Ghosting the Tax Authority: Fake Firms and Tax Fraud

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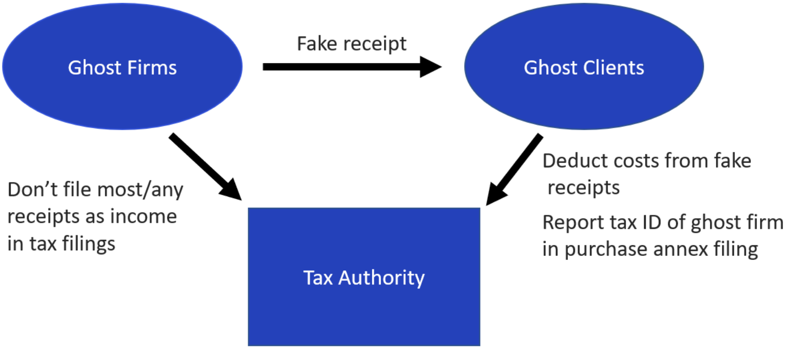
Motivation

- Reducing tax evasion is a key concern of governments around the world
  - Billions of dollars of losses in government revenues
  - Economic distortions and efficiency losses
    - e.g. Feldstein (1999); Chetty (2009)
  - Reliance on inefficient tax instruments
    - e.g. Gordon & Li (2009); Best et al. (2015)
- Growing literature showing importance of third-party information to combat evasion
  - E.g. Kopczuk & Slemrod (2006), Gordon & Li (2009), Kleven et al. (2011), Pomeranz (2015), Carrillo, Pomeranz & Singhal (2017)
- Major threat to the effectiveness of third-party reporting
  - Tax fraud with fake receipts from "ghost firms"
  - Important but poorly understood form of evasion
    - OECD (2017), Mittal et al. (2018), Wazeem (2020)

Ghost Firms

Registered firms that specialize in selling fake receipts for bogus sales to other firms



This Project

1. Detailed country-wide micro-level evidence on ghost firms and their clients
   - Using matched administrative tax data
2. Use transaction-level data to identify informative differences in transaction patterns between ghost firms and regular firms
3. Evaluate innovative enforcement policy by Ecuadorian tax authority to recoup evaded corporate income tax
   - Enforcement directly against ghost firms is challenging
     - Often transient; owners may be shell companies, deceased, victims of identity theft, or without known address; may be part of sophisticated criminal enterprises
   - Alternative approach: enforcement targeting ghost firm clients.
4. Use ownership data to quantify the extent to which this type of tax evasion, and the government's ability to recoup the lost income, are regressive or progressive in nature

Preview of Results: New Facts on Ghost Clients and Transactions

- Facts on the extent and nature of ghost clients and their owners:
  1. Deductions based on fake receipts from ghosts are prevalent and large
  2. Larger firms use more ghost deductions
  3. Ghost deductions are most prevalent in firms owned by high-income individuals

- Facts on the patterns of ghost transactions:
  4. Ghost transactions increase strongly towards the end of the tax year
  5. Much more likely to bunch at round numbers
  6. Strong bunching just below the $5,000 threshold above which firms are required to use the financial system

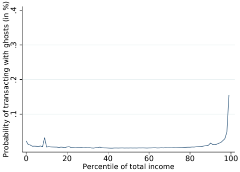
Preview of Results: Enforcement Against Ghost Clients

- Tax authority identified ghost firms and sent notifications to over 1,500 client firms, informing them that
  - deductions from ghost firms have been detected in their past tax filings
  - they are are required to file an amendment
- Firms made back payments of taxes of $20.6 million within 90 days, over $44 thousand per amending firm

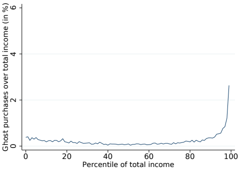
Fact 3: Ghost deductions are most prevalent in firms owned by high-income individuals.

- The probability of engaging in ghost transactions increases with owners' income
- The amount of ghost purchases increases relative to owners' income

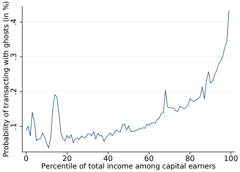
(a) Probability of Owning a Ghost Client, by Owner Total Income



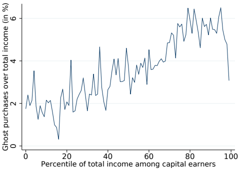
(b) Value of Ghost Purchases Over Total Owner Income, by Owner Total Income



(c) Same as (a) Only for Capital Earners

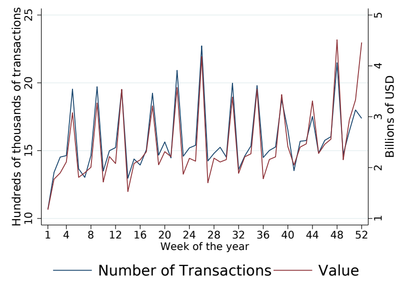


(d) Same as (b) Only for Capital Earners

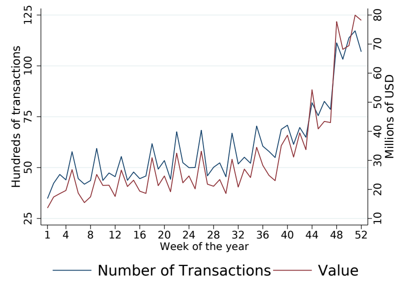


Fact 4: The number and value of ghost transactions increase strongly towards the end of the tax year.

(a) Number and Value of Reported Purchases from Non-Ghost Firms Over the Year



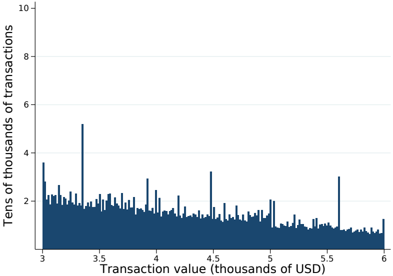
(b) Number and Value of Reported Purchases from Ghost Firms Over the Year



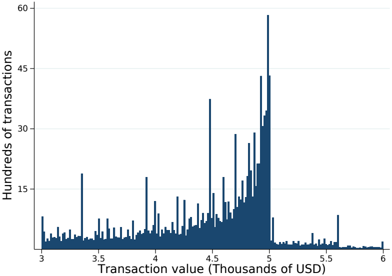
→ Pattern is consistent with firms assessing their annual revenues at the end of the year and then utilizing ghost transactions to achieve a target profit level or rate for tax purposes

Fact 6: Ghost transactions exhibit strong bunching just below the financial system payments threshold.

(a) Distribution of Non-Ghost Purchases



(b) Distribution of Ghost Purchases



- Density of non-ghost transactions is smooth through the threshold (some round-number bunching)
- Strong bunching of ghost transactions exactly at and just below $5,000, and very little density above the threshold

Anti-Evasion Campaign by the Ecuadorian Tax Authority

- Inform ghost clients about the amount of fake deductions detected in their corporate income tax returns; request amended tax filing
- Letter Text:

The SRI has identified transactions with firms that are regarded as inexistent for tax purposes or with ghost firms engaged in pretended economic activity [. . .].

You are required to justify the veracity of these economic activities and the expenses reported in your tax declaration in relation to the following transactions, or file an amendment within 10 working days:

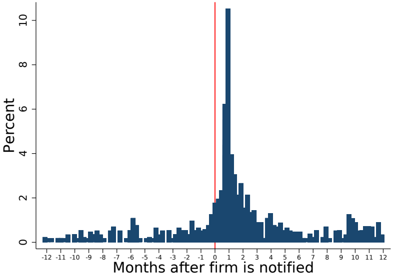
Fiscal year	Tax ID of supplier	Amount
2010	102145	14,000
2011	154699	27,620

Identification strategy

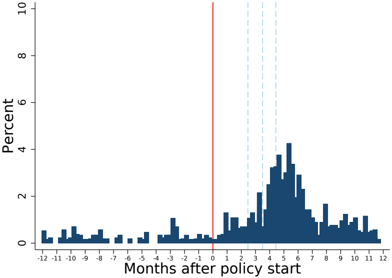
- Identifying assumption: Can compare firms' own pre- and post-notification filings to get the causal effect of the notification (as in Carrillo et al., 2017)
    - Firms rarely spontaneously amend returns filed in previous years
    - Difference in firm filings before and after notification can be interpreted as a causal response to the notification intervention
- External validity
    - Firms were selected mostly based on the magnitude of expected revenue recovery
    - Sample of interest for tax enforcement interventions

Amendment Patterns in Response to the Notifications

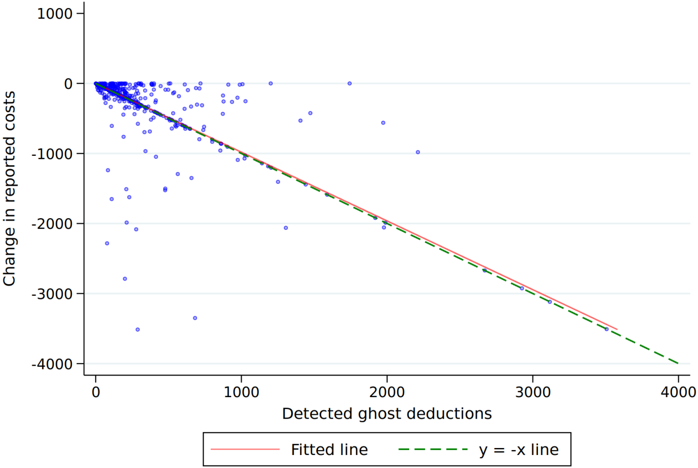
(a) Amendment Rate of Notified Firms



(b) Amendment Rate of Notified Firms



Cost Reductions vs. Notified Amount (Adjusting Sample)



Slope of the fitted line: -0.98

Impact of Notifications on Adjusting Firms

- On average, adjusting firms decreased reported costs by around $230,000 within 90 days after notification
- Increase in tax liability corresponds to 81% of the pre-treatment filing

	(1) 2015	(2) 2010-2015
Revenue	-17,733	-10,079
	(21,534)	(6,872)
Cost	-228,583***	-181,626***
	(51,238)	(28,680)
Tax liability	40,165***	34,003***
	(7,529)	(5,114)
Number of firms	172	460
Number of firm-year pairs		605

▸ Impacts on all notified firms

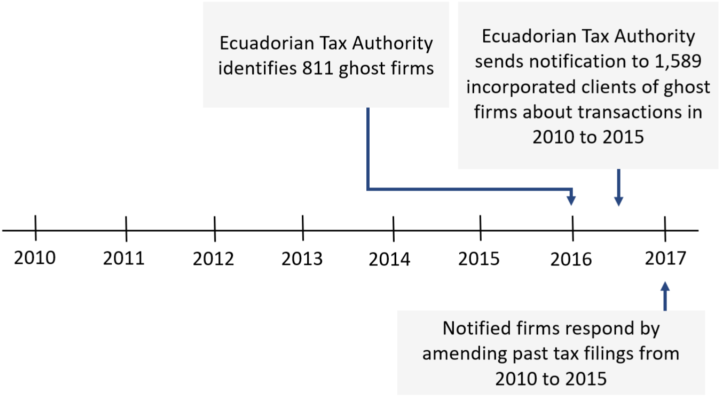
Conclusion

1. Ghost firms represent both an important source of tax evasion and a unique enforcement challenge for tax authorities around the world
    - Evasion on the cost margin, rather than under-reporting of revenue
    - Fabrication of documents for fraudulent deductions constitutes tax fraud, i.e., a felony
2. Ghost deductions for corporate income tax evasion grow disproportionately with firm size and are concentrated in firms with high-income owners
    - May therefore threaten not only horizontal but also vertical tax equity
3. Observed pattern of ghost transactions displays striking suspicious features
    - Round number bunching
    - End-of year peak
    - Avoidance of financial system
4. While targeting and prosecuting ghost firms or their owners is very challenging
    - Policy intervention shows that retroactively targeting ghost clients can be highly successful

Looking forward to your comments!

Appendix

Timeline of the Intervention



Fact 1: Tax deductions based on fake receipts from ghost firms are widespread and large.

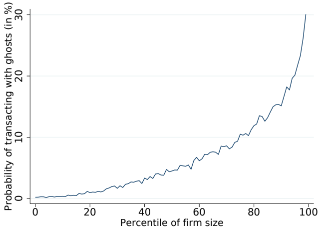
- Almost 5000 firms made purchases from ghost firms in 2015, representing 5.3% of all incorporated firms
- On average, 14% of the value of purchases registered by ghost clients came from transactions with ghost firms

Summary Statistics - All Firms and Ghost Clients

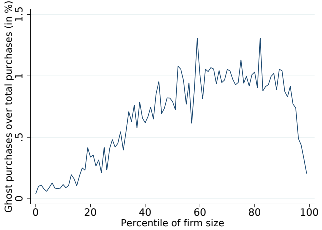
Fact 2: Evasion through the use of ghost firms is more prevalent among relatively large firms.

- Mean revenue is 5.2 times higher than that of regular incorporated firms ($8.6 million vs. $1.6 million)
- Median is 16.1 times higher ($802k vs. $50k)

(a) Probability of Being a Ghost Client, by Firm Size



(b) Value of Ghost Purchases Over Firm Total Purchases, by Firm Size



Fact 5: Round number bunching is much stronger among transactions with ghost firms than in transactions with non-ghost firms

- 6.81% of net-of-VAT transaction values for purchases from ghost firms are multiples of $500
- For purchases from non-ghost firms this is 0.83%

Summary Statistics - All Firms vs. Ghost Clients

	2015		2010-2015	
	(1) All firms	(2) Ghost clients	(3) All firms	(4) Ghost clients
Revenue ($000)	1,574	5,499	1,640	8,556
	(35,060)	(28,741)	(50,419)	(146,377)
	[52]	[750]	[50]	[803]
Cost ($000)	1,483	5,183	1,482	7,555
	(32,209)	(26,143)	(35,733)	(98,579)
	[54]	[716]	[51]	[765]
Tax liability ($000)	24.54	69.11	35.17	220
	(776)	(472)	(3,769)	(12,370)
	[0.02]	[5.30]	[0.02]	[5.97]
Share exporting firms	0.04	0.10	0.03	0.10
Number of identified ghost purchases/ total number of purchases		0.05		0.04
Value of identified ghost purchases/ value of total purchases		0.14		0.10
Number of firms	93,511	4,959	133,131	14,742
Number of observations	93,511	4,959	507,183	27,190

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Summary Statistics - Notified and Adjusting Ghost Clients

	(1) 2010	(2) 2011	(3) 2012	(4) 2013	(5) 2014	(6) 2015	(7) 2010-2015
Panel A: Notified firms							
Revenue ($000)	7,061	9,950	4,986	4,982	4,838	5,589	5,605
	(35,012)	(31,144)	(22,966)	(21,029)	(12,004)	(15,120)	(20,696)
	[1,323]	[2,060]	[1,330]	[1,191]	[1,317]	[1,305]	[1,326]
Cost ($000)	6,675	9,341	4,733	4,478	4,554	5,305	5,248
	(33,033)	(29,004)	(21,736)	(17,413)	(11,456)	(14,629)	(19,075)
	[1,286]	[1,992]	[1,236]	[1,091]	[1,233]	[1,236]	[1,258]
Tax liability ($000)	90.83	142	59.49	97.10	64.42	69.39	79.37
	(489)	(707)	(298)	(810)	(167)	(189)	(475)
	[18.00]	[23.33]	[12.77]	[13.73]	[14.52]	[12.94]	[14.27]
Detected ghost transactions ($000)	261	356	291	316	384	362	338
	(447)	(388)	(373)	(518)	(634)	(578)	(529)
	[145]	[210]	[168]	[165]	[204]	[191]	[181]
Observations	153	182	416	513	556	562	2,382
Panel B: Adjusting firms							
Revenue ($000)	2,757	4,217	2,959	2,925	4,047	3,706	3,486
	(4,774)	(4,453)	(9,508)	(7,596)	(9,371)	(8,130)	(8,360)
	[1,259]	[2,604]	[906]	[887]	[1,235]	[1,189]	[1,121]
Cost ($000)	2,707	4,202	2,878	2,755	3,862	3,510	3,328
	(4,743)	(4,920)	(9,342)	(7,182)	(8,938)	(7,679)	(8,004)
	[1,180]	[2,416]	[849]	[811]	[1,220]	[1,100]	[1,053]
Tax liability ($000)	20.34	64.15	26.35	37.99	44.16	52.05	41.99
	(17.97)	(85.85)	(66.87)	(115)	(111)	(141)	(114)
	[20.37]	[25.20]	[6.79]	[10.76]	[11.69]	[8.69]	[10.01]
Detected ghost transactions ($000)	216	350	205	214	297	316	268
	(407)	(462)	(230)	(307)	(405)	(508)	(402)
	[113]	[201]	[118]	[121]	[178]	[151]	[145]
Observations	27	20	89	136	161	172	605

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Impact of Notifications on All Notified Firms

- Results for the full notification sample are mechanically attenuated relative to those for the adjusting firms

	(1)	(2)
	2015	2010-2015
Revenue	-4,338	-2,667
	(7,106)	(1,898)
Cost	-66,421***	-44,748***
	(16,971)	(8,060)
Tax liability	16,834***	10,909***
	(2,844)	(1,564)
Number of firms	562	1,589
Number of firm-year pairs		2,382

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