

# The Rents from Trade and Coercive Institutions: Removing the Sugar Coating

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## Terms of trade and institutions

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# Motivations

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- In the 19th century, collapse of world sugar prices ...  
... but wages didn't go down in the British West Indies sugar Colonies
- Claim : fall of sugar prices reduces rents of elites, which in turn reduces investments in coercive institutions

# Motivations

## Barbados vs Virgin Islands

### Barbados

- Huge majority of lands were used by elite for sugar
- After prices decline, sugar continued to account for 85% of exports
- Why ? No outside option for workers

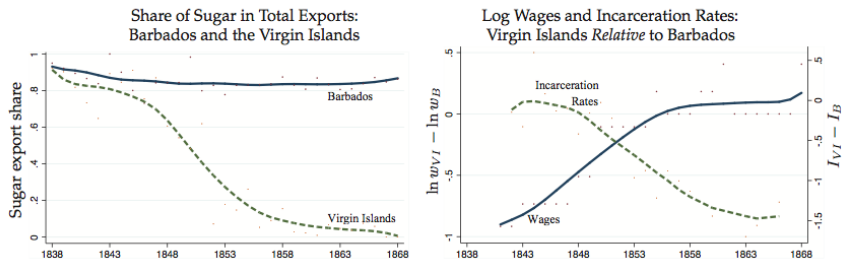
### Virgin Islands

- Hurricanes => lot of free and abandoned lands
- After prices decline, elite couldn't prevent ex-slaves from developing off-plantation works.

# Motivations

## Barbados vs Virgin Islands

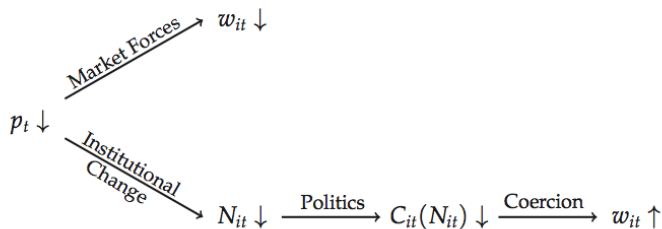
Figure 1: The Evolution of Trade, Wages, and Coercion in Barbados and the Virgin Islands



# Motivations

## Thesis of the paper

Figure 2: The Impact of Trade on Wages via Market Forces and Institutions



- Panel data on the evolution of 14 British West Indies sugar colonies from 1838 to 1913
- Source: Colonial Blue Books
- Includes wages, incarceration rates per capita, exports by crop
- Authors add : share of land suitable for sugar cane, hurricane landfalls

# Historical Background

## Abolition of Slavery

### Act for the Abolition of Slavery (1833)

- Barbados and Antigua : future wage not expected to go up since elite owned all of the land
- Guyana, Trinidad, Jamaica : opposite

# Historical Background

## Legal Coercion

Def: use of colonial laws to prevent former slaves from farming legally on freeholds or farming illegally on abandoned plantations.

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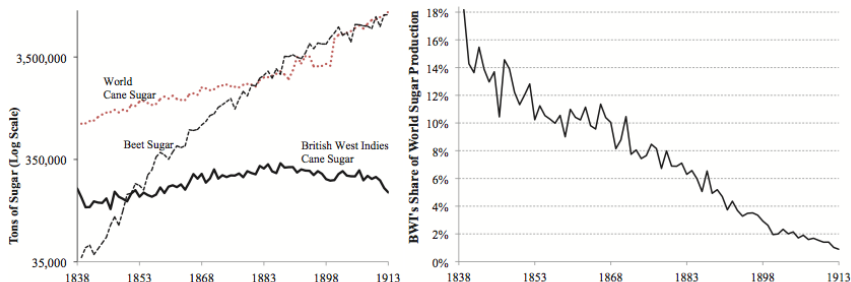
Four types of legal coercion

- Tenancy-at-will (threat to destroy cottage and land if you don't work enough)
- Restrictions to buy lands (artificially high price, sold in large lot size, pooling of resources to buy was banned, tax system to penalize smallholders, ...)
- Prevention of squatting (thrown in jail if you squat)
- Immigration-Emigration policy (used to depress wages)

# Historical Background

## Terms of Trade Shocks

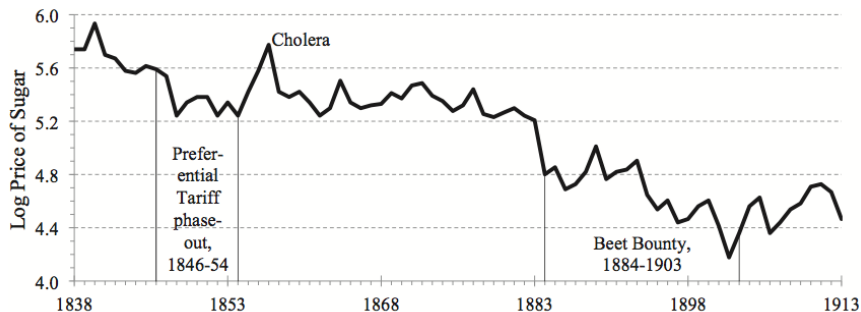
Figure 3: World Sugar Production by Region and the British West Indies' Share



# Historical Background

## Terms of Trade Shocks

Figure 4: The Secular Decline in Sugar Prices



# Historical Background

## Terms of Trade Shocks

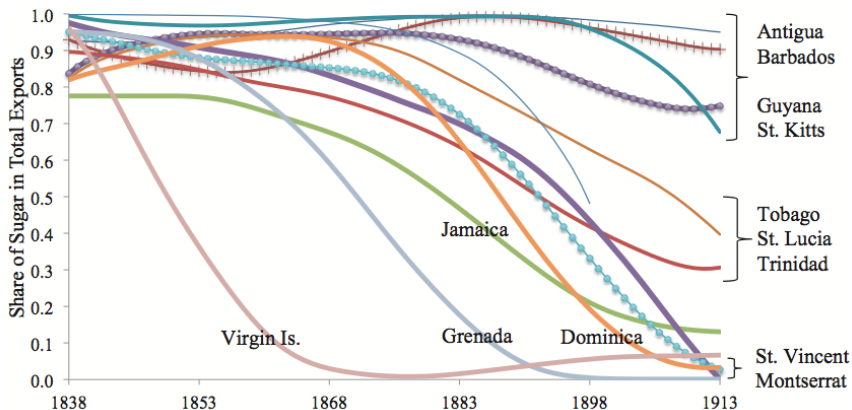
Figure 5: Jamaican Sugar Plantations in 1790 and 1890



# Historical Background

## Terms of Trade Shocks

Figure 6: The Share of Sugar in Total Exports and its Differential Decline



### Small open economy

- 2 goods : sugar (price  $p$ , exo) and food (numeraire)
- $L$  workers (exo),  $N$  planters (endo)

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### Continuum of land plots with heterogeneous quality

- If plot  $i$  is used for sugar, production of  $\phi x(i)$  with  $x' < 0$
- If plot  $i$  is used for sugar, production of  $\Phi - i$
- Planters occupy the best plots  $[0, N]$ , use coercion to prevent ex-slaves using  $[N, N + C]$  where  $C$  has cost  $C^\gamma$ , and  $[N + C, L + C]$  is used for food by ex slaves

# Model

## Wage Determination

On each planter's plot lives an ex-slave

- Deal : wage  $w$ , generate sugar income  $p\phi x(i)$
- No Deal: worker relocates to the most marginal plot  $i = L + C$  and earns  $\Phi - L - C$

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Nash Bargaining over Surplus

- Hence surplus from negotiations is  $p\phi x(i) - (\Phi - L - C)$
- Let  $\theta(N)$  be planter's bargaining power
- Solution is  $w(i, C, N) = (1 - \theta(N))p\phi x(i) + \theta(N)(\Phi - L - C)$

Planter's profit is

$$\pi(i, C, N) = \theta(N)p\phi x(i) - \theta(N)(\Phi - L - C) - C^\gamma/N$$

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Hence  $C$  is chosen in order to maximize

$$W(C) = \alpha(N) \int_0^N \pi(i, C, N) di + \int_0^N w(i, C, N) di + \int_{N+C}^{L+C} (\Phi - i) di$$

st  $C \geq 0$ , where  $\alpha(N)$  is weight given to planter's profits.

There is a critical planter strength  $N^C \in [0, L]$  such that

- $C(N) = 0$  for  $N < N^C$
- $C(N) > 0$  with  $C_N > 0$  for  $N \geq N^C$

# Model

## Equations to test

Differentiating the wage equation yields:

$$dw = (1-\theta)\phi x dp - [\theta C_N + (\phi x - \Phi + L + C)\theta_N]dN + (1-\theta)p x d\phi + \theta d(-L)$$

Differentiating coercion equation yields:

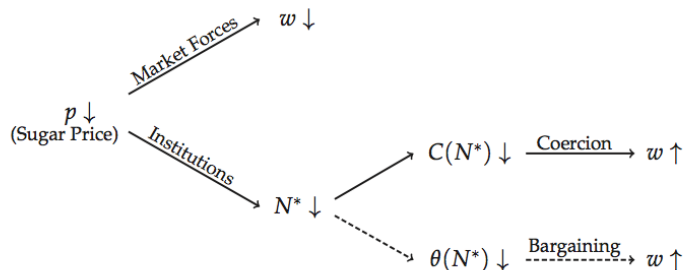
$$dC = C_N dN$$

Hence, core regressions are

$$\ln w_{it} = \beta^w N_{it} + \gamma^w \ln p_t + \delta^w X_{it} + \lambda_i^w + \lambda_t^w + \epsilon_{it}^w$$

$$C_{it} = \beta^c N_{it} + \delta^c X_{it} + \lambda_i^c + \lambda_t^c + \epsilon_{it}^c$$

Figure 10: The Impact of Sugar Prices, Productivity, and the Outside Option on Wages



# OLS Results

## Panel A

Panel A. Dependent Variable: Log Wages  $\ln w_{it}$

	Static				Lagged Wages (Dynamic)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$N_{it}$ : Sugar exports as a share of total exports		-0.44*** (-3.11)	-0.44*** (-3.25)	-0.44*** (-3.16)		-0.58*** (-4.21)	-0.42*** (-4.01)	-0.47*** (-4.03)
$\ln p_t$ : Price of sugar in London	0.03 (0.58)	0.19*** (3.42)			0.09 (1.22)	0.28*** (3.68)		
$\ln w_{i,t-1}$ : Lagged wages					0.79*** (15.68)	0.76*** (15.68)	0.75*** (16.41)	0.75*** (14.27)
Colony FE	y	y	y	y	y	y	y	y
Year FE	n	n	y	y	n	n	y	y
Observations	944	944	944	803	893	893	893	768
$R^2$	0.65	0.68	0.75	0.69	0.87	0.88	0.90	0.87

# OLS Results

## Panel B

Panel B. Dependent Variable: Incarceration Rates per Capita  $C_{it}$

	Static				Lagged Incarceration Rates (Dynamic)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$N_{it}$ : Sugar exports as a share of total exports		0.47** (2.46)	0.59*** (3.61)	0.57*** (4.09)		0.41** (2.46)	0.47*** (3.52)	0.50*** (3.65)
$\ln p_i$ : Price of sugar in London	0.08 (0.97)	-0.10 (-0.97)			0.07 (0.96)	-0.09 (-0.99)		
$C_{i,t-1}$ : Lagged incarceration rates					0.65*** (10.86)	0.64*** (10.89)	0.63*** (11.10)	0.62*** (10.40)
Colony FE	y	y	y	y	y	y	y	y
Year FE	n	n	y	y	n	n	y	y
Observations	856	856	856	803	783	783	783	737
$R^2$	0.48	0.49	0.58	0.60	0.71	0.71	0.75	0.76

# Conclusion

## Main results

- According to standard international trade theories, 19th C decrease in  $p$  should have reduced  $w$  in each of the sugar colonies
- In colonies that were either marginally suited for sugar cane cultivation or impacted by hurricanes, fall of  $p$  impacted power of planter elite
- This improved opportunities to peasants, so  $w$  went up

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## Comments

- Immigration-emigration as a major policy ... but  $L$  is exo
- Taxes as a major coercion policy ... but  $C$  paid only by farmers
- Why farmers, sugar workers and free workers should have the same weight in the objective function
- Why only  $N$  workers in farms ?
- (not covered in the presentation: how they endogenize  $N$  is questionable)