



What we talk about when we talk about saving: Concepts and measures of household saving and their application to South Africa

Anna Orthofer

ERSA working paper 530

July 2015

Economic Research Southern Africa (ERSA) is a research programme funded by the National Treasury of South Africa.

The views expressed are those of the author(s) and do not necessarily represent those of the funder, ERSA or the author's affiliated institution(s). ERSA shall not be liable to any person for inaccurate information or opinions contained herein.

WHAT WE TALK ABOUT WHEN WE TALK ABOUT SAVING:
CONCEPTS AND MEASURES OF HOUSEHOLD SAVING
AND THEIR APPLICATION TO SOUTH AFRICA

Anna Orthofer*

Stellenbosch University

This draft: 5th July 2015

South African household savings rates have been declining steadily over the last five decades, from about ten percent of national income to nil or negative levels today. Due to the importance of savings on both the household- and aggregate level, the government has introduced several initiatives to reverse the trend. It is against this background that this paper asks whether our current way of measuring savings as the residual between income and expenditure is appropriate to guide economic policy in South Africa. Comparing different macroeconomic concepts and measurements of savings, I first show that the measure of savings in the national income and production accounts greatly understates the household savings rate compared to other measures. Specifically, a balance-sheet perspective on savings yields a significantly higher and historically relatively stable savings rate. While households haven't been "putting aside" their incomes, they have nevertheless grown richer, driven largely by favourable asset price developments. I also examine the impact of taking non-financial savings and wealth (such as human capital accumulation) into account, and conclude that household sector savings on the aggregate are higher than the national accounts suggest. However, these adjusted measures of savings are most relevant for the upper tail of the income and wealth distribution, raising important distributional concerns. Specifically, the well-documented observation that the rich save more becomes even more pronounced when the adjusted savings measures are considered. Overall, this paper underscores the importance of being precise in what we talk about when we talk about savings, and in using less conventional data sources (balance sheet and household survey data) to measure the concepts most relevant to the question asked.

JEL Classification: E01, E21, D31

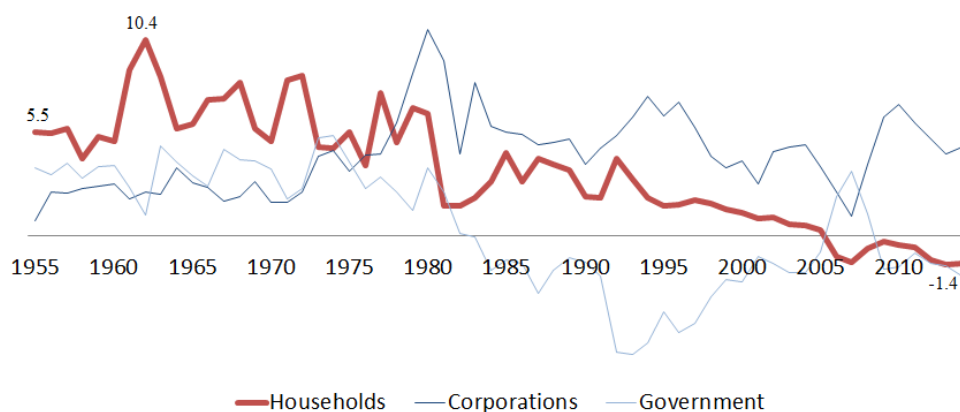
Keywords: Saving; Wealth; Measurement and Data; National Income Accounting; Income and Wealth Distribution

*Anna Orthofer (anna.orthofer@gmail.com) is a PhD candidate at the Department of Economics of Stellenbosch University. This work was supervised by Stan du Plessis and Dieter von Fintel, whom I wish to thank for extensive discussions and invaluable comments. I also wish to thank Nicolaas van der Wath and Karen Kuhn for their guidance on navigating the South African national accounts.

1 INTRODUCTION

A look at the South African national accounts suggests that South African households save worryingly little. Household savings rates have been declining steadily over the last fifty years, from about ten percent of GDP to almost nothing today. In net terms, household savings rates have been in negative territory for almost a decade, meaning that they are insufficient to replace even existing capital, let alone fund new investment (see figure 1). While low levels of savings are widespread across sub-Saharan Africa, the South African situation is in stark contrast to that of the fast-growing Asian economies, where household savings rates in excess of twenty or thirty percent of GDP have often been associated with the successful transition to more dynamic economies (Commission on Growth and Development, 2008).²

Figure 1: *Savings rates by institutional sector, net, % of GDP. Annual data. Source: South African Reserve Bank, author's calculations.*



In response to these trends, the South African government has launched a number of initiatives to enhance the country's saving culture, most recently through the introduction of tax-free savings accounts in March 2015. The government's concern about savings is founded on both micro- and macro-level considerations. On the household level, the low savings rate means that households are vulnerable to unexpected losses or expenses, and will face challenges to maintain their living standards during retirement. On the aggregate level, the failure of the household sector to contribute to the aggregate savings pool increases the reliance on foreign capital inflows to finance domestic investments. This is thought to carry the risks of higher macroeconomic volatility and a less

²The *Growth Report* led by Michael Spence and Robert Solow identified high savings and investment rates as one of the five main ingredients of the successful postwar growth economies, and points out that 'there is no case of a sustained high investment path not backed up by high domestic savings' (Commission on Growth and Development, 2008, p.21-22,54). While the direction of causality between savings and investment is generally controversial (see, for instance, Carroll and Well, 1993; Schmidt-Hebbel et al., 1996; Deaton, 1999), it has been argued that savings may be causally related to growth in developing countries as they allow domestic banks to co-finance projects and thus attract foreign investments (Aghion et al., 2006). Since the global financial crisis, a relatively new literature on money creation has come to question even this argument, noting that banks can finance projects without pre-existing savings (see Jakab and Kumhof, 2015). Among academics and practitioners in economic development, however, savings continue to attract considerable attention.

competitive market structure, as larger companies have better access to foreign capital than smaller ones (National Planning Commission, 2012).

Given the prominence of the savings debate in South Africa, it is surprising how little attention is currently paid to understanding what exactly we are measuring as savings in the national accounts. Saving is by no means an unequivocally defined concept, and different measures yield vastly different results. The most commonly used metric (according to which household savings are nil or negative) stems from the national income statements, where savings are calculated as the residual between disposable income and consumption expenditures. If, instead, we look at the balance sheet side of the national accounts, we find that real household wealth increased by five to ten percent of GDP per year over the last decades – a rather different result than the savings debate suggests. Our assessment of the level of household savings also changes when we consider investments in physical, human and environmental capital in addition to pure financial savings and wealth; an adjustment that would add another three to seven percentage points to the conventionally measured savings rate.

Although one specific measure of savings dominates contemporary empirical analyses, it is not clear that it is the one measure that corresponds most closely to the theoretical concepts we try to investigate. Nor would that be true for the alternative measures of savings. Instead, the variety of questions asked by economists and economic policymakers—whether low levels of household savings cause a reliance on foreign capital, to what extent households are prepared to absorb unexpected losses and expenses in the short run or retire in the long run, and whether their savings behaviour corresponds to our models, to name but a few—calls for different concepts and measures of savings.

The insight that there is no universal or correct measure of savings is by no means new. The literature on concepts and measurement of savings dates back to Henry Simons (1938), John Hicks (1939), Raymond Goldsmith (1955) and Milton Friedman (1957), and was revived in the 1980s and 1990s through a large number of empirical studies on the decline in the American household savings rate (see, for instance, Blades and Sturm, 1982; Boskin, 1991; Browning and Lusardi, 1996; Gale et al., 1999; Perozek and Reinsdorf, 2002). A number of recent studies on different measures of savings have also been conducted by the National Treasury of New Zealand (most recently by Gorman et al., 2013), one of the countries with the lowest household savings rates among the high-income economies.

This paper contributes to a synthesis of the conceptual insights of the existing literature (in sections 2 – 5) and to a careful implementation and interpretation of the relevant adjustments for the South African household sector (in section 6). Although this paper does not seek to explain the determinants of the South African household savings rate, it is thus related to the few existing studies on household savings behaviour in South Africa (see, specifically, Aron and Muellbauer, 2000). In addition, this paper also links the established literature on the concepts and measures of savings to the newer literature on balance sheet variables in macroeconomics. While the aforementioned American studies already discussed the discrepancy between measures of savings and wealth in the 1980s, comprehensive sectoral wealth data were only gradu-

ally introduced outside the United States in the late 1990s and early 2000s, and received widespread attention only after the global financial crisis of 2007/2008 and the publication of Piketty’s *Capital in the 21st Century* in 2013/2014 (Piketty, 2014; Piketty and Zucman, 2014; Saez and Zucman, 2014). For South Africa, the first retrospective household sector balance sheets were released in 2006 (Aron et al., 2006a,b), and while the full integration into the national accounts is still ongoing, South Africa remains the only emerging market with complete household sector balance sheets to date (Stierli et al., 2014). To my knowledge, this paper is thus the first to attempt a reconciliation between the savings and wealth measures in an emerging market. In this sense, it can also serve as a test for the internal consistency of the current national accounting framework and guide the ongoing integration of the balance sheets in the future.

2 TWO PERSPECTIVES ON SAVINGS

2.1 FLOW AND STOCK CONCEPTS OF SAVINGS

There are two conceptual approaches to defining household saving. The first concept views savings as the proportion of resources that accrue to a household over any given period of time, but are not spent on consumption within that same period. This notion of savings corresponds to the common usage of the word *saving* as a verb; such as in “saving money on groceries” or in “saving for retirement”. The second concept, in contrast, views savings as the accumulation of wealth—the value of all assets net of all debts—between the beginning and the end of a specific period. In common language, the use of the word *savings* as a noun—such as in “retirement savings” or in “savings for a rainy day”—expresses this view of saving as the accumulation of wealth.

The two concepts are of course closely related: In accordance with the logic of double-entry bookkeeping, savings ‘supplied’ through restraint on consumption must be ‘used’ to build up one’s assets or pay down one’s debts. To highlight this relationship, the relevant literature often refers to the two concepts as ‘flow’ and ‘stock’ or ‘source’ and ‘use’ concepts of saving.³ Abbreviating them as S_F and S_S , respectively, and letting Y_t denote available resources, C_t consumption expenditure, and W_t wealth in period t , the two concepts can be written as:

$$S_{F,t} = Y_t - C_t \qquad s_{f,t} = S_{F,t}/GDP_t \qquad (1)$$

$$S_{S,t} = W_t - W_{t-1} = \Delta W_{t-1} \qquad s_{s,t} = S_{S,t}/GDP_t \qquad (2)$$

Whilst the stock concept of savings is generally considered to represent the pure theoretical view of savings as defined by Classical economists (see Hicks, 1939; Thuronyi, 1990), the flow concept has come to dominate the empirical work in post-war, pre-crisis macroeconomics. This is largely due to the mundane issue of data availability, owing to the way in which national accounts are constructed. Although national wealth was

³Provided, of course, that they are not destroyed or transferred to others instead. Both possible alternative ‘uses’ for household sector savings—unreciprocated capital transfers to foreigners or other institutional sectors, or the destruction of these funds—are, however, generally small. Alternative notations in the literature include ‘financial’ and ‘economic’, ‘active’ and ‘passive’ or ‘NIPA’ and ‘Balance Sheet’ concepts of savings.

at the centre of economic analyses before the first World War, the Great Depression and the Keynesian revolution in macroeconomics turned the focus of economists and statisticians towards short-term income and expenditure flows instead (Piketty, 2014).

It took forty years until the System of National Accounts (SNA)—the international accounting standards first published by the United Nations in 1953—included recommendations on the compilation of balance sheet accounts. While flow measures of saving have thus been available ‘off-the-shelf’ to economists for decades, wealth data (which allow the calculation of the stock measure of savings) have only recently become available in most countries. In South Africa, retrospective household balance sheets were first released in 2006 (Aron et al., 2006a,b). Until today, the country remains the only emerging market to publish such data (Stierli et al., 2014).

If the two concepts of savings yielded similar empirical measures, the predominance of the flow concept in empirical analyses would be of little interest. However, a substantial literature notes that the annual increase in wealth tends to exceed the flow measure of savings by a wide margin (see, for example, Peach and Steindel, 2000; Perozek and Reinsdorf, 2002; Scobie and Henderson, 2009; Gorman et al., 2013). As figure 2 shows, this is also the case in South Africa: While the flow measure of savings has been declining for five decades towards levels around zero today, the stock measure of savings is much higher and—although much more volatile—exhibits no clear downward trend. While South Africans thus spend their entire disposable income on the consumption of goods and services, they nevertheless get collectively wealthier – by more than twenty percent of GDP per year since 1975 in nominal terms, or by 6.5 of GDP on average in real terms (see section 6.2 for a detailed discussion).⁴ Real household savings as defined in the flow view account for only fifteen percent of the increase in real household wealth between 1975 and 2014. This discrepancy points to the importance of household wealth dynamics that are not reflected in current-period household saving figures.

2.2 EXPLAINING THE DISCREPANCY

The discrepancy between the flow and stock measure of savings can easily be traced to the rules of national accounting. Under the SNA, household saving is calculated as the residual between disposable income and final consumption expenditure, as recorded in the National Income and Production Accounts (NIPA) for the household sector. The change in household wealth on the balance sheets, in turn, contains not only this ‘savings-induced’ increase in wealth, but also the change in the value of the existing stock of assets as well as the change in the quantity of assets due to capital transfers or

⁴In nominal terms, the annual increase in net wealth was 22.6 percent on average between 1975 and 2014; in real terms (using both net wealth and GDP at constant consumer prices), the equivalent figure is 6.5 percent of GDP. Inflation averaged 9.8 percent per year over the forty-year period. Note that the difference in the order of magnitude is due to the fact that household wealth stands at more than 200 percent of GDP. Taking the numerator only, net wealth increased by 13.3 percent per year in nominal and 3.5 percent per year in real terms. Note also that we compare S_S to the net rather than the gross measure of S_F , meaning that the consumption of fixed capital (‘depreciation’) is excluded from the savings figure: Since the Balance Sheets value household assets at fair value, depreciation is implicitly taken into account in S_S . Comparing S_S to a gross measure of S_F would thus overstate the latter relative to the former.

other factors such as destruction or discovery:

$$S_{S,t}^{BS} = S_{F,t}^{NIPA} + \frac{\Delta P_t}{P_{t-1}} \times W_{t-1} + K_t + O_t \quad (3)$$

In a fully integrated system of national accounts, the latter three elements are recorded in the accumulation accounts, which link the NIPA and the balance sheet as illustrated in figure 3. While these accumulation accounts are still under construction for South Africa, the figures from other countries suggest that asset revaluations are by far the most important of the three.

Asset revaluations—also referred to as unrealized capital gains or holding gains (or losses)—occur when asset prices increase or decrease over time. In contrast to interest, dividends and rents (which are recorded as incomes in the NIPA and are thus reflected in S_F and S_S alike), asset revaluations are ‘paper profits’ that affect the balance sheet but not the income statement, thus driving S_S away from S_F . Even when the gains materialize as assets are sold at a higher price, they remain unaccounted for in the income statement and excluded from S_F . Since asset revaluations affect primarily real estate and stocks, the importance of the ‘revaluation effect’ in household wealth dynamics depends on the importance of these asset classes in household portfolios as well as on the development of house and stock prices over time: In periods of booming asset prices, in particular, the wealth dynamics of households with real estate assets and stock portfolios can become largely disconnected from their savings as measured in the NIPA.⁵

2.3 WHICH CONCEPT IS MORE RELEVANT?

The large and persistent discrepancy between the flow and the stock measure of savings raises the question which of the two concepts is more relevant. It is clear that the answer depends largely on the question that is being asked in the first place. When studying savings in the context of investment volumes and current account imbalances—flow variables themselves—the flow measure is generally the appropriate counterpart.⁶ When asking to what extent households can weather unemployment or retirement, in contrast, their wealth position (and composition) presumably plays an important role. In studies on household saving behaviour, again, it is important to take an approach that reflects what households themselves have in mind when making spending decisions. The question what households consider as their available resources is, however, by no means unequivocal.

⁵Note that increases in stock prices should largely reflect retained profits, i.e. corporate savings. While household wealth can thus become disconnected from *household* savings, it should be more closely associated with *household and corporate* savings taken together. This will be discussed in section 4.

⁶Note, however, that stock variables are common in modern international macroeconomics, more so even than in domestic analyses. In the international accounts, the Balance of Payments (BoP) captures the flow variables (the transactions between residents and nonresidents over a specific period of time) while the International Investment Position (IIP) records the corresponding stocks (the claims on and liabilities to nonresidents at any specific point in time). As in the case of the national accounts, a set of accumulation accounts links the two sides of the international accounts by including changes in assets and liabilities that are not captured in the BoP (such as revaluations), and as in the case of the national accounts, these changes are often substantial (International Monetary Fund, 2009).

Figure 2: Flow- and stock measures of household savings rates, net, % of GDP. Top chart: nominal increase in wealth over GDP; Bottom chart: real increase in wealth over real GDP (2000 CPI = 100). Source: South African Reserve Bank National Accounts data, author's calculations.

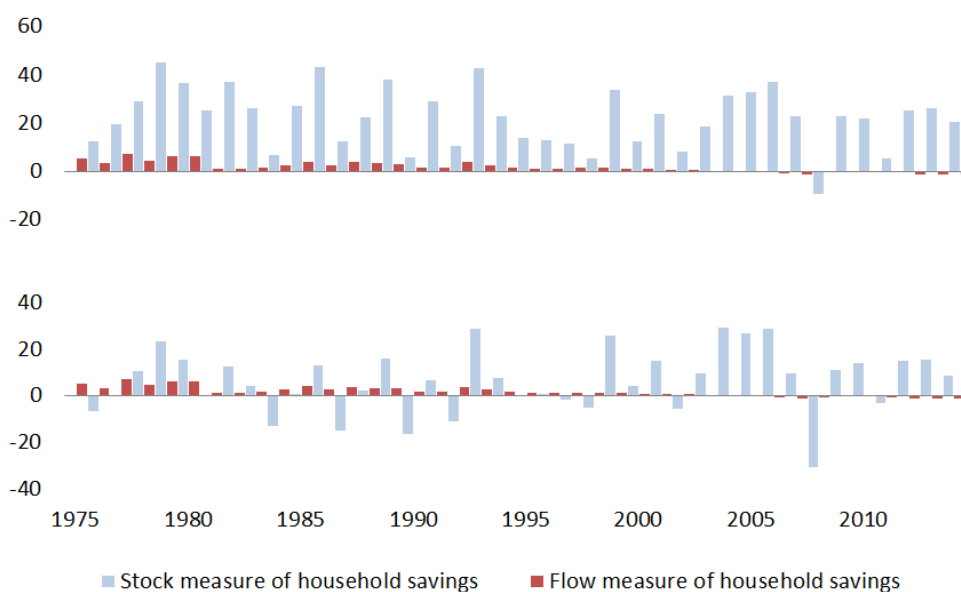
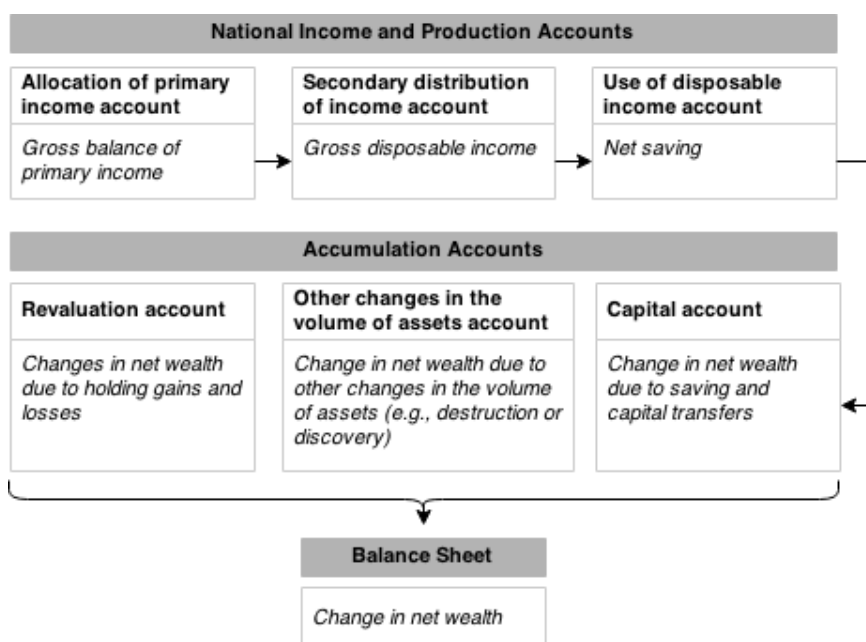


Figure 3: Link between savings and wealth in the 2008 System of National Accounts



It is clear from equations (1) – (3) that the two concepts of savings would be equivalent if household resources, Y_t , were defined to include all capital gains or losses, net capital transfers and other changes in the volume of assets, in addition to what the SNA defines as adjusted disposable income.⁷ This would be equivalent to defining income as the sum of an individual’s consumption expenditure on the one hand and the change in his wealth on the other – a widely accepted theoretical concept referred to as ‘Haig-Simons income’ in reference to the work of Robert Haig and Henry Simons (Thuronyi, 1990). It would also reflect John Hicks’ idea that ‘the purpose of income calculations in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves’ (Hicks, 1946, p.172), i.e. the amount that they can spend without reducing their wealth position.

The Haig-Simons view of income (and thus the stock concept of savings) is consistent with a world in which households are acutely aware of their net worth and adjust their spending accordingly. If the value of their retirement fund rises significantly due to a prolonged stock market boom, for instance, they might find it less pressing to add to these funds by continuing to forgo current consumption.

The definition of income in the SNA (and thus the flow measure of savings), in contrast, reflects a view in which households are somewhat more myopic or conservative – taking their spending decisions solely on accounts of their regular cash receipts. This may either be because they are unaware of other changes in their net worth or because they are sceptical about the permanent nature of these ‘windfalls’. It may also be due to financing constraints, particularly when the majority of capital gains occur on housing assets or interests in long-term savings products. The wealth effect thus also depends on the liquidity profile of the portfolio (Aron and Muellbauer, 2000). In terms of Milton Friedman’s (1957) Permanent Income Hypothesis, which underpins most modern models of household behaviour, the definition of income in the SNA is consistent with a view in which asset revaluations (including realized gains from buying low and selling high) are seen as purely transient components of income, while the Haig-Simons income is consistent with a situation in which households view these gains at least partly as permanent sources of wealth.

Empirical studies on this matter suggest that the truth lies somewhere in the middle. In terms of stock market wealth, rising share prices indeed contribute to rising consumer spending, even though the marginal propensity to spend out of wealth is

⁷The definition of disposable income in the NIPA consists of labour and capital incomes (the latter consisting of interest, dividends, rents, and investment income attributable to insurance policyholders) net of all current transfers (a category that mainly includes taxes and payments related to social insurance schemes, including social assistance and social security funds as well as pension and non-life insurance funds). From this measure, an adjustment is made for the change in household pension entitlements: While contributions and benefits to and from pension and social security schemes are already recorded in the ‘secondary distribution of income account’ and thus taken into account as part of household disposable income, the adjustment in the ‘use of disposable income account’ reflects the fact that current contributions can deviate from current benefits and translate into future claims or liabilities for the household sector on the financial sector that is ultimately responsible for paying the benefits. Note that no such adjustment is made for claims on the public sector in the form of entitlements under social security schemes, since these do not accrue predictably in line with contributions (2008 SNA, Sections 9.20–9.25). Refer to Chapters 7–9 of the 2008 SNA for details on the methodology, and to table 1 for an illustration for South Africa.

smaller than the propensity to spend out of labour or capital incomes (Poterba, 2000). In the case of housing, too, it is generally found that households do take the market value of their houses into account when making their spending decisions, although the propensity to spend out of illiquid assets is only about half as high as the propensity to spend out of liquid forms of wealth (Aron and Muellbauer, 2000, 2011).

This discussion supports a cautionary observation: When households have a different perception of their available resources than we assume in our models, our conclusions from these models can be seriously misleading. If, specifically, households take prolonged periods of asset price increases into account when making their spending decisions, analyses focusing only on the flow measure of savings will understate to what extent households are actually making future-oriented decisions. Note, however, that the importance of this effect probably varies across different subsets of the population, as wealth tends to be highly unevenly distributed. While the discrepancy between wealth accumulation and savings, as conventionally measured, is considerable for the wealthiest households, the two measures of savings are likely roughly equivalent for households in the lower end of the income and wealth distribution. Section 7 will discuss the distribution of savings and wealth in South Africa in more detail.

3 TOWARDS A CONCEPT OF GENUINE SAVINGS

In the previous section, we saw that the conceptual discrepancy between the stock and the flow concept and measure of savings can be boiled down to the definition of *income*. Regardless of which definition of income is chosen—whether the flow or the stock approach to savings is taken—, however, additional definitional issues arise regarding the definition of *consumption* and *wealth*.

From a stock perspective, it has often been argued that the assets accounted for in the national accounts (tangible non-financial and financial assets) cover only a portion of ‘true’ household wealth. On the one hand, households own tangible assets other than those reported (primarily housing), notably in the form of durable consumer goods. On the other hand, a large part of ‘true’ household wealth is intangible, particularly when it comes to human capital (Becker, 1975) or to natural or environmental capital (Hamilton and Clemens, 1999; Atkinson and Hamilton, 2007; Arrow et al., 2012).⁸

If these forms of capital form part of household wealth, it follows that the expenditures incurred on building them should be treated as investment or saving rather than as consumption. From a broadened definition of what constitutes wealth thus follows a broadened definition of what constitutes saving. Savings measures adjusted in this vein are sometimes referred to as measures of “genuine savings” (Hamilton and Clemens, 1999), and are closely linked to the literature on sustainable development: Using the concept of genuine savings, economic development can be said to be economically or environmentally sustainable when the appropriately adjusted savings rates are non-negative, and unsustainable otherwise (Arrow et al., 2012).

⁸Sociologists often include other elements in their definitions of societal wealth, including for instance social or institutional capital. These forms of wealth are, however, not only hard to measure but difficult to attribute to the household sector, such that they will not be discussed in this piece of work.

3.1 PHYSICAL CAPITAL

The measure of final consumption expenditure in the NIPA includes expenditures on durable consumer goods; a category that includes items such as household furniture and appliances, personal vehicles, computer equipment and certain recreational goods. While depreciating assets such as cars or computers are certainly no advisable savings vehicles, they do differ from other goods and services in that they provide a flow of ‘consumption services’ for several years beyond the time of purchase and therefore preclude certain future expenditures. A range of authors—beginning with John Hicks (1939, Chapter XIV), Raymond Goldsmith (1955) and Milton Friedman (1957, Chapter V)—have thus suggested to reclassify durable goods expenditures as investments, by treating only the current depreciation but not the original outlays as current consumption.⁹

Indeed, the reclassification of durable goods as investments is probably the most common adjustment to the household savings rate in the literature (see, for example, Blades and Sturm, 1982; Boskin, 1991; Gale et al., 1999; Perozek and Reinsdorf, 2002; Gorman et al., 2013). According to a recent survey, the capitalisation of durable goods has an impact of up to three percentage points in the United States (where the consumption of durable goods has historically been higher than in other countries), between one and two percentage points in the Euro Area and between one half and one percentage points in New Zealand and Australia (Gorman et al., 2013).

3.2 HUMAN CAPITAL

The reason we considered excluding durable goods from the measure of final consumption expenditure was that they provided consumption services over longer periods of time. Strictly speaking, education and healthcare services are consumed immediately, such that this justification is not applicable here. However, these expenditures have a distinct forward-looking character as they increase the stock of human capital, which in turn is among the most important determinants of future prosperity: While the stock of health impacts the amount of time each individual can spend on income- or commodity-generating activities, the level of the education affects the productivity of these activities (Becker, 1975). From this it follows that education and health should be treated as investments rather than as consumption expenditures.

The main difference with respect to the reclassification of durable goods as investments in physical capital is that the stock of human capital and its depreciation are unobservable and difficult to approximate. In contrast to tangible assets that wear and tear over a number of years after their acquisition, the overall economic value of human capital tends to first increase with time before decreasing later in life (Becker, 1975).

⁹The simple methodology of excluding durable goods expenditures from final consumption expenditure and including the associated depreciation expenses is largely equivalent to the more complex treatment of owner-occupied housing. Owner-occupied housing enters the NIPA in that the imputed rental value of the house is recorded both as consumption expenditure and as income of the household, as if the household rented out the house to himself. Depreciation is subtracted from income alongside other expenses to the household in its role as a “landlord”. See Perozek and Reinsdorf (2002) for a more detailed discussion of the methodology and a comparison with the treatment of owner-occupied housing in the national accounts.

There are likely also differences between the depreciation of education—which humans acquire during their youth—, training—which they receive during their working life and which helps to prevent the depreciation of their education—, and that of health—with which humans are endowed at birth, and which depreciates at an accelerating speed with age unless investments in healthcare are made to postpone some of this depreciation.

Despite the difficulties in measuring the stock and depreciation of human capital, a number of authors have attempted to make appropriate adjustments for human capital investments. For education, the reclassification of private expenditures has been estimated to add up to 2.5 percentage points to the household savings rate of advanced economies, with the values near zero in Scandinavia (where education is largely government-funded) and the highest values in North America (Blades and Sturm, 1982). While no comparable estimates are available for household-sector healthcare investments, Arrow et al. (2012) suggest that health capital is, on aggregate, even more important in magnitude than education.

3.3 NATURAL CAPITAL

A somewhat more recent major addition to the savings literature is the inclusion of natural capital in an economy’s wealth, and thus the formation or consumption of natural capital in measures of saving or dissaving (Pearce and Atkinson, 1993; Hamilton and Clemens, 1999; Atkinson and Hamilton, 2007; Arrow et al., 2012).

The consumption of natural capital includes the depletion of natural resources on the one hand and the degradation of the environment on the other. The ownership of natural resources is generally clearly determined and thus at least partly accounted for as assets in the balance sheet, unless in the cases in which no ownership rights can be exercised or in which mineral or fuel deposits have not been discovered or are not workable. Changes in the volume of these natural assets are then recorded in the ‘other changes in the volume of assets account’ in the accumulation accounts, which are currently under construction in South Africa (2008 SNA, Sections 1.46-1.47). In general, the vast majority of these resources are owned and depleted by the corporate and public sector rather than the household sector.

The quality of the environment, in contrast, is a public good, which can neither be valued in monetary terms nor attributed to individual institutional sectors. It seems reasonable to assume that households are the main beneficiaries of a clean environment, while all three institutional sectors are jointly responsible for polluting and degrading it. An adjustment for environmental degradation is thus likely more meaningful on a national level than for the household sector alone. The World Bank provides estimates for such economy-wide adjusted savings rates for a large number of countries in the World Development Indicator database. For all major economies, the adjustment for natural and environmental capital requires us to lower our estimates of the national savings rates.

4 HOUSEHOLD, CORPORATE AND PUBLIC SAVINGS: ISSUES OF AGGREGATION AND DISAGGREGATION

After having discussed the definition of household income in section 2 and the definition of household consumption in section 3, this section discusses the challenges of delineating the household sector itself. Indeed, the boundaries between the household, the corporate and the public sector are not clear cut, and household savings are not independent of how much other sectors save. This is reflected in the frequent observation that total national savings are more stable over time than either private savings (the sum of household and corporate savings) or public savings, and that private savings in turn exhibit greater stability than household or corporate savings considered separately (David and Scadding, 1974; Blades and Sturm, 1982).

4.1 HOUSEHOLD CLAIMS ON CORPORATE SAVINGS

The definition of the household sector in the SNA comprises not only private households, but also unincorporated business enterprises of households, non-profit institutions serving households, as well as private trusts and friendly societies. The main justification for including unincorporated businesses in the household sector lies with the unlimited liability of the owners of these businesses, which means that all household assets are at risk in the case the enterprise declares bankruptcy. Similarly, non-profit institutions, private trusts and friendly societies are included because the boundary to private households is not always clear. Usually, their overall share is relatively small compared to private households.

Incorporated businesses, on the other hand, constitute a separate institutional sector – although ultimately also owned, in large parts, by private households via direct shareholdings or indirect interests in pension- or long-term insurance funds. As a major shareholder, the household sector has claims on corporate profits. At any point in time, corporations can choose between paying these profits out as dividends (or through share repurchases) or holding onto them internally, thus increasing shareholders' claims on future payouts instead. The Modigliani-Miller invariance proposition predicts that shareholders are indifferent between these two options, such that dividend payouts always translate into an equivalent drop in shareholder value (Miller and Modigliani, 1961). As shown in section 2, however, only the stock concept of savings reflects this theoretical invariance by reflecting asset revaluations. For the flow measure of savings under the SNA definition, in contrast, retained profits are entirely accounted as corporate savings in the NIPA, while they are entirely shifted to the household sector once paid out as dividends.

In light of the substitutability between corporate and household savings, although imperfect, it has been suggested that total private saving may be a more meaningful measure than household saving when flow measures are used (David and Scadding, 1974; Blades and Sturm, 1982; Boskin, 1991; Gale et al., 1999). Given the interest in household savings from a theoretical perspective, and the importance of household savings in most countries in practice, aggregating over household and corporate savings could stretch the point. Yet, this discussion certainly suggests that changes in corporate saving should

be taken into consideration when interpreting changes in the savings figures as provided by the NIPA.

4.2 HOUSEHOLD CLAIMS ON PENSIONS, LIFE INSURANCE AND SOCIAL SECURITY FUNDS

In addition to their claims on corporate savings through their stock ownership, households also have claims on savings from private and public pension funds, social security or provident funds and long-term insurance funds, who are responsible for making future payments to the household sector on the basis of current contributions. One of the main conclusions of the early literature on the measurement of household savings was that these savings should be attributed to the household sector, since this reflects that rational households take into account ‘the savings accumulated on their behalf by the business sector and the social security system’ (Blades and Sturm, 1982, p.14) (see also Friedman, 1957, p.116).

In contrast to earlier versions of the SNA, the current standards prescribe that a portion of the savings that are thus accumulated on the behalf of households are indeed attributed to the household sector. This is done through an adjustment of household disposable income for the change in pension entitlements, and an adjustment of household assets for the interest of households in pension funds and long-term insurers. However, the adjustment remains incomplete. Notably, the adjustment is only made for claims that accrue ‘in a predictable fashion or for predictable reasons’ (2008 SNA, p.181), which is considered not to be the case for defined benefits entitlements under social security schemes (2008 SNA, Sections 9.20–9.25).

4.3 TAXES, TRANSFERS AND PUBLIC SERVICES

Private and public savings may be even more entangled than household and corporate savings. The direct mechanism through which savings are shifted between the public and the private sector is through current transfers, i.e. taxes and grants. An increase in taxes relative to grants directly lowers the current disposable income of the household sector while increasing that of the government. If the levels of consumption remained unchanged, tax increases would thus directly shift savings from the household to the public sector, and vice versa.

However, it is implausible that consumption is independent of the level of taxation. If, for instance, the government were to spend its entire additional revenue on the provision of services that households would otherwise purchase on the market (such as on education and healthcare), household expenditure would drop by a comparable amount as disposable income, leaving the level of savings unchanged (assuming comparable productivity between public and private provision of these services). In high-tax countries in which education and healthcare are primarily provided by the government, household savings should thus not be systematically lower than in low-tax countries in which these services are provided by the market. Blades and Sturm (1982) note that the share of public services, funded through direct taxes, only affect the savings rate when expressed in percent of disposable income (as opposed to GDP, which is invariant

to the reallocation of resources between sectors). By the same logic, the choice of the tax structure should not affect the savings rate in international comparisons.

5 OTHER ISSUES IN THE MEASUREMENT OF SAVINGS

Strictly speaking, national accounts data are not *measured*, but constructed under a number of assumptions from a variety of sources. These sources range from household surveys and administrative statistics to industry censuses and other sources (see table 3 for an overview over sources and methods in the South African household sector accounts). Thus, national accounts data are prone to errors and omissions in the source data as well as in the aggregation process. Note that even very small measurement errors in the income and expenditure data are compounded into large errors when the residual between these variables is considered: if the national accounts show income as 100 and consumption as 90 while income is, in reality, one percent higher (101 instead of 100), the resulting savings measure is understated by as much as ten percent (10 instead of 11) (see Boskin, 1991; Gorman et al., 2013). Measurement errors are similarly compounded when the difference in wealth is considered instead.

Measurement errors can be classified in two groups: systematic errors, whose magnitude can be predicted based on other variables, and random errors, where this is not the case. One systematic error in the measurement of savings is the treatment of inflation, which overstates the savings of net creditors and understates those of net debtors as will be shown in section 5.1 (Jump, 1980). A second systematic error concerns the discrepancy between excluding capital gains but including the corresponding taxes in the calculation of disposable income, which effectively understates savings (Peach and Steindel, 2000). The effects of other measurement errors are, per their nature, hard to estimate, but will be discussed in the subsequent section 5.3.

5.1 TREATMENT OF INFLATION

One specific measurement error in the national accounts stems is related to inflation expectations. Jump (1980) showed that measures of income and saving contain a spurious element whenever inflation expectations are non-zero. This bias is related to the inclusion of nominal net interest payments or receipts in the calculation of sectoral income (see table 1). Nominal interest rates consist of two components: a real interest component, and a premium intended to compensate the creditor for the expected inflation-induced reduction in the value of the principal. Since both components are included as ‘net interest receipts’ in the calculation of sectoral income (without deducting losses on the principal accordingly), a positive inflation premium will overstate the income of net creditors and understate that of net debtors. Since the household sector is generally a net creditor to the public and corporate sector, this spurious element in the measurement of income leads to an overstatement of household saving rates – particularly in times in which inflation expectations are high. It also introduces an element spurious correlation between inflation and saving rates when inflation expectations change over time (Jump, 1980).

To achieve inflation-invariant savings rates, the measured savings figure can be adjusted by subtracting the product of the (expected) inflation rate and the net creditor (+) or debtor (−) position of the household sector towards other sectors and the rest of the world. For the United States, Jump (1980) finds that inflation-adjusted household savings rates are between one and two percentage points lower than the measured rates in the NIPA. In a more recent estimate, the discrepancy was only one half percentage points, owing to the decline in American inflation rates since the 1980s (Perozek and Reinsdorf, 2002).

Note that the measurement of wealth in the balance sheet is not subject to this measurement issue. In fully integrated national accounts, real holding gains and losses are recorded in the revaluation account (2008 SNA, paragraph 7.121).

5.2 TREATMENT OF CAPITAL GAINS TAXES

Another systematic ‘measurement error’ in the national accounts concerns the treatment of capital gains taxes. As Peach and Steindel (2000) point out, realized capital gains from the disposal of assets are excluded from the calculation of income in the NIPA, on the basis of the principle that gains and losses from non-produced assets should not enter the current accounts. On the other hand, taxes on these capital gains are considered as current transfers when calculating disposable income.¹⁰ This asymmetry thus understates disposable income, and increases the wedge between the flow and the stock measure of savings. Peach and Steindel (2000) and Perozek and Reinsdorf (2002) find that excluding these taxes or including realized capital gains raises the United States household savings rate between less than one percent (subtracting capital gains taxes) and more than five percentage points (adding realized capital gains). Again, the stock measure of savings is not subject to this measurement issue.

5.3 THE NON-OBSERVED ECONOMY

The most obvious candidate for measurement errors in the national accounts is the non-observed economy, which ranges from non-monetary transactions (such as the production of goods and services for own consumption or for provision free-of-charge to others) to hidden monetary transactions (such as black-market or underground transactions). The fact that these activities are missing from administrative sources, however, does not mean that they are entirely excluded from the national accounts. Since the national accounts are partly based on survey data, targeted questions can be included in household or enterprise surveys to estimate the size of the informal sector. Alternatively, statistical estimation and triangulation approaches can be used. When appropriate imputations are made, only some proportion of non-observed transactions will eschew coverage the national accounts (consult the *Handbook on Measuring the Non-Observed Economy* OECD, 2002, for details on the different methods).

¹⁰In South Africa, capital gains taxes apply whenever an asset is disposed of (e.g., sold or bequeathed) at a value that exceeds the base cost, subject to particular provisions for housing assets. The effective tax rate depends on the income bracket.

To what extent do these non-observed transactions affect the savings figures in the national accounts? Since savings are calculated as the residual between income and consumption expenditure, a bias arises only when some transactions are reflected in one but not the other measure. In principle, the internal consistency requirement of the system of national accounts will prevent such a discrepancy: If reported cigarette consumption exceeds reported cigarette sales due to smuggling, for instance, an appropriate imputation is made to the income side of the accounts (2008 SNA, Section 25.28-25.35). However, the existence of non-observed transactions can contribute to the discrepancy between the savings measure in the NIPA and the accumulation of wealth. This happens when unrecorded production goes towards the formation of fixed capital rather than towards consumption, such as in the case of do-it-yourself or black-market construction, maintenance or repair activities that increase the market value of the housing stock. In countries where construction activity is largely informal, this could lead to a significant understatement of the flow measure of savings relative to the stock measure of wealth accumulation (Gorman et al., 2013).

5.4 IS SURVEY DATA BETTER?

The weaknesses of the ‘macroeconomic’ national accounts data could point us towards using ‘microeconomic’ survey data instead. Although household surveys are an important input for the construction of the national household sector accounts, the two data sources differ systematically – particularly so in developing countries (Ravallion, 2003; Deaton, 2005; Sala-i Martin et al., 2014). This discrepancy results, in part, from different definitions between both frameworks. For instance, national accounts define the household sector more broadly than surveys do, and apply different accounting practices regarding imputations for non-monetary transactions. However, the discrepancy also results from differing errors and omissions within each dataset (Ravallion, 2003; Deaton, 2005).

Both income and consumption expenditure are generally lower when constructed from surveys than when taken from the national accounts (Ravallion, 2003; Deaton, 2005), despite the fact that surveys should not be subject to the issues regarding the non-observed economy. In South Africa, this discrepancy is particularly pronounced: Some household surveys capture less than sixty percent of national accounts income (Van der Berg et al., 2007). Since income is usually understated even more substantially than consumption, survey data thus understates savings relative to national accounts data. The downward-bias in income and consumption is due to under-sampling and under-reporting, since wealthier households are less likely to respond to surveys (and to reveal their full incomes if they do respond) than poorer households (Deaton, 2005). It can also result from flaws in the survey design and execution, or from low-quality responses that respondents give to the numerous and complicated survey questions from which income and consumption figures are constructed (Deaton, 2005). Overall, Sala-i Martin et al. (2014) suggest that national accounts give more accurate estimates of the variation in average per-capita incomes—and hence savings—than surveys do.

When taking the stock rather than the flow approach, survey data are even less likely to yield accurate information. Non-response is frequent in wealth-related surveys because wealth is considered as socially sensitive issue. When households do choose to

respond, they generally find it difficult to estimate the value of their assets (Daniels et al., 2012). Because survey data on wealth is so ‘noisy’, ‘differencing an already noisy series (wealth) can lead to very high (and spurious) variability in the saving level’ (Browning and Lusardi, 1996, p. 1814).

Despite all their shortcomings, national accounts data might thus still be our best source for empirical analyses on income, consumption, wealth and savings of the household sector on the aggregate. Since surveys contain distributional information that escape the national accounts, however, analyses on savings should make use of select survey data to shed light on distributional questions.

6 THE CASE OF SOUTH AFRICAN HOUSEHOLD SAVINGS

6.1 DATA

The responsibility of compiling the South African NIPA is split between Statistics South Africa (Stats SA) (who compiles the production and income side), and the South African Reserve Bank (SARB) (who compiles the expenditure side of the national accounts). To reconcile the SARB estimates of household sector income with the StatsSA estimates of GDP, the former is adjusted by a residual item. In addition, the SARB has the responsibility to compile the institutional sector accounts, the balance sheets and the accumulation accounts. For consistency and traceability, all data used in this section stem from the SARB Quarterly Bulletin database, unless otherwise noted.¹¹

Like most other economies, South Africa subscribes to the SNA, the internationally accepted national accounting standards issued by the United Nations. The most recent version of the SNA (the 2008 SNA), released in December 2009, is gradually being implemented in South Africa since the fourth quarter of 2014.¹² In addition, the SARB is still implementing changes introduced in the previous release of the SNA (the 1993 SNA), specifically regarding the full integration of the balance sheets through the compilation of the accumulation accounts (as was shown in figure 3 in section 2). The first balance sheet estimates for the household sector were released in 2006, and now cover the period of 1975-2014. While the full integration of the balance sheet side into the national accounts is still ongoing, note that South Africa is not the only country in which this is the case. As Piketty and Zucman (2014) note, even Germany released its first retrospective balance sheet estimates only in 2010. And according to Stierli et al. (2014), South Africa is still the only emerging market to publish such data at all.

Gross versus net savings

The flow savings measure in the NIPA is recorded in gross and in net terms, whereby the latter is derived by subtracting the consumption of fixed capital (‘depreciation’) from the former. Although gross savings measures are often preferred for international

¹¹All data available online: www.resbank.co.za/Research/Statistics/Pages/OnlineDownloadFacility.aspx

¹²The 2008 SNA contains 44 changes relative to the previous 1993 SNA, of which six impact the GDP estimates. For the November 2014 GDP figures published by Statistics South Africa, four of these changes have been implemented, and revised retrospective figures have been released.

Table 1: Household savings in the National Income and Production Accounts. Source: South African Reserve Bank Quarterly Bulletin, Statistical Appendix, March 2015

Account	Categories	Code KPB	Values 2014 R millions
<i>Generation of income</i>	Gross operating surplus	6826	485 641
<i>Allocation of primary income account</i>	1 Compensation of employees	6240	1 730 845
	2 Property income received	6827	395 730
	2a <i>Interest</i>	6828	53 801
	2b <i>Dividends</i>	6829	159 940
	2c <i>Property income attributed to insurance policy holders</i>	6830	181 569
	2d <i>Rent on land and subsoil assets</i>	6831	420
	3 Less: Property income paid	6832	167 023
	3a <i>Interest</i>	6833	164 234
	3b <i>Rent on land and subsoil assets</i>	6834	2 789
	4 Gross balance of primary income	6835	2 445 193
<i>Secondary distribution of income account</i>	5 Social benefits received	6836	325 740
	6 Other current transfers received	6837	211 249
	6a <i>Non-life insurance claims</i>	6838	141 267
	6b <i>Miscellaneous current transfers</i>	6839	69 982
	7 Less: Current taxes on income and wealth	6845	353 601
	8 Less: Social contributions paid	6840	207 432
	9 Less: Other current transfers paid	6841	150 082
	9a <i>Net non-life insurance premiums</i>	6842	141 267
	9b <i>Miscellaneous current transfers</i>	6843	8 815
		10 Gross disposable income	6844
<i>Use of disposable income account</i>	11 Adjustment for the change in net equity of households in pension funds reserves	6845	38 519
	12* Less: Residual	6846	5 511
	13 Total available household resources	6847	2 304 075
	14 Less: Final consumption expenditure	6007	2 299 426
	15 Gross saving	6848	4 649
	16 Less: Consumption of fixed capital at replacement value	6849	58 754
	17 Net saving	6200	-54 105
<i>Capital account</i>	15 Gross saving	6848	4 649
	16 Receivable capital transfers	6850	18 095
	17 Less: Payable capital transfers	6851	102
	18 Less: Change in assets**	6852	69 928
	19 Net lending (+) / borrowing (-)	6855	-47 286

*Statistical discrepancy between the expenditure components and gross domestic product

**Gross fixed capital formation and changes in inventories

Table 2: *Household wealth in the Balance Sheet. Source: South African Reserve Bank Quarterly Bulletin, Statistical Appendix, March 2015*

	Categories	Code KPB	Values 2013 R billions	Values 2014 R billions
	<i>Non-financial assets</i>	6920	2 583	2 853
	Residential buildings	6921	2 126	2 358
	Other non-financial assets	6922	458	495
<i>Assets</i>	<i>Financial assets</i>	6923	6 449	7 057
	Assets with monetary institutions	6924	762	895
	Interest in pension funds and long-term insurers	6925	3 430	3 810
	Other financial assets	6926	2 257	2 388
	Total household assets	6927	9 032	9 910
	<i>Liabilities</i>	6928	1 696	1 783
<i>Liabilities & net wealth</i>	Mortgage advances	6929	833	854
	Other debt	6930	868	929
	<i>Net wealth</i>	6931	7 336	8 127
	Total household liabilities and net wealth	6932	9 032	9 910
	Memo item: Net wealth including durable consumer goods	6933	7919	8760

comparisons due to better comparability, net savings is arguably a more meaningful concept in the national context: From a microeconomic perspective, households presumably seek to achieve savings and accumulate assets beyond what is needed to offset the wear and tear of their existing assets (Boskin, 1991); from a macroeconomic angle, it is net rather than gross savings that constitute the resources for new investments in the economy. Finally, only the net measure of savings in the NIPA is directly comparable to the change in wealth in the balance sheet: Since the balance sheet values household assets at fair value, depreciation is implicitly taken into account in the wealth figures.

To achieve consistency, net measures are used in all analyses of the South African household savings rate. While this choice lowers the level of the savings figures it does not affect their trend, as depreciation expenses are stable over time.¹³

Choice of the denominator

Household savings are commonly expressed either in percent of household disposable income or in percent of GDP. From a household perspective, the former is arguably

¹³In the two decades since 1995, the first year for which the figures are made available by the SARB, the consumption of fixed capital by the household sector consistently amounted to about 1.5–1.8 percent of GDP per year. This is much lower than for the corporate sector, whose assets (primarily machinery and equipment) have a shorter life span than those of the household sector (primarily housing assets). The reason that depreciation plays a role at all for the household sector is partly due to the grouping of unincorporated businesses (and their rapidly depreciating machinery) with private households.

more meaningful, as household make their spending and saving decisions on the basis of their own disposable income rather than in terms of total GDP. From a macroeconomic perspective, in contrast, the latter is more commonly used.

For reasons of transparency and greater ‘recall value’ for policymakers, savings rates will be expressed in percent of GDP rather than in percent of disposable income.¹⁴ In contrast to the trend-neutrality of the gross/net debate, the choice of the denominator can affect our interpretations in times where the share of disposable household income to GDP changes significantly. Indeed, the disposable income share of South African households bounced around quite significantly, falling from 70 to 56 percent between 1946 and 1980 and rising back to 67 percent in 1992 before falling back to 59 percent today. While the choice of the denominator can thus not explain the long-term decline in the household savings rate (expressed in percent of GDP), it could overstate the decline in households’ propensity to save over the past two decades.

6.2 ADJUSTMENTS: FLOW AND STOCK MEASURES OF SAVINGS

South Africa’s household savings rate, as measured in the NIPA, has been declining over the last six decades. In gross terms, s_f stood at only 0.1 percent of GDP in 2014; in net terms even at -1.4 percent. Net savings have been in negative territory since 2006, meaning that household savings have been falling short even of what is needed to offset only the wear and tear of existing fixed assets.

Looking at the balance sheet side instead, the situation is different. In 2014, the nominal increase in household wealth over the previous year amounted to 20.8 percent of GDP, despite the negative savings rate measured in the NIPA. Part of the increase in wealth in any specific year is, of course, driven by increases in the general price level. Yet even in after correcting for inflation, the annual increase in net wealth amounted to 9.0 percent in 2014 and to 6.5 percent on average between 1975-2014; significantly higher than the flow measure of savings would suggest.¹⁵ And although s_s is significantly more volatile than s_f —reflecting, for instance, the emerging markets crises of the 1990s, the dot.com- and 9/11-crises of the early 2000s and the global financial crisis of 2007/08—, it does not mirror the long-term downward trend of the flow savings rate.

Overall, real household wealth quadrupled between 1975 and 2014, whereby only fifteen percent of the increase can be explained through compound household savings over that period. As discussed in section 2, the discrepancy between the flow and the stock measure of savings stems from revaluations on the existing stock of assets on the one hand and from capital transfers and other changes in the volume of assets on the other.

¹⁴Using GDP instead of disposable income increases the simplicity and transparency of adjustments to the savings measure, since these adjustments (such as the reclassification of certain expenditure items as investments or the reallocation of savings between institutional sectors) then affect only the nominator while leaving the denominator unchanged.

¹⁵The stock measure of savings is calculated as the increase in wealth between the beginning and the end of a period over current-period GDP, $s_s = \frac{(W_t - W_{t-1})}{GDP_t}$. Over the same period of time (1975-2014), the average annual increase in wealth, $S_s = \frac{(W_t - W_{t-1})}{W_{t-1}}$ was 13.3 percent per year in nominal terms and 3.5 percent per year in real terms, as inflation averaged 9.8 percent over the forty-year period.

Table 3: *Documentation on the construction of income, expenditure and net wealth in the national accounts by the South African Reserve Bank*

Measure	Main sources and methodology
Disposable income of households ('Total available resources of households')	The responsibility of compiling the South African national accounts is split between StatsSA (who compiles the production and income side), and the SARB (who compiles the expenditure side of the national accounts as well as the institutional sector accounts). To reconcile the SARB estimates of household sector income with the StatsSA estimates of GDP, the former is adjusted by a residual item.
Final consumption expenditure by households	Estimates of the main expenditure aggregates are compiled by the SARB on the basis of household surveys (the Income and Expenditure Survey by Stats SA and intermittent surveys by the Bureau of Market Research at the University of South Africa) and verified against supply and use estimates in the benchmark year. In all subsequent quarters, the base-year estimates are extrapolated using retail sales data from monthly surveys by Stats SA and from other sources (e.g., industry associations); Annual data are verified against appropriate data sources. (See South African Reserve Bank, 2015, p.26-29)
Non- financial assets of households	Non-financial assets of households comprise residential and non- residential buildings, non-agricultural land, construction works, machinery and equipment, computer and related equipment, transport equipment, agricultural land and orchards, and inventories at market value. Stock values are derived by the SARB from national account capital stock measures; market values are obtained by multiplying them by an appropriate asset price index (in the case of residential buildings, an average house price index). The capital stock itself is constructed on the basis of the flows of capital formation and capital consumption in the NIPA ('perpetual inventory method'). (See Kuhn, 2010, p.66-67)
Financial assets of households	Financial assets of households comprise assets with monetary institutions; interest in pension funds and long-term insurers; equities, bonds and other domestic financial assets; as well as financial assets abroad. Data on financial assets are sourced by the SARB from monetary institutions, pension and provident funds and long-term insurers as well as other various sources. (See Kuhn, 2010, p.67)
Financial liabilities of households	Financial liabilities of households consist mainly of mortgage advances and consumer credit. Data on financial liabilities are sourced by the SARB from the monthly regulatory returns submitted to the Bank Supervision Department (for mortgage advances) from the National Treasury and from industry associations. (See Kuhn, 2010, p.69)

In a fully integrated set of national accounts, these three elements could be easily read from the accumulation accounts, which consist of the revaluations account, the capital account, and the ‘other changes in the volume of assets account’, respectively.¹⁶ At the time of this writing, however, only the capital account has been released by the SARB.

According to the capital account estimates, capital transfers play a relatively small role in explaining the discrepancy between the flow and the stock measure of savings in South Africa. In 2014, capital transfers received by South African households exceeded capital transfers paid by only 0.5 percent of GDP in 2014.

Although no data on other changes in the volume of assets are available, it is unlikely that these changes—resulting, for instance, from destruction or discovery—are significant either. Assuming that the ‘other changes in the volume of assets account’ is roughly zero, the residual between S_G (9.0 percent), S_F (−1.4 percent) and the capital account (0.5 percent) is then entirely due to asset revaluations (9.9 percent in 2014). Leaving it at this, however, would be unsatisfying. While I am in no position to provide my own, sophisticated estimates of the South African revaluation account before the SARB estimates are released, I will attempt to provide some rough calculations that allow preliminary interpretations and may inform the ongoing process at the SARB.

Formally speaking, the value of household assets equals the sum-product of the quantity and the current price of each asset, such that the change in the value of assets—and hence in wealth—between two points in time can be decomposed into a quantity effect (a change in the quantity of assets relative to liabilities at constant prices) and a revaluation effect (a price-induced increase in the value of assets over inflation) by applying a standard growth accounting procedure as described in Appendix A.1. Since real estate and equities are the main asset classes that generate holding gains and losses, we can calculate the revaluation effects as long as we know the value of housing and stocks in household portfolios, and the development of their prices relative to consumer price inflation.¹⁷

Consider real estate first. In 2014, housing constituted 24 percent of assets of the South African household sector, while mortgage advances constituted 48 percent of liabilities (see figure 4). Since mortgage advances are not only used to finance new housing but are taken out by existing homeowners to finance other purchases, the true ‘housing wealth’ lies somewhere between the value of housing assets and the residual between housing assets and mortgage liabilities (Scobie and Henderson, 2009). Overall, the importance of real estate assets for South African households is surprisingly low. In the OECD, housing accounts for seventy percent of total household assets and mortgages

¹⁶The fourth accumulation account is the financial account. However, this account is not needed to link the savings measure of the NIPA to the change in wealth of the balance sheet.

¹⁷Of the four main asset classes (real estate, equities, bonds, and cash equivalents) the former two are subject to major revaluations. Minor holding gains and losses can also occur on fixed-income securities before their maturity, as well as on other asset classes such as commodities. Gains and losses from asset sales are excluded from income, since the NIPA excludes all gains and losses associated to non-produced assets.

for eighty percent of liabilities (OECD, 2015), although home-ownership rates are not much higher in most advanced economies than they are in South Africa.¹⁸

Over the period since 1975, residential house prices increased by 10.8 percent per year while consumer price inflation averaged 9.8 percent.¹⁹ Over the forty-year period, this small gap between house- and consumer price inflation resulted in a roughly fifty percent increase of house prices relative to consumer prices. Using the growth accounting procedure described in equation (7) in the Appendix, we find that 58 percent of the increase in real house prices can be attributed to real additions to the housing stock, while the remaining 42 percent are due to real revaluations. The revaluation effect was particularly pronounced between 2000 and 2008, where house prices grew strongly while inflation remained low (see figures 6 and 7). In 2014, the increase in household wealth driven by real revaluations of housing assets amounted to 1.3 percent of GDP; if mortgages are subtracted, the equivalent figure is 0.9 percent. While these figures are substantial when compared to the unadjusted flow measure of savings, they explain only a very small proportion of the discrepancy from the stock measure. They are also very small compared to many advanced economies, in which real house price increases were the main driver of private wealth accumulation over the last decades (Rognlie, 2015).

Turn, thus, to equities. While the SARB records the financial assets of the household sector not by asset class but by the financial institution through which they are held ('assets with monetary institutions', 'interest in pension funds and long-term insurers' and 'other financial assets'), the amount of equities held by households can be estimated from the balance sheets of the relevant counterparties (public and private pension funds and long-term insurers on the one hand and unit trusts on the other). Using this procedure, we arrive at a substantial equity share in household portfolios, at almost sixty percent of financial assets or over forty percent of total assets.²⁰ Comprehensive counterparty balance sheet data are only available since 1990. Since this point in time, stock prices increased by 12.4 percent per year in nominal terms, or 4.7 percent per year in real terms at an average inflation rate of 7.8 percent. Using the growth accounting procedure again, we find that 93 percent of the real increase in the value of household equity portfolios were due to revaluation. In 2013 (the latest available date), the revaluation effect amounted to 8.6 percent of GDP.

Is such a high revaluation effect on stocks plausible? The South African equity market has indeed performed remarkably well since the inception of the Johannesburg Stock Exchange (JSE) in 1887. According to the *Crédit Suisse Global Investment Returns Yearbook* (Dimson et al., 2015), the JSE generated real equity returns of 7.4

¹⁸According to the Housing Finance Information Network, 62 percent of units in urban areas were owner-occupied in South Africa in 2014. The equivalent figures for the United States, the United Kingdom and Germany are, for instance, 65 percent, 50 percent and 43 percent only (www.hofinet.org). The discrepancy is thus more likely to lie within financial wealth, particularly funded pension assets (as pay-as-you go pension systems are prevalent in most OECD countries).

¹⁹Calculations on the basis of the middle-segment house price index provided by ABSA, a South African commercial bank (www.absa.co.za).

²⁰To estimate the composition of the financial assets of households, I apply the aggregate portfolio composition of official pension and provident funds, private self-administered pension funds and long-term insurers to the household sector's 'interest in pension funds and long-term insurers', and the portfolio composition of unit trusts to the 'other financial assets' bucket. Household 'assets with monetary institutions' are simply cash equivalents.

Figure 4: Composition of household sector assets and liabilities according to household sector balance sheets, 2014, percent of total assets. Source: South African Reserve Bank, author's calculations.

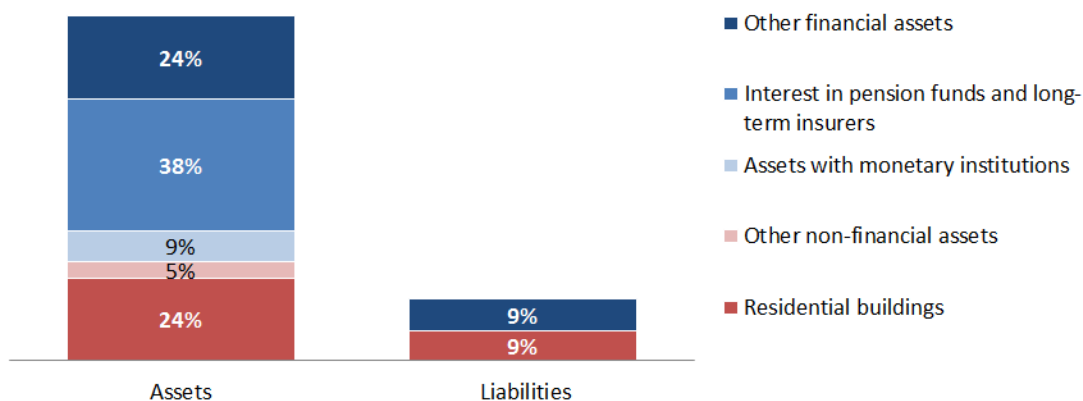


Figure 5: Composition of household sector assets as estimated from household and financial sector balance sheets, 2013, Billion Rand, percent of total assets. Note that real estate here includes indirected real estate holdings through institutional investors. Source: South African Reserve Bank, author's calculations.

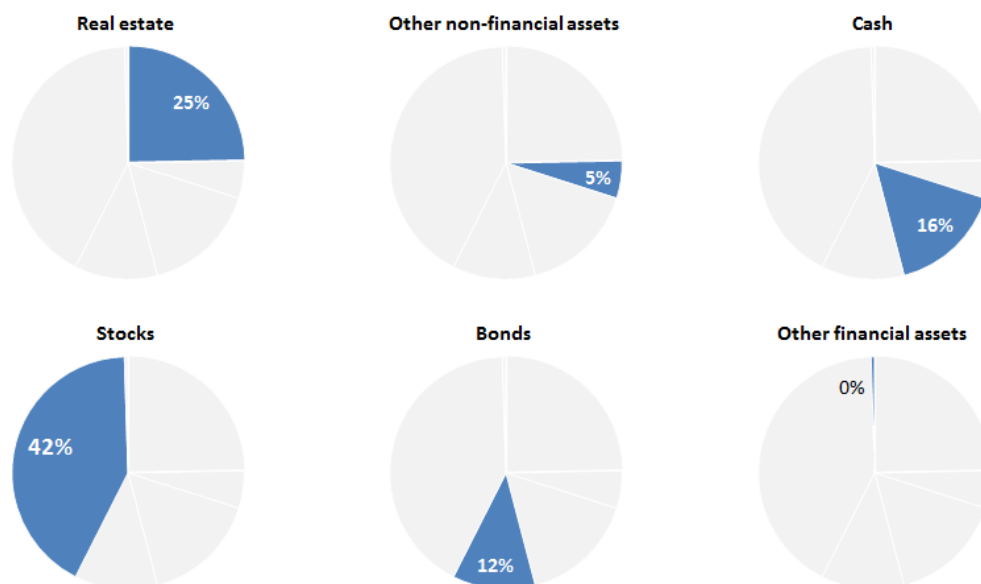


Figure 6: Annual price change of real estate and equities, % per year. Source: South African Reserve Bank (consumer price index), ABSA (middle-segment property price index), JSE (all-share index), author's calculations.

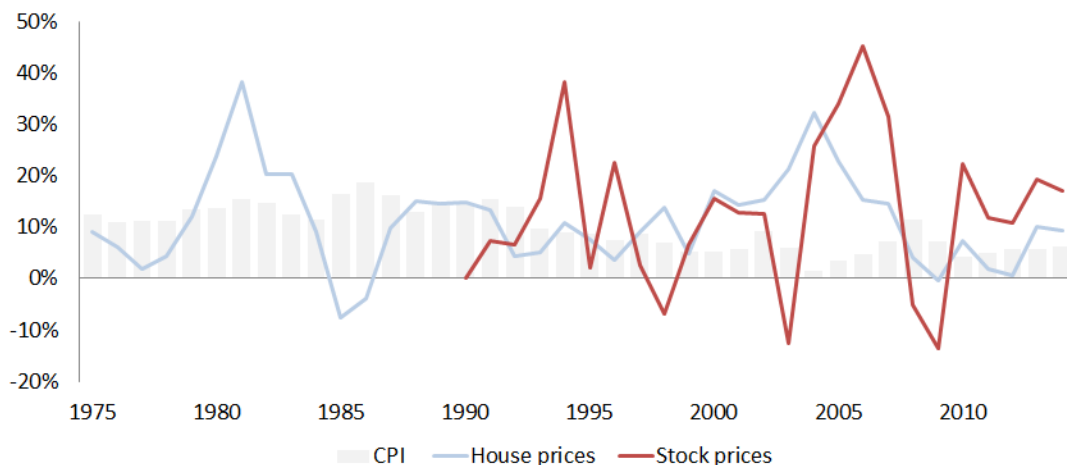
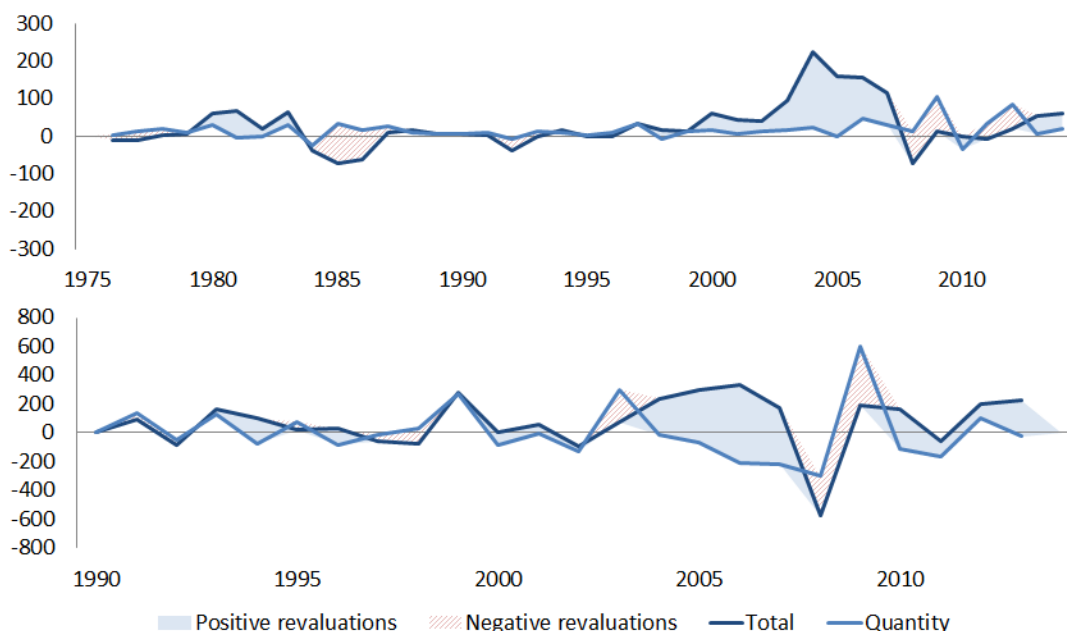


Figure 7: Decomposition of the annual real increase in real estate (top panel) and equities holdings (bottom panel) into quantity and price effects, Billion Rand (2000 CPI = 100). Source: South African Reserve Bank, ABSA (middle-segment house price index), author's calculations.



percent per year on average since 1900 – the highest among the 23 countries covered in the Yearbook. Over the same time, the real exchange rate depreciated by only 0.9 percent per year against the US dollar. The annualized real returns on equities were even higher in more recent decades than in the earlier years of the JSE. Since 1965, South African shares generated real equity returns of 8.0 percent per year, the equivalent figure since 2000 is 9.6 percent. Due to the strong home bias of South African investors, it is likely that South African households benefited sizably from these gains.²¹

6.3 OTHER ADJUSTMENTS: TOWARDS MEASURES OF GENUINE SAVINGS

Physical capital

The vast majority of household final consumption expenditure in South Africa goes towards services and non-durable goods. In line with historical averages, share of durables stood at 8.7 percent of household final consumption expenditure or at 5.3 percent of GDP in 2014. Since the depreciation of durable goods is not recorded in the national accounts, I estimate it on the basis of the schedule of write-off periods acceptable to the South African Revenue Services (SARS), using a straight-line depreciation method over five years.²²

Using this methodology, I estimate the consumption of durable goods at 3.0 percent of GDP, meaning that net investment in durable goods amounted to 1.3 percent of GDP in 2014. Adding this figure back to the flow savings rate raises s_f from -1.4 to -0.2 percent of GDP.²³ This adjustment is broadly in line with that for the advanced economies: According to a survey by Gorman et al. (2013), the capitalisation of durable goods has an impact of up to three percentage points in the United States (where the consumption of durable goods has historically been higher than in other countries), between 1.0 and 1.8 percentage points in the Euro Area and between 0.4 and 1.0 percentage points in New Zealand and Australia. Since household expenditure on durable goods has stayed roughly constant over time, however, this adjustment does not reverse

²¹Equities are usually held by households indirectly, through pension or long-term insurance funds or other collective investment schemes. As shown in figure 4, these ‘interests in pension funds and long-term insurers’ and ‘other financial assets’ constitute more than half of all household assets in South Africa. Owing in part to the long history of controls regarding capital and exchange outflows, the large majority of equities held through such institutional investment schemes is likely domestic. Under the current prudential rules of the SARB the foreign exposure of pension funds is restricted to 25 percent of retail assets; in the case of collective investment funds, long-term insurance funds and other institutional investors, this share cannot exceed 35 percent of assets under management; although an additional allowance in the order of five percent of assets exists for African assets in both cases (see Section O – F.6 Capital transactions in the Exchange Control Manual available online from the SARB).

²²I chose the 5-year period on the basis of the Interpretation Note No. 47(3) of 2012 to the Income Tax Act No. 53 of 1962. According to the Note, taxpayers are allowed to elect between diminishing-value and straight-line methods to calculate the depreciation allowance. While the write-off periods for consumer durables range widely, the presumably largest expenditure items centre around five years (e.g., computers: 3; motorcycles: 4; cars: 5; washing machines: 5; furniture and fittings: 6; kitchen equipment: 6 years).

²³The deviation between the figures for net investment (1.3 percent) and the absolute adjustment made to the savings rate (1.2 percent) are due to rounding (exact net investment figure: 1.255 percent of GDP). Adjusting the denominator, GDP, to include depreciation as some authors do, does not change the result, also yielding an adjusted savings rate of -0.2 percent of GDP for 2014.

the downward trend of the household savings rate over the last decades. For the two decades between 1995 and 2014, average net investment in durable goods amounted to 1.4 percent of GDP, raising the average savings rate from 0.2 percent to 1.6 percent of GDP.

Since the household balance sheets in the national accounts report ‘net wealth including consumer durable goods’ as a memo-item, the same adjustment can also be made from a stock perspective. Using this figure for the calculation of the savings rate increases s_s by 1.3 percentage points (22.2 compared to 20.8 percent) in 2014 and by 1.6 percentage points (20.8 compared to 19.2 percent) for the twenty-year period between 1995 and 2014.²⁴

Human capital

In principle, net investments in human capital can be reclassified analogous to the way we just reclassified net investments in physical capital (durable goods). In practice, this adjustment is much harder to make; both because of limited data on actual expenditures on human capital formation and because of the conceptual and methodological difficulties in estimating the associated depreciation expenses.

Household expenditures on educational services are grouped together with expenditures on recreational and entertainment services in the NIPA, forming a category that jointly amounts to 3.3 percent of GDP. To isolate education expenditures, I use survey data from the Income and Expenditure Survey (IES) and the National Income Dynamics Survey (NIDS), according to which educational services constitute 2.7 percent of total household expenditure or 1.6 percent of GDP.²⁵

While healthcare expenditures are reported separately (as expenditures on medical services and medical insurance and as expenditures on medical or pharmaceutical products, which together constitute 7.5 percent of household final consumption expenditure or 4.6 percent of GDP), the challenge herewith is that only a part of healthcare expenditures actually contribute to future productive activity and are thus ‘investments’ in the economic sense. This is because medical expenditures tend to increase with age – in contrast to educational expenditures, which are usually incurred before an individual enters the workforce. If only half of all healthcare expenditures improved productive activity compared to a situation in which these expenditures are not made, gross investment in healthcare would be in the order of 3.8 percent of final consumption expenditure or 2.3 percent of GDP. Note that this presents a lower bound: For New Zealand, for instance, where the population is much older on average, Gorman et al. (2013) assume that seventy percent of healthcare expenditure is ‘productive’.

Taken together, at least 6.5–10.2 percent of South African household consumption expenditure thus goes towards the formation of human capital. As discussed in section

²⁴The 0.2 percentage point difference in the longer-term adjustment is presumably due to minor differences in the methodology used to estimate depreciation.

²⁵The IES is conducted every five years since 1995 by Stats SA, and reports the share of education in total household expenditure as 1.8 percent in 1995, 2.8 percent in 2000 and 2005, and 2.7 percent in 2010. The NIDS is conducted biannually since 2008 by the University of Cape Town, and reports a share of 3.1 percent in 2008, 2.8 percent in 2010 and 2.7 percent in 2012.

3.2, the depreciation of human capital investments is unobservable and hard to estimate. In the absence of depreciation, the South African household savings rate could be adjusted upwards by the full 3.9–6.2 percentage points of GDP. The zero depreciation assumption is plausible for healthcare: In contrast to education, humans inherit their stock of health at birth rather than building it up through investments — expenditures on medical services and pharmaceutical products thus only serve to mitigate the inevitable depreciation, and don't in themselves depreciate. In the case of education, however, different assumptions on depreciation are also possible. Under a depreciation rate of 8.5 percent (based on adjusted estimates from the literature as described in Appendix A.2), the reclassification of expenditures on education would increase the savings rate by only 0.9 percentage points, bringing the total adjustment for human capital down to +3.2–5.5 percentage points.

While comparable figures are not available for a broad range of countries, a comparison with New Zealand (+0.5 percentage points) suggests that the adjustment to the South African savings rate is relatively high (Gorman et al., 2013). This is likely due to the fact that advanced economies in general and New Zealand in particular fund a larger share of education and healthcare expenditures through taxes and social security contributions than South Africa.

Natural capital

For natural or environmental capital, we can resort to estimates provided by the World Bank. These estimates, available only on the national (as opposed to sectoral) level, consider carbon dioxide damage and particulate emission damage (environmental degradation) as well as for energy, minerals and net forest depletion (natural resources depletion). For South Africa, the estimated adjustments to the national savings rate amounted to -1.8 percent of GDP from the former, and -4.8 percent from the latter.²⁶

As discussed previously, the depletion of natural resources can likely be attributed to the corporate and public sectors in cause and consequence. While environmental degradation is also caused by all sectors, it affects households first and foremost. From that perspective, the 'dissaving' in terms of environmental quality in the order of -1.8 percent of GDP constitutes an upper bound for an adjustment to the South African household savings rate.

6.4 HOUSEHOLD, CORPORATE AND PUBLIC SAVINGS: ISSUES OF AGGREGATION AND DISAGGREGATION

We saw in section 4 that the level and movements of the household savings rate cannot be considered independently of those of the other institutional sectors. Yet at first sight, it is difficult to see a clear correlation between household, corporate and public sector savings in South Africa (see figure 9). Over the very long run, the decline in household savings was partly mirrored in an increase in corporate savings (correlation coefficient of -0.3 in 1955-2014), but over shorter periods of time the two series seem

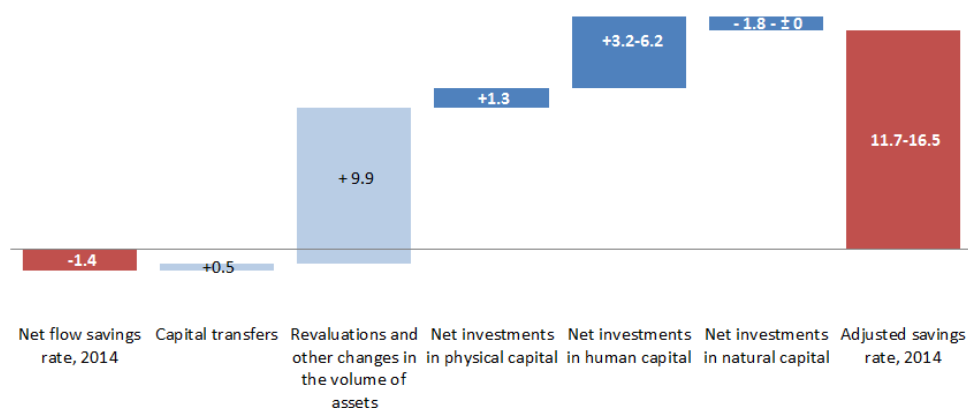
²⁶Latest available data for 2013. Source: World Bank Development Indicators database, accessed 25 April 2015

Table 4: Overview: Adjustments to the South African headline savings rate, 2014. Source: Author's calculations.

Measure/Adjustment	Impact, 2014, %-points	Savings rate, 2014, % of GDP
Gross savings		0.1%
Consumption of fixed capital	-1.5	
Net savings (s_f)		-1.4%
Capital transfers	+0.5	
Real revaluations: real estate	+0.9 – 1.3	
Real revaluations: equities*	+8.6 – 9.0	
Change in real net wealth (s_s)		9.0%
Physical capital: Durable goods	+1.3	
Human capital: Education	+0.9 – 1.6	
Human capital: Healthcare	+2.3 – 4.6	
Natural capital: Environment	-1.8 – 0.0	
Genuine savings (s'_f)		11.7 – 16.5%

* Calculated as a residual since stock holdings for 2014 not available

Figure 8: Overview: Adjustments to the South African headline savings rate, 2014. Source: Author's calculations.



largely independent. For household and public savings, the reverse is true: While the household and public savings moved in different directions in the last two decades (correlation coefficient of -0.7 in 1995-2014), the inverse correlation disappears over longer horizons.

What about the specific links between the savings rates of the three institutional sectors? With regards to the link between household and public savings, we had highlighted the role of household claims on public pension and social security schemes, which are generally not reflected in the adjustments for the ‘interest of households in pension funds and long-term insurers’ (R3,810 billion in 2014) in household wealth and the ‘adjustment for the change in net equity of households in pension fund reserves’ (R38.5 million in 2014) in household sector income and savings. While we cannot easily estimate the value of households entitlements regarding such schemes, the market-based structure of the South African retirement system implies that they are likely small compared to the adjustments already made.

With regards to household and corporate savings, the main link arises from the fact that a large proportion of corporations are usually owned by the domestic household sector. When corporations retain profits instead of distributing them immediately, shareholders accrue claims on future payouts of these savings. As figure 10 shows, attributing all corporate savings to the household sector would explain a large proportion of the quadrupling of real wealth between 1975 and 2014 – much larger than the share explained by household savings proper. Note, however, that South African corporations are not only owned by South African households, but also by the government and foreign investors. On the other hand, South African households also own foreign equities in addition to South African stocks. Unfortunately, a detailed decomposition is not possible due to data limitations.

Figure 9: NIPA savings rates by institutional sector, net, % of GDP. Annual data. Source: South African Reserve Bank, author’s calculations.

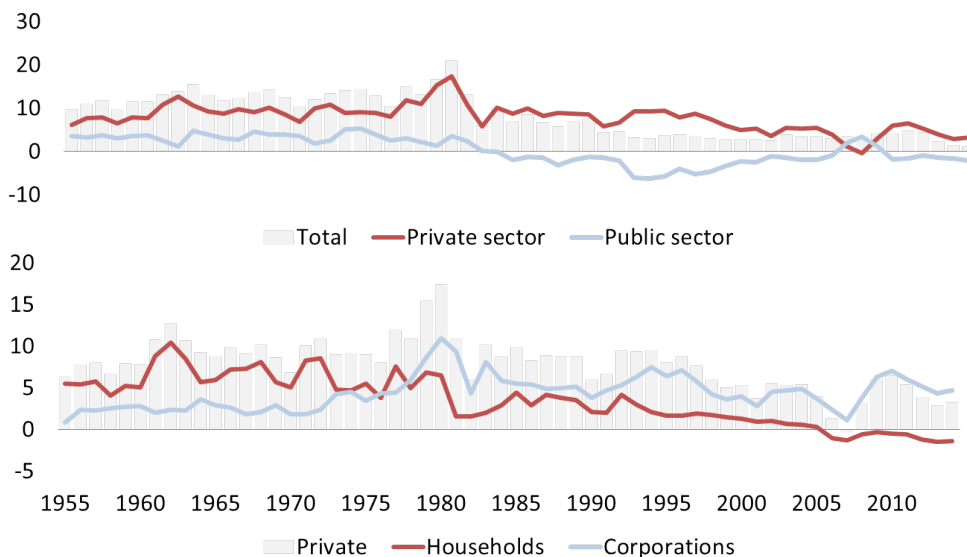
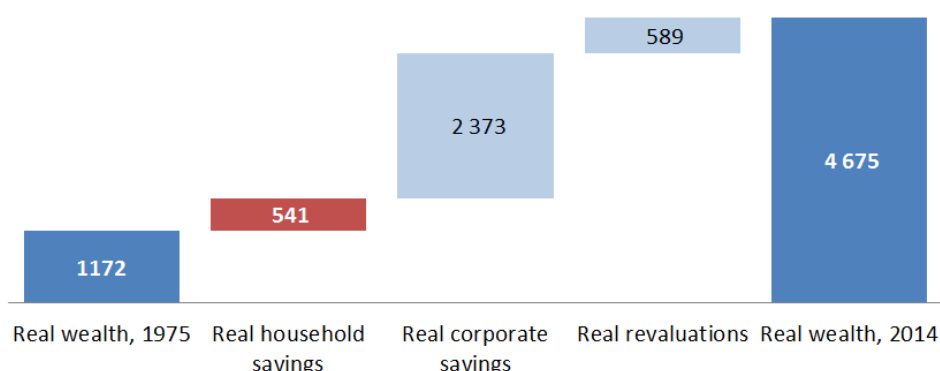


Figure 10: *Decomposition of the increase in real household wealth, 1975-2014. Billion Rand at 2000 prices. Source: South African Reserve Bank, author's calculations.*



7 DISCUSSION: ON THE DISTRIBUTION OF SAVINGS, WEALTH AND DEBT IN SOUTH AFRICA

7.1 A NOTE ON THE DISTRIBUTION OF SAVINGS AND WEALTH

Any discussion about savings and wealth in a country as unequal as South Africa also requires for a distributional analysis. With an income Gini coefficient between 0.6 (for incomes after taxes and transfers) and 0.7 (for market incomes), South Africa remains one of the world's most unequal economies. Income inequality is more than twice as high as in the OECD economies (where the average Gini coefficient stands at 0.3), and even higher than when the country had just transitioned to democracy in 1994 (0.6–0.65) (Solt, 2014; OECD, 2015).²⁷

The high concentration of incomes already indicates that the bulk of savings is certainly provided by a small share of the population. In reality, savings are even more concentrated than incomes. Using household-level data from the 2012 NIDS, the most recent large-scale household survey on income and expenditures for South Africa, we find that ten percent of surveyed households receive roughly half of all income but contribute three quarters of savings when defined as income minus consumption expenditure (see table 5). While these data need to be taken with a grain of salt (see Appendix A.3), the finding that the wealthy have a higher propensity to save is generally well documented in the literature (Browning and Lusardi, 1996; Carroll, 2000; Dynan et al., 2004).

²⁷The lower values refer to the net-income Gini (after taxes and transfers) while the higher values refer to the market-income Gini coefficients. Income inequality in South Africa is still characterized by persistently high levels of inequality between racial groups. Black South Africans, on average, earned only about one eighth of white South Africans in 2008 – almost unchanged since 1994. However, the increase in aggregate inequality in the post-apartheid era is primarily attributable to widening within-group inequality, particularly within the black South African population. The main reason for the increase in inequality lies in the labour market; both in the increase in unemployment and in rising earnings inequality among the employed population (Leibbrandt et al., 2010).

The degree of concentration of savings increases further if we consider the stock rather than the flow concept of savings. This is because wealth is typically more concentrated than incomes and consumption, such that capital gains are only significant for a small share of the population (Piketty and Zucman, 2014). For South Africa, the only public source on household-level wealth data is the 2010 wave of the NIDS, as wealth-related questions were dropped in the following wave. According to this dataset, the wealthiest ten percent of South African households hold up to 87 percent of total wealth; the wealthiest one percent alone 51 percent (see table 5). Again, these estimates need to be interpreted with some caution, both due to sampling and measurement errors in the underlying wealth data (see Daniels et al., 2012) and due to the issues associated with calculating distributional statistics from complex social survey data (see Appendix A.3). However, alternative estimates also indicate that wealth is highly concentrated in South Africa, if less so than our estimates suggest. In an earlier analysis on the NIDS dataset, Daniels et al. (2012) estimated the wealth share of the top decile at 84 percent.²⁸ Alternative estimates provided by the *Crédit Suisse Global Wealth Report* on the basis of cross-country regressions between income and wealth inequality (as well as on the basis of information from global rich lists such as the Forbes Billionaires List, according to which seven South African individuals alone own more than four percent of the entire net wealth of the household sector) put the wealth share of the top decile at 72 percent (Stierli et al., 2014). The equivalent figure for the OECD average is about fifty percent, although the variation between the member countries is substantial (OECD, 2015).

Table 5: *Quantile group shares and other distributional metrics*

<i>Variable</i> <i>Source</i>	Income NIDS 2012	Consumption NIDS 2012	Saving Derived	Wealth NIDS 2010
99%	12%	10%	22%	51%
90%	48%	46%	76%	87%
50%	4%	4%	3%	0%
40%	3%	3%	1%	0%
Gini coefficient*	.61	.60	.71*	.93*
P90/P50 ratio	5.1	5.9	8.4	56.9
P90/P10 ratio	17.7	15.2	<i>n/a</i>	<i>n/a</i>

* Note: Gini coefficients exclude negative observations (including negative savings/wealth: 1.2/.94)

P90/P50 ratio: Ratio of the upper bound value of the ninth decile to the median

P90/P10 ratio: Ratio of the upper bound value of the ninth decile to that of the first decile

Details on data and methodology in Appendix A.3

While wealth is more concentrated than incomes, corporate stocks tend to be even more concentrated than other forms of wealth. In the OECD, the financial assets of the

²⁸Daniels et al. (2012) argue that this estimate might be overstated due to measurement errors and ‘outliers’, and provide a ‘trimmed’ estimate of 54 percent. Given that the wealthiest seven South African individuals alone (less than one-hundredth percent of the top one percent) own more than four percent of the entire net wealth of the South African household sector according to the Forbes 2015 World’s Billionaires List—more than the bottom fifty percent combined—, however, trimming the outliers is a non-trivial decision.

top quintile are seventy times as valuable as those of the bottom quintile; the value of their non-financial assets are thirty times larger (OECD, 2015, Chapter 6). Although comparable data is not published for South Africa, several observations indicate that this tendency might particularly pronounced in the emerging market context. According to the 2012 NIDS survey, about 45 percent of adults have a bank account or a membership in a savings group or “stokvel”, but only one percent of adults have a private pension annuity and less than one percent use trusts, stocks and shares. From tax statistics, it can be read that only three percent of South African taxpayers have taxable interest incomes, and only one percent have taxable incomes from capital gains. The fact that three quarters of retired South Africans receive the means-tested government old-age grant also indicates that these individuals have no material interests in funded pensions that would benefit from stock appreciations.²⁹

Home ownership, in contrast, is more widespread, with more than sixty percent of South African urban households owning the dwellings they occupy according to the Housing Finance Information Network and almost eighty percent of adults living in a dwelling that is owned by a household member according to the NIDS. Although the value of residential buildings varies widely, lower-income home-owners do benefit from revaluations, for instance as house price growth in former townships exceeded that of many suburban residential areas in the last decade.³⁰

The importance of stock revaluations for household wealth dynamics and the indication that these revaluations accrue to only a very small fraction of the South African population has a strong implication. While the stock measure of savings had indicated that the aggregate state of South African savings was less worrisome than the flow measure suggested, this discussion suggests that the distribution of savings is probably more unequal than otherwise expected. Specifically, the tendency that the rich save more is likely even more pronounced when a balance sheet view on savings is taken.

7.2 A NOTE ON HOUSEHOLD DEBT

If households spend more than they earn in any given period of time, they must fund the differential by selling their assets or increasing their liabilities. Indeed, the dis-saving of South African households over the last decade has been accompanied by an increase in debt. Household debt now stands at almost fifty percent of GDP or eighty percent of disposable income. While this is relatively low compared to the advanced economies (where household debt in many cases exceeds one hundred percent of GDP), it is relatively high compared to other emerging markets.³¹ When seen in proportion

²⁹Source: South African Revenue Service (<http://www.sars.gov.za/About/SATaxSystem/Pages/Tax-Statistics.aspx>). Note that different sources report different numbers on financial inclusion: In a recent survey, the South African financial industry found that only twenty percent of the population has access to formal savings products from banks or non-bank financial institutions (Finmark Trust: FinScope South Africa 2014). The World Bank, in contrast, states that seventy percent of adults own an account with a financial institution or a mobile money provider (World Bank: Global Findex Database 2014).

³⁰Sources: Housing Finance Information Network (www.hofinet.org); FNB Property Barometer (blog.fnb.co.za/2015/05/property-barometer-townships-may-2015/).

³¹According to the McKinsey Global Institute, the rich economies of Denmark (129 percent), Norway (124 percent), the Netherlands (115 percent) and Australia (113 percent) have the highest debt-to-GDP ratios out of 47 advanced and developing countries. In the BRICS countries, household debt stood at

to assets, household debt is relatively high even compared to the rich economies – the relevant figures are eighteen percent for South Africa and fourteen percent for the OECD average (OECD, 2015, Chapter 6).

Two often used criteria to determine whether an entity is over-indebted are whether the debt-to-asset ratio exceeds 75 percent and whether the debt-to-income ratio exceeds 300 percent (OECD, 2015). As long as incomes or asset prices are not falling dramatically, the South African household sector is thus not collectively over-indebted. Despite these aggregate figures, the really interesting question again concerns the distribution of debt across different strata of the income and wealth distribution. According to the NIDS 2010 data, a quarter of households fulfil the first criterion for over-indebtedness (a debt-to-asset ratio above 75 percent), while two percent fulfil the second one (a debt-to-income ratio above 300 percent).³² As in the case of household wealth, more disaggregated data will help drawing more relevant conclusion on household welfare and potential risks to the South African economy.

8 CONCLUSION

The comparison of different concepts and measures of savings stresses one main point: since there is no single ‘correct’ measure of savings, a careful choice of the most relevant concept and measure is an important step in any analysis of the level of savings or the savings behaviour of households. The most important distinction is that between the balance sheet and the income statement view of savings: while households haven’t been “putting aside” their incomes according to the latter concept, they have nevertheless grown richer, driven largely by favourable asset price developments that are not reflected in conventional measures of income. Although detailed revaluation accounts are still under construction in South Africa, the available data suggests that this owes primarily to the exceptional appreciation of domestic corporate equities over the last decades, which in turn is largely due to substantial retained profits. The full integration of the South African national accounts will contribute to our understanding of aggregate savings and wealth dynamics in the future.

While the strong increases in aggregate household wealth paint a less worrisome picture than the conventionally measured savings rates (according to which household savings have been nil or negative for decades), it raises important distributional questions. Since equity ownership tends to be highly concentrated, it is highly probable that the vast majority of asset revaluations have accrued only to a small share of the South African population. As a result, true savings inequality is likely even more pronounced than conventional forms of measurement suggest. Unfortunately, household-level wealth data is still scarce at the time of writing. More transparency on the private wealth, be it through survey data or administrative records, would greatly enhance our knowledge of the wealth distribution and open up valuable paths for further research on inequality dynamics in South Africa.

25 (Brazil), 16 (Russia), 9 (India) and 38 percent (China) in 2014 (McKinsey Global Institute, 2015). Note that the McKinsey Global Institute estimates the equivalent figure for South Africa at 39 percent, while the SARB figures indicates that household debt amounted to 47 percent of GDP.

³²For the OECD, the equivalent figures are ten and twelve percent (OECD, 2015).

REFERENCES

- Aghion, P., D. Comin, and P. Howitt (2006). When does domestic saving matter for economic growth? *NBER Working Paper 12275*.
- Aron, J. and J. Muellbauer (2000). Personal and corporate saving in South Africa. *The World Bank Economic Review* 14(3), 509–544.
- Aron, J. and J. Muellbauer (2011). Wealth, credit conditions and consumption: Evidence from South Africa. *University of Oxford Department of Economics Discussion Paper Series 580*.
- Aron, J., J. Muellbauer, and J. Prinsloo (2006a). Estimating household-sector wealth in South Africa. *South African Reserve Bank Quarterly Bulletin, June 2006*, 61–72.
- Aron, J., J. Muellbauer, and J. Prinsloo (2006b). Estimating the Balance Sheet of the Personal Sector in an Emerging Market Country. *UNU-WIDER Research Paper 99*.
- Arrazola, M. and J. D. Hevia (2004). More on the estimation of the human capital depreciation rate. *Applied Economics Letters* 11(3), 145–148.
- Arrow, K. J., P. Dasgupta, L. H. Goulder, K. J. Mumford, and K. Oleson (2012). Sustainability and the measurement of wealth. *Environment and Development Economics* 17(03), 315–316.
- Atkinson, G. and K. Hamilton (2007). Progress along the path: Evolving issues in the measurement of genuine saving. *Environmental and Resource Economics* 37, 43–61.
- Becker, G. S. (1975). *Human capital: A theoretical and empirical analysis, with special reference to education* (2nd ed.). Princeton: National Bureau of Economic Research.
- Blades, D. W. and P. H. Sturm (1982). The concept and measurement of savings: The United States and other industrialized countries. In *Saving and Government Policy, Conference Series No. 25*. Boston: Federal Reserve Bank of Boston.
- Boskin, M. J. (1991). Issues in the measurement and interpretation of saving and wealth. In E. R. Berndt and J. E. Triplett (Eds.), *Fifty Years of Economic Measurement: The Jubilee of the Conference on Research in Income and Wealth, January 1991*, pp. 159–184. Chicago: University of Chicago Press.
- Browning, M. and A. Lusardi (1996). Household saving: Micro theories and micro facts. *Journal of Economic Literature* 34(4), 1797–1855.
- Carroll, C. D. (2000). Why Do the Rich Save So Much? In J. B. Slemrod (Ed.), *Does Atlas Shrug? The Economic Consequences of Taxing the Rich.*, pp. 465–84. Boston: Harvard University Press.
- Carroll, C. D. and D. N. Well (1993). Saving and growth: A reinterpretation. *NBER Working Paper 4470*.
- Commission on Growth and Development (2008). *The Growth Report: Strategies for sustained growth and inclusive development*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.

- Daniels, R. C., A. Finn, and S. Musundwa (2012). Wealth in the National Income Dynamics Study Wave 2. *NIDS Discussion Paper 83*.
- David, P. A. and J. L. Scadding (1974). Private savings: Ultrarationality, aggregation, and "Denison's law". *Journal of Political Economy* 82(2), 225–249.
- Deaton, A. (1999). Saving and growth. In K. Schmidt-Hebbel and L. Servén (Eds.), *The economics of saving and growth*, pp. 33–70. Cambridge: Cambridge University Press.
- Deaton, A. (2005). Measuring poverty in a growing world (or measuring growth in a poor world). *The Review of Economics and Statistics* 87(1), 1–19.
- Dimson, E., P. Marsh, and M. Staunton (2015). *Credit Suisse Investment Returns Yearbook 2015*. Zurich: Credit Suisse AG.
- Dynan, K. E., J. Skinner, and S. P. Zeldes (2004). Do the Rich Save More? *Journal of Political Economy* 112(2), 397–444.
- Finn, A. and M. Leibbrandt (2013). Mobility and Inequality in the First Three Waves of NIDS. *NIDS Discussion Paper 120*.
- Friedman, M. (1957). *A Theory of the Consumption Function* (1st ed.). Princeton: Princeton University Press.
- Gale, W. G., J. Sabelhaus, and R. E. Hall (1999). Perspectives on the household saving rate. *Brookings Papers on Economic Activity* 1, 181–224.
- Goldsmith, R. W. (1955). *A study of saving in the United States, Vols. I and II*. Princeton: Princeton University Press.
- Gorman, E., G. M. Scobie, and Y. Paek (2013). Measuring saving rates in New Zealand: An update. *New Zealand Treasury Working Paper 4*.
- Groot, W. (1998). Empirical estimates of the rate of depreciation of education. *Applied Economics Letters* 5(8), 535–538.
- Hamilton, K. and M. Clemens (1999). Genuine savings rate in developing countries. *The World Bank Economic Review* 13(2), 333–356.
- Hicks, J. R. (1939). *Value and Capital. An Inquiry Into Some Fundamental Principles of Economic Theory* (1st ed.). Oxford: Oxford University Press.
- Hicks, J. R. (1946). *Value and Capital. An Inquiry Into Some Fundamental Principles of Economic Theory*. (2nd ed.). Oxford: Oxford University Press.
- International Monetary Fund (2009). *Balance of payments and international investment position manual*.
- Jakab, Z. and M. Kumhof (2015). Banks are not intermediaries of loanable funds – and why this matters. *Bank of England Working Paper 529*.
- Jenkins, S. P. (2006). Estimation and interpretation of measures of inequality, poverty, and social welfare using Stata. *5th North American Stata Users Group Meeting, 24-25 July 2006, Boston, MA, USA*.

- Jump, G. V. (1980). Interest Rates, Inflation Expectations, and Spurious Elements in Measured Real Income and Saving. *American Economic Review* 70(5), 990–1004.
- Kuhn, K. (2010). Note on household wealth in South Africa. *South African Reserve Bank Quarterly Bulletin, September 2010*, 66–73.
- Leibbrandt, M., I. Woolard, A. Finn, and J. Argent (2010). Trends in South African income distribution and poverty since the fall of apartheid. *OECD Social, Employment and Migration Working Papers* (101), 1 – 91.
- McKinsey Global Institute (2015). *Debt and (not much) deleveraging*. McKinsey & Company.
- Miller, M. H. and F. Modigliani (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business*, 34(4), 411–433.
- Mincer, J. and H. Ofek (2011). Interrupted work careers: Depreciation and restoration of human capital. *The Journal of Human Resources* 17(1), 3–24.
- National Planning Commission (2012). *Our future - make it work*.
- OECD (2002). *Measuring the non-observed economy. A handbook*. Paris: OECD Publishing.
- OECD (2015). *In it together. Why less inequality benefits all*. Paris: OECD Publishing.
- Peach, R. and C. Steindel (2000). A nation of spendthrifts? An analysis of trends in personal and gross saving. *Federal Reserve Bank of New York - Current Issues in Economics and Finance* 6(10), 2–7.
- Pearce, D. and G. Atkinson (1993). Capital theory and the measurement of sustainable development: An indicator of weak sustainability. *Ecological Economics* 8, 103–108.
- Perozek, M. G. and M. B. Reinsdorf (2002). Alternative measures of personal saving. *United State Department of Commerce - Survey of Current Business* 82(4), 13–24.
- Piketty, T. (2014). *Capital in the twenty-first century*. Cambridge: Harvard University Press.
- Piketty, T. and G. Zucman (2014). Capital is Back: Wealth-Income Ratios in Rich Countries, 1700-2010. *Quarterly Journal of Economics* 129, 1255–1310.
- Poterba, J. M. (2000). Stock market wealth and consumption. *Journal of Economic Perspectives* 14(2), 99–118.
- Ravallion, M. (2003). Measuring aggregate welfare in developing countries: How well do national accounts and surveys agree? *Review of Economics and Statistics* 85(3), 645–652.
- Rognlie, M. (2015). Deciphering the fall and rise in the net capital share. *Brookings Papers on Economic Activity. BPEA Conference Draft, March 19-20, 2015*.
- Saez, E. and G. Zucman (2014). Wealth inequality in the United States since 1913: Evidence from capitalized income tax data. *NBER Working Paper 20625*.

- Sala-i Martin, X., M. Pinkovskiy, and X. Sala-i Martin (2014). Lights, camera,... income! Estimating poverty using national accounts, survey means, and lights. *Federal Reserve Bank of New York Staff Reports 669*(Revised January 2015).
- Schmidt-Hebbel, K., L. Servén, and A. Solimano (1996). Saving and investment: paradigms, puzzles, policies. *The World Bank Research Observer 11*(1), 87–117.
- Scobie, G. M. and K. Henderson (2009). Saving rates of New Zealanders: A net wealth approach. *New Zealand Treasury Working Paper 4*.
- Simons, H. C. (1938). *Personal income taxation: The definition of income as a problem of fiscal policy*. Chicago: University of Chicago Press.
- Solt, F. (2014). The Standardized World Income Inequality Database. Working paper. SWIID Version 5.0, October 2014.
- South African Reserve Bank (2015). South Africa’s national accounts 1946 - 2014. An overview of sources and methods. Supplement to the South African Reserve Bank Quarterly Bulletin, March 2015.
- Stierli, M., A. Shorrocks, J. B. Davies, R. Lluberás, and A. Koutsoukis (2014). *Credit Suisse Global Wealth Report 2014*. Zurich: Credit Suisse AG.
- Thuronyi, V. (1990). The concept of income. *Tax Law Review 46*, 45–105.
- Van der Berg, S., R. Burger, M. Louw, and D. Yu (2007). A series of national accounts-consistent estimates of poverty and inequality in South Africa. *Stellenbosch Economic Working Papers 09*.
- Yu, D. (2013). Poverty and Inequality Estimates of National Income Dynamics Study Revisited. *Stellenbosch Economic Working Papers 05*.

A APPENDIX

A.1 CALCULATION OF REVALUATION EFFECTS

The assets of the household sector are comprised of non-financial and financial assets, the former consisting primarily of real estate and the latter comprising equities and fixed-income securities. On the liability side, households have debt in the form of mortgages and other obligations, while their wealth constitutes the balancing item between the value of assets and the amount of debt. While the latter is determined at the time that the debt is contracted, the value of the former is determined daily on the market. Formally speaking, the value of household assets equals the sum-product of the quantity and the current price of each asset, such that the change in the value of assets—and hence in wealth—between two points in time can be decomposed into a quantity effect and a revaluation effect by applying a standard growth accounting procedure as proposed by Scobie and Henderson (2009).

$$V_t = Q_t \times P_t \quad (4)$$

$$\% \Delta V_t = \% \Delta Q_t + \% \Delta P_t + \% \Delta P_t \times \% \Delta Q_t \quad (5)$$

$$\Delta V_t = \underbrace{\% \Delta Q_t \times V_{t-1}}_{\text{Quantity effect}} + \underbrace{\% \Delta P_t \times V_{t-1}}_{\text{Price effect}} + \underbrace{(\% \Delta P_t \times \% \Delta Q_t) \times V_{t-1}}_{\text{Interaction term}} \quad (6)$$

Revaluation effect

To distinguish between real and inflation-induced revaluations, I apply the same growth accounting procedure as described in (6) in the article to decompose nominal prices into a real and an inflation component ($P_t = P_t^R \times CPI_t$), nesting this decomposition in formula (6) to arrive at formula (7):

$$\begin{aligned} \Delta V_t = & \underbrace{\% \Delta Q_t \times V_{t-1}}_{\text{Quantity effect}} + \underbrace{\% \Delta P_t^R \times V_{t-1}}_{\text{Real price effect}} + \underbrace{\% \Delta CPI_t \times V_{t-1}}_{\text{Inflation effect}} \quad (7) \\ & + \underbrace{(\% \Delta P_t^R \times \% \Delta Q_t) \times V_{t-1} + (\% \Delta CPI_t \times \% \Delta Q_t) \times V_{t-1}}_{\text{Interaction terms}} \\ & + \underbrace{(\% \Delta P_t^R \times \% \Delta CPI_t \times \% \Delta Q_t) \times V_{t-1}}_{\text{Triple interaction term}} \end{aligned}$$

In the most general terms, an increase in real wealth thus can thus stem from two sources: a price-induced increase in the value of assets over inflation and a change in the quantity of assets relative to liabilities.

In the very long term, asset prices should not diverge systematically from the prices of goods and services, and the revaluation effect should ultimately even out (Piketty and Zucman, 2014). Over an infinite horizon, moreover, historic wealth-income ratios do not affect current ones, such that the steady-state wealth-income ratio can be written as:

A.2 ESTIMATION OF HUMAN CAPITAL DEPRECIATION

Empirical studies on the depreciation of education often find a decelerating depreciation pattern, with more rapid depreciation for people out of the workforce than those who use their skills in the workplace. Studying the depreciation of human capital depreciation from interrupted work careers, for instance, Mincer and Ofek (2011) find that the reduction of future wages associated with each year outside the workforce (corrected for tenure-related effects) are highest in the first year and average 0.6-1.1 percent per year in the long-run. Groot (1998) models the current value of formal education as $(1 - \tau)^T S$ (where τ denotes the depreciation rate and S the stock of education). He estimates τ at 11-17 percent, which points to a rapid (but decelerating) depreciation of the stock of formal education and emphasizes the importance of lifelong learning to maintain the education stock. Arrazola and Hevia (2004) employ a similar model, in which they include an estimate for the contribution of work experience to the stock of

qualifications. Recognizing that work experience contributes to maintaining the capital stock, they arrive at a depreciation rate of 1-1.5 percent per year.

Since the NIPA figures on education presumably include primarily formal education and not on-the-job training, it seems most appropriate to use Arrazola and Hevia's estimates for employed individuals and Groot's estimates for individuals outside the workforce. A weighted average on the basis of an employed share of 42 percent among the South African working-age population in 2014 suggests a depreciation rate of 8.5 percent.³³ It is important to recognize that this is a very rough estimate based on two other rough estimates from different countries in different times as well as a rough estimate on the historical education expenditure (and thence education stock) of households in South Africa. It means that half the value of the stock of education is lost after eight years. Only ten percent of the value remains after 25 years, and nothing after sixty years.

A.3 NOTES ON THE ESTIMATION OF DISTRIBUTIONAL STATISTICS

All estimates on the distribution of income, consumption, saving and wealth were conducted on the basis of the National Income Dynamics Survey (NIDS), a large-scale household survey conducted biannually since 2008 by the University of Cape Town. All income, consumption and saving data were taken from the third wave of the survey in 2012. Wealth data, however, were taken from the second wave in 2010, as these data were not gathered in the more recent survey. More information on the NIDS survey can be found on the program homepage (NIDS.uct.ac.za).

All calculations were made on the entire household dataset (weighted with the post-stratified weights to account for the different probability of different demographic groups in the survey sample), without dropping incomplete interviews or outliers. The only restriction made was to use only one observation per household, since all members of each household show up with the same values of income, consumption and wealth. No adjustment is made for household size and composition. All distributional statistics were calculated using the *sumdist* and *ineqdec0* STATA modules provided by Thomas Jenkins. Note, however, that these non-stochastic estimates partly reflect the sampling variability of the underlying survey (including clustering and stratification), meaning that the top income shares can be overstated (Jenkins, 2006). Note also that distributional statistics were calculated to include negative values, which explains the very high shares at the top of the distribution as well as the very high Gini indices, which are no longer bound to one if the underlying distribution contains negative values.

It is beyond the scope of this paper to provide a more detailed analysis of the income, savings and wealth distribution in South Africa. For careful studies on income and wealth inequality in South Africa, the interested reader is referred to Leibbrandt et al. (2010); Finn and Leibbrandt (2013); Yu (2013) (income inequality) and Daniels et al. (2012) (wealth inequality), respectively.

³³The working-age population in itself constitutes only 52 percent of the population. Since we are interested in the depreciation of education over the future working life of the individuals that currently invest in education, though, I use the employed share of the working-age population as a proxy.