

INTERROGATING THE LOGIC OF ACCUMULATION IN THE SUGAR SECTOR IN SOUTHERN AFRICA

Alex Dubb - Institute for Poverty Land and Agrarian Studies
(PLAAS); Southern African Sugar Research Network (SSRN)

Introduction



- Introduction to **regional patterns** of sugar production accumulation by way of **data analysis** for key (formerly 'South African') firm **Illovo** across 6 countries
- '**Centrifugal**' logic throws-up a **diversity of routes of accumulation**, and different broad political compacts, despite focusing on a single company, **(monolithic?) commodity** and **region**
- Detailed case studies to provided by **SSRN** in special issue of Journal of Southern African Studies

The Sugar 'Boom'



- Expansion: **Increases in aggregate** measures of production
- **Geographical dispersion** of formerly 'South African' corporate capital; Illovo and Tongaat-Hulletts
- **Reshuffling of corporate ownership** (Unbundling monopoly capital, Illovo purchased by British Sugar)
- Given rise to **puzzling differentials** in corporate **profits**

Average sugar production and cane area harvested in Southern Africa 1962-2012

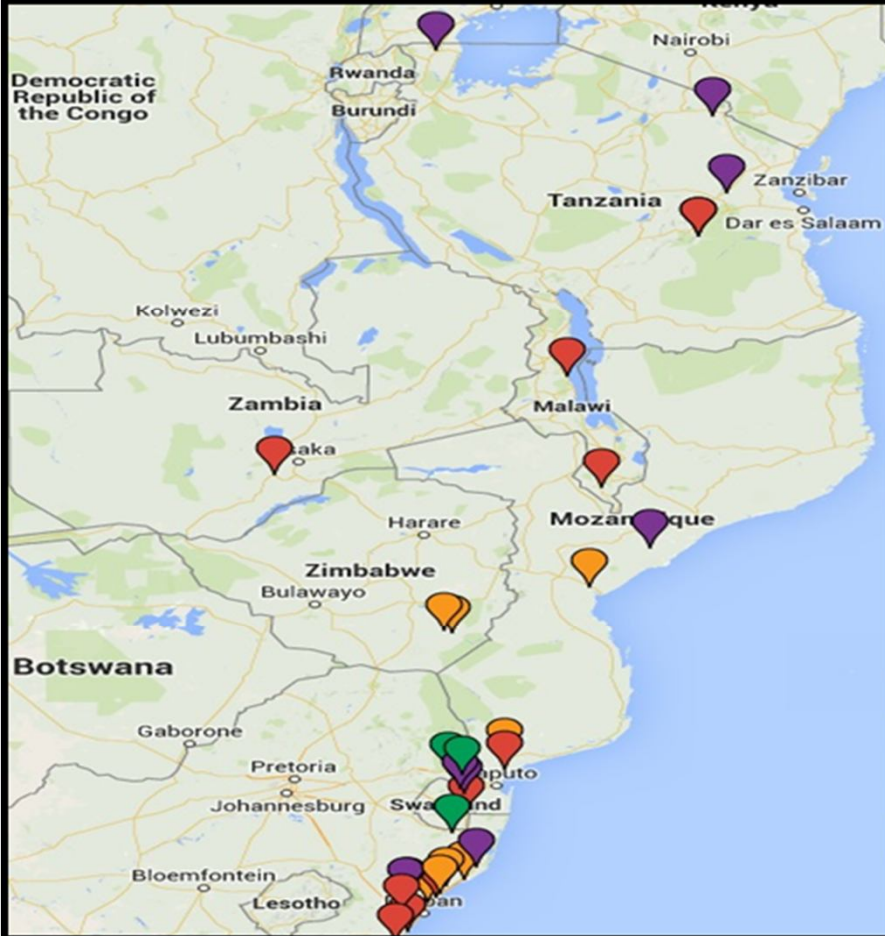
Average sugarcane area harvested Southern Africa (000' ha)

	Malawi	Moz.	Zim.	Swazi.	Tanzania	Zambia	Sub Total	South Africa	Total
1962-1972	2	41	13	12	31	15	102	161	263
1972-1982	9	53	26	21	27	25	143	211	354
1982-1992	15	22	23	36	14	31	130	267	397
1992-2002	19	25	27	40	15	35	148	300	448
2002-2012	23	37	43	51	22	41	201	313	514

Average sugar production in Southern Africa (000' ton)

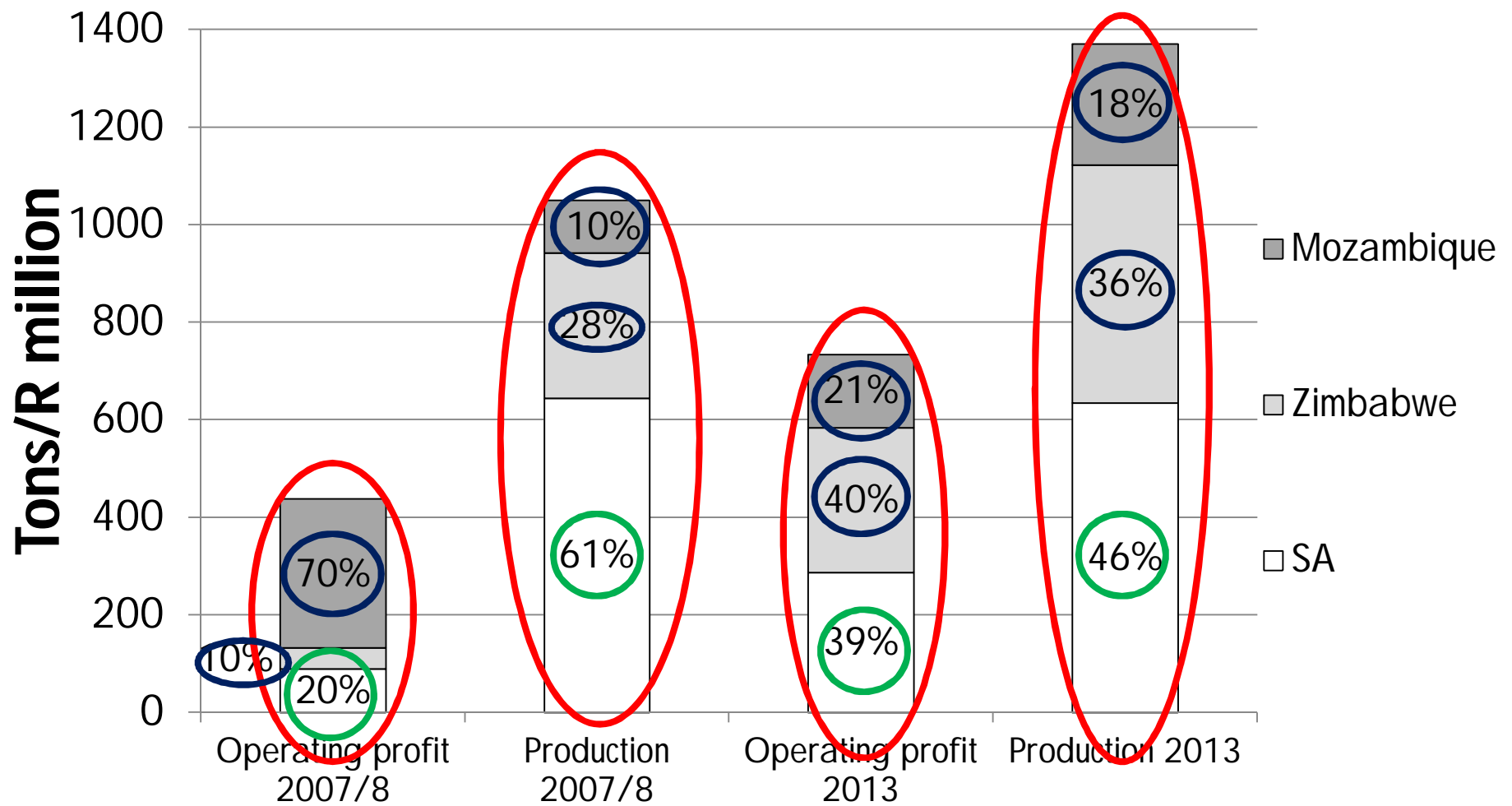
	Malawi	Moz.	Zim.	Swazi.	Tanzania	Zambia	Sub Total	South Africa	Total
1962-1972	24	222	196	137	80	37	667	1,469	2,136
1972-1982	96	223	315	262	111	84	1,090	1,989	3,078
1982-1992	173	39	411	486	104	135	1,349	2,141	3,490
1992-2002	203	44	445	493	118	178	1,482	2,204	3,685
2002-2012	278	267	408	626	261	289	2,129	2,327	4,456

Sugar mills in Southern Africa

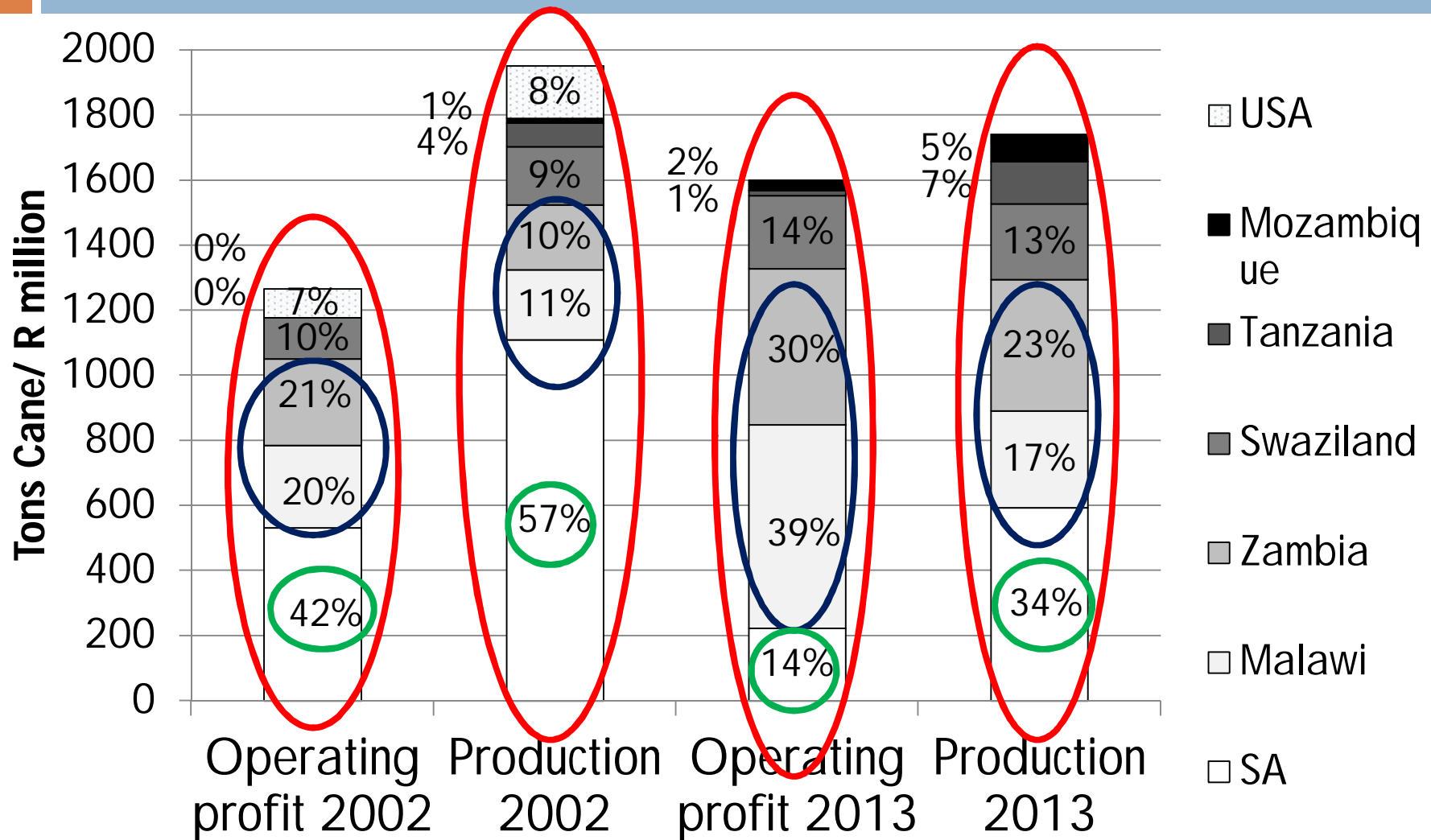


Company	Country	Mills	
Illovo	Malawi	Dwangwa , Nchalo	
	Mozambique	Maragra	
	South Africa	Eston , Gledhow , Noodsberg , Sezela , Umzimkulu**	
	Swaziland	Ubombo	
	Tanzania	Msolwa , Ruembe	
	Zambia	Nakambala	
Tongaat-Hulett's	Mozambique	Mafambisse , Xinavane	
	South Africa	Amatikulu , Darnall , Maidstone , Felixton	
	Zimbabwe	Hippo Valley , Triangle	
TSB	South Africa	Malelane , Komati , Pongola	
Others			
	Tereos/Petrobras	Mozambique	Sena Sugar
	Union Cooperative Ltd	South Africa	Dalton
	Umfoloji Sugar Mill	South Africa	Umfoloji
	Royal Swazi	Swaziland	Mhlume , Simunye
	Sukari Investment Company	Tanzania	TPC (Moshi)
	Tanzania Sugar Industries Ltd	Tanzania	Mtibwa
Kagera Sugar Ltd	Tanzania	Kagera	

Tongaat-Hulett's operating profit and sugar production for 2007/8 and 2013



Illovo operating profit and sugar production for 2002 and 2013



Puzzle of differential profits

- What explains these differentials?
- Hypothesis of two key sets of factors:
 - ▣ Differential productivity
 - ▣ Uneven terms of exchange
 - Similar to focus on 'oligopoly rents' & 'economies of scale' in African value chains identified by Gibbon & Ponte 2005
- Opportunity for evaluation of data provided by **Ilovo's 2013 Good Corporate Citizenship reports**, (complimented by South African Sugar Technologists Association production data and World Bank international price data)

Differential productivity: Hierarchies of field and factory

- Extreme form of “**industrial throughput system**” (Weis 2007; 2010)
- Miller’s profitability centred on **maximising** consumption of high-quality (sugarcane):
 - ▣ Profits experienced only in ‘**last tons processed**’ (See Senior’s Last hour; Marx, 1976)
 - ▣ Profits highly contingent on **reducing the value composition of raw materials** (sugarcane) (Moore, 2011)

Differential productivity: Hierarchies of field and factory

- Structurally **monopsonic relationship** between miller-processing and sugarcane cultivation
 - ▣ **Highly perishable** (requires immediate processing);
 - ▣ **No market for raw-cane** (requires processing for valorisation) (Mintz, 1986; Binswanger and Rosenzweig, 1986)

Differential productivity: Hierarchies of field and factory

- Productivity in Southern African **cane** production defined by **labour, water and input** intensity
 - ▣ **Labour Intensity:**
 - land dispossession → access to land & 'reserve army' of 'cheap' African labour (Lincoln, 2006; Head, 1980; Mlambo and Pangeti, 1996; Richardson, 1982; Beinart, 1990).
 - Capital intensity in processing and transport, but cultivation un-mechanized (Van Bilijon, 1970; Minaar, 1993; O'Laughlin, forthcoming);

Differential productivity

- ▣ **Input and water intensity:** Labour productivity increases rest largely on:
 - improving seedcane varieties, chemical fertilizers, pesticides and;
 - increasing water intensity in **high-rainfall areas** or through the **development of (often state-subsidized) irrigation infrastructure** (Tyler, 2007; Minaar 1992; Mlambo and Pangeti, 1996; NDC, 1992; Beck, 1964).

Key characteristics of Illovo's sugar production by country

	Malawi	Moz.	South Africa	Swaziland	Tanzania	Zambia
	(2 mills)	(1 mill)	(4 mills)	(1 mill)	(2 mills)	(1 mill)
Cane						
Total cane (tons)	2 460 735	719 860	5 119 944	2 165 058	1 309 145	3 246 082
Average ERC%	12.2%	11.7%	11.6%	10.8%	9.9%	12.4%
Water (m ³) / tons estate	183	74	0	133	94	105
Total hectare	24,567	9,300	?	23,600	24,162	28,000
Tons per hectare	100	77	?	92	54	116
Total employment	7,954	4,798	23,431	6,411	10,993	6,369
Ton cane/worker (total)	411	154	223	419	292	545
Sugar						
Total sugar (tons)	299,494	84,546	598,700	232,723	129,737	403,867
Mill capacity						
Tons cane per hour	501.69	297.48	1,051.70	398.92	252.6	642.07
Tons sugar per hour	61.06	36.07	122.86	42.88	25.05	79.88
Time efficiency	87.6%	80.4%	78%	82.4%	81%	84.2%
Total employment	7,032	1,684	2,879	1,467	1,036	3,035
Ton sugar/worker	42.59	49.88	206.32	158.83	125.23	133.11

Outgrowers

- Substantial numbers of 'outgrower' farmers (large & small) supplying sugar mills
- Monopsonic mill position → outgrowers constitute a ***social fraction*** within a nominally ***technically and economically unified*** process of sugar production.

Outgrowers

- Facilitate sugar accumulation directly,
 - ▣ by **absorbing the risk/cost** (Glover Kusterer, 1990):
 - **Of cane production.** Mill often **only purchases sucrose** . If there is a production failure, the mill is unaffected,
 - **Of sugar marketing.** Reducing/withholding payment for sucrose that was not ultimately sold, or scaling down other services
 - **Of circulation/transport.** Growers oft carry full cost of cane transport, including losses due to delays.
 - ▣ **Fragments workers** and **embeds exploitation** within local structures of authority and reciprocity; evade minimum wages difficulties sourcing/disciplining labour on estates (Wilson 1986; Little and Watts 1994).
 - ▣ Longer working hours, lower wages and poor conditions may, however, simply serve to **compensate for lower-than-average levels of productivity (in field or factory)**, and **may be captured by either farmers or millers** (Starosta, 2010).

Outgrowers

- Facilitate accumulation indirectly:
 - ▣ **attracting investment of development aid** or preferential finance into cane production;
 - ▣ rendering the absorption of **land and water resources** land into estate **production more politically palatable**;
 - ▣ encouraging the **political promotion** of favourable mercantile arrangements for **sugar pricing and tariff protection**, often connected to **different models of land reform** (see Chinsanga; James & Woodhouse; Matenga; Terry; Scoones; Sulle, forthcoming).

Key characteristics of Illovo's outgrower supply base by country

	Malawi		Mozambique		South Africa		Swaziland		Tanzania		Zambia	
	(2 mills)		(1 mill)		(4 mills)		(1 mill)		(2 mills)		(1 mill)	
	N	%	N	%	N	%	N	%	N	%	N	%
Total Cane (tons)	2,460,735	100	719,860	100	5,119,944	100	2,165,058	100	1,309,145	100	3,246,082	100
Estate	2,102,002	85	532,560	74	358,396	6	862,058	40	726,145	55	1,942,435	60
Outgrower	358,733	15	187,300	26	4,761,548	94	1,303,000	60	583,000	45	1,303,647	40
Total (n, % tons)	2,047	100	371	100	5,707	100	±3,031	100	8,000	100	270	100
"Small"	1,888 (2.5 ha)	90	337 (< 20 ha)	17	5,071 (3-5 ha)	5	±3,000 (3 ha)	32	6,320 (< 5 ha)	70	254 (6-7.5 ha)	16
"Medium"	159 (?)	10	29 (20-120 ha)	37	58 (?)	3	15 (<50 ha)	3	1,667 (5-50 ha)	19	-	-
"Large"	-	-	5 (120+ ha)	45	578 (50+ ha)	92	16 (+50 ha)	65	13 (50+ ha)	11	16 (50+ ha)	84
Total hectares												
Estate	19,567	80	6,000	65	?	?	8,600	36	9,562	40	17,025	61
Outgrower	5,000	20	3,300	35	?	?	15,000	64	14,600	60	10,975	39
Tons/hectare**												
Estate	107		89		?		100		76		114	
Outgrower	72		57		?		87		40		119	
Total Employment	7,954	100	4,798	100	23,431	100	6,411	100	10,993	100	6,369	100
Estate*	4,520	57	3,173	66	780	3	1,290	20	1,509	14	2,979	47
Outgrower	3,434	43	1,625	34	22,651	97	5,121	80	9,484	86	3,390	53
Tons/worker**												
Estate*	411		154		223		419		292		545	
Outgrower	465		168		399		667		481		652	
Outgrower	104		115		212		254		61		385	

Markets, Mercantilism

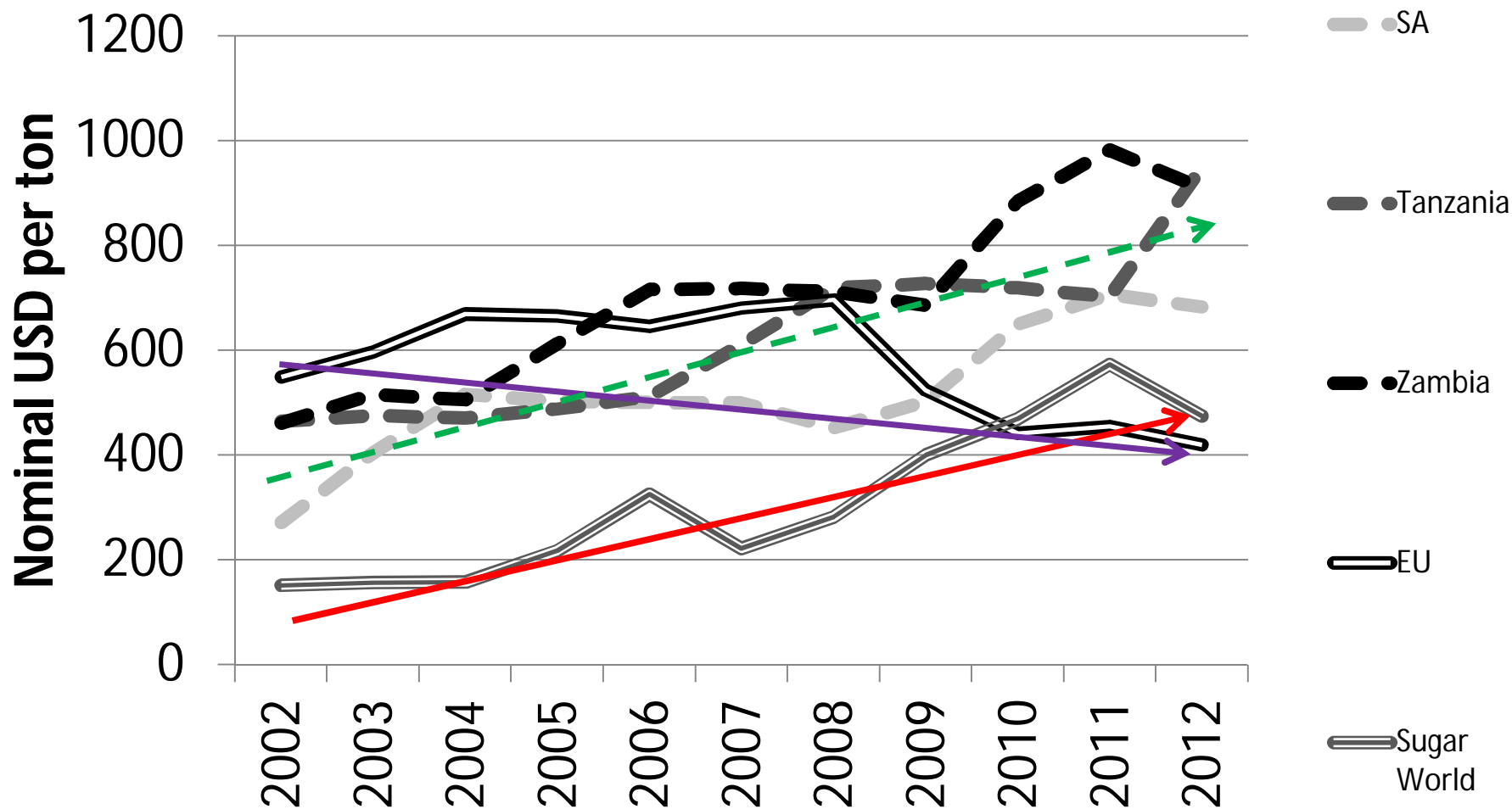
- **Evaded the wholesale liberalization and deregulation** in other sectors and industries,
- Sugar retains a **strong *mercantile*** character, and is subject to a **complex politics of domestic and regional *market segmentation***.
- Here 'mercantile' is used to mean **purposely shifting terms of trade**, erstwhile **anonymously determined** by 'market' forces.

Markets, Mercantilism

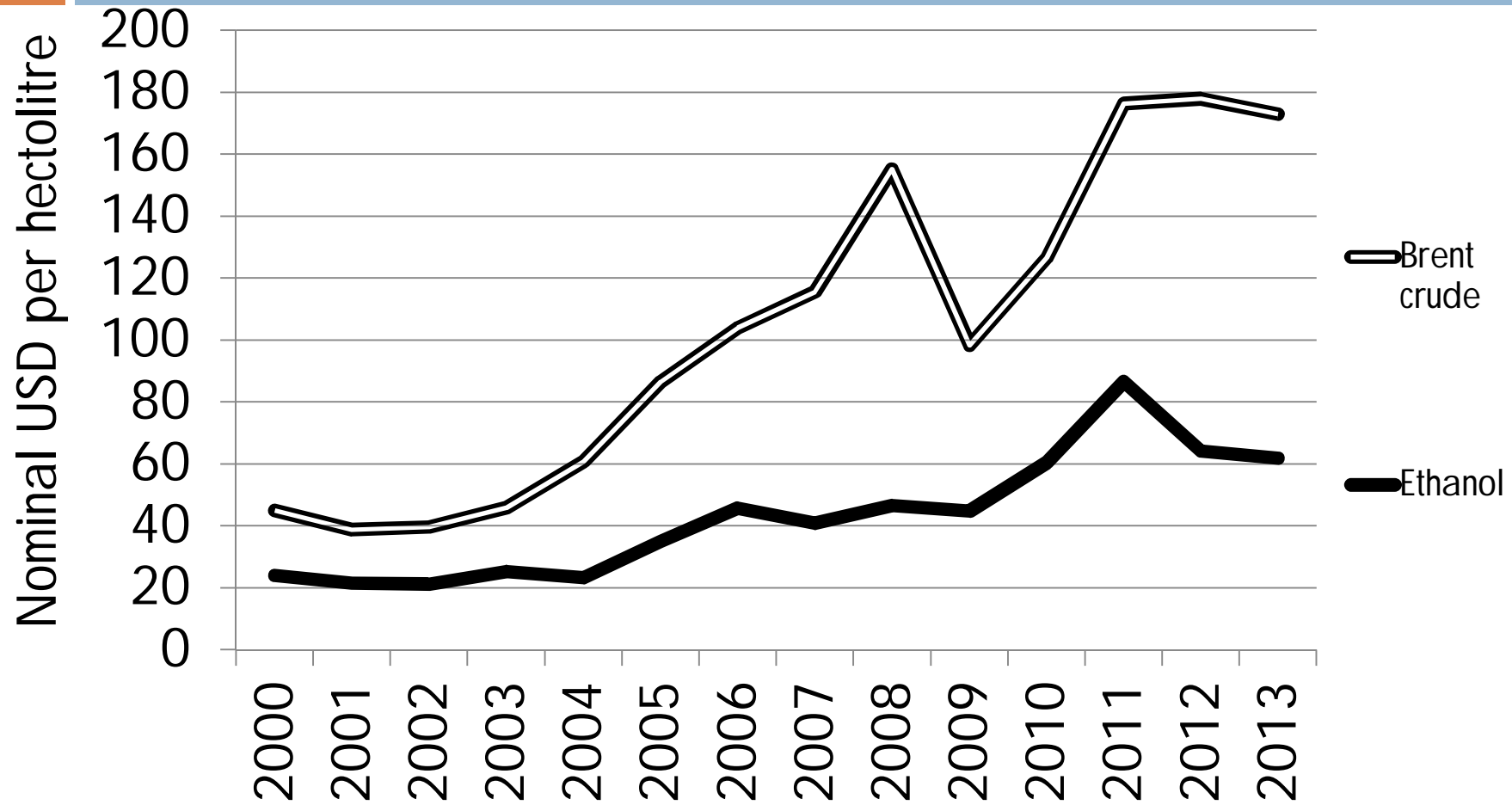
□ *5 key features:*

- **Rents.** Prices governed by **direct price-setting or tariff** protection, shape rents are established in domestic market mediate **contradictory interests** of **producers and 'consumers'** (incl. man).
- **'Residual' world market.** widespread international **protection and subsidy** of sugar industries internationally; bulk of **sugar trade bilateral**, world price highly **sensitive to variations in supply and demand.**
- **'Overproduction'.** Potential crises **when insufficient world prices** account for **large** proportions of **production.**
- **Preferential market access.** The evasion of 'overproduction' has been heavily mediated by a politics of **access to protected markets**, particularly those in the USA and the EU.
- **Biofuel production.** Potential to divert cane processing to (fuel and non-fuel) ethanol as a form of 'surplus absorption'

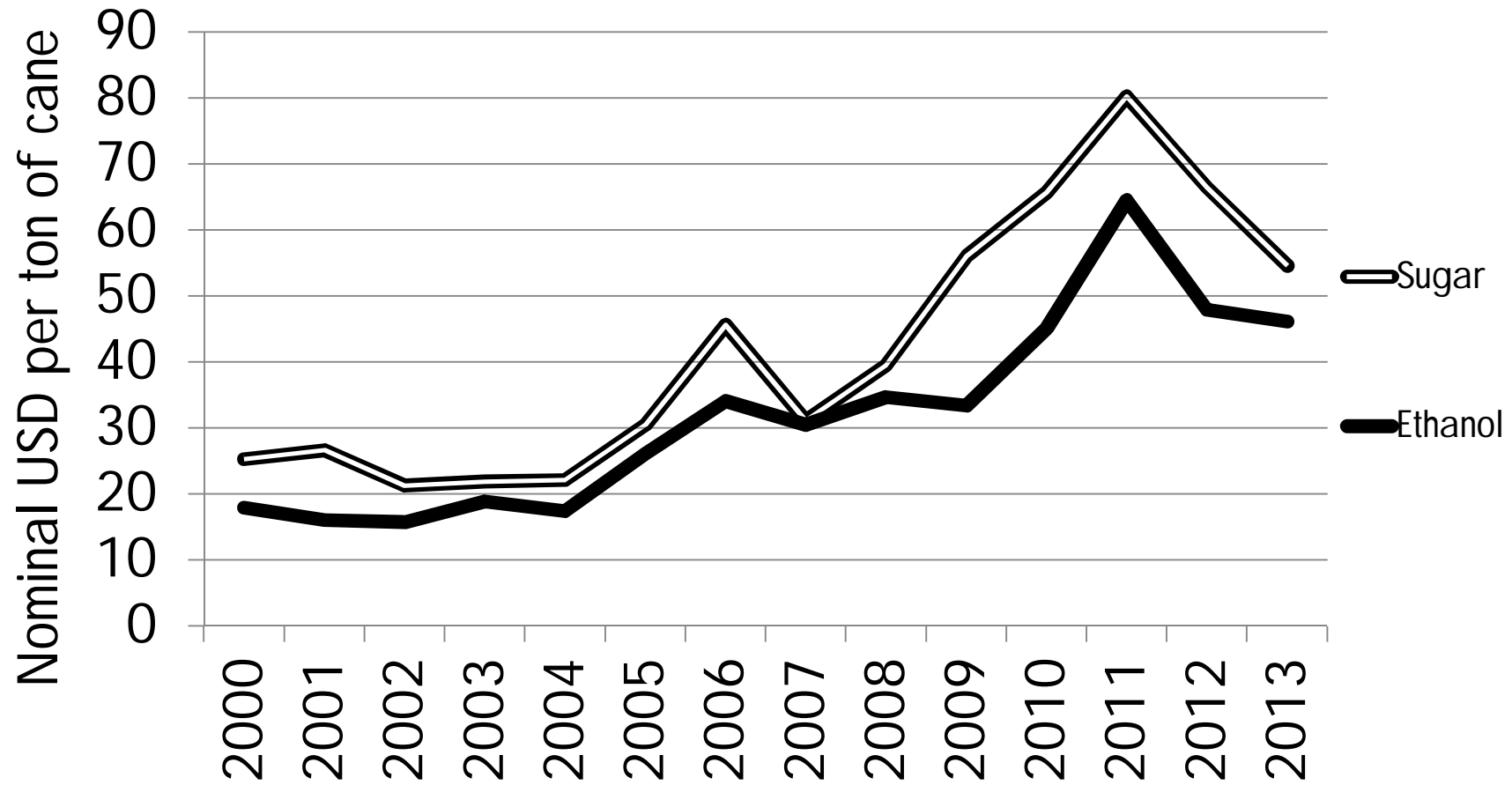
Nominal EU, world, and select domestic sugar prices, 2002-2012



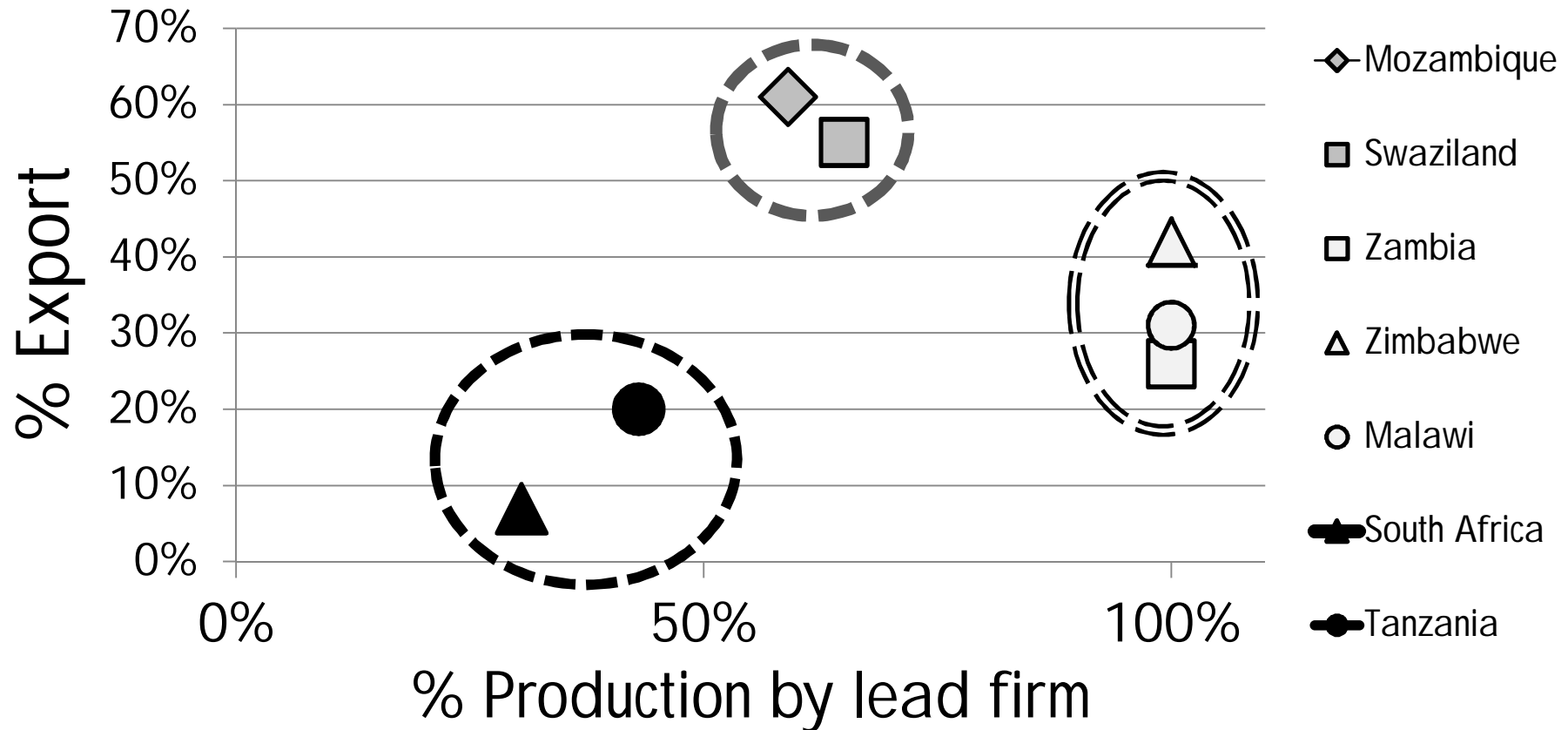
Nominal Brent crude and ethanol prices per hectolitre, 2000-2013



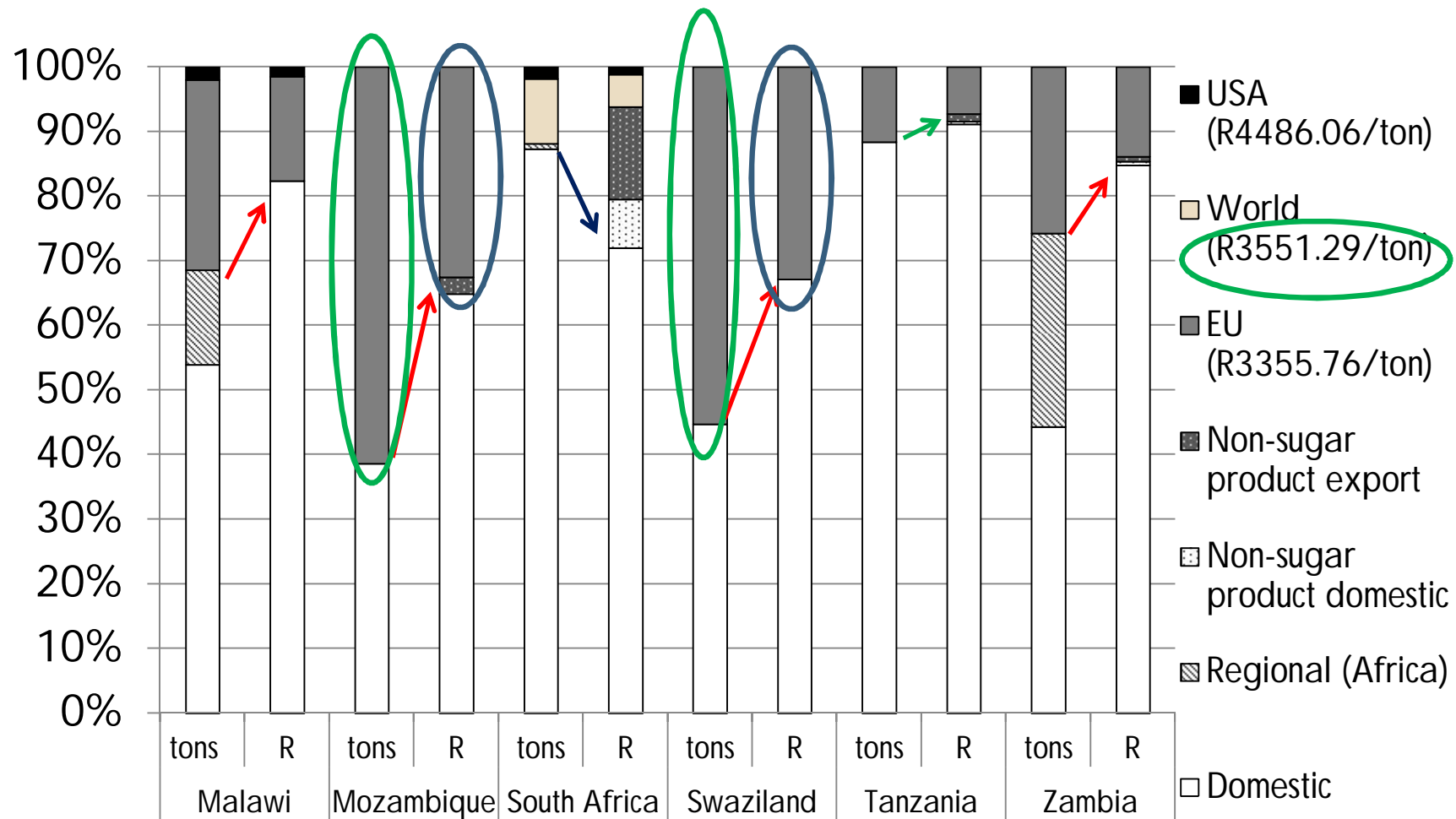
Nominal sugar and ethanol prices per ton of cane, 2000-2013



Proportions of export production and production by lead firms in Southern Africa in 2012/13



Comparison of market destinations and realized values of Illovo's operations in 2012/13



Estimated Prices

$$\text{Average realized sugar price} = \frac{\text{Gross revenue}}{\text{Gross sugar production}}$$

and;

$$\begin{aligned} & \text{Average domestic + regional price} \\ &= \frac{\text{Gross Revenue} - \text{EUval} - \text{USval} - \text{Worldval}}{\text{Total production} - \text{EU export} - \text{US export} - \text{World export}} \end{aligned}$$

Where:

- EUval = Realized value from European export = EU price * EU export
- USval = Realized value from American export = US price * US export
- Worldval = Realized value from world export = World price * world export
- In Tanzania, unsold stocks of approximately 17,000 tons were deducted from total production in this calculation in order to better approximate prices received for sold production.

Estimated sugar prices, cane, factory and wage costs across Illovo's operations in 2012/13

	Est. dom. & regional price (R/ton)	Average realized sugar price (R/ton)	DoP %	OG realized share (R/ton)	Mill realized share (R/ton)	Notional cost/TSH	Lowest wage (R/year)	Average permanent wage (R/year)
Malawi	7,336	6,110	60%	3,666	2,444	7,189,650	7,728	37,277
Moz.	10,659	6,386	60.5%*	3,863	2,522	5,769,337	10,512	84,046
SA	5,767	7,120	66%	4,699	2,421	12,086,928	28,800	265,840
Swazi.	8,483	5,643	60.5%*	3,414	2,229	9,461,940	19,788	144,702
Tanzania	6,485	5,384	57%	3,069	2,315	9,385,230	12,144	144,435
Zambia	7,123	6,237	59%	3,686	2,551	12,641,462	23,448	187,718

Interrogating Profits



- Clearly, both productive and 'mercantile' features sources of considerable importance and variation
- Not sufficient data for statistical procedure
- Counter-factual analysis:
 - ▣ Simple self-designed arithmetic model
 - ▣ Impose mathematical relationship between value data and physical data

Interrogating Profits

$$P \text{ (Profit)} = \text{Revenue} - C_1 \text{ (outgrower cane)} - C_2 \text{ (manufacturing costs)} - W_1 \text{ (permanent labour)} - W_2 \text{ (seasonal labour)}$$

Where:

- ▣ Revenue = Price per ton sugar * annual tons of sugar
- ▣ C_1 = Price/ton sugar * Division of Proceeds * ERC% * Total outgrower cane production
- ▣ $C_2 = \frac{\text{Manufacturing costs}}{\text{Tons Sugar Hour}} * \text{Tons Sugar Hour}$
- ▣ $W_1 = \frac{\text{Gross salaries} - (\text{Number of seasonal workers} * \text{Lowest monthly wage} * 12)}{\text{Number of permanent workers}}$
- ▣ $W_2 = \text{Number of seasonal labourers} * \text{Lowest Monthly Wage}$
- ▣ ERC% = % Estimated Recoverable Content = $\frac{\text{Total cane crushed}}{\text{Sugar produced}}$
- ▣ $W_3 = \text{Number of workers employed by outgrowers} * \text{Lowest monthly wage} * 12$

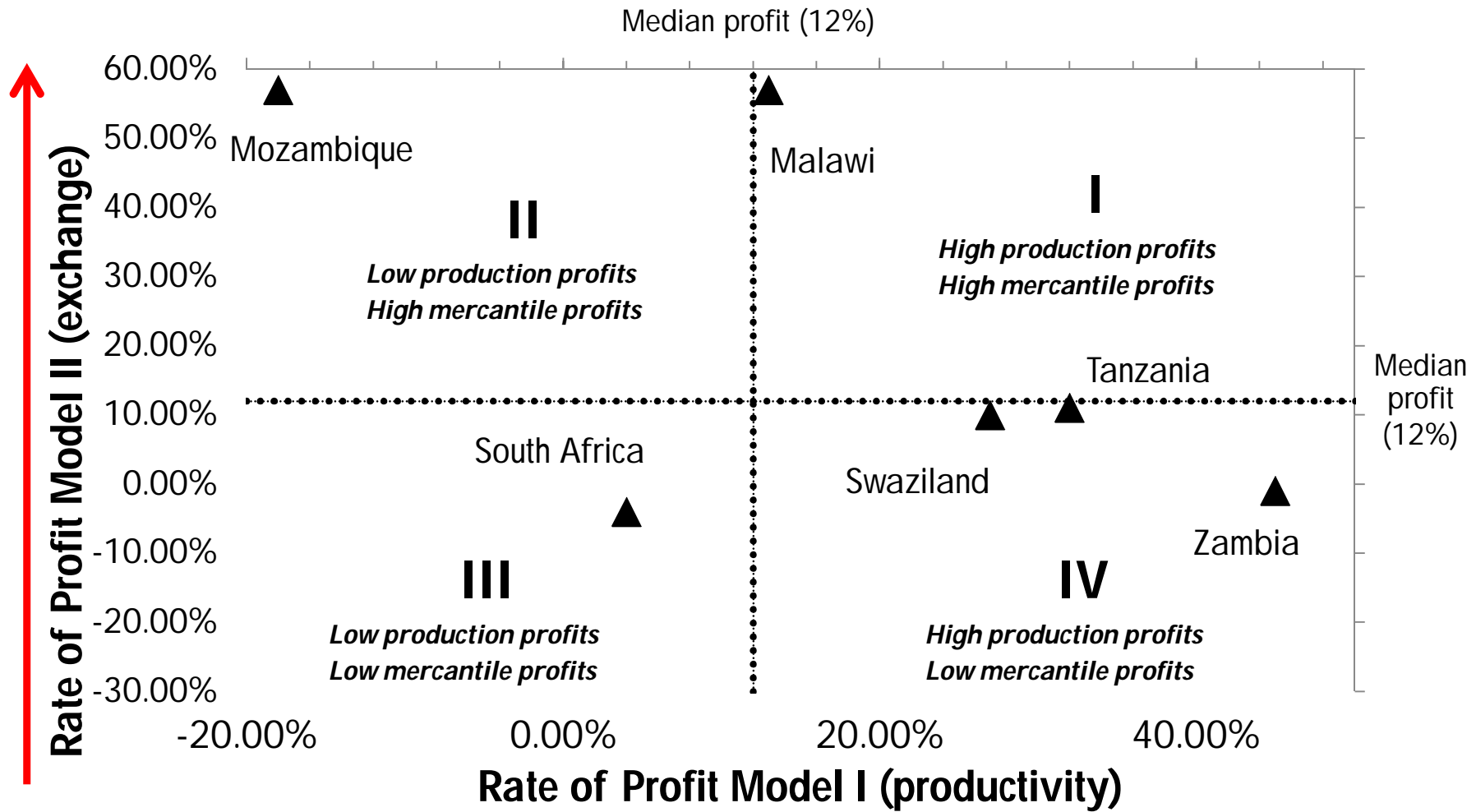
Interrogating Profits

- arithmetic **not precise**, only **guides analysis differentials**.
Three key failings:
 - The calculation of **Estimated Recoverable Content (ERC%)** = total cane crushed/sugar produced does **not accommodate differences between outgrower and estate cane quality**, nor the sucrose extraction **efficiency of milling operations**, which is **notoriously difficult** to measure and disentangle from cane quality (Formound, 1966).
 - The **division of proceeds** formula applied **in Swaziland and Mozambique was not reported**, and was assumed to be the average of the remaining countries.
 - Finally, **manufacturing costs** (C_2) are **divided according to Tons Sugar per Hour factory** capacity as a proxy for per-unit capital costs, but in reality also **include estate costs**.

Interrogating Profits

- Two Models:
- **Model I, Productivity: average values applied to exchange characteristics** (Price per ton of sugar; division of proceeds; lowest annual wage; average annual wage permanent workers) so **only productive characteristics vary** (Total sugar; Total cane crushed; ERC%; Outgrower cane; TSH; Time Efficiency; Seasonal Workers; Permanent workers; workers employed by outgrowers)
- **Model II, Terms of exchange: Inverse; average productive characteristics applied so terms of exchange vary**

Interrogating Profits



Zambia

- **Productive efficiency**, rather than **monopoly rents**, claimed the highest RoP in the group in Model I, ran at loss in Model II.
- The political economy of Zambia Sugar's productivity-centred approach appears to cohere around **a three-way compact**:
 - **State permits company's access to substantial productive resources**, including the **controversial extension of its water-intensive estates** with the acquisition of Nanga Farms and **highly integrated management of outgrowers** (see Matenga, forthcoming) and further **low-tax commitments** (leaving aside allegations of tax evasion) (Lewis 2013).
 - **Illovo's substantial profits come without unusually high consumer rents**, and ensure **substantial wages and outgrower returns** can be financed.
 - In turn, Zambia Sugar's economic benefits translate into **enhanced electoral support** in its opposition-held area of operation (Richardson 2010: 930).

Malawi

- Model I profitable: **vast labour and water-intensive estates, low lost crushing-time and low outgrower, and manufacturing costs** being incurred.
- Model II **super-profitable**: low per-unit capital costs, and **extreme labour exploitation** at core
- Suggests Illovo's Malawian operation **retains the patrimonial relationship** forged in the past between Hastings Banda's Malawi and Tiny Rowland's Lonrho Sugar, despite reports that sugar distribution quotas will no longer be leveraged by individual politicians (Gosnell, 2005; Gondwe 2005; Illovo 2014a).
- Unlike Zambia, **no 'democratic dividend'** obstructs the **generalized squeeze** on land, water and labour (see Chinsinga, forthcoming) by the **triumvirate of party, state, and company**.

Mozambique

- **Least productive** operations run at an **outright loss in Model I**, but **extreme profits in Model II**
- **Mercantile 'squeezing'** central Illovo's Mozambique operation: **highest domestic prices** (counterbalancing **large export burden**), **depressed capital prices**, and **extremely low wage bill**; second only to Malawi.
- **Buur (2011)** has argued that generally direct economic **returns to the state** were **secondary** to the potential **electoral benefits** in projects of party political consolidation.
 - ▣ **Maragra mill performance** relative to local competitors, or particular **political returns generated, not clear.**
 - ▣ Profitability – despite low productivity – suggest profits come at the **greatest 'externalised' social, environmental and economic cost** of the entire cohort.

Swaziland

- Significant **profit in Model I, highly productive** capital and water intensive factory and estate, but **less profitable than Tanzania as a result of higher outgrower cane purchases**
- **Low Profits in Model II:** despite **second-highest domestic price**, obtains low realized price and revenue due **to large export burden**.
- Swaziland's resembles Malawi's, **close patrimonial relations between company and state:** the state is the country's **largest sugar producer** and is effectively **controlled by the King's personal trust**, Tibiyo TakaNgwane (Daniel 1982).
- Where the **price premiums** attending substantial **European market** access once stood at the **foundation** of Swaziland sugar's profitability, this feature is now its **chief liability**.
- Although the pattern is not completely clear, in this case **Illovo appears to be blending mercantile and productive responses**. Illovo has undertaken considerable **capital expansion** while **downscaling employment and services**, utilized **EU relief funds to promote outgrower production**, and should be benefitting from **raised Southern African Customs Union prices** following South Africa's tariff increase (Ngwenya-Richardson & Richardson, 2014; Illovo 2014d; see Terry, forthcoming).

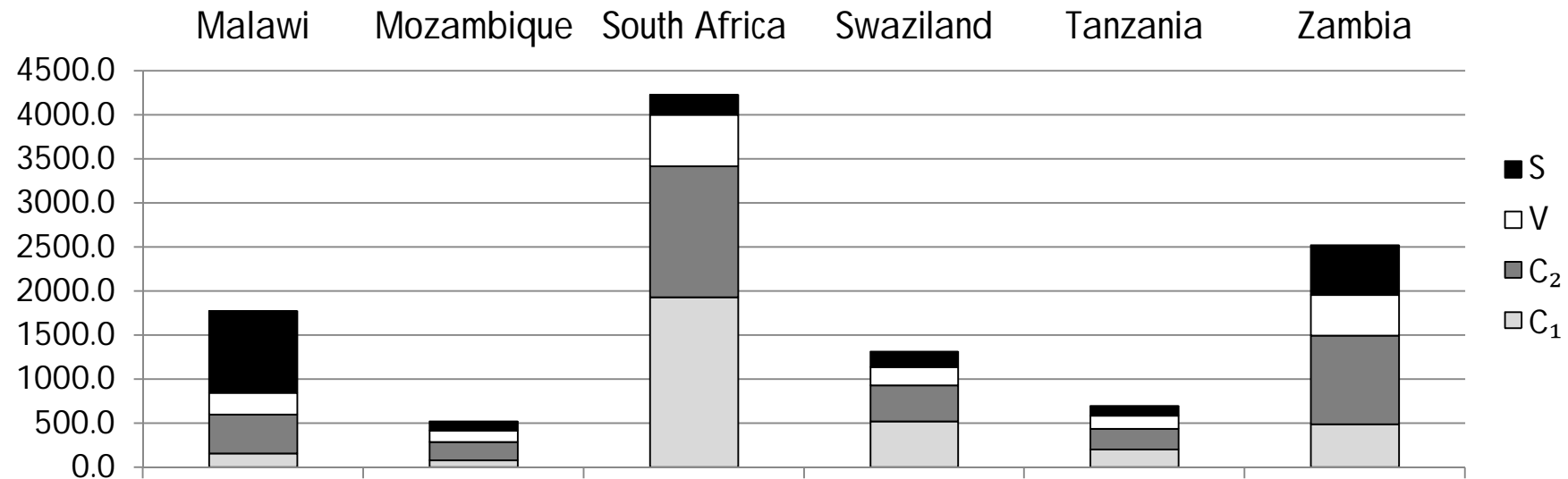
Tanzania

- Similar results to Swaziland, but for different reasons:
 - **Profits in Model I** come as a consequence of **low capital commitments** in purchasing Outgrower cane.
 - Strain in Model II **due to low realized prices**. Unlike Swaziland, however, not a result of a high export burden. **'Low' domestic prices** in Tanzania have been the subject of great **controversy and scandals** surrounding the **illicit import** of sugar and the issue of import licences.
 - In 2012/13, Illovo estimated that **17,000 tons** of produced sugar was withheld for the past year as a consequence (Illovo, 2014e), representing 13% of production in Model I, and 6% in Model II.
- Interesting counterpoint to the contradictions endured in the state-led era of modernization and import-substitution.
 - Previously, **consumer-oriented pan-territorial pricing** criticized for **not sufficiently supporting 'producers' (invoking outgrowers)**, despite being a **net sugar importer**, endured **crisis** in late 1970-80s as **cost of imported capital** rose, **international prices dropped** and companies were exposed to intense taxation (NDC, 1992).
 - Despite **'rehabilitation'** of production, however, structural adjustment and privatization, **Taxation is higher** for Illovo in Tanzania than elsewhere. **Sugar prices remain 'too low'** without effective protection – with **outgrowers bearing the brunt** of the burden (see Sulle, forthcoming) – while **Tanzania remains a net importer of sugar**.

South Africa

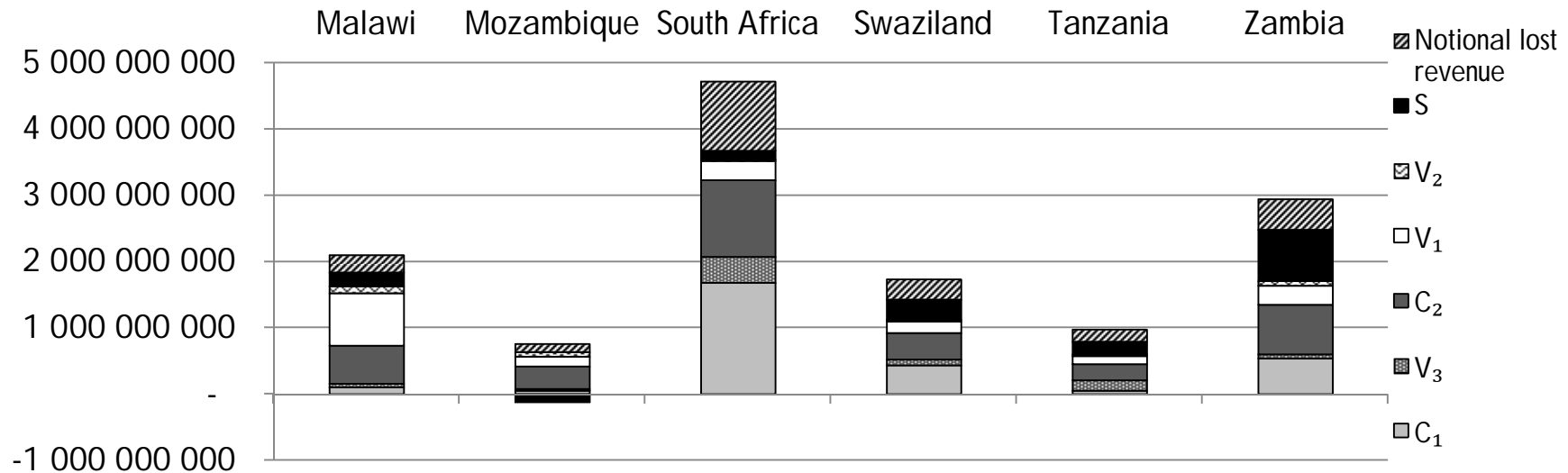
- **Regional expansion** alleviated South African '**over-production**' to the mid-1990s.
- Despite **Illovo's disinvestment**, South African operations still claim **most production and least profit**.
- Low profits in **Model I** due largely to **insufficient cane supply and high outgrower costs**, only slightly offset by **impressive mill labour productivity**. Consistent with concerns over **low rainfall**, with Illovo's **Umzimkulu mill** in particular being forced to close this coming year (Mokhema & Alberts, 2015).
- Outright **loss in Model II**, suggesting that the South African operations inhabit the worst of both hypothetical worlds.
 - Exhibit the **highest capital and wage rates** in the group
 - mitigated only by **the exceptionally high average realized price**, due to **export of non-sugar value-added** by-products (not high domestic prices).
 - The importance of value-adding with non-sugar by-products, however, are likely **overstated** in this model, owing to its **exclusion of the recent tariff and wage hikes**.

Composition of realized values in Illovo's operations across country



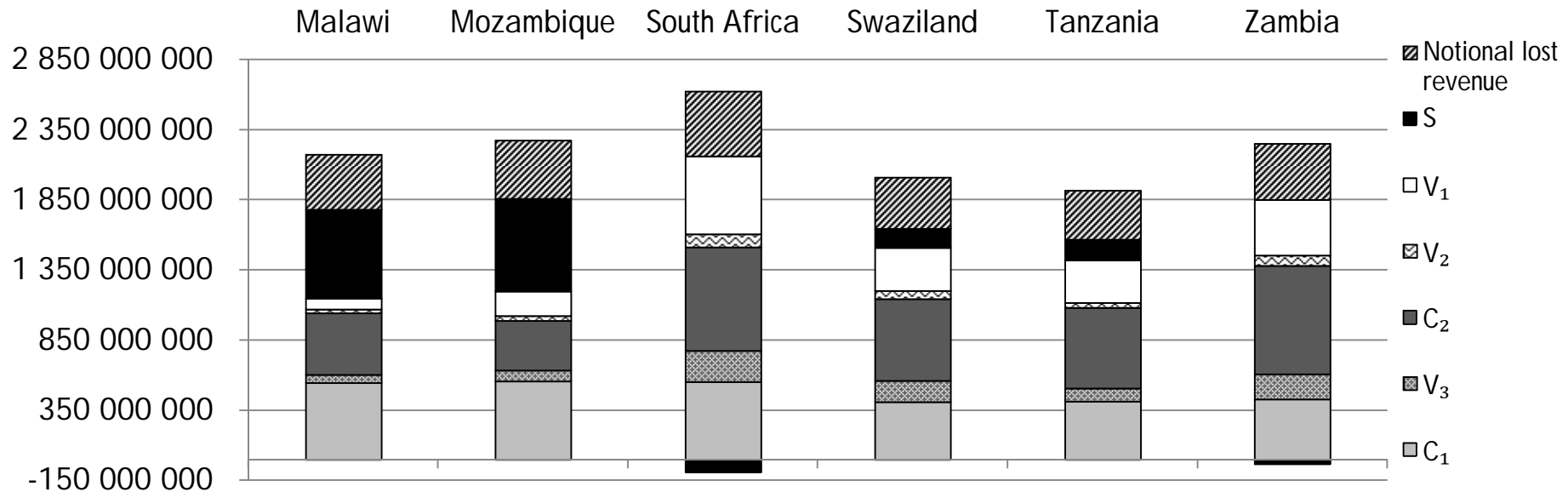
	Rate of Profit	Profit-Wage Ratio (Rate of Exploitation)	Capital-Wage Ratio (Value Composition of Capital)
	$\frac{S}{(C_1 + C_2) + V}$	$\frac{S}{V}$	$\frac{C_1 + C_2}{V}$
Malawi	109% (1)	367% (1)	238% (2)
Mozambique	24% (3)	80% (4)	228% (1)
Swaziland	16% (5)	86% (3)	447% (5)
South Africa	6% (6)	39% (6)	585% (6)
Tanzania	19% (4)	77% (5)	301% (3)
Zambia	29% (2)	121% (2)	324% (4)

Model I: Composition of values by country



	Rate of profit	Profit-Wage Ratio (Rate of exploitation)	Capital-Wage Ratio (Organic composition)	Profit-Capital Ratio
	$\frac{S}{(C_1 + C_2) + (V_1 + V_2)}$	$\frac{S}{(V_1 + V_2)}$	$\frac{(C_1 + C_2)}{(V_1 + V_2)}$	$\frac{\text{Rate of Exploitation}}{\text{Organic Composition}}$
Malawi	13% (4)	24% (5)	83% (1)	0.29 (4)
Mozambique	-18% (6)	-55% (6)	196% (2)	-0.28 (6)
South Africa	4% (5)	42% (4)	1013% (6)	0.04 (5)
Swaziland	27% (3)	149% (2)	456% (5)	0.33 (3)
Tanzania	32% (2)	125% (3)	293% (3)	0.43 (2)
Zambia	45% (1)	221% (1)	387% (4)	0.59 (1)

Model II: Composition of values by country



	Rate of profit	Profit-Wage Ratio (Rate of exploitation)	Capital-Wage Ratio (Organic composition)	Profit-Capital Ratio
	$\frac{S}{(C_1 + C_2) + (V_1 + V_2)}$	$\frac{S}{(V_1 + V_2)}$	$\frac{(C_1 + C_2)}{(V_1 + V_2)}$	$\frac{\text{Rate of Exploitation}}{\text{Value Composition}}$
Malawi	57% (1)	628% (1)	1010% (6)	0.62 (1)
Mozambique	57% (2)	321% (2)	468% (5)	0.69 (2)
South Africa	-4% (6)	-12% (6)	232% (1)	-0.05 (6)
Swaziland	10% (4)	40% (4)	310% (3)	0.13(4)
Tanzania	11% (3)	45% (3)	314% (4)	0.14 (3)
Zambia	-1% (5)	-5% (5)	294% (2)	-0.02 (5)