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Sustainable housing financing model to reduce South Africa housing deficit

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Abstract

Purpose – This study aims to identify and establish effective housing financing concepts to be adopted by government in achieving its mandate of providing sustainable affordable housing for the poor to decrease the building of shacks, as well as proposing solutions to the housing deficit in South Africa. A rise in demand and shortage in supply of housing calls for the need to address issues of affordable housing in South Africa, and developing countries in general, to ensure a stable and promising future for poor families.

Design/methodology/approach – Literature has revealed that the South African government, at all levels, accorded high priority to the provision of low-cost housing. Thus, government has adopted subsidy payment as a method of financing affordable housing to ensure that houses are allocated free to the beneficiaries. This also addresses the historically race-based inequalities of the past, but unfortunately, this has not been fully realised. This study uses a sequential mixed method approach, where private housing developers and general building contractors were the research participants. The qualitative data were analysed using a case-by-case analysis, and quantitative data were analysed using a descriptive statistical technique on SPSS.

Findings – The results of the qualitative analysis reveal a gross abuse of the housing subsidies system by the beneficiaries of government-funded housing in South Africa. This is evident from illegal sale of the houses below market value. This has led to a continual building of shacks and an increased number of people on the housing waiting list instead of a decrease in the housing deficit. The results from quantitative analysis affirm the use of “Mortgage Payment Subsidies, Mortgage Payment Deductions, Down-Payment Grant and Mortgage Interest Deductions” as viable alternatives to subsidy payment currently in use to finance affordable housing projects by the South African Government.

Practical implications – At the moment, the focus of the South African National Government is continual provision of free housing to the historically disadvantaged citizens, but the housing financing method being used encourages unapproved transfer of ownership in the affordable housing sector. This study thus recommends the use of an all-inclusive housing financing method that requires a monetary contribution from the beneficiaries to enable them take control of the process.

Originality/value – The relational interface model proposed in this study will reduce pressure on government budgetary provision for housing and guarantee quick return of private developers’



investment in housing. Government must, as a matter of urgency, launch a continuous awareness programme to educate the low-income population on the value and the long-term benefits of the housing.

Keywords South Africa, Housing finance systems, Low-income, Financing model, Housing deficit, Sustainable housing

Paper type Research paper

Introduction

The high rate of household formation, due to an increase in the population, has resulted in a significant shortage of affordable housing in South Africa. It has become a challenging task, for both the government and private real estate developers, to provide affordable housing to lower- and medium-income families in urban centres, mainly because of high demand, escalating prices and non-preference to vertical expansion apartments. Wood (2007) and Jenkins *et al.* (2006) noted an increase in demand for housing, which has grown globally in recent decades, a trend that is expected to continue.

This rise in demand and shortage in supply of housing calls for the need to address issues of affordable housing in South Africa, to ensure the well-being of the society and a stable and promising future for the South African family. Nonetheless, the economic contribution of investment in housing is enormous, as it is generally the largest investment that people make in their lives (Maliene and Malys, 2009). According to Dfid (2015), the housing sector contributes about 4.5 per cent of the global gross domestic product in low-income economies and 9.1 per cent in upper-middle income economies. South Africa's urban settlements (according to du Plessis and Landman, 2002; Goebel, 2007) reveal unsustainability in its past, present and projected future. Thus, the South African Government, at all levels, accorded high-priority attention to the provision of housing for low-income households in post-apartheid South Africa, which is largely due to the need to cater for the historically disadvantaged citizens and contemporary rural-urban migration. These policy initiatives of government give much hope for a better life to the people, but are unable to fully address the multifaceted challenge of providing housing infrastructure while, at the same time, assuring a secure and a sustainable environment.

The policy focus of the South African National Government has been to provide housing for the historically disadvantaged citizens. Thus, government adopted the use of "subsidy payment" as mode of financing affordable housing to ensure that the beneficiaries are allocated free houses to right the wrongs of the past. This study is thus set out to identify and establish effective housing finance concepts and to enable the government to achieve its mandate of providing sustainable affordable housing, without jeopardising its commitment to make decent accommodation within the reach of the historically disadvantaged population.

Overview of South Africa housing deficit

The provision of housing has been one of the cardinal objectives of national government in South Africa since 1994. The quest for affordable and decent housing that departs from the sites and services schemes (popularly referred to as "toilet towns" in South Africa) have propelled the government to develop several policy and statutory changes relating to housing, which attest to the extensive and convoluted housing problem in South Africa (Tissington, 2011; Huchzermeyer, 2009; Onatu, 2010). According to the National Department of Human Settlements reports, government investments in housing from 1994 to 2004 have generated 1.6 million houses and provided half a million households with secure titles. By 2007, government spending on housing showed that 2.4 million houses had been constructed on sites that had been allocated, and while financial housing subsidies continued to be on the

rise, actual housing delivery appeared to be on the decline by 2009. In 2010, the National Minister of Human Settlement, while stating the progress achieved in housing delivery, mentioned that over 2.3 million housing units were constructed for nearly 11 million people. Corroborating the Minister of Human Settlement's claim, [Tissington \(2011\)](#) stated that government disbursements on housing are project linked subsidies, where developers construct housing and qualifying households take ownership of the residential unit from the developers on completion.

The general household survey released by Statistics South Africa (StatSA) ([Statistics South Africa, 2011](#)) revealed an increase in informal settlements despite huge budgetary allocations for housing development. [Statistics South Africa \(2011\)](#) gave the number of families living in shacks in informal settlements in the three largest provinces in South Africa; Western Cape, KwaZulu-Natal and Gauteng as 134,000, 176,000 and 481,000, respectively. [Huchzermeyer \(2009\)](#) argues that the StatSA figures are grossly unreliable. [Huchzermeyer \(2009\)](#) asserts that shacks counts by housing officials through aerial surveys and supplemented by ground survey are most realistic. The difference in the shacks count by a combination of aerial and ground survey in most cases is about 45 per cent higher than StatSA figures ([Huchzermeyer, 2009](#)). Conversely, [Tissington \(2011\)](#) contends that inadequacy of statistics on informal settlements and shack-dwellers attests to non-availability of accurate data on demand for housing in South Africa, which contributes largely to lack of proper planning for affordable housing construction.

The slow pace of housing delivery, characterised by poor coordination between the arms of government responsible for housing development, delays in project initiation and approval, has been the norm in the affordable housing sector, despite huge amounts of money budgeted. Construction cost escalation also reduced the value of subsidies to below the required amount to complete a house. This makes the subsidy an inappropriate mechanism, as it fails to adjust to changes in housing needs and market conditions ([Tissington, 2011](#)). The South African Government has, over the years, made concerted efforts in the provision of affordable housing to accommodate the low income population, but the recent figures from StatSA still show that much needs to be done in this regard. The little progress made in areas of affordable housing provision attests to the need for a review of the financing model through which affordable housing construction is financed.

Housing finance and mortgage systems in South Africa

Economic viability is often the most common factor used globally to define housing affordability. Often times, important issues such as sustainability, housing location and quality are overlooked ([Huchzermeyer, 2009](#); [Mulliner et al., 2013](#)). However, an individual living in a house which requires more than a certain proportion of his income is often considered to be living in unaffordable housing. In contrast to the conventional way of determining affordability, researchers, such as [Stone \(2006\)](#), recognise that housing affordability is closely linked to housing standards. [Stone \(2006\)](#) therefore posited a "shelter-poverty" measure as a way to evaluate household affordability. [Stone \(2006\)](#) thus suggests that an assessment of household income adequacy should cover housing costs and other non-housing costs to enable the household to maintain a decent living standard. A major impediment in the delivery of housing for low-income households is the challenges confronting commercial banks to grant loans to the poor population in the housing market notwithstanding supporting initiatives by government, although inadequate knowledge and experience of the low-income families in securing housing loans from commercial banks in South Africa could be the reason for this problems ([Pillay and Naude, 2006](#); [Tomlinson, 2007](#)).

The South African housing finance system began to suffer set-backs because of political unrest prior to 1994. The political unrest brought service delivery in all the municipalities to a halt and caused huge loan defaults, most especially for commercial banks providing home loans to the low- and middle-income families (Pillay and Naude, 2006). By 1994, commercial banks, together with the leading government mortgage lender “Khayaletu Home Loans”, had recorded about 34,000 landed-properties confiscated because of nonperforming loans (Banking Council, 1999). Consequently, the lenders withdrew from the low- and middle-income sector of the housing market because of the inability of the mortgagee to conveniently evict residents that defaulted on payments. This led to the collapse of mortgage financing opportunities for low-income earners in the housing market.

Home ownership has captured the attention of policymakers across the globe in recent years, and this attention has often been negative. Bank failures based on failed home mortgages and a nearly worldwide housing recession have raised difficult questions about the viability of pro-ownership public subsidies. For example, in the USA, high foreclosure rates have provoked a debate over using limited federal resources to promote home purchases (Beracha and Johnson, 2012; Davis, 2012; Shlay, 2006). Yet, demand for buying a home remains strong, even among households that suffer the negative outcomes of failed home ownership programmes (Drew and Herbert, 2012). The lure of owning a home remains part of the social and economic fabric of families and communities. There has been vigorous debate about the optimal role of government in subsidising housing construction to stimulate the economy and the role of mortgages in the financial sector. A common theme is the concern about how best to support low-income, first-time home buyers, a dilemma which the adoption of a sustainable financing method for housing projects could resolve. In this study, sustainable housing financing is anchored on the definition provided by Li and Tsoi (2014), which simply means the loans, funds and other supportive systems through taxation that are made available by government to housing developers to construct environmentally, economically and socially responsive buildings.

To actualise the provision of the much needed support required by first-time home owners after the collapse of mortgage financing for low-income housing in 1994, the South African Government introduced a new approach to motivate mortgage lenders to offer loans to the low-income sector. A capital subsidy payment was injected into the low-income housing sector purposely to deliver a defined housing product instead of targeting progressive realisation of housing. The subsidy payment was managed by the Provincial Housing Boards (PHBs), and in the year 2000, government disestablished the structures of PHBs and made the Provincial Member of The Executive Council responsible for the subsidy allocation. Between 1995 and 2001, one million subsidies were allocated, the majority to people earning less than South African Rand 1,500 (ZAR1,500) per month, about 8 per cent to people earning ZAR1,501-ZAR2,500 per month and only 2 per cent of the subsidy was allocated to those earning less than ZAR3,500 per month (CSIR, 2000; South Africa National Department of Housing, 2001; Huchzermeyer, 2001; Pillay and Naude, 2006; Tomlinson, 2007).

According to Huchzermeyer (2001) and Gilbert (2004), housing subsidies have reduced housing challenges in South Africa. However, there are concerns over the long-term sustainability of confronting housing problems through subsidy in the face of high unemployment, huge income inequality and poverty level (Gilbert, 2004). Currently, South Africa is confronted with low-income housing challenges, with the housing backlog estimated at over three million units (Statistics South Africa, 2016). Financing low-income housing is characterised by a multitude of constraints and have been argued to include lack of continuity due to withdrawal of private developers from the low-income housing sector,

inefficient allocation of government subsidies and inability of government mortgage finance institutions to absorb higher risk when there is lack of performance in the market (Pillay and Naude, 2006).

Subsequent to the aforementioned, one major problem that characterised the Capital Housing Subsidies was the instant development of housing queues in all the provinces. Since 1994, 3.74 million housing subsidies delivered by the end of 2014 failed to reduce the long list of applicants. Another common complaint about the housing provided through subsidy has been its poor distribution, which has been uneven, and most of the homes built in the urban cities are located far from the main centres of employment. Some critics have alleged that the policy has heightened social segregation (Huchzermeyer, 2001; Gilbert, 2004) which the democratically elected government is mandated to correct as directed by the “1994 Housing White Paper”. Many stakeholders in housing have criticised the new kinds of “official slums” being created by the subsidy programme. The government’s success in providing housing for the very poor has produced ghettos of unemployment and poverty. In many cases, some of the house owners traded in the subsidy for quick cash because of the inability to maintain the accommodation (Gilbert, 2004).

Every government proposing housing subsidy has to resolve a basic quagmire. Given the required level of expenditure, the first dilemma is how to maximise the number of subsidies in the face of an increased number of households waiting to be allocated a home, and the second is quality of house to be delivered. However, an attempt to deliver more subsidies could lead to lower housing quality. Clearly, efficient production and programming can increase the quality of a housing solution at any given price, but the basic trade-off is unavoidable. Gilbert (2004) is of the opinion that the cost difference between the number of subsidies and the quality of the final housing product can be masked in many ways. One of these is to supplement low-subsidies by credit, thereby raising the quality of the homes on offer, whereas inclusion of higher-income households, eligible only for small subsidies, will increase the number of subsidies to be allocated (Gilbert, 2004). The Housing-Subsidy scheme has provided homes to a very large number of poor households and though it is a good way of providing free housing, it is not economically sustainable and was unable to solve all the housing problems. Hence, there is a need to investigate other housing financing models to finance affordable housing construction in a manner that is more economical to both the government, housing developer and the beneficiaries.

Housing financing models for sustainable development

As discussed in the preceding sections, one of the basic problems confronting low-income households wishing to purchase homes through mortgage is the lack of substantial equity stake in the mortgage market. To address these challenges, grants and one-digit interest loans are offered by government to provide low-income borrowers with sufficient down-payments to enable easy accessibility to mortgage loans. In some cases, grants are made available to pay for closing costs, legal fees and other costs related to the purchase of low-cost homes. This type of assistance is generally limited to low- and very-low-income families. Individuals are to apply for this aid directly through an accredited, non-government organisation or governmental agency, and the aid could commence before or after a lender has agreed to grant the aid (Calomiris *et al.*, 1994; Choguill, 2007). The financing models that have the capacity to provide housing loans to low-income and very-low-income families are down payment grants, mortgage payment subsidies, mortgage interest deductions and credit enhancement.

Down payment grant

Down payment grant can be structured in a number of different ways, including grants and loans. Loans ideally result in the repayment of capital that is then re-used as a down payment loan for another borrower. These loans can be amortising, but most often are designed as “silent” junior liens due at resale or refinance. Because these loans tend to be small, they must be monitored over many years and lose value with inflation. The costs of administering these loans are high relative to the loan amount. In addition, subsidies in the form of junior liens can limit owners from taking out additional loans. Instead of loans, some assistance programmes use down payment grants, which are administratively efficient but are strictly one-time in nature (Ergungor, 2010).

Mortgage payment subsidies

Mortgage payment subsidies are housing financing models that realistically lessen the interest rate and other periodic charges to be paid by an individual or organisation that has taken a loan for a housing project. According to Calomiris *et al.* (1994), Hui *et al.* (2009), Ergungor (2010) and Collins (2013), a mortgage payment subsidies programme is restricted to developers that do not have adequate initial capital to obtain housing loans and individuals that could not obtain private financing without this assistance, though in the case of a subsidy scheme, the recipients of mortgage subsidies apply for subsidy payment through developers or government agencies. Mortgage revenue bonds, which is a form of Mortgage Payment Subsidies, are sold to investors to finance housing below-market interest rate mortgages (Ergungor, 2010). The sets of housing provided under this form of arrangements in South Africa are referred to as “GAP Housing”, which is housing provided for the category of people whose monthly income is above ZAR3,500. However, Mortgage Payment Subsidies enforce easy recapture of mortgage assistance on a home sold within nine years of buying the home, which is achieved through enforcement of tax obligatory on net sales earnings in a weaker economic situation (Collins, 2013).

Mortgage interest deduction

Mortgage interest deduction is a subsidy for home ownership delivered through the tax code. Though this financing model is yet to be used in affordable housing financing in South Africa, it is the largest support for owning a home in the USA and applies to all home owners, not just those with low income (Davis, 2012). Many public housing programmes provide grants to provincial and municipal governments, and many non-profit organisations and private developers, to help them build, rehabilitate or purchase housing for resale or rental to low-income families. Regardless of the details, each of these programmes affects the credit market by directly increasing the supply of subsidised housing available for purchase by low-income families (Calomiris *et al.*, 1994). Mortgage borrowers may deduct mortgage interest from taxable income when calculating federal income tax. This deduction can reduce tax liabilities for home buyers and thus increase income available for monthly housing payments (Davis, 2012). Studies by Glaeser (2011), Davis (2012) and Bourassa *et al.* (2012) suggest that the mortgage interest deduction is largely capitalised into house prices which depend on the elasticity of local housing markets and in reality is less of a support to home owners.

Credit enhancement

Credit enhancement is a financing model that does not provide direct financing for low-cost housing but can overcome financing barriers. It involves additional guarantees, insurance or collateral, to increase access to capital to finance a home. This housing financing model enhances the credit-worthiness of the person or entity seeking financing by reducing or

eliminating some identified risk (Jaffee and Quigley, 2009). A specific example of this is loan guarantees and mortgage insurance, which are credit enhancements that reduce or eliminate risks of loss if a default occurs and make loan payments more affordable. In some cases, enhancements lower the costs of borrowing and might be viewed as a subsidy to buyers. The rise and fall of government financial commitment for housing provision offers a cautionary tale in how credit protections can distort lender and financial institution practices in ways that may not be ideal from a public resources perspective. Nevertheless, the incremental effect of credit enhancements for prospective buyers tends to be small, particularly when housing supply is equal with demand (Jaffee and Quigley, 2009).

Research methods

This study's focus is to establish effective housing finance concepts to enable the government to achieve its mandate of providing sustainable affordable housing for low-income families without compromising the ability of a citizen to meet up with their needs. From the literature reviewed, housing financing models that could be used for the purpose of financing affordable housing, bearing in mind the targeted beneficiaries of these houses when completed, were identified. To achieve the objective of this study, a sequential mixed method approach posited by Onwuegbuzie and Johnson (2006), Teddlie and Tashakkori (2009) and Ostlund *et al.* (2011) was used. The process of the sequential mixed methods approach used is presented in Figure 1. Qualitative case study interviews were conducted with four selected housing developers and construction organisations in South Africa. These interviews were transcribed and analysed using content analysis to identify the themes and sub-themes upon which the quantitative survey instrument for the study was developed.

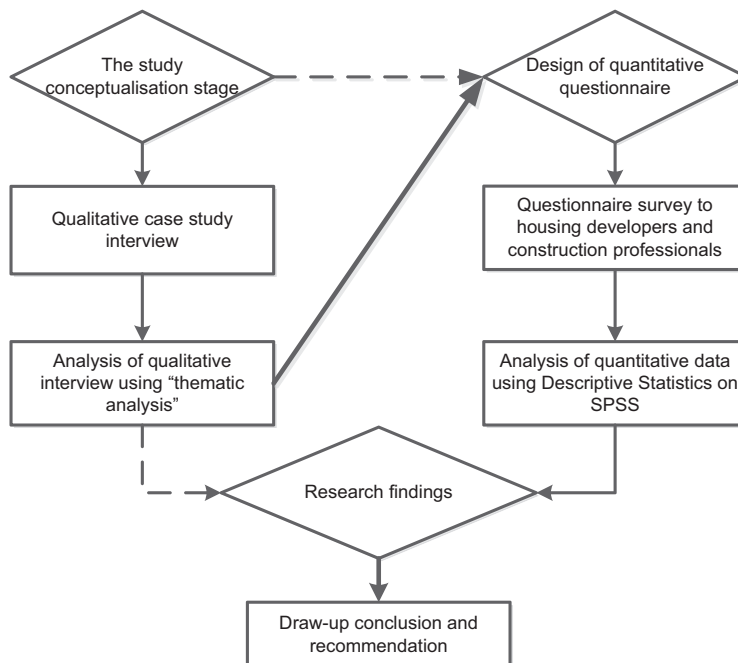


Figure 1.
Research process used
for the study

In addition to the findings from the qualitative analysis, a quantitative questionnaire was developed and administered to housing developers and construction professionals who practise in South Africa. Considering the coverage of the study, an internet-mediated (Survey Monkey) platform was used to administer the questionnaire survey to the research participants. It is pertinent to note that the benefits of using Survey Monkey for questionnaire surveys in construction management research are widely documented in literature (notably Blaxter *et al.*, 2006; Creswell, 2009; Bryman, 2012). Probability sampling techniques were used in the selection of the sampled population for the study. Housing developers and General Building (GB) Contractors registered with the Construction Industry Development Board (CIDB) listed on the CIDB 2015 GB-register were targeted. A total of 3,283 GB contractors/developers were on the CIDB register, and a total of 162 organisations were selected to form the survey sample size for this study. This survey sampled size was calculated using a sample representation formula developed by Czaja and Blair (cited in Ankrah, 2007; Akadiri, 2011; Ganiyu *et al.*, 2015). The formula is as follows:

$$ss = z^2 x \frac{p(1-p)}{c^2}, \quad (1)$$

where ss = sample size, z = standardised variable, p = percentage picking a choice, expressed as a decimal and c = confidence interval, expressed as a decimal.

After calculating the sample size using equation (1), the new sample size was determined using equation (2):

$$new\ ss = \frac{ss}{1 + \frac{ss - 1}{pop}}, \quad (2)$$

where pop is the population.

Finally, the survey sampled size was calculated using equation (3):

$$survey\ ss = \frac{new\ ss}{response\ rate}. \quad (3)$$

In addition to calculation of the survey sample size, the quantitative survey questionnaire was sent to the 162 selected research participants via Survey Monkey, and 105 out of the 108 responses received were found suitable for analysis.

Analysis and findings from qualitative studies

Analysis of qualitative data across individual cases was conducted to identify and establish the shortcomings confounding the housing financing strategy currently used in the delivery of affordable housing. Four case studies were undertaken and in presenting findings from each of the case study, a structural approach was used by giving a synopsis of the general background information to each individual case and by presenting the findings from individual case analyses in a composite summary to identify themes and sub-themes of the cross-case analysis.

Case study 1

Perception about South African Government housing finance strategy. The Project Manager of organisation “w” described the financing model used by the company to finance its private housing project as largely mortgage finance and stated that government houses were built

through “Housing Subsidies”. The respondent stressed that it is very expensive to build affordable houses with mortgage loans from commercial sources, but it is cheaper to build through subsidies. The respondent expressed worries over illegal sales of government affordable housing below prevailing market prices. The respondent stated that:

[...][...]. My view to the government is that if you want to sell your own BNG house for ZAR30,000 the government should buy it. They should have a market for it, the first owner want say ZAR40,000 the money be given to him; you know why, government can take another BNG guy and put him in the house instead of keeping people on the waiting list. I don't understand why the government allows informal trading with ZAR40,000 (as a buying price) to continue and build with ZAR165,000, until the market price of these houses comes up to the real value, this whole thing will remain a broken process. I think some other financing model, that will make it mandatory for a beneficiary of this house to contribute to the cost of construction, must be employed by government.

The respondent thus affirms the need to use other financing models through which affordable housing could be financed to encourage construction of houses around the needs of the user.

Case study 2

Perception about South African Government housing finance strategy. The organisation “x” Project Controller describes the financing scheme used by the company to finance housing projects as largely through government “Housing Subsidies”. The respondent stressed that it is cheaper to build using subsidies and suggested that government must find a way to stop the illegal sale of the houses below prevailing market prices, which has been going on in the affordable housing market:

[...][...]. the education process for people on the cost of the house is essential, people must be told that the house costs R165,000, it will be stupid to sell the house at R30,000 or even R40,000.

The respondent asserts the need for government to engage in a continuous awareness to sensitise the people on the value of the house to discourage illegal sale of the house below its market worth.

Case study 3

Perception about South African Government housing finance strategy. The organisation “y” Regional Project Manager describes the financing scheme used by the organisation to finance housing project as “Housing Subsidies”:

[...][...]. The department is the funding agency for affordable housing projects. At the moment, what we use is basically housing subsidies and what we are interested in is to provide free housing to the people. Yes, using some other financing model is very necessary because that is going to make community engagement a viable input in our decision-making. Another programme that we have, to finance housing for those outside the cost band for affordable housing, is captured under “Integrated residential development programme” in which these category of people are made to pay top-ups.

The respondent acknowledged the difficulties in curbing the illegal transfer of ownership of the houses, which is the norm in the affordable housing sector at the moment. He suggested the need to use other housing financing models that will encourage community-based construction in the planning and construction of affordable housing.

Case study 4

Perception about South African Government housing finance strategy. The CEO of organisation “z” describes the financing scheme used by the company to finance its private housing project as largely mortgage finance, and government houses were built through

“Housing Subsidies”. The respondent stressed that it is cheaper to build government houses through subsidies, even though the system is not sustainable in the long-run. The respondent also expressed worries over illegal sales of the affordable houses below prevailing market prices. The respondent stated that:

[...]. My opinion to government is that the use of the subsidy scheme for provision of low-income housing should be stopped. This is because of the gross abuse of the system by the people, considering the economic realities being faced by South Africa and the long-term sustainability of subsidy schemes. I think some other financing scheme, that will make it mandatory for a beneficiary of this house to contribute to the cost of construction, must be employed by government.

The respondent thus affirms the need to use other means through which affordable housing could be financed to encourage construction of houses that are user-demanded.

Findings from qualitative analysis

The results of case-by-case analysis of qualitative interviews conducted with four research participants were analysed. The identities of the respondents were masked to fulfil the ethical requirements of conducting a research of this nature. The results of the case-by-case analysis affirm the need to use other means through which affordable housing could be financed so as to encourage construction of houses based on individual user-demand and to discourage illegal sales of the houses below their market value. It was also revealed that the use of other housing financing systems must be adopted to enable housing beneficiaries to take control of the process, as the system will necessitate a monetary contribution from the beneficiaries. This could make housing constructed through this arrangement more sustainable, as it will discourage illegal sale and reduce the continual emergence of shacks.

Subsequent to the findings from the analysis of qualitative interview, the quantitative questionnaire was drawn-up to establish the basis that might influence the choices of other financing models identified from the literature.

Identifying housing financing model that enhances sustainable housing construction

The main objective of this study was to establish effective housing financing models through which affordable housing construction could be financed, to enable government to achieve its mandate of providing housing for the poor population. To achieve the construction of housing that is equitable, bearable and economically viable, the need for evaluation of housing financing concepts is imperative to ensure the use of the most economical means to both the housing developer and user of the building. Housing finance has a great influence on successful delivery of a project and is an essential part of a well-functioning housing programme. Therefore, identifying the most appropriate housing financing system is crucial to construction and delivery of sustainable housing.

Down payment grant as housing finance model

A down payment grant is a housing financing system where an interest-free loan is granted to a prospective home buyer at the point of sale of the house. The results of the analysis of factors considered for the use of down payment grant as a financing system, presented in [Table I](#), showed that this financing system encourages user participation right from the planning stage through to completion stage (ranked first). More so, it encourages home buyer contribution to help mortgage repayment and is responsive to reduction in payment default by home buyers (these were ranked second and third, respectively). Approximately 50 per

Table I.
Descriptive statistics
on down-payment
grant to finance
housing project

Coding	Variables	Frequency						Mean	SD	Rank
		Never (%)	Rarely (%)	Sometimes (%)	Very often (%)	Always (%)				
HFDPG2	Encourages user participation	1.9	5.7	37.1	34.3	21	3.67	0.937	1	
HFDPG4	Encourage homebuyer contribution to help Mortgage Payments	1	5.7	38.1	36.2	19	3.67	0.884	2	
HFDPG3	Responsive to reduction in payment default by homeowner	0	6.7	36.2	43.8	13.3	3.64	0.798	3	
HFDPG6	Enhances delivery of affordable sustainable housing	1	9.5	39	37.1	13.3	3.52	0.878	4	
HFDPG1	Strengthens commitment to deliver high quality in constructed facility	1.9	10.5	41.9	31.4	14.3	3.46	0.931	5	
HFDPG5	Help to achieve Government Goal of providing free housing	2.9	29.5	48.6	10.5	8.6	2.92	0.927	6	

cent agreed that the down payment grant enhances delivery of sustainable affordable housing.

Mortgage payment subsidies as housing finance model

Mortgage payment subsidies is a housing financing model which consists of tax free mortgage revenue bonds sold to investors to finance housing developments below market mortgage rates. The results in [Table II](#) show that construction stakeholders in housing development strongly prefer using mortgage payment subsidies because the system strengthens commitment to deliver high-quality housing. It enhances delivery of affordable housing, encourages user participation and reduces payment default by the homeowner. These factors were ranked based on their significance in [Table II](#).

Mortgage interest deduction as housing finance model

[Table III](#) shows that mortgage interest deduction is preferred to finance housing because of the commitment to deliver high-quality housing. In total, 57 per cent of the respondents perceived enhanced delivery of affordable sustainable housing as motivation for using mortgage interest deduction, and this also encourages user participation. Furthermore, the reduction in payment default by home owners also contributed to the choice of mortgage interest deduction to finance housing projects.

Using “Subsidies” as housing finance model

“Subsidies” is a housing financing option aimed to lower both the initial purchase price and monthly repayment and to provide financial assistance to home owners. The results of analysis of the factors considered for the use of subsidies as a financing system presented in [Table IV](#) showed that approximately 79 per cent of the construction professionals surveyed strongly agreed that the subsidies system, when used to finance housing projects, helps the government to achieve their goal of providing free housing to the poor. The respondents also agreed that this model encourages resale of the house below market price, which corroborates the findings from the qualitative case study.

Credit enhancement as housing finance model

The results of the analysis in [Table V](#) indicate that approximately 54 per cent of the respondents strongly prefer credit enhancement to finance housing, as it enhances sustainable housing delivery. In total, 55 per cent of the respondents perceived access to mortgage with little support, and encouraging user participation was strongly supported by approximately 53 per cent. Commitment to deliver high-quality housing was motivation for approximately 53 per cent of the construction professionals in housing development.

Discussion of findings

This study identified five housing financing concepts and seven variables upon which the choices of the concepts are determined by housing developers. In addition to the descriptive statistical analysis conducted on each of the housing financing concepts, cross tabulation of the variables and the financing concept were carried out using the mean score value of each variable from the results of the descriptive analysis. The average mean score values of the variables across all financing concepts were calculated and the median of the mean value was equally determined. The average mean score calculated was used to rank the variables in order of their contribution to the choice of the concepts under investigation. Enhanced delivery of affordable housing ranked first (average mean value = 3.60), encouraging user participation was ranked second (average mean value = 3.57), commitment to deliver high

Table II.
Analysis on
“Mortgage payment
subsidies” to finance
housing project

Coding	Variables	Never (%)	Rarely (%)	Frequency				Mean	SD	Rank
				Sometimes (%)	Very often (%)	Always (%)				
HFMP54	Strengthens commitment to deliver high quality in constructed facility	0	6.7	33.3	37.1	22.9	3.74	0.876	1	
HFMP51	Enhance delivery of affordable sustainable housing	1	7.6	29.5	41.9	20	3.69	0.804	2	
HFMP52	Encourage user participation	0	7.6	37.1	39	16.2	3.67	0.895	3	
HFMP53	Respond to reduction in payment default by homeowner	0	8.6	47.6	29.5	14.3	3.53	0.921	4	
HFMP56	Access mortgage with little payment support	1.9	8.6	37.10	41	11.4	3.49	0.833	5	
HFMP55	Help to achieve government providing free housing	2.9	35.2	38.1	14.3	9.5	2.95	0.974	6	

Coding	Variables	Frequency (%)					Always (%)	Mean	SD	Rank
		Never (%)	Rarely (%)	Sometimes (%)	Very often (%)	Always (%)				
HFMID4	Strengthens commitment to deliver high quality in constructed facility	0	9.5	24.80	47.6	18.1	3.74	0.866	1	
HFMID1	Enhance delivery of affordable sustainable housing	0	6.7	32.40	46.7	14.3	3.69	0.804	2	
HFMID2	Encourage user participation	0	9.5	33.30	38.1	19	3.67	0.895	3	
HFMID3	Respond to reduction in payment default by Homeowner	2.9	6.7	39.00	37.1	14.3	3.53	0.921	4	
HFMID6	Access mortgage with little payment support	1.9	6.7	41.9	40	9.5	3.49	0.833	5	
HFMID5	Help to achieve government in providing free housing	2.9	31.4	42.9	13.3	9.5	2.95	0.974	6	

Table III.
Descriptive statistics on "Mortgage interest deduction" to finance housing project

Table IV.
Descriptive analysis of
subsidies housing
financing system

Coding	Variables	Never (%)	Rarely (%)	Sometimes (%)	Very often (%)	Always (%)	Mean	SD	Rank
HFS5	Help achieve government goal of providing free Housing	1	9.5	10.5	19	60	4.28	1.052	1
HFS6	Encourages resell of the Home by buyer below market price	1	5.7	36.2	45.7	11.4	3.61	0.803	2
HFS1	Enhances delivery of affordable sustainable housing	0	10.5	49.5	27.6	12.4	3.42	0.841	3
HFS2	Encourage users participation	0	22.9	41	24.8	11.4	3.25	0.938	4
HFS4	Strengthen commitment to deliver high quality in Constructed facility	0	19	48.6	22.9	9.5	3.23	0.869	5
HFS3	Responsive to payment default by Homeowner	0	26.7	44.8	20	8.6	3.10	0.898	6

Coding	Variables	Frequency					Mean	SD	Rank
		Never (%)	Rarely (%)	Sometimes (%)	Very often (%)	Always (%)			
HFCE1	Enhances delivery of affordable Sustainable Housing	1	7.6	37.1	32.4	21.9	3.67	0.937	1
HFCE6	Access to mortgage with little support	0	5.7	39	40	15.2	3.65	0.808	2
HFCE2	Encourages user participation in design	1	9.5	36.2	33.3	20	3.62	0.944	3
HFCE4	Strengthens commitment to deliver high quality in Constructed House	0	12.4	34.3	34.3	19	3.6	0.936	4
HFCE3	Responsive to reduction in payment default by Owner	0	10.5	39	34.3	16.2	3.56	0.887	5
HFCE5	Help to achieve government free Housing policy	2.9	21.9	54.3	11.4	9.5	3.03	0.914	6

Table V.
Results of descriptive analysis of credit enhancement housing financing model

quality ranked third (average mean value = 3.55) and reduction in payment default by home owner was ranked fourth (average mean value = 3.47). The realisation of government’s goal of providing free housing policy ranked fifth (average mean value = 3.23) and “encouraging home buyer contribution to help mortgage payment” was ranked sixth (average mean value = 2.86). It must be noted that the rejection of “free housing” as a variable for selection of financing method for housing projects is based on the need to stop the informal/illegal sale of the government houses below their market value for quick cash, which is currently very common in the affordable housing market.

Moreover, to ascertain housing financing model(s) that could best be used to finance affordable housing projects ensuring adherence to sustainability, the median of the variables was computed, which was then used as the threshold value upon which the significant variables under each of the concepts were determined. The results showed that down payment grant, mortgage payment subsidies, mortgage interest deduction and credit enhancement have strong statistical correlation with the first five most ranked variables. These results demonstrate that combining these housing financing concepts, as shown in Figure 2, is important for the realisation of sustainable affordable housing. This inference is thus corroborated by Warnock and Warnock (2008), who mention the need for development of capital markets that will encourage the provision of housing finance on the supply side and could further increase the supply of capital in the emerging economy countries. Warnock and Warnock (2008) further state that concerted efforts are required by government to strengthen legal rights and deepen credit information systems to enable the poor to have access to housing finance. Of the 12 million households in South Africa, roughly 3 million do not qualify for any sort of mortgage product (Rust, 2008; Melzer, 2006), hence the need to adopt housing finance programmes to create social capital, engage in capacity building and encourage low-income households to save (Datta and Jones, 2001; Huchzermeyer, 2009). In

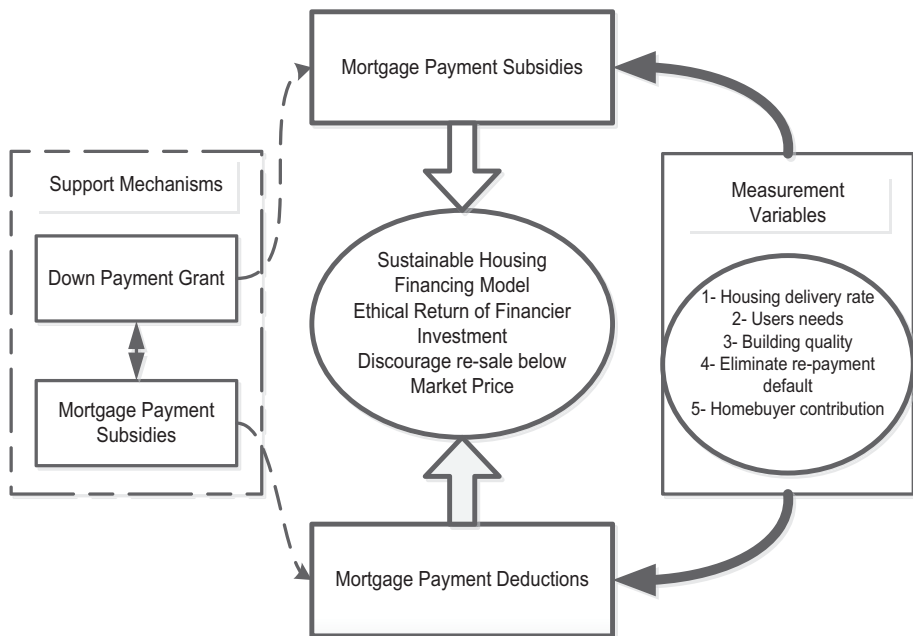


Figure 2.
Relational interface
model of housing
financing concept

addition, budget constraints have been attested by Assaf *et al.* (2010), Sullivan and Ward (2012) and Aigbavboa (2013) as a significant constraint in the achievement of user requirements in housing construction. Thus, the relational interface model proposed in this study promotes user contribution towards financing housing projects, thereby reducing the pressure on government budgetary provision for affordable housing construction. Merging two or more concepts provides a model that avoids the low-income population from drifting into relative poverty and allows financiers of housing to actively pursue an ethical return on their investment.

Conclusions

There has been gross abuse of the housing subsidies system by the beneficiaries of government-funded housing in South Africa. This is evident from the illegal sale of houses below the market value of the property and continual building of shacks and increased number of people on the housing waiting list. To curb this, government must, as a matter of urgency, launch an awareness programme to educate the low-income population on the value of the houses allocated to them. This study identifies housing financing models that are effective for the delivery of sustainable affordable housing. The unique characteristics of this financing model were put together as variables for measuring the effectiveness of each model. It is concluded that down payment grant, mortgage payment subsidies, mortgage interest deduction and credit enhancement are the most effective mechanisms to finance construction of affordable housing to enhance sustainability, as well as curbing unapproved/illegal sale of the government affordable houses below market value. The results of the analysis on housing financing systems have demonstrated that sustainable affordable housing construction will best be achieved through a combination of two or more financing concepts, as the economic situations of individual house owners differ from one another. Hence, the housing financing relational interface model developed in this study will enhance the construction of user-defined affordable housing and help to eliminate the housing deficit over time. The findings of this study can be generalised from the reflection that a lot of households in South Africa do not have the capacity to access mortgage finance formally, even if the mortgage finance systems were fully efficient. At present, the situation is the same across the African continent and other developing countries; thus, instituting other housing finance systems is a must for the South African housing sector and across the developing countries. The fact that efficient systems capable of offering the kind of housing loans that are common in the developed economies are not yet functional calls for comprehension of the limitations of such housing financing systems in the affordable housing sector in developing countries.

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