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**Small Business Tax Policy, Informality, and Tax  
Evasion – Evidence from Georgia**

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Research Papers

## **Small Business Tax Policy, Informality, and Tax Evasion – Evidence from Georgia**

Miriam Bruhn and Jan Loeprick<sup>1</sup>

### **Abstract**

Using a panel of administrative data and regression discontinuity analysis, this paper examines how the introduction of preferential tax regimes for Georgian micro and small businesses in 2010 affects formal firm creation and tax compliance. The results show that the new tax regime for micro businesses increased the number of newly registered formal firms by 18–30 percent below the eligibility threshold during the first year of the reform, but not in subsequent years. The analysis does not find an effect of the new tax regime for small businesses on formal firm creation in any year. Policy makers are often concerned about abuse risks stemming from differentiated tax treatment of micro and small businesses. The analysis in this paper reveals reduced tax compliance in 2010 around the micro business eligibility threshold, but does not find significant evidence of reduced compliance by Georgian firms in later years. The results also do not show any significant evidence of strategic sorting around the regime eligibility thresholds.

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## 1. Introduction

This paper measures the impacts of a tax reform directed at Georgian micro and small enterprises (MSEs). Using a panel of administrative data provided by the Revenue Service and regression discontinuity analysis, we examine how the introduction of preferential tax regimes for micro and small businesses in 2010 affects formal firm creation and tax compliance.

Extensive informality of small firms and individual entrepreneurs is frequently cited as a critical challenge for developing countries (Perry et al. 2007, Enste and Schneider 2002). Yet, when looking at the loosely defined concept of informality<sup>2</sup> from a tax policy vantage point, the need for nuance becomes obvious (Keen 2013). Broadly speaking, while small unregistered businesses have little to do with large tax evaders, unreported business activity is ‘informal’ regardless of its initiator. Formality may, however, only be marginally relevant for (micro) businesses with little growth potential; and tax administrations tend not to gain much from paying attention to these entities either. Alternatively, informality may be a smart choice of entrepreneurs gaining cost advantages distorting competition (Farrel 2004) and, in this context, provides a major loophole affecting revenue collections.

Many country-specific factors play a role in determining the scale and scope of informal economic activity, which includes a variety of non-compliant behaviors.<sup>3</sup> Among these, regulatory and tax policy and resulting administrative procedures, are commonly seen as one of the main policy levers. Starting with de Soto’s influential work (1989), many recent studies examining businesses’ formalization decision highlight that unevenly enforced and burdensome regulations as well as corruption (Friedman et al, 2000) and entry costs (Djankov et al., 2002; Auriol and Walters 2005; Bruhn 2013) are associated with (in)formal economic behavior. Looking more specifically at tax regulation, changes in statutory rates combined with enforcement (Ihrig and Moe 2004), sector specific needs for access to formal sources of financing (Feltenstein and Shamloo 2013), as well as regressive compliance costs may determine businesses’ compliance levels (WB 2011).

Consequently, tax policy and administration is likely an important instrument affecting businesses’ formalization decisions and their related growth potential, as well as the development of a reciprocal relationship between governments and the majority of their constituents, particularly in developing economies (IMF 2011, OECD 2010, WBG 2008). A wide range of countries is therefore relying on some form of special tax regimes geared towards small businesses. The benefits and shortcomings of

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<sup>2</sup> Perry et al. (2007, p.21-22) provide a useful overview on the range of agents that can be captured under the term informality. In the context of this paper a definition of “firms and individuals avoiding taxation or other mandated regulations (...) [or] registering only part of their workers and part of their sales” seems most appropriate. When we assess the effect of the Georgian reforms on registration we consider a firm to be registered only when it has also filed a tax return in a given year (non-registered businesses thus includes firms that are registered with the tax authority, but do not file a tax declaration, even if they do not owe taxes).

<sup>3</sup> Informality and formality are not “all-or-nothing” stages but multi-dimensional with varying degrees. Some firms are registered but do not pay (all) taxes, did not obtain a land title for their premises, or do not have the licenses required for their business. Others may be fully compliant with corporate taxation, but never declare all staff in order to avoid social security contributions. Given its heterogeneous nature, it is clear that there are a multitude of definitions for informal economic activity, possibly affecting measurements of informality (Schneider and Enste, 2000) and often resulting in differing policy recommendations.

different forms of such simplified taxation approaches in encouraging formalization have been widely discussed (Bodin and Koukpaizan 2008, IFC 2009). A major concern is the strategic behavior around eligibility thresholds which create a disconnect between the general tax system and special regimes (Bird and Wallace 2004, Engelschalk 2004). Another concern is that preferential treatment or higher level of tolerated evasion by small businesses in combination with low effective tax rates for large businesses, which typically benefit from a range of special provision to encourage investment, may result in an inverted U-shaped pattern of the tax burden, potentially placing medium-sized business at a competitive disadvantage (Gauthier and Gersovitz 1997; Gauthier and Reinikka 2006).

Country practices range from subjecting micro and small businesses to standard income and value-added tax obligations, to simplified assessments on presumed income, all the way to a complete exemption from income tax obligations. Arguably, the most common approach in developing countries, as well as in a range of OECD economies, is to offer the option of applying simplified presumptive tax regimes to micro and small business (ITD 2006).<sup>4</sup> These simplified regimes, typically rely on turnover as a presumptive tax base, though several countries have opted for different approaches such as indicator and asset based instruments (Loeprick 2009, Memon 2010). In light of the multiplicity of design options available to policy makers and administrative solutions applied by tax administrations globally, a better understanding of their effectiveness in widening the tax base, preserving fairness and mitigating abuse has relevance beyond the academic discourse. Yet, evidence of the impact of targeted tax policy and administrative reforms on small business behavior is in short supply, particularly in developing economies.<sup>5</sup>

The most relevant assessments of the effect of introducing a simplified tax regime study a tax policy reform for small businesses in Brazil. Expanding earlier work by Monteiro and Assuncao (2006), Fajnzylber et al (2010) find a significant local effect of the introduction of the simplified turnover based tax regime ('SIMPLES') that was introduced in November 1996 on the registration and resulting performance of small businesses. To our knowledge, Fajnzylber et al (2010) provide the first set of robust estimates illustrating a beneficial impact of tax reforms geared towards micro and small enterprises (MSMEs) on formalization and firm performance. However, this analysis is limited to estimating the benefits of the Brazilian reform based on survey data, raising concerns about the reliability of self-reported compliance behavior and, notably, not offering the possibility to capture potential abusive behavior in response to the reform.

The strategic response by businesses and individuals to tax policy thresholds has been investigated in a number of studies examining, for instance, taxpayer bunching around kinks in the United States (Saez 2010) and Danish income taxes (Chetty et al 2011). Kanbur and Keen (2014) provide a theoretical framework to analyze the complex link between the level of tax thresholds and compliance behavior, suggesting that higher evasion risks may justify higher thresholds. Looking more specifically at

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<sup>4</sup> Typically, but not necessarily defined by the VAT threshold; Several OECD countries operate presumptive regimes. Weichenrieder (2007) provides a comprehensive summary of OECD country practices.

<sup>5</sup> Empirical research is limited; likely the result of both the relatively small contribution of this segment to official output numbers and the scarcity of reliable centralized information on small business activity. See also Bruhn (2011).

small business tax policy measures, Onji (2009) documents that generous treatment in the Japanese VAT system provides an incentive for downward migration of larger entities hiding below the eligibility threshold. Kleven and Waseem (2013) provide insights into taxpayer responses to thresholds in a developing country context. Studying the behavioral response to income taxation in Pakistan with administrative data, they find evidence of bunching below bracket cutoffs with discontinuous jumps in tax liabilities.<sup>6</sup>

Exploiting tax policy changes in Georgia, we aim to provide further insights into MSE compliance behavior, including an analysis of strategic business behavior that could potentially undermine the objective of policy reform. Using administrative data and a regression discontinuity design, we focus our analysis on the eligibility thresholds for the new regime. We investigate (i.) to which extent the Georgian reforms promote formal firm creation, by prompting more businesses to register with the tax authority, and (ii.) to which extent the reforms impact tax compliance, by providing an incentive to declare a lower fraction of business income to the tax authority, and/or cause firms to hide and migrate below the threshold of eligibility.<sup>7</sup>

Our findings suggest that the Georgian reform did indeed contribute to formal firm creation – the new tax regime aimed at micro businesses increased the number of newly registered formal firms below the eligibility threshold of GEL 30,000 by 18-30%. This effect is, however, limited to the first year of the introduction of the reform. Unlike for the micro business regime, we do not find a robust effect of the small business tax regime on formal firm creation in any year. When looking at abuse risks, our results show no significant evidence of strategic sorting following the introduction of the new regime, but we do find some evidence of less tax compliance by previously registered firms around the micro taxpayer threshold. Similarly to the effect on firm registration, this effect on tax compliance appears to be short-lived and only lasts for the first year after the new regime was introduced.

The findings and the underlying analytical steps, including a review of overall taxpayer registration trends are valuable for practitioners - hopefully informing implementation work in Georgia - as well as for the global policy discussion on taxation and informality. While our findings indicate that the design of presumptive tax regimes may indeed be an instrumental policy tool to encourage tax registration, the goal of the Georgian policy reforms, it also suggests that such reforms are, at best, a small piece in a much bigger puzzle. Skepticism about easy solutions in this particular area of tax policy thus seems vindicated. At the same time, the absence of strong evidence of major abuses is meaningful for the discussion of presumptive tax instruments. Similar to the discussion of expected benefits, risks

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<sup>6</sup> The Pakistani income tax system has different brackets with constant average rates.

<sup>7</sup> The first question above encompasses both the start-up of new formal firms, as well as the tax registration of previously informal firms. Note that the second question allows for the possibility that the reform could discourage firms from declaring a higher fraction of their income. The reason for this possible outcome is that only firms below GEL 30,000/ GEL 100,000 are eligible for the new tax regimes, which could provide an incentive for firms to not report income higher than these amounts. There is also a risk of firms responding to the incentives provided in the simplified regimes by splitting-up activities to reregister them below the threshold(s), thereby increasing new registration levels below the thresholds and decreasing the number of firms above the thresholds. These strategic incentives also pose some difficulties for our empirical analysis, as explained below.

associated with differentiated tax treatment for MSEs might be overstated; with our findings suggesting that good policy design and administration can be effective in curbing abuses.

The paper proceeds as follows, Section 2 provides an overview on the Georgian tax reform, including a discussion on potential trade-offs resulting from the policy changes. In the following sections we present our data (3), empirical approach (4), and findings (5). Section 6 concludes.

## **2. The 2010 Tax reform for MSMEs**

The Government of Georgia (GoG) passed a new tax code on September 17<sup>th</sup>, 2010 and subsequently conducted several outreach events to inform the private sector of the coming changes.<sup>8</sup> As part of the reforms new tax regimes were introduced for micro and small businesses. The GoG took the established VAT exemption threshold of GEL 100,000 as the starting point for the design of the presumptive (income) tax regime.<sup>9</sup> Businesses with an annual turnover below GEL 30,000 (US\$ 18,255<sup>10</sup>) and without employees were designated as “micro” businesses and exempt from income taxation, and businesses with an annual turnover between GEL 30,000 and GEL 100,000 (US\$ 60,850) were designated as “small” businesses and have the option to be taxed based on turnover at a rate of 3 or 5 percent.<sup>11</sup> The design of the Georgian system deviates from commonly used presumptive regimes (i.) by fully exempting micro businesses (instead of requiring a lump sum payment)<sup>12</sup> and (ii.) by offering the option to small businesses to reduce the applicable turnover rate from 5% to 3%, in case of sufficient documented expenditures.<sup>13</sup>

This new regime was designed to significantly reduce compliance and administrative costs for businesses and the revenue service. The policy objective of these measures was to foster a culture of compliance and to provide businesses with certainty through registration, particularly for micro entities. Policy makers recognized that actual tax liabilities of small businesses could also be reduced under the new regime, depending on profitability levels. The new tax code came into force retroactively for the tax year 2010.

### *2.1 Background of the reform*

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<sup>8</sup> See for example: Georgian Journal, 23rd September 2010: “New Tax Code Favors Small Business”; Finchannel September 21st: “IFC, Georgian Ministry of Finance Host Public-Private Dialogue to Reform Tax System; 24 Hours (Daily Georgian Newspaper), 17th September: “Consultation on New Tax Code Finished”.

<sup>9</sup> This approach is based on the assumption that taxpayers, who are required and capable to comply with the standard VAT, can also be expected to pay taxes based on their income.

<sup>10</sup> Using the August 2012 exchange rate of 1 GEL = 0.6085 USD.

<sup>11</sup> The small business tax regime also applies to businesses with annual turnover below GEL 30,000 that have employees.

<sup>12</sup> As an additional safeguard, only physical persons that operate a business without employees are eligible for the “micro” status.

<sup>13</sup> The regime provides a number of key advantages over a system simply based on gross turnover, most importantly by providing an incentive for performing basic accounting and maintaining a single rate while recognizing differences in sector profitability. At the same time, the approach favors businesses with high profit margins (for instance in the service sector). Finally, the full exemption of micro businesses, using a comparatively high threshold of GEL 30,000, risks creating a strong disincentive to business growth.

Over the last two decades, the tax treatment of small Georgian businesses has varied extensively with the application of different presumptive tax regimes. These experiences have been rather unsatisfying, being both a reflection of the challenges of taxing this sector of the economy and the uncertainty among policymakers regarding the appropriate design of presumptive tax regimes.<sup>14</sup>

In an early attempt to simplify the taxation of small traders, an area-based presumptive tax regime was introduced in 1994-95. However, the system faced common problems of size-based indicators, namely weak correlation with turnover and profitability, as well as loopholes facilitating abuse. The regime was abolished in 1996. A new presumptive “patent” system was adopted in 1998, distinguishing a number of different trades.<sup>15</sup> For a patent system with lump sum payments this approach did not sufficiently differentiate between business activities and, not surprisingly, performed poorly in terms of revenues.<sup>16</sup> Subsequently, the regime’s categories were extended to more than 30, yet the performance continued to be unsatisfactory in terms of revenue generated. This was partly due to the lack of information on actual profitability in different sectors and the resulting non-alignment of tax payments with the liabilities under the regular tax regime. The introduction of a simplified turnover tax was attempted in 2001, but rejected in parliament because the proposed single rate of 7% was seen as too high (Engelschalk 2004). Instead, with the adoption of the new tax code in 2005, a single tax treatment for all taxpayers with same rates and compliance requirements for micro, small, medium and large taxpayers was introduced.

While such a single tax regime for all businesses ensures a consistent tax environment, the result of using the same provisions for large and small firms is a comparatively higher relative compliance burden for small businesses. After the reform in 2005, taxpayer perceptions, captured in a World Bank survey, improved dramatically among large businesses with a drop from 26% in 2005 to only 4% of respondents in 2008 pointing to tax administration as a constraint for their operations (see Figure 1). For small firms, however, the trend went in the opposite direction; the share of small businesses that identified tax administration as a key barrier to doing business, rose from 11% in 2005 to 20% in 2008. With the objective of reducing administrative and taxpayer compliance costs in order to encourage participation of micro and small taxpayers in the formal economy, the GoG decided to re-introduce a presumptive tax regime in 2010. Subsequently, in 2013, taxpayer perceptions improved dramatically among small business respondents to a World Bank Survey, though they worsened among medium sized taxpayers.<sup>17</sup>

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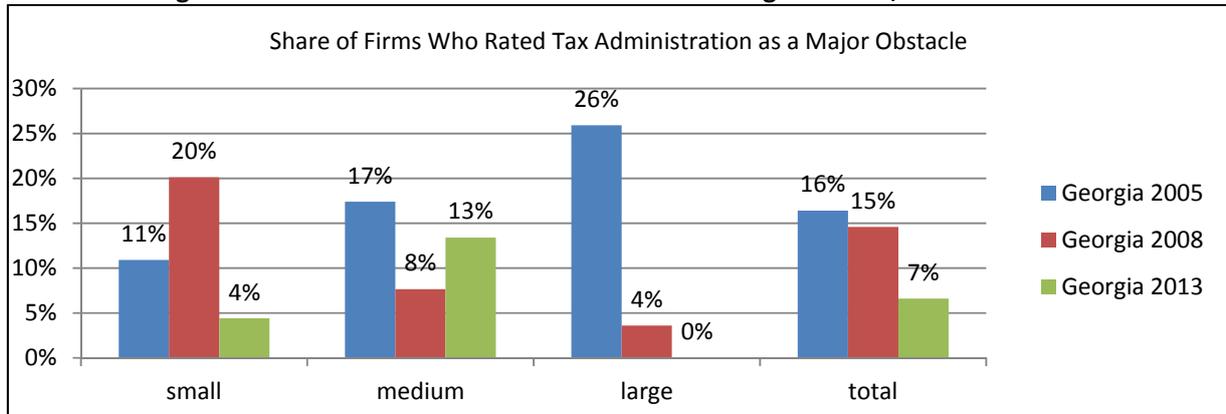
<sup>14</sup> See discussion on Georgia in Engelschalk (2004).

<sup>15</sup> Retail trade, goods production, services, transportation, jewelry shops, repair of watches, as well as an indicator based tax regime for restaurants

<sup>16</sup> Presumptive tax collection was only GEL 5 million or 0.7% of total tax revenues in 2000 (see Engelschalk 2004)

<sup>17</sup> It is, however, unlikely that the changes in perception were solely driven by the (re-)introduction of a simplified presumptive tax regime given that many respondents to the survey have likely not registered for the regime (see table 4 below). A number of additional reforms aimed at improving taxpayer experiences were adopted in 2010, including for instance a revised tax appeals process.

**Figure 1: Tax administration as a constraint in Georgia in 2005, 2009 and 2013**



Source: World Bank Enterprise Survey in Georgia in 2005, 2009 and 2013

### 3. Data and descriptive statistics

#### 3.1 General description of the data

We use a database obtained from the Georgian Tax Authority with anonymized information on firms that are registered for tax purposes, covering tax years 2005 through 2012. Each year, this database reports the date when the firm first registered, legal status, revenue declared to the tax authority, and amount of tax paid. It also indicates whether a firm has signed up for the micro or small tax regime, along with the sign-up date. The number of employees is available for a subset of firms. The database includes both individual entrepreneurs (70% of firms in the database) and companies or other. Since only sole proprietors are eligible for the reform, we restrict our analysis to individual entrepreneurs and physical persons. Companies tend to have much higher revenues than sole proprietors and are thus likely not a valid comparison group for firms that are eligible for the reform. The average (median) revenue for companies in the database is about GEL 1 million (GEL 63,000) compared to GEL 41,500 (GEL 7,700) for sole proprietors.

Table 1 displays the number of sole proprietors included in the database each year. The numbers show that comparatively few firms appeared in the database in 2005 and 2006, probably because the tax authority introduced electronic records only shortly before these years. From 2007 on, more than 100,000 sole proprietors are covered in the database. However, in 2007 about 42 percent of our observations have either missing or zero revenue, which indicates that the majority of these firms either did not file a tax return in that year or that the declaration was not entered into the electronic database. The percentage of firms with zero or missing revenue decreases in later years. We will thus focus the analysis on data from 2008<sup>18</sup> and later years, when data quality appears to be best. Focusing

<sup>18</sup> With the caveat that the business performance was seriously affected by the Russo-Georgian War (Five-Day War) in August 2008.

on these years gives us two years of pre-reform data (2008 and 2009) and three years of post-reform data (2010, 2011, and 2012).<sup>19</sup>

**Table 1: Number of firms (sole proprietors) in the database each year**

Year	# firms	# firms with zero or missing revenue	% zero or missing of total
2005	51,540	16,254	31.54
2006	3,378	1,432	42.39
2007	104,051	43,831	42.12
2008	115,536	32,285	27.94
2009	121,670	28,285	23.25
2010	122,979	20,244	16.46
2011	145,179	30,292	20.87
2012	159,384	33,545	21.05

### 3.2 Revenue distribution of firms

The majority of sole proprietors in the database fall into the revenue category that is eligible for the micro tax reform (revenues below GEL 30,000). Table 2 shows the number and percentage of firms in this revenue group in 2008 and 2009, as well as the equivalent statistics for firms that were eligible for the small tax reform (revenues of between GEL 30,000 and GEL 100,000) and for larger firms.

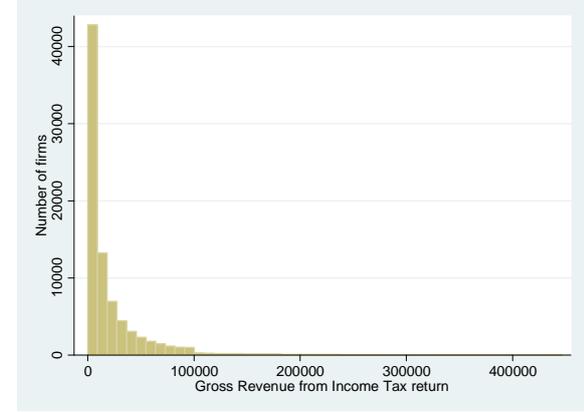
**Table 2: Number and percentage of firms (sole proprietors) in 2008 and 2009 by revenue group**

Revenue group	2008		2009	
	# of firms	% of firms	# of firms	% of firms
< GEL 30,000	64,471	77.44	73,799	79.03
GEL 30,000 - 100,000	14,793	17.77	15,959	17.09
> 100,000	3,987	4.79	3,627	3.88

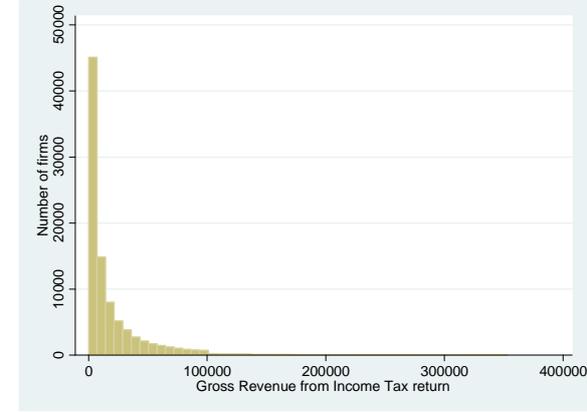
Figure 2 shows the distribution of firms according to the revenue declared on their tax return in more detail, excluding the top 1% of outliers in our sample. Figures 3 and 4 zoom in on the distribution around the reform cutoffs (GEL 100,000 and GEL 30,000). Figure 2 illustrates that the number of firms drops sharply after revenue of GEL 100,000, suggesting that firms avoid declaring revenue above GEL 100,000. This was the case even before the recent SME tax reform (data are from 2008 and 2009) and is thus likely driven by the mandatory VAT registration threshold at GEL 100,000. In contrast to the firm distribution around the GEL 100,000 cutoff, the distribution around the GEL 30,000 micro firm reform cutoff looks smooth (Figure 3).

<sup>19</sup> Note that although the reform implies that micro businesses do not have to pay income tax, they still have to file a tax return post-reform and we thus have data on their declared revenue for both the pre- and post-reform period. Also, even though small businesses may be taxed based on turnover vs. income after the reform, they have to declare revenue on their tax return in either case, so that we have data on their declared revenue pre- and post-reform.

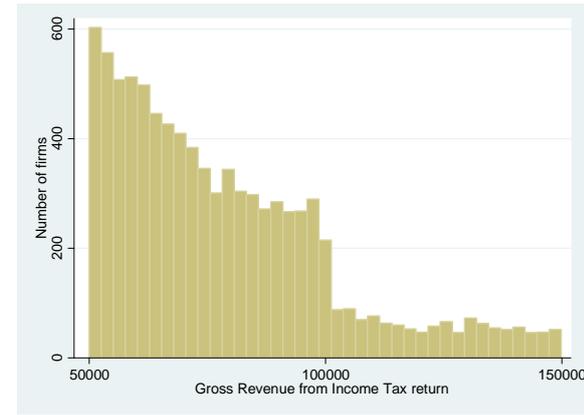
**Figure 2a: Distribution of firms in 2008**



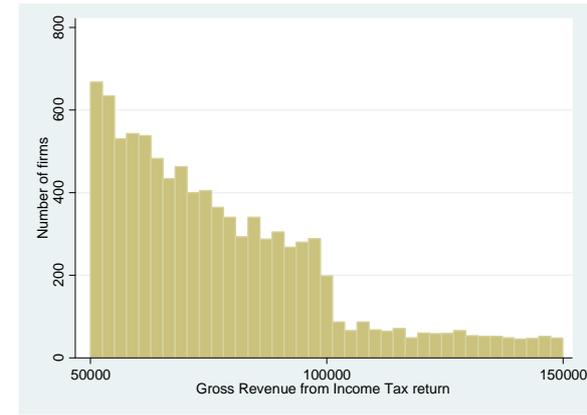
**Figure 2b: Distribution of firms in 2009**



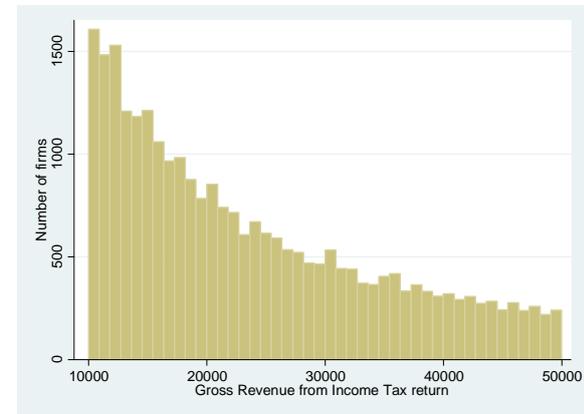
**Figure 3a: Distribution of firms around GEL 100,000 in 2008**



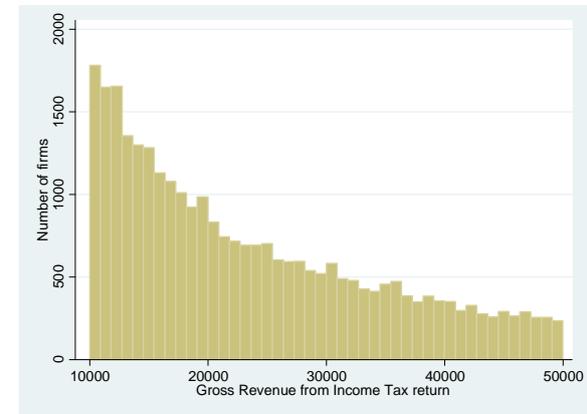
**Figure 3b: Distribution of firms around GEL 100,000 in 2009**



**Figure 4a: Distribution of firms around GEL 30,000 in 2008**



**Figure 4b: Distribution of firms around GEL 30,000 in 2009**



### 3.3 Number of newly registered firms

One of our variables of interest is the number of firms that register with the tax authority each year. When we look at the year of registration recorded in the database, we see that between 16,000 and 20,000 new firms register each year (Table 3). This number corresponds to about 14 percent of all firms that appear in the database each year, i.e. the entry rate is about 14 percent. Table 3 shows the number of newly registered firms and entry rates for each year in the database.<sup>20</sup>

**Table 3: Number of newly registered firms and entry rates by year**

Year	Number of newly registered firms	Entry rate (new as % of total)
2008	16,700	14.45
2009	19,218	15.80
2010	16,963	13.79
2011	19,840	13.67
2012	16,061	10.08

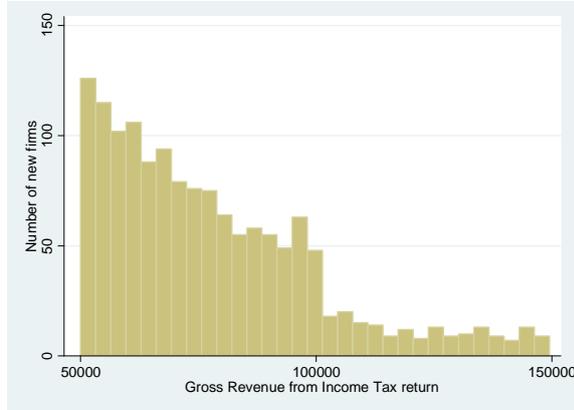
Figure 5 illustrates that the number of newly registered firms also drops sharply at GEL 100,000, similarly to the distribution of all firms. The distribution of new firms around GEL 30,000, however, is smooth (Figure 6).<sup>21</sup>

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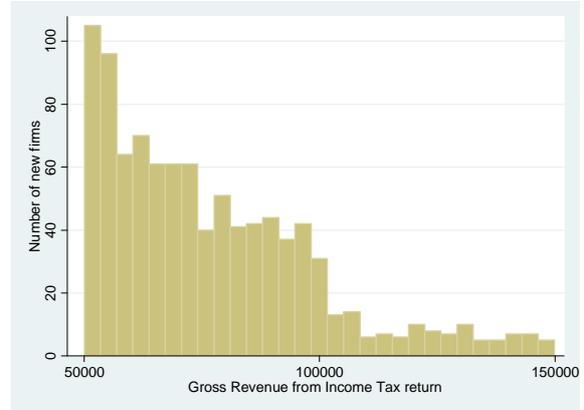
<sup>20</sup>In tax year 2012, the entry rate is lower than in previous years (about 10 percent compared to 14 percent). However, the number of newly registered firms in 2012 is comparable to previous years (16,061). The lower entry rate is thus mostly driven by an increase in the total number of firms recorded in the database. In 2012, the database included almost 160,000 firms, more than in any previous year. About 50 percent of the newly recorded firms have registration dates before 2012 (going back to 1995), that is they previously existed, but did not appear in the database. It is possible that these firms had losses or were temporarily closed during the years when they are not in the database. In Georgia, penalties for late- and non-filers are determined on the basis of the evaded tax amounts, implying that loss-making entities face no risk of penalization. As a result, especially smaller firms frequently do not file a return for years with losses or no business activity.

<sup>21</sup>In Figure 4 and 5, we plot number of firms registered in the previous year against declared revenue. For example, for 2008 declared revenue, we plot the number of firms that registered in 2007 since 2008 is the first full tax year for these firms.

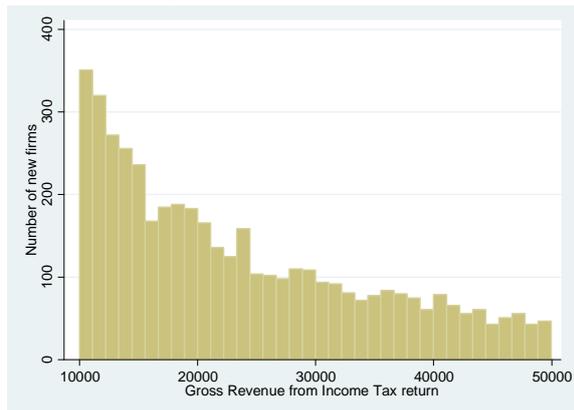
**Figure 5a: Distribution of newly registered firms around GEL 100,000 in 2008**



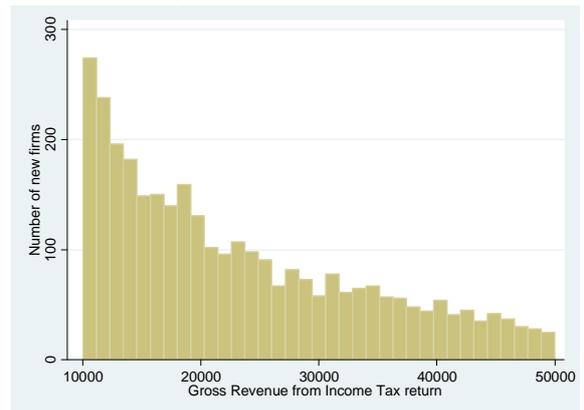
**Figure 5b: Distribution of newly registered firms around GEL 100,000 in 2009**



**Figure 6a: Distribution of newly registered firms around GEL 30,000 in 2008**



**Figure 6b: Distribution of newly registered firms around GEL 30,000 in 2009**



### 3.4 Reform take-up

According to the database, by the end of 2012, a total of 16,721 firms had registered for the small firm regime and 13,266 firms had registered for the micro firm regime. We have data on 2012 revenues for 15,543 of the firms in the small firm regime and for 9,701 of the firms in the micro firm regime. Based on this date, Table 4 shows the percentage of firms in each revenue group that have signed up for either the micro or small firm regime. Note that some firms with revenues below GEL 30,000 signed up for the small taxpayer regime instead of the micro regime, probably because they had employees, which disqualifies them from micro taxpayer status. Very few businesses signed up in revenue groups that are not technically eligible for the specific regime (shaded in grey). We believe that these observations are due to recording errors.

**Table 4: Percentage of firms that signed up for the new tax regimes**

<b>2012 revenue group</b>	<b>% of firms that signed up for small firm tax regime</b>	<b>% of firms that signed up for micro firm tax regime</b>
<b>All firms</b>		
< GEL 30,000	14.69	10.77
GEL 30,000 - 100,000	8.59	0.01
> GEL 100,000	0.01	0.01
<b>Firms registered with tax authority before 2010</b>		
< GEL 30,000	14.14	10.55
GEL 30,000 - 100,000	8.39	0.01
<b>Firms registered with tax authority in 2010, 2011, or 2012</b>		
< GEL 30,000	15.63	11.14
GEL 30,000 - 100,000	9.08	0.01

Table 4 also shows the percentage of firms that signed up for a new tax regime, broken down by whether the firm was already registered with the tax authority when the new regime was announced (before 2010) or whether the firm was registered with the tax authority after the reform was announced. The percentage of firms that signed up for a new regime is slightly larger among firms that were registered after the reform.

We now examine the sectoral distribution of firms that signed up for the new tax regimes. Turnover tax regimes often tend to be biased towards sectors of small business activity with higher average margins favoring, for instance, small service providers over traders. Discrimination can be avoided by introducing different rates, which, however, tend to increase administrative complexity (Engelschalk and Loeprick 2014). In Georgia, rather than using different rates, differentiation based on documented business expenditures is aimed at offering an option to lower the tax burden for low margin activities (and at providing an incentive to keep records).<sup>22</sup> Table 5 shows the distribution of firms across different sectors, in reform eligible revenue brackets, as well as for firms that actually signed up for a new tax regime. Overall, the distributions are relatively similar, with relatively small differences in the trade and services sectors. However, higher regime participation among service providers in 2012 suggests that a small bias towards high margin activities persists among business with turnover between GEL 30,000 – 100,000 in the small business regimes.

<sup>22</sup> See also discussion in fn 14 above.

**Table 5: Percentage of firms that signed up for the new tax regimes by sector**

Sector	2012 revenue < GEL 30,000	2012 revenue GEL 30,000 - 100,000
<b>% of firms in each sector (all firms)</b>		
Manufacturing	5.87	5.02
Trade	41.31	48.05
Services	27.93	21.00
Other	1.05	0.90
Unidentified	23.85	25.02
<b>% of firms in each sector (only firms that signed up for the micro or small tax regime)</b>		
Manufacturing	8.29	8.26
Trade	47.41	40.06
Services	23.47	25.49
Other	0.57	1.05
Unidentified	20.26	25.14

Note: Only includes firms that registered with the tax authority in 2009 or earlier. From 2010 on, the sector is unidentified for over 95% of firms. The category "other" covers agriculture and non-commercial firms.

Table 6 shows registration for the new tax regimes by region. More businesses outside Tbilisi registered for the new tax regimes than in the capital. This pattern may be partly explained by higher difficulties faced in complying with general tax obligations in regions outside Tbilisi, making the new regime particularly attractive for firms located in these regions. Notably, in a country-wide survey on tax compliance costs in 2009, businesses outside of Tbilisi indicated that they spend more time in finding and analyzing information for tax purposes (see Table 7).

**Table 6: Percentage of firms that signed up for the new tax regimes by region**

Region	2012 revenue < GEL 30,000	2012 revenue GEL 30,000 - 100,000
<b>% of firms in each region (all firms)</b>		
Tbilisi	33.31	41.55
Other	66.69	58.45
<b>% of firms in each region (only firms that signed up for the micro or small tax regime)</b>		
Tbilisi	25.46	25
Other	74.54	75

Note: Region is based on the regional authority where the firm registered. The table only includes firms that registered with the tax authority in 2009 or earlier. From 2010 on, over 80% of firms registered with a national agency and their region is not identified in the database. The category "other" includes all regions outside Tbilisi.

**Table 7: Average annual number of workdays spent on certain accounting tasks in 2009<sup>23</sup>**

Activity	Tbilisi	Other Regions	Total
Finding & analysis of accounting & tax legislation	12.1	19.6	16.0
Finding and analysis of legislation specifically on filing and paying taxes	8.8	15.6	12.4
Preparation of additional information upon request of tax authorities	3.3	4.0	3.6
<i>Sample size</i>	<i>225</i>	<i>356</i>	<i>581</i>

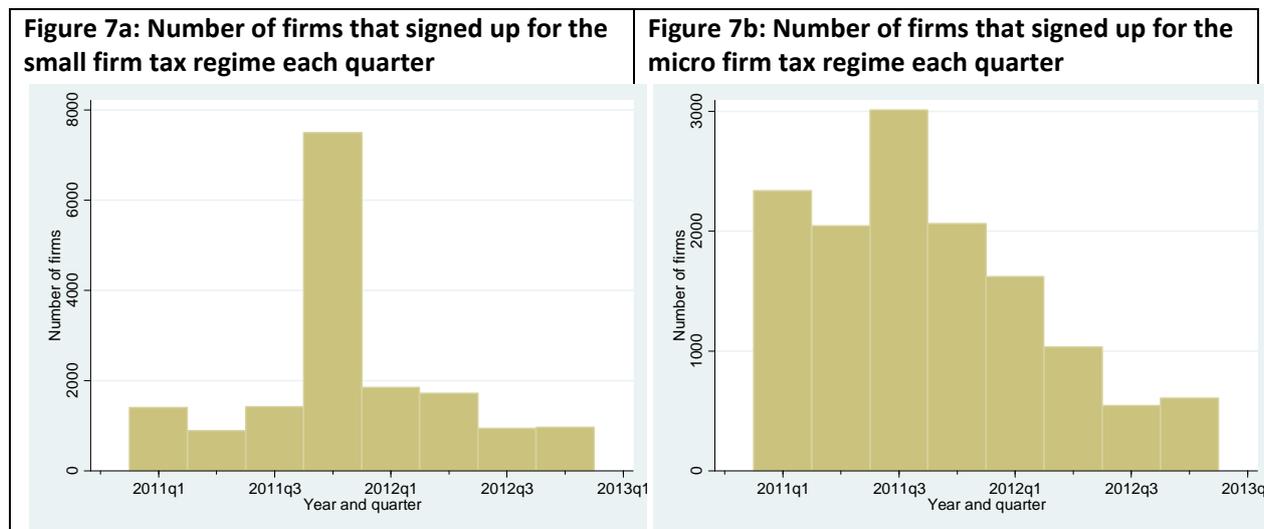
Source: IFC Tax Compliance Cost in Georgia, 2009

Moreover, the Georgian Revenue Service launched a compliance management strategy targeting micro and small enterprises following the introduction of the new simplified presumptive tax regimes. The administration introduced the function of advisory District Officers (DO) to change the adversarial nature of interactions between small businesses and the revenue service and to facilitate the identification of non-registered taxpayer. DOs are tasked to walk through assigned areas and offer assistance to businesses. They are not allowed to issue penalties. However, when they come across unregistered businesses they note their address, visit the owner and explain the risk of facing an inspection and penalties from regular SRS staff. The officer typically explains the registration process and support taxpayers in understanding the resulting tax liabilities and reporting obligations. The new administrative concept was launched in May 2011 in Tbilisi and subsequently rolled-out country wide. Given the constraints for public administration in reaching remote areas of the country, it seems likely that the DO campaign disproportionately increased the tax administration's (perceived) presence in the regions.

Figure 7 plots the distribution of registration for the new regimes over time, i.e. it shows the number of firms that signed up for a new regime in each quarter since the first quarter of 2011. The majority of firms signed up for a new regime after the first quarter of 2011, which implies that they were taxed under this regime for the first time in tax year 2011 (tax returns need to be submitted by April of the year following a tax year). The spike in registrations at the end of 2011 is likely linked to the increased administrative efforts by the Revenue Service starting in May 2011. We thus expect the impact of the reform to be relatively small in tax year 2010 and to be larger in tax years 2011 and 2012. However, it is notable that the percentage of firms that had signed up for the tax regime by the end of 2012 is not high overall – covering only 10 percent of eligible micro firms and 9 percent of small firms with revenue of GEL 30,000 – 100,000 (see also Table 4).

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<sup>23</sup> Specifically, business owners were asked: "How many person-days were spent in 2009 on each of the following?:  
1. On finding and analysis of bookkeeping/accounting and tax-related legislation  
2. Specifically on finding and analysis of legislation on how to calculate, file and pay taxes  
3. On preparation of additional information upon request of tax authorities, if any"



The low take-up of the new regimes in Georgia is not uncommon and likely linked to a number of related factors. First, to limit the room for abuse and strategic behavior by firms, the Georgian Authorities restricted the regimes to individual entrepreneurs and, in the case of the micro regime, also prevented businesses with employees from participating. In addition, special regimes tend to be unattractive for businesses with major supplies to (or from) VAT registered entities, as presumptive taxpayers cannot voluntarily register for the VAT. Finally, though the micro regime is highly advantageous in exempting businesses from income tax obligations, uncertainty regarding the long term stability of this policy choice may keep businesses from registering.<sup>24</sup>

#### 4. Estimation Approach

In order to measure the effects of the tax reform on formal firm creation and tax compliance in a rigorous way, we need an adequate comparison group for firms affected by the reform. Given that eligibility for the reform was based on thresholds, we use a regression discontinuity design (RDD) based on the GEL 30,000 and GEL 100,000 cutoffs in annual turnover to estimate the effects of the reform. The RDD approach takes advantage of the fact that only firms with annual turnover below GEL 30,000 (GEL 100,000) are eligible to file under the new micro (small) firm tax regime. If we compare firms just below each cutoff to firms just above the cutoff, as the RDD does econometrically, we have two groups that should be very similar to each other. However, the patterns of bunching around the GEL 100,000 threshold shown in Section 3 that existed even before the reform can invalidate the RDD. The following paragraphs first explain the simple RDD approach and the assumptions needed for this methodology to be valid and then discuss how our analysis can adjust the design to account for strategic under-reporting around the GEL 100,000 threshold, while leaving the design intact to study the group around the GEL 30,000 threshold where the distribution is smooth.

<sup>24</sup> In a number of Eastern European countries, the lack of predictability of MSME tax policy is a major concern for the business community (Engelschalk and Loeprick 2014).

#### 4.1 Studying the impact of the reform on formal firm creation at each threshold

In order to study the impact of the reform on formal firm creation, we thus compare the number of newly registered firms just below and just above the cutoffs after the reform. If the reform led to formal firm creation, the number of newly registered firms should be higher just below each cutoff than above the cutoff. More formally, using the example of the GEL 30,000 cutoff, we estimate the following simple RDD regression to determine whether the tax reform increased formal firm creation

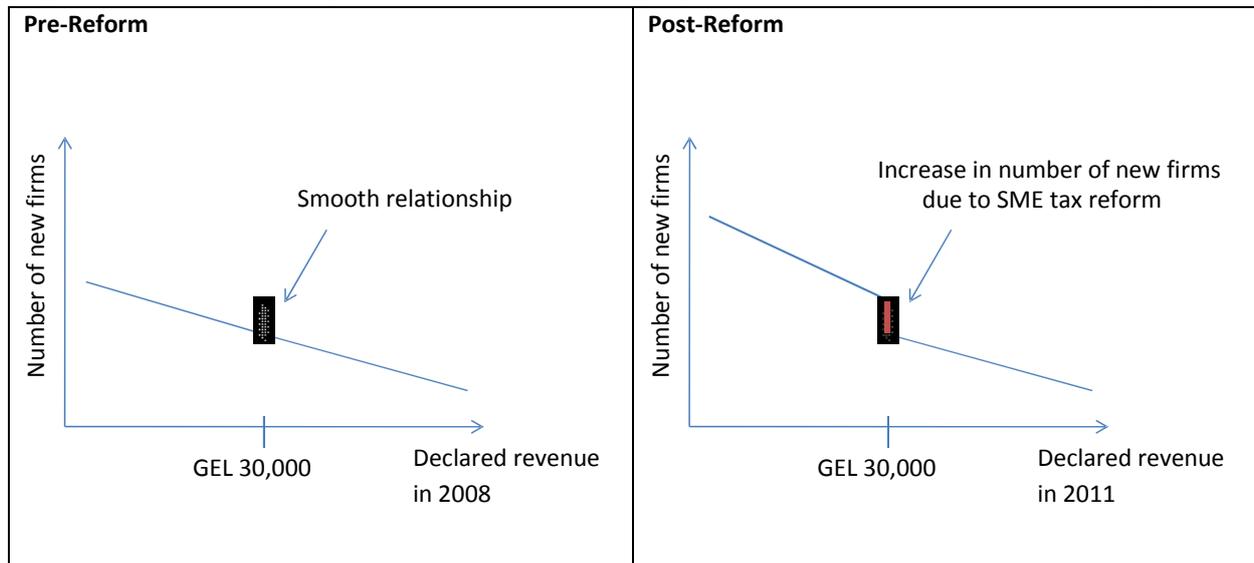
$$\text{NumberNewFirms}_t = a_0 + a_1 * \text{Indicator}[\text{Revenue}_{t+1} < 30,000] + a_2 * \text{Revenue}_{t+1} + \varepsilon_t, \quad (1)$$

where the unit of analysis is a GEL 100 interval of revenue. That is, we first calculate the number of new firms in each GEL 100 interval in a range around the cutoff and then run the regression above on this interval-level data. If we use the range GEL 10,000 to GEL 50,000, we have 400 intervals for the analysis.

The intuition behind this regression is that if we plot declared revenue on the x-axis and the number of new firms on the y-axis before the reform, we should see a smooth relationship without jumps. If we plot the same graph with post-reform data, we should see a jump in the number of new firms right below 30,000 (as illustrated in Figure 8 below), indicating a positive impact of the reform on formal firm creation. To account for the fact that the number of new firms may not be a linear function of revenue, as depicted in Figure 8 for simplicity reasons, we add revenue squared, as well as revenue to the power of three and four as additional controls to regression Equation 1.

Equation 1 uses revenue reported in the next tax year to determine eligibility for the new tax regime (e.g. new firms in 2010 and reported revenue in 2011). The reason is that a firm that registers in any given year reports revenue corresponding to a full calendar year for the first time on the tax return for the following year. Since tax regime eligibility is based on annual revenue we need to have a measure of revenue for the full calendar year to determine whether a firm falls above or below the cutoff.

**Figure 8: Illustration of regression discontinuity design (Reform impact on formal firm creation)**

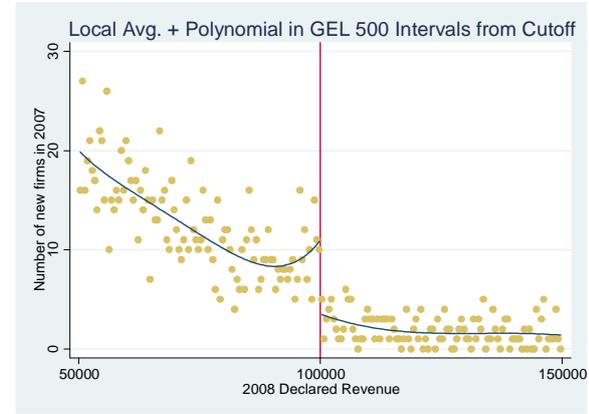


We face two potential problems with using the RDD design to study reform impact in practice. The first one is related to the jump in the firm distribution around GEL 100,000 that existed even in the pre-reform period, as shown in Figure 5. The second problem is related to misreporting in response to the reform. The following paragraphs discuss each issue in turn and how adjusted designs can mitigate them.

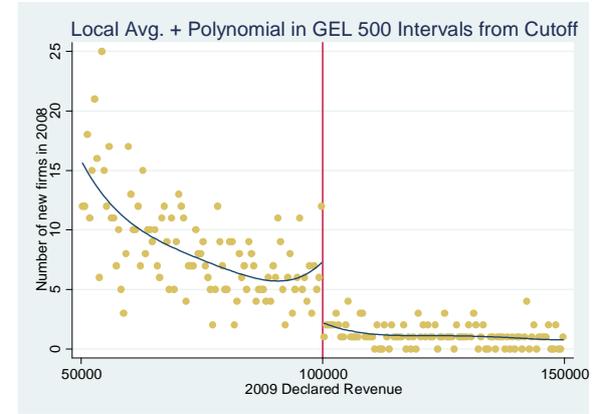
#### 4.1.1 Addressing the preceding discontinuity at GEL 100,000

The distribution of new firms suggests that even before the reform, a discontinuity existed at the GEL 100,000 threshold (which we attribute to that fact that GEL 100,000 is also the thresholds for paying VAT). That is, the number of new firms drops significantly at GEL 100,000. Figure 9 illustrates this issue by plotting the number of new firms in intervals of GEL 500 around GEL 100,000 using pre-reform data on declared revenue for 2008 and 2009. The lines represent a 4<sup>th</sup>-order polynomial that was fitted to the dots separately below and above GEL 100,000. The number of new firms first declines and then increases again slightly right below the cutoff. At GEL 100,000, the number of new firms jumps downward and is at a relatively low level for all values above the cutoff.

**Figure 9a: Number of new firms around GEL 100,000 cutoff – 2008 data (pre-reform)**



**Figure 9b: Number of new firms around GEL 100,000 cutoff – 2009 data (pre-reform)**



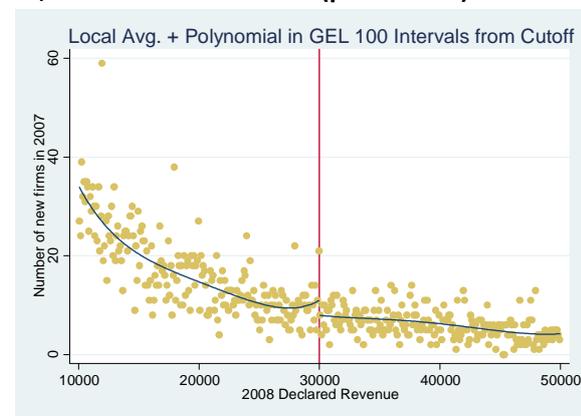
The discontinuity at GEL 100,000 in the pre-reform period displayed in Figure 9 suggests that we cannot use a basic RDD methodology to estimate the impact of the reform on firm registration around GEL 100,000. With an additional assumption, we can, however, use a difference-in-difference analysis. That is, if we assume that the size of the jump in the number of new firms at GEL 100,000 would be constant over time in absence of the reform, we can compare the size of this jump over time and we can attribute post-reform changes in the jump to the reform. The plots for 2008 and 2009 in Figure 9 suggest that this may be a reasonable assumption, i.e. the jump is of similar size using 2008 and 2009 data. In fact, estimating regression (2) for years 2008 and 2009 gives an estimated jump size of 5.3 in 2008 and 4.4 in 2009 (coefficient  $a_1$  in the regression represents the size of the jump) – both estimated jumps are statistically significant at the 0 percent level.<sup>25</sup>

For the difference-in-difference methodology, we run regressions along the lines of Equation 1, adding a time dimension, i.e. year fixed effects and interaction terms of the variables with these fixed effects. This approach estimates the impact of the reform in each year relative to the first year of data (2008). That is, the estimated impacts are differences with respect to 2008 data.

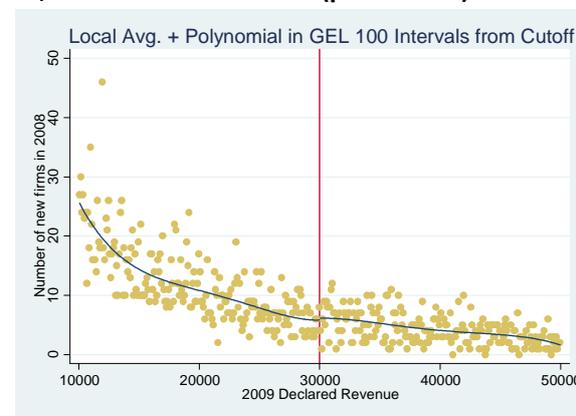
There is no comparable discontinuity in the revenue distribution around GEL 30,000, suggesting that the basic RDD approach is valid around GEL 30,000. Figure 10 plots the number of new firms in intervals of GEL 100 around GEL 30,000. Here, we can use smaller intervals since we have many more firms in each interval, reducing noise in the data. The number of new firms shows a more uniform pattern around GEL 30,000 than around GEL 100,000, decreasing below and above the cutoff. The 2008 graph displays a small discontinuity at GEL 30,000, but this jump is not statistically significant. We thus use a standard RDD methodology with cutoff GEL 30,000 to estimate the impact of the micro tax regime on firm registration.

<sup>25</sup> We cannot use data on declared revenue for 2007 to see whether the size of the jump in new firms was similar in 2006, since as discussed above, the 2007 revenue data is much less complete than for later years.

**Figure 10a: Number of new firms around GEL 30,000 cutoff – 2008 data (pre-reform)**



**Figure 10b: Number of new firms around GEL 30,000 cutoff – 2009 data (pre-reform)**



#### 4.1.2 Misreporting by new firms in response to the reform

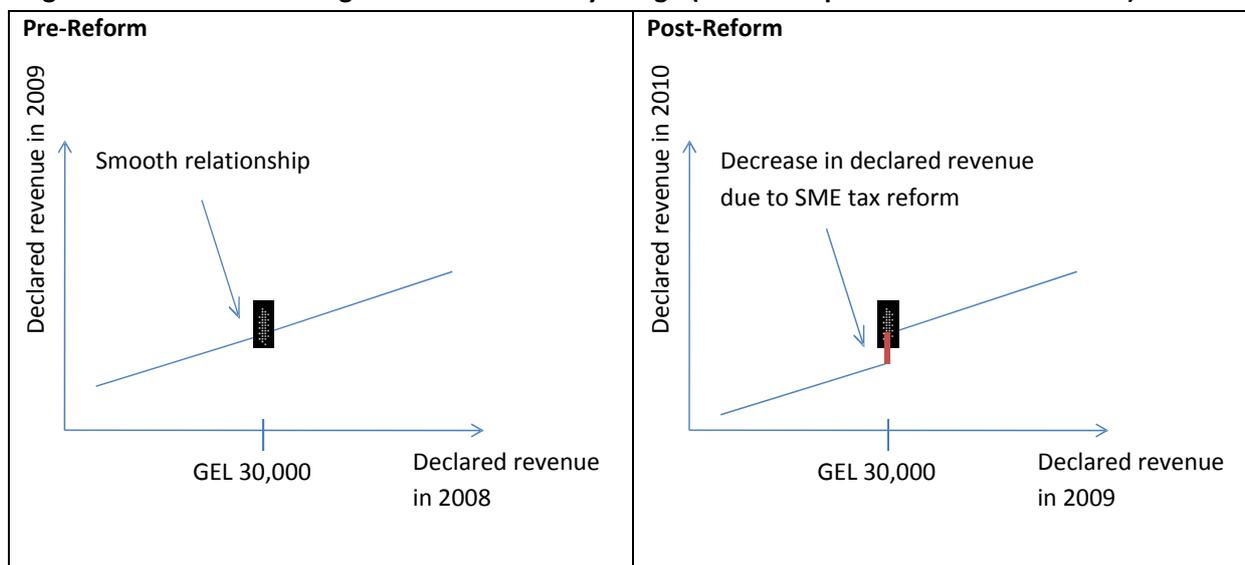
The second potential issue with using an RDD methodology is that the reform may provide an incentive for misreporting in the sense that some new firms with revenue above the cutoff that otherwise would have reported revenue above the cutoff may choose to report revenue below the cutoff to be eligible for the reform. That is, the number of new firms may drop above the cutoff as a result of the reform, implying that the comparison group may also be affected. This sorting around the cutoff could be an undesirable driver of some of the reform effect on registration and it could happen both around the GEL 100,000 and GEL 30,000 cutoff. We assess whether this sorting happens by measuring whether the number of new firms above the cutoffs declines significantly after the reform compared to pre-reform years.<sup>26</sup> Also, in the pre-reform period, the number of new firms just above the cutoff decreases slightly as declared revenue increases (Figures 9 and 10). If firms become less likely to register right above the cutoff after the reform, this pattern should be reversed, i.e. the number of new firms should increase with declared revenue in the neighborhood just above the cutoff in the post-reform period, which is something we can test.

#### 4.2 Studying the impact of the reform on tax compliance by previously registered firms

In order to study the impact of the reform on tax compliance by previously registered firms, we use a RDD methodology that estimates a discontinuity in declared income around the GEL 30,000 mark. However, because of the misreporting by existing firms in pre-reform years, we are not able to use the RDD approach around the GEL 100,000 cutoff and thus are not able to study the impact of the reform on tax compliance for this group of firms. The RDD methodology around the GEL 30,000 cutoff examines whether firms below the cutoff that are eligible for the reform, as determined by revenue declared in 2009, declare significantly less revenue in 2010, 2011, and 2012 than firms just above the cutoff, in order to remain eligible for the reform. Figure 11 illustrates the jump in declared revenue at the cutoff that may arise due to the reform.

<sup>26</sup> One further potential abuse dynamic is the artificial division of larger entities into several “small” businesses that operate below the eligibility threshold. Such a trend would not be captured by our analysis.

**Figure 11: Illustration of regression discontinuity design (Reform impact on declared revenue)**



The estimation equation is analogous to Equation 1, but using declared revenue in the following year as the outcome variable

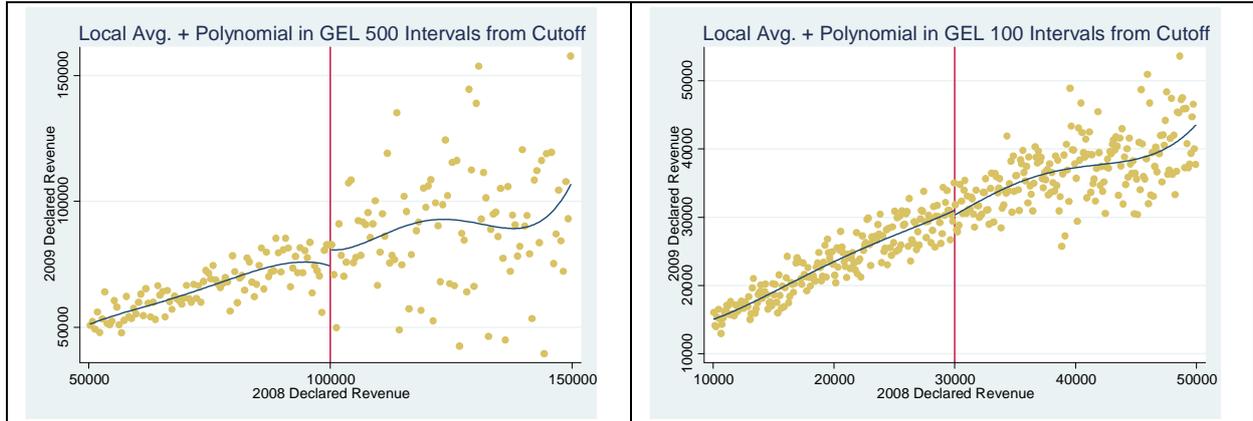
$$\text{Revenue}_{t+1} = a_0 + a_1 * \text{Indicator}[\text{Revenue}_t < 30,000] + a_2 * \text{Revenue}_t + \epsilon, \quad (2)$$

Here we do not have to aggregate the data to the interval level and we can run a firm-level regression instead since declared revenue is a firm-level outcome (unlike number of newly registered firms). Since the revenue data is quite noisy, we drop the top and bottom 5% outliers from the analysis.

Similarly to the caveats discussed above, the fact that the GEL 100,000 reform eligibility threshold coincides with the VAT threshold creates problems for using a simple RDD design to estimate the reform impact on declared revenue. Figure 12 plots declared revenue in 2009 against declared revenue in 2008. For better illustration, they show average revenue in GEL 500 intervals for the GEL 100,000 cutoff and in GEL 100 intervals for the GEL 30,000 cutoff instead of firm-level data.

We observe a jump in declared revenue at GEL 100,000 even in the pre-reform period, indicating that firms tend to under-declare revenue to remain below the GEL 100,000 threshold. The estimated size of the jump using firm level data is about GEL -7,700 (i.e. firms just below the cutoff tend to declare GEL 7,700 less in revenue the following year than firms just above the cutoff) and is statistically significant at the 12.4-percent level. Around GEL 30,000, however, we do not see a jump in declared revenue.

<b>Figure 12a: Declared revenue in pre-reform period around GEL 100,000 cutoff</b>	<b>Figure 12b: Declared revenue in pre-reform period around GEL 30,000 cutoff</b>
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Since estimating Equation 2 requires data on revenue for two years, we prefer not to use a difference-in-difference approach to control for the pre-reform jump around GEL 100,000. The reason is that we have fewer years of outcome data since we are using one year of data as the explanatory variable and cannot use the same variable at the outcome (and 2008 and 2009 are the only pre-reform years we have with good data). This lack of data means that we cannot test whether the jump in declared revenue is constant in different pre-reform years. We thus focus on the GEL 30,000 threshold for estimating the impact of the reform on declared revenue. As businesses below the 30,000 GEL are exempt from income taxation, increases that remain below the threshold have no associated cost for entrepreneurs aside from potentially attracting more scrutiny of tax inspectors verifying the eligibility of their exempt status. In order to estimate this impact, we will run the following regressions

$$\text{Revenue}_{2010} = a_0 + a_1 * \text{Indicator}[\text{Revenue}_{2009} < 30,000] + a_2 * \text{Revenue}_{2009} + \varepsilon, \quad (3)$$

$$\text{Revenue}_{2011} = a_0 + a_1 * \text{Indicator}[\text{Revenue}_{2009} < 30,000] + a_2 * \text{Revenue}_{2009} + \varepsilon, \quad (4)$$

$$\text{Revenue}_{2012} = a_0 + a_1 * \text{Indicator}[\text{Revenue}_{2009} < 30,000] + a_2 * \text{Revenue}_{2009} + \varepsilon, \quad (5)$$

where the coefficient  $a_1$  measures the reform impact (we also add higher order polynomial terms of  $\text{Revenue}_{2009}$  as additional controls). Note that we use declared revenue in 2009 as the explanatory variable for 2010, 2011, and 2012 declared revenue since 2010 and 2011 revenue may be endogenous to the reform. A caveat here is that the predictive power of 2009 revenues is likely declining as we look at revenue in future years, which may lead to less statistically significant estimation results when we use 2011 and 2012 revenues as the outcome variables.

## 5. Empirical Results

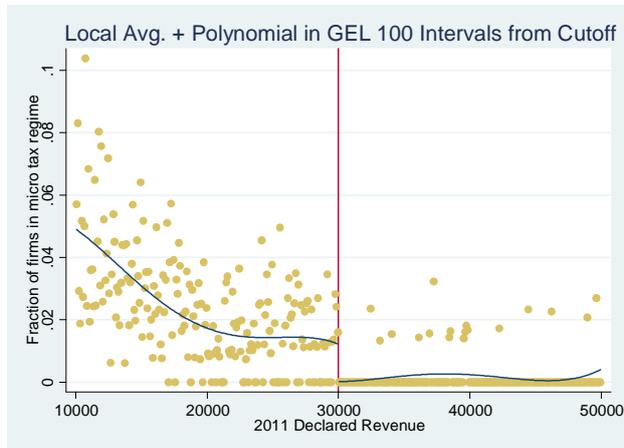
### 5.1 Filing under a new tax regime around the cutoffs

We first verify that there is indeed a jump in number of firms that are filing under the micro (small) tax regime at the GEL 30,000 (GEL 100,000) cutoff in 2011 and 2012. Mechanically, this has to be the case since firms above each threshold were not eligible for the respective new regime. However, conducting this test will give us an idea of how large the jumps in firms filing under a new regime are at each cutoff. It is important to verify the size of the jumps since only about 10 percent of eligible firms had registered for a new regime by the end of 2012 and these may or may not be located close to the cutoff. Since our identification strategy relies on the cutoffs, a significant difference in the fraction of firm filing under a new regime around the cutoffs is needed.

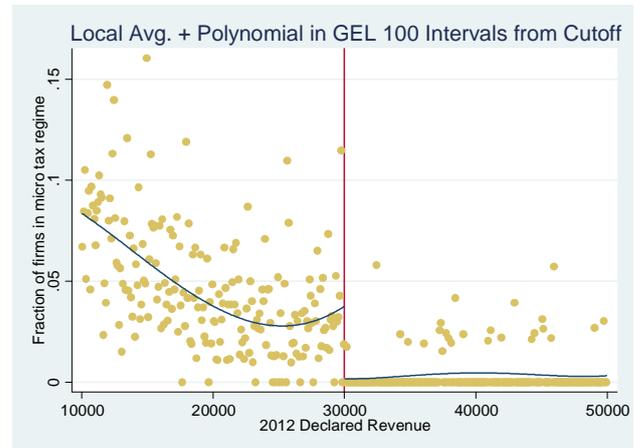
Figure 13a (b) plots the fraction of firms filing under the micro tax regime in 2011 (2012) around the GEL 30,000 cutoff in 2011 (2012). Similarly, Figure 14a (b) plots the fraction of firms filing under the small tax regime in 2011 (2012) around the GEL 100,000 cutoff in 2011 (2012). We observe a jump at each cutoff for both 2011 and 2012. We use regression analysis, as described in Equation 1 above, to estimate the size of the jump. The results show that only about 1 percent of firms had registered for the micro firm tax regime just below the GEL 30,000 cutoff by the end of 2011. This number is statistically significantly larger than above the cutoff, where essentially no firms registered, but it is still a small difference. By the end of 2012, the percentage of micro firms registered for the tax regime just below the cutoff had increased to about 3 percent. Just below the GEL 100,000 cutoff, about 3 (6.5) percent of firms registered for the small firm tax regime by the end of 2011 (2012), compared to close to zero percent above the cutoff.

It is important to note that these numbers are smaller than the overall fractions of eligible firms registered for each regime reported in Table 4. A limitation of the RDD approach is that it estimates the effect of the reform only for firms close to the cutoff. The effect may be larger for firms further below the cutoff. However, we do not have a valid counterfactual for these firms since they are likely to be quite different from firms above the cutoff. We thus expect our RDD estimates to provide a lower bound for the effect of the reform on all eligible firms.

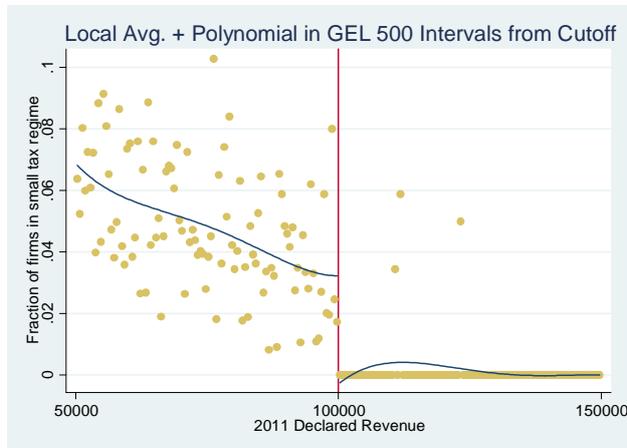
**Figure 13a: Fraction of firms in micro tax regime around GEL 30,000 cutoff – 2011 data (post-reform)**



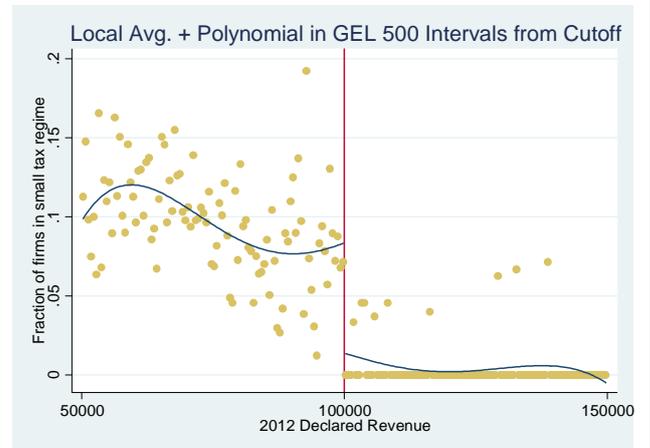
**Figure 13b: Fraction of firms in micro tax regime around GEL 30,000 cutoff – 2012 data (post-reform)**



**Figure 14a: Fraction of firms in small tax regime around GEL 100,000 cutoff – 2011 data (post-reform)**



**Figure 14b: Fraction of firms in small tax regime around GEL 100,000 cutoff – 2012 data (post-reform)**

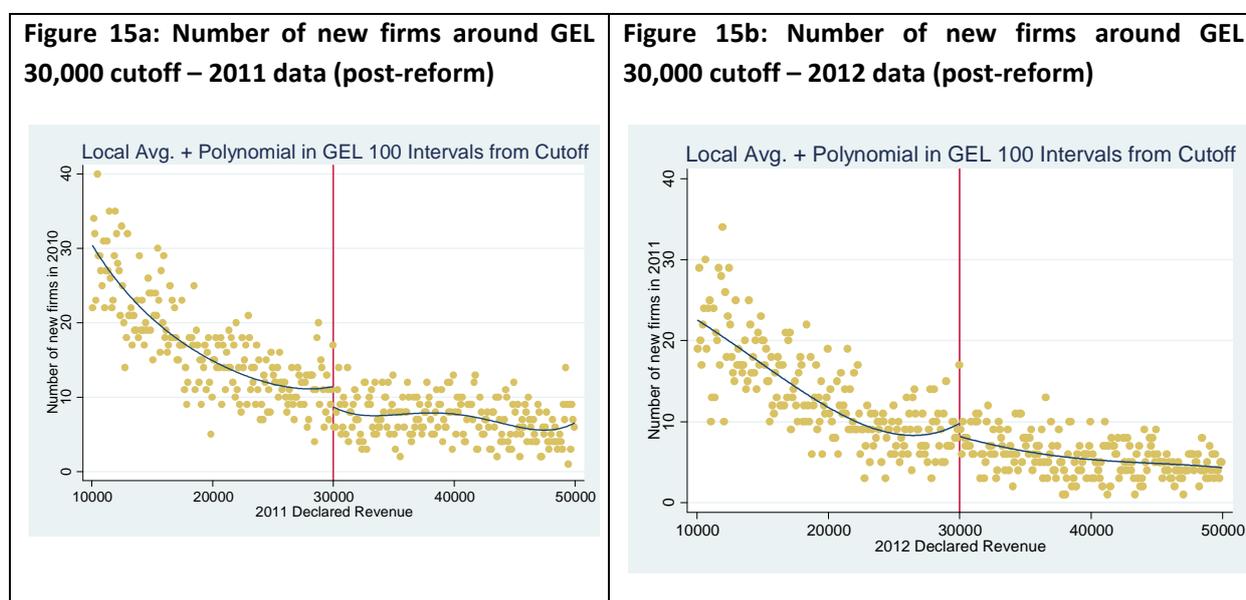


## 5.2 Impact of the reform on formal firm creation

This section uses 2010 through 2012 data to estimate the impact of the reform on formal firm creation. It is important to point out the following measurement issue here. The eligibility thresholds are based on annual revenue. For a firm that registers in one year, for example 2010, we only have data on declared annual revenue for the following year, in this case 2011. This is because the firm declares revenue for less than a full year in the year when it was created, simply because it has not yet been

operating for a full year. As also mentioned above,<sup>27</sup> our definition of a new firm is thus a firm that for the first time files a tax return for a full year in any given tax year. For tax year 2011, these are firms that registered in 2010. If we use 2011 revenue data to analyze the effect on formal firm creation, we are thus studying whether additional firms were created in 2010 due to the reform. The government passed the reform in September 2010 and the reform was publicly announced in July 2010, so it is possible that firms registered due to the reform in 2010. We also use revenue data for 2012 to measure whether the reform led more firms to register in 2011.<sup>28</sup>

Figures 15a and 15b show the corresponding RDD graphs around the GEL 30,000 cutoff in 2011 and 2012. The number of new firms registered with the tax authority is clearly higher just below the cutoff in 2011 than just above the cutoff. The pattern in the 2012 data is not as clear, although the graph also shows a small jump at the cutoff.



As previously shown, there was no statistically significant jump in number of new firms at the GEL 30,000 cutoff in the pre-reform period (2008 and 2009), implying that we can use basic RDD analysis to estimate the effect of the micro tax reform. Table 8 shows regressions following Equation 1. The specifications in Columns 1 and 2 use a relatively narrow window of revenue around the cutoffs, whereas the specification in Column 3 uses a wider range of observations. The specifications in Column 1 and 2 include a linear function of revenue as a control variable since, in the relatively small intervals,

<sup>27</sup> See supra note 9.

<sup>28</sup> Another way of dealing with this measurement issue would be to annualize 2011 revenue declared by firms that were created in 2011. For example if a firm registered in April 2011, implying that their declared revenue is for 9 months in 2011, we could divide this by 9 and multiply by 12 to annualize the revenue. However, this method does not allow for seasonal variation and would probably lead to inaccurate estimates. Robustness checks using this approach give results that are overall similar, but tend to be noisier.

the relationship between the outcome variable and revenue is approximately linear. The specification in Column 3 controls for a quadratic function of revenue to allow the relationship to be non-linear.

The shaded rows give the estimated impact of the reform in terms of new firms registered. The estimates in Panel A suggest that the micro tax reform increased the number of new firms in 2010 below the threshold by 2.2 to 3.4 firms, depending on the specification used. This effect is statistically significant at least at the 5-percent level. The size of the effect corresponds to an 18 to 30-percent increase in the number of new firms below the GEL 30,000 cutoff<sup>29</sup>. In contrast, the results in Panel B show no significant increase in firms registered in 2011 due to the reform.

**Table 8: Basic RDD to estimate the effect of the micro firm tax regime around GEL 30,000 on formal firm creation**

	(1)	(2)	(3)
Sample with revenue between	25,000 and 35,000	20,000 and 40,000	10,000 and 50,000
Observations (intervals)	100	200	400
Panel A - Dependent variable: Number of new firms in 2010			
2011 Revenue < 30,000 dummy	3.420**	2.256**	2.642***
	(1.332)	(0.932)	(0.882)
2011 Revenue	0.401	-2.384***	-58.692***
	(2.050)	(0.811)	(16.364)
Constant	6.737	16.124***	68.628***
	(6.692)	(2.858)	(10.212)
R-squared	0.226	0.380	0.773
Panel B - Dependent variable: Number of new firms in 2011			
2012 Revenue < 30,000 dummy	1.514	0.093	-0.033
	(1.131)	(0.810)	(0.785)
2012 Revenue	0.108	-2.737***	-38.352**
	(1.889)	(0.720)	(15.538)
Constant	6.849	16.050***	50.786***
	(6.112)	(2.519)	(9.975)
R-squared	0.065	0.248	0.717

Note: Revenue is in intervals of 10,000s of GEL. The regression in Column 3 additionally controls for a quadratic function of revenue (coefficients not reported to save space). Robust standard errors in parentheses. Statistical significance levels: \*10 percent, \*\*5 percent, \*\*\* 1 percent.

Figures 16a and 16b show the jump in number of new firms around the GEL 100,000 threshold in the post-reform period, using 2011 and 2012 data. In both years, the number of new firms is clearly higher just below the threshold than it is just above the threshold. However, as discussed above, at the GEL 100,000 cutoff, there was already a jump in newly registered firms in the pre-reform period since

<sup>29</sup> The average number of new firms registered in the 50 revenue intervals below the GEL 30,000 cutoff in the estimation sample in Column 1 (i.e. in the revenue intervals that fall between GEL 25,000 and 30,000) was 12 in 2010. That is, an increase in the number of firms by 2.2 corresponds to  $2.2/12 = 18$  percent (similarly for 3.4).

GEL 100,000 coincides with the threshold for paying VAT. We thus need to use a difference-in-difference analysis to estimate whether the size of the jump increased due to the reform.

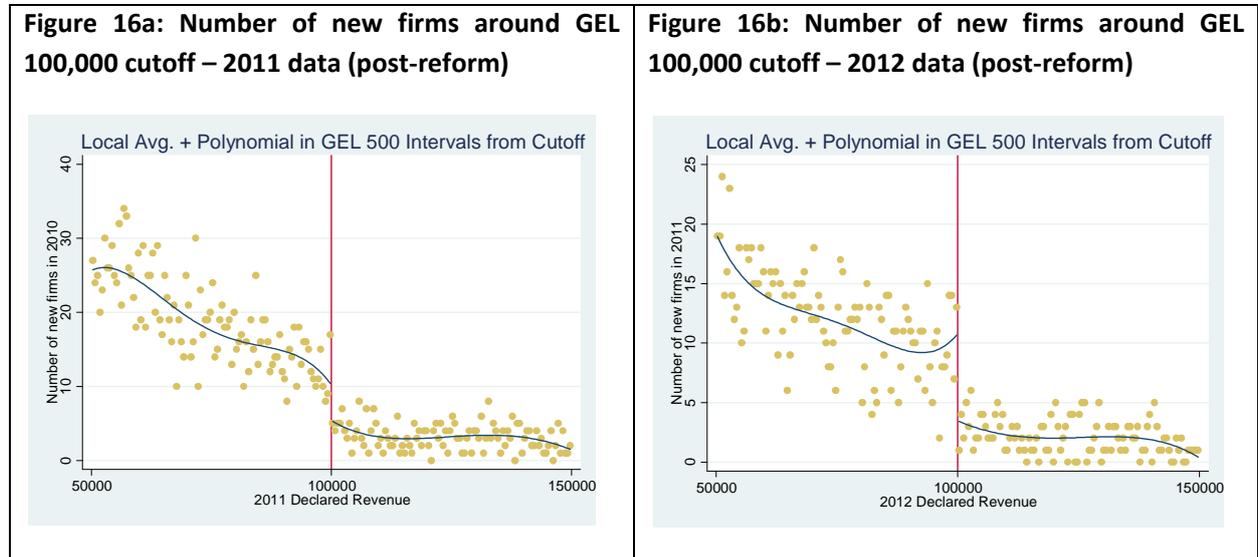


Table 9 displays the results of the difference-in-difference regressions, using data for 2008 through 2012. Here, we add interaction terms of the reform threshold with a dummy for years 2009, 2008, 2011, and 2012. The coefficient on the variable “Revenue < 100,000 dummy” gives the size of the jump at the GEL 100,000 threshold in 2008. The interaction terms with each year show the difference in the size of the jump in that year, relative to 2008. The shaded estimates indicate that the size of the jump was greater in 2011 and in 2012 than in 2008, but only one of the coefficients is statistically significant and only at the 10-percent level. The size of the coefficients in 2011 and 2012 also varies quite a lot across specifications, implying that we do not find a robust effect of the small firm tax regime on formal firm creation.

**Table 9: Difference-in-Difference Analysis to Estimate the Effect of the Small Firm Tax Regime around GEL 100,000 on Formal Firm Creation**

	Dependent variable: Number of new firms		
	(1)	(2)	(3)
Revenue < 100,000 dummy	6.683***	5.378***	5.324***
	(1.487)	(1.022)	(0.981)
Revenue < 100,000 dummy*2009	-2.18	-1.095	-0.915
	(2.051)	(1.394)	(1.311)
Revenue < 100,000 dummy*2010	1.550	2.581	2.422
	(2.252)	(1.605)	(1.485)
Revenue < 100,000 dummy*2011	0.245	1.795	2.497*
	(2.167)	(1.587)	(1.479)
Revenue < 100,000 dummy*2012	-0.022	0.302	1.337
	(2.022)	(1.022)	(1.270)
Revenue function	Linear	Linear	Quadratic
R-squared	0.720	0.776	0.849
Observations (intervals, years)	250	500	1,000
Sample with revenue between	87,500 and 112,500	75,000 and 125,000	50,000 and 150,000

Note: Revenue is in intervals of 10,000s of GEL. All regressions include year fixed effects, as well as year fixed effects interacted with each term of the revenue function. Robust standard errors in parentheses, clustered at the revenue interval level. Statistical significance levels: \*10 percent, \*\*5 percent, \*\*\* 1 percent.

### 5.3 Impact of the reform on misreporting by new firms

A key concern with respect to differentiated tax treatment is the risk that new firms respond to eligibility thresholds and entrepreneurs who would otherwise have registered an entity with turnover above the cutoff may register below the cutoff in response to the reform. In this case, the measured effect of the reform using the RDD methodology would not be an indication of additional firm creation, but only of sorting around the cutoff. To assess whether this is the case around the GEL 30,000 cutoff, where we find a significant effect of the reform on formal firm creation in 2010, we estimate whether the number of new firm decreased right above the cutoff in post-reform tax years, relative to tax year 2008.

Table 10 shows the results from a regression that takes all revenue intervals just above the cutoff and fits a linear function to the number of new firms in each interval and year. The variables “Constant” and “Revenue” represent the intercept and slope of this linear function in 2008. The interaction terms of these two variables with year dummies represent the difference in intercept and slope each year, relative to 2008<sup>30</sup>. Only one of the interaction terms (for 2012) is statistically significant

<sup>30</sup> Using 2009 as the base year yields similar results as using 2008.

at the 10 percent level and actually has the opposite sign from what we would expect if there was sorting – a higher, not lower, number of firms registered just above the cutoff in 2012 than in 2008.

The interaction terms with tax year 2011, which is the year for which we find a positive effect of the micro tax reform on formal firm creation, have the sign and size we might expect if there was sorting. That is, the coefficients indicate a lower number of new firms registering just above the cutoff in 2011 than in 2008 and they indicate that the number of new firms became an upward sloping or flat function of declared revenue in 2011 as opposed to 2008 when the function was downward sloping. However, since the interaction terms with year 2011 are not statistically significant, we do not interpret these findings as evidence for sorting around the cutoff.

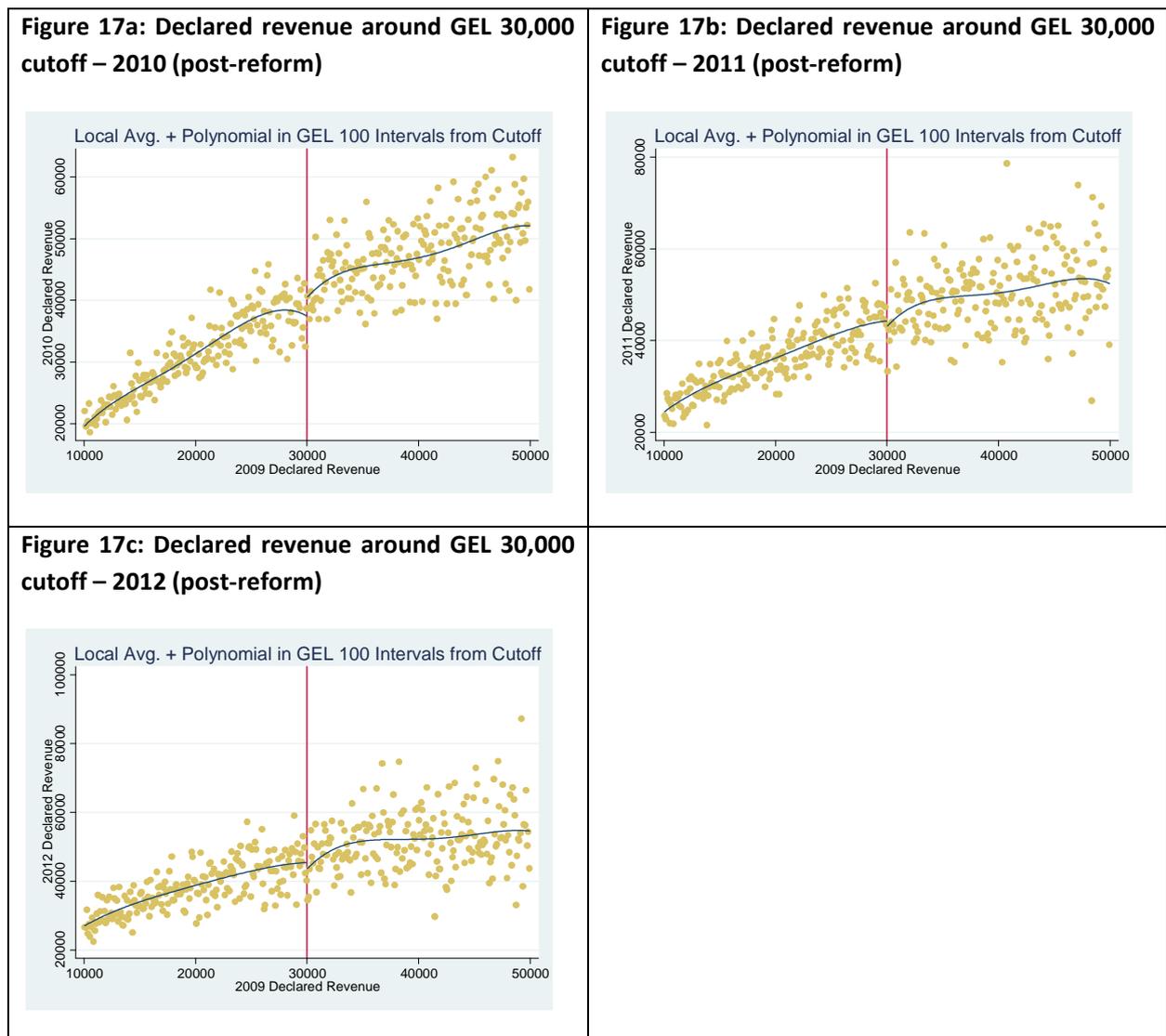
**Table 10: Did fewer new firms register above the GEL 30,000 cutoff after the reform?**

	Dependent variable: Number of new firms		
	(1)	(2)	(3)
Constant	14.503	12.886***	14.662***
	(8.720)	(3.289)	(1.269)
Tax year 2009 dummy	-4.906	0.777	-2.143
	(12.476)	(4.225)	(1.669)
Tax year 2010 dummy	0.015	0.428	-1.567
	(13.580)	(4.695)	(1.804)
Tax year 2011 dummy	-10.894	-4.762	-2.337
	(12.343)	(4.478)	(1.920)
Tax year 2012 dummy	1.187	3.785	-2.154
	(9.610)	(4.627)	(1.565)
Revenue	-2.161	-1.642*	-2.154***
	(2.675)	(0.942)	(0.310)
Revenue*Tax year 2009 dummy	1.018	-0.773	0.079
	(3.854)	(1.193)	(0.403)
Revenue*Tax year 2010 dummy	-0.115	-0.285	0.258
	(4.156)	(1.324)	(0.436)
Revenue*Tax year 2011 dummy	3.526	1.543	0.848*
	(3.798)	(1.252)	(0.469)
Revenue*Tax year 2012 dummy	-0.451	-1.273	0.455
	(2.936)	(1.271)	(0.376)
R-squared	0.079	0.135	0.253
Observations (intervals, years)	250	500	1,000
Sample with revenue between	30,000 and 35,000	30,000 and 40,000	30,000 and 50,000

Note: Revenue is in intervals of 10,000s of GEL. Robust standard errors in parentheses, clustered at the revenue interval level. Statistical significance levels: \*10 percent, \*\*5 percent, \*\*\* 1 percent.

#### 5.4 Impact of the reform on tax compliance by previously registered firms

In order to study the impact of the reform on tax compliance by previously registered firms, we use the basic RDD analysis around the GEL 30,000 threshold described in Equation 2. This analysis compares revenue declared in 2010, 2011, and 2012 to revenue declared in 2009 (as specified in Equations 3 through 5). If firms start declaring less revenue to continue being eligible for the micro firm tax regime, we should see a downward jump in declared revenue at the GEL 30,000 threshold in 2010, 2011, and 2012. As shown in Figures 17a – 17c, we observe a downward jump at the threshold in 2010, but not in 2011 and 2012.



The RDD regressions in Table 11 estimate Equations 3 through 5 to measure the size of the jump at the GEL 30,000 threshold in 2010, 2011, and 2012. In line with Figures 17b and 17c, the shaded rows in Panel B and Panel C show no statistically significant jump in declared revenue in 2011 and 2012 at the

GEL 30,000 threshold. The results in Table 11a, however, suggest that firms with declared revenue just below the GEL 30,000 in 2009 reported between GEL 2,000 and 3,750 less on their 2010 tax return. These amounts correspond to 6 and 11 percent of average declared 2010 revenue just below the threshold (GEL 30,000). We thus find evidence that the reform led to less tax compliance by previously registered firms in 2010. However, this effect dissipated by 2011 and thus lasted for only one year.

**Table 11: Basic RDD to estimate the effect of the micro firm tax regime around GEL 30,000 on tax compliance by previously registered firms**

	(1)	(2)	(3)
Sample with revenue between	25,000 and 35,000	20,000 and 40,000	10,000 and 50,000
Panel A - Dependent variable: Declared revenue in 2010			
2009 Revenue < 30,000 dummy	-3,750*** (1,371)	-1,289 (978)	-1,999** (955)
2009 Revenue	0.268 (0.242)	0.771*** (0.082)	0.780 (1.027)
Constant	34,646*** (7,849)	17,843*** (2,870)	11,534* (5,931)
R-squared	0.016	0.062	0.209
Observations (firms)	3,071	6,460	18,500
Panel B - Dependent variable: Declared revenue in 2011			
2009 Revenue < 30,000 dummy	-634 (2,012)	505 (1,401)	-778 (1,362)
2009 Revenue	0.671* (0.350)	0.856*** (0.118)	1.854 (1.461)
Constant	25,233** (11,337)	18,460*** (4,129)	9,925 (8,450)
R-squared	0.007	0.033	0.111
Observations (firms)	2,619	5,477	13,290
Panel C - Dependent variable: Declared revenue in 2012			
2009 Revenue < 30,000 dummy	-90 (2,495)	102 (1,745)	-1,281 (1,696)
2009 Revenue	0.800* (0.435)	0.806*** (0.147)	2.991 (1.793)
Constant	22,182* (14,134)	22,062*** (5,153)	6,751 (10,370)
R-squared	0.006	0.022	0.073
Observations (firms)	2,405	5,022	12,350

Note: The regression in Column 3 additionally controls for a quadratic function of revenue (coefficients not reported to save space). Robust standard errors in parentheses. Statistical significance levels: \*10 percent, \*\*5 percent, \*\*\* 1 percent.

## 6. Conclusion

Taking advantage of recent policy changes in Georgia, we show that a new tax regime aimed at micro businesses increased the number of newly registered formal firms below the eligibility threshold of GEL 30,000 by 18-30% during the first year of the reform, yet there is no increase in registrations in the following years. At the GEL 100,000 cutoff for a new small business tax regime, we do not find a robust effect of the reform on formal firm creation in any year.

Presumptive tax regimes for small and micro businesses are a widespread policy tool in developing countries and in a number of OECD economies. While there is no shortage of theoretical assessments of their benefits and risks influencing entrepreneurs' decision making, empirical evidence on their effects is limited. The fact that we find a short-term effect of the micro business tax reform on firm registration is in line with earlier research and might point to an existing stock of informal firms that decided to register when the reform was introduced. In the Georgian context, the initial effect on firm registration might also be linked to outreach activities that complemented the policy reform soon after its introduction. We cannot estimate how large the effect of the reform on firm registration would have been without these outreach activities, but the effectiveness of such activities is an interesting area for future research.

Policy makers are also often concerned with abuse risks stemming from differentiated treatment of taxpayers. We find some indication of reduced tax compliance in 2010 around the threshold for the micro business tax regime. However, we do not find reduced tax compliance by Georgian firms in subsequent years. Similarly, our results show no significant evidence of strategic sorting around the eligibility thresholds for the new micro and small business tax regimes.

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