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WP/24/01

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Cash transfers and prices:
what is the impact of social welfare on prices?

Chloe Allison[*] and Neryvia Pillay[†]

Abstract

South Africa faces high inequality and numerous challenges posed by the long-lasting legacies of apartheid. South Africa's generous social welfare system represents a major government intervention to address these challenges. Using a province fixed effects model with annual price and household survey data, we study the relationship between existing grants and prices from 2009 to 2021. We observe a significant increase in the prices of goods and services consumed by individuals in the poorest deciles. We find that results are dependent on the type of grant received and the characteristics of beneficiary households. We also find that price increases are particularly evident in markets with inelastic supply, where the demand for goods and services outpaces their supply.

JEL classification

CH63, H53, I38.

Key words

Conditional cash transfers, policymaking, public economics, transfers.

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1. Introduction

Pervasive poverty and high inequality are the two main developmental challenges facing South Africa. The country's generous social welfare system represents a major government intervention to address these challenges, which are among the legacies of apartheid. Among developing countries, South Africa has one of the largest social welfare systems. It spends abouts 3.5% of its gross domestic product (GDP) on cash transfers (National Treasury 2023), compared with the average spend by other developing countries of 1.5% of GDP (World Bank 2018; Centre for Development and Enterprise 2022). Fifty-five percent of the South African population lives below the poverty line and cash transfers support a large share of the poor population, especially in the poorest three quintiles (Gentilini et al. 2020; Statistics South Africa 2022a). Just under half of the population, or more than 30 million South Africans, receive a grant of some form (National Treasury 2023).

Debates on expanding the social welfare system have re-emerged in South Africa since the introduction of the social relief of distress grant in May 2020. The grant was introduced on a temporary basis during the COVID-19 pandemic as a social safety net for those who are not protected by any other grant. There have been calls for this grant to be extended permanently – this would be in addition to the social grants currently available to South Africans.

South Africa's extensive social welfare system and its expansion over the last two decades has significant budget implications, which also affect price dynamics. The economic consequences, particularly concerning inflationary pressures and price dynamics, require careful analysis and consideration. There is little evidence of the effect of sustained cash transfers on prices. Our research aims to fill the gap by investigating the various mechanisms through which cash transfers can affect prices, especially in a developing country.

In this paper, we first discuss the theoretical implications of the implementation and expansion of the social welfare system, considering the constraints of financing and the effects of long-term implementation. Cash transfers can have multifaceted effects on inflation and prices within an economy. A significant cash injection to households may boost aggregate demand, leading to increased spending on goods and services.

This surge in demand could exert upward pressure on prices, as demand outpaces supply. The redistribution of income through cash transfers may also affect income distribution dynamics, shifting consumption patterns and relative price levels across different sectors. Furthermore, financing cash transfers can cause significant price effects. Financing the cash transfers through an increase in public debt risks putting upward pressure on prices, especially when there is already a high debt burden.

We then evaluate the evidence of the effect of cash transfers on prices that have come from randomised control trials. Evidence from such trials has been useful in understanding the effects of an exogenous cash transfer. However, these trials fail to consider the broader impacts of large-scale expansions of cash transfers on prices stemming from financing constraints, reallocation of expenditure and a sustained addition to government spending.

Finally, we provide an empirical assessment of how existing grants have influenced prices in South Africa. We use a province fixed effects model with price and household survey data to study the relationship between existing grants and prices using annual data from 2009 to 2021. We find that an increased number of grants in South Africa is associated with increased price effects for the biggest expenditure categories of low-income households.

The structure of our paper is as follows. In section 2, we discuss the channels through which cash transfers can influence the economy. Section 3 examines empirical evidence from other countries on the relationship between cash transfers and prices. In section 4, we outline our methodology and describe the data employed in our research. In section 5, we estimate the relationship between the current extensive social grant system and prices, leveraging these estimates to understand the potential impact of expanding the social welfare system on prices in section 6.

2. What are the channels through which cash transfers affect prices in South Africa?

Over the last two decades, social assistance in South Africa has expanded. This has had substantial implications for financing. Increased social protection spending must

be financed through an increase in taxes, an increase in debt or a reallocation of existing spending (or some combination of these measures).

From 2009 to 2021, a number of these measures to finance government spending were implemented.[1] Social protection expenditure increased from R118 billion in 2009 (National Treasury 2009) to R227 billion in 2021 (National Treasury 2021). Various tax policy adjustments have been made, including an increase in value-added tax (VAT) from 14% to 15% and increases in direct tax rates. Since 2009, the marginal tax rate on personal income for top earners has increased from 40% to 45%. Below inflation adjustments to tax income brackets have also been made. Additionally, the debt-to-GDP ratio increased from 29.8% in 2009 (National Treasury 2009) to 81.9% in 2021 (National Treasury 2021).

Tax changes influence prices, investment decisions, financing decisions and allocation of capital. These changes vary across countries and sectors (Harris 2009). When taxes such as VAT, fuel taxes and excise taxes are increased, this constitutes an increase in the price of all taxable goods – contributing to inflationary pressure. Social protection spending can be funded through increases in indirect taxes to redistribute wealth from the rich to the poor. In this instance, taxes such as VAT, fuel taxes and excise taxes would be increased. Assuming demand is not perfectly elastic, opting for this method would constitute an increase in the price of all taxable goods – all taxable goods that are in the consumer price index (CPI) basket would contribute to inflationary pressure. Increases in indirect taxes are expected to result in immediate upward price pressure but the subsequent effect depends on various other factors, such as the elasticity of supply and factors of production (Tanzi 1982).

Financing social welfare by increasing indirect taxes distorts prices for everyone, but especially for the poor. Often in low- and middle-income countries, large proportions of the population do not pay direct taxes due to unemployment or informal participation in the labour market, but most people will consume taxable goods. Indirect taxes in South Africa are slightly regressive: up to the seventh income decile, the cumulative

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[1]   Of course, these measures have been used to finance government spending in areas other than social protection too.

share paid of total indirect taxes exceeds the cumulative share of disposable income (Inchauste et al. 2015). This is especially true for excise taxes as the poor consume proportionately more of goods that are "sin taxed".[2] VAT, however, is slightly progressive due to the zero-rating of basic food items. If these items are no longer zero-rated to fund social welfare, then the incidence will likely fall on those in lower income deciles. The poor are disproportionately affected by this increase in indirect taxes and individuals in lower expenditure deciles will face higher prices.

An increase in income tax could increase wages if the incidence of the tax falls on workers. When income taxes increase, workers demand higher wages to compensate for the reduction in disposable income. Fedderke and Liu (2018) found that, in South Africa, there is a strong positive relationship between inflation and nominal wages. An increase in wages would place inflationary pressure on prices. However, increases in income taxes could also have a deflationary effect as they lead to a reduction in aggregate demand. The net effect would determine the direction and magnitude of the pressure on prices. Financing increased social welfare through an income tax increase would constitute a net transfer away from high-income households towards low-income households – as money shifts, this will put price pressure on certain goods. In the short run, goods and services that are consumed by low-income households would experience disproportionate price pressure as demand increases (Gentilini et al. 2020). However, this would only occur if the market's supply of these goods is unable to meet demand.

Social welfare funded by an increase in corporate income tax will affect firm and investor decisions, which can then affect wages and output prices. Due to the complex economic interactions involved, it is difficult to isolate the effect of corporate income taxes on prices (Harris 2009) but it is likely to have some price effects too. Corporate income tax could reduce investment, leading to reductions in labour productivity and wages if workers bear the incidence of the tax. Under perfect competition in goods and factor markets, the pass-through of corporate taxes should be zero; however, this is not the case in practice.

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[2]   "Sin tax" is an excise tax placed on goods such as cigarettes and alcohol and activities such as gambling. The items subject to this tax are perceived to be harmful or costly to society.

Baker, Sun and Yannelis (2020) were the first to empirically estimate the pass-through of state-level corporate taxes into retail prices in the United States. They found that a 1 percentage point increase in a state-level corporate tax rate leads to an increase in affected retail prices of approximately 0.24 percent. They find that about half of the corporate tax incidence falls on consumers. Dedola, Osbat and Reinhelt (2022) used variations in tax rates across time in Germany to estimate the tax pass-through into retail prices and found that a 1 percentage point tax increase results in a 0.4% increase in the retail prices of goods produced by taxed firms. There is an estimated pass-through of taxes to retail prices of about 40%. Consumers thus end up bearing a substantial share of the tax burden.

Fuest, Peichl and Siegloch (2018) use German data and find that corporate taxes affect real wages. They find that workers bear about 51% of the total tax burden. Thus, increases in corporate taxes could result in increases in retail prices and wages, thereby creating inflationary pressure.

An increase in funding for the social welfare system derived from an increase in all taxes is likely to lead to negative macroeconomic effects as each tax increase magnifies the effects of others (Hollander, Havemann and Steenkamp 2022).

An increase in social grants could be funded by an increase in public debt. Increases in public debt levels in low- and middle-income countries are a growing concern and are likely to have an inflationary impact. Increasing public debt levels in emerging market countries with high debt-to-GDP ratios (above 60%) exacerbates inflationary effects (Reinhart and Rogoff 2010; Bildirici and Ersin 2007). Lopes da Veiga, Ferreira-Lopes and Sequeira (2016) find evidence from Southern African Development Community (SADC) countries that high levels of public debt coincide with rising levels of inflation. SADC countries that experience high debt-to-GDP ratios see a corresponding increase in the inflation rate of 64% (Lopes da Veiga et al. 2016). South Africa has experienced a long-term rise in the debt-to-GDP ratio, which has increased by 44 percentage points since 2006/07. As of 2023, South Africa has a debt-to-GDP ratio of 74% (National Treasury 2023). Therefore, increasing public debt to finance an expanded social welfare system is likely to heighten inflation in the country.

Furthermore, increasing public debt is likely to cause a rise in inflation expectations, which will push inflation rates upward (Kwon, McFarlane and Robinson 2006).

A reallocation of existing government expenditure could affect demand in different markets. For example, a budget-neutral increase in social grants could result in a net transfer away from some households and toward others. We might then observe price increases in goods that are disproportionately consumed by households receiving a net cash transfer. In South Africa, the poorest six deciles pay close to zero in personal income tax but 69% of all cash transfers go to the bottom 40% of income earners (Inchauste et al. 2015).

With this kind of redistribution of income from high- to low-income households, we expect to see price increases in goods consumed by the bottom 40% of income earners. South Africans' consumption and expenditure patterns differ based on household income. The weighting structure applied by Statistics South Africa (Stats SA) to construct the CPI basket for different expenditure deciles provides an indication of how consumption changes based on income. In the poorest two income deciles, around 50% of expenditure is devoted to food and non-alcoholic beverages, compared with the richest income decile where this proportion is only 10%. Individuals in the lowest income decile devote a large proportion of their spending to clothing and footwear. In the poorest income decile, 8.67% of expenditure is for clothing and footwear; this decreases as income increases, with the richest income decile spending only 2.52% on these items (Stats SA 2022b). As income increases, individuals also spend more on miscellaneous goods and services (20.2% in the richest income decile compared with 4.3% in the poorest income decile).

It is also important to consider how expenditure patterns change when a cash transfer is introduced. Matata et al. (2022) studied the effects of targeted cash transfers on food expenditure in Northern Kenya and found that households diversified their diet to some high-value foods, moving away from starch-based food and including some proteins. Their findings indicate that cash transfers increased the food expenditure of the beneficiaries. Case and Deaton (1998) reviewed the impact of the South African old age grant and found that pension income from the old age grant is not spent any differently to other types of income. Thus, we expect that in poorer households the

majority of income is spent on food items. Lloyd-Sherlock, Agrawal and Gómez-Olivé (2020) analysed the effects of old age grant receipt on household consumption in rural north-eastern South Africa and found that living in a pension household is associated with a reduced risk of reported food scarcity and with higher levels of consumption of food and drink. Cash transfers allow households to allocate larger portions of their income to basic needs such as food, housing and clothing. We therefore expect that with a cash transfer we will see increases in the prices of these goods and services.

However, certain public services in South Africa are free for social grant beneficiaries. The public health-care system in South Africa, which serves over 80% of the population, provides primary health care free of charge to everyone and hospital fees are provided at a fee calculated by income level. Individuals living in households with an income of less than R6 000 per month, children under six years, pregnant women and social grant beneficiaries are automatically exempt from paying for any public health services (Inchauste et al. 2015). Similarly, on application at public schools, beneficiaries of the child support grant should automatically be exempted from paying school fees. As such, in CPI categories such as education and health care, we do not expect to see changes as the prices of these goods and services are regulated by the government.

We expect to see that with cash transfer receipts, expenditure on food will increase, especially in the poorer deciles. As Case and Deaton (1998) found, social grant income is treated the same as any other kind of income. Burger et al. (2015) estimated the income elasticities of demand in South Africa and found higher income elasticities on clothing items, indicating that people with higher incomes would spend proportionally more on clothing than food items. Within the category of food, they found that meat, vegetables, oils, dairy products, eggs and beverages have higher estimated income elasticities than grains and starches, indicating that with increases in income, the consumption of these items will increase (Burger et al. 2015).

3. What has been the effect of cash transfers on prices in other countries?

Inflationary risks are a concern with cash transfers. The evidence of cash transfers on inflation is limited, but the available evidence suggests that large once-off cash transfers in high-income countries do not yield any significant inflationary price effects

on any goods. This was the case in both Australia in 2008–09 and Kuwait in 2008, where cash transfers of between US$1 400 and US$3 600 were granted to 90% of households and 1.1 million citizens, respectively (Hyslop 2014; *The Economist* 2011). However, these results may have differed had the cash transfer been implemented on a long-term basis, as government cash transfers would be implemented. A long-term, large, widespread cash transfer increases disposable income, which increases spending and demand for goods and services. Jones and Marinescu (2022) measured the impact of the Alaska Permanent Fund Dividend on inflation and found evidence of positive inflation and price effects correlated with this cash transfer. However, uncertainty remains regarding the causality due to the difficulty of constructing a synthetic control group – Alaska faced unusual and unique inflation dynamics in the pre-treatment period. It is also possible that price effects on cash transfers in high-income countries are not observed due to markets being more integrated than in low- and middle-income countries.

Given the limited evidence of long-term government cash transfers on inflation, we consider the effects of other types of cash transfers. On average, the evidence from randomised control trials shows that there are insignificant inflationary price effects from cash transfers in low- and middle-income countries. Aker et al. (2016) found no price effects on a basket of goods in weeks where cash was dispersed in rural Niger. Beegle, Galasso and Goldberg (2017) found that a cash transfer amounting to 4.5% of village food expenditures yielded no significant price effects in the five top-consumed items. Similarly, Angelucci and De Giorgi (2009) and Cunha, De Giorgi and Jayachandran (2019) found that a Mexican cash transfer programme of between 16% and 19% of village food expenditure resulted in no significant effect on prices in many communities.

However, several factors affect the likelihood of transfers having inflationary effects. The evidence suggests that the more impoverished a village is, the more likely it is to experience inflationary price effects. In more rural Mexican villages, in-kind transfers decreased the price of selected items included in the food basket by 5 percentage points (Cunha, De Giorgi and Jayachandran 2019). Similarly, in more remote villages, cash transfers led to increases of 1.5% in overall food prices (Cunha, De Giorgi and Jayachandran 2019). In more impoverished villages, the size of the transfer is larger

relative to income, thus villages can spend more on goods. Additionally, given the rural nature of these villages, the supply of market goods is likely to be more constrained.

Evidence from Filmer et al. (2023) show that the size and reach of the transfer are important as well. In the Philippines, a randomised control trial that introduced a cash transfer equivalent to 15% of village income resulted in no significant price effects on average. However, price increases of 6–8% for non-tradable, perishable goods were observed in villages where the share of treated households neared 100%. These inflationary effects persisted 31 months after the programme's introduction, which negatively impacted non-treated households (Gentilini et al. 2020).

Inflationary effects on prices from cash transfers are likely to be seen in markets where the supply response does not meet the increased demand for goods and services caused by the cash injection of the transfer (Handa et al. 2018). This was seen in Indonesia where cash transfers, amounting to 15% of village income, increased the demand for health services by beneficiaries but crowded out health spending by non-beneficiaries due to higher health costs (Triyana 2016). This occurred due to the limited supply of trained health-care workers in Indonesia; these effects are likely not to be seen in markets where supply is less constrained. This is substantiated by research done by Egger et al. (2019) on the impact of cash transfers in Kenya. A transfer was introduced amounting to 25% of village income in Kenya, at least 6 percentage points greater than the other randomised control trials previously discussed in this paper. However, the effects, while positive, were economically insignificant. One potential reason for negligible price effects in the case of Kenya is a high elasticity of supply (Egger et al. 2019). In Egger et al. (2019), with a 25% increase in village expenditure, there was also a significant increase in village GDP. As such, supply was able to match the increased demand that cash transfers generated.

The evidence from the randomised control trials suggests that often the injection is not big enough to have a significant impact on price levels. When cash transfers are more widespread, or the value of the transfer is relatively high, price effects are more likely to be seen. The elasticity of supply is also an important factor in determining the impact on price levels. In goods markets where supply cannot meet the increased demand, it is more likely that there will be an increase in the price level of those goods. There is

very little research done at the country or provincial level that estimates the impact of cash transfers on price level, especially in developing countries. For price effects to be more reliably estimated, cash transfers need to be widespread, or the value of the cash transfer needs to be substantial.

4. What has been the effect of social grants on inflation in South Africa?

We assess the impact of the current grants on the changes in prices in South African provinces. We use the three largest and most widespread grants to estimate these effects. The South African government currently spends R92 billion on the old age grant, R77 billion on the child support grant and R24 billion on the disability grant (National Treasury 2023); there are currently 3.8 million, 13 million and 1 million recipients of the grants, respectively. All three grants are means-tested: the old age grant and the disability grant are R1 860 a month, and the child support grant is R445 a month. These grants are 175% and 40% of median per capita income, respectively (Woolard and Leibbrandt 2013).

The current grant system is widespread and represents a large cash transfer to poor households. We use a province fixed effects model to study the relationship between grants and prices using annual data from 2009 to 2021. We use two models. Model (1) estimates the effects of an increase in all grants, including other grants, on prices. Model (2) estimates the impact of the three largest grants.

$$\Delta ln\,(P_{i,t}) = \delta_1 ln\,(G_{i,t}) + X'\mu + \alpha_i + \Omega_t + \varepsilon_{i,t} \tag{1}$$

$$\Delta ln\,(P_{i,t}) = \beta_1 ln\,(OAG_{i,t}) + \beta_2 ln\,(CSG_{i,t}) + \beta_3 ln\,(DG_{i,t}) + X'\mu + \alpha_i + \Omega_t + \varepsilon_{i,t} \tag{2}$$

where $\Delta \mathrm{ln}\,(P_{i,t})$ is a measure of inflation, $G_{i,t}$ represents the total number of grants received in the province i in the year t, $OAG_{i,t}$ represents the total number of old age grants received, $CSG_{i,t}$ represents the total number of child support grants received, $DG_{i,t}$ represents the total number of disability grants received and Ω_t is a full set of year dummies to flexibly control for time trends. The year dummies control for factors that affect inflation across all provinces in a given year, such as interest rates, global food

prices and the COVID-19 pandemic. The α_i is the province fixed effects, which controls for the unobserved time-constant factors such as geography and culture.

The vector $X'\mu$ includes provincial-level controls that vary over time and are likely to affect inflation. We control for provincial population, provincial GDP and the unemployment rate. In the regressions with health sector price changes as the dependent variable, we additionally control for the proportion of the population over 65 as this group is likely to have higher health-care spending (Yang, Norton and Stearns 2003). In all specifications, standard errors are clustered at the provincial level.

There are many factors that could affect both inflation and grant prevalence. In our specification, we control for the unobserved time-constant factors through the province fixed effects and some observed time-varying factors (population, GDP, unemployment rate, the proportion of the rural population and, in some specifications, the proportion of the population over 65). The inclusion of province fixed effects means that we exploit only variation within a province over time. There are remaining sources of heterogeneity that we are unable to control but may be important. For example, we do not have data on investment at the provincial level, which could affect the supply of goods and services and, in turn, impact prices. Investment might be correlated with grant prevalence, as the latter could be an indicator of the economic health of a province. Due to these limitations, we emphasise that we are only able to identify correlations and not causation.

Since the dependent variable is inflation and thus stationary by default (since it is bounded within a closed interval), we ignore issues of cointegration in panels. Phillips and Moon (1999) show that panel regressions with nonstationary data behave differently to time-series regressions and the relationship between two variables, such as $\Delta ln\left(P_{i,t}\right)$ and $ln\left(G_{i,t}\right)$, can be interpreted as a long-run average relationship over the cross-section. As such, spurious regressions are less of a concern with panel data.

4.1 Data

Our measure of inflation comes from the Stats SA CPI data, which are available annually by province for the years 2009 to 2021. The price data are supplemented by household survey data from the General Household Survey (GHS), which allows us to

construct provincial aggregates for grant receipt and other relevant variables, as well as Stats SA data on labour market statistics.

The Stats SA inflation data come from the monthly Survey of Consumer (Retail) Prices, which surveys the prices of goods bought by the average household in South Africa. We use CPI measures for all goods and services, as well as specific line items such as food, clothing, housing and health. Stats SA obtains price information from retailers through fieldwork and online collection. The CPI data are collected for all areas and presented in general categories; certain categories are then further separated into subcategories. We use the CPI data for food, housing and utilities, health, and clothing and footwear. Food CPI has been further separated into bread and cereals, meat, fish, milk, eggs and cheese, oils and fats, fruit, vegetables, and sugar, sweets and desserts. We exclude fruit CPI as price data were not collected in every province over the sample period. Clothing and footwear CPI is further separated into clothing and footwear. Housing and utilities CPI is separated into actual rentals for housing, owners' equivalent rent, maintenance and repair, water and other services, and electricity and other fuels. Administered prices such as water, paraffin and electricity have been excluded as their price levels are set by the government.

The Stats SA GHS measures the living circumstances of South African households and is designed to be representative at the provincial level. From 2002 to 2019, survey officers visited and interviewed all the sampled dwelling units in each of the provinces. Interviews were conducted with 25 330 households using the GHS questionnaire, which includes 182 questions on biographical information, economic activities, household information, food security, income and expenditure (Stats SA 2012). On 29 March 2020, Stats SA suspended face-to-face data collection for all its surveys because of the COVID-19 pandemic. Instead, the GHS 2019 sample was reused, and households that provided operational telephone numbers in 2019 were contacted by survey officers. Many households, however, did not provide usable contact numbers in 2019, and as a result, the sample size decreased significantly. The response rates in 2020 decreased from 94% to 39% (Stats SA 2021). This decrease continued into 2021.

We use the GHS to construct measures at the provincial level. To construct these measures, we used the weights provided by Stats SA to aggregate the responses of each household to the provincial level. We construct a measure that estimates the number of recipients of each grant in each province. We construct a measure that estimates provincial population size and composition – we construct population size using the GHS measure for household size, we construct population composition using the GHS responses to the type of geographical area in which the household is located, and we aggregate each household response to represent the province. Provincial GDP is constructed using household income as a proxy. Data on employment rates are taken from Stats SA labour statistics.

The descriptive statistics in Table 1 illustrate the mean, standard deviation, and minimum and maximum values of the variables across all provinces over the 13-year period. As expected, the child support grant is the largest grant in terms of the number of recipients, while the disability grant is the smallest. The child support grant makes up almost 25% of all grants.

Table 1: Descriptive statistics

Variable	Mean	Standard deviation	Min.	Max.
Total grants	1 774 215	993 746	326 920	4 462 132
Old age grant	294 272	158 312	58 367	705 005
Disability grant	70 073	38 737	20 090	208 215
Child support grant	331 622	230 266	57 900	1 040 367
Inflation rate	4.78%	1.18%	2.72%	7.30%
Food inflation	5.51%	3.10%	-1.34%	13.37%
Breads & cereals inflation	4.74%	6.23%	-16.35%	18.60%
Meat inflation	5.87%	4.21%	-4.87%	19.01%
Fish inflation	6.03%	3.71%	-5.59%	18.94%
Milk, eggs & cheese inflation	5.08%	3.63%	-6.17%	11.24%
Oils & fats inflation	4.96%	9.28%	-22.87%	29.05%
Vegetables inflation	5.23%	6.76%	-6.04%	22.12%
Sweets & desserts inflation	7.97%	4.79%	-5.97%	23.13%
Housing & utilities inflation	5.27%	1.88%	1.13%	9.60%
Rentals inflation	3.95%	2.11%	-2.46%	9.36%
Owners' equivalent rent inflation	3.73%	2.04%	-1.82%	8.86%
Clothing & footwear inflation	3.22%	1.86%	0.30%	8.50%
Clothing inflation	3.45%	2.01%	-0.32%	9.08%
Footwear inflation	2.67%	1.84%	-0.64%	8.51%
Health inflation	5.05%	1.39%	1.47%	7.85%
Provincial controls				
Population	5 758 220	3 709 473	1 002 049	17 200 000
Rural population	2 046 754	1 782 895	199 149	6 195 016
Population under 18	2 035 503	1 181 493	361 960	5 538 396
Population over 60	457 516	261 916	85 814	1 229 797
Unemployment rate	27.19	5.2	18.1	43.8

The average inflation rate ranges between 2% and 7%. We see the most variation in the inflation rate, as shown by the standard deviation, in food products, especially sweets and desserts. We find that our constructed provincial variables are consistent with the statistics reported by the South African Social Security Agency (SASSA).[3] We are unable to use the SASSA statistics as the data were not reported from the beginning of our sample period.

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[3]   A comparison of estimates can be found in Annexure A1.

Figure 1 shows the relationship between inflation and grants over time. The inflation rate is relatively similar across provinces. KwaZulu-Natal consistently has more grant recipients than any other province. Grants in South Africa have largely followed a gradual upward trend from 2009 to 2021, indicating that more people in South Africa are receiving social assistance. This can be attributed to several factors, including increased grant uptake, expanded eligibility criteria and an increased need for social assistance. Grant uptake peaked in 2020 as a result of the COVID-19 pandemic, the national lockdown and the introduction of the social relief of distress grant.

Figure 1: Inflation and total grants
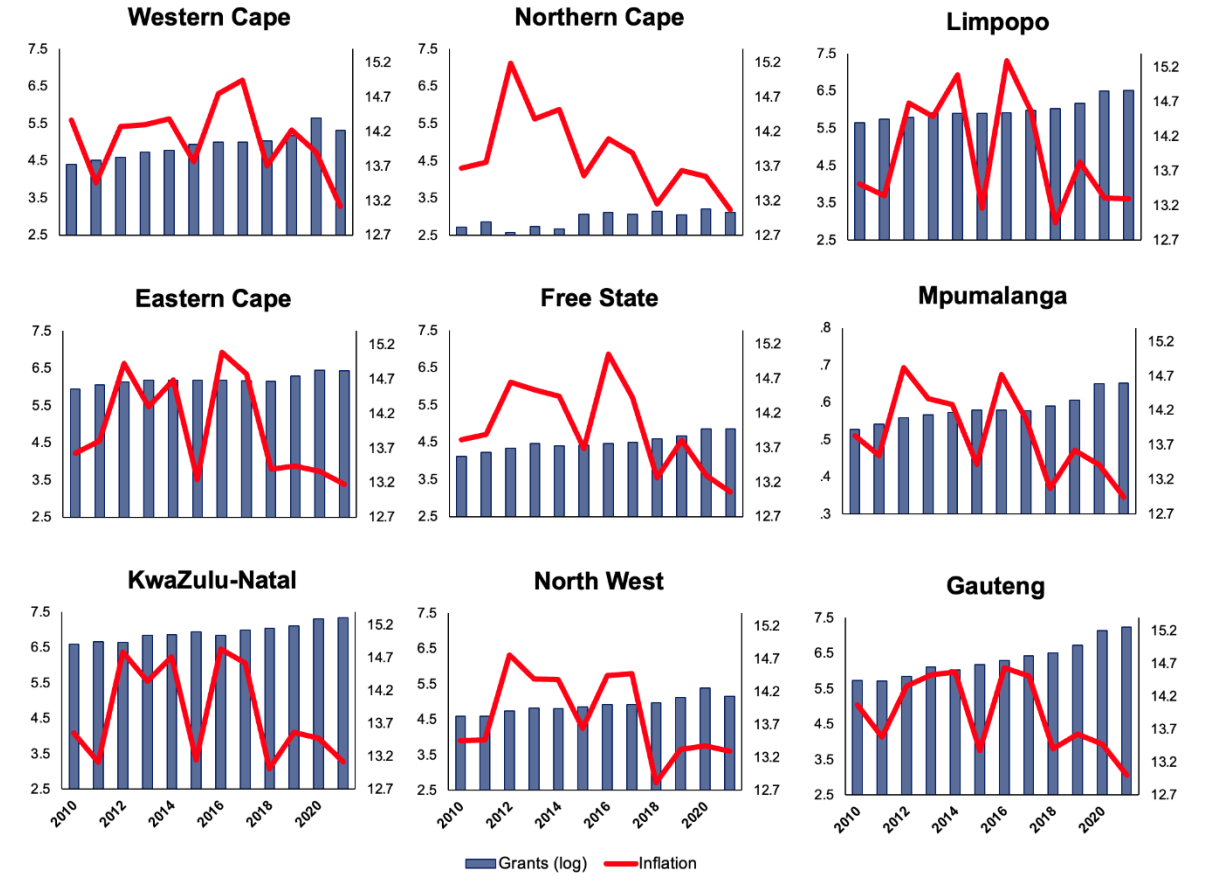
5. Results

Tables 2 and 3 illustrate the results of estimating equations (1) and (2), respectively, on our data over the period 2009–2021. Each row of the tables represents a separate regression using a different inflation measure, $y_{i,t}$. In Table 2, column (1) gives the estimate for δ_1. In Table 3, column (1) gives the estimate for β_1, column (2) for β_2 and

column (3) for β_3. The models produced an R^2 of around 0.5–0.9, indicating that our models account for 50–90% of the changes in inflation within each province over time.[4]

For ease of interpretation in both tables, each coefficient is multiplied by 10, so the effect shown is a 10% increase in the number of grants. A 10% increase constitutes a total increase of 1.8 million grants, with the old age grant increasing by 380 000, the child support grant by 1.3 million and the disability grant by 100 000 over the current grant system's beneficiaries.

Table 2 shows the estimated effect of a 1.8 million increase in grants over the current grant system's beneficiaries. We find no statistically significant effects on the overall inflation rate or on any specific categories. The coefficient estimate in only one of the 17 regressions is statistically significant (footwear) at the 5% level, which is consistent with 5% of tests being significant by chance.

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[4]   The high R^2 is largely due to the year dummies included in the model. Annexure A2 shows the model without the year dummies to illustrate this.

Table 2: The effect on inflation of increased receipt of grants

	(1) All grants	(2) R-squared	(3) Observations
Inflation rate	-0.054	0.881	108
	(0.088)		
Food inflation	0.009	0.882	108
	(0.237)		
Breads & cereals inflation	-0.106	0.895	108
	(0.419)		
Meat inflation	0.368	0.697	108
	(0.353)		
Fish inflation	-1.300	0.509	108
	(0.732)		
Milk, eggs & cheese inflation	0.006	0.856	108
	(0.169)		
Oil inflation	0.312	0.925	108
	(0.628)		
Vegetables inflation	-0.830	0.876	108
	(0.543)		
Sweets & desserts inflation	-0.283	0.812	108
	(0.465)		
Housing & utilities inflation	-0.309	0.640	108
	(0.366)		
Rentals inflation	-0.177	0.492	108
	(0.482)		
Owners' equivalent rent inflation	-0.283	0.440	108
	(0.502)		
Clothing & footwear inflation	-0.234	0.905	108
	(0.171)		
Clothes only inflation	-0.161	0.870	108
	(0.191)		
Shoes inflation	-0.452**	0.828	108
	(0.183)		
Health inflation	0.071	0.734	108
	(0.081)		

Note: For simplicity, the coefficients on the controls have been excluded from the table. The following controls were included: provincial GDP, provincial population, rural population, unemployment rate, the elderly population (for the health specification) and a full set of year dummies.

Robust standard errors in parentheses.

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

Table 3 shows the impact of an increase in the number of each of the three largest grants separately. The results indicate that different grants have different effects, which is largely due to the differences in the grants themselves. The grants are targeted at different populations and are of differing monetary values. The old age grant targets the older population, the child support grant targets the younger population and the disability grant targets people with disabilities that hinder their labour force participation. The child support grant is intended to supplement income to alleviate child poverty. The child support grant is R445 a month, which is roughly 25% the size of the old age grant and the disability grant, which are R1 860 a month. The old age grant is intended to be a state pension; thus the value of the grant must be sufficiently large to cover living expenses. Similarly, the disability grant serves to protect the population that cannot earn a living wage due to disability, so it must be sufficiently large to cover living expenses. We see a significant but relatively small decrease in the inflation rate of all goods and services associated with an increase in receipt of the child support grant. A 10% increase in receipt of the child support grant is associated with a 0.088 percentage point decrease in the inflation rate. While a decrease is unexpected, the effect is likely small as the grant is a reallocation of income from those in richer income deciles to those in poorer income deciles. We expect – rather than see effects in the inflation rate for all goods – that goods in certain categories will see significant price changes as consumption patterns differ across income deciles.

Table 3: The effect on prices of increased receipt of old age grants, child support grants and disability grants

	(1) Child support grant	(2) Old age grant	(3) Disability grant	(4) R-squared	(5) Observations
Inflation rate	-0.088*	-0.035	0.005	0.886	108
	(0.039)	(0.060)	(0.038)		
Food inflation	0.237**	-0.450**	-0.101	0.889	108
	(0.096)	(0.161)	(0.102)		
Bread inflation	0.037	-0.615	-0.117	0.899	108
	(0.123)	(0.341)	(0.242)		
Meat inflation	0.688**	-0.558	-0.144	0.710	108
	(0.240)	(0.471)	(0.136)		
Fish inflation	-0.587	-0.053	0.393**	0.516	108
	(0.318)	(0.677)	(0.135)		
Milk, eggs & cheese inflation	-0.023	-0.059	-0.043	0.857	108
	(0.129)	(0.217)	(0.125)		
Oil inflation	0.130	0.449	-0.155	0.926	108
	(0.345)	(0.404)	(0.155)		
Vegetables inflation	-0.418	-0.534	0.159	0.880	108
	(0.407)	(0.520)	(0.148)		
Sweets & desserts inflation	0.010	0.548	-0.068	0.816	108
	(0.203)	(0.399)	(0.111)		
Housing & utilities inflation	-0.586***	0.428**	0.061	0.690	108
	(0.133)	(0.178)	(0.071)		
Rentals inflation	-0.711***	0.616*	0.098	0.563	108
	(0.167)	(0.302)	(0.114)		
Owners' equivalent rent inflation	-0.668***	0.704**	0.067	0.510	108
	(0.177)	(0.278)	(0.093)		
Clothes & footwear inflation	0.003	-0.038	-0.042	0.904	108
	(0.029)	(0.092)	(0.045)		
Clothes only inflation	0.007	-0.078	-0.005	0.869	108
	(0.042)	(0.110)	(0.057)		
Shoes inflation	-0.065	0.039	-0.095	0.825	108
	(0.141)	(0.203)	(0.076)		
Health inflation	-0.021	-0.077	0.006	0.735	108
	(0.105)	(0.188)	(0.091)		

Note: For simplicity, the coefficients on the controls have been excluded from the table. The following controls were included: provincial GDP, provincial population, rural population, unemployment rate, the elderly population (for the health specification) and a full set of year dummies.

Robust standard errors in parentheses.

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

As discussed in section 2, the two largest categories of spending for the poor are food, and housing and utilities. We expect that an increase in the number of grants targeted at poor households will have an effect on inflation in these categories, and indeed we observe significant effects on food and housing inflation associated with the child support grant, disability grant and old age grant.

Increases in the number of child support grants and disability grants are associated with increases in food inflation. A 10% increase in child support grant receipt is correlated with a 0.237 percentage point increase in the inflation rate for food. A large and significant increase is seen in the inflation rate for meat products, which increases by 0.688 percentage points. A 10% increase in disability grant receipt is associated with a 0.393 percentage point increase in the inflation rate for fish products. A 10% increase in old age grant receipt is associated with a 0.428 percentage point increase in the housing and utilities inflation rate, driven by an increase in the rentals inflation rate of 0.616 percentage points and an increase in the owners' equivalent rent inflation rate of 0.704 percentage points.

Interestingly, we also observe some negative effects on inflation. A 10% increase in child support grant receipt is correlated with a 0.586 percentage point decrease in the inflation rate for housing and utilities. A 10% increase in child support grant receipt is correlated with a 0.711 percentage point decrease in the inflation rate for rentals and a 0.668 percentage point decrease in the inflation rate for owners' equivalent rent. A 10% increase in old age grant receipt is associated with a 0.45 percentage point decrease in the food inflation rate.

Thus, it appears that the old age grant and child support grant have opposing effects on inflation. We test whether these effects counteract each other by testing if $\beta_1 + \beta_2 = 0$, and find that we cannot reject the null hypothesis. Thus, the overall inflationary effect of both grants is neutral.

The opposing effects are likely due to the composition of households receiving the grants and the size of the grants themselves. The old age grant is associated with larger household sizes (Lund 2002); thus, households are able to pool income, enabling them to spend on more expensive goods. Additionally, there is evidence that

households that receive pensions are more likely to spend them on productive assets. Lund (2002) finds that rural beneficiaries often use grant income to acquire credit and promote savings.

Findings from Ardington and Lund (1995) show that, broadly, the old age grant allows people to invest in consumer durables and improve housing. A report published in 2009 that tracked households receiving grants from 2005 to 2009 found evidence that those who received the old age grant upgraded their housing and invested in housing-related assets (Neves et al. 2009). Due to the generous value of the old age grant, households were able to secure credit to buy furniture or invest in building materials to upgrade housing. On the other hand, studies comparing child support grant recipients and matched households that have individuals who are eligible for a child support grant but do not receive it show differential levels of food expenditure (Delany et al. 2008). Households that receive the child support grant will generally spend this extra income on food.

The finding of only one significant effect for the disability grant increase could be due to the nature of the grant. The grant, while the same amount as the old age grant, is relatively small in terms of reach. The increase in receipt of the disability grant is under a tenth of the increase in receipt of the child support grant and almost a quarter of the increase in receipt of the old age grant. This is corroborated by the evidence in a study by Filmer et al. (2023), who found that price effects are more likely to be seen when a grant is sizeable and widespread. Additionally, the disability grant is not as well targeted as the child support grant and the old age grant: the disability grant is received by individuals in higher income groups (Inchauste et al. 2015). The means test is relatively less stringent, and the grant is received on a permanent or temporary basis, depending on the disability. If the grant is less targeted, this may distort the results as higher-income individuals have different consumption patterns. It is therefore less likely that the price effects of redistribution of income would be observed for the disability grant.

Inflationary effects on food items associated with grant receipt can be explained by the market for fish and meat products and the income elasticities of these goods. Burger et al. (2015) show that protein-rich food items have higher estimated income

elasticities, thus consumption increases as income increases. The presence of a significant effect on the inflation rate for meat products with increased child support grant receipt could be due to people spending more money on protein-rich goods if they receive the child support grant. The same is true for the increase in the fish inflation rate associated with the increase in disability grant receipt. This echoes the research by Matata et al. (2021), which found that receipt of cash transfers is correlated with households moving away from starch-based foods and towards proteins. The increase in the price of these specific products could be attributed to child support grant and disability grant beneficiaries diversifying their diets.

A final potential reason for this increase is that meat and fish products are perishable items. Similar to the findings of Filmer et al. (2023), we see that perishable items increase significantly with an increase in grant recipients. The supply of perishable items is inelastic in nature, thus increased demand is likely to have the effect of increasing prices.

We also observe significant effects in housing, which is a supply-constrained market as there are regulations that increase the cost of building and acquiring a house. In addition, there are geographic limitations to building houses (Paciorek 2011). Receiving more income from grants may increase housing improvements, demand for rentals and demand for housing. Egger et al. (2019) illustrate that when supply can meet the corresponding increased demand, there is less likelihood of inflationary effects. The converse is true: if the market supply of housing and utilities cannot meet the increased demand, prices may rise.

6. Conclusion

We have examined the relationship between existing social grants and prices, highlighting several key findings. We observe that there are significant price effects on the goods and services consumed by individuals in the poorest deciles in South Africa. This can likely be attributed to the redistributive nature of the current social grant system.

We find distinct effects attributable to the differing nature and target populations of these grants. The child support grant, aimed at alleviating child poverty, demonstrates

a modest but significant decrease in the overall inflation rate. However, specific categories exhibit noteworthy impacts. Increases in receipt of the child support grant and disability grant are associated with higher food inflation, while receipt of the old age grant is correlated with increased housing and utilities inflation. These price increases are particularly evident in markets with inelastic supply, where the demand for goods and services outpaces their supply. Perishable items have been found to be more susceptible to price changes.

We also find negative inflationary effects. The child support grant is linked to a decrease in housing and utilities inflation, particularly in rentals and owners' equivalent rent. Receipt of the old age grant correlates with a decrease in food inflation. Thus, the child support grant and old age grant display opposing effects on housing inflation, generating a neutral overall inflationary impact when considering both grants simultaneously. These opposing effects are attributed to household compositions and grant sizes. Larger households associated with old age grants spend money on pricier goods, while recipients of the child support grant predominantly allocate extra income to food expenses.

Consistent with the existing literature, our results show that the magnitude of a grant has an impact on the likelihood of observing price effects. Larger grants tend to exert a more pronounced influence on prices. Additionally, we find that grants targeted at larger proportions of the population are more likely to result in price increases.

We find that an expansion in the number of social grants could increase prices. This has implications for the introduction of a basic income grant, a long-debated topic in South Africa. More topically, it has implications for the nature of the COVID-19 social relief of distress grant. Discussions about making this grant permanent need to take into account how it will affect prices.

Expanding the social welfare system while aiming to alleviate poverty could negatively impact consumers by increasing prices. Price increases are especially problematic for consumers in lower income deciles, as they will experience price increases in their largest expenditure categories. Price increases caused by the expansion of the social

welfare system have significant monetary policy implications, as policy institutions will have to mitigate inflationary effects.

However, we reiterate that our analysis only establishes correlation and not causation, given the complex dynamics surrounding social grants and prices. The ideal analysis will establish causal relationships, which would provide more robust insights into the mechanisms at work. Financing is a significant concern of social protection. Exploring the effects of tax increases and public debt on price dynamics is crucial for policymakers to make informed decisions about the implementation and sustainability of social grant programmes. Our findings also highlight the nuanced and category-specific impacts of grant increases on inflation, emphasising the need to consider grant characteristics and recipient behaviours. The observed opposing effects reflect the intricate dynamics shaping the inflationary consequences of social grants.

Annexures

A1.1: Comparison of constructed GHS estimates and SASSA published estimates

Year	Province	SASSA	GHS	Difference
2018	WC	1 565 731	1 287 331	-17.78%
2018	EC	2 785 534	2 354 773	-15.46%
2018	NC	475 414	462 903	-2.63%
2018	FS	1 005 170	1 016 876	1.16%
2018	KZN	3 887 365	3 809 157	-2.01%
2018	NW	1 228 597	1 245 509	1.38%
2018	GP	2 612 513	2 861 701	9.54%
2018	MP	1 472 355	1 571 603	6.74%
2018	LP	2 477 316	2 191 441	-11.54%

A1.2: Comparison of constructed GHS estimates and SASSA published estimates

Source: SASSA & GHS

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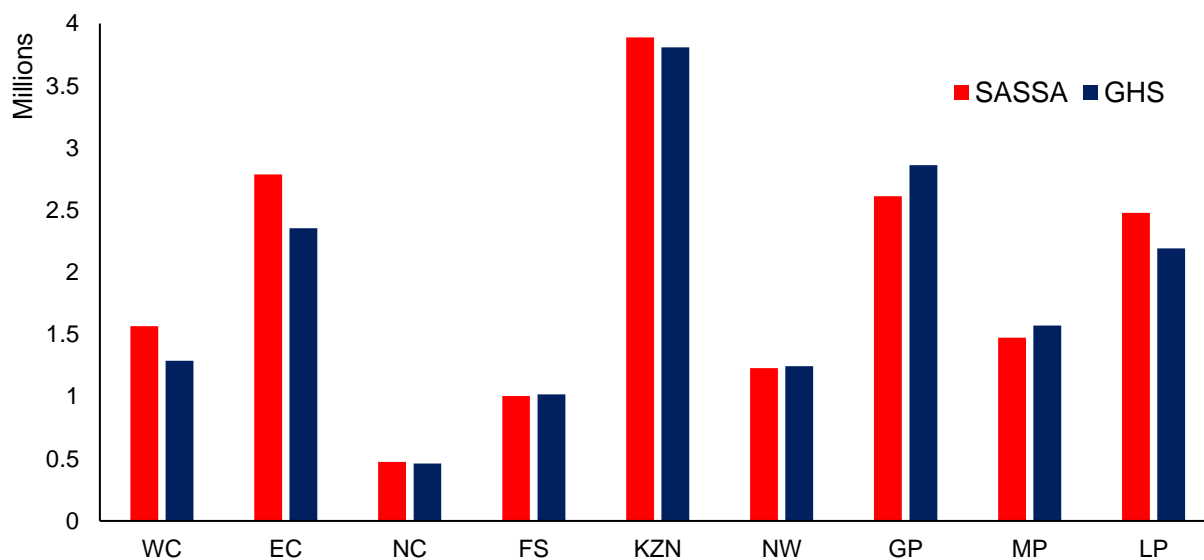
A2: Model (2) without the inclusion of the year dummies

	(1) Child support grant	(2) Old age grant	(3) Disability grant	(4) R-squared	(5) Observations
Inflation rate	0.088	-0.362*	-0.032	0.221	108
	(0.155)	(0.161)	(0.077)		
Food inflation	1.020	-0.927	-0.306	0.106	108
	(0.624)	(0.598)	(0.222)		
Bread inflation	1.142	-1.058	-0.632	0.044	108
	(0.839)	(0.765)	(0.517)		
Meat inflation	1.254	-0.881	-0.246	0.072	108
	(0.924)	(0.919)	(0.262)		
Fish inflation	0.039	-0.031	0.329	0.108	108
	(0.380)	(0.386)	(0.257)		
Milk, eggs & cheese inflation	0.919*	-0.933*	0.091	0.084	108
	(0.473)	(0.482)	(0.189)		
Oil inflation	1.973	-0.314	-0.939*	0.062	108
	(1.246)	(0.952)	(0.439)		
Vegetables inflation	0.793	-1.015	0.014	0.081	108
	(0.884)	(0.799)	(0.472)		
Sweets & desserts inflation	0.002	-0.266	-0.226	0.058	108
	(0.625)	(0.793)	(0.222)		
Housing & utilities inflation	-0.567**	-0.409	0.107	0.501	108
	(0.175)	(0.221)	(0.083)		
Rentals inflation	-0.643*	-0.071	0.165**	0.410	108
	(0.297)	(0.262)	(0.071)		
Owners' equivalent rent inflation	-0.566	-0.027	0.157*	0.358	108
	(0.317)	(0.289)	(0.077)		
Clothes & footwear inflation	0.135	-0.483*	0.021	0.152	108
	(0.254)	(0.235)	(0.199)		
Clothes only inflation	0.133	-0.495	0.036	0.143	108
	(0.301)	(0.281)	(0.209)		
Shoes inflation	0.081	-0.412*	0.009	0.113	108
	(0.198)	(0.180)	(0.191)		
Health inflation	-0.375	-0.195	0.084	0.281	108
	(0.220)	(0.330)	(0.087)		

Note: For simplicity, the coefficients on the controls have been excluded from the table. The following controls were included: provincial GDP, provincial population, rural population, unemployment rate, the elderly population (for the health specification).

Robust standard errors in parentheses.

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

References

Aker, J C, Boumnijel, R, McClelland, A and Tierney, N. 2016. 'Payment mechanisms and antipoverty programs: evidence from a mobile money cash transfer experiment in Niger'. *Economic Development and Cultural Change* 65(1): 1–37.

Angelucci, M and De Giorgi, G. 2009. 'Indirect effects of an aid program: how do cash transfers affect ineligibles' consumption?' *American Economic Review* 99: 486–508.

Ardington, E and Lund, F. 1995. 'Pensions and development: social security as complementary to programmes of reconstruction and development'. *Development Southern Africa* 12(4): 557–577.

Baker, S R, Sun, S T and Yannelis, C. 2020. 'Corporate taxes and retail prices'. National Bureau of Economic Research Working Paper No. 27058.

Beegle, K, Galasso, E and Goldberg, J. 2017. 'Direct and indirect effects of Malawi's public works program on food security'. *Journal of Development Economics* 128: 1–23.

Bhorat, H, Oosthuizen, M and Stanwix, B. 2021. 'Social assistance amidst the COVID-19 epidemic in South Africa: a policy assessment'. *South African Journal of Economics* 89(1): 63–81.

Bildirici, M and Ersin, O O. 2007. 'Domestic debt, inflation and economic crises: a panel cointegration application to emerging and developed economies'. *Applied Econometrics and International Development* 7(1): 31–47.

Burger, R, Coetzee, W, Kreuser, F and Rankin, N. 2015. 'Income and price elasticities of demand in South Africa: an application of the linear expenditure system'. WIDER Working Paper 2015/100. Helsinki: UNU-WIDER.

Case, A and Deaton, A. 1998. 'Large cash transfers to the elderly in South Africa'. *The Economic Journal* 108(450): 1330–1361.

Centre for Development and Enterprise. 2022. 'Poverty and a basic income grant: six questions about a BIG'.
https://www.cde.org.za/wp-content/uploads/2022/06/BIG-full-report-pdf.pdf.

Cunha, J M, De Giorgi, G and Jayachandran, S. 2019. 'The price effects of cash versus in-kind transfers'. *Review of Economic Studies* 86: 240–281.

Dedola, L, Osbat, C and Reinelt, T. 2022. 'Tax thy neighbour: corporate tax pass-through into downstream consumer prices in a monetary union'. European Central Bank Working Paper No. 2681.

Delany, A, Ismail, Z, Graham, L and Ramkissoon, Y. 2008. 'Review of the child support grant: uses, implementation and obstacles'. Johannesburg: Community Agency for Social Enquiry.

Egger, D, Haushofer, J, Miguel, E, Niehaus, P and Walker, M W. 2019. 'General equilibrium effects of cash transfers: experimental evidence from Kenya'. National Bureau of Economic Research Working Paper No. 26600.

Fedderke, J and Liu, Y. 2018. 'Inflation in South Africa: an assessment of alternative inflation models'. *South African Journal of Economics* 86(2): 197–230.

Filmer, D, Friedman, J, Kandpal, E and Onishi, J. 2023. 'Cash transfers, food prices, and nutrition impacts on ineligible children'. *The Review of Economics and Statistics* 105(2): 327–343.

Fuest, C, Peichl, A and Siegloch, S. 2018. 'Do higher corporate taxes reduce wages? Micro evidence from Germany'. *American Economic Review* 108(2): 393–418.

Gentilini, U, Grosh, M, Rigolini, J and Yemtsov, R (eds). 2020. *Exploring universal basic income: a guide to navigating concepts, evidence, and practices.* Washington, DC: World Bank.

Handa, S, Daidone, S, Peterman, A, Davis, B, Pereira, A, Palermo, T and Yablonski, J. 2018. 'Myth-busting? Confronting six common perceptions about unconditional cash transfers as a poverty reduction strategy in Africa'. *World Bank Research Observer* 33(2): 259–298.

Harris, B H. 2009. 'Corporate tax incidence and its implications for progressivity'. Urban Institute and Brookings Institution Tax Policy Center.

Hollander, H, Havemann, R and Steenkamp, D. 2022. 'The macroeconomics of establishing a basic income grant in South Africa'. ERSA working paper no. 881.

Hyslop, D. 2014. 'The distributional effects of the Australian cash bonus payments response to the Global Financial Crisis'. Wellington: University of Wellington.

Inchauste, G, Lustig, N, Maboshe, M, Purfield, C and Woolard, I. 2015. 'The distributional impact of fiscal policy in South Africa'. World Bank Policy Research Working Paper 7194.

Intellidex. 2022. 'What funding options are possible for BIG?'

Jones, D and Marinescu, I. 2022. 'Universal cash transfers and inflation'. *National Tax Journal* 75(3): 627–653.

Kemp, J H. 2019. 'The elasticity of taxable income: the case of South Africa'. *South African Journal of Economics* 87(4): 417–449.

Kwon, G, McFarlane, L and Robinson, W. 2006. 'Public debt, money supply, and inflation: a cross-country study and its application to Jamaica'. IMF Working Papers, 2006/121.

Le Roux, P. 2002. 'Financing a universal income grant in South Africa'. *Social Dynamics* 28(2): 98–121.

Lloyd-Sherlock, P, Agrawal, S and Gómez-Olivé, F X. 2020. 'Pensions, consumption and health: evidence from rural South Africa'. *BMC Public Health* 20(1): 1–10.

Lopes da Veiga, J A, Ferreira-Lopes, A and Sequeira, T N. 2016. 'Public debt, economic growth and inflation in African economies'. *South African Journal of Economics* 84(2): 294–322.

Lund, F. 2002. '"Crowding in" care, security and micro-enterprise formation: revisiting the role of the state in poverty reduction and in development'. *Journal of International Development* 14(6): 681–694.

Matata, M J, Ngigi, M W, Bett, H K and Michael, P M. 2022. 'Effects of cash transfers on food expenditure patterns in northern Kenya'. *Cogent Food & Agriculture* 8(1).

National Treasury. 2009. *Budget review 2009*.

National Treasury. 2021. *Budget review 2021*.

National Treasury. 2023. *Budget review 2023*.

Neves, D, Samson, M, van Niekerk, I, Hlatshwayo, S and du Toit, A. 2009. *The use and effectiveness of social grants in South Africa.* Institute for Poverty, Land and Agrarian Studies and Economic Policy Research Institute.

Paciorek, A. 2013. 'Supply constraints and housing market dynamics'. *Journal of Urban Economics* 77: 11–26.

Pesaran, M H and Smith, R. 1995. 'Estimating long-run relationships from dynamic heterogeneous panels'. *Journal of Econometrics* 68(1): 79–113.

Phillips, P and Moon, H R. 1999. 'Linear regression limit theory for non-stationarity panel data'. *Econometrica* 67(5): 1057–1112.

Reinhart, C M and Rogoff, K S. 2010. 'Growth in a time of debt'. *American Economic Review* 100(2): 573–578.

Statistics South Africa. 2022a. 'National poverty lines'. Statistical release.

Statistics South Africa. 2022b. 'Consumer price index (CPI) 2019 weights'. Statistical release.

Tanzi, V. 1982. 'Tax increases and the price level: higher taxes may not reduce inflation'. *Finance & Development* 19(3): 27–30.

The Economist. 2011. 'Throwing money at the street'. 10 March.

Triyana, M. 2016. 'Do health care providers respond to demand-side incentives? Evidence from Indonesia'. *American Economic Journal: Economic Policy* 8(4): 255–288.

Yang, Z, Norton, E C and Stearns, S C. 2003. 'Longevity and health care expenditures: the real reasons older people spend more'. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences* 58(1): S2–S10.

Woolard, I. 2003. 'Social assistance grants, poverty and economic growth in South Africa'. *TIPS Forum 2003 Papers.* Paper presented at TIPS/DPRU conference, Johannesburg, 8–10 September.

Woolard, I and Leibbrandt, M. 2013. 'The evolution and impact of unconditional cash transfers in South Africa'. In *Annual World Bank conference on development economics – global, 2011: development challenges in a postcrisis world*, edited by C Sepúlveda, A Harrison and J Yifu Lin. Washington, DC: World Bank. 363–384.

World Bank. 2018. *The state of social safety nets 2018.* Washington, DC.