliant firms are less likely to be audited, and that reporting information that directly contradicts third-party information results in a certain audit.

Using a similar approach to Phillips (2014), we write the probability of detection as

$$p_i(R_i, Q_i, K_i) = \begin{cases} 1, & \text{if } R_i < K_i \\ \frac{\alpha_i Q_i - R_i}{2 Q_i}, & \text{if } R_i \geq K_i \end{cases}, \quad (\text{A2})$$

where $\alpha_i \leq 1$ summarizes firm i 's *audit threat* from enforcement efforts other than information reporting. For example, a firm experiences a low audit threat if it believes that increasing its under-reporting is (1) unlikely to result in an audit in the absence of information reporting, or even (2) unlikely to be detected in the event of an audit. The specific functional form we use here is an expository tool, allowing us to capture all variation in audit threat in a single firm-specific parameter—in the more general model in the paper (see Equation 2) the role of α_i is replaced by the first derivative of a function $q_i(R, E)$ with respect to R .

Factors causing firm-specific variation in audit threat could include the size of the business, how much income the business owner has from other sources, the salience of tax enforcement to the taxpayer and, importantly, the share of transactions conducted in cash, which is more easily hidden from the tax authority than those received through payment cards. One could also add to this model a second parameter summarizing idiosyncratic preferences for tax compliance, which would multiply the last term in Equation (1). This parameter would have effects on compliance identical to the effects of α_i , so in an informal sense one can think of α_i as summarizing the taxpayers' *propensity to report truthfully* in the absence of information reporting, which could vary due to enforcement efforts targeting different kinds of taxpayers or varying taxpayer preferences for compliance (Erard and Feinstein 1994). Another key parameter for the solution to the problem is $\gamma_i \equiv \frac{K_i}{Q_i} \leq 1$, the fraction of the firm's receipts subject to information reporting.

The solution to the firm's problem is given by the following:

$$R(\alpha_i, \gamma_i, K_i, s, t, Q_i) = \begin{cases} \left(1 - \frac{t}{s\alpha_i}\right) Q_i, & \text{if } t \leq s\alpha_i \text{ and } \left(1 - \frac{t}{s\alpha_i}\right) > \gamma_i \\ K_i, & \text{if } t > s\alpha_i \text{ or } \left(1 - \frac{t}{s\alpha_i}\right) \leq \gamma_i \end{cases} \quad (\text{A3})$$

Using Equation (A3), we can calculate the effect on reported receipts of an increase in information reporting (i.e., the introduction of the Form 1099-K) from zero to some level K_i , casewise. That effect is summarized by the following:

$$R(\alpha_i, \gamma_i, K_i, s, t, Q_i) - R(\alpha_i, 0, 0, s, t, Q_i) = \begin{cases} 0, & \text{if } \left(1 - \frac{t}{s\alpha_i}\right) > \gamma_i \\ K_i - \left(1 - \frac{t}{s\alpha_i}\right) Q_i, & \text{if } 0 \leq \left(1 - \frac{t}{s\alpha_i}\right) \leq \gamma_i \\ K_i, & \text{if } \left(1 - \frac{t}{s\alpha_i}\right) \leq 0 \end{cases} \quad (\text{A4})$$

There are three distinct possibilities suggested by the three rows of Equation (A4), which we can characterize in terms of the two key parameters that vary across firms, the audit threat α_i and the share of true receipts reported to the tax authority, γ_i . Panel A of Figure A1 depicts these possibilities.

- Case 1: if α_i is large and γ_i is small, firms report some constant fraction of income that depends negatively on the tax rate and positively on the penalty rate and the propensity to report truthfully. These firms are unaffected by information reporting.
- Case 2: if α_i is small (but not so small so as to result in Case 3) and γ_i is large, the firm reports receipts exactly equal to the amount reported by third parties. These firms increase reported receipts on the intensive margin in response to information reporting.
- Case 3: if α_i is sufficiently small, the firm reports only receipts about which third parties inform the tax authority, regardless of the level of information reporting. These firms are affected on the extensive margin of receipts reporting by 1099-K.

Case 3 firms would not report anything in the absence of information reporting. For both Case 2 and Case 3 firms, the incentive to avoid the audit threat causes bunching where $R_i = K_i$, that is, where $K_i/R_i = 1$. Panel B of Figure A1 plots the firm's receipts with and without information reporting as a function of the fraction of receipts subject to information reporting, γ_i , for Cases 1 and 2. Note that when all a firm's receipts are subject to information reporting, so that $\gamma_i = 1$, the firm reports truthfully. Panel C of Figure 2 shows the predicted value of K_i/R_i , as a function of γ_i .

It illustrates a key insight from the model used in the paper: any firm that responds to the 1099-K, either intensively or extensively, will report exactly the amount on the information reports: $R_i = K_i$.

This simple model illustrates that the effect of Form 1099-K is likely heterogeneous, depending especially on (1) the fraction of true receipts subject to information reporting, and (2) the firm's propensity to report truthfully in the absence of information reporting. These two factors matter because they can cause the firm's counterfactual report—the report made in absence of Form 1099-K—to be well above the amount of receipts reported to the IRS, so much so that the audit threat introduced by 1099-K is negligible. The firms most likely to be affected have a large fraction of receipts subject to information reporting and/or a large degree of noncompliance in the absence of the form. The first criterion would apply primarily to businesses like online merchants who accept payment mostly through payment cards or third-party networks (such as PayPal), in sharp contrast with individuals receiving large amounts of cash, such as taxi drivers or convenience stores. Notably, these two criteria (whose importance was summarized in the model by α_i and γ_i) may be *positively correlated*: even without the Form 1099-K, the paper trail associated with payment card use increases audit threat. Tax under-reporting by small businesses is empirically found to be correlated with cash use (Morse et al., 2009). However, firms with high rates of cash use could still be affected by 1099-K provided they had high rates of noncompliance prior to the form (i.e., very low α_i in the model). In Section 6 of the paper we shed some empirical light on the possible causes of a response to 1099-K using the sectoral composition of the 1099-K recipients that bunch where reported receipts are close to the gross 1099-K amount, and whether 1099-K's came from payment card entities or TPSEs.

Expenses

Many small businesses have costs of doing business that are deductible from receipts in the calculation of income subject to tax (Internal Revenue Code (IRC) §162). We can introduce deductible expenses into the model by allowing the firm to choose not only reported receipts, but reported expenses. Expenses are not subject to information reporting in the model or in reality, though the Affordable Care Act included a provision incorporating some expense reporting into new 1099 forms, which was later eliminated.

The firm's problem with expense reporting becomes Equation (1) in the body of the paper, and the probability of detection with expense reporting, the generalization of Equation (A2), is contained in Equation (2) in the body of the paper. We will not discuss the results described in that section further here, except to note that the insights from the above simplified version of the model still obtain in the general case, and that when E_i is fixed this model nests the model in the previous section. We also note that the point made by Carrillo et al. (2014) that reported expenses can in general be greater *or less* than true expenses (before and/or after an increase in information reporting of receipts) obtains in our version of the model, but does not affect the prediction that increased receipts reporting will be offset by increased expense reporting.

Other Extensions and Discussion

Here we discuss how a few variations of the model would affect its predictions.

We can incorporate into the model the notion that a firm that does not submit a Schedule C may

face a lower probability of detection than a firm filing a Schedule C and declaring arbitrarily small receipts and expenses. To examine how this changes the model, we can add an extensive margin filing choice variable $F \in \{0, 1\}$, such that $F = 0$ indicates non-filing, and write the probability of detection as

$$p_i(R_i, E_i, K_i) = \begin{cases} 1, & \text{if } R_i < K_i \\ q(R_i, E_i) - \beta_i(1 - F), & \text{if } R_i \geq K_i \end{cases} \quad (\text{A5})$$

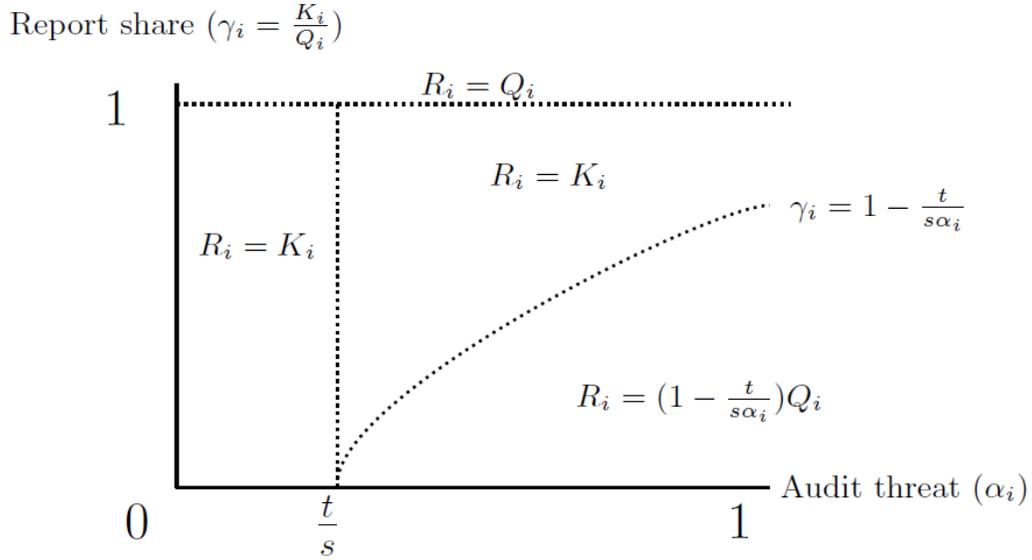
where $\beta_i > 0$ summarizes how the firm's detection probability declines discretely when, in addition to reporting no receipts or expenses, it declines to file a Schedule C.

This addition changes the predictions of the model in two ways. First, information reporting intensifies the predicted extensive margin response. The receipts-only model in Section 3.1 predicted an extensive margin response to increased information reporting (due to the non-negativity constraint on R_i), but this possibility adds to the reasons a firm may not file a Schedule C. Second, this addition breaks the prediction that *every* firm affected by information reporting will end up reporting $R_i = K_i$, although the model does predict that some affected firms—and virtually all affected firms when β_i is small—will report $R_i = K_i$, so long as some firms have sufficiently low α_i . This reasoning highlights that some firms caused to file Schedule C by 1099-K may not be visible in the analysis in Section 6, which focuses on firms reporting R_i near K_i .

In our theoretical discussion, we have ignored the possibility that γ_i may be influenced by the firm at some cost. Were the cost of doing so low enough, noncompliant firms would want to decrease γ_i , either by incentivizing cash payments or by declining to accept some payment methods subject to information reporting. Our data do not provide a credible means of examining whether firms respond to the Form 1099-K in this way. If they do, however, its effect would be smaller than predicted in the model presented here, but qualitatively similar: many firms affected by 1099-K should still bunch near the point where reported receipts equal the 1099-K amount, and firms reporting substantially below the 1099-K amount would have had little change in their reported receipts (but possibly some change in their payment methods) in response to 1099-K. Relatedly, we find no “hole” in the distribution of 1099-K amounts around the *de minimis* restrictions applying to third-party network vendors (\$20,000 dollars and 200 transactions). This fact suggests that firms are not willing and/or able to decrease their receipts from third-party network transactions to avoid information reporting from third-party network vendors, at least along the intensive margin. This finding is consistent with the findings of Arango and Taylor (2008) and Jonker (2011), whose work suggests that many firms have limited capacity to manipulate the share of receipts from various transactions types.

Figure A1. Model Predictions of the Impact of Form 1099-K

Panel A. Reported receipts as a function of the share of receipts reported and audit threat in absence of information reporting



Panel B. Reported receipts as a function of the amount reported to the tax authority

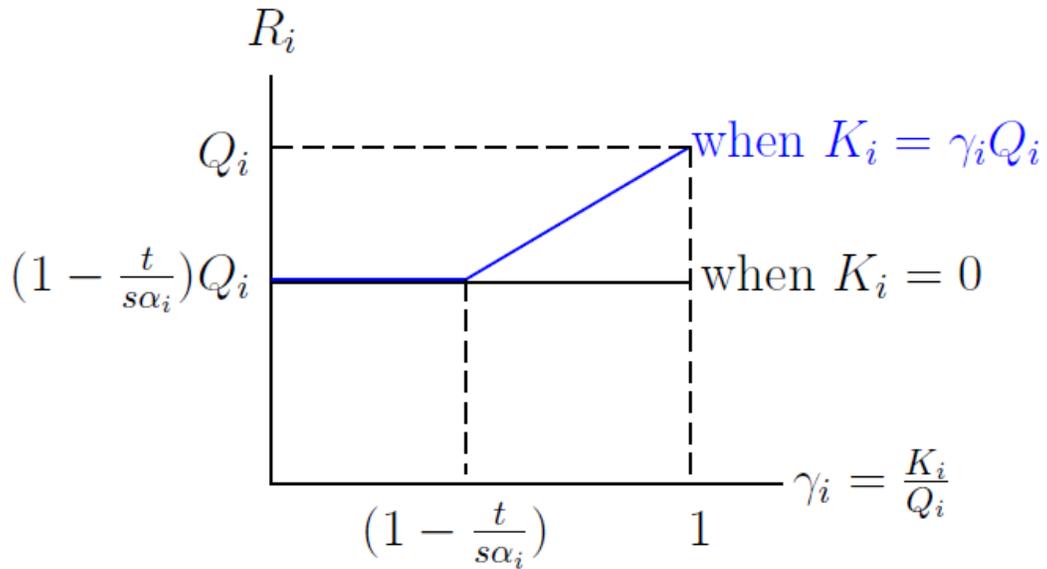
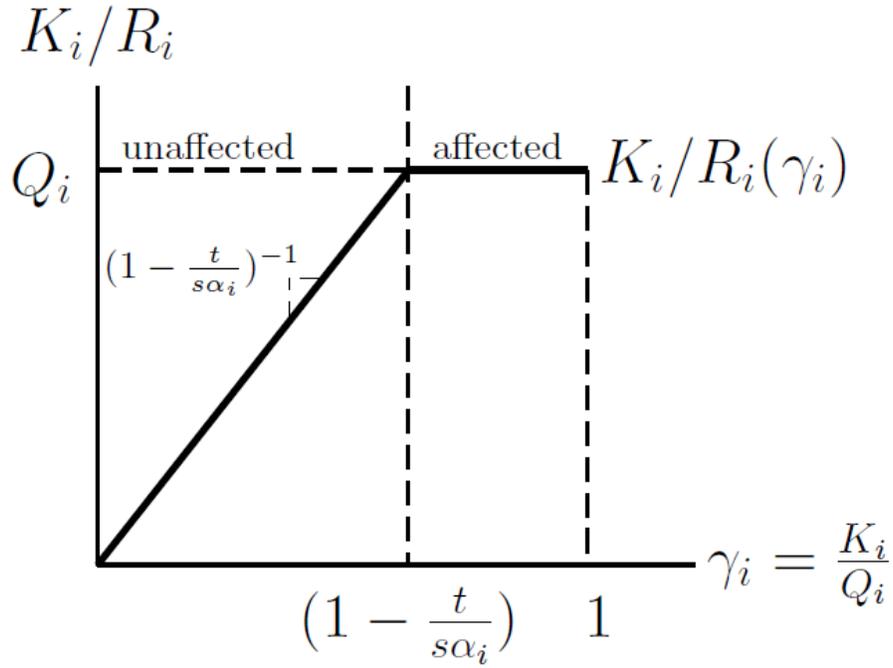


Figure A1. (continued) Theoretical Prediction of the Impact of Form 1099-K

Panel C. Predicted ratio of information report amounts and receipts amounts



Note: This figure depicts the theoretical predictions for how firms' response to Form 1099-K is affected by its propensity to report truthfully in absence of information reporting and the share of its receipts subjected to information reporting, derived using the simple receipts-only model discussed above. Panels B and C are drawn for the case where the firm under-reports in the absence of information reporting, rather than not reporting any receipts at all.