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Adam Aboobaker

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Macroeconomic Determinants of South Africa's Post-Apartheid Income Distribution[a]

Adam Aboobaker[b]

South Africa's distributive regime is striking to all who observe it. This paper situates developments in post-apartheid income distribution within key macroeconomic developments and debates, arguing that deterioration in the wage share between 2000 and 2008 is better explained by factors associated with the commodity boom, rather than those associated with neoliberalism, such as austere fiscal policy, trade openness, or 'financialization.' The distribution of market income has undergone developments at the sector level post-apartheid that have received little attention. While the aggregate wage share remains close to its initial level at the start of democracy, the wage share in mining is 12 percentage points lower than at the beginning of 1993, after recovering somewhat from a nearly 20 percentage point decline over the commodity boom period. The ratio of consumer prices to sector level producer prices is the 'wedge' between real consumption and real product wage rates and in theory a key relative price determining distributive outcomes. In sectors like mining, where real product and real consumption wage rates may depart in significant part, workers may not easily observe the real product wage and nominal productivity shocks may weakly carry through to wages. Other sectors have different dynamics. The wage share in manufacturing has stabilized at a level nearly 20 percentage points higher than where it was in 2005 and in utilities the wage share resembles a mountain with a steep climb during the first fifteen years of democracy and a sharp cliff edge around the Great Recession. This paper reviews existing debates about macroeconomic policy and performance, reflecting on how they relate to the evolving wage share before considering evidence from autoregressive distributed-lag and error correction models. The concluding analysis calls for reorienting the focus of predominant critique of post-apartheid macro policy from insufficient state allocation of resources toward social policy to a critique concerning the state's failure to mobilize the necessary resources to drive forth rapid structural transformation.

1. Introduction

A central but surprising feature of the post-apartheid political economy of South Africa (SA) is the decline of the wage share soon after the transition from apartheid. How could a falling wage share accompany the extension of democratic franchise and a political settlement in which trade unions became an important political constituency within the governing alliance? Critical perspectives on post-apartheid economic policy have emphasized the exclusion of organized labor, the Left and heterodox economists from the design of economic policy, despite their embeddedness in the political system to varying degrees. However, allegations of neoliberal policies are hard to square with the significant expansion in post-apartheid social policy, growing

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wage rates (and the wage share) in the state-run utilities, and the general growth of government consumption as a share of national output.

I consider an alternative explanation for the falling wage share: booming commodity prices set in international markets raised revenue and profits but not wage compensation in select sectors. There was neither a generalized increase in intensity of worker repression nor a withdrawal of social protections undermining worker fallback positions. I provide graphical evidence and use error correction models, autoregressive distributed-lag models, and cointegration tests to assess competing hypotheses.

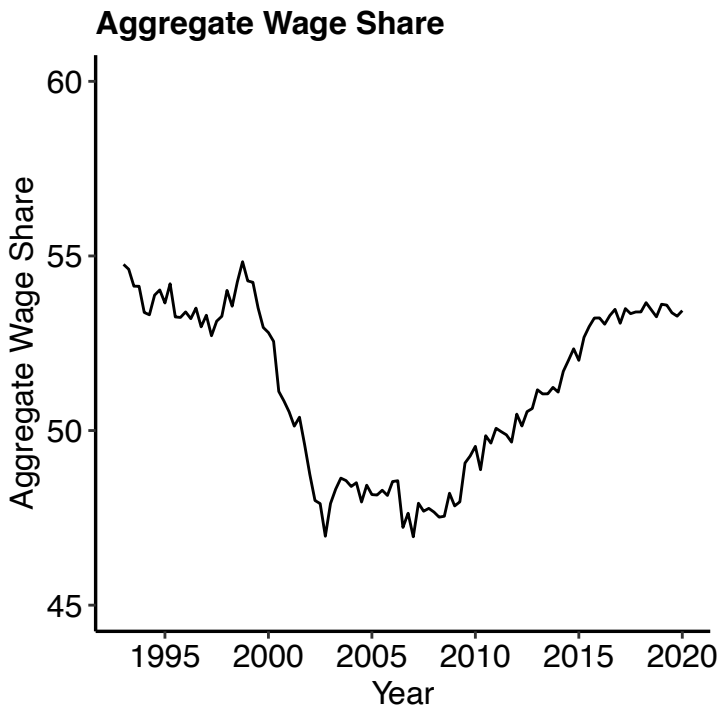

Figure 1. The aggregate wage share in the democratic era, after seasonal adjustment, in %. Author's calculation. Data from Statistics South Africa.

As Figure 1 shows, the aggregate wage share fell significantly in the period around the year 2000 from a level of around 55% to lows of 47%, where it hovered until the Great Recession of 2008. After the Great Recession, the wage share roughly returned to its dawn-of-democracy level.[1] Both sides of these upward and downward trends are mirrored in two sectors of interest (mining and manufacturing, Figures 3 and 4), with a considerable collapse in the mining wage share from

[1] Resultingly, there is not any clear trend to the wage share during the democratic era and short-run factors may be more relevant factors explaining movement in the wage share than long-run factors.

55% pre-2000 to 35% at the time of the Great Recession and a notable appreciation of the manufacturing wage share from 50% in the aftermath of 2008 to stabilizing at around 63% after 2012.[2] The decline of the wage share is pronounced in the mining sector during the commodity boom. The same is true for manufacturing, but the striking fact of functional income distribution in manufacturing is the dramatic rise of the wage share after the Great Recession. Other sectors have very distinct characteristics.[3]

The falling aggregate wage share in democratic SA is associated with a profit windfall during the 2000s commodity super-cycle. This contention is supported by the strong sectoral diversity in the movement of wage shares, and the timing of changes. Profit windfalls in the mining sector can stimulate demand conditions that yield complementary operating surpluses in sectors like manufacturing or construction with strong linkages to mining. During the commodity boom SA also experienced: high rates of manufacturing capacity utilization; big increases in trade volumes with the rest of the world; a loss of competitiveness reflected in appreciation of the real effective exchange rate; and a major increase in mining's output price relative to other SA sectors. Outside of the commodity boom, SA's post-apartheid macroeconomy has been characterized by stagnating (and recently falling) per capita income levels; persistent mass unemployment; a growing share of finance, insurance, real estate and business services in national output; and a severe energy crisis associated with issues of patronage and corruption that have affected state capacity.

The neo-Kaleckian tradition has been criticized for assuming a one-way direction of causality from distribution to growth (Skott 2017). This paper considers and tests primarily the reverse direction. In contrast to the literature that has assumed changes in income distribution are driven largely by exogenous redistributions, this paper argues for the possibility of major short and long period changes in income distribution that have little to do with pure redistributions from one social class to another.[4]

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[2] It should also be commented upon that the vast degree of variation at the sectoral level contrasts strongly with the 'Kaldor facts' (Kaldor 1956) – the wage share fluctuates rather wildly in the context of interest.

[3] See Figures 8-10 in Appendix A.

[4] This raises questions about estimates of the growth effects of changes in functional income distribution. Why should a rise in the profit share, say, driven by a purely exogenous profit windfall (with a constant real consumption wage bill) result in a decline in consumption (Onaran and Galanis 2012, 12)? There need not be any unique relationship between functional income distribution and aggregate demand – shocks to income distribution in a single direction, either positively or negatively, but delivered by different means, may have substantially different ramifications for growth (Ros 2016, Skott 2017).

The remaining sections of this paper are as follows: section 2 sets out stylized facts and questions of interest in relation to key debates, section 3 considers theoretical issues outlined in the post-Keynesian tradition, section 4 the data, section 5 the econometric strategy, section 6 econometric results. Section 7 concludes.

2. *Hypotheses and stylized facts*

This section outlines a series of channels by which the functional distribution of income in SA may have evolved over time, some of the existing literature on those channels and some corresponding descriptive empirics.

2.1. The democracy puzzle

Between the end of apartheid and the Great Recession, the SA wage share declined steadily (see Figure 1). From a political-economy perspective, this is a puzzle.[5] The apartheid regime actively repressed the majority of the country's workers. In contrast, in the democratic era the Congress of South African Trade Unions (COSATU) has been an important political actor in a dominant tripartite alliance including the South African Communist Party (SACP) and the ruling African National Congress (ANC). Democracies are supposed to pay higher wages (Rodrik 1999). Moreover, deteriorating distributive outcomes are worrying in a country plagued by levels of personal income inequality amongst the highest in recorded history (Piketty 2020, 555). Chatterjee *et al*. (2021) provides the most up to date account of personal income inequality and redistributive policies in SA. Macroeconomic developments have not featured prominently in accounts of changes in the personal distribution of income post-apartheid, however, the findings, particularly concerning cumulated income growth of the top 1% presented in Chatterjee *et al*. (2021, 49), are consistent with the commodity boom story explored in this paper.

Downward pressure on the country's wage-share seems to particularly characterize an important part of the first decade of the 2000s. Understanding what has driven these outcomes is relevant both to the socially deleterious effects of rampant inequality in SA as well as debates over

[5] Tilly (1999) commented of the democratic transition in SA: "that shift in political power will most likely cause some equalization in wealth, income, education, health, housing, and living conditions across what had been one of the world's starkest divisions of categorical inequality." Michie (2020) meanwhile leads with the question 'why did the ANC fail to deliver redistribution?' Acemoglu and Robinson (2015) also discuss the SA puzzle.

macroeconomic performance and policy. It would be tempting to treat observations of SA's falling wage-share as the result of a neoliberal turn driven by orthodox macroeconomic policies, particularly in a context where advocacy for 'growth through redistribution' has been central to critical perspectives within the tripartite alliance at least since the transition period.[6] While the track record of post-apartheid macroeconomic policies in SA speaks for itself – exceptionally high rates of open unemployment, unfavorable shifts in sectoral structure in line with premature deindustrialization, and in recent years falling per capita income levels – it may be inaccurate to identify the movement of the wage share as reflective of structural shifts in the strength of labor or in ideology concerning the role of the state. This is most evident in the democratic state's allocation of resources to social policy and developments in public sector remuneration.

One measure of the democratic dividend is the share of government consumption in GDP. Considering the apartheid regime grossly restricted provision of quality social services to the black majority one would have expected a democratic regime to increase government consumption, and

[6] An influential 1990 ANC policy document proposed "growth through redistribution in which redistribution acts as a spur to growth and in which the fruits of growth are redistributed to satisfy basic needs" (Nattrass 1994, 348). This broad framework was said to have expediency in terms of uniting various constituencies within the ANC, and the basic idea has proven persistent in macroeconomic debates in SA. Ismail (1993) attributes the introduction of 'Growth through redistribution' in ANC policy debates to Raphael Kaplinsky, Harris (1993, 95) attributes the concept to Alec Erwin – the latter is said to acknowledge the concept "to be a very sweeping approach with no content to it". Michie (2020, 525) renews calls in SA's 'growth through redistribution' tradition "to use Keynesian policies in support of a developmental state" in his article attempting to unpack why the ANC 'failed' to deliver redistribution. Marais (2011, 100) and Freund (2013) provide an overview of some of the debates. Critical perspectives in SA could be summarized in the following two propositions: 1) the South African state has consistently pursued an overly tight fiscal policy that has constrained the growth prospects and distributional objectives for the country, 2) to add insult to injury, these outcomes could have been avoided had a group of heterodox economists that cohered around the Macroeconomic Research Group (MERG) not been sidelined in the early 1990s. However, fiscal policy during the democratic era has commonly had a strong counter-cyclical component and has been associated with a largely unparalleled expansion of social expenditure, to redistributive effect (at least in terms of measures of personal income distribution – see footnote 9 below). Moreover, there is no necessary or unambiguous relationship between counter-cyclical fiscal policies and capital-labor income shares. The MERG report meanwhile pursued a relatively modest projection for the growth of government expenditure as a share of GDP following its chief policy recommendations, and strongly cautioned in its section on fiscal policy that national development "will not happen, however, if increased public expenditure simply goes to higher, consumption-oriented social welfare and low productivity employment in the public sector." (MERG 1993, 27). In other sections, the MERG report makes clear that growth objectives necessitate "[t]he containment of government consumption expenditure over this period to roughly its present level in real terms" (MERG 1993, 47). Sachs (2021) makes similar observations about the 1994 Reconstruction and Development Programme (RDP), which was seen to be sidelined in a similar way to the MERG. On monetary policy, the MERG report targeted a real effective exchange rate rule aimed at keeping manufacturing relative prices constant and predictable. It further argued that a target for real depreciation was consistent with fiscal tightening (MERG 1993, 64). Outlining where MERG was or was not consistent with post-apartheid macro policy is interesting and important not least because of the conspiracy theories the sidelining of the MERG has elicited (Padayachee and van Niekerk 2019, 173-4).

this variable measured as a share of GDP has indeed generally trended upward since democracy.[7] A higher share of government consumption in national output might be expected to raise the wage share if it raises workers' fallback positions and the reservation wage. If the wage-share was falling primarily because of welfare state retrenchment, we might expect to see similar sectoral wage-share trends and falling government consumption. This is not reflected in the data[8] and more generally the considerable effect of fiscal policy on reducing personal inequality in SA is well established in the literature.[9] One complicating factor with analyzing the effects of the government consumption share on the wage share concerns the endogeneity of government consumption, a policy variable, to the state of the goods market – automatic stabilizers and policies with explicit Keynesian motivations would be expected as a feature of downturns where profits fall and the wage share consequently rises. Indeed, Gouzoulis *et al*. (2021), a study of determinants of the *private sector* wage share in SA using annual data for 1971-2019 and a similar econometric methodology to this paper, hypothesize and find that public consumption is negatively correlated

[7] Although, interpreting this variable as a measure of the size of the welfare state is complicated by the large military expenditure share of government consumption inherited from the apartheid regime, and efforts to curtail this form of wasteful expenditure after democracy, as well as cyclical variation of this variable corresponding to the role of automatic stabilizers amid output fluctuations. An obvious alternative does not come to mind – measuring instead the *rate* of government consumption (scaling the social wage by the number of beneficiaries) would not account for the effects of the vast expansion in coverage to social policy – a key feature of the democratic era. Analyzing the trend of this variable post-apartheid is also complicated by developments in the latter years of apartheid. During the 1980s, P.W. Botha (prime minister from 1978-1984 and state president from 1984-1989) devised the 'Total Strategy' for maintaining white minority rule, built on the multiple fronts including exerting brutal military force and concessions for creating a black middle class to facilitate efforts to divide-and-conquer. Both aspects are considerably associated with a dramatic increase in the government consumption share of GDP over the course of the 1980s. Harris (1993, 100), in an analysis of the route forward for politics and policy penned from a radical perspective, notes the importance to SA's macroeconomic balance to "reduce its overstaffed, inefficient bureaucracy where payrolls are based on administering the intricacies of apartheid. Existing jobs have to be slashed rather than guaranteed and that is especially so since new generations of black officials have to be quickly brought into public management." The fact that "Pik" Botha (foreign minister during the last years of apartheid) was assigned control of the ministry of minerals and energy during the first post-apartheid government is perhaps indicative that Harris' advice was not heeded.

[8] According to World Bank national accounts data, in 2019 SA's government consumed roughly 3% more of national output than the average upper middle-income country and 2% more than the average high-income country.

[9] See Inchauste *et al*. (2015) for an account of the effects of fiscal policy on income distribution in SA specifically. Lustig (2016) compares fiscal redistribution in SA with Brazil, Chile, Colombia, Indonesia, Mexico and Peru, finding that the redistributive effect is largest in SA. The difference between SA's Gini-coefficient on market income and final income in 2010 was nearly 0.18. This compares favorably with Brazil in 2009 after the vaunted reforms under Lula, where the difference is 0.14. More recently Chatterjee *et al*. (2021, 31) have shown that fiscal policy in SA is highly redistributive, if insufficient to curb the rise of inequality. Specifically, the authors show that the share of net national income distributed to the bottom 50% of the income distribution has increased from 8.5% to over 12% between 1993 and 2019. Taxes on the top 10% meanwhile have increased from 9% to 14% of net national income. Some of the findings presented in this paper (notably Figures 1 and 3) explain why, despite considerable efforts at state redistribution through fiscal policy, personal income inequality has worsened after democracy. Sachs (2021) meanwhile, firmly establishes the strong expansion of public resources allocated to health, education, policing and public servant remuneration.

with the private wage share. However, these authors confusingly characterize expanded public welfare state coverage as consistent with fiscal austerity and the motivation for their hypothesis is decidedly unclear.[10]

More generally, the public sector, as seen in utilities dominated by state-owned enterprises managing energy and water production and distribution, has been characterized by trends that depart significantly from some of the aggregate phenomena. In the fifteen years after democracy, the utilities wage share grew considerably from around 30% to nearly 50%.[11] The growth of public sector wages and employment have generally been associated with low quality investment in infrastructure and as a result severe energy shortage over much of the last decade. With prices in this sector administered, managers of the utilities attempted to rationalize operations by considerably raising energy and water prices (hence the dramatic decline in the wage share in this sector after the Great Recession). A look at this sector would suggest that where the ANC has had more influence, as in the public sector, it *has* influenced outcomes consistent with downward redistribution – just not sustainably nor to the advantage of the economy and society more generally. High energy prices and shortages have likely curtailed prospects for industrial development (manufacturing is energy intensive), and frustrated household energy consumption. Wage levels in this sector have risen more than indicated by the wage share.

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[10] The authors argue that "[g]iven the history of discriminatory public welfare expenditures in South Africa and narrow welfare reforms in the post-democratisation period, we do not expect government consumption to increase the private sector wage share as in the standard literature" (Gouzoulis *et al*. 2021, 11). Taking for granted the, arguably incorrect, claim that welfare reforms were narrow (a point addressed in the footnote above), and assuming the effects of discriminatory welfare expenditures during the apartheid era dominate any effects after the period where state-institutionalized discrimination ended – most years in the authors' study, why should the private sector wage share be falling in discriminatory public spending? Even if black wages were falling in discriminatory public expenditures, a dubious proposition, white workers' wages may be increasing in public expenditure and the private sector wage share is a measure of all wages paid, including both black and white workers. Generally, Gouzoulis *et al*. (2021) presents a difficult to follow perspective on what the authors characterize as a "non-redistributive democratic transition" – the empirical results from their paper cover *both* the apartheid and democratic eras (accounting for this structural shift exclusively through use of a time dummy), disregard the public sector (an important sphere by which the democratic government used policy at consequence to income distribution), and the sectoral heterogeneity within the private sector wage share is disregarded. The concluding analysis that "schooling and industrial actions are equalisers, but *not* enough when a society is racially divided in terms of capital ownership and unionization, and/or when policy betrays political promises" is hard to fit with the paper's findings: Racial factors are omitted from the core analysis, and moreover it is unclear what channel precisely the authors believe motivate a relationship between racial inequality of capital ownership and the functional distribution of income. Indeed, a central feature of the post-apartheid era is falling inequality of capital ownership in racial terms – taking the hypothesized relationship of Gouzoulis *et al.* at face value, this development should have *contributed to* rather than stalled equalization.

[11] Some of these developments invoke research on the soft budget constraint (Kornai *et al*. 2003).

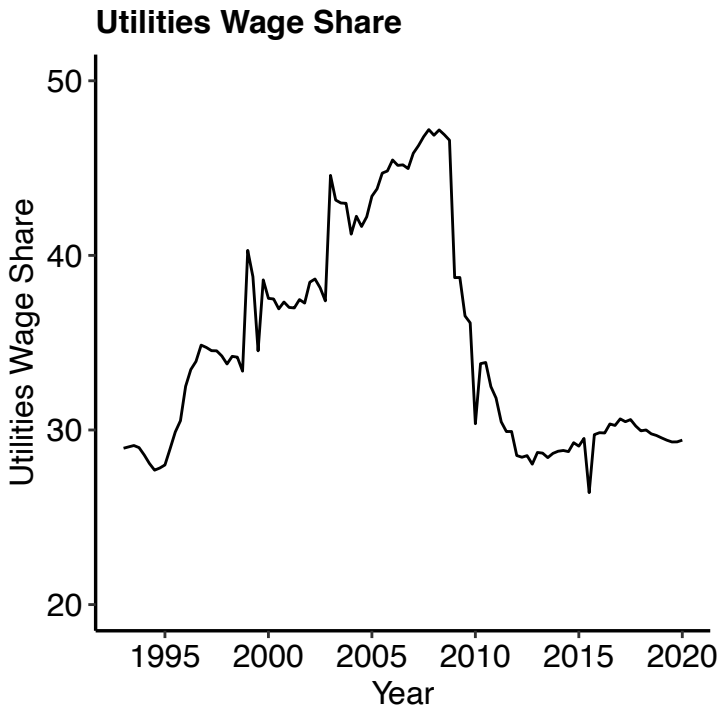

Figure 2. The wage share in the utilities sector since democracy, after seasonal adjustment, in %. Author's calculation. Data from Statistics South Africa.

In short, if a falling aggregate wage-share in the democratic era is puzzling given the importance of the labor movement to the ruling political alliance and the expansion of the social wage, it is more puzzling when one considers the expansion in the social wage[12] and the growth of public sector wages.[13]

It is less puzzling when considering accounts of the insulation of economic policy from union influence. In Marais' (2011, 105) account of the influence of unions over policy during the transition, COSATU

[12] The 2019 Statistics South Africa (2019, 29) General Household Survey shows that the percentage of persons who have benefitted from social grants grew from just under 13% in 2003 to nearly 31% in 2019.

[13] Figure 15 in Appendix B plots an index of public and private sector wage rates between 1970 and 2020. The index of public sector wage rates jumps from 66.1 to 77 between quarter one and quarter two of 1994. South Africa obtained democracy in April 1994, and it would seem transparent that higher public sector wages were a priority for a government trying to establish political stability, particularly during the initial government of national unity, where efforts to comfort the old guard may have been prevalent. A reading of Figure 15 might suggest that private sector wages responded to these developments with a lag and that democracy has yielded considerably higher average wage growth across both public and private sectors than in previous decades.

"pushed for a stronger institutionalised role in economic and industrial policymaking. It wished to see decision-making on key economic issues transferred into a forum where trade unions could wield influence. Key ANC figures, such as Trevor Manuel (the party's [then] shadow finance minister [and later finance minister]), openly disapproved and insisted that economic policy was the preserve of government."

This sidelining of trade unions and the Left from influencing macroeconomic policy would be a persistent and central feature to the political antagonisms that emerged from the 1996 Washington Consensus-style macro-program, 'Growth, Employment and Redistribution' (GEAR).[14] GEAR pursued reducing government deficits, liberalizing the capital account and dramatically slashed trade protections. It also targeted in name, if not in practice, keeping the exchange rate stable and competitive, wage restraint and partial privatizations. A stylized Harrodian account of GEAR might recognize that it created space for a high 'warranted' rate of growth by initially squeezing government consumption. However, it failed to actualize that growth due to inadequate efforts to ensure requisite rates of investment were forthcoming to fill the space. A related criticism of the GEAR paradigm, made also in Marais (2011), is that policymakers of this period overemphasized a role for stimulating the ethereal 'business confidence,' over the dictates of profitability and an industrial policy facilitating high investment rates.

2.2. The role of mining

Piketty's (2014) blockbuster opened with a discussion of the 2012 massacre of 34 mineworkers in Marikana near Johannesburg. To many observers, the massacre reflected the enduring significance of class conflict in this sector to the country's political and economic history.

[14] An under-discussed aspect of the politics underlying post-apartheid macro-policy has been Nelson Mandela's explicit support for key elements of the policy regime that would come to be scrutinized by critics of GEAR. In his first State of the Nation Address, Mandela (1994) emphasized his government's commitment to including the trade union movement and civic organizations into decision making. However, in the same breath he also stated a commitment to "continue existing programmes of fiscal rehabilitation" and expressed determination "to make every effort to contain real general government consumption at present levels and to manage the budget deficit with a view to its continuous reduction." Interviews (Trew 2014, 2015) with early post-apartheid finance ministers, Chris Liebenberg and Trevor Manuel, independently demonstrate the influence of international expectations and expectations of financial market actors to appointments to the economic portfolio. Both interviewees intriguingly indicate that Mandela made his first appointment of finance minister (Liebenberg) on the day François Mitterrand would conduct one of the first state visits to the newly democratic South Africa. The appointment of Liebenberg was perhaps indicative of attempts to mitigate adverse financial market reactions of the sort that characterized the Mitterrand electoral victory in 1981 (see Girardi 2021).

Mining capital have been a powerful constituency throughout SA's modern history – going back to the 19th century, they were an influential interest group in the failed Jameson Raid[15] and numerous accounts have put them at the center of the negotiations to end apartheid.[16] The mining sector remains an important, albeit declining, driver of macroeconomic outcomes in SA, despite the area around Johannesburg once, in the 1970s, representing the largest hub of industrial activity south of Turin (Malherbe and Segal 2001). Since then, SA's economy has been characterized by deindustrialization premature for its level of per capita income and the decline of mining as a share of output. Interest in mining's role in aggregate distributive outcomes is motivated by the striking evolution of the mining wage share post-apartheid. Alvaredo and Atkinson (2021) briefly discuss the role of the natural resource sector in 20th century SA income distribution, calling for further time series investigation.

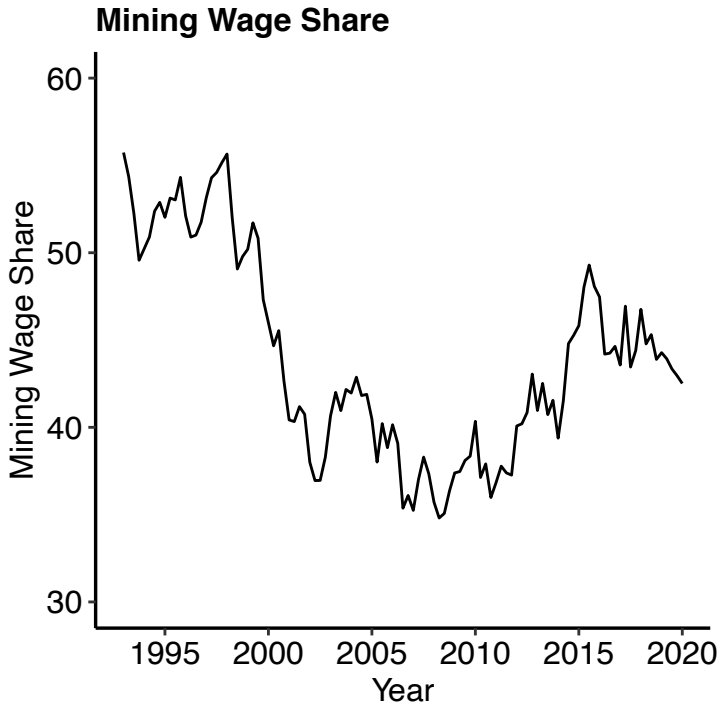

Figure 3. The wage share in the mining sector since democracy, after seasonal adjustment, in %. Author's calculation. Data from Statistics South Africa.

[15] The coup attempt against Paul Kruger in the 1890s. Hobson (1900, 17) discusses reasons for the Jameson Raid.
[16] See Hirsch (2005, 43) and Padayachee and van Niekerk (2019, 85). More recently, Maharaj and Jordan (2021, 104 and 126) provide a related account of the role of mining capital, in a detailed insider's account of the negotiations that ended apartheid.

The evidence for class conflict over realizing targeted output shares in sectors like mining is less clear than one might expect. Profit windfalls from upswings in the commodity cycle have historically been discussed as a plausible channel for evolving distributive outcomes in SA. Discussing the Gold Standard era, Eichengreen (2021) notes fears in SA of negative effects of increasing gold prices on real wages. Richards (1933) argued that abandonment of the Gold Standard would cause a depreciation that would stimulate gross profits whilst leaving working costs roughly constant, and consequently drive a significant growth in South African mining share prices listed on the London Stock Exchange. A weak response in wage rates to booming gold prices was expected by virtue of "unlimited supplies of native labour" (Richards 1933, 338).[17]

A weak response of money wages to commodity cycle upturns brings up the question of labor market institutions and their role in influencing distributive outcomes. Are unions able to win gains for members when mining profits are surging for exogenous reasons? The 1970s in SA was a period that corresponded to a significant growth in trade union representation for many black South Africans. Alongside these developments was the United States' abandonment of the Gold Standard, which oversaw an almost twenty-fold increase in the price of gold between 1970 and 1980 (Wilse-Samson 2013). Analysis of the sectoral data for this period is beyond the scope of this paper, but a glance at the aggregate data[18] suggests that the wage share hit a peak *prior* to the militancy that would come to characterize important moments of the 1970s and 1980s, falling from a peak of 58.9% in quarter 1 of 1972 to a trough of 47.5% in quarter 1 of 1980. This would generally fit with an observation that organized labor in the mining sector has not had an interest in, or power over, maintaining a fixed proportion between nominal wages and sector-level prices over the commodity cycle. This is evident in Figure 7 (in Appendix A), demonstrating the sharp fall in the SA's aggregate wage share as the international gold price doubled at the end of 1979, followed by rapid bounce back as gold prices halved and returned their mid-1979 level by mid-1982. Consequently, commodity cycle upturns may be plausible drivers of deteriorating distributive outcomes at the sector and aggregate level.

Visual inspection of mining wage share figure raises the question of contemporary union strategy. The upturn in the mining wage share correlates with industrial action in the mining sector

[17] This language is reminiscent of W. Arthur Lewis' characterization of the determination of income distribution in dual economies, discussed in Section 3.
[18] The aggregate wage share between 1946 and 2020 is provided by Figure 7 in Appendix A.

and the end of the commodity boom – Sil and Samuelson (2018) argue that attempts to cut the wage bill in several firms after the end of the commodity boom triggered the wildcat strikes in 2012 in the lead up to the Marikana massacre.[19] In an applied sense, this raises the question of worker agency over and interest in the distribution of income in a sector like mining.[20] The 2012-2014 platinum belt strike wave was exceptional because it contested not only capitalist power and state power, but also trade union bureaucracy[21] – a formidable set of structural obstacles. Most interestingly for the topic of this paper, this strike wave happened after the commodity boom, in a period where if anything mining producer prices failed to keep up with consumer prices.

Outside of the mining sector, commodity booms can shape distributive outcomes through several channels. The implications for the distribution of income in the manufacturing sector are of special interest, given the sector's importance to national development. The distribution of income in the manufacturing sector is likely to be influenced considerably by demand conditions, with gross profits bolstered when demand is high and vice versa.[22] Commodity booms might drive forward demand for manufactured goods in contexts with strong linkages between mining and manufacturing.[23] However, commodity booms are associated with 'Dutch Disease'[24] and declining

[19] These strikes would culminate, in 2014, in one of the largest and most protracted strike actions in the mining sector having lasted five months and involving 70,000 workers, yielding major material benefits for workers. Reports at the time suggested that the strike cost companies R20 billion in lost revenue and the striking workers R9 billion in wages (England 2014).

[20] In the first instance, and considering Rowthorn's (1977) distinction between 'expectation' and 'anticipation', it seems pertinent to ask whether mineworkers bargaining choices are influenced by the *distribution* of income at the firm or sector level? Rowthorn notes that "[t]o *expect* something means simply to believe with greater or less confidence that it will occur, whereas to *anticipate* something means both to expect it and to act upon this expectation [emphasis in original]." If booming commodity prices did not feed into higher nominal wages during the commodity boom, the Rowthorn framework would suggest that these price increases were either unexpected or unanticipated. In low- and middle-income economies hierarchical preference structures (De Janvry and Sadoulet 1983) might help explain both a lack of expectations and 'action': 1) workers will more readily observe the real consumption wage than the real product wage, especially in contexts with a high degree of trade union bureaucratization and 2) workers in a given sector may be somewhat indifferent to changes in the real product wage delivered by the sector's output price inflation. Eswaran and Kotwal (1993) make related claims in contexts where industrial productivity gains putting downward pressure on prices fail to boost real consumption wages when a key segment of the population earns an income below a critical threshold articulating wage demand with industrial output.

[21] See Chinguno (2015) for a detailed account of the bureaucratization of the National Union of Mineworkers and the emergence of the rival Association of Mining and Construction Union.

[22] Profits are realized when output is sold.

[23] Figure 6, below, presents data on capacity utilization in manufacturing. More generally, Figures 3 and 4 show mining and manufacturing wage shares have been moving in the same direction. Mining and manufacturing relative prices (discussed extensively in the next section of this paper) are highly correlated. This is plausibly a significant marker of the integration of mining and manufacturing in SA.

[24] See van der Ploeg (2011) for discussion of the natural resource 'curse.'

export competitiveness, often making the relationship between demand conditions and commodity booms ambiguous for the manufacturing sector.

Figure 4. The manufacturing wage share since democracy, after seasonal adjustment, in %. Author's calculation. Data from Statistics South Africa.

2.3. Relative price movements

The preceding claims about windfalls from upturns in commodity prices underline the importance of looking at relative prices at the sector level. Prior accounts of SA's aggregate and sectoral performance, as in Rodrik (2008), have likewise emphasized the importance of relative price movements to explain outcomes like premature deindustrialization. This calls for consideration of why relative prices matter and what they measure. The relationship between consumer prices (CPI) and producer prices (PPI) can be informative about distributive dynamics, if, at the sector/firm level, workers' notions of fairness are overwhelmingly influenced by maintaining targets for consumption standards and capitalists are predominantly concerned with how costs correspond to the price of their own output. The relationship between these two sets of prices is important because it determines the relationship between real consumption wages and real product wages, which is plausibly related to the mark-up. That is to say that CPI is suggestive

of what workers can buy with their wages, whereas the industry-specific PPI can be indicative of whether the sector is booming. In this paper, the 'wedge' (ω) refers to the ratio of the real product wage in a given sector to the real consumption wage of that same sector– this reduces to a relative price, as follows from equations 1-3.[25] Subscripts *i* represent the sector, *t* represents the year and quarter, *W* gives the gross nominal wage bill, *L* the number of workers employed, w^c gives the real *consumption* wage rate, w^p the real *product* wage rate, *CPI* gives the economy-wide consumer price index, PPI_{it} meanwhile gives the sector-specific producer price index:

$$w_{it}^{c} = \frac{W_{it}*100}{L_{it}*CPI_t} \tag{1}$$

$$w_{it}^{p} = \frac{W_{it}*100}{L_{it}*PPI_{it}} \tag{2}$$

$$\omega_{it} = \frac{w_{it}^{p}}{w_{it}^{c}} = \frac{CPI_t}{PPI_{it}} \tag{3}$$

Due to the high degree of aggregation in the publicly available national accounts data, I am unable to explore the implications of the wedge in manufacturing – a sector I believe the implications of cleavages between real product and real consumption wages to be of particular interest. The inability to leverage national accounts data to do relevant analysis in this regard relates to the categorization of food processing to a sizable proportion of manufacturing value added – this categorization muddies potential to analyze implications of changes in the ratio consumer to producer prices in manufacturing. Analyzing disaggregated data for important non-wage good manufacturing sub-sectors would help address this issue.

Money illusion and relative wage norms are also plausible determinants of worker bargaining decisions but are not the focus here.[26] It is hard to identify a strong *a priori* rationale for the most relevant reference group for whom workers benchmark their living standards against. In the South African context, with its historical legacy of spatial segregation, within-group

[25] Aron and Muellbauer (2000), analyzing profitability and saving behavior in South Africa, use two similar measures (the ratio of wholesale prices to unit labor costs, and the terms of trade for gold) in their profits equation.
[26] Adelman and Robinson (1989) discuss drivers of tolerance for inequality and competition between inter- and intra-group inequalities.

differentials may matter more than broadly defined between-group differentials and might explain greater volatility in capital-labor splits driven by external shocks.[27]

Rodrik (2008) emphasizes the decline in the relative price in accounting for key measures of South African manufacturing's poor performance. For Rodrik, declining profitability in manufacturing is plausibly related to heightened levels of import competition[28] (since the 1990s) and real exchange rate appreciation. Manufacturing relative prices have, however, generally moved in a favorable direction since 2000 and cannot be used as an explanation for the profit-squeeze in manufacturing.[29]

The main hypothesis I investigate in this paper concerns whether movements in the wage share are at least partially explained by movements in the relative price of consumer to producer prices in mining, which might be understood as the wedge driving the bargaining positions of capital and labor, respectively. This explanation may be especially relevant in the context of mining goods undoubtedly featuring modestly in the average worker's consumption basket. Due to the nature of bargaining agreements in SA, which are explicitly indexed against consumer prices rather than producer prices, rent sharing agreements are in a sense written out of bargaining at the firm or sector level. This means that consumer and producer prices have the possibility of moving in different directions or different speeds in the short and long run. I expect that where consumer prices grow faster than producer prices at the sector level, workers will attain a higher wage share because they bargain over preserving or bettering the real consumption wage and not the real

[27] This is to say that the structure of South African inequality may make it harder for workers to identify windfalls reaped by capitalists – the presence of significant spatial and racial stratifications might limit a strong influence of between-group norms on bargaining processes. This is compatible with evidence presented in Posel and Rogan (2018, 13), which shows that income aspirations correlate positively with income levels and inequality within the district. Crucially, this finding is not robust to racial heterogeneity: when including racial variation, the average income of non-Africans becomes a negative predictor of Africans' minimum income aspiration, within the district. That this finding holds even *within* the district underscores the potential for weak capital-labor distributive norms to characterize within firm wage bargaining (although, South Africa's capitalist class has increasingly deracialized post-apartheid): workers housed in a platinum belt hostel might as well live in a different country from a mine's shareholders, housed in a leafy Johannesburg suburb, and bargaining relationships may be weakly influenced by inter-group norms. This observation underscores the self-perpetuating nature of inequality.

[28] After democracy in the 1990s, SA opened to trade and capital flows considerably (Edwards 2005). The experience has suggested that building a national bourgeoisie (the 'patriotic bourgeoisie' in then President Thabo Mbeki's parlance) is difficult if policymakers open the capital account and permit the bourgeoisie to internationalize freely. Developing a national bourgeoisie was central to notions of a National Democratic Revolution within the Tripartite Alliance.

[29] This is true for the manufacturing 'wedge' (ω, defined above), it is also generally true for another key relative price – the real effective exchange rate, which has also generally trended in a favorable direction for tradable sector firms.

product wage, and assuming different price trends are not explained by differences in productivity growth.

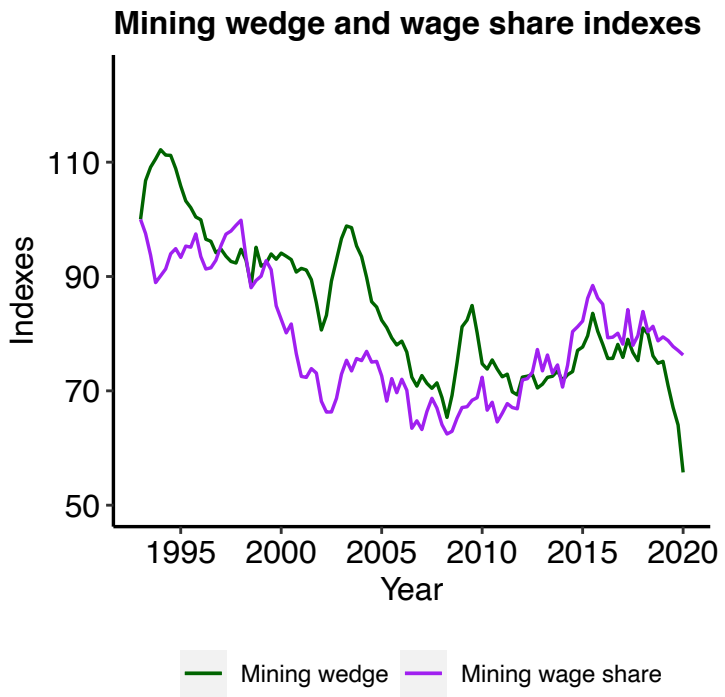

Figure 5. Indexes of the mining wedge and mining wage share. Author's calculation. Data retrieved from the Federal Reserve Economic Database and Statistics South Africa.

Another important relative price potentially influencing income distribution at the sector level is reflected in the real effective exchange rate (REER). The REER is included in the regressions as a trade-weighted measure of competitiveness. A real depreciation (falling REER) should be associated with competitiveness gains and inflated operating surpluses, which might negatively affect the wage share. The REER has been volatile but trended downward over the last thirty years, reflecting a shift in the terms of trade in favor of the tradable sector.[30]

2.4. Trade openness

The implications of trade openness for functional income distribution are, theoretically speaking, ambiguous. Trade openness restricts the pricing power of capitalists through import

[30] The real effective exchange rate is a weighted average of bilateral exchange rates and relative consumer prices. An increase in the REER here reflects a loss of competitiveness (bilateral exchange rates are measured in terms of units of foreign currency per Rand).

competition but may also be related to oft-cited concerns of races to the bottom in terms of wages. Erten *et al*. (2019) empirically investigate the effects of trade liberalization on wages in SA, finding no significant effect. Trade openness in this paper is measured as the sum of aggregate exports and imports divided by aggregate output. A range of studies have justified the inclusion of such a variable as a measure of globalization, expecting it to negatively affect the wage share. I include it in this study to see how it stacks up against the evidence in SA but have no strong priors on the sign of this variable – particularly in a context where import competition may be associated with adverse demand conditions for South African firms but also may harm labor market conditions for workers.[31] Relatedly, in the context of limited domestic beneficiation, SA mining output is overwhelmingly for the international market – commodity booms ought to correlate with rising export shares in national output. In the mining sector I expect that a rising export share is negatively correlated with the wage share.

2.5. The 'reserve army' and demand conditions

In the South African context, there is a long history of explicit recognition of managing labor market tightness to regulate the distribution of income, principally prior to and during apartheid.[32] In the modern era, and with an economy with open rates of unemployment often exceeding 30% by broad definition, labor market slack has often been related to discussion of inequality in SA, including in relation to the wage share in Makgetla (2004). One reason attributed to the high rate of open unemployment in SA has been the relatively low rate of informal employment.

[31] The latter is shown in Erten *et al*. (2019).

[32] As evidenced by documents like the Special Mines Report of 1897 (Chamber of Mines of the South African Republic 1897, 4-7). See also van Onselen (1979, 292) for a fascinating account of the long history of procuring, controlling, and stabilizing the labor force, going back to the 19th century Randlords. In the cultural sphere, Hugh Masekela's song 'Stimela' would depict the alienation of migrant laborers on the mines. The William Kentridge sketch 'Reserve Army' (Image 1) depicts a miner's Ife-like head adorned with a headlamp.

Image 1. William Kentridge, 'Reserve Army' (1991), reproduced with permission.

The unemployment rate may be cyclically correlated with goods market conditions, which can be observed with capacity utilization data.[33] Capacity utilization rates in manufacturing have been relatively volatile, with a surge during the commodity boom visible in the figure below. Capacity utilization is a measure of (primarily) demand conditions, measured for the manufacturing sector in SA. Changes in rates of capacity utilization are plausibly positively related to changes in price mark-ups[34], suggesting high rates of utilization may inflate gross profits, and hence be negatively related to the wage share in the absence of sufficiently determined worker bargaining institutions targeting a fixed real product wage.[35] In downturns, money wages may be downward rigid and adverse demand conditions measured through low rates of capacity utilization may reduce gross profits and inflate the wage share. Since capacity utilization is influenced by firms over longer time horizons in line with profit-maximizing objectives, it seems plausible that this variable is most significantly associated with distributive outcomes in the short run.

[33] Indeed, Aron and Muellbauer (2000) use changes in capacity utilization to proxy for changes in labor market tightness – this is likely to be an unconvincing proxy in a dual economy setting and where mark-ups are endogenous to goods market tightness.
[34] See Flaschel and Skott (2006).
[35] The negative correlation between manufacturing capacity utilization and the aggregate wage share in SA underscores some of the limitations of one-sector neo-Kaleckian models to analyze growth performance in dual economies, from either a normative or descriptive standpoint.

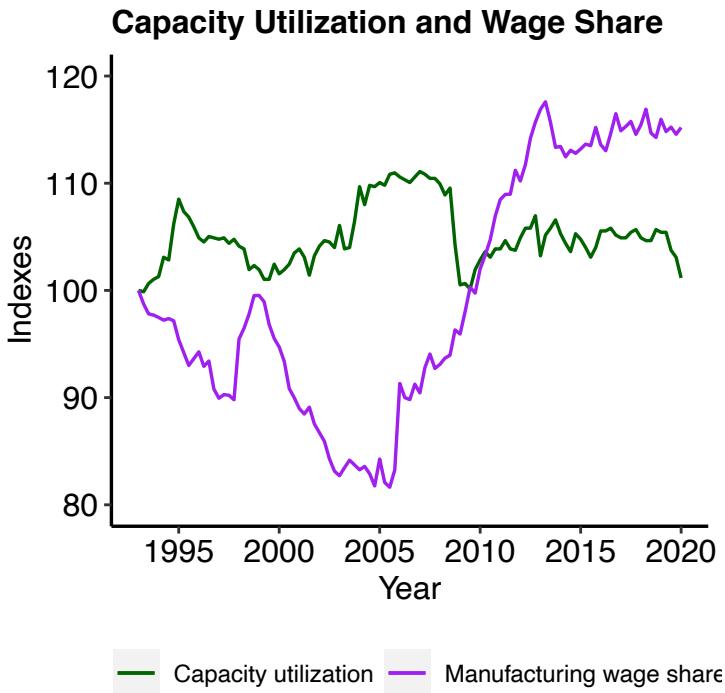

Figure 6. Indexes of manufacturing capacity utilization and the wage share in manufacturing, after seasonal adjustment. Data from Statistics South Africa.

The wage share is typically understood as a counter-cyclical variable, owing to the pro-cyclicality of profits derived from demand conditions and downward nominal wage rigidity/labor hoarding. In the context of high degrees of labor market slack and correlation between labor and goods market conditions I hypothesize a positive short run association between unemployment and the wage share.

2.6 Financialization

The finance, insurance, real estate, and business services value added share has consistently trended upward post-apartheid, in line with what many have dubbed 'financialization'.[36] A large literature has emerged relating financialization to the repressed bargaining power of workers[37], and in SA specifically Burger (2015) has discussed it as a plausible explanation for the falling

[36] The finance, insurance, real estate and business services share of value added has grown from about 15% in 1994 to around 23% by 2020.
[37] See Tomaskovic-Devey *et al*. (2015), Köhler *et al*. (2019).

wage share. The growth of business services (outsourcing) as a strategy for weakening worker bargaining power in sectors like manufacturing is discussed in Tregenna (2010).

In summary of this section, several time-varying factors of relevance to post-apartheid income distribution are worth acknowledging in an analysis of the evolving post-apartheid wage share. The relevance of empirical analysis of these factors are the result of a number of ambiguities: 1) government consumption may strengthen the fallback position of workers, but may also stimulate operating surpluses by lifting demand conditions; 2) workers may look to eat into increasing mark-ups (even if they lack the power to realize it if sectoral labor supply is sufficiently elastic at the given wage rate) delivered by sectoral shocks to producer prices, or they may disregard the price of firm/sector output, zeroing in on denominating wage targets in the price of consumption goods; 3) trade openness may squeeze mark-ups via competitive pressures from international firms, but may also stimulate the global race to the bottom in wages; 4) high rates of open unemployment may (weakly) suppress worker bargaining power, but the association between unemployment and the wage share might be confounded by correlation between the unemployment rate and demand conditions, taking into consideration sensitivity of mark-ups to goods market conditions.

A major contention of this paper is that analysis of the sector-level wage share tells a different story from analysis of the aggregate wage share. A falling wage-share in the first 15 years of democracy may not be attributable to factors associated with neoliberalism – the state has occupied an important role in provision of expanded social policy and has maintained substantial involvement in sectors like utilities. The evidence for the claim that the post-apartheid state in SA was not particularly neoliberal is evidenced by expanded social policy, expanded public employment and the general role of organized labor in politics. The counterevidence concerns the Marikana massacre, finance's rapid growth, and the fall in barriers to trade. However, it seems plausible that booming commodity prices were a significant factor in the deterioration of the wage share during the 2000-2008 period and it may be relevant to characterize this development distinctly from those developments associated with neoliberalism. The commodity boom story developed in this paper is partially justified on the basis that the absence of significant direct presence of unprocessed minerals from the conventional wage basket may unmoor wage bargaining from pricing in the mining sector (and even enclaves of manufacturing backwardly

linked to mining), if workers' primary target is preserving or bettering the purchasing power of wages.[38]

This tells the story for mining, but why did the wage share fall in manufacturing during the 2000-2006 period? The commodity boom may be compatible with a falling wage share in the manufacturing sector, through the windfall's effects on rates of capacity utilization. While there are strong reasons to believe that labor market slack generally undermines worker bargaining power, in keeping with accounts like James (1992, 8),[39] variation in wage rates might not be very elastic to variation in the unemployment rate at the considerable levels of slack visible in SA's open unemployment data. If anything since the unemployment rate is likely to be somewhat correlated with demand conditions (a determinant of profits), the unemployment rate may counterintuitively be positively correlated with real product wage rates in particularly those sectors sensitive to variation in domestic demand. SA's unemployment rate consequently may not feature as a significant short-run driver of a falling wage share at the sector or aggregate level.[40]

3. *Theory*

Discussion concerning determinants of functional income distribution has a long history in the political economy tradition, going back to the Classical economists.[41] Various arguments have also been set forward by Kaldor, Kalecki and Keynes. In these contributions I focus on three broad themes of relevance to this paper: 1) workers' influence over, and interest in, the distribution of income; 2) cyclical variation in the wage share and 3) the role of commodity prices. Each of these themes influences the empirical strategy outlined in following sections. Interest in the 'wedge' as a determinant of functional income distribution is at least partly motivated by whether workers have interest over influencing the functional distribution of income, in and of itself. The wedge in mining is of course much related to the third theme discussed here regarding the role of commodity

[38] Moreover, the price of mining goods is likely to be set internationally and not driven by a mark-up on wages – endogeneity of mining prices is less likely to be an issue in this sector, relative to other sectors that cater to the internal market at greater extent.
[39] Where it is argued that the effects of the growth of black unions on matters of workers' interests was constrained by excess labor supply.
[40] The mining sector is a natural candidate for testing the sensitivity of the wage share to measures of labor market slack because demand conditions for the sector's output ought to be less correlated with the domestic unemployment rate.
[41] Adelman and Robinson (1989) summarize some of this literature, as does Feiwel (1974).

prices. The role of unemployment and capacity utilization meanwhile are centrally tied to interest in cyclical variation in the wage-share.

The first theme concerns the (in)ability of workers to influence real wages and income distribution in the context of capitalist dominion over price setting. In the *Critique of the Gotha Programme*, Marx denounced the Lassallean 'Iron Law of Wages', contesting the idea that unions are unable to influence real wages and income distribution due to nominal wages causing proportional increases in prices (Marx 1875; see also Baumol 1983).

Post-Keynesian theory, meanwhile, does not offer a unified position on the ability of workers to influence income distribution. Kregel (1978) provides an account of the passive role of workers in determining income distribution in the Keynesian-Kaleckian paradigm. Marglin (1984, 127), meanwhile, criticizes Keynesian characterizations of fixed money wages for "assuming a supine working class." However, Marglin's dynamic equation for the evolution of the real wage assumes a constant balance of class forces and hence the convergence of actual real wages to their conventional level. Asimakopolus (1988, 141), in a sense aims to rebut Marglin's criticism in an account of post-Keynesian distribution theory that includes Kalecki's views on how bargaining power can influence the mark-up, in the extraordinary instance of a "spectacular wage rise." Skott (1989a) criticizes this approach as unconvincing in a closed economy context. A more recent discussion is found in Herr's (2019) account of Kalecki, which suggests workers' bargaining power negatively influences the mark-up but that mark-ups also positively influence worker bargaining power, suggesting an ambiguous relationship between bargaining power and the mark-up.[42]

Much of the previously mentioned contributions relate to discussion of mature economies. Dual economies have been characterized by wage-setting featuring the absence of working-class influence over distributive shares.[43] The Lewis (1954) model famously assumed that the rewards of capitalist development accrue exclusively to the capitalist class until the economy reached what came to be known as 'the Lewis turning point,' a conclusion Bleynat *et al*. (2020) argue fits with the ultra-long-run data for dual-economies like Mexico. Related views can be found in Kalecki, who considered a rising mark-up a central part long-run growth (FitzGerald 1990, 185).

[42] "High mark-ups in existence will encourage strong trade unions to bargain for higher wages since they know that firms can 'afford' to pay them" (Kalecki 1971, 161 [cf. Herr 2019]).
[43] For Lewis (1954, 157), "The central fact of economic development is that the distribution of incomes is altered in favour of the saving class."

The second theme concerns the relationship between the business cycle and income distribution[44], of relevance to attempts to identify the role of demand conditions in the empirical analysis that follows. This theme is addressed in several forms, including in 'the Kalecki principle' that capitalists earn what they spend, and workers spend what they earn. To construct a Keynesian theory of income distribution, Kaldor (1956) uses the following identities, where Y = nominal income, $W = wL$ = the wage bill (the product of the average wage rate and employment), Π = gross profits, I = investment, S = saving, S_k= the level of capitalist saving, s_k= the saving rate of capitalists, π = the profit share.

$$Y \equiv W + \Pi \tag{4}$$

$$I \equiv S \tag{5}$$

$$S = S_k = s_k \Pi \tag{6}$$

$$I = s_k \Pi \tag{7}$$

Unlike Kalecki, Kaldor assumes full employment, and the profit share is the accommodating variable if workers do not save: simple manipulation of (7) shows that a higher level of investment corresponds to a higher level of profits, facilitated by price adjustment:

$$\frac{\Pi}{Y} = \pi = \frac{I}{Y}\frac{1}{s_k} \tag{8}$$

Kalecki (1968, 266) explicitly discounts the counter-cyclicality of the wage share, choosing instead to assume a constant profit share over the business cycle and recognizing the incompatibility of this perspective with the view that the profit share may be "the instrument of securing—through price flexibility in relation to demand—the full utilisation of resources."

If one introduces saving out of wages, s_w= the saving rate out of wages (where $s_w < s_k$), the profit share can be written as follows, and the determination of functional income shares becomes slightly less straightforward than the 'widow's cruse':

$$\pi = \frac{I}{Y}\frac{1}{s_k - s_w} - \frac{s_w}{s_k - s_w} \tag{9}$$

[44] An early paper addressing this topic is Kalecki (1938).

Keynes (1936, 17) outlined reasons for his belief in the counter-cyclicality of the real wage.[45] Swanson (2004) systematically reviews the evidence using data for a significant period of post-war US manufacturing, distinguishing between the real consumption wage and the real product wage. When deflating industry nominal wages by industry prices (rather than an aggregate deflator) one finds clearer evidence of the countercyclicality of real wages.[46] In keeping with these findings, recent research argues that low wage share firms have their low wage share character by virtue of high revenue labor productivity rather than low wages and that this is best explained by demand factors (Kehrig and Vincent 2021).

While few post-Keynesian analyses have drawn on both Keynesian precepts of downward nominal wage rigidity and Marxian class conflict frameworks, these tendencies were brought together within a synthetic account in Skott (1989b). There, the profit share is increasing in the rate of capacity utilization, with the level of saving increasing in the profit share, the growth rate of output increasing in profits, and a non-standard investment equals savings equilibrium condition is introduced, characterized by out of equilibrium price adjustment. Class conflict is integrated via the effect of employment rates on the growth rate of output, and not directly on functional income shares, as in standard Goodwin representations. The framework predicts cyclical movements in employment and the profit share, with the profit share leading movements in employment. However, Goodwin frameworks may have little relevance to dual economies, where large amounts of open or hidden unemployment prevent workers from exerting strong upward pressure on wages or constrain output expansion of firms.

In summary of short run factors, post-Keynesian theories of mature economies have outlined income distribution as endogenous to demand conditions and the state of the labor market. However, as mentioned immediately above, the tightness of the labor market, reflected in measures of open unemployment rates, may be less relevant in dual economies where hidden or visible unemployment fulfills a 'reserve army' function over the long run.[47] Hence, short-run/cyclical

[45] Mitra (1954, 88) accords with this perspective.
[46] This is related to long-run changes in the consumption pattern of workers. Hanes (1996, 846) shows that the bivariate association between real consumption wages and output shifted from negative to positive during the course of the 20th century in the United States, over which period the food share of the consumption basket fell considerably.
[47] This is compatible with the evidence on a lower labor share in developing countries (Izyumov and Vahaly 2015).

drivers of the wage share include downward-sticky nominal wages, and pro-cyclical producer prices and capitalist expenditures.[48]

A third theme of relevance concerns the role of commodity prices. Keynes (1930) offered thoughts on the evolution of functional income distribution during capitalism's nascent period in Western Europe. He introduces, by way of historical account, an illustration of how commodity windfalls, and not diminished consumption/thrift, stimulated the profit share and capital accumulation in Europe during the 16th century[49] through his account of 'profit inflation.'[50] Kalecki (1938, 108) and Mitra (1954, 24-25) also highlight the profit share as increasing in commodity prices.

The role of commodity prices has thus featured in some accounts of determinants of income, and it is perhaps slightly surprising that little attention has been paid to the effects of the 2000s commodity boom on income distribution in this context.[51] A simple accounting perspective about the relationship between commodity prices and functional income distribution might start with recognition of the following accounting relationship, where σ_R is the wage share (one minus the profit share, π_R) in the resource sector, $p_R, w_R, \omega_R, L_R, Y_R$ gives the sector's price level, nominal wage rate, 'wedge', employment level and output level, respectively:

$$\sigma_R = 1 - \pi_R = \frac{w_R L_R}{p_R Y_R} = \left(\frac{w_R}{CPI}\right)\left(\frac{CPI}{p_R}\right)\left(\frac{L_R}{Y_R}\right) = \frac{w_R^c \omega_R L_R}{Y_R} \tag{10a}$$

In circumstances where movement in the mining wedge, ω_R, is driven by movement in producer prices rather than consumer prices, and where nominal wage bargaining is driven primarily by efforts to preserve the real purchasing power of wages and relative wage norms[52] rather than sectoral distributive shares, upward pressure on mining producer prices is definitionally

[48] Empirically, one may expect to see a significant *positive* short-run correlation between unemployment and the wage share in dual-economies, given that movements in the unemployment rate move with the business cycle and small fluctuations of the unemployment rate are unlikely to influence labor's bargaining power significantly in economies with as large labor surpluses.

[49] This account seems to have some affinity with Marx's (1977 [1867]: 751) evocative account of primitive accumulation.

[50] Munro (2008) discusses criticisms of this perspective.

[51] Martins and Skott (2021) is an important exception in the literature.

[52] Figure 13 gives the manufacturing to mining relative wage over the democratic era. This relative wage rate initially fell considerably as SA entered its democratic era, possibly as a result of high manufacturing wages that had artificially been raised through job reservation.

related to the mining wage share. However, this merely reflects an accounting relationship and a macroeconomic story with some behavioral content would shed more light on the topic. A short run narrative might emphasize the role of windfalls generating demand externalities in an economy characterized by Engel effects and manufacturing price adjustment to short run demand conditions.

In summary of this section, literature on income distribution relevant to this paper can be categorized into three themes: the interest and influence of workers' over the distribution of income, cyclical variation in the wage share determined by goods market conditions, and the influence of commodity price shocks on income distribution. Influenced by much of this literature, the approach of this paper to the topic at hand is guided by the following propositions: 1) sectoral disaggregation is important considering wide variation in the economic conditions facing different sectors[53], 2) wages respond weakly to profit inflations driven by external economic conditions in sectors where workers do not consume the product and in the context of large reservoirs of surplus labor and 3) gross profits, especially in the non-extractive tradable sector, are relatively sensitive[54] to the business cycle[55], at an extent that nominal wages and the wage bill are not.

4. Data

The key outcome variables of interest in this study are sectoral wage-shares (in particular, mining and manufacturing, of special importance to aggregate outcomes in SA), calculated from Statistics South Africa data. [56] To calculate the wage share, I divide through remuneration of

[53]The grand aggregate stories about monopolistic markets, trade globalization or neoliberal welfare state retrenchment might not be sufficiently informative, resultingly.

[54] Wages might not be as sensitive as profits to downturns, especially in contexts that ordinarily have large reservoirs of surplus labor. See Bewley (1999) for an extended analysis of wage rigidity during recessions.

[55] In manufacturing, where data for capacity utilization is relatively abundant, observing the effects of commodity boom-driven demand on gross profits may be informative. This brings up the Hirschmanian issue of linkages. Gelb (1988, 33), going well beyond the contemporary period, notes that the "discovery of the gold fields of the Witwatersrand spurred the development of the modern South African economy, financing imports without which expansion would have been impossible while creating demand for transport services, intermediate inputs, and capital goods". These linkages might suggest more complementarities between the mining sector and structural transformation in line with literature on the 'minerals energy complex' (Fine and Rustomjee 1996). Rodrik (2008b) alludes to some of these issues in discussion of the relative benefits of mineral beneficiation.

[56] One questionable feature to this national accounting data appears to be of direct relevance to this study: the mining value-added share is in secular decline post-apartheid, even during the commodity boom. This seems implausible and leads to estimates of mining profits as a share of GDP that are inconsistent with the World Bank's estimates of 'natural resource rents.' The World Bank estimates that natural resource rents (effectively a measure of mining *profits*) grew from under 2.5% to nearly 12% of GDP between 1999 and 2008 (see Figure 14 in Appendix A), dwarfing the mining *value-added share* reflected in Statistics South Africa data. If Statistics South Africa is underestimating the size of the mining sector, this would also tend to underestimate the effect of the falling mining wage share on the aggregate wage

employees by value added for each sector and in aggregate. I ignore the informal sector and the issues associated with apportioning mixed income to either end of the capital-labor split. An index of domestic mining and quarrying producer prices is retrieved from the Federal Reserve Economic Data (FRED) database. Domestic manufacturing producer prices have likewise been retrieved from FRED. Data for the unemployment rate is obtained from the South African Reserve Bank (SARB) from 1994 to 2020. Sectoral employment series are likewise obtained from the SARB. Data on trade openness (exports plus imports, normalized by GDP is often used in the literature[57]) is calculated from data obtained from the SARB. Capacity utilization data for the South African manufacturing sector is obtained from Statistics South Africa. All data is at the quarterly frequency.

Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Mining wage share	109	0.439	0.064	0.327	0.591
Manufacturing wage share	109	0.547	0.067	0.425	0.687
Agriculture, forestry, fishing wage share	109	0.336	0.113	0.171	0.640
Utilities wage share	109	0.348	0.078	0.224	0.580
Construction wage share	109	0.512	0.074	0.378	0.732
Wholesale, retail wage share	109	0.447	0.033	0.390	0.531
Transport, storage, communications wage share	109	0.360	0.063	0.282	0.509
FIRE, business services wage share	109	0.383	0.031	0.332	0.442
Government services wage share	109	0.846	0.017	0.806	0.873
Personal services wage share	109	0.649	0.031	0.577	0.695
Official unemployment rate	105	24.344	2.901	16.900	30.100
GDP growth rate	108	0.637	0.625	-1.556	1.858
Export share of GDP	109	28.004	3.556	20.600	36.900
Import share of GDP	109	27.228	4.700	17	40
Real effective exchange rate	109	104.620	14.639	70.070	134.357
Manufacturing capacity utilization	109	81.398	2.224	77.400	86.100
Mining employment	109	488,851.400	57,594.730	401,770	629,657
Manufacturing employment	109	1,432,546.000	165,871.900	1,197,956	1,752,679
Consumer price index	109	67.896	28.179	26.954	124.989
Mining PPI	109	69.337	35.643	20.931	182.624
Manufacturing PPI	109	66.150	30.217	24.108	125.983
Real mining output	109	58,338.600	2,381.299	49,916.700	63,570.700
Manufacturing labor productivity	109	90.421	18.360	54.700	115.100
Government consumption share	109	19.558	1.044	17.400	21.500
FIRE and Business Services VAS	109	0.194	0.025	0.150	0.240

share. It would also seem to be compatible with accounts of capital flight in South Africa's mining sector (Aboobaker *et al*. 2021) and some surprising features of the econometric results commented upon below.

[57] For example, de Janvry and Sadoulet (2016, 189).

5. *Econometric strategy*

Augmented Dickey-Fuller tests show that we fail to reject the null hypothesis of non-stationarity for all variables.[58] Spurious regression is a well-known concern when attempting to analyze the relationship between non-stationary variables. Because of this danger, I(1) variables will be differenced in line with Error Correction Model (ECM) methodology and the possibility of cointegration between the variables will be analyzed using the bounds test methodology of Pesaran *et al*. (2001). The latter methodology is valid if all variables are I(1), I(0) or a combination of both. If a cointegration relationship exists Autoregressive-Distributed Lag (ARDL) models can be used to analyze the nature of the long-run relationships identified by the bounds test. Under the bounds testing approach of Pesaran *et al*. (2001) two sets of critical values are given corresponding to two cases assuming either that regressors are either all I(1) or I(0). If the test statistic exceeds the upper bound critical value a long run relationship/association can be inferred and a regression can be estimated in levels, whereas if the test statistic falls below the lower bound critical value, we can infer the absence of a long run relationship. Where the test statistic falls in between upper and lower bounds the test results are indeterminate.

For all regressions, the 'optimal' lag structure was chosen according to the Akaike Information Criterion (AIC).[59] Lags of the dependent variable and independent variables up to a maximum order of four quarters were selected for all models. An error correction term is also fitted and included in the output. All models are selected with an unrestricted intercept and unrestricted trend ('case = 5', in Pesaran *et al*. (2001)). Newey-West standard errors are employed to account for heteroskedasticity and autocorrelation that commonly characterize time-series analyses.

I run variations on equation 11, where the dependent variable σ_t (or $1 - \pi_t$) corresponds to the wage share in a particular sector (the mining sector, below), $\Delta\mu$ gives a vector of first differenced variables and x corresponds to a vector of independent variables subtracted from the dependent variable (in levels). If a cointegration relationship exists then the latter term is I(0) and a long-run relationship can be inferred.

$$\Delta\sigma_t = \alpha_0 + \sum_1^a \beta_a \Delta\, \sigma_{t-a} + \sum_0^c \delta_c \Delta\mu_{t-b} - \sum_0^b \gamma_b\, x_{t-c} + \varepsilon_t \qquad (11)$$

[58] See Appendix B.

[59] The AIC provides a means for comparing model quality, hinging on a trade-off between over and underfitting a given model.

6. *Results*

Below I present some findings, which suggest that the mining wedge may be a significant determinant of the wage share, particularly in mining in the short run, if inconclusively in the long run, with F-statistics from the bounds test for regressions analyzing determinants of the mining wage share indicating the absence of a cointegration relationship.[60]

Regressions 1.1 through 1.6 look at associates of the wage share in the mining sector, results are summarized in the table below combining output from ARDL and ECM models.[61] In all regressions a one period upward change in the natural logarithm (henceforth the log) of the mining wedge is positively associated with the log of the mining wage share, at high levels of statistical significance. A percentage point change in the contemporaneous mining wedge is positively associated with a change in the mining wage share of within the range of 0.23 – 0.42 percentage points. In long-run levels, these econometric results suggest the absence of any significant relationship between the mining wedge and the mining wage share. The short run coefficients on the mining wedge may seem small given the following algebraic manipulation of equation 10a, which would suggest the mining wedge should have something more like a proportional relationship to the mining wage share from a simple accounting perspective. S_R gives revenue, $\sum F_i\, p_i$ gives total intermediate input cost to the sector.

$$\sigma_R = \frac{w_R L_R}{p_R Y_R} = \left(\frac{w_R}{w_{non-R}}\right)\left(\frac{w_{non-R}}{CPI}\right)\left(\frac{CPI}{p_R}\right)\left(\frac{L_R}{Y_R}\right) = \left(\frac{w_R}{w_{non-R}}\right)\left(\frac{w_{non-R}}{CPI}\right)(\omega_R)\left(\frac{L_R}{S_R} - \frac{p_R L_R}{\sum F_i p_i}\right) \tag{10b}$$

However, complementary mining inputs may experience contemporaneous price increases alongside commodity prices that contract value added in this sector. A more important factor diminishing the elasticity of the wage share to the wedge may be substantial capital flight through means like export misinvoicing. I include the export share as another commodity boom-related variable plausibly influencing distributive outcomes in the sector. The short-run coefficients on this variable show a significant negative association with the mining wage share.

[60] Although, running error correction models of regressions 1.1-1.6 produces results where the error correction term is negative and statistically significant, in line with a long run cointegration relationship.

[61] Output from ARDL models is represented by variables run in levels, whereas ECM output is run in first differences, denoted by Δ.

Regression results: Mining wage share

	Regression 1.1	Regression 1.2	Regression 1.3	Regression 1.4	Regression 1.5	Regression 1.6
Ln(Mining WS).t-1	-0.060	-0.088**	-0.112***	-0.113***	-0.198***	-0.083*
	(0.040)	(0.040)	(0.041)	(0.041)	(0.064)	(0.043)
Δ Ln(Mining WS).t-1	-0.092	-0.125	-0.151	-0.170*	-0.218**	-0.143
	(0.105)	(0.094)	(0.091)	(0.090)	(0.102)	(0.096)
Δ Ln(Mining WS).t-2			0.085	0.069		
			(0.090)	(0.089)		
Δ Ln(Mining WS).t-3			-0.076	-0.064		
			(0.088)	(0.087)		
Δ Ln(Mining WS).t-4			-0.210**	-0.217**		
			(0.087)	(0.086)		
Ln(Mining Wedge).t-1	0.091	0.140**	0.078	0.023	-0.119	-0.004
	(0.069)	(0.060)	(0.061)	(0.066)	(0.079)	(0.061)
Δ Ln(Mining Wedge).t	0.402***	0.416***	0.401***	0.360***	0.229*	0.318***
	(0.108)	(0.099)	(0.095)	(0.108)	(0.116)	(0.110)
Δ Ln(Mining Wedge).t-1	-0.038					
	(0.130)					
Δ Ln(Mining Wedge).t-2	0.143					
	(0.119)					
Δ Ln(Mining Wedge).t-3	-0.004					

Standard errors reported in brackets.

Lag structure chosen according to the AIC

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Regression 1.1	Regression 1.2	Regression 1.3	Regression 1.4	Regression 1.5	Regression 1.6
	(0.121)					
Δ Ln(Mining Wedge).t-4	-0.087					
	(0.116)					
Ln(Unemployment rate).t-1		-0.075*	-0.077**	-0.059	-0.083**	
		(0.040)	(0.038)	(0.040)	(0.040)	
Δ Ln(Unemployment rate).t		-0.056	-0.085	-0.070	-0.117	
		(0.080)	(0.078)	(0.077)	(0.079)	
Ln(Government Consumption % GDP).t-1			0.346***	0.273**	0.428**	
			(0.115)	(0.120)	(0.184)	
Δ Ln(Government Consumption % GDP).t			0.274	0.243	0.220	
			(0.178)	(0.175)	(0.184)	
Δ Ln(Government Consumption % GDP).t-4					-0.342*	
					(0.193)	
Ln(Export % GDP).t-1				-0.089	0.037	-0.113*
				(0.068)	(0.085)	(0.064)
Δ Ln(Export % GDP).t				-0.185**	-0.276***	-0.248***
				(0.078)	(0.082)	(0.076)
Δ Ln(Export % GDP).t-1					-0.285***	-0.082

Standard errors reported in brackets.

Lag structure chosen according to the AIC

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Regression 1.1	Regression 1.2	Regression 1.3	Regression 1.4	Regression 1.5	Regression 1.6
					(0.094)	(0.077)
Δ Ln(Export % GDP).t-2					-0.207**	
					(0.085)	
Δ Ln(Export % GDP).t-3					-0.164**	
					(0.079)	
Δ Ln(FIRE & BS % GDP).t					0.058	
					(0.616)	
trend	0.000	0.001**	0.000	0.000	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Num.Obs.	104	104	104	104	104	107
R2	0.206	0.216	0.334	0.375	0.433	0.271
R2 Adj.	0.130	0.159	0.246	0.277	0.296	0.212
AIC	-391.7	-397.0	-403.9	-406.6	-404.7	-414.7
BIC	-362.6	-373.2	-366.8	-364.2	-346.5	-388.0
Log.Lik.	206.847	207.505	215.932	219.276	224.334	217.354

Standard errors reported in brackets.

Lag structure chosen according to the AIC

* p < 0.1, ** p < 0.05, *** p < 0.01

How should these results be interpreted intuitively? With wages, particularly sectorally determined minimum wages, in SA often indexed against consumer price inflation, and mining prices set internationally, an increase in the mining wedge is a plausible measure of a shrinking mark-up in the mining sector. With either bureaucratized trade unions or workers aiming for a target level of real consumption, and where output of the firm/sector does not enter the consumption basket, output sharing agreements may be weak. Indeed, this is the story that accords with visual inspection of Figure 3 and the general volatility of the wage share in South Africa historically (Figure 7).

In the mining sector where movements in the aggregate unemployment rate may be less strongly correlated with demand conditions in the sector, we have clearer room for observing associations between the unemployment rate and distributive outcomes. In lagged levels, the log

unemployment rate is consistently negatively associated with the log of the mining wage share, however, the bounds test suggests the absence of a cointegration relationship and these long run coefficients should be interpreted cautiously. The long-run coefficient on the government consumption share, meanwhile, is positively associated with the mining wage share. Due to the unique nature of demand for the output of this sector we would indeed expect the wage share to be more visibly positively correlated with government consumption than in other sectors, as stimulatory state expenditures are unlikely to bolster profits in the sector. However, whether the coefficient of interest here reflects state consumption policy bolstering worker bargaining power or merely reflects a strong correlation between mining profit windfalls, which the mining wage share ought to be falling in, and aggregate economic performance, which the government consumption share is falling in (by policy or definition), is unclear.

Diagnostic tests for regressions 1.1-1.6 are provided in Appendix B. Appendix C gives a regression table for factors associated with the manufacturing wage share and the corresponding diagnostic tests. The one period change in the rate of capacity utilization is a robust negative correlate of the manufacturing wage share, in line with expectations outlined in Section 3. The change in the real effective exchange rate is likewise a robust correlate of the manufacturing wage share. However, all regressions 2.1-2.6 explain a limited degree of variation in the manufacturing wage share and the profit-squeeze characterizing manufacturing since the Great Recession is unexplained.[62] An obvious candidate for the profit-squeeze in this sector is the dramatic growth of energy prices and unreliable energy supply post-2008, given the energy intensity of manufacturing.

A brief note on the method underlying the preceding results is required. Caution is due regarding strong causal inference from the econometric methods used in this paper, and it is worth being up front about the absence of clear mechanisms in the reduced-form specifications from where the results highlighted above are derived. The time-series approach in this paper is motivated by the view that research in economics must be driven first by a desire to answer questions of interest – the method follows according to the nature of the question or data available. To my knowledge, the time series sector-level and aggregate data used above presents the longest run data covering the democratic era for this study's key variables of interest. For the present purposes, it may be sufficient to identify associations of interest that shed light on differences in

[62] The unexplained post-2008 upward trend in the manufacturing wage share may be a reason for the very low p-value to the Shapiro-Wilk tests, indicating the presence of non-normal residuals.

bargaining relationships at the sector level, suggest the plausibility of sensitivity of distributive outcomes to external shocks, and reflect on some of the puzzles and ambiguities of the post-apartheid political economy.

7. *Conclusions*

What are the key messages from this paper? In many ways, the political economy of SA in the democratic era is puzzling. The arrival of democracy in 1994 was met with near euphoric expectations, unsurprising after the end of the prior regime. The ruling ANC populated the state bureaucracy with its own party members, as well as leaders from its alliance partners, the SACP and COSATU. The alliance has benefited from near one-party (ANC) dominance over the electoral system for several decades and many would argue that popular demand for a significantly more radical dispensation is high. Why then has the aggregate wage share never risen above its pre-democracy level and why did it fall so precipitously during the early 2000s? Is this a marker of the stranglehold of neoliberalism on the ruling alliance and country?[63] A careful look at the policy documents underlying contestation over macro policy and a glance at the sectoral heterogeneity tell a different story. Radical policy debates in SA have not always reflected sufficient conceptual clarity[64] and the commodity boom may have played a significant role in placing downward pressure on the aggregate wage share.

This should not be misunderstood as a defense of post-apartheid macro policy nor the ANC. The track record of both speaks for itself. The incumbent President of ANC and country, Cyril Ramaphosa, was a key actor in the events surrounding the Marikana massacre, in his capacity as non-executive director of the mining company at the center of the massacre. In terms of macroeconomic performance, growth has generally been insipid, particularly in comparison to growth in other upper-middle income economies, in line with the country's premature deindustrialization. These policy failures are strongly associated with Washington Consensus-style trade and capital account policies. However, counter-cyclical stabilization policies have been included within the macro policy arsenal. Moreover, a careful reading of early 'heterodox' policy

[63] Other narratives have emphasized conspiracies invoking a role for 'White Monopoly Capital'. Aboobaker (2019) addresses misleading and dangerous aspects to some of these nationalistic conspiracy theories pervading political and economic discourse in SA.

[64] This may be related to Harris' (1993, 92) observation that "blunt dichotomy [between revolution and capitalist reform] was not conducive to discussions of how a liberated South Africa would set about transforming society".

analysis, like the MERG report, discussion of which is at the heart of the critique of post-apartheid economic policy, indicates that contrary to accounts like Michie (2020) a higher target for the rate of government consumption was *not* the primary policy instrument for realizing higher growth and more equitable distribution.

Consequently, it may be misleading to attribute stagnation and inequality to anti-statist 'Thatcherite' policies. This conclusion is supported by the reality of rapid growth in public sector wages in sectors like utilities[65] and the considerable expansion of social policy during the democratic era. Recognition of this point underscores the need for progressives to shift the onus of policy critique from inadequate social policy to inadequate growth policy, rather than conflate one another.[66]

To understand why distributive outcomes have deteriorated in SA during an important period of the post-apartheid era this paper takes a closer look at the sectoral variation in distributive outcomes. Descriptive statistics and econometric results presented above are consistent with the view that the 2000s commodity boom altered relative prices in a direction that allowed mining capital to capture a greater share of output, at least over the short run. However, the results from reduced-form econometric tests should be treated cautiously, particularly in the context of the diagnostic test results[67] and plausible endogeneity issues.

In significant parts of SA's progressive advocacy spheres export-orientation is treated with mistrust. Full evaluation of this position is well beyond the scope of this paper, but in theory the effects of trade openness for distributive outcomes are ambiguous. This brings up the issue of what the wage share really is an indicator of at the sector and aggregate level. At the sector level, if the wage share is constant but both wages and prices have fallen in proportion because of heightened trade competition, is it a good, bad, or neutral outcome? If workers' consumption baskets are composed of little of the sector's product the real consumption wage may fall, alongside the level of profits. Neither capital nor labor may feel satisfied with their returns but observing the functional

[65] Discussed under Figure 2 and plotted in Figure 15 (in Appendix A).

[66] The general tendency to conflate social policy with growth policy is reflected in the influence of sloganistic advocacy for 'growth through redistribution' over post-apartheid policy debates. This has reflected an implicit bias toward instrumentalizing social policy to (particularly short run) growth effects and has had a distorting effect on policy debate in SA, considering the country's long run growth challenges. SA seems to be in a vicious cycle where poor aggregate performance intensifies calls for expansive social policy which is outcompeting allocation of resources required to drive forth growth, exacerbating poor aggregate performance. See Figure 11 in Appendix A for a measure of the expenditure priorities reflected in post-apartheid fiscal policy.

[67] The diagnostic test results suggest that non-normality of residuals characterizes the regressions analyzing the manufacturing wage share, in particular. See Appendix C.

income split would leave us none the wiser. Moreover, a narrow pursuit of a higher aggregate wage share may miss important sectoral interactions: is it a good thing for workers and the broader economy if the wage share is pushed up in a sector like manufacturing through a squeeze on the gross level of profits delivered by inflated (administered) energy prices? Descriptively, the wage share is influenced by a range of factors outside of traditional parameters of class conflict, including commodity windfalls, intermediate input costs and demand conditions. Moreover, from a normative standpoint I am skeptical that a radical policy agenda in SA ought to find it's organizing principle in maximizing the wage share, at least at this stage in SA's development trajectory.[68]

Returning to the South African case specifically, government consumption has trended upward significantly post-apartheid. The econometric results are generally supportive of the idea that this development has been associated with a higher wage share. Whether this is driven by cyclical co-movements in the wage share and government consumption share through the role of automatic stabilizers, or rather by the strengthened fallback position of workers is unclear and clean inference for policy is not possible.

Where do I feel more comfortable drawing policy conclusions? With recent talk of a new commodity super-cycle amidst the post-Covid global economic recovery[69], it may be prudent for the state to identify additional ways of channeling windfall rents into productive economic activity consistent with a long-run development strategy. Windfalls from upturns in the commodity cycle are temporary (by definition) and with SA's manufacturing sector enduring a considerable profit-squeeze it would be desirable to direct windfall revenues to projects with long-term payoffs to growth and structural transformation, or to smooth consumption of windfall revenues over the commodity cycle. A starting premise underlying this suggestion is that the state takes capturing corporate resource rent windfalls seriously – this is no trivial matter in the presence of weak

[68] It is hard to reconcile the need to rapidly raise the rate of capital accumulation in important sectors like manufacturing without raising the profit-share. Fortunately, this need not imply putting downward pressure on real consumption wages – cheap targeted credit, subsidies, tariffs, and real exchange rate policies might be used to stimulate profits in manufacturing in line with a development strategy. Real consumption wages meanwhile can be boosted by policies that promote productivity growth in wage-goods producing sectors. More generally at the level of discourse, the slogan 'growth through redistribution' has arguably yielded little value in radical policy debates. Perhaps the comments of SACP stalwart and intellectual, Jeremy Cronin, can be treated as frank and self-critical recognition of this: "Did we all get it wrong back [in 1993-1994] by assuming that development = redistribution?" (Padayachee and van Niekerk 2019, 140).

[69] See Hume *et al*. (2021)

bureaucratic will[70] or capital flight, and as potentially reflected in disparity between my calculation of mining profits (as a share of GDP) from the national accounts and the World Bank's measures.[71] A second issue, assuming that the windfall is captured, regards the present biases that predispose political actors toward directing resources to projects that are politically hard to cut when the windfall disappears, resulting in harmful changes to the composition of expenditures and threatening inflationary spirals in contexts with strong relative wage norms.[72]

If workers captured temporary upturns in commodity prices, and assuming inter-sectoral wage norms were rigid, commodity booms could squeeze manufacturing profits beyond the short run due to downward nominal wage rigidity. But it is no more socially and economically desirable for capitalists to uniquely accrue this windfall, to be stashed in tax havens or spent on luxuries. In a context where real public infrastructure investment has been falling over the past five years, it may be socially and economically desirable for excessive profit income from an upturn in commodity prices to be appropriated by the state through design of a special commodity-windfall tax and directed at income generating projects via industrial policies (targeted subsidies, preferential credit, tax credits) or infrastructure investment.

References

Aboobaker, A. 2019. 'Visions of stagnation and maldistribution: Monopoly Capital, 'White Monopoly Capital' and new challenges to the South African Left.' *Review of African Political Economy*, Vol. 46, Issue 161.

Aboobaker, A.; Naidoo, K.; Ndikumana, L. 2021. 'Capital Flight from South Africa: A Case Study,' in Boyce, J. K. and Ndikumana, L. (eds.), *On the Trail of Capital Flight from Africa: The Takers and the Enablers*, Oxford University Press.

Acemoglu, D.; Robinson, J. A. 2015. 'The Rise and Fall of General Laws of Capitalism.' *Journal of Economic Perspectives*, Vol. 29, No. 1.

Adelman, I.; Robinson, S. 1989. 'Income distribution and development.' Chapter 19 in Chenery, H. and Srinivasan, T. (eds.), *Handbook of Development Economics*, Elsevier.

Alvaredo, F.; Atkinson, A. B. 2021. 'Top incomes in South Africa in the twentieth century.' *Cliometrica*.

[70] During the commodity boom government officials in South Africa explicitly played down the prospects for a windfall tax, after recommendations made by a government appointed task team. See Russell (2007) for related reporting.

[71] The interested reader may refer to the earlier footnote for further discussion of this issue. World Bank measures of mining profits (natural resource rents, in their terminology) during the commodity boom exceed SA's official statistical agency's measure of mining *output*.

[72] See Martins and Skott (2021) for an interesting account of related concerns in light of Brazil's experience during the commodity boom. Figure 13 presents manufacturing-mining relative wage rates post-apartheid.

Aron, J.; Muellbauer, J. 2000. 'Personal and Corporate Saving in South Africa.' *World Bank Economic Review*, Vol. 14, No. 3.

Asimakopolus, A. 1988. 'Post-Keynesian Theories of Distribution,' in Asimakopulos, A. (ed.), *Theories of Income Distribution*, Kluwer Academic Publishers.

Baumol, W. 1983. 'Marx and the Iron Law of Wages.' *American Economic Review*, Vol. 73, No. 2.

Bewley, T. F. 1999. *Why wages don't fall during a recession*. Harvard University Press.

Bleynat, I.; Challú, A. E.; Segal, P. 2020. 'Inequality, living standards, and growth: two centuries of economic development in Mexico.' *Economic History Review*.

Burger, P. 2015. 'Wages, productivity and labour's declining income share in post-apartheid South Africa.' *South African Journal of Economics*, Vol. 83:2.

Chamber of Mines of the South African Republic. 1897. 'Report of the Executive Committee.'

Chatterjee, A.; Czajka, L.; Gethin, A. 2021. 'Can Redistribution Keep Up with Inequality? Evidence from South Africa, 1993-2019.' *World Inequality Lab Working Paper 2021/20*.

Edwards, L. 2005. 'Has South Africa liberalised its trade?' *South African Journal of Economics*

Eichengreen, B. 2021. 'Gold and South Africa's Great Depression.' *Economic History of Developing Regions*.

Erten, B.; Leight, J.; Tregenna, F. 2019. 'Trade liberalization and local labor market adjustment in South Africa.' *Journal of International Economics,* 118.

Eswaran, M.; Kotwal, A. 1993. 'A theory of real wage growth in LDCs.' *Journal of Development Economics,* 42.

Feiwel, G. 1974. 'Determinants of macrodistribution under imperfect competition.' *Keio Economic studies,* Vol. 11, No. 1.

Fine, B.; Rustomjee, Z. 1996. *The political economy of South Africa. From minerals energy complex to industrialisation*, Westview Press.

FitzGerald, E. V. K. 1990. 'Kalecki on financing development: an approach to the macroeconomics of the semi-industrialised economy.' *Cambridge Journal of Economics,* Vol. 14, No. 2.

Flaschel, P.; Skott, P. 2006. 'Steindlian Models of Growth and Stagnation.' *Metroeconomica,* 57:3.

Freund, W. 2013. 'Swimming against the tide: the Macro-Economic Research Group in the South African transition 1991-94.' *Review of African Political Economy*, Vol. 40, No. 138.

Gelb, A. 1988. *Oil Windfalls. Blessing or Curse?* Oxford University Press.

Girardi, D. 2021. 'Did capital strike? Redistribution, firm value and private investment during the 1981-1983 French Socialist Experiment.' Working paper.

Gouzoulis, G.; Constantine, C.; Ajefu, J. 2021. 'Economic and political determinants of the South African labour share, 1971-2019.' *Economic and Industrial Democracy*.

Guschanski, A.; Onaran, Ö. 2017. 'Why is the wage share falling in emerging economies? Industry level evidence.' *Greenwich papers in political economy,* GPERC52.

Hanes, C. 1996. 'Changes in the Cyclical Behavior of Real Wage Rates, 1870-1990.' *Journal of Economic History*, Vol. 56, No. 4.

Harris, L. 1993. 'South Africa's economic and social transformation from 'no middle road' to 'no alternative'.' *Review of African Political Economy*, 20:57.

Herr, H. 2019. 'Karl Marx's thoughts on functional income distribution – a critical analysis from a Keynesian and Kaleckian perspective.' *European Journal of Economics and Economic Policies: Intervention,* Vol. 16, Issue 2.

Hirsch, A. 2005. *Season of Hope*. University of KwaZulu-Natal Press.

Hobson, J. A. 1900. *Capitalism and imperialism in South Africa*. The Tucker Publication Company.

Hume, N.; Sheppard, D.; Terazono, E.; Sanderson, H. 2021. 'Broad commodities price boom amplifies 'supercycle' talk.' *Financial Times*. Accessed online: https://www.ft.com/content/1332da37-bf45-409f-9500-2fdac344d1dd?shareType=nongift

Inchauste, G.; Lustig, N.; Maboshe, M.; Purfield, C.; Woolard, I. 2015. 'The Distributional Impact of Fiscal Policy in South Africa.' *World Bank Policy Research Working Paper 7194*.

Ismail, F. 1993. 'A contribution to the debate on industrial strategy and economic development in South Africa.' *Development Southern Africa*, 10:4.

Izyumov, A.; Vahaly, J. 2015. 'Income shares revisited.' *Review of Income and Wealth*, Series 61, Number 1.

James, W. G. 1992. *Our Previous Metal: African Labour in South Africa's Gold Industry, 1970-1990*. Indiana University Press.

de Janvry, A.; Sadoulet, E. 1983. 'Social Articulation as a Condition for Equitable Growth.' *Journal of Development Economics,* 13.

de Janvry, A.; Sadoulet, E. 2016. *Development Economics: Theory and Practice*. Routledge.

Kaldor, N. 1956. 'Alternative theories of distribution.' *Review of Economic Studies*, Vol. 23, No. 2.

Kalecki, M. 1938. 'The determinants of distribution of the national income.' *Econometrica,* Vol. 6, No. 2.

Kalecki, M. 1955. 'The Problem of Financing of Economic Development.' *Indian Economic Review,* Vol. 2, No. 3.

Kehrig, M.; Vincent, N. 2021. 'The micro-level anatomy of the labor share decline.' *Quarterly Journal of Economics*, Vol. 136, Issue 2.

Keynes, J. M. 1930. *The Collected Writings of John Maynard Keynes. Volume VI. A Treatise on Money*. Cambridge University Press. (2013 edition).

Keynes, J. M. 1936. *The General Theory of Employment, Interest, and Money*. First Harvest/Harcourt, Inc. (1964 edition).

Keynes, J. M. 1939. 'Relative movements of real wages and output.' *Economic Journal*, Vol. 49, No. 193.

Köhler, K; Guschanski, A.; Stockhammer, E. 2019. 'The impact of financialisation on the wage share: a theoretical clarification and empirical test.' *Cambridge Journal of Economics*, 43.

Kornai, J.; Maskin, E.; Roland, G. 2003. 'Understanding the Soft Budget Constraint.' *Journal of Economic Literature*, Vol. 41, No. 4.

Kregel, J. A. 1978. 'Post-Keynesian Theory: Income Distribution.' *Challenge*, Vol. 21, No. 4.

Lewis, W. A. 1954. 'Economic Development with Unlimited Supplies of Labour.' *The Manchester School*.

Lustig, N. 2016. 'Inequality and fiscal redistribution in middle income countries: Brazil, Chile, Colombia, Indonesia, Mexico, Peru and South Africa.' *De Gruyter*, 7(1).

Maharaj, M., Jordan, Z. P. 2021. *Breakthrough: The Struggles and Secret Talks that Brought Apartheid South Africa to the Negotiating Table*. Penguin books.

Malherbe, S.; Segal, N. 2001. 'Corporate Governance in South Africa.' *Paper prepared for the OECD Development Centre.*

Mandela, N. 1994. 'State of the Nation Address.' *Accessed Online*: https://www.gov.za/state-nation-address-0.

Marais, H. 2011. *South Africa pushed to the limit: The political economy of change*. Zed Books.

Marglin, S. 1984. 'Growth, distribution and inflation.' *Cambridge Journal of Economics*.
Martins, G.; Skott, P. 2021. 'Sources of inflation and the effects of balanced budgets and inflation targeting in developing economies.' *Industrial and Corporate Change*.
Marx, K. 1875. *Critique of the Gotha Programme*. Progress Publishers. Accessed online: https://www.marxists.org/archive/marx/works/1875/gotha/.
Marx, K. 1867. *Capital, Volume 1*. International Publishers. (1977 edition).
MERG (Macroeconomic Research Group). 1993. *Making Democracy Work*. Centre for Development Studies.
Michie, J. 2020. 'Why did the ANC fail to deliver redistribution?' *International Review of Applied Economics*, 34: 4.
Mitra, A. 1954. 'The share of wages in national income.' *PhD dissertation*, Nederlansche Economische Hoogeschool te Rotterdam.
Munro, J. H. 2008. 'Money, Prices, Wages, and 'Profit Inflation' in Spain, the Southern Netherlands, and England during the Price Revolution era: ca. 1520 – ca. 1650.' *História e Economia,* vol. 4, no. 1.
Onaran, Ö.; Galanis, G. 2012. 'Is aggregate demand wage-led or profit-led?' *ILO Conditions of Work and Employment Series No. 40*.
van Onselen, C. 1976. 'Randlords and Rotgut 1886-1903: An essay on the role of alcohol in the development of European imperialism and Southern African capitalism, with special reference to black mineworkers in the Transvaal Republic.' *History Workshop*, No. 2 (Autumn).
van Onselen, C. 1979. 'The world the mineowners made: social themes in the economic transformation of the Witwatersrand, 1886-1914.' *Review (Fernand Braudel Center)*, Vol. 3, No. 2.
Padayachee, V.; van Niekerk, R. 2019. *Shadow of Liberation*. Wits University Press.
Pesaran, M. H.; Shin, Y.; Smith, R. J. 2001. 'Bounds testing approaches to the analysis of level relationships.' *Journal of Applied Econometrics*.
Piketty, T. 2014. *Capital in the Twenty-First Century*. Harvard University Press.
Piketty, T. 2020. *Capital and Ideology*. Harvard University Press.
van der Ploeg, F. 2011. 'Natural Resources: Curse or Blessing?' *Journal of Economic Literature*, 49:2.
Posel, D.; Rogan, M. 2018. 'Inequality, Social Comparisons and Income Aspirations: Evidence from a Highly Unequal Country.' *Journal of Human Development and Capabilities*.
Rice, X.; Hume, N. 2014. 'Platinum jumps on South Africa strike fears.' *Financial Times*. Accessed online: https://www.ft.com/content/d6b9f860-e1d1-11e3-b7c4-00144feabdc0
Richards, C. S. 1933. 'The boom in "Kaffirs" – an analysis.' *South African Journal of Economics*.
Rodrik, D. 1999. 'Democracies pay higher wages.' *Quarterly Journal of Economics*, Vol. CXIV, Issue 3.
Rodrik, D. 2006. 'Understanding South Africa's economic puzzles.' *NBER Working Paper 12565*.
Rodrik, D. 2008a. 'Understanding South Africa's economic puzzles.' *Economics of Transition*, Vol. 16(4).
Rodrik, D. 2008b. 'Normalizing industrial policy.' *Commission on Growth and Development,* Working paper 3.
Ros, J. 2016. 'Can growth be wage-led in small open developing economies?' *Review of Keynesian Economics*, Vol. 4, No. 4.

Rowthorn, R. E. 1977. 'Conflict, inflation and money.' *Cambridge Journal of Economics*, Vol. 1, No. 3.

Russell, A. 2007. 'S African officials play down windfall tax reports.' *Financial Times*. Accessed online: https://www.ft.com/content/42cfa39c-c709-11db-8078-000b5df10621.

Sachs, M. 2021. 'Fiscal Dimensions of South Africa's Crisis.' *SCIS Working Paper Number 15*.

Sil, R.; Samuelson, K. 2018. 'Anatomy of a massacre: the roots of heightened labour militancy in South Africa's platinum belt.' *Economy and Society*, Vol. 47 No. 3.

Skott, P. 1989a. *Conflict and Effective Demand in Economic Growth*. Cambridge University Press.

Skott, P. 1989b. 'Effective Demand, Class Struggle and Cyclical Growth.' *International Economic Review*, Vol. 30, No. 1.

Skott, P. 2017. 'Weaknesses of wage-led growth.' *Review of Keynesian Economics*, Vol. 5, Issue 3.

Statistics South Africa. 2019. 'General Household Survey.' Accessed online: http://www.statssa.gov.za/publications/P0318/P03182019.pdf

Swanson, E. T. 2004. 'Measuring the Cyclicality of Real Wages: How Important is the Firm's Point of View?' *Review of Economics and Statistics*, Vol. 86, No. 1.

Tilly, C. 1999. *Durable Inequality*. University of California Press.

Tregenna, F. 2010. 'How significant is intersectoral outsourcing of employment in South Africa?' *Industrial and Corporate Change*, Vol. 19, No. 5.

Trew, T. 2014. 'Manuel, Trevor: Interviewed by Tony Trew, 2014, Johannesburg: [Transcript].' Accessed online: https://archive.nelsonmandela.org/index.php/za-nmcom-tpy-5.

Trew, T. 2015. 'Liebenberg, Chris: Interviewed by Tony Trew, 2015, Somerset West: [Transcript].' Accessed online: https://archive.nelsonmandela.org/index.php/za-nmcom-tpy-24.

Tomaskovic-Devey, D.; Lin, K. H.; Meyers, N. 2015. 'Did financialization reduce economic growth?' *Socio-Economic Review.*

Wilse-Samson, L. 2013. 'Structural change and democratization: evidence from rural apartheid.' Working paper. Accessed online: http://www.columbia.edu/~lhw2110/wilse_samson_apartheid.pdf.

Appendix A

Figure 7. The aggregate wage share since 1960, in %, author's calculation. Dashed line gives transition to democracy. Data from the South African Reserve Bank.

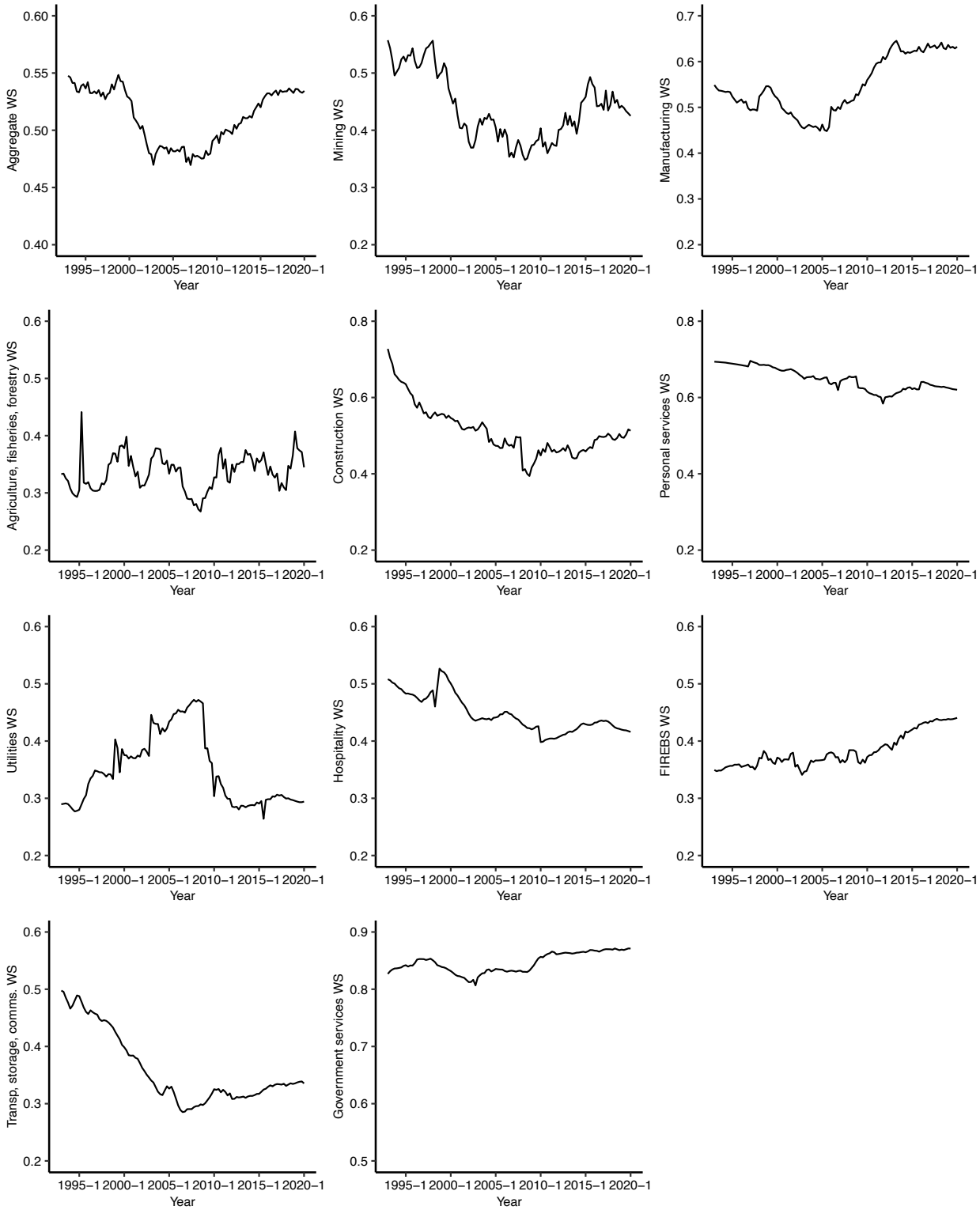

Figure 8. The wage share across ten sectors and in aggregate, after seasonal adjustment. Author's calculation. Data from Statistics South Africa.

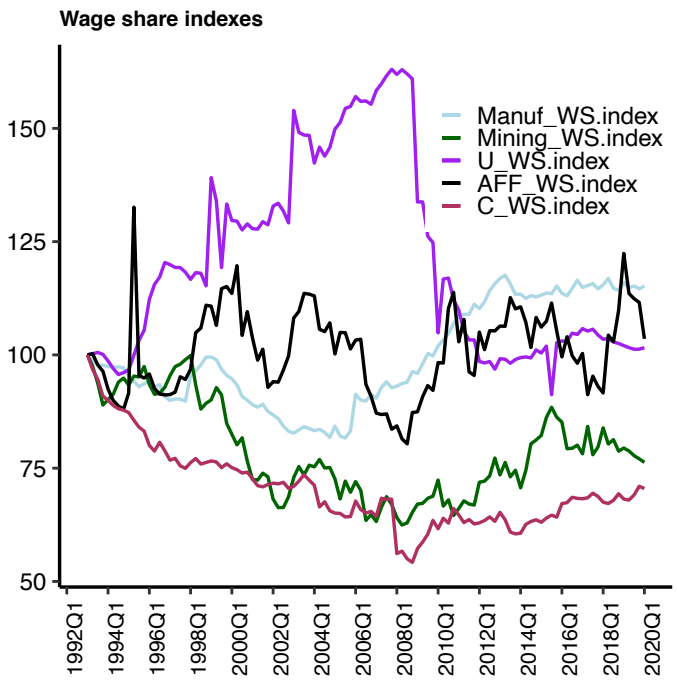

Figure 9. An index of the wage share for manufacturing, mining, utilities, agriculture-forestry-fisheries, and construction, where 1993q1 = 100 and after seasonal adjustment. Author's calculation. Data from Statistics South Africa.

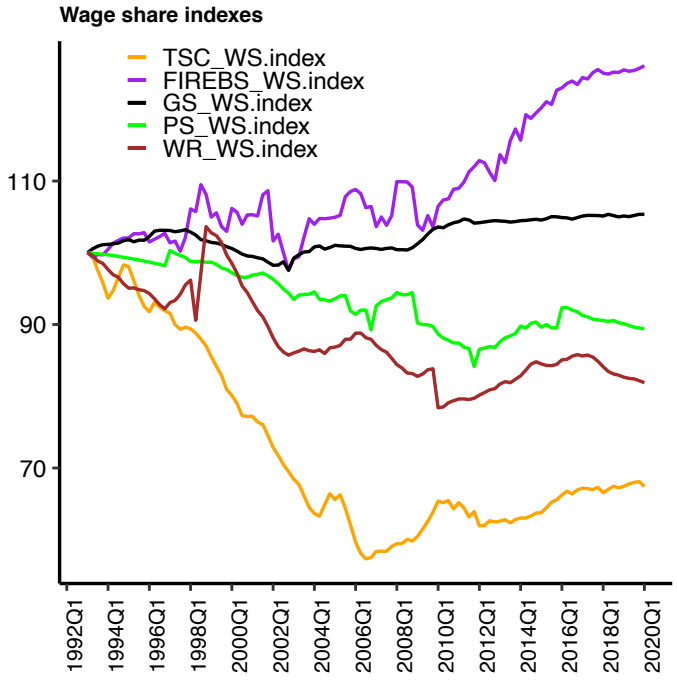

Figure 10. An index of the wage share for transport-storage-communications, FIRE-business services, government services, personal services and wholesale-retail sectors, where 1993q1 = 100 and after seasonal adjustment. Author's calculation. Data from Statistics South Africa.

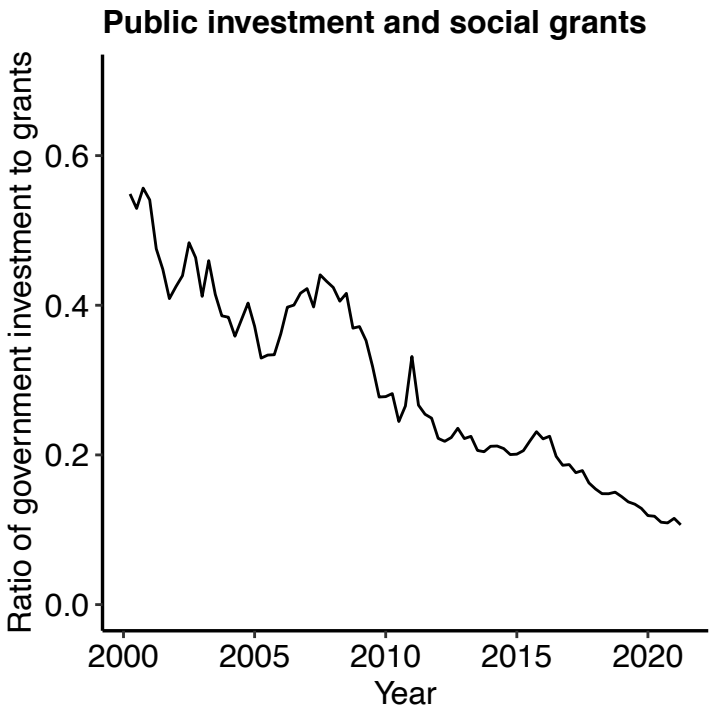

Figure 11. Ratio of public investment to expenditure on social grants by national government, after seasonal adjustment. Author's calculation. Data from the South African Reserve Bank.

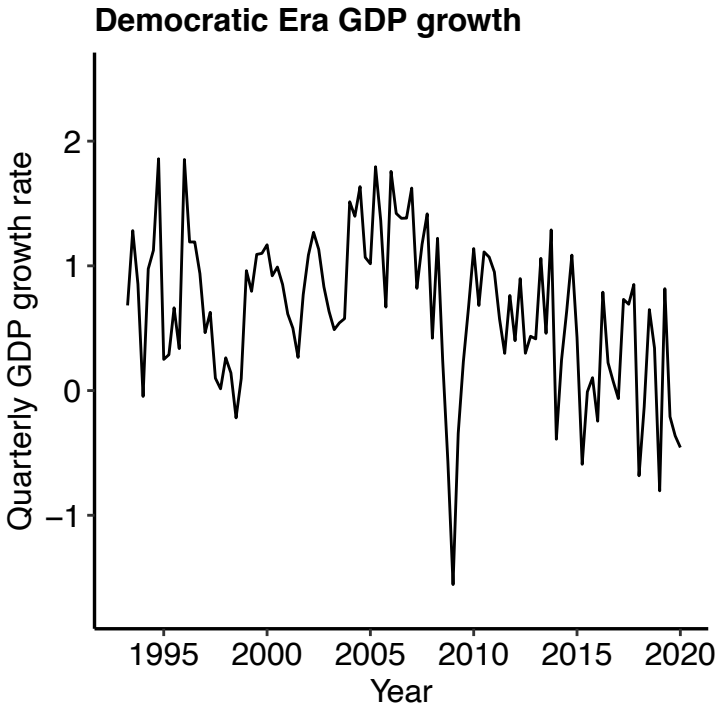

Figure 12. Quarter-on-quarter real GDP growth rate. Author's calculation. Data from Statistics South Africa.

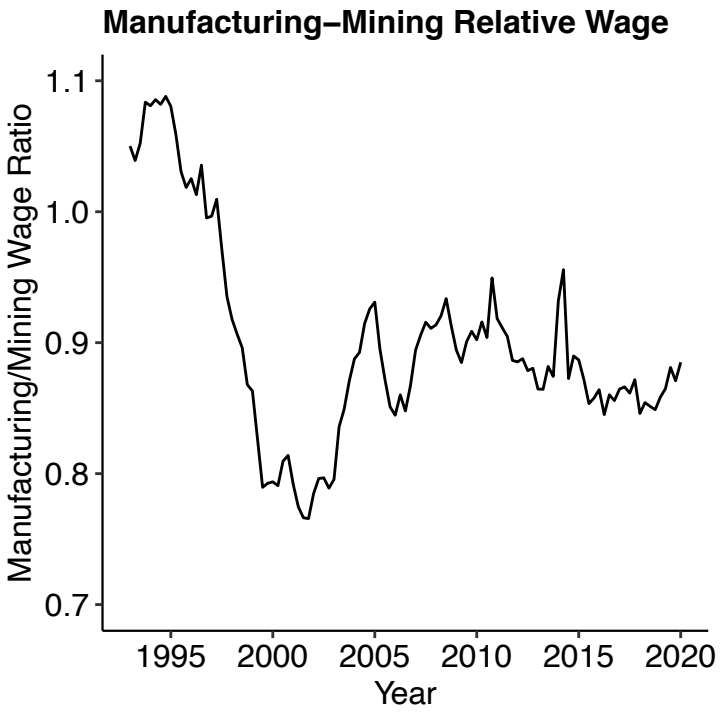

Figure 13. Relative average wage rates in manufacturing relative to mining. Author's calculation. Data from Statistics South Africa and the South African Reserve Bank.

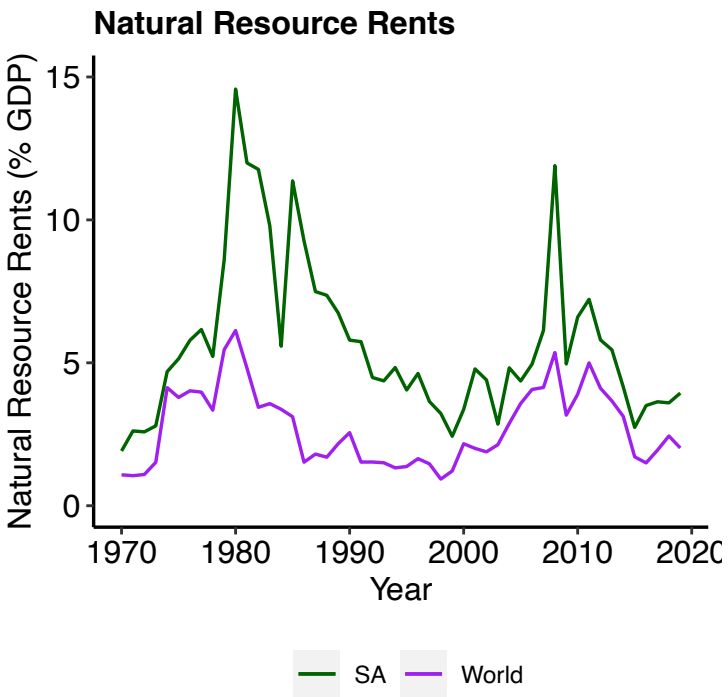

Figure 14. Natural resource rents as a % of GDP. Author's calculation. Data from the World Bank.

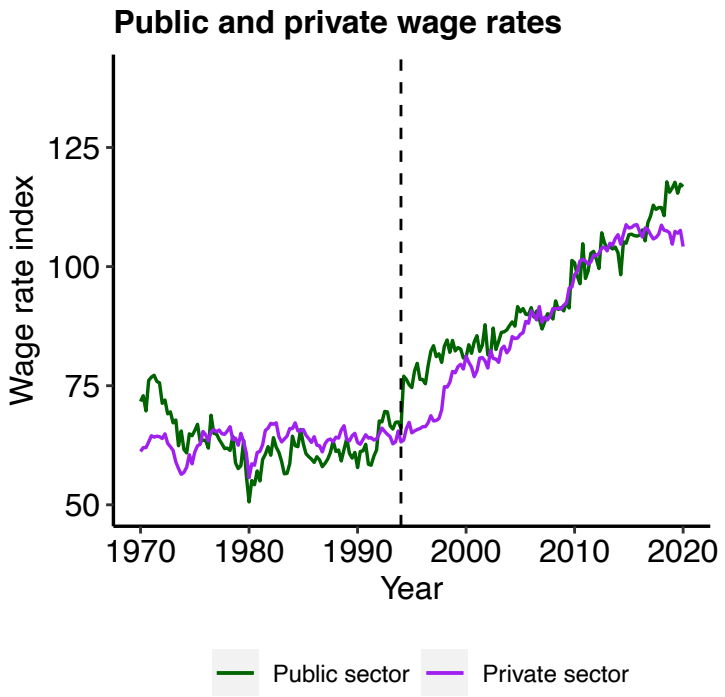

Figure 15. Indexes of public and private sector wage rates. Dashed line gives transition to democracy. Author's calculation. Data from the South African Reserve Bank.

Appendix B

Variable	Test statistic	1%	5%	10%
Mining wage share	-2.0159784	-3.46	-2.88	-2.57
Manufacturing wage share	-0.2182683	-3.46	-2.88	-2.57
Aggregate wage share	-1.2259405	-3.46	-2.88	-2.57
Mining wedge	-1.2099374	-3.46	-2.88	-2.57
Manufacturing wedge	-1.4698734	-3.46	-2.88	-2.57
Government consumption share	-1.6821701	-3.46	-2.88	-2.57
Real effective exchange rate	-2.7259342	-3.46	-2.88	-2.57
Trade share	-2.7037703	-3.46	-2.88	-2.57
Manufacturing capacity utilization	-2.6882902	-3.46	-2.88	-2.57
FIREBS value added share	-0.6714113	-3.46	-2.88	-2.57
Export share	-2.5545783	-3.46	-2.88	-2.57

Table 1. Augmented Dickey-Fuller statistics. Last three columns are critical thresholds.

	Breusch–Pagan	Box–Ljung	Shapiro–Wilk	Breusch–Godfrey
Reg1.1	0.20	0.91	0.76	0.35
Reg1.2	0.09	0.88	0.92	0.57
Reg1.3	0.49	0.69	0.68	0.31
Reg1.4	0.72	0.78	0.86	0.56
Reg1.5	1.00	0.99	0.22	0.98
Reg1.6	0.45	0.93	0.44	0.77

Table 2. P-values from diagnostic tests for regressions 1.1-1.6 (dependent variable: mining wage share). Breusch-Pagan test is for homoskedasticity of residuals, Breusch-Godfrey and Ljung-Box tests are for autocorrelation in residuals, Shapiro-Wilk test is for normality of residuals.

Appendix C

	Regression 2.1	Regression 2.2	Regression 2.3	Regression 2.4	Regression 2.5	Regression 2.6
Ln(Manufacturing WS).t-1	-0.032	-0.058*	-0.049	-0.014	-0.035	-0.045
	(0.025)	(0.032)	(0.031)	(0.034)	(0.035)	(0.033)
Δ Ln(Manufacturing WS).t-1	0.089	0.083	0.000	-0.080	-0.091	-0.081
	(0.103)	(0.097)	(0.097)	(0.102)	(0.101)	(0.106)
Δ Ln(Manufacturing WS).t-2		0.029	0.008	-0.020	0.008	
		(0.097)	(0.097)	(0.098)	(0.096)	
Δ Ln(Manufacturing WS).t-3		0.212**	0.203**	0.185*	0.219**	
		(0.097)	(0.092)	(0.094)	(0.093)	
Ln(Capacity utilization).t-1	0.030	-0.048	-0.057	-0.033	-0.047	-0.120
	(0.088)	(0.098)	(0.095)	(0.104)	(0.104)	(0.094)
Δ Ln(Capacity utilization).t	-0.264*	-0.266*	-0.349**	-0.246*	-0.281*	-0.343**
	(0.142)	(0.140)	(0.135)	(0.145)	(0.142)	(0.132)
Δ Ln(Capacity utilization).t-1	-0.027					
	(0.149)					
Δ Ln(Capacity utilization).t-2	-0.005					
	(0.143)					
Δ Ln(Capacity utilization).t-3	-0.179					
	(0.142)					

Newey-West standard errors reported in brackets.

Lag structure chosen according to the AIC

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Regression 2.1	Regression 2.2	Regression 2.3	Regression 2.4	Regression 2.5	Regression 2.6
Δ Ln(Capacity utilization).t-4	0.110					
	(0.144)					
Ln(Unemployment rate).t-1		-0.022	0.005	0.029	0.022	
		(0.024)	(0.024)	(0.026)	(0.025)	
Δ Ln(Unemployment rate).t		0.013	0.024	0.043	0.055	
		(0.041)	(0.039)	(0.039)	(0.039)	
Ln(Government Consumption % GDP).t					0.089	0.071
					(0.061)	(0.060)
Δ Ln(Government Consumption % GDP).t-1					-0.124	-0.106
					(0.083)	(0.082)
Ln(Trade openness).t-1				0.058*	0.077**	0.057
				(0.029)	(0.031)	(0.036)
Δ Ln(Trade openness).t				-0.006	0.009	0.007
				(0.040)	(0.040)	(0.041)
Δ Ln(Trade openness).t-1				-0.057	-0.060	
				(0.039)	(0.038)	
Δ Ln(FIRE & BS % GDP).t						0.201
						(0.303)
Δ Ln(REER).t			0.052**	0.060**	0.055*	0.057*

Newey-West standard errors reported in brackets.

Lag structure chosen according to the AIC

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Regression 2.1	Regression 2.2	Regression 2.3	Regression 2.4	Regression 2.5	Regression 2.6
			(0.026)	(0.030)	(0.029)	(0.029)
trend	0.000	0.000*	0.000*	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Num.Obs.	104	104	104	104	104	107
R2	0.114	0.152	0.255	0.297	0.346	0.287
R2 Adj.	0.030	0.070	0.166	0.186	0.225	0.188
AIC	-544.8	-549.3	-558.9	-558.8	-562.3	-579.0
BIC	-515.7	-520.2	-524.5	-516.5	-514.7	-538.9
Log.Lik.	283.407	285.645	292.427	295.414	299.139	304.477

Newey-West standard errors reported in brackets.

Lag structure chosen according to the AIC

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

	Breusch–Pagan	Box–Ljung	Shapiro–Wilk	Breusch–Godfrey
Reg2.1	0.51	0.97	0	0.78
Reg2.2	0.21	0.80	0	0.40
Reg2.3	0.22	0.77	0	0.38
Reg2.4	0.53	0.88	0	0.66
Reg2.5	0.01	0.94	0	0.86
Reg2.6	0.00	0.99	0	0.95

Table 3. P-values from diagnostic tests for regressions 2.1-2.6 (dependent variable: manufacturing wage share). Breusch-Pagan test is for homoskedasticity of residuals, Breusch-Godfrey and Ljung-Box tests are for autocorrelation in residuals, Shapiro-Wilk test is for normality of residuals.