The Long-Run Relationship between House Prices and Inflation in South Africa: An ARDL Approach*

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Abstract

This paper investigates whether house prices provide a suitable hedge against inflation in South Africa by analysing the long-run relationship between house prices and the prices of non-housing goods and services. Quarterly data series are collected for the luxury, large middle-segment, medium middle-segment, small middle-segment and the entire middle segment of house prices, as well as, the consumer price index excluding housing costs for the period 1970:Q1–2011:Q1. Based on autoregressive distributed lag (ARDL) models, the empirical results indicate long-run cointegration between the house prices of all the segments and the consumer price index excluding housing costs. Moreover, the long-run elasticity of house prices with respect to prices of non-housing goods and services, i.e., the Fisher coefficient is greater than one for the luxury segment, virtually equal to one for the small middle-segment, and less than one for the large and medium middle-segments, as well as the affordable segments. More importantly though, the estimated Fisher coefficients are not statistically different from unity – a result consistent with the proposed theoretical framework relating housing prices and consumer prices excluding housing expenditure. In general, we infer that house prices in South Africa provide a stableinflation hedge in the long-run.

Keywords: House prices; Inflation; South Africa

JEL Classification: C32, E31, R31

1. Introduction

For the majority of the population in South Africa, homeowner equity is their main form of investment accounting for 29.40 percent of household assets and 21.68 percent of total wealth (Das, Gupta and Kanda, 2011). Hence, alterations in homeowner equity can impact not only the individual's wealth but also the economy in its entirety. Due to the importance of homeowner equity, its ability to hedge against the general price level is of great interest to researchers.

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The main purpose of this paper is to investigate whether property prices provide a suitable hedge against inflation by examining the existence of a long-run relationship between housing prices and the general prices of the non-housing prices of goods and services in the South African economy. A number of studies have been conducted for the South African housing sector focusing on forecasting housing prices, impact of monetary policy on housing prices, "ripple" effects and convergence, and the impact of housing prices on consumption (a few recent examples: Burger and van Rensburg, 2008; Gupta & Das, 2008; Das, Gupta, & Kabundi, 2009; Gupta, Jurgilas, & Kabundi, 2010; Das, Gupta, & Kaya, 2010; Balcilar, Gupta, & Shah, 2011; Balcilar, Beyene, Gupta, & Seleteng, forthcoming; Das, Gupta and Kanda, 2011), however, none of the papers have shed light into the relationship between housing and general prices in South Africa to date.

The inflation hedging characteristics of property prices have been well examined, but is mainly limited to developed countries, as will be seen from the literature review section. But, the same has thus far not been analyzed for the South African housing sector, and this is where the uniqueness of our study lies. Note, following Anari and Kolari (2002), rather than using the return series and inflation rates as in the literature on the inflation hedging ability of real estate, we examine the whether house prices act as a long-run hedge against inflation in South Africa by analysing the relationship between house prices and the prices of non-housing goods and services. There are two reasons for this methodological departure: (i) the total return on housing is fully reflected in house prices even when it cannot be measured accurately, and (ii) valuable long-run information can be captured by using prices rather than using returns, since differencing house prices and non-housing CPI lead to a loss of long-run information contained in the series. Moreover, unlike previous studies, and following Anari and Kolari (2002), to avoid potential bias in estimating the relationship between inflation and housing prices, we exclude housing costs from our measure of the consumer price index of goods and services. More importantly, when we analyze the long-run relationship between house price and CPI excluding the housing costs, we look at different segments of the South African housing market rather than treating the housing market as an aggregated sector. As will be seen below in the discussion of the data, the South African housing market is divided into three price categories, namely, luxury, middle and affordable, with the middle segment being further subdivided based on sizes of house into large, medium and small middle-segments. Understandably, such a categorization of the housing market, allow us to analyze the long-run house price and inflation relationship for different income category of households, and hence, helps us to understand if there could be possible differences across the different housing segments that relates to different types of households. Note that, the richness in the South African housing data, allows us to focus on such an issue, which has, however, not been analyzed in this literature before. Apriori, one could expect that, In the long run, monetary neutrality would suggest that the inflation elasticity of house price should equal one. In other words, the real housing value should be a constant. In this regard, following Anari and Kolari (2002), we present a theoretical model in the next section that formalizes this line of argument by looking at the hedging characteristics of housing. Further, when discussing the empirical results, we also try and relate the findings regarding the long-run elasticity with our understanding of the structure of the different South African housing segments.

The remainder of the paper is organised as follows: Section 2 presents a brief literature review, while the following section discusses the theoretical framework of the study. Section 4 discusses the research methodology along with the the data. Subsequently the empirical results are presented in Section 5 and, finally Section 6 concludes.

2. Related literature

The existence or not of the relationship between general prices and rates of return and/or housing prices has attracted lot of attention in the housing literature over the years. In the 1980s, Spellman (1981) found that US housing prices tended to rise quicker than CPI during the period from 1963 to 1978. Later, Newell (1996) examined the relationship between office, retail and industrial property returns, and inflation. His results showed that the property prices present strong inflation-hedgining characteristics in the case of Australia for the period from 1984 to 1995. Bond and Seiler (1998) indicated that residential real estate can be considered a hedge against expected and unexpected inflation. More recently, Anari and Kolari (2002) used US monthly data for the period 1968-2000 and found that house prices are a stable inflation hedge. Following the same approach, Ma and Liu (2008) analyzed the relationship between consumer prices and house prices in Australia. In general, they found that a long-run relationship between housing prices and inflation exists in Australia for the period 1989 to 2001. Employing a multi-factor error correction approach, Hoesli et al. (2008) examined the inflation characteristics of US and UK property investments, and concluded that in US, inflation has a positive coefficient, but there exists little evidence of short term adjustments of property prices to changes in inflation. The results for UK were similar to that of the US, and was in line of those obtained earlier by Stevenson (2000) who used OLS models, cointegration and causality techniques to conclude that house prices and inflation share a common long-run trend and are indeed cointegrated. The fact that house prices tends to be a hedge against inflation could also be found in the works of Brown (1990) for Australia, Newell (1995) for Canada, Newell and Boyd (1995) for New Zealand and Hoseli (1994) for Switzerland. No studies on this topic have, however, been conducted on developing or emerging economies to the best of our knowledge, and, hence, by looking at the South African housing market, we aim to analyze whether housing acts as an inflation hedge in a typical emerging economy environment.

The magnitude and importance/significance of the long-run relationship between inflation and housing prices varies depending on different factors. Results may vary across time periods, market conditions, characteristics of the countries in question and different components of returns, as well as, the various variables that are included in the modelling exercises (Hoesli et al. 2008). Looking at geographical differences, Ma and Liu (2008) found that the relationship depends on the characteristics of the different cities of Australia. Goodhart and Hofmann (2008) argued that the effects of shocks in macroeconomic variables, and specifically to general prices are stronger when the housing prices are booming. Additionally, Barber et al., (1997) concluded that commercial property tends to be a weak inflation hedge in UK for the period 1967 to 1994. Hoesli et al. (2008) also argues that different segments of property prices should be examined separately, such as private and public assets. In line with this, we decided to examine the long-run house price and inflation relationship, not only for the overall housing sector, but also for various housing segments that relates to different income categories in the economy.

3. Theoretical Background

As Anari and Kolari (2002) explain, a house can be considered either an investment or a consumer good. Hence, there are two channels through which higher general prices can be transmitted to increases in higher housing prices, since housing can be considered both as a consumption and investment good. If the general price level increases, this will lead to increases of the construction costs (building materials and wages) of new houses when houses are considered consumer goods. Due to the fact that old houses are substitutes to new (more expensive) houses, the replacement costs of existing houses also increase, thus leading to a rise of their price.

From an investment point of view, on the other hand, the price of a house is equal to the present value of future streams of actual or imputed net rents, for example total rental income minus maintenance costs and depreciation (net rent). Assuming then that there are no taxes on incomes and capital gains, the present value model for the expected rents is as follows:

Equation 1

$$HP = PV = \sum_{k=1}^{n} \frac{E_t(R_{t+k})}{(1+r)^k}$$

where *HP* is the house price; *PV* the present value; *n* is the estimated lifespan of the house; $E_t(R_{t+k})$ is the net annual expected rent of period *t+k* in period *t* and *r* the discount rate.

The depreciation charges that have been accumulated at the end of a house's lifespan are assumed to be used for building another house. So the flow of net rent is permanent. The present value can be represented in real terms if the rent and the discount rate are also in real terms. The previous equation can be converted as follows if the annual rent is constant:

Equation 2

$$HP = PV = \frac{R}{r}$$

This equation can be re-written in nominal terms to show the relationship between nominal house prices and general prices adjusted for housing costs, taking into account the long-run relationship between real and nominal interest rates. As Anari and Kolari (2002) explains: "Landlords, like lenders, seek to maintain the purchasing power of rental income in real terms and for this purpose incorporate expected inflation in rent agreements by relating the rent to a goods price index such as the consumer price index". Equation 2 can now be re-written as:

Equation 3

$$HP_t = PV_t = \frac{R(\frac{E_t(NH\_CPI_{t+1})}{NH\_CPI_b}}{r}$$

where $E_t(NH\_CPI_{t+1})$ is the expected nonhousing price index for period *t+1* based on information from period t and NH_CPI_b is the nonhousing index in the base period. Subsequently, we take the natural logarithm of Equation 3 with the assumption that R and r are constants and that the non-housing index is equal to 1 at the base period (Equation 4).

Equation 4

$$lnHP_t = \alpha + \beta lnE_t(NH\_CPI_t)$$

where the constant term (α) is equal to (*ln R-ln r*) and the β=1. So according to this equation, an inflation elasticity of unity is expected (consistent with the Fischer effect) for housing prices with respect to general prices adjusted for housing costs. The above analysis holds under the assumption that there are no taxes involved. In this specific study, however, except for the total house prices, we investigate the impact of non-housing prices on various price and size segments of the housing market.[1]

[1] It is important to highlight that though the theoretical model provides the underpinning of the empirical relationship between house prices and CPI excluding housing costs, it has some limitations. Though, it is not

4. Research method and Data

Econometric methodology

In the literature, a number of studies use cointegration techniques to test for the existence of a long-run relationship among variables. In this paper, to examine the effect of non-housing prices of goods and services on house prices, the bounds testing autoregressive distributed lag (ARDL) model is preferred for the analysis of level relationships (Pesaran & Shin, 1999; Pesaran, Shin, & Smith, 2001). Apart from detecting the existence of a long-run relationship among time series, this method can also estimate the size of this relationship. One of the benefits of this method is the fact that it does not require prior knowledge of the order of integration of the time series variables, provided that the series are up to second order of integration[2].

Following Anari and Kolari (2002) that used the ARDL approach to estimate the long-run cointegrating relationship between non-housing and housing prices for US, firstly, we estimate a model with the variables in first differences (Equation 5) and subsequently, an *F*-statistic test is conducted to determine if additional lags for housing prices and non-housing CPI result in significant coefficients (Equation 6).

Equation 5

$$\Delta HP_t = \mu + \sum_{k=1}^{n} B_k \Delta HP_{t-k} + \sum_{k=1}^{n} C_k \Delta NHP_{t-k}$$

Equation 6

$$\Delta HP_t = \mu + \sum_{k=1}^{n} B_k \Delta HP_{t-k} + \sum_{k=1}^{n} C_k \Delta NHP_{t-k} + \delta_1 HP_{t-1} + \delta_2 NHP_{t-1}$$

where Δ denotes the first difference operator, *HP* is the housing prices, *NH_CPI* is the CPI excluding housing costs, B_k and C_k are the coefficients of lagged ΔHP and ΔNH_CPI to be estimated. The null hypothesis for the *F*-statistic is $\delta_1=\delta_2=0$ (no long-run relationship or no co-integration).

The *F*-statistic distribution is non-standard and hence the critical values have to be calculated. Pesaran et al. (2001) and Narayan (2005) both develop two bounds of critical values where the upper bound applies when all variables are integrated of order 1 and the lower bound

irrational to assume that the discount factor is constant in the long-run, it is likely, that there are other variables, besides inflation, that could significantly affect the growth rate of rental price. In light of this, our empirical model could be over-estimating the long-run elasticity between house prices and CPI excluding housing costs. Having said this, the long-run relationship between these two variables of concern could remain unaffected even after allowing for additional fundamentals within the model. In this regard, refer to footnote 7 and the conclusion section for further details.

[2] Based on standard unit root tests, all the six house prices and the CPI excluding housing costs were found to be I(1). These results are available upon request from the authors.

when all of them are stationary. If the *F*-statistic for a particular level of significance lies between the lower and upper bounds, then *conclusive inference cannot be made* (Ziramba, 2008). If the test statistic is higher than the upper bound [smaller than the lower bound], the null hypothesis cannot [can] be accepted and hence the conclusion is that there is co-integration [no cointegration].

In order to estimate the above equations, the appropriate lag length has to be decided. To do so, a simple vector autoregressive (VAR) model of house prices and non-housing CPI is estimated. From there, a suite of criteria, such as the Akaike Information Criterion (AIC), the Schwarz Information Criterion (SIC), the Hannan-Quinn (HQ) and the Final Prediction Error (FPE), are applied to determine the lag order in the test equation.

Preliminary data analysis

Local sources of data were used in applying the ARDL methodology. The consumer price index is derived from Statistics South Africa for the period 1970 (first quarter) to 2011 (first quarter). It should be noted that the index excludes housing costs, following Anari and Kolari (2002), for the reasons discussed in the previous sections.

The housing prices cover the same time period and are obtained from Allied Bank of South Africa (ABSA). According to ABSA, the housing prices are categorised in three segments based on their value: luxury (ZAR[3] 3.5 million- ZAR 12.8 million), middle (ZAR 480 000- ZAR 3.5 million) and affordable (below ZAR 480 000 and area between $40m^2$-$79m^2$). The middle segment is further divided into three more according to their size: large (221 -400 m^2); medium (141-220 m^2); small (80-140 m^2). [4] To compile these indices, ABSA follows a specific process: Firstly, data are extracted from applications for mortgage finance that were approved by the bank. Then these data including purchase prices, building and land area and building and land value among others are generated and filtered for the different size categories. Cut –off prices for affordable, middle and luxury segments are determined once a year based on various trends such as the CPI inflation and growth in housing prices. These series are then seasonally adjusted and smoothed and the average house price data series are compiled for each segment. For the sub-segments (small, medium and large) the weighted average is lastly combined based on the sample sizes of each of the segments.[5][6]

[3] ZAR is the local currency for South Africa, known as the South African Rand.
[4] Housing prices are available in monthly frequency only for the sub-segments of the middle category. Hence, this study uses data in quarterly frequency for comparison purposes across all segments.
[5] Though there are other house price indices available for South Africa, none of them report data starting in 1970:Q1, except for ABSA house price indices, which starts in 1966:Q1. Given that cointegrating analysis

In Figure 1, we plot the different types of house prices in local currency units separately along with the the non-housing CPI.

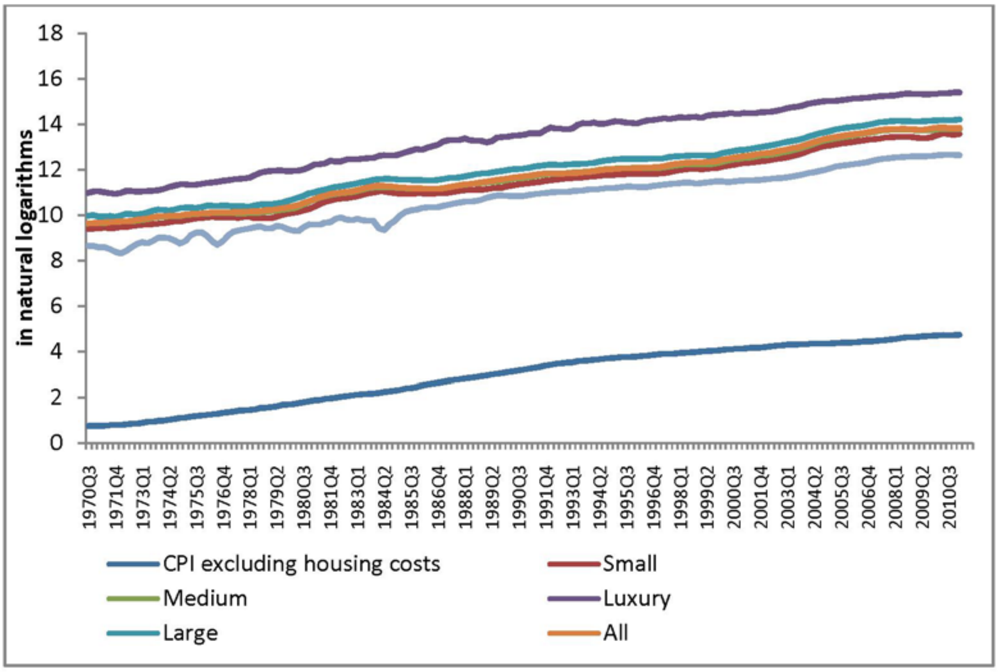

Figure 1: Housing prices (various segments) and CPI in South Africa 1970-2011

As Figure 1 illustrates, housing prices in all segments of the South African housing market have shown positive trends since 2002. The non-housing prices on the other hand also depictan increasing trend, and co-moves with housing prices. The question that arises here is whether there is a statistical long-run relationship between non-housing and housing prices that suggest possibly that the housing prices are an inflation hedge in the long run.

requires relatively long data span, we decided to use the ABSA database to obtain reliable results. Note that, in this regard, we follow the existing literature that analyzes the housing market of South Africa.

[6] It is important to point out that the house price index is not adjusted for quality. The prices of homes are influenced by their internal and external features and location, which altogether are termed their 'quality'. Within any housing market, homes of different qualities are likely to be traded over time. This can lead to severe biases in house price indices based on the average values of properties traded. House prices affect consumer spending and saving decisions, which in turn affect overall economic activity, hence, accurate measures of house prices is of paramount importance. Further, given that from the Central Banks' point of view, monitoring of house price movements is important for maintaining financial stability, it is essential to have accurate measure of aggregate housing prices, since, biased measures could lead to wrong policy conclusions. Two common approaches to quality-adjustment are repeat sales and hedonic models. In repeat sales indices, only the prices of properties with known previously traded values are included. In hedonic-based indices, values are estimated for specific property attributes and aggregated. Both approaches have strengths and weaknesses but are a great improvement on the average approach. Simple repeat sales indices exclude new property and have sample selection biases. Hedonic indices may miss out important variables necessary to adjust quality.

5. Empirical results

Before proceeding with the estimation of the ARDL model, the lag length should be determined. Employing a suite of different criteria as mentioned in the previous section, the optimal number of lags for the Luxury house prices is 4 (based on AIC, SIC, FPE, HQ); for the all and large is 5 (based on AIC, SIC, FPE, HQ); for the Medium segment the number of lags is 6 (based on AIC, FPE and HQ); for the Small segment it is 5 (Based on AIC, FPE and HQ) and finally, for the Affordable group the optimal number of lags is 7 (based on AIC, FPE and HQ).

Table 1 presents the results of the ARDL models. Panel A reports the critical values of Pesaran et al. (2001) and Narayan (2005). Both papers generated critical values for specific non-standard *F*-distribution, however, Pesaran et al. (2001) generated them using samples of between 500 and 1000 observations. Narayan (2005), on the other side, argues that Pesaran et al.'s (2001) critical values might not be appropriate for smaller samples. Given, that they regenerated critical values using samples of 30 to 80 observations. The sample size in our case comprises of 165 observations, which is, neither as many as in Pesaran et al.'s (2001), and nor as small as Narayan's (2005). For this reason, both sets of critical values will be reported for the purpose of comparison.

As Panel B of Table 1 reports, all pairs of housing prices and non-housing CPI present test-statistics substantially higher than both the Pesaran et al. (2001) and Narayan (2005) upper bound critical values at the 1% level of significance. The only exception is the luxury segment that has a test statistic higher than the upper bound of the 5% level of significance. These results indicate that for all cases, the null hypothesis of no cointegration is rejected and hence, there is a long-run relationship between the two variables.[7]

[7] One of the referees suggested that we should carry out the cointegration test of regime changes, as outline in Allan and Hansen (1996). When we conducted this test, we failed to reject the null of no cointegration only for the luxury and affordable segments. However, realizing that the Allan and Hansen (1996) test is based on the residual of a cointegrating vector, we proceeded to test for structural breaks in the residual. Using the Bai and Perron (1998) methods of testing for multiple structural breaks, we could not detect any structural breaks for any of the cointegrating residuals, barring the affordable segment. However note, the Allan and Hansen (1996) test had already indicated the existence of a cointegrating relationship for the affordable segment. In addition to this, we analyzed the CUSUM test on the coefficients of the cointegrating vector, and failed to detect any instability. Further, using the more recent test of nonlinear cointegration proposed by Li and Lee (2010), the null of cointegration could not be rejected for any of the segments. Finally, using the Zivot and Andrews (1992) unit root test with one structural break on the residuals of the cointegrating relations too failed to reject stationarity. All in all, we found that our cointegrating relationships are stable over the sample. All these results are available upon request from the authors and have been suppressed to save space.

Table 1: Autoregressive distributed lag (ARDL) model analysis[4]

Panel A: Critical values according to Pesaran et al. (2001) and Narayan (2005)						
Critical values	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Pesaran	6.840	7.840	4.940	5.730	4.040	4.780
Narayan	7.095	8.260	5.060	5.930	4.135	4.895
Panel B: Results of ARDL tests for the existence of a long run relationship						
Luxury	6.872**					
All	37.011***					
Large	19.478***					
Medium	40.626***					
Small	18.247***					
Affordable	13.960***					

Note: *, **, *** denotes that the null can be rejected at 10%, 5% and 1% levels of significance respectively.

Having found a long-run relationship between housing and non-housing prices, we next estimate the long-run elasticities. Table 2 reports the long-run elasticities for all six models, the corresponding standard errors and *t*-statistics. The *p*-values correspond to the test of whether the long-run elasticity is significantly different from one or not. All the coefficients are positive and significantly different from zero at one percent level of significance, as can be seen from the *t*-statistics reported in the fourth column of Table 2. The sign confirms our *a priori* expectations as well.

We then test the so-called Fisher (1930)-type relationship between the house prices and the non-housing CPI by testing whether the long-run elasticity of the former with respect to the latter is equal to unity. This relationship indicates the attempt of landlords to maintain the purchasing power of rental income in real terms, whereby they incorporate expected inflation based on a goods price index in rental agreements. Thus, if the Fisher (1930) effect holds in our case, the long-run elasticity for house prices in relation to goods and services prices adjusted for housing costs should be unity. As can be seen, barring the luxury segment, where one percent increase in the non-housing CPI leads to more than one percent increase in the housing price, the increase in house prices is less than one percent for the entire, large and medium middle-segments and the affordable segment. The elasticity is nearly unitary for the small middle-segment. However, statistical tests, reported in the fifth column of Table 2 indicate that the estimated Fisher coefficients are not significantly different from one.[8] As such, the results are in line with the theory discussed above, which suggests a one-to-one relationship between house prices and prices of goods and services adjusted for housing costs.[9]

Table 2: Long-run elasticity of house prices in response to non-housing prices of goods and services

		Long-run elasticity	Standard error	t-statistic	P (H_0: λ=1)
1	**Luxury**	1.111***	0.056	19.744	0.168
2	**All**	0.952***	0.140	6.801	0.740
3	**Large**	0.941***	0.119	7.943	0.626
4	**Medium**	0.938***	0.155	6.064	0.703
5	**Small**	1.006***	0.228	4.414	0.978
6	**Affordable**	0.902***	0.129	6.976	0.450

Note: Define long-run elasticity: $\boldsymbol{\lambda}=-\delta_2/\delta_1$. *, **, *** denotes that the null hypothesis that λ=0 can be rejected at 10%, 5% and 1% level of significance respectively; P (H_0: λ=1) denotes probability that the null hypothesis of long-run elasticity of home prices with respect to non-housing prices of goods and services is equal to one.

The pertinent question is: Does the results make sense? As indicated above our results are consistent with the theoretical framework. Further, it is also in line with our *apriori* expectations of monetary neutrality. In addition to this, if for a moment we forget the fact that the long-run elasticity is not statistically different from one, and just concentrated on the numerical values, the results are in line with our understanding, based on personal experience, of the operations of the

[8] One complication when comparing the elasticities across housing segments is the fact that the regional distribution of housing stock may vary between the segments. For example, a major part of luxury houses may be located in some rapidly growing centres of the country, while most of the affordable housing stock may be located in smaller towns and peripheral areas. We would like to thank one of the referees for pointing this out to us. Unfortunately, the data information does not allow us to control for regional disparities. The data on housing for the different segments is at the national level. Having said that, it is likely that pricing of a property does incorporate naturally the type of the area the property is actually located in.

[9] As suggested by one of the referees, we also considered ARDL models that included real GDP and/or population, which follows from the theoretical model specified in DiPasquale and Wheaton (1996). In all the scenarios, the null of no cointegration was overwhelmingly rejected. However, barring the case where only GDP is considered in the model, the long-run elasticity of CPI excluding housing cost was found to be insignificant. Further, in the model with GDP, the long-run elasticity was also different from unity. The details of these results are available upon request from the authors. Realizing that the quarterly population figures are obtained from linear interpolation of the annual values, due to data being available only at the annual frequency, the results from ARDL model with population could suffer from an artificially generated trend in the data. Importantly though, there exists a long-term relationship between these variables with house prices. Given that, our empirical model is based on a theoretical model relating house price and CPI excluding housing costs, we decided to use a bivariate framework of the two variables of our concern. In addition note that, obtaining a cointegrating relationship between house prices and CPI excluding housing costs, GDP and population does not guarantee that there exists a long-run relationship between house price and CPI excluding housing costs.

South African housing market. Given the inherent nature of the type of housing at the two extreme ends (the luxury and affordable segments) of the market,hedging options are limited to some degree.. Note that, price is generally regulated in the affordable segment and, hence, is likely to increase less than proportionately corresponding to a rise in the price of non-housing goods and services. For the luxury segment, the price increase is likely to be more than proportionate, given that luxury housing is built with high-end materials and products. In addition, for luxury housing, the value of the land needs to be taken into account, since they are generally built on large plots, values of which tendto increase more than proportionately following an increase in the general price level. Further, it is not irrational to assume that price movements in the luxury segment, as well as affordable segments, are less likely to reflect hedging. In the luxury segment, hedging is mostly carried out by foreigners or South Africans residing abroad or exceptionally rich South Africans residing domestically. The biggest hedging opportunity are in the middle segment, with the richest South Africans buying large middle segment housing, and the middle income groups buying properties priced at a level lower than where they are currently residing in. So, the inflation elasticities in the middle segment is expected to be very close to unitary, and hence, be in line with the theoretical model of housing being considered as an investment good. The small middle-segment is most attractive for hedging, where by relatively richer income groups would want to own such properties for renting. All in all, the parameter estimates are in line with how we believe the South African housing market works. Whether the parameters are driven purely by the hedging channel or the cost channel is difficult to disentangle, however. Most likely it is a bit of both. It is important to keep this complication in mind while interpreting our results. Having said that, there is no doubt that a large part, and perhaps majority, of the housing demand originates from hedging incentives. Such a belief cannot be contradicted in our case, as it is vindicated by the fact that the inflation elasticities are not significantly different from unity, and thereby conform with the conclusions of the theoretical model outlined above.

6. Conclusion

The objective of this paper is to analyze whether house prices provide a suitable hedge against inflation in South Africa by analysing the long-run relationship between house prices and the prices of non-housing goods and services. For this purpose, the ARDL methodology was employed on aquarterly dataset covering the period of 1970:Q1 to 2011:Q1. As far as housing prices are concerned, the paper uses the housing segment classification of ABSA – the private bank, from which the data is sourced. There are three segments based on costs, namely, luxury, middle and affordable, with the middle segment being further divided into large, medium and small, based on property sizes.

The exercise here is twofold: on one hand, we investigate the existence of a long-run relationship and on the other, the strength of this relationship through the long-run elasticities is analyzed. The findings of the first part showed that all pairs of housing prices and non-housing CPI confirm the existence of a long-run relationship. Next, for all segments, the long-run elasticities are positive as expected, and significantly different from zero, with the coefficient being greater than one for the luxury segment, virtually equal to one for the small middle-segment, and less than one for the large and medium middle-segments, and the affordable segment.

More importantly though, the estimated Fisher coefficients, i.e., the long-run elasticities are not statistically different from unity – a result consistent with the theoretical framework relating house prices and consumer price index excluding housing costs. These results are an indication that housing prices in South Africa act as significant inflation hedge in the long-run.

Given that, it is well-known that house prices are likely to be affected significantly by other fundamentals of the economy, besides inflation, future research would aim to analyze the impact of inflation on house prices, both in the short-run and long-run, using a multiple variable cointegrated VAR model.

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