VAT Remittance Responsibility, Firm Compliance, and Production

Evidence from a Withholding Reform in Senegal

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Preview of results

Motivation: Irrelevance proposition about the identity of the party responsible for tax remittance to the state in a taxed transaction breaks down once we account for evasion opportunities. Withholding systems are often put in place to prevent evasion and reduce administrative costs.

Main Question: What is the effect of switching remittance responsibility from buyers to sellers on VAT compliance?

Background: VAT reform in Senegal which terminated withholding policies for large and medium taxpayers.

Main result and mechanisms: Negative and significant effects on extensive and intensive margins of compliance for firms registered at large taxpayer unit. No effects for medium-size taxpayers.

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What is withholding VAT?

- Usually, in most transactions, sellers receive a payment inclusive of tax.
- But with withholding VAT, the seller receives a payment exclusive of tax.
- **Definition:** Withholding VAT is an *advance payment* through which suppliers in designated transactions receive prices net of VAT. The buyer has the statutory responsibility to remit VAT to the state. The seller usually receives a creditable certificate for its own accounting.

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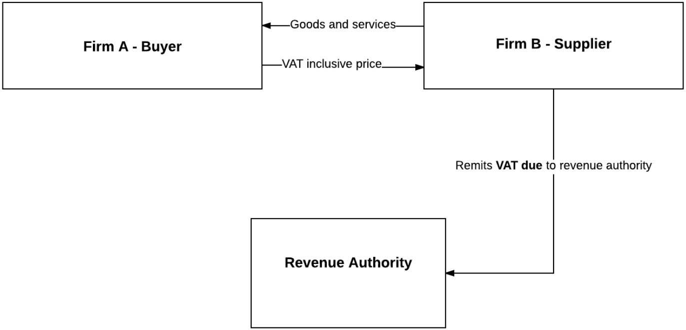
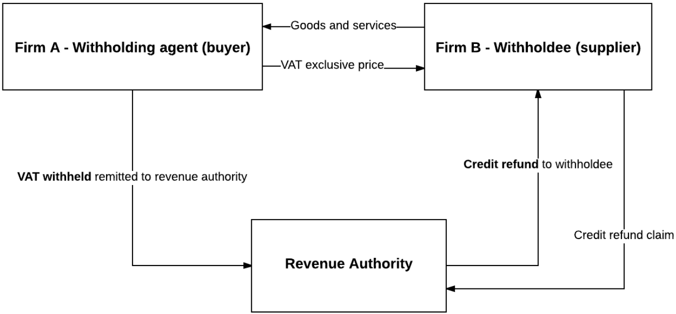
Example 1: Transaction without withholding VAT



Example 2: Transaction with a withholding agent



Withholding in Senegal

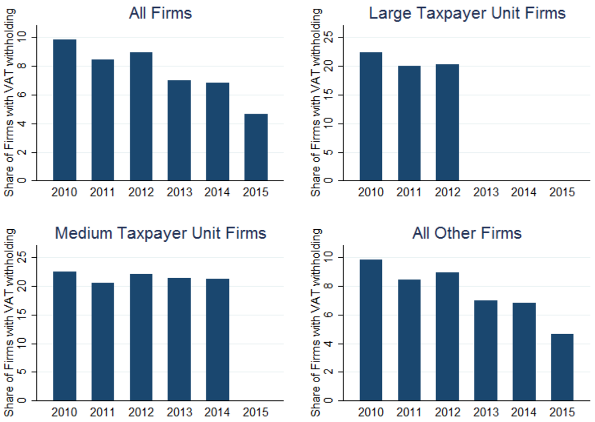


Figure 3: Share of Firms with Positive withholdings

Why use withholding VAT?

3 main reasons to adopt a withholding scheme

1. Administrative cost argument: As a large business-based remittance, withholding VAT creates economies of scale and reduces resources devoted to audits. Focus is on large firms. (Kleven et al. 2016; Bachas and Jensen 2017; Kuchumova 2017)
2. Compliance argument: It creates a compliance default on both the extensive and intensive margins.
3. Cash-flow argument: Withholding VAT ensures that revenue reaches the treasury in a timely manner.

Withholding VAT is controversial

Excess-credit formation and often tax authorities do not respect statutory maximums for reimbursements. Excess-credits/Turnover

- Certificates can be used as collateral for short-term loans, but often with a significant haircut. Businesses provide an interest free loan to the state and turn around to pay banks for access to funds.
- **Adverse consequence 1:**Tax on production, Neutrality of VAT.
- **Adverse consequence 2:** Constraints on firms' expenditures.

Research questions

2 Main questions

1. Does the removal of withholding VAT reduce compliance? Mechanisms: Extensive and/or intensive margins?
2. Does the termination of withholding VAT increase firm productivity?

Related Literature in PF

- Importance of remittance responsibility in tax systems. Does it matter who remits the tax to the revenue authority? (Brockmeyer and Hernandez 2017, Slemrod 2008, Kopczuk et al. 2016)

- Relative importance of remittance responsibility with respect to information reports. Recent literature in PF has studied the effect of information reports (Kleven et al. 2011, Pomeranz 2015, Carillo et al. 2016, Brockmeyer et al. 2016). Partial story since the two mechanisms jointly operate in the enforcement of many taxes.

- Role of firms in modern tax systems (Dharmapala et al. 2011, Kopczuk and Slemrod 2006, Kleven et al. 2015, Bachas and Jensen 2017)

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Analytical Framework: Compliance of the withholdee

Theory on the effect of VAT withholding removal on compliance and payment margins of **withholdees**.

- Under the standard expected utility framework, with full credit reclaim, we fall back to the A-S(1972) model.
- $\Rightarrow$ No effect of withholding system parameters on compliance.
- With delays in reimbursement, firm compliance depends on net position with respect to tax authority after withholding: Net credit vs Net debit.

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Analytical Framework: Compliance of the withholdee - Graphical illustration

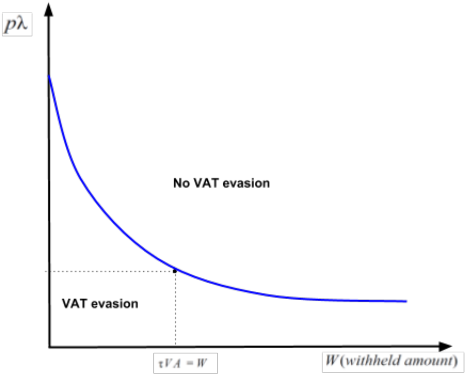

Figure 4: VAT Evasion decisions

Analytical Framework: Compliance of the withholdee - Predictions

- **Prediction**: Evasion depends on the size of the excess credit (in addition to detection probabilities and penalties).

  $\Rightarrow$ Evasion can be prevented even when detection does not involve a penalty.

- **Important result**: Since penalties are often subject to negotiations first with the auditor and then through administrative appeals, withholding can act as preventive measure before any fraud takes place.

- Withholding is a substitute to other VAT fraud detection methods, including audits.

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Analytical Framework- Production

Withholding, Excess-credits and Production

- Under VAT withholding, firms with excess credits operate with **expenditure constraints**.
- Build-up of excess credits leads to adjustments in factor allocation and production.
- **Prediction**: Removing withholding relaxes the upper bound on expenditures and raises the use of all factors, as well as production.

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Empirics: Reform in Senegal

Table 1: Withholding VAT policy over time

	< 01/2013	>=01/2013	>= 01/2015
Large Taxpayer Unit	50%	0%	0%
Medium Taxpayer Unit	100%	100%	0%
Other Firms	100%	100%	100%

Empirics:Identification strategy

- Reform implemented in 2013 for large taxpayers and 2015 for medium taxpayers
- Difference-in-differences with heterogeneous effects based on withholding experience before reform
  - **Treatment groups**: LTU (MTU) firms for which withholding was terminated.
  - **Control groups**: All other firms
  - **Outcomes of interest**: Extensive and intensive payment margins ; Filing margin; A preliminary measure of productivity (turnover per employee).
  - **Assumptions**: Pre-treatment parallel trends in treatment and control groups. ParallelTrends

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Empirics: Specification

$$\begin{aligned} y_{it} &= \alpha_i + \mu \cdot t + \beta_1 Treat_i \cdot Post_t + \beta_2 Treat_i \cdot W_i \\ &+ \beta_3 W_i \cdot Post_t + \delta Treat_i \cdot Post_t \cdot W_i + \epsilon_{it} \end{aligned}$$

Where:

- y_{it} is the outcome of firm i in period t
- $Treat_i$ is the treatment status
- $Post_t$ is denotes the post-reform period
- $W_i = \mathbf{1}(\sum_{t=-24}^{t=0} W_{it})$, where W_{it} is the withholding VAT for firm i in time t

Empirics: Preliminary results

Table 2: Extensive Margin

	(1) LTU	(2) MTU
	=1 if VAT Paid>0	=1 if VAT Paid>0
Treatment× Post (β_1)	-0.0408***	0.0401***
	(0.0137)	(0.0130)
Treatment × Withholding VAT	-0.0162	0.0391*
	(0.111)	(0.0222)
Withholding VAT × Post	0.0283***	0.0113**
	(0.00725)	(0.00483)
Treatment× Withholding VAT× Post (δ)	-0.0391**	-0.0400**
	(0.0182)	(0.0160)
Constant	0.787***	0.666***
	(0.0231)	(0.00200)
Month FE	Yes	Yes
Firm FE	Yes	Yes
Observations	116,540	648,862
Number of firms	2,495	21,218
R-squared	0.007	0.001

Empirics: Preliminary results

Table 3: Intensive Margin

	(1) LTU	(2) MTU
	Log (VAT Paid)	Log (VAT Paid)
Treatment × Post (β_1)	-0.450**	0.778***
	(0.219)	(0.207)
Treatment × Withholding VAT	-0.647	1.036***
	(1.688)	(0.371)
Withholding VAT× Post	0.697***	0.329***
	(0.124)	(0.0648)
Treatment× Withholding VAT × Post (δ)	-0.947***	-0.772***
	(0.304)	(0.254)
Constant	12.01***	8.142***
	(0.353)	(0.0305)
Month FE	Yes	Yes
Firm FE	Yes	Yes
Observations	115,600	639,069
Number of firms	2,494	21,205
R-squared	0.008	0.002

Empirics: Preliminary results

Table 4: Treatment Effects on Productivity

	(1) LTU	(2) MTU
	Log (Turnover/Employee)	Log (Turnover/Employee)
Treatment × Post (β_1)	0.417**	0.325*
	(0.180)	(0.189)
Treatment × Withholding VAT	1.708*	0.670**
	(1.027)	(0.286)
Withholding VAT × Post	-0.0910	0.0686
	(0.107)	(0.0510)
Treatment × Withholding VAT × Post (δ)	-0.235	0.0313
	(0.240)	(0.223)
Constant	12.24***	8.895***
	(0.218)	(0.0273)
Month FE	Yes	Yes
Firm FE	Yes	Yes
Observations	116,540	648,862
Number of firms	2,495	21,218
R-squared	0.011	0.003

Preliminary Findings

- **Compliance**: The removal of withholding leads to greater evasion.
    - Mechanisms: Significant effect of withholding removal on the intensive and extensive payment margins for large firms. No statistically significant fir effect for medium-size firms.

- **Production**: No treatment effect for firms which previously experienced withholding VAT.

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Excess-credits as a share of turnover

Excess-credits/Turnover

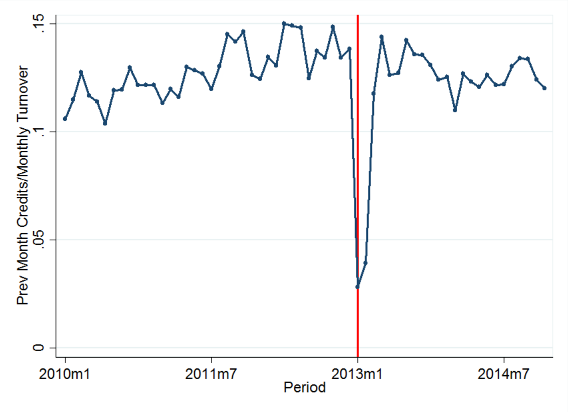

Figure 5: Illustration of VAT Withholding resulting in a Credit Refund

Parallel Trends LTU share with VAT Paid$>$ 0 ParallelTrends

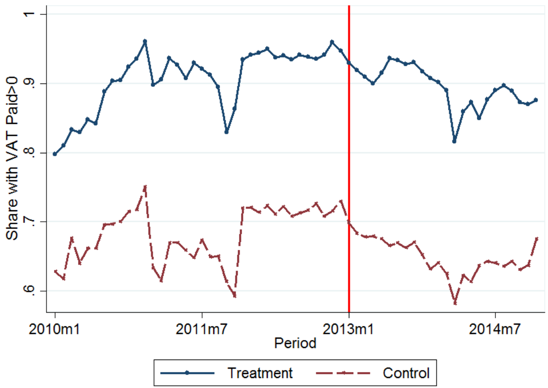

Figure 6: Illustration of VAT Withholding resulting in a Credit Refund