What drove the profitability of colonial firms? Labour coercion and trade preferences on the Sena Sugar Estates (1920-1974)

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Agenda

(1) Historical debates

Historical debates

Two immediate objectives of modern colonialism (Austin, 2010):

1 Keep it cheap (avoid draining metropolitan coffers)
2 Stimulate economic development (attract investment)
$\implies$ ensure 'effective occupation' and revenues

Economic history of colonialism (esp. in Africa) has sustained two long-standing debates:

1 To what extent were colonial institutions 'extractive'?

- Techniques & experiences of extraction (historians)
- Implications for long-run development (economists)

2 Were (large) settler/colonial enterprises profitable?

- Did advantageous treatment pay-off?
- Was empire 'worth it'?

Debate 1: Sources of colonial rents

Large literature!

Three techniques of economic governance (c.f., Amin, 1972):

1 Privileged allocation & protection of property rights
  - Acemoglu, Johnson and Robinson (2001)
  - Forced land resettlement in RSA (Abel, 2019)
  - Restrictions on cash crops (Frankema et al., 2016)

2 Labour repression/coercion
  - Coffee in Rwanda (Blouin, 2021)
  - Rubber in Congo (Lowes and Montero, 2021)

3 Preferential market access to the metropole (Brown, 1985)
  - Stabilize home access to raw commodities
  - Incentivize production/investment

Implemented by various means: differentiated rights based on ethnic-cultural origin, trade/fiscal tools (e.g., hut tax) and security apparatus.

Debate 2: Were colonial enterprises profitable?

Successor to debates regarding profitability of slavery

Colonial institutions claimed to be "civilizing", European firms (and settlers) prime immediate economic beneficiaries.

A number of studies show colonial business infrastructure $\rightarrow$ improved local development outcomes in targetted areas (Jedwab & Moradi, 2016; Dell and Olken, 2020)

But little systematic evidence of super-profits!

- Frankel (1935) estimates a nominal return of between 5 – 11% on capital invested in Witwatersrand gold mining industry (1887-1932) ... but, probably an over-estimate (Broberg, 2018)
- 'for the general investor in the years after 1880, the Empire was probably a snare and a delusion' (Davis & Huttenback, '87)
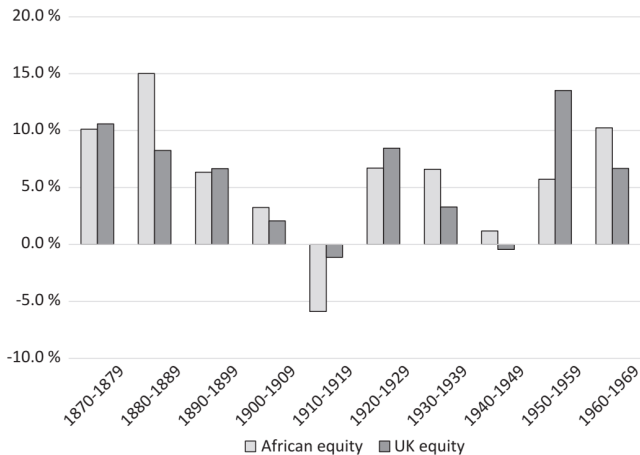- Finding reinforced by Rönnbäck & Broberg (2019) ...

Fig. 6.10 Real return on investment in Africa compared to previous research on investments in the UK, by decade, 1870–1969 (geometric mean per year). Source: Our estimates based on African Colonial Equities Database (ACED); Edelstein's figures based on (Edelstein 1976, appendix 3); Dimson et al.'s figures based on (Dimson et al. 2002, Table 32–2). Note: Dimson et al.'s figures have here been adjusted by using the same data for UK inflation rate as is used throughout this study, so that any differences due to different estimates of the inflation rate are eliminated

Rönnbäck & Broberg (2019: 122-123)

The median company operating in Africa and traded on the London Stock Exchange was not generating a particularly high rate of return on investment – in nominal terms, yielding an average rate of return of around 1 per cent per year. A nominal rate of return of that magnitude would not even match the average inflation rate during the period under study. ... Unsurprisingly, a large number of the companies in the sample, therefore, wound up or were acquired by competitors

Of course, there were *some* super-stars (there always are), but dominated by mining monopolies (esp. diamonds – e.g., Diamang, Angola) and rarely sustained.

Our contribution

Literature suggests pervasive, material colonial rents, but unexceptional firm performance : extraction ≠ super-profits.

Not clear why – these two strands of literature have not been explicitly connected.In part, because focus of performance of colonial firms has been on external returns to a portfolio investor, not internal profitability at the firm-level.

> We ask: what *were* the sources of the (un)profitability of colonial enterprises? ⇔ To what extent were colonial rents core drivers of firm performance?

We look at this in the context of Sena Sugar Estates plc.

Adopt a counterfactual approach, reconstructed series of annual accounts and financial records (1920-1974) + simple econometric analysis of firm productivity

(2) Portuguese colonialism

Portuguese colonialism in Africa

Portugal both the world's first and last colonial empire (UNESCO, 1973)

Relative backwardness throughout 19th and 20th centuries:
- Financial crisis in 1890, resulting in debt default in 1892
- In 1913, GDP per capita US$1,250 vs. US$5,024 in UK
- In 1910, merchant fleet 114,000 tonnes vs 11.5 million in UK

In Mozambique:
- Until late 19th century, colonial presence limited to coastal trading posts and semi-feudal *prazo* system
- 1890s: large-scale concessions (*companhias majesticas*) financed with foreign capital; and provision of labour + transport to neighbouring British colonies
- Only in 1930s (Salazar's '*Estado Novo*') move to *de facto* territorial integrity and centralized administrative control
- No significant (rural) white settler movement

Persistent use of forced labour

Following abolition of slavery, to which Portugal slowly acceded, the *problema de mão-de-obra* was a recurring issue in Lisbon and overseas administrations (Jerónimo & Monteiro, 2012).

Clear view that (i) economic development impossible without African (native) labour; and (ii) such labour would not be available spontaneously at quality and quantity desired.

Thus: "não há que ter escrúpulos em obrigar, forçar esses rudes negros de África (...) a trabalhar" (Comissão Redatora do Regulamento de Trabalho Indígena, 189?)

But how? Four planks (1899-1961):

- Penalization of vagrancy and indolence
- Legal status of *indígena*, requiring state intervention
- Work *should be* voluntary, but state can compel if not
- Poll taxes (cash or kind) [as per *mussoco* of *prazos*]

Regulamento geral do trabalho dos indígenas nas colónias portuguesas

CAPITULO I

Disposições gerais

Artigo 1.º Todo o indígena válido das colónias portuguesas fica sujeito, por esta lei, à obrigação moral e legal de, por meio de trabalho, prover ao seu sustento e de melhorar sucessivamente a sua condição social.

Art. 2.º Todo o indígena válido que não tiver domicílio certo, nem meios de subsistência, nem exercer habitualmente alguma profissão, ofício ou outro mester em que ganhe a sua vida nos termos do artigo 1.º, não provando necessidade de fôrça maior, que o justifique, de se achar nestas circunstâncias, será julgado pelo curador de serviçais e colonos, administrador do respectivo concelho ou circunscrição civil, ou se fôr pelo capitão-mor respectivo, conforme os casos, e, condenado, será entregue à autoridade administrativa, que lhe poderá fornecer trabalho pelo período que entender conveniente, dentro da área do respectivo distrito, por um espaço de tempo não inferior a 3 meses, nem superior a um ano.

Forced labour in practice

Different forms of labour:

- *Voluntário*: present for employment to private employers (e.g., to pay taxes)
- *Contratado*: forced labour for private employers often through direct state authority
- *Chibalo*: corveé for public works (mostly women)
- *Conta própria*: debatable

Until 1942, wage rates linked directly to head tax obligations $\implies$ often employers would transfer value direct to local administration.

Local authorities played a direct role in recruitment and enforcement, not least due to critical importance of 'native' tax returns (Havik, 2013)

Forced labour in practice

Persistent external *and* internal critiques of forced labour in Portuguese Africa, e.g.,: 1925 Ross Report (League of Nations); oral testimonies (e.g., Vail and White, 1978; Isaacman, 1992)

Report of Inspector of Angola, Henrique Galvão (1947):

> *"Today, the native is not bought – he is simply rented from the Government, though he may have the status of a free man. His master could hardly care less if he falls ill or dies as long as he goes on working while he lives. ... When he becomes unable to work or when he dies the master can always ask to be supplied with other laborers."*

ILO report (1962):

> *"The provisions concerning the moral obligation to work contained in the Native Labour Code of 1928 had not been formally repealed as of the date of this present report. ... It would appear that a clear distinction may not always have been drawn .. between lack of activity as such and cases of vagrancy"*

Sugar and imperial preferences

Sugar an important colonial export since late 19th century.

Globally, sugar subject to complex trade arrangements. Limited volume sole on to "free market".

Portuguese colonial sugar:

- Primarily intended to support (growing) demand in the metropole (limit demand for foreign exchange)
- Supported by concessional tariff-rate quotas and incentive pricing (fixed prices)
- Implied moderate advantages vis-à-vis world price, but primarily gave both market and price stability

Mozambique a major potential supplier – e.g., Munro (1913):

> *Blessed with a combination of favoring conditions – including a warm climate, abundant rainfall, a magnificent river system, ... and an abundant and industrious Native population – the Province of Mozambique has, in the opinion of every authority who has visited it, agricultural possibilities far surpassing those of any other part of South Africa."*

(3) Sena Sugar Estates

Sena Sugar Estates

Early history of 'adventure capitalism':

- **1890**: John Peter (Pitt) Hornung founds the *Companhia de Assucar de Mocambique* (CAM) and begins the first sugar plantation in Mopeia, Prazo Maganja d'aquem Chire, (left bank of Zambézi) aquired via family connections
- **1905**: Hornung leases 5,000 hectares in Prazo Caia from Companhia de Moçambique, builds Sena Sugar Factory at Villa Fontes, (right bank of Zambézi)
- **1906**: construction begins on Lisbon sugar refinery (*Refinaria Colonial*) with a capacity of 20,000 tons p.a. (inaugurated 1909)
- **1909**: Hornung acquires the Marromeu estate of the Sociedade Assucareira de Africa Oriental Portuguesa, in Prazo Luabo (right bank of Zambézi)
- **1920**: consolidates entities into Sena Sugar Estates plc, listed on London Stock Exchange

Production volumes (tonnes, raw sugar)
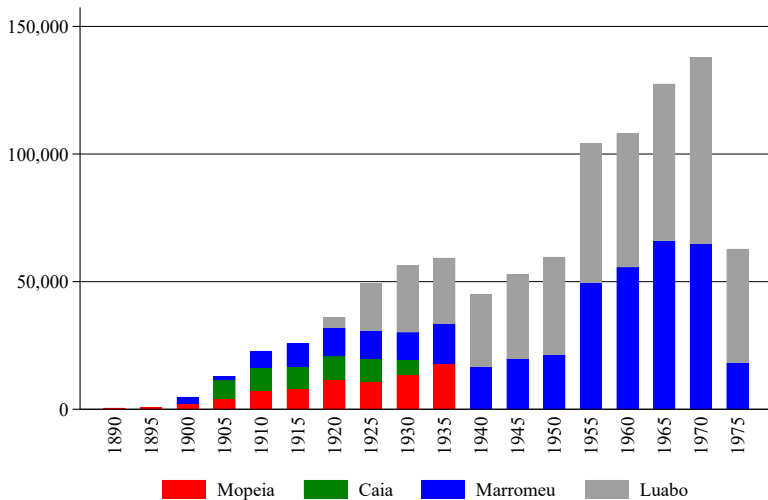
Sales markets (sugar)
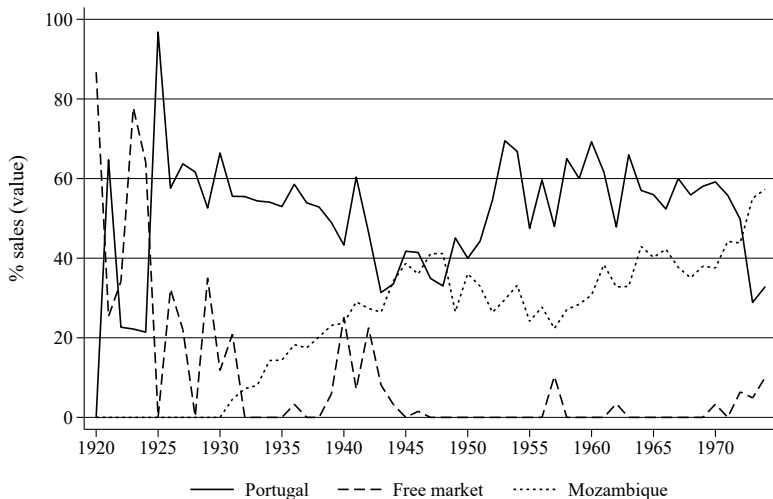
Labour

From earliest days access to labour a constant issue: local *prazos* de-populated and competition from newly formed chartered companies → SSE sub-leased more *prazos* (incl. Angonia, Luabo etc.)

Growth in 1900-1920 → "Hornung contract" : a 20-year contract for government to supply a constant 3,000 men recruited for 6 month periods from Zambezia labour reserves

Hornung contract revoked in 1926 and with abolition of *prazos* SSE came to rely on recruitment from across the region + *sufficiently attractive* wages to sustain flow & longer contracts.

Labour structure remained constant throughout: mass of 'natives' recruited (at force) on 6 month contracts (up to 30.000 per year), most from distant locations; upper-tier of (Asian) skilled workers from British colonies; European managerial elite (Mozambique & London)

Technology

Limited use of modern capital/inputs in early period:

- No widespread use of irrigation

- No use of chemicals

- Reliance on basic 'Uba' variety (until 1947)

- But, mill was state-of-art (1924, Luabo)

Slow modernization from late 1950s, mostly to raise output but also to save labour:

- Overhead irrigation (Luabo)

- Chemical fertilizer, herbicides and pesticides

- Mechanization: e.g., digging, loading etc. (1964-)

(4) Data and statistics

Data

Collate financial and administrative records, plus colonial era correspondence, from multiple sources.

Primary sources:

- The Hornung Papers (West Sussex Record Office)
- The Oury archive (Borthwick Institute, Uni. of York)
- Sena Sugar Estates reports and accounts (Uni. of York)
- Colonial files in *Arquivo Histórico de Moçambique*, UEM

Secondary sources (access to estate archives, now lost):

- Vail and White (1980)
- Head (1980)
- Lapperre (2020)

Digitialize and clean $\rightarrow$ 86 variables (1920-1974)

Descriptive statistics: quantities

	1920	1930	1940	1950	1960	1970
Harvested area (ha.)	9,268	12,054	11,551	13,805	16,053	15,992
African workers (av./day)	12,281	12,190	11,603	16,047	16,246	11,842
Raw sugar (tonnes)	41,087	50,684	48,904	81,983	117,737	137,851
sold into Portugal	21,379	24,955	20,901	46,978	70,946	71,666
sold into Mozambique	0	3,024	13,114	21,282	39,791	56,298
sold onto free market	12,898	2,707	3,746	1,001	633	5,864
SIDUL refined sales (tonnes)	19,690	30,972	24,913	40,688	65,382	73,089

Factor inputs

Legend:
- Total harvested area (Ha)
- Average number of native labourers/ day, all
- Property, plant and equipment
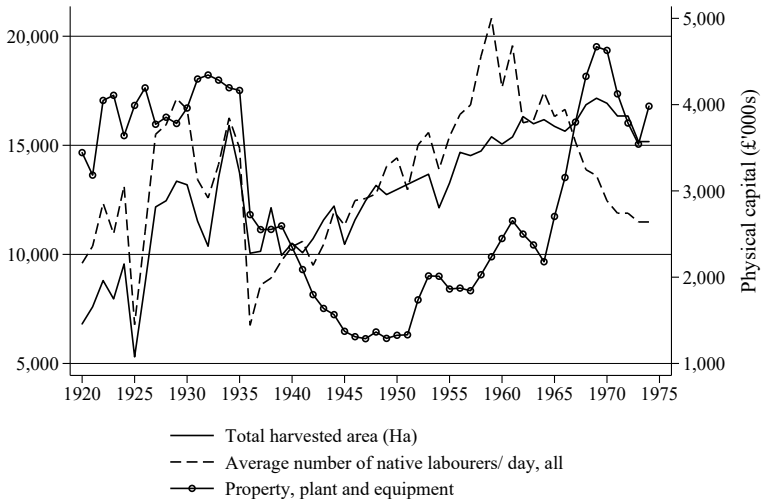
Sales prices (inflation-adjusted)
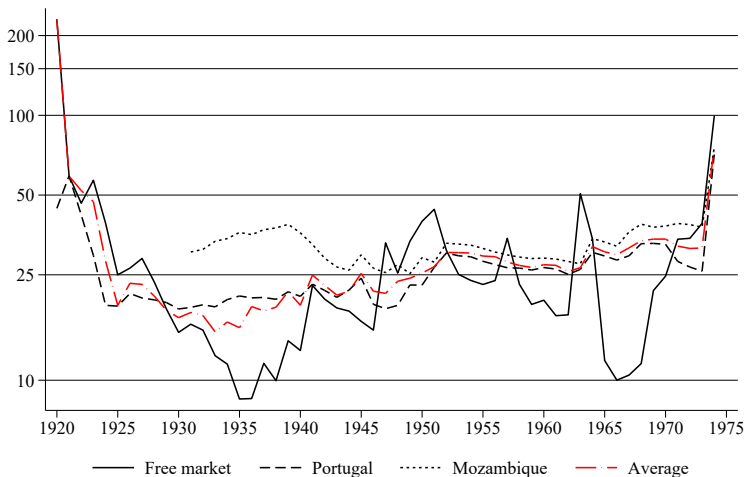
Profit & loss by decade, constant 1950s prices

	1920	1930	1940	1950	1960	1970
SIDUL						
Revenues	*1,226*	*2,343*	*1,378*	*2,383*	*3,802*	*3,645*
Expenses	*1,188*	*2,305*	*1,348*	*2,318*	*3,713*	*3,544*
Sugar purchases	409	462	395	833	1,418	1,562
Import duties	21	53	43	86	297	805
Refining (all)	758	1,789	909	1,399	1,999	1,176
African operations						
Revenues	*1,852*	*923*	*1,176*	*2,423*	*3,600*	*5,512*
of which, sugar	1,813	889	1,102	2,300	3,535	5,380
Expenses	*849*	*941*	*1,029*	*2,478*	*3,405*	*2,842*
African labour	324	340	290	724	1,001	747
European labour	248	292	218	541	621	377
Sugar production	4	141	284	695	1,002	729
Other	273	169	236	519	781	989
SSE (consolidated)						
Total revenue	*2,610*	*2,775*	*2,132*	*3,737*	*6,307*	*7,246*
EBITDA	*531*	*292*	*339*	*825*	*1,015*	*1,297*
Profit (after tax)	*249*	*124*	*170*	*347*	*437*	*434*

(5) Firm performance analytics

Comparative performance

Measures

External return on investment:

$$\text{ROI}_{it} = \frac{\Delta p_{it} + d_{it}}{p_{it-1}} \tag{1}$$

$$\text{ROI}_t \approx \frac{\sum_i d_{it}}{\sum_i p_{it}} \tag{2}$$

(NB: some evidence price movements were negligible).

Internal return on investment:

$$\text{ROCE}_t = \frac{\text{EBIT}_t}{\text{Net assets}_t} \tag{3}$$

Evidence from both measures indicates SSE was neither a super-star nor a disaster ... a consistent and solid performer, near the middle of distribution of comparable returns.

ROI and ROCE for SSE (group), inflation-adjusted
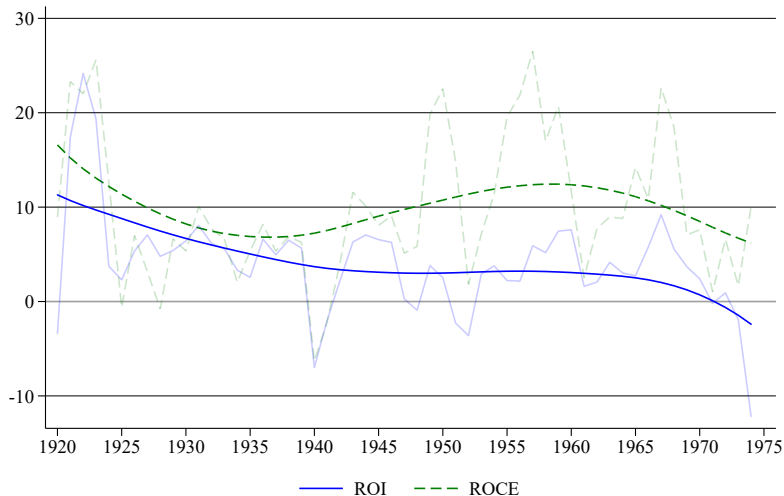
Comparative ROIs, inflation-adjusted

Legend: SSE (red line with × markers) — Safe assets (global) (dashed) — Risky assets (global) (dotted)
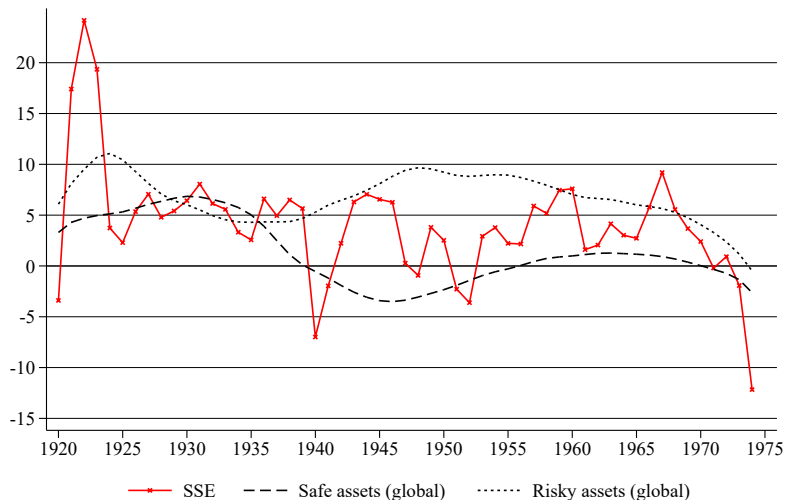
Comparative ROCEs, inflation-adjusted

|	Firm(s)	Period	Nominal	Real
(a)	Harrisons & Crosfield	1921-1941	9.8	9.8
	Finlay & Co.	1924-1941	7.3	7.3
	Borneo Company	1921-1941	2.7	2.7
	SSE	1920-1941	7.4	7.4
(b)	Select UK companies	1939-1950	12.9	7.2
	SSE	1939-1950	14.0	7.8
(c)	Lancashire cotton mills	1920-1938	3.2	3.8
	Lancashire cotton mills	1946-1960	15.3	11.2
	SSE	1920-1960	12.3	10.0
(d)	UK companies (all)	1949-1974	17.3	11.7
	UK food companies	1949-1974	17.2	11.7
	Tate & Lyle	1949-1974	16.9	11.3
	Booker	1949-1969	19.6	15.1
	SSE	1949-1974	18.0	12.4

Comparative ROCEs (1949-74), inflation-adjusted
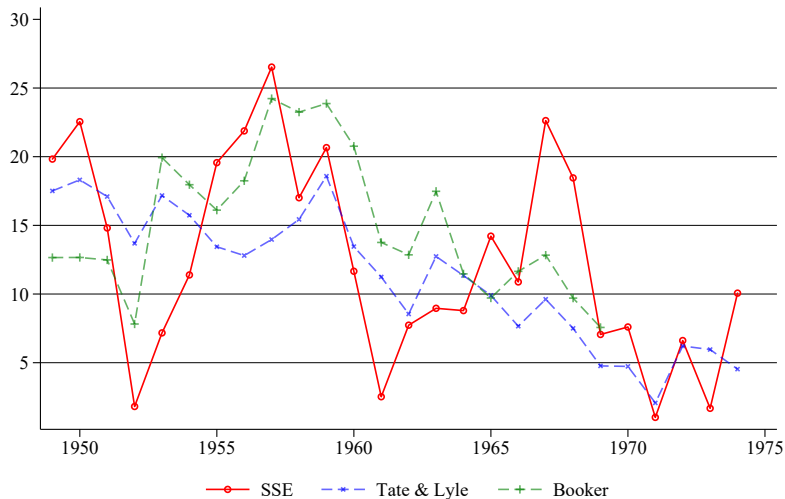
Counterfactual performance

Method

Focus on the ROCE – total revenues and costs (operating profits) enter the numerator.

Run a series of thought experiments ('what if' scenarios) where we vary specific elements of operating revenues or costs based on plausible alternative conditions (c.f., Mitchell et al., 2011).

Focus on two key prices (at least partially exogenous):
- Local labour costs
- Sugar sales (export prices / market access)

Labour scenarios

Decade	Obs.	Counterfactual			
		(I)	(II)	(III)	(IV)
1920	10.8	7.4	0.0	-3.5	-2.6
1930	6.4	3.6	-1.9	1.8	6.4
1940	6.5	4.2	-5.6	2.9	1.0
1950	16.3	11.6	11.5	8.8	5.7
1960	11.3	6.2	10.9	5.0	-0.9
1970	5.4	1.9	5.3	2.4	0.5
All	9.8	6.2	3.2	2.9	1.8

I All labour paid at rate of *voluntários*
II Wages fixed in real terms at mean 1962-65 values
III Total local labour costs $\geq$ 40% of African sugar prod. costs
IV Scale local labour costs by ratio of mean regional rural unskilled African wage to SSE average wage

Sales price (markets) scenarios

| Decade | Obs. | Counterfactual | | | |
		(I)	(II)	(III)	(IV)
1920	10.8	13.7	11.0	14.6	11.0
1930	6.4	2.0	3.8	5.6	6.4
1940	6.5	8.0	5.3	8.6	5.5
1950	16.3	17.2	17.2	30.3	25.1
1960	11.3	0.9	0.8	22.2	15.6
1970	5.4	12.2	6.8	20.6	10.2
All	9.8	8.7	7.6	16.7	12.5

I All sales to Portugal at London CIF price
II All non-Portugal sales at London CIF price
III All sales to Portugal at USA in-quota CIF price
IV All non-Portugal at USA in-quota CIF price

Productivity analysis

Productivity implications

What implications did changing labour and market protection conditions have for firm productivity?

Simple Cobb-Douglas production function:

$$Y = A^{\delta t + \pi w + \phi m} \cdot H^{\alpha} \cdot K^{\beta} \cdot L^{\gamma} \cdot \varepsilon \qquad (4)$$

A total factor productivity

t time trend

w real wage index (vs. 1964)

m market protection (SSE average / free price)

H labour inputs (men/day)

K physical capital (value)

L land area harvested

Productivity implications

	(I)	(II)	(III)	(IV)	(V)	(VI)
Labour	0.07	0.27**	0.32**	0.27**	0.28**	0.30**
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Land area	1.25***	0.64***	0.57***	0.65***	0.61**	0.54**
	(0.17)	(0.22)	(0.21)	(0.22)	(0.23)	(0.22)
Physical capital	0.33***	0.24***	0.16***	0.24***	0.24***	0.15***
	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)	(0.05)
Time		0.01***	0.01***	0.01***	0.01***	0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Real wage index			0.26**			0.34***
			(0.11)			(0.13)
Protection				-0.01		-0.12**
				(0.04)		(0.06)
Global price index					-0.02	-0.06
					(0.05)	(0.05)
Constant	-3.90***	0.24	1.03	0.21	0.47	1.53
	(1.12)	(1.49)	(1.43)	(1.51)	(1.56)	(1.55)
N	55	55	55	55	55	55
R^2	0.87	0.91	0.91	0.91	0.91	0.92
$(\alpha + \beta + \gamma) - 1$	0.65	0.16	0.05	0.16	0.14	-0.01
prob.	0.00	0.34	0.78	0.34	0.43	0.97

(6) Summary and discussion

Summary

Main insights:

- Persistence of 'colonial rents' in Portuguese East Africa (esp. around forced labour)
- SSE was a solid performer, comparatively stable returns
- Cheap local labour until at early 1960s was essential to its business model (capacity to sustain returns)
- Likely, enterprise inviable without cheap labour, esp. <1950s
- Trade preferences not *so* critical, and less favourable than some other markets; but helped ensure stable returns
- Larger colonial rents (esp. associated with forced labour) associated with lower total factor productivity

How does all this relate back to the literature?

Colonial rents did translate into higher profits in a counterfactual sense – i.e., investment unlikely to have been forthcoming in their absence.

But offset by high *other* costs:

- European workforce, racialized labour structure
- Other inputs, transport, insurance (exogenous)
- = Likely, slowed adoption of modern technology
- **...** and lower overall productivity

> Extractive institutions sowed seeds of own destruction

Competitive advantage not based on superior productivity + while evidence shows a more stabilized African workforce potentially viable, history of labour repression and absence of local management skills (in SSE and beyond) made successful transition to Independence extremely difficult, partly explaining collapse of SSE in late 1970s.