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# Accumulation by Intermediation: The Contestation of Agro-Food Capital in the South African Maize Industry

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## ABSTRACT

The power of agro-food capital is frequently highlighted, but its internal dynamics are under-researched. This paper contributes to the understanding of agro-food capital in agrarian political economy through an analysis of milling and storage activities that intermediate grain production and consumption in South Africa. The paper shows that these activities can provide important sources of income and optionality supporting diverse accumulation strategies by a range of big business interests. Our analysis highlights that agro-food capital may not always be a coherent set of interests that is distinct from, and acts upon, other fractions of capital in the agrarian political economy. Instead, it may come to be a contested space, used to support differing accumulation strategies pursued by actors with varying interests. Such contestation may produce complex amalgamations of agricultural, industrial, financial and trading capital and contribute to variegation in trajectories of agrarian change.

## 1 | Introduction

There is widespread concern over increasing concentration in food systems (e.g., Clapp 2021; Howard 2016; IPES-Food 2017), particularly regarding the power of 'agro-food capital': agribusiness actors in the post-harvest mid-sections of food value chains responsible for 'controlling, refining, combining, distributing and marketing what is being produced on farms' (Weis 2007, 13). Food chains increasingly exhibit an hourglass structure, with a decreasing number of industrial firms intermediating farmers and consumers (ibid.; Clapp 2020). Much research has highlighted the growth of powerful, multinational commodity trading and food manufacturing firms and its implications for farmers and consumers. However, the internal dynamics of agro-food capital are relatively seldom explored (Baines 2015). As Harriss (2021, 165) notes '[t]he role that the likes of millers, merchants and petty traders, transporters and money-lenders play in agrarian political economy is widely acknowledged, yet relatively little analysed'. Influential recent work in agricultural economics refers to the 'hidden middle' of food chains, widely overlooked by researchers (Reardon 2015).

This paper analyses the changing characteristics of agro-food capital, its drivers, and its implications, in the South African context since liberalisation in the 1990s through a study of the mid-sections of the maize to maize meal value chain producing the nation's staple carbohydrate. Building on foundational work by Bernstein (1996a), the case contributes to more recent literature on concentration and corporate power in South Africa's food system (Anseeuw, Ducastel, and Boche 2015; Bernstein 2013; Greenberg 2017) and seeks to provide from this broader reflections on the place of agro-food capital in agrarian political economy.

It draws on original empirical research including 29 interviews with milling companies, and 17 key informant

[Correction added on 7 February 2025, after first online publication: The affiliation and email address of author Nishal Robb have been corrected in this version.]

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interviews with other actors in maize supply chain, including storage, trading and equipment suppliers. Interview data enable detailed qualitative insights into the characteristics of agro-food capital, including accumulation strategies, competition and power relations, and their evolution. This was supplemented by analysis of official statistics, grey literature and major firms' financial reports. While focused on the dynamics of agro-food capital specifically, the paper seeks to understand these dynamics relationally, tracing the mutually constitutive interactions between these and other powerful actors along the value chain.

The paper shows that the milling, handling and storage assets that intermediate grain flows and constitute agro-food capital, form a highly concentrated funnel point in the value chain. This intermediation produces significant income streams, but its systemic importance, we argue, also derives from it being a source of optionality and a complement to large firms' highly diversified accumulation strategies pursued in a context of volatile, financialised commodity markets and intense forms of vertical competition. Key intermediation activities have therefore increasingly become contested by differing large-scale business interests or fractions of capital. Rather than being a distinct, coherent entity within the chain, agro-food capital is a complex amalgamation of agricultural, industrial and trading capital, among which there can be different interests. This contestation of agro-food capital has meant that, while overall patterns of centralisation and dominance by big business in the maize industry have persisted or deepened, established interests have in key instances been challenged in a manner which has led to forms of fragmentation and deconcentration. This includes the entry of large agricultural producers, traders and agribusiness into grain milling, and the growth of on-farm storage and temporary grain storage technologies.

## 2 | Agro-Food Capital and Agrarian Change

Modern agrarian economies comprise a wide range of industrial, financial and trading activities upstream and downstream of agriculture (Bernstein 2010). Weis (2007) defines the ensemble of post-harvest storage, trading, transporting and processing enterprises as agro-food capital ('agro-input' capital being upstream). Intermediating food production and consumption, it shapes the 'activities and reproduction' of farming and the development of agriculture–industry production linkages (Bernstein 2010, 65). These 'midstream' activities tend to account for an increasing proportion of food systems' economic activity (Yi et al. 2021) and have grown rapidly in many developing economies (ibid.; Barrett et al. 2022). Across differing research traditions, agro-food capital is viewed as poorly understood (Barrett et al. 2022; Harriss 2021; Leach et al. 2020).

Much critical agrarian political economy scholarship has scrutinised the rising concentration in, and power of, global agro-food and agro-input capital in the 'middle space' (Clapp 2020) of the world food economy, and its implications for farming, nutrition and sustainability (e.g., Clapp 2021; Howard 2016; IPES-Food 2017; Weis 2007). Food regime approaches identified corporate agribusiness[1] as central to a third food regime in which private regulatory power increasingly challenged or surpassed that of states, resulting in increased subordination of agriculture to agro-food capital (e.g., McMichael 2014). The approach can risk portraying large-scale agribusiness as a coherent, if not monolithic entity (with its correspondingly homogenised peasant 'other'), producing a 'steamroller effect which flattens accounts of current history' (Baines 2015; Bernstein 2016, 639; Friedmann 2016). While scale and concentration are generalised tendencies and the growing power of large-scale, vertically integrated multinational firms is a key feature of contemporary food systems, it is important not to neglect the potential heterogeneity of agro-food capital. Alongside tensions between agro-food capital and other agrarian interests, most obviously agriculture, there can be significant tensions within agro-food capital (Baines 2015; Friedmann 2016). Post-harvest value chain segments can vary considerably across contexts, with small firms playing a major role in some instances (Harriss-White 2018, 2016). Historical circumstances may produce varying composites of commercial (trades) and industrial capital within agro-food capital (Banaji 2016; Harriss-White 2018).[2] Contributing influentially to internal heterogeneity of agro-food capital is variety in the manner it 'binds' to agriculture (Banaji 2016; Harriss-White 2016). This heterogeneity can create intense contradictions and conflicts among large-scale corporate capitals (Baines 2015; Friedmann 2016). Baines (ibid.) therefore argues for the importance of pursuing agrarian political economy's general concern with differentiation and disaggregation in the study of large-scale agro-food capital.

A 'fractions of capital' approach helps conceptualise the 'diversity and heterogeneity within actually existing capitalist classes' (Jan 2021, 59). Various literatures have developed the concept of fractions, from Marxist theoretical debates on the state and capitalism writ large (see discussion in Jessop and Overbeek 2019) to competing analyses of South African capitalism under colonialism and apartheid (Clarke 1978; Davies et al. 1976). Bernstein (2010, 112), for example, uses 'classes of capital' to refer to capital as 'distinguished by the interests and strategies of capital in particular activities and sectors and on scales from local to regional, national to transnational'. Mtero, Gumede, and Ramantsima (2024) apply this to South Africa in an analysis of land reform policy and processes as an emerging site of capital accumulation. For the purposes of this paper, however, we employ Jan's (2021) framework, which emerges from an analysis of the term in Marx's political and journalistic work, helping to draw out key insights from our empirical material. Following Jan (ibid.), a fraction is a relatively cohesive grouping thereof in terms of economic role and socio-political interest. These can differ according to dimensions including scale of production and associated forms of business organisation and ownership, spatial concentration around specific regions or industries, and 'social origins' concerning race, religion, nationality and suchlike (ibid.). Differing fractions may pursue widely different accumulation strategies, creating antagonisms that are highly relevant for understanding wider political economy dynamics. Such fractional differentiation is typically prominent in agrarian economies, commonly manifesting in tensions between agriculture and downstream industries, between different commodity groupings in agriculture, and between more locally-embedded small-scale businesses and multinational firms. The following sections explore these issues in relation to agro-food capital in the South African maize value chain.



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## 3 | Agro-Food Capital and the Evolution of South Africa's Agrarian Political Economy

This section provides historical context on agro-food capital in the production of maize meal, situating it within the broader evolution of large-scale agrarian capital—meaning 'both large-scale commercial farming operations and agribusiness firms that are active up- and down-stream of farming itself' (Hall and Cousins 2018, 16)—in South Africa's agrarian political economy up to the period of liberalisation.[3] The wider agrarian sector includes a range of other actors and institutions, most importantly labour, the state, and smallholder farmers on communal lands (see Bernstein 2010, 2013; Cousins 2013), though for the limited purposes of this paper the focus is principally on changes pertaining to large-scale capital.

Maize meal has been South Africa's staple carbohydrate, and maize is its most important field crop, since the late 19th century, when it was adopted to feed a growing urban working class (McCann 2005). Land and agricultural policy during colonialism and apartheid virtually eradicated black peasant grain production (Cochet 2015), while extensive state support modernised white agriculture. This generated enduring dualistic inequalities, with large-scale, capital-intensive, white-owned commercial farms in the Highveld 'maize triangle', and limited small-scale, low-productivity, maize production by black farmers in the former 'homelands'.

Institutional arrangements established during the mid-20th century generated concentration in downstream segments of the value chain. For a half-century prior to mid-1990s liberalisation, there was a single-channel state marketing board system paying white maize farmers pan-territorial prices, generally above world levels, with import protection (Bayley 2000; Vink 2012). Land Bank loans funded large, rail-linked, concrete grain silo complexes operated by farmer co-operatives (co-ops) (Ducastel and Anseeuw 2018), and organised as tessellated regional storage monopolies serving farmers within a 20 km radius (Bernstein 1996a). There was consequently limited on-farm storage (van der Vyver 2019; Vink 2012). As marketing board agents, co-ops channelled inputs and finance to farmers, while diversifying into various activities from processing to retail (Ortmann and King 2007). By 1950, 90% of white farmers were co-operative members (Beinart 2001). Politically, co-ops underpinned 'organised agriculture', influentially representing white agriculture's collective interests on the marketing boards (Bernstein 2004; Bernstein 1996b). With maize farming predominantly carried out by Afrikaners, relations with the Afrikaner nationalist National Party were close and reciprocal, with Highveld maize producing regions a key source of votes (Bernstein 1996b).[4] White commercial maize farming thus formed a politically and economically significant fraction of capital, coherent in terms of spatial and scalar dimensions as well as social identity, and closely enmeshed with key aspects of agro-food capital through the co-ops.

Turning to processing, milling firms were licensed by the board, with entry tightly constrained.[5] Marketing board controls over grain flows limited opportunities for small-scale informal millers, which benefit from direct purchase from and co-location with farmers (Traub and Jayne 2008). Millers bought and sold at fixed prices the former typically high to benefit farmers, the latter low to aid wage suppression. Major millers, though organised through the Chamber of Milling, were not as coherent or significant a fraction of capital. They lacked farmers' political and social capital in the context of Afrikaner nationalist rule[6]: The largest, Tiger Oats, Premier and Ruto, were founded by Jewish industrialists, who played a major role across food processing (Kaplan 1986). Rudy Frankel, Tiger Oats' Chairman, argued for a free market grain trade, lamenting government had 'bent over backwards to do the best they can for the maize farmer', with fixed prices encouraging 'farmers of marginal ability to remain in the industry' (Frankel 1988, 270–271). With maize meal product specifications limiting product innovation, competitive strategy centred on scale.[7] Price controls made urban mills close to consumers most profitable, with rural mills lacking competitive advantage from proximity to farming (Vink 2012). Though there were smaller rural mills, many owned by co-ops, the industry was dominated by large-scale urban milling operations.[8] Mirroring industry broadly, at the democratic transition, milling was concentrated and capital-intensive, with major firms embedded in large multisector conglomerates (Joffe et al. 1995). Four ultra–large mill-owners accounted for around four-fifths of maize meal output.[9]

The patterns of industrial concentration and agrarian inequality sketched above were key challenges for the incoming ANC-led government. It pursued market liberalisation as the main response. Liberalisation had been underway for some time prior, notably with co-ops able to convert to companies from 1993 (Bernstein 1996a). A wave of co-op privatisation and mergers took place, with 25 amalgamations involving 60 co-ops between 1990 and 1994 (Bernstein 1996a; Ducastel and Anseeuw 2018; Ortmann and King 2007). The key regulatory reform was the Marketing of Agricultural Products Act (1996), which abolished marketing boards to create a free-market system, exposing all industry actors to significant price risks (Bayley 2000). A newly established derivative exchange—SAFEX, now the Johannesburg Stock Exchange's (JSE) Commodity Derivative Market (CDM)—enabled trade in 100-ton maize futures contracts to manage this and quickly became the price formation mechanism (Bayley 2000).

As Bernstein (1996a) notes, liberalisation had both efficiency and equity justifications. Pursued in combination with land reform, proponents argued that liberalisation would lower entry barriers for black enterprise, subject incumbent businesses to competitive pressures, and thus dilute white economic power (Bayley 2000). Subsequent scholarship has shown that concentration and racialised inequality have persisted across the agrarian system (Anseeuw, Ducastel, and Boche 2015; Bernstein 2013; Greenberg 2017). Food manufacturing has high income concentration levels even relative to other manufacturing sub-sectors—albeit declining slightly in the past decade (Table 1). Within agriculture, 67% of total 2017 income in commercial agriculture was earned by 2610 large-scale farms, representing 6.5% of total farm units, with 86% of all farm operator/managers white (StatsSA 2020).

There have been important processes of change and continuity. As Bernstein (1996b) anticipated, the removal of state



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**TABLE 1** | Income shares of top 5 and top 20 firms by manufacturing subsector, 2008–2021.

| | 2008 income share | | 2017 income share | | 2021 income share | |
|---|---|---|---|---|---|---|
| | 5 largest firms | 20 largest firms | 5 largest firms | 20 largest firms | 5 largest firms | 20 largest firms |
| Food products and beverages | 30% | 54% | 29% | 50% | 25% | 46% |
| ... of which, production, processing and preserving of meat/meat products | 50% | 59% | 26% | 54% | 26% | 50% |
| ... of which, processing and preserving of fruit and vegetables | 51% | 80% | 51% | 77% | 54% | 81% |
| ... of which, manufacture of dairy products | 71% | 90% | 60% | 85% | 55% | 87% |
| ... of which, manufacture of grain mill products, starches/starch products | 70% | 88% | 66% | 88% | 56% | 84% |
| Textiles, clothing, leather and footwear | 17% | 31% | 14% | 29% | 14% | 27% |
| Wood, wood products, paper, publishing and printing | 30% | 52% | 32% | 51% | 28% | 49% |
| Coke, petroleum, chemical products, rubber and plastic | 50% | 76% | 40% | 65% | 45% | 64% |
| Glass and other non-metallic mineral products | 38% | 60% | 38% | 63% | 34% | 58% |
| Metals, metal products, machinery and equipment | 27% | 46% | 23% | 37% | 19% | 35% |
| Electrical machinery and apparatus | 29% | 56% | 31% | 54% | 34% | 57% |
| Telecommunication, medical and optical equipment and watches and clocks | 33% | 55% | 29% | 65% | 33% | 61% |
| Transport equipment | 53% | 76% | 55% | 77% | 56% | 75% |
| Furniture, other manufacturing and recycling | 23% | 31% | 39% | 60% | 30% | 54% |
| Manufacturing: total | 15% | 36% | 13% | 32% | 12% | 31% |

*Source:* StatsSA, 2010, 2019 and 2023.

regulation led to new forms of private regulation, most notably in various instances of anticompetitive behaviour among large incumbent firms (Bernstein 2013; Makhaya and Roberts 2013). Liberalisation altered the balance of power between established capital fractions, while creating opportunities for new types of corporate actors and strategies. It significantly disempowered farmers relative to downstream processors and supermarket retailers—the latter becoming the most powerful actors in most food value chains (Bayley 2000; Bernstein 2004; Makhaya and Roberts 2013; Ortmann and King 2007). International openness enabled both outward regional investment by South African firms, and domestic market penetration by multinationals (Greenberg 2017; Hall and Cousins 2018). Growth of commodity derivative markets created opportunities for traders, seized by both domestic and multinational firms. The more significant transformations in the structure and dynamics of the agrarian economy have thus occurred primarily within large-scale agrarian capital (Anseeuw, Ducastel, and Boche 2015, 331). The following sections explore these for maize meal.

## 4 | Context: Maize Consumption and Production

Maize remains central to South Africa's agrarian economy as the most important field crop by value and a key source of carbohydrates in diets. Maize meal is produced predominantly from white maize, which in the decade to 2020 was, on average, 55% of annual maize production—yellow maize is mainly used for animal feed.[10] While becoming relatively less important in the average diet given increased consumption of other carbohydrates, maize meal remains the staple for lower-income consumers as the most affordable form of energy: even for a more expensive brand, it contains 370 calories per Rand spent, compared with 110 for white bread, 50 for pasta and 60 for potatoes.[11] It



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accounts for 10%–15% of lower household consumption deciles' food expenditure.[12]

Consumers purchase maize meal predominantly through a highly concentrated supermarket retail system (Competition Commission 2019), with chain retailers and wholesalers generally viewed by millers interviewed as the most powerful actors in the value chain. This combination of price–sensitive low-income consumers with powerful retail/wholesale chains has important consequences for the nature of competition among processors, discussed in Section 5.

Upstream, white commercial grain farmers in the Highveld remain the key source of maize output, which has expanded considerably (Figure 1) driven by yields, which doubled between 1998 and 2018 to around 6 tons per hectare. Maize production from black farmers remains marginal, accounting for an estimated 5% of current annual maize production, which yields a quarter of those typical white commercial farms (Department of Agriculture, Forestry and Fisheries (DAFF) 2017; Greyling and Pardey 2019).

Commercial maize production has become increasingly concentrated. Less efficient producers struggle with cost pressures in a capital- and input-intensive production system, with numbers of commercial maize farmers dropping from around 14,000 in 2000 to 5504 in 2015 and 3406 in 2024 (Department of Agriculture, Land Reform and Rural Development (DALRRD) 2024). This has combined with a spatial concentration. The area planted fell from around 3.5 million hectares to 2.6 million hectares between 1998 and 2018, and as shown in Table 2, production has moved eastward to become more centralised in the Free State. The province accounted for 43% of maize production in 2016/2017–2019/2020, compared with 31% in 1986/1987–1990/1991, contributing 60% of output growth over this period. This is a long-term outcome of liberalisation, with the removal of fixed pan-territorial prices causing production to drift towards more profitable areas and away from an increasingly arid North West.[13] As discussed in Section 5, this concentration and centralisation in grain production have important implications for agro-food capital.

## 5 | Accumulation by Intermediation in Grain Handling and Storage

This section analyses the first key element of agro-food capital in the maize-to-maize meal value chain: the interlinked grain handling, storage and trading activities intermediating farmers and millers. The key actors are a handful of large, diversified agribusinesses, all former farmer co-operatives of the kind discussed in Section 7. Despite having privatised in the early 1990s, these are still commonly called 'co-ops'; we use 'former co-ops' here to describe their post-liberalisation form.

The concrete grain silo complexes constructed in the mid-20th century are the essential material infrastructure facilitating the circulation of grain, and the financial systems that propel this circulation. They transform the seasonal, physically heterogeneous, rapidly decaying output of farming into a standardised, durable commodity, available year-round, and made suitable for advanced industrial food manufacturing through primary processing including grading, cleaning, screening, weighing, drying and fumigation, while ensuring compliance with food safety regulations. This standardisation process also underpins the functioning of the derivatives market, which requires standardised contracts. Storage operators issue tradable receipts from JSE-registered storage locations.

Storage ownership is concentrated. In 2022, there were 299 JSE-CDM registered storage sites, 252 for maize specifically, averaging around 66,000t capacity.[14] Though there are 15

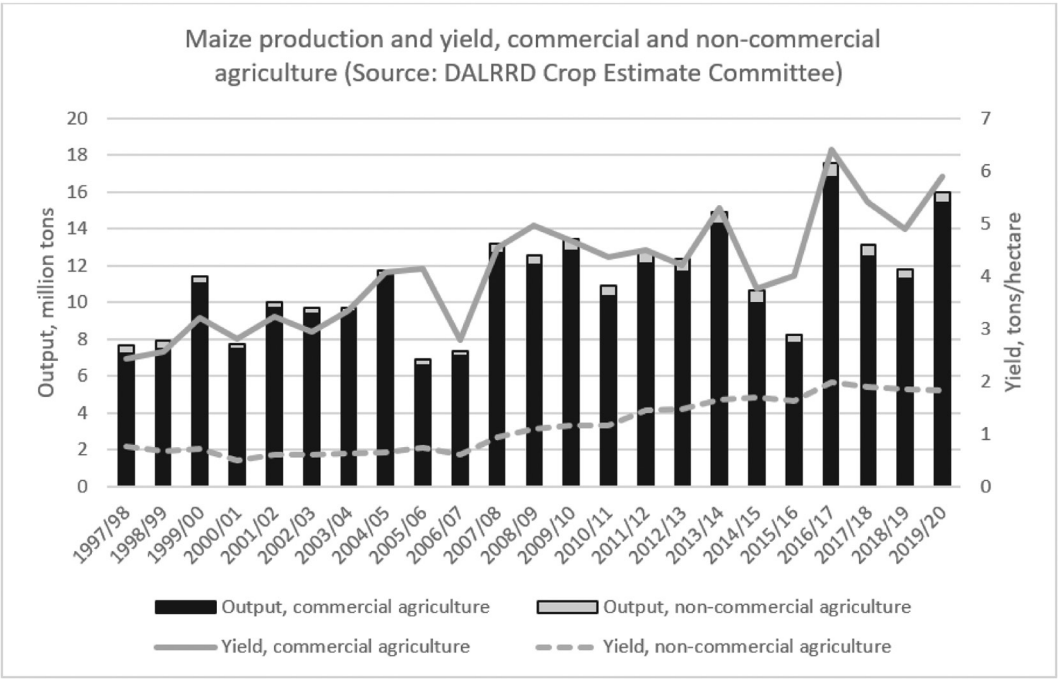



**FIGURE 1** | Maize production and yield, commercial and noncommercial agriculture. *Source:* DALRRD Crop Estimate Committee.



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**TABLE 2** | Maize production per-province.

| | 1986/1987–1990/1991 | | 1991/1992–1995/1996 | | 1996/1997–2000/2001 | | 2001/2002–2005/2006 | | 2006/2007–2010/2011 | | 2011/2012–2015/2016 | | 2016/2017–2019/2020 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1000t average production/% of total production | | | | | | | | | | | | | | |
| Free State | 2613 | 31% | 2610 | 34% | 3120 | 37% | 3169 | 34% | 4288 | 39% | 4423 | 40% | 5925 | 43% |
| Gauteng | 429 | 5% | 415 | 5% | 383 | 4% | 438 | 5% | 517 | 5% | 551 | 5% | 676 | 5% |
| North West | 2745 | 33% | 2189 | 29% | 2611 | 31% | 2521 | 27% | 2399 | 22% | 1961 | 18% | 2336 | 17% |
| KZN | 330 | 4% | 297 | 4% | 280 | 3% | 377 | 4% | 469 | 4% | 540 | 5% | 698 | 5% |
| Mpumalanga | 1879 | 23% | 1820 | 24% | 1794 | 21% | 2118 | 23% | 2434 | 22% | 2613 | 23% | 3052 | 22% |
| Limpopo | 115 | 1% | 84 | 1% | 75 | 1% | 112 | 1% | 197 | 2% | 293 | 3% | 289 | 2% |
| Eastern Cape | 70 | 1% | 76 | 1% | 41 | 0% | 67 | 1% | 82 | 1% | 98 | 1% | 109 | 1% |
| W. Cape | 4 | 0% | 12 | 0% | 11 | 0% | 19 | 0% | 28 | 0% | 36 | 0% | 31 | 0% |
| N. Cape | 120 | 1% | 160 | 2% | 229 | 3% | 511 | 5% | 597 | 5% | 669 | 6% | 677 | 5% |

*Source:* DALRRD.

JSE-registered storage companies,[15] of the 16.5mt 2022 registered maize, storage capacity of 78% was owned by three companies, all former co-ops spanning the 'maize triangle': Senwes (5.6mt), NWK (2.5mt) and Afgri (4.7mt).[16] Another, VKB, has around 1.4mt capacity. Consolidation began with the aforementioned 1990s merger wave, continuing with events including Afgri's 2004 takeover of Natalagri (Afgri 2005), VKB's 2022 merger with GWK (VKB 2022), and most notably Senwes' 2020 acquisition of Suidwes, then the fourth-largest silo owner. The Competition Commission advised prohibiting the latter due to 'a substantial lessening of competition in the grain storage markets and associated grain trading markets' (Competition Tribunal 2020), though the acquisition was ultimately permitted subject to conditions (ibid.; Senwes 2022).

The former co-ops' silo infrastructure has enabled them to maintain a central position in grain intermediation, albeit challenged by the emergence and growth of alternatives. This includes independent storage providers using cheaper, quickly assembled semipermanent storage technologies like silo bags and bunkers. There has also been significant growth in on-farm storage by wealthier farmers (van der Vyver 2019).[17] The former co-ops view both as competitive threats, with silo profitability hinging on capacity utilisation, which the shifting geography of maize production discussed above has threatened in some locations (Competition Tribunal 2020; Senwes 2019a; VKB 2022).[18] Indeed, total estimated grain storage capacity has grown over the post-liberalisation period from around 20 million tons to around 30 million tons in recent years (Agbiz Grain 2023). This increase has been driven by investments in semipermanent structures and on-farm storage, with the former co-ops now controlling only around two thirds of total capacity (Agbiz Grain 2022). Only one new concrete silo complex has been built post-liberalisation (Competition Commission 2021; van der Vyver 2019). Grain storage, a first key element of agro-food capital in this case, has in some respects undergone a considerable process of fragmentation post-liberalisation as other actors in the agrarian economy have contested the former co-ops' dominance of storage.

Nonetheless, no large-scale challengers have emerged, and the former co-ops have some key competitive advantages over prospective rivals. Notably, though semipermanent storage has low up-front costs, concrete silos have important benefits as a storage technology concerning grain quality, longer storage periods and lower insurance costs (Competition Tribunal 2020).[19] The cost for prospective rivals of duplicating the former co-ops' legacy infrastructure is prohibitively large—as Figure 2 shows, the depreciated book value of Afgri's silos is a small fraction of their enormous replacement value.[20] The industry also blames low standardised JSE storage tariffs as inhibiting new investment in silos (Agbiz Grain 2023). Indeed, the former co-ops themselves have significantly expanded storage capacity in high-demand areas through bunkers and bags rather than constructing new concrete facilities (Senwes 2019a; van der Vyver 2019). The increasing technological and regulatory complexity of storage and associated financial risks make significant long-term grain storage extremely challenging for most farmers and millers (Agbiz Grain 2023; Competition Tribunal 2020; van der Vyver 2019).[21] Indeed, industry experts suggest much on-farm storage serves more as post-harvest buffering prior rather than long-term storage.[22]



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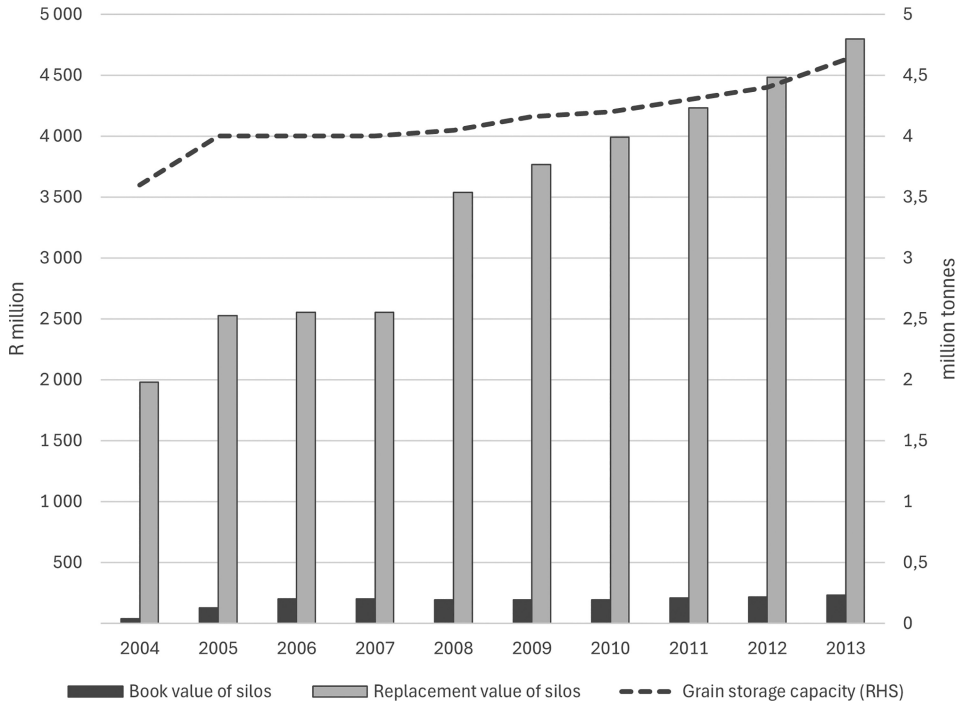



**FIGURE 2** | AFGRI silo asset value and storage capacity, 2004–2013. *Source:* AFGRI annual reports, 2004–2013, Thomson-Reuters Eikon.

These factors combined mean continued concentrated control of the key material infrastructure of grain intermediation. This concentration is often higher at a local level as a path dependency of co-ops' regional organisation during apartheid. Senwes and Afgri have reported 70% and 80% storage market shares within their respective regions (Fairfax 2019; Senwes 2017). Given high transportation costs, long-term grain storage can be near-monopolistic for farmers in some localities.

The former co-ops' legacy infrastructure thus forms a narrow funnel in the value chain's mid-section and is an important source of income in the value chain. Farmers delivering grain to silos receive tradable receipts. The grain may then change ownership multiple times without leaving the silo.[23] Farmers may sell to traders immediately or hold in hope of rising prices. The former may entail selling low given post-harvest gluts, but the latter entails incurring storage fees. These costs are typically incurred by farmers or traders, given processors generally buy only when needed (van der Vyver 2021). Combined with handling and administration fees, storage costs can become significant over longer periods—potentially several hundred Rand per ton[24]—with the National Agricultural Marketing Council (NAMC) previously estimating storage and handling as 20% of mill-door prices and 7% of maize-meal retail prices (NAMC 2012).

Notwithstanding challenges with data availability and comparability given differing reporting conventions, financial statements from the three largest former co-ops appear to show intermediation activities associated with grain handling and storage to be an important source of group income. Senwes' Grainlink division, the storage, handling and marketing operation, achieved return on capital employed of 50.8% in 2017, compared with a group level 13.8%, and has tended to outperform other divisions (Senwes 2017, 54). Over recent years for which comparable data are available, operating profit margins in business segments containing grain handling and storage have been generally higher than group margins (Table 3, rows 1–2), and contributed significantly more to operating profits than to revenues (Table 3, rows 3–4).[25] As Table 4 shows, at a group level, the three have managed distribute significant shares of profits to shareholders and creditors, with financial market distributions (row 3) outweighing capital expenditure (row 4).

These relatively stable incomes generated by intermediation of grain flows are potentially attractive to other fractions of capital, as exemplified by Afgri where finance capital came to displace agricultural capital. Following its public listing, it was extensively restructured in the early 2000s by two major institutional investors, with the majority of Afgri's board, then mostly farmers, 'politely asked to leave' (Finance Week 2001). As Ducastel and Anseeuw (2018, 562) put it, the company's evolution to 2013, 'was characterized by the increasing role of the Afgri management team and its empowerment as an autonomous element of 'corporate capital,' positioned in between commercial farmers and financial industry'. Shareholdings by institutional investors rose significantly, peaking at 78% in 2013. Economic value added (EVA) principles shaped strategy (Afgri 2004; OTK 2002). Afgri was then delisted from the JSE in 2014 following its takeover by a Mauritius-based consortium owned by Canadian private equity firm Fairfax Financial Holdings (Competition Tribunal 2014; Ducastel and Anseeuw 2018).[26]

In a subsequent illuminating development in the penetration of finance capital into grain storage, in 2019, Afgri's grain storage assets—then 69 silos and 15 bunkers, representing 30% of national storage capacity—were spun-off into a separate infrastructure investment 'platform', the Afgri Grain Silo Company ('SiloCo') (Fairfax 2019). With Afgri retaining minority ownership, stakes were sold for US$228.8m (R3.3bn) to BEE investment vehicle Wiphold (34% owned by insurance and banking



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**TABLE 3** | Revenue and profits of major agribusinesses.

| | Senwes (2015–2022) | NWK (2014–2019) | Afgri (2002–2013) |
|---|---|---|---|
| 1. Average group operating profit margin | 11% | 6% | 8% |
| 2. Average storage/handling operating profit margin | 33% | 58% | 40% |
| 3. Average grain storage/handling % of revenue | 21% | 7% | 6% |
| 4. Average grain storage/handling % of operating profit | 57% | 67% | 35% |

*Note:* Reporting conventions across the firms differ, meaning figures reflect different activity combinations, albeit in each case with grain handling and storage core to the segment. Senwes' figures are from its Market Access segment: '[H]andling and storage of agricultural produce, the transportation of grain commodities [and] processing of seed. Commission earned on marketing of grain and revenue from the sale of grain. Electronic issuing and trading of silo certificates'. (Senwes 2022, 20). NWK figures are from the Silo Services unit of its Agricultural Commodities segment: '[S]toring and marketing a broad range of agricultural commodities' (NWK 2019, 127); Afgri figures are from the Grain Management segment, which 'houses the Group's Handling and Storage division, including the procurement element of grain trading' (Afgri 2013, 118).
*Source:* Company annual reports.

**TABLE 4** | Financial market distributions of major co-ops.

| | Senwes (2015–2022) | NWK (2016–2022) | Afgri (2002–2013) |
|---|---|---|---|
| 1. Shareholder distributions as % of operating profit | 23% | 22% | 29% |
| 2. Interest expense as % of operating profit | 29% | 101% | 48% |
| 3. Financial market distributions as % of operating profit | 51% | 123% | 77% |
| 4. Capital expenditure as % of operating profit | 30% | 45% | 39% |

*Note:* Financial market distributions comprise dividends, share repurchases and interest.
*Source:* Company annual reports.

group, Old Mutual), the state-owned Land Bank, and Stanlib Infrastructure Yield Fund, a private equity infrastructure investment fund focused on yield assets (Afgri 2019; Fairfax 2019, 6–7). The rationales for this financial innovation, and the corresponding positioning of silos within the infrastructure asset class, emphasise the stable, long-term profits derived from grain storage. Fairfax described it as 'an entry point to institutional investors interested in long-term investment in agriculture and infrastructure through an attractive yield instrument', with Fairfax continuing to derive fee income from a management services agreement (Fairfax 2019, 6–7). Wiphold described silos as 'a unique infrastructure type asset in the agriculture and grain value chain with stable, growing cash flows … The investment generates returns that are well above current yields on infrastructure-type assets and generates an attractive and growing running yield' (Wiphold 2019).

In the other major former co-ops, agricultural fractions maintained a stronger hold against such potential transformations in ownership. Co-op members became shareholders as part of the privatisation process, but restrictions to prevent ownership slipping from farmers' control were commonly maintained (Ducastel and Anseeuw 2018). Though listed, Senwes and NWK restrict share transfers to 'bone fide' farmers, with Senwes' public free-float amounting to only 10% of shares (NWK 2017; Senwes 2019b). VKB is also farmer-owned (VKB 2022).

Alongside offering stable sources of income that are seemingly attractive to financialised accumulation strategies of the kind represented by the SiloCo venture discussed above, grain handling and storage form a part of the former co-ops' highly diversified business models that—to differing degrees—integrate multiple functions within agro-food capital. Though not participating directly in farming, they underpin commercial maize production as the main suppliers of machinery, farm inputs and technical support. Though overtaken by the major banks, they remain a major source of agricultural credit alongside other financial services like insurance. Afgri moved its financial assets to the Land Bank's balance sheet in 2011/2012 while retaining responsibility for and earning fees from origination, credit and services (Fairfax 2019). This made Afgri the Land Bank's lending intermediary (Ducastel and Anseeuw 2018; Fairfax 2019). Afgri used this arrangement to expand credit to its silo business's customer base.[27] In 2010, prior to the agreement, the Land Bank had gross loan book exposure to grains (primarily maize and wheat) of R4.3 billion, or 31% of its gross loan book; by 2019, it had R26.3 billion exposure, 58% of its loan book.[28]

Alongside handling and storage, former co-ops offer producers an array of post-harvest services including market information, procurement and trading, and logistics (NWK 2021; Senwes 2023). Grain procurement and trading are particularly significant aspects of the former co-ops' evolution post-liberalisation. Traders compete to price farmers' maize and sell it to millers,[29] and some former co-ops provide trading services for marketing grain and managing price risks in volatile maize markets. White maize futures are the JSE-CDM's most traded contract, with the value of outstanding contracts large and growing in relation to physical grain production. This also creates opportunities for speculative trading strategies, and as such, a wide range of financial actors besides former co-ops are engaged in maize trading, including major international commodity traders, such as Cargill, Louis



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Dreyfus and Bunge. Storage being a key trading input, former co-ops' storage operations must give nonpreferential treatment to their groups' trading divisions—Senwes was in 2012 reprimanded for charging external traders higher storage tariffs (Constitutional Court 2012). Nonetheless, synergies between the different interconnected grain intermediation activities can make them more than the sum of their parts, with the aim, as Senwes (2018, 48) puts it, to obtain an 'increased share of the customer's wallet by offering a fully integrated business solution rather than a once-off product'.

Alongside this extensive diversification within the South African maize value chain—which, as discussed in Section 5, has included milling further downstream—the former co-ops have also pursued risk-offsetting diversification into other commodities and geographies. The former co-ops have been key drivers of the broader regional expansion of South African agribusiness in southern Africa (Hall and Cousins 2018). Senwes (2023) has called this strategy 'externalisation'. 'Externalisation' has sometimes been pursued in partnership with multinational trading firms, not always successfully. Senwes established operations in Mozambique, Zambia, Kenya and Malawi in the early 2010s, including through a joint venture with Bunge—these operations were discontinued during 2016/2017 (Senwes 2018, 124). More recently, it has sought to '[d]iversify and derisk shareholders' income streams' (Senwes 2023, 38) through acquisition of German John Deer agencies. NWK's acquired cotton operations in Zambia and animal feed production in Botswana (Who Owns Whom 2019). Afgri has had the more extensive regional footprint. By 2017, it was operating storage, retail and manufacturing businesses in 17 African countries (Fairfax Africa 2017) and, in 2020, also cited operations in Australia, the United Kingdom and the United States (Helios Fairfax Partners 2020). Their externalisation also produced mixed outcomes, with recent 'back to basics' restructurings disposing of some African operations (Afgri 2023).

In summary, the former co-ops have evolved from an extension of agricultural capital to a more complex, diversified and integrated composite including aspects of trades, financial and industrial capital. Grain handling and storage remain central to these diversified accumulation strategies, which position the former co-ops as key intermediaries between grain producers and users further downstream in agro-food capital. While there are obvious complementarities and coevolutionary relations with other aspects of large-scale agrarian capital, the former co-ops' positioning can also create some tensions. These are explored in the following section.

## 6 | Centralisation Amid Deconcentration: The Contestation of Milling After Liberalisation

This section analyses the evolution of large-scale agro-food capital in maize milling. As discussed in Section 7, marketing board-era regulations created a highly concentrated, centralised, capital-intensive milling industry. While these broad structural features have persisted and major incumbent firms have remained powerful actors, maize milling has become increasingly contested by various fractions of capital in the agrarian economy.

As of 2019, there were 187 formally registered white maize processing firms. The three largest stand apart for a combination of ultra–large-scale production, breadth of distribution, brand power and embeddedness in diversified multinational food manufacturing enterprises. These are Pioneer Foods, and its *White Star* brand, Premier with *Iwisa* and *Nyala*, and Tiger Brands with *Ace*. Each can trace origins back a century and have undergone complex post-apartheid restructuring processes, touching upon other aspects of agro-food capital. Pioneer was established in the 1997 merger of Sasko and Bokomo, milling firms with co-operative origins. *White Star*, the market-leading maize meal brand, was launched shortly after. Pioneer was listed in 2008 and was purchased by PepsiCo in 2020 as a 'springboard into Africa' (Pioneer Foods 2019, 11). Premier was de-listed in the mid-2000s and majority purchased by the black-owned Foundation for African Business and Consumer Services (FABCOS). It was taken private by Luxembourg-listed holding company Brait, the largest shareholder of which being South African retail mogul Christo Wiese of the Shoprite supermarket chain, South Africa's largest, before re-listing in 2023. Tiger Brands has been among South Africa's largest food manufacturers since the mid-20th century, with interests across various products and markets. The three firms' combined revenue was equivalent to around 7.5% of South African household food and beverage expenditure in 2019.[30] Other longstanding major players in milling include Pride, established from a management buyout of Afgri's maize mills in 2001, and diversified food manufacturer RCL, majority owned by Remgro.

Liberalisation was expected to instigate a rush of small-scale entrants, as in other African contexts (Traub and Jayne 2008). While rising maize meal prices in the years following liberalisation elicited concerns about inadequate competition (ibid.), reforms did expose incumbents to new challenges. Formally registered millers increased from 211 in 1997/1998 to a peak of 291 in 2003/2004. Liberalisation unlocked co-locational advantages for rural millers linked to grain farming. Millers post-liberalisation became squeezed between an extremely volatile maize input price and the increasing buyer-power of supermarkets serving price-sensitive consumers.[31]

Major millers formed price-fixing cartels for maize meal and bread lasting 1999–2007, prior to discovery by the Competition Commission. In maize meal, this involved 17 firms, coordinated by the 'big-three' via the National Chamber of Milling (Competition Tribunal 2010). The Commission observed that the cartel extended the 'culture of co-operation and discussion ... entrenched in the industry over many years' (ibid., 32). The cartel's effectiveness was questionable given ease of defection and low entry barriers (Bonakele and Mncube 2012; ibid.). Prosecution resulted in fines and plummeting Chamber membership.

Large millers' responses to the changing competitive environment were not limited to this attempted 'private regulation' of markets. They also sought to defend their position through increased scale and automation.[32] Premier consolidated its South African maize milling operations to a single Free State facility, claimed as the world's largest maize mill for human consumption. The most advanced automated mills, one former-executive stated, have 'basically no labour costs'.[33] Connected to this was



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upgrading to produce ultra-refined 'super' maize meal and corresponding investments in brands to increase pricing power. Pioneer launched *White Star* in 1999, following a R60m product development process, and assumptions based on market research that urbanisation was changing consumer preferences towards a whiter, faster cooking, longer lasting, more calorie-dense and consistently granulated product.[34] This entails removal of the fibrous husk and oily germ, creating a more starchy end-product, and more by-product. Rudy Frankel, former president of Tiger Oats remarked (1988, 186), '[i]t is common cause that it [super] has less nutritional value than whole ground maize'. Compulsory fortification of maize meal was introduced in 2003. 'Super' grew from 27% of maize meal output in 1996/1997 to 81% in 2018/2019.[35] Smaller millers have been forced to pursue technological catch-up—a costly and challenging process (Bowman and Chisoro 2024).

The major industrial interests in milling thus have had a range of important advantages over new entrants. Milling has also remained important to these large industrial interests, as a complement to diversified food manufacturing business models. Mirroring global trends among large-scale food manufacturers, the big-three's parents have also pursued diversification across multiple branded products and merger-and-acquisition-driven international expansion. Production of South Africa's staple carbohydrates nonetheless remained the financial bedrock from which to pursue such riskier ventures. In the decade to 2019, staple grain operations in maize and wheat milling and bread baking remained the largest contributors to revenue[36]: 44% in Tiger Brands' grain division, 59% in Pioneer's 'Essential Foods' division,[37] while Premier derives 13% of revenue from maize milling, 16% from wheat milling and 52% from bread baking. Significantly, these operations contributed proportionally more to operating profits than to revenues (Table 5).

Milling typically has slim profit margins, but with production volumes sufficiently large this can still generate significant cash flows.[38] Additionally, these incomes can be relatively stable, notwithstanding the challenges of maize price volatility. In the firms' investment propositions, staples are 'defensive' products with consistent, counter-cyclical demand for such goods buffering against adverse economic conditions and more volatile demand for discretionary products (Pioneer Foods 2011, 2019; Premier Foods 2023).

**TABLE 5** | Staple carbohydrates' financial contribution, 2010–2019.

| | Tiger brands | Pioneer foods | Premier foods |
|---|---|---|---|
| Staple carbohydrates contribution to revenues | 41% | 60% | 81% |
| Staple carbohydrates contribution to operating profits | 53% | 63% | NA |

*Source:* Company annual reports.

However, notwithstanding their various advantages over rivals, the big-three are vulnerable in other respects. Their dominant position has been effectively contested by other fractions of capital as a result. In particular, as listed firms (or subsidiaries thereof) under pressure to compete on capital markets and deliver shareholder value, their milling operations must maintain relatively high investment returns.[39] Medium-scale, privately-owned competitors—commonly called 'regional' millers—can tolerate lower returns and thus price aggressively. Competition from regional millers has increased, as other fractions of capital have entered milling, using it to (re)capture surplus otherwise lost to downstream actors and provide optionality in volatile commodity markets. This has included investments by traders, former co-ops, and, perhaps most importantly, by large-scale commercial farmers. These investments have produced some highly-competitive operations. Of the 17 of the largest 20 milling firms excluding the big three, it is notable that while some are long-established regional millers, many are either relatively recent entrants—nine were established after 1990, and several major players after 2000[40]—or have pursued rapid expansion from a smaller scale.

A common feature of such firms is a close connection with commercial maize farming, either through spatial proximity, ownership or direct trading relationships, particularly within the major Free State maize growing areas in which agricultural production has become increasingly concentrated, and in which a number of such firms are located.[41] Diversification and downstream vertical integration by commercial farmers has been a general feature of South Africa's post-liberalisation agrarian economy, accompanying increased differentiation and consolidation in agriculture (Greenberg 2017, 477). Eleven of 28 small and medium scale firms interviewed entered milling from commercial maize farming, with a further seven from grain trading or related agribusinesses. In multiple instances, mills were set up in co-operation with local farmers.

Vertical integration into milling can have important advantages to commercial farmers, potentially enabling them to recapture of value otherwise lost to downstream actors in agro-food capital in the form of storage, trading and milling. Interviewees highlighted avoidance of storage and handling fees as a key motivation. Discussing the establishment of the firm, one interviewee stated: 'They [the founders] were looking to add value to own maize, because of the problem of the price differential with [former co-op name removed], and what they pay farmers, the handling fees etc. The only option for farmers in the local area is [former co-op name removed] so they wanted to, bypass the silos'.[42] Another interviewee highlighted the problem for farmers:

> These guys [former co-ops] have got big funding and capital, they will finance the farmer and buy in the crop and market it to mills. The farmer who farms in that way, loses a big chunk of money. They sell at the time of year when the Safex [South Africa Futures Exchange] price is lowest, at harvest time, that puts [downward] pressure on the maize price. The farmer has to take a lower price. The farmer can use futures, but it's risky.[43]



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They cited costs of around R300/ton to local silos, which were an effective monopoly in their area: 'Instead of losing that, it's better to bring into your own facility and store it. But to do this, you need to also have your own market for the maize'. Milling provides this market. 'Also,' they explained, 'this is nice as I do not have to trade in Safex [JSE-CDM], I don't have to worry about Safex'.[44] The additional benefit of milling is therefore optionality: gaining more options on how to dispose of grain in unpredictable market conditions, particularly in periods of excess supply.[45] Milling is particularly attractive to farmers when maize prices are low, with farmer-operated mills springing up 'like mushrooms' during price slumps.[46]

Even if not vertically integrated, there are key advantages to mills' spatial and relational proximity with commercial farming. With the removal of pan-territorial pricing, the weight-value ratios of raw and milled products favours co-location with maize farming. An additional benefit is proximity to intensive livestock farming, particularly major beef feedlots: the fast-rotting by-product of maize meal production, chop, must be sold to secure maximum profitability. Other interviewees cited advantages from close, trust-based relationships with farmers. As one stated: 'The local farmers, [buying from them] it suits us, you can speak directly with them, tell them the crop and cultivar we want, [and we] know we get a good quality of maize in … some guys say 'maize is maize' [but] then you get the soft maize, or poor quality maize from the silos where [former co-op name removed] has mixed it'.[47] Other said they were able to use maize for months without paying farmers with whom they had good relations. Close, relational ties with the commercial agriculture can thus provide important competitive advantages for milling firms, and this has enabled the agricultural fraction of capital to establish a significant presence in milling.

Milling can also be attractive to other interests in the agrarian economy. The optionality derived from processing attracts trading enterprises to milling (Blas and Farchy 2021; Kingsman 2019).[48] Most notably in this context, Louis Dreyfus, the multinational commodity trading giant, purchased two large milling firms in 2017, Noordfed (from NWK) and Progress, both then top 20 millers, in a joint venture with Willowton Group (Competition Tribunal 2017) (Competition Tribunal 2017). Several of the former co-ops also own maize processing operations, albeit the largest Afgri and Senwes, though owning some stakes in milling firms previously, have limited presence in maize meal. Afgri is a major player in animal feed but disposed of its white maize milling (in the creation of Pride), and, though owning stakes in two mills, Senwes (2018, 43) has eschewed significant downstream vertical diversification 'due to the fact that we do not compete with our client base, neither with the producers nor processors'. VKB have significant milling operations, with the rationale to 'create a market for the producer's products and add value to the products [so] the agricultural producer is given the opportunity to share in the value generated downstream in the agricultural value chain' (VKB 2019). A range of large firms in grain trading and grain handling and storage have thus pursued investments in milling, not simply as a standalone source of profits, but as a complement to other activities.

While 'regional millers' are heterogeneous in ownership, some broad commonalities can be observed. Though typically situated in rural maize-growing districts, regional millers sell to more densely populated areas, often a significant distance away. Aggressively low pricing is the competitive strategy, targeting low-income consumers, with Gauteng reportedly often avoided given the harsher competitive conditions. Free State millers interviewed trucked maize meal vast distances to consumers in Limpopo, Kwa-Zulu Natal and Eastern Cape. Ability to produce large volumes and tolerance of low prices makes such firms important suppliers for supermarkets' own-label maize meal. Regional millers are frequently cited in company reports and investor presentations from the big-three corporate millers as a major competitive threat, used to explain disappointing performances (Brait 2018; Pioneer Foods 2018; Tiger Brands 2016, 2022; Wasserman 2018).

Accompanying this has been remarkable erosion of the market-share of the large-scale incumbents. While company-by-company output data is not publicly available, data provided by SAGIS show the share of processed white maize from the four-largest millers declining from around 80% at liberalisation, to around 60% in 2010, to around 40% in 2019.[49] Concurrently, however, the overall number of millers shrunk, with numbers dropping 36% from the 2003/2004 peak to 187 in 2018/2019 as small-scale millers have struggled to survive. Growth of regional millers proximate to maize production has led to the Free State's maize growing districts supplanting Gauteng as the industry's centre of gravity—the province's share of processed output increased from 24% to 34% in just over a decade 2011/2012 to 2022/2023 (Table 6).

For small-scale maize producers in former homeland regions, the absence of local milling capacity and the demand pull it provides

**TABLE 6** | White maize processing for human consumption, 2011–2023.

| | | E&W Cape | Free State | KZN | MP | Limpopo | Gauteng | Northwest | Total |
|---|---|---|---|---|---|---|---|---|---|
| 2011/2012 | 1000t | 309 | 1029 | 346 | 363 | 446 | 835 | 904 | 4232 |
| | % | 7% | 24% | 8% | 9% | 11% | 20% | 21% | 100% |
| 2022/2023 | 1000t | 225 | 1681 | 337 | 633 | 360 | 832 | 923 | 4994 |
| | % | 5% | 34% | 7% | 13% | 7% | 17% | 18% | 100% |
| Change | 1000t | −84 | 652 | −9 | 270 | −86 | −3 | 19 | |
| | % | −27% | 63% | −3% | 74% | −19% | 0% | 2% | |

*Source:* SAGIS.



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remains one of many critical obstacles to growth.[50] Thus, while in some respects there has been a considerable transformation in the nature of agro-food capital, involving fragmentation, the erosion of the dominant position of incumbent firms and considerable deconcentration at the top of the distribution as milling has come to be contested by a range of differing fractions of capital, in key respects the centralised and concentrated features of the maize value chain have persisted and deepened.

## 7 | Conclusions

Though the significance of agro-food capital is frequently highlighted within agrarian political economy, most notably with reference to the power it commonly exerts over agriculture, the internal dynamics of agro-food capital have been insufficiently researched (Baines 2015; Harriss 2021). The paper has sought to contribute towards this in the context of the South African maize value chain, analysing the evolution of large-scale agro-food capital since liberalisation in the 1990s, its drivers and its implications. It shows how the milling and storage assets that constitute the key material infrastructure of agro-food capital intermediating producers and consumers of grain can generate significant income streams, while also providing a source of stability and optionality in a context of volatile, financialised commodity markets. Intermediation activities can, additionally therefore, provide important complements to the diversified accumulation strategies pursued by a range of different fractions of capital within the South African agrarian political economy.

Contestation of agro-food capital by differing fractions has produced significant changes. Within grain milling, the dominant position of incumbent food manufacturing interests has been challenged by the entry of other fractions of capital. Most importantly this has involved competitive mills linked to agricultural capital in the major maize producing areas of the Free State, but also significant milling operations owned by traders and former co-ops. This has led to a process of deconcentration at the top end of the size distribution, even while small firms have exited the milling industry. Grain handling and storage, previously controlled by farmer co-operatives, have fragmented with the entry of alternative storage providers and on-farm storage, albeit with former co-ops' grain silo complexes still playing the central role. These form a key component in diversified business models pursued by the privatised former co-ops, enabling an all-encompassing range of services to producers and users of grain. The stable income streams generated by storage infrastructure also makes them attractive targets for finance capital, as shown by Afgri's acquisition by private equity, and the more recent financial restructuring of its silo infrastructure into an 'investment platform'.

Thus, while overall structural features of centralisation, concentration and capital intensity have broadly persisted or even deepened since liberalisation—notably in the increased spatial concentration of maize production and processing in the commercial farming districts of the Free State—there have been important processes of fragmentation and integration within agro-food capital. It has become a complex amalgamation of agricultural, industrial, financial and trading fractions of capital, among which there can be different interests even as the boundaries between them become increasingly blurred.

While there are hazards to generalisation from a particular case, we argue the findings yield several insights potentially of wider significance. Firstly, while large-scale agro-food capital is commonly understood as a particular and distinct interest in agro-food systems, externally acting upon farming, with its accumulation imperatives driving the extraction of surpluses from upstream agricultural production, the case suggests more complex possibilities. Key assets and associated productive activities within agro-food capital appear not so much the focal points of accumulation, but rather components of more diversified accumulation strategies pursued by other elements of agrarian capital—large-scale commercial agriculture included. Beyond South Africa, this is apparent, for example, in trends over the past decade for major transnational commodity traders to purchase processing and storage assets along their supply chains to cut costs, manage risks and smooth the cyclicality of commodity markets (Blas and Farchy 2021; Kingsman 2019).

As this case and previous work by Baines (2015) show, agro-food capital can thus be a contested space, composed of varying interests, operating according to varying logics, and it is important to avoid a tendency to discuss it in monolithic terms (Bernstein 2016; Friedmann 2016). Relatedly, the case also highlights that processes of change within agro-food capital may differ from the common assumption of a linear trajectory towards increased concentration and corporate control. Depending on the manner in which it is contested by different fractions within the agrarian political economy, there can also be significant processes of fragmentation and deconcentration—as illustrated here in the case of milling. Variegation in the forms, internal dynamics and trajectories of change within agro-food capital, we suggest, may be particularly strongly influenced by its connections with primary agriculture. In this case, the power and resources of the agricultural fraction in maize have, while diminished, continued to have a key bearing on the direction of agro-food capital. This resonates with other literature highlighting the complex interconnections between agriculture and downstream industries (Banaji 2016; Harriss-White 2016; Hart 1997). It underlines, as Goodman and Watts (1997, 17) noted, the ways in which 'agrarian institutions, social relations, and social capital' can be 'carried over' to shape the characteristics of rural industry, with 'multiple, nonlinear, and divergent trajectories through which industrial capital in various guises encounters and intersects with enormously varied agrarian conditions' (Hart 1997, 56). Agricultural capital may shape agro-food capital rather than simply being shaped by it.

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on the panel Agrarian Change IV: Comparative political economy of agro-industrialization in Africa, the one-day University of Edinburgh conference, The Political Economy of Food System Industrialization, and a seminar at the Institute for Poverty, Land and Agrarian Studies Institute, University of the Western Cape.

### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### Endnotes

[1] 'Agribusiness' is a potentially ambiguous term, and we use it here to refer to the broad range of corporations investing in agriculture and the wider agri-food system, including both agro-food capital and agro-input capital (see Bernstein 2010).

[2] Banaji's (2016) use of 'commercial' refers to a specific form of capital engaged in the produce trades, rather than the more common usage of 'commercial' referring to profit-seeking business in general.

[3] By 'commercial farming', we mean forms of profit-orientated agriculture which produces a marketable surplus sufficient to enable re-investment and capital accumulation, distinct from forms of agriculture, typically carried out at a smaller scale, which produce for the more limited purposes of household reproduction—either through direct consumption or income generation.

[4] This relationship frayed in the 1980s (Bernstein 2004).

[5] Interview with a former senior employee (2) of a major milling firm (anonymised), via Zoom, 31/08/2020.

[6] Interview with a former senior employee (2); interview with a former senior employee (3) of a major milling firm (anonymised), Johannesburg, 26/06/2019.

[7] Ibid.

[8] Interview with a former senior employee (2).

[9] Data from SAGIS.

[10] Ibid.

[11] Author calculations using StatsSA 2019 CPI data, with nutritional information for White Star maize meal, Albany Everyday white bread.

[12] StatsSA Living Conditions Survey data, 2014/2015.

[13] Interview with an industry association representative (anonymised), Gauteng, 09/04/2019.

[14] Authors' calculations, JSE data. A number of these are also used to store soya and sunflower seeds, but the data required to determine what proportion of each are used for which grain is not publicly available.

[15] Authors' calculations, JSE data.

[16] Authors' calculations, JSE data.

[17] Interview with an industry association (anonymised), Gauteng, 26/08/2019; interview with an agribusiness (anonymised), Gauteng, 04/02/2020.

[18] Interview with an agribusiness (anonymised), Gauteng, 11/09/2019; interview with an agribusiness (anonymised), Gauteng, 04/02/2020.

[19] Interview with an agribusiness (anonymised), Gauteng, 04/02/2020.

[20] Interview with an agribusiness (anonymised), Gauteng, 04/02/2020.

[21] Interview with an agribusiness (anonymised), Gauteng, 11/09/2019. Interview with an industry association (anonymised), Gauteng, 26/08/2019; interview with Wiana Louw, Southern Africa Grain Laboratory, Gauteng, 05/09/2019.

[22] Comments at Agbiz Grain Symposium, 2023, Day 1, 'The sustainability of the Storage Sector and Returns on Investment', 5/09/2023.

[23] Interview with an agribusiness (anonymised), Gauteng, 11/09/2019.

[24] Derived from interviews and advertised storage tariff in the 2019/2020 season.

[25] Reporting segments combine multiple intermediation activities, with returns from storage itself being unclear and potentially significantly lower. The industry argues JSE standardised storage tariffs have recently squeezed storage profitability (Agbiz Grain 2023).

[26] The remaining 40% was split among Bafepi Agri (20%), South Africa's Public Investment Corporation (15%) and AFGRI management (5%).

[27] According to the agreement, Afgri would only be liable for bad debts 'on a second loss basis to a maximum of between 0.7% and 0.5%' (Afgri 2013, 165).

[28] Land Bank annual financial statements, various years.

[29] Interview with an agribusiness (anonymised), Gauteng, 11/09/2019.

[30] Authors' calculations, company annual reports and South African Reserve Bank data.

[31] Interview with a former senior employee (1) of major milling firm (anonymised), Johannesburg, 17/07/2019; interview with a former senior employee (2); interview with a former senior employee (3).

[32] Interview with a former senior employee (3); interview with a former senior employee (1).

[33] Interview with a former senior employee (1).

[34] Interview with a former senior employee (1).

[35] Authors' calculations, SAGIS data.

[36] Maize milling's precise contribution is not reported, though its contribution is less than wheat products which are higher value.

[37] Milling (maize and wheat) and bread baking, as well as rice and pasta.

[38] Interview with a former senior employee (1); interview with a senior executive at a major milling firm (4) (anonymised), via Zoom, 01/09/2020.

[39] Interview with a senior executive at a major milling firm (4).

[40] Based on Companies and Intellectual Properties Commission records and company websites.

[41] Interview with a medium-scale miller (6), Free State, 29/08/19; interview with a medium-scale miller (7), Free State, 28/08/19.

[42] Interview with a medium-scale miller (1) (anonymised), Free State, 14/10/2019.

[43] Interview with a small-scale miller (1), Kwa-Zulu Natal, 26/09/2019.

[44] Ibid.

[45] Interview with a medium-scale miller (5), Free State, 26/08/19.

[46] Interview with a small-scale maize miller (2), Free State, 27/08/2019; interview with a medium-scale miller (6), Free State, 29/08/19.

[47] Interview with a medium-scale miller (1).

[48] Interview with a medium-scale miller (5).

[49] The figure was corroborated by an interviewee from a big-three miller. Interview with a senior executive at a major milling firm (4).



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[50] Interview, agricultural lender; interview with an industry association (anonymised); interview with South African government ministry officials (anonymised), 10/09/2019; interview with South African government department officials (anonymised), 02/09/2019.

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