PROPERTY BAROMETER
–FNB’s 4 National House Price Index methodologies and their merits

This is a discussion of what house price indices are and are not, our key considerations for determining which house price index methodology to use, and FNB’s 4 National House Price Indices.

INTRODUCTION

Of all the myriad of housing market-related data in existence, almost undoubtedly it is measures of house price trends that are most-watched, most scrutinized and most discussed. Households who own homes want to see house values rise, those who want to own one in future want to see affordability, estate agents see rising home values as a marketing tool, while mortgage lenders who use the home as security don’t want to see values drop.

But what is a house price index? Some will be surprised to hear that it isn’t even a measure of average home values and/or their trends, but rather of average home transaction values and/or their trends, and the difference can be significant.

Average house price estimates are also not necessarily a good indicator of housing market “equilibrium” price, with the market sometimes drifting far away from equilibrium.

And the compilation of house price indices presents a number of challenges. Changes in the characteristics of homes (as they get upgraded, altered or “downgraded”), and in the composition of the country’s property stock, over time mean that house price comparisons over time are not always comparing “apples with apples”.

During property cycles, we find transaction “activity shifts” across market segments as the relative strength/weakness of market fluctuate, and this can distort our view of what we believe to be house price trends.

And then there are the data constraints, and having to choose between the larger Deeds data sample, which lacks in terms of various property details, versus our smaller FNB data sample but one which has a high level of property detail and is the far more “current” data set.

At FNB, we have 4 different National House Price Indices, using 4 differing methodologies. They include a Median House Price Index, a simple “Mean” House Price Index, the FNB Repeat Sales Index and our FNB “official” House Price Index which we term a “fixed weight” methodology, whereby we fix the weights of a significant number of sub-segments with the aim of reducing the “distorting” impact of transaction volume shifts across segments.

This report discusses the main issues and considerations around house price indices, our 4 national indices and their performance over time.
WHAT DOES A HOUSE PRICE INDEX MEASURE AND WHAT DOES IT NOT MEASURE?

It is important to understand what a house price index is telling us, and what it is not. There can often be misunderstanding in this regard. Below are the key points regarding what an average house price estimate is and is not:

- **Stating the obvious, a National House Price Index is exactly that, and individual homes’ values cannot always be expected to move in line with this aggregated index**

  Firstly, we have to state the obvious, and that is that a National Average House Price Data Series/Index is exactly that, i.e. designed to provide a view on the national average for home transaction prices or price trends. If it has risen or declined by a certain percentage over a period of time, it does not mean that one person’s specific property price, or even their specific area or region, has performed in exactly the same manner.

  Area-specific trends, such as land availability or microeconomic trends specific to that area or region, can cause a deviation in property price performance from the national trend. To accommodate such differences as far as is realistic, we compile a set of regional house price indices, “Area Value band” indices and property segment indices. But there are limits to how far one can realistically go with segmenting the market, and these limits are set by the need for a minimum data sample size.

  Nevertheless, a national average price index remains useful. South Africa is a single country with a common set of national laws and economic policies throughout, and a highly integrated economy. It has one Reserve Bank that sets the same policy interest rate level across the entire country. Therefore, most areas of the country, while differing in certain respects also have much in common driving their individual markets. So, while the magnitudes in price moves can differ, one finds that various regions/areas price trends are very often moving in similar directions at a given point in time, driven to a large extent by those common national market drivers such as interest rates.

  For example, back around 2004/5, there were very few areas of the country that weren’t experiencing a massive house price inflation boom, while during the national recession of 2008/9 there were very few housing markets that weren’t relatively weak and experiencing some price deflation.

  Therefore, a national average price time series has important uses, especially to national policy makers such as central banks, but we need to be mindful of its limitations.

- **An average house price series measures home transaction price levels, NOT average home values. There is a difference**

  Some may be surprised to hear that a House Price Index is NOT a “Home Value Index”. This may sound strange, but there is a big difference. Any of the South African House Price Indices that exist are based on the value of home transactions of the rate of price inflation of homes being transacted. If it were possible to value each and every home every month, we could compile an average value of all the homes in South Africa, but this is impractical. So we use transaction value information.

  In South Africa, there is a considerable bias in transaction value data towards the higher end of the residential market, because people higher up the income ladder are more mobile, relocate more frequently, and this implies that there is a disproportionately large number of transactions in the higher priced segments relative to the number of residential units that exist. Conversely, at the very low end of the market the frequency that homes get transacted is less.

  The most affordable segment of the residential market, depending how you segment it, is the group of areas formerly labeled as “Black Townships” back in the Apartheid era. Here, one finds a massive number of residential units, but with relatively few transactions, because the lowest income groups don’t have the means or the abundance of employment opportunities to relocate frequently.

  This means that the estimated average transaction price of homes in South Africa is well-above the average value of all existing homes within the country’s borders.

  Once again, it doesn’t render a national average house price data series useless. Rather, it means that the use for such data is more in trend analysis, while the average price level’s use is limited to, perhaps inter-regional comparisons where average household mobility is similar and home transaction frequencies are similar.
A house price index doesn’t measure what doesn’t get transacted, which can mean that it doesn’t capture the full extent of a market slowdown

In toughening economic times, one can see a slowdown in the volume of residential transactions being more significant in more financially pressured areas, and of course the number of such financially pressured areas can increase during recessionary and stagnant economic periods. The influence of such areas or market segments on an overall house price index can then decline, whereas stronger market segments’ transaction volumes could conceivably hold up better. Such relative shifts in transaction volumes can see house price indices telling a better story than “on the ground” reality, should the weakest areas’ transactions have all but dried up.

It can get even worse. When certain areas experience extreme decay, as is arguably more likely during prolonged periods of economic weakness, it can get to a level where they exit the formally traded residential market altogether. Parts of the Joburg CBD (Central Business District) and surroundings must have come close to this state at the end of the 1990s. If little or nothing gets traded in such areas, then there are no transaction prices to be included in a national house price index.

However, even if derelict and disused, every property still has a value. That value can be zero, and there were probably even properties in the Joburg CBD at a stage that were even negative. Yes, negative, meaning that the owner may have to donate the property to someone or even pay them to take the property and its huge rates bill off his hands. But zero value properties don’t often change hands, so they “exit” a formally traded housing market and thus a house price index in much the same way as a company that closes its doors will exit the stock exchange’s All Share Index.

Such “exits”, or “diminished influence” of certain areas on an (transaction-based) index, can become more frequent in an economic downturn, raising the likelihood that a house price index can over-estimate how well residential values have held up in tougher economic times.

A slowing house price index growth rate is thus unlikely to tell the full story of residential weakness should it occur, because such an index only records what gets transacted, and not what has “exited” the residential market.

It is this limitation in average house price measures that can contribute to the widely-told myth that houses “always hold their value” or “home values never fall, because those that fall very sharply in value often cease to trade, either temporarily or permanently, limiting a house price index’s magnitude of decline.

The reality is that home values can and do fluctuate up and down, perhaps more than we think and more than a house price index would tell us. The property owners in Joburg CBD (and certain other CBDs) and immediate surroundings back in the 1990s would perhaps testify to this.

The average house price level, as depicted by a house price index, is not necessarily the “market equilibrium” price. Markets can stray far from their equilibrium price.

A House Price index attempts to provide an average estimate of house prices transacted, from which it is very useful to calculate house price inflation, but that average price is NOT necessarily a “Market Equilibrium” price.

In the residential market, there are various reasons for very strong resistance towards dropping prices to make a sale. Home sellers, for various reasons, are reluctant to sell for a lower price than what they purchased the house for, and often resist selling for a lower price than their often sometimes “inflated” idea of what the property is worth. This is due sometimes to the mortgage debt which they have to settle, sometimes to their belief that house prices never go down, or because they see the home as an investment and measure of wealth, and its value thus far more important than that of their consumer items. This “downward resistance” also perhaps stems in part from the competition amongst estate agents to obtain the selling mandate, with the agent quoting the highest selling price often more likely to get that all-important sales mandate.

But perhaps a further key cause of this resistance is a miscalculation of the “holding costs” of a for sale home, should it remain on the market for a long time, as well as an “inflation illusion”, which means that if a seller has to wait a year to sell her house at the asking price, due to an initially unrealistic asking price, it means that she has effectively dropped the asking price in real terms over that 12 month period, often without even realizing it.
Whatever the myriad of reasons, this resistance towards dropping prices means that, when one gets a drop in residential demand, such as back around 2008/9, house prices don’t necessarily fall sufficiently to keep the market in demand-supply equilibrium. Rather, there may be some price decline, but simultaneously a significant rise in residential supply leading to a supply-demand imbalance, which is reflected in an increase in the average time of homes on the market.

In such a case, the transaction prices being fetched in a relatively thin volume market may be above demand-supply equilibrium prices, with the market remaining oversupplied for a long period of time and home holding costs substantially elevated in many cases.

- The theoretical representation

A very simple representation of the theory on a demand-supply graph below appears as follows. Lets assume a sudden sharp interest rate hike. As this is not a house price-related residential demand-driver, the Housing Demand Curve would shift to the left from D1 to D2. The average price may not immediately decline, however. Therefore, the market initially shifts from point 1 to point 2 on the graph, the average price initially remaining unchanged but quantity demanded and transacted declining from a 6.5 to 2.5 level.

Initially, however, the supply of homes remains at 6.5, and the market is oversupplied. This move to an oversupplied situation would be witnessed in an increase in the average time of homes on the market. The prices now getting transacted in the market at position 2 are above the market equilibrium price. Only over a significantly longer period, would the market then gradually make its way to position 3 on the graph, with supply shrinking somewhat due to a lack of demand, and price levels declining gradually (often only in real terms over time as inflation takes its toll), with the market eventually finding a new demand-supply equilibrium at a lower transaction volume level than prior to the demand shift, i.e. 4.5, but higher than straight after the initial demand drop.

- A real life example of a market correction – the 2008/9 Recession impact

A real life example of such an adjustment to a fall in demand took place around 2008/9, as last decade’s residential property boom came to an end.

It became possible to portray these dynamics better since the introduction of the FNB Estate Agent Survey.

Examinig the FNB Estate Agent Activity Rating, we started to see a broad slide in the Estate Agent Residential Activity Rating from 2005 onward, ignoring a very brief respite in 2007.

This, we believe to be in part driven by slowing residential demand, or at least slowing growth in demand, in turn the result of massive prior house price inflation causing a sharp deterioration in home affordability. Later, from mid-2006 onward, rising interest rates would add to this affordability deterioration.
Indeed, FNB’s valuers began to perceive residential demand to be weakening. The FNB Valuers’ Residential Demand Strength Rating began its slide from early in 2005, and declined all the way from 70.9 as at January 2005 to 45.7 by August 2009. This saw the FNB Valuers’ Market Strength Index, the balance between their Demand and Supply Ratings, peaking in early 2005 and also gradually starting to weaken thereafter. In short, therefore, our agent and valuer-generated indicators pointed to the weakening residential demand from around 2005. At that stage, the strongest part of SA’s Residential Property Boom was past.

Perceptions of slowing residential demand, however, were not seen in the transactions volume numbers until 2007, but further growth in transactions volumes did slow to a snails’ pace after 2004. In the mean time, a massive building boom was gathering speed, and residential supply was beginning to improve. How did the market move towards its new equilibrium level? The peak in real house prices, according to the FNB House Price Index, only came in December 2007. Admittedly, though, we did see slowing real house price growth from early 2007, but no all out decline, yet.

What we did see a lot sooner, however, was the start of a rising trend in the average time of homes on the market prior to sale. From near 5 weeks average in early-2005, the average time on the market rose steadily to ultimately peak at 21 weeks and 1 day in the 2nd quarter of 2009. Therefore, not all of the market weakening was immediately reflected in a decline in nominal or real house price levels. In 2005, we did start to see slowing real house price growth, but not yet an all out decline yet.

Decline, and a simultaneous rise in the average time in the market. This rise in average time on the market reflects a deterioration in the balance between demand and supply with prices correcting far too slowly. If one assumes that an “equilibrium time on the market” is around 3 months (12 weeks, an admittedly subjective assumption), a longer average time suggests disequilibrium, where supply exceeded demand, and this lengthy average time on the market continued for some years.

By 2008, we would suggest that the equilibrium average house value was below that of the actual average house price reflected in the FNB House Price Index, reflected in an average time of homes on the market rising to well-above the 3 month mark.
By February 2008, this disequilibrium also started to be reflected in the start of a bout of year-on-year decline in real house price levels, and in August 2008 a period of nominal year-on-year house price decline set in, which lasted all the way to late 2009.

So part of the market weakness was indeed witnessed in a real and nominal average house price decline. However, this period of real and nominal house price “correction” appeared too slow to bring the market back to equilibrium until only some years later, where the average time on the market began to move steadily lower towards that 3 month mark around 2013/14, while the FNB Valuers Market Strength Index, too, only recovered to once again reach the 50 “equilibrium” level only as recently as 2014.

Therefore, the move towards the new equilibrium was a very slow “multi-year” one.

Why would it matter if the residential market was in disequilibrium around 2008/9, and perhaps for a considerable time thereafter until a gradual demand recovery had mopped up the oversupply? A long average time on the market for a home owner not in a hurry to sell would probably not be an issue. However, it becomes an issue for a financially distressed home seller who has to “offload” the property quickly. And it becomes an issue for a lending institution keen not to incur the holding costs that go with a property. These two groups are often forced into going below the market prices at the time to find the equilibrium price in order to make the sale at a faster rate than the market’s slow pace at the time.

- Our average house price estimates are exactly that, the average price of what has been transacted in a period, and don’t take into account fluctuating levels of maintenance and upgrades

Examining the FNB Estate Agent Survey’s Maintenance and Renovations market survey questions, we saw a noticeable deterioration in levels of residential maintenance and upgrades around 2007/8. An increasingly financially pressured household sector saw cut backs in the levels of home maintenance, with that “lower” level, namely “the percentage of owners only attending to basic maintenance” increasing in significance, while at the top end of the scale, those “investing in their properties with a view to adding value (upgrades)” declined sharply, according to the agents surveyed.

Less investment and upkeep regarding residential property is typical of tougher economic times and vice versa in stronger economic times. An average house price index measures the average transaction price of a home. Some of the change to the average price over time may be due to a change in average maintenance and upgrade levels, i.e. increased capital expenditure, and not only due to genuine price inflation of “un-altered” homes.
Over the longer term, especially, the composition and characteristics of housing stock that exists changes the composition of a house price index.

Maintenance and upgrading aside, house price indices experience a change over time in the size and characteristics of the “average” house. When we group the many homes that FNB has valued over the years according to the date in which they were built, we see noticeable changes over the past few decades. Whereas the average Full Title stand size of those homes built from 1975 to 1979 was 1,171 square metres, from 2010 onward it was a far smaller 506.7 square metres. Homes built in 1975-79 averaged 212 square metres in building size, whereas this had declined to 142.9 square metres from 2010 onward.

Other major changes have been seen, notably a big drop in the portion of homes being built with swimming pools and domestic workers’ quarters for example.

In short, over time (especially in the long term) we are not always comparing “apples with apples”. The composition of the country’s housing stock changes in character over time, and this is ultimately reflected in a house price index.

In the short run, however, the changes to property stock composition are more limited than in the long run.
This section then focuses on the various FNB National House Price Index methodologies, and key factors that we have had to consider along the way when constructing the various indices.

- **Data quality and property detail versus sample size. It's not that simple.**

  For the FNB analysis and construction of house price data, the choice was between using Deeds Office data or the FNB Valuers’s data. From a simple sample size point of view, Deeds data wins, capturing transactions across the market, both cash transactions and bonded transactions. FNB data, by comparison, is a smaller sample size, capturing only those properties financed by Firstrand Bank. Theoretically, and simplistically, house price indices produced using Deeds data would thus be a far better reflection of the overall market. However, it isn’t only about data sample size. It is also about data quality and characteristics.

  - The 1st challenge that one runs into with South African Deeds data is that there is no distinction between a commercial and a residential property. We believe that in more recent years (since the tax attractiveness of registering homes in juristic entities has diminished) one can largely get around this by only using areas deemed to be residential, and by using only transactions by “natural persons” (individuals) as opposed to juristic entities. Using FNB data, though, we can be more certain of eliminating this issue, as the bank’s data makes this distinction.

  - There is also no distinction in Deeds data between a built up property and a vacant stand. This is challenging, especially the “land-to-building” issues when using a so-called “Repeat Sales” methodology with Deeds data. The term “Land-to-building” refers to the issue of huge inflation when a property goes from vacant land to being built up.

  - Besides not easily being able to identify commercial properties from residential ones in Deeds data, or vacant land from built up stands, there are also no property characteristics present in the Deeds data. Does the building, if there is one, have 2 or 3 bedrooms, a swimming pool or 2 bathrooms, and what is the building size?. Any such detail is lacking.

  - Finally, deeds data is not as current as FNB data, being updated in full only a number of months after property transactions and registrations take place.

In short, Deeds data was compiled for purposes other than compiling house price indices, and thus has its shortcomings in this regard.

This is not to say that we don’t find Deeds data useful. With various filters, we do compile the FNB Metro Area Value Band house price indices (on a fixed weight basis, grouping various areas according to price or geographic location), and for regional and value segment performance analysis these indices prove very useful.

However, for our main FNB House Price Indices, those being the national monthly house price indices and segment indices by property characteristics (design, size, stand size and additional features), it was decided to use the smaller FNB dataset due to its high quality in terms of the myriad of property-specific detail that it possessed.

A further key consideration when deciding to use FNB data was how current the data was compared with a few months time lag in the case of Deeds data. At month end, therefore, we are able to update the FNB House Price Index for that month just coming to an end. This is a major plus point, given that the key reason for compiling such house price indices is to be as up to date as possible with market trends and trend changes. 3 months later, a trend change is old news.

Therefore, while we could be questioned regarding the FNB data sample representivity, we felt there were more positives than negatives in our “quality over quantity” decision for the FNB National House Price Indices, and that the sample size was large enough to be used monthly on a national aggregated basis.

While we possess a myriad of segment house price indices, in this report we focus on our national average house price index methodologies, broadly discussing the pros and cons of each.
At FNB we compile 4 national house price indices (although we only normally publish one), constructed according to 4 different methodologies. Let’s examine each one.

1. The FNB “Segmented Fixed Weight” Average House Price Index (The “official” FNB House Price Index)

The 1st of our 4 National House Price Indices is our “official” index. This is the most publicized of our four. It is publicly known as the FNB House Price Index. Although also working on the average price principle (as opposed to median or repeat sales methodology), the FNB House Price Index differs from our FNB “Simple Average”, or “Mean” House Price Index in that it could probably be termed a “Segment Fixed Weight” Average House Price Index”.

One of the practical problems with house price indices is that relative short term transaction activity shifts up and down the price ladder can lead to an average or median price index rising or declining where there was not necessarily “genuine” price inflation on homes. For example, if “Full Title 3 Bedroom volumes remain unchanged from one month to the next, but “Sectional Title 1 Bedroom and Less” (the cheapest segment on average) transaction volumes hypothetically double, the overall national average price could conceivably decline due to this relative activity shift, and not due to “genuine” average home price deflation across the market.

This challenge of transaction activity shifts (i.e. change in the composition of the sample) between segments is arguably the most significant one faced by producers of house price indices. In an attempt to reduce this effect, we decided to fix the weightings of the FNB House Price Index’s sub-segments in the overall national index.

This “fixed weighting” can contribute greatly to reducing the effect of transaction activity shifts and their distorting effect, but can never entirely resolve the problem.

But how does one segment the market? One consideration would be to segment the market according to prices, and have price band cut-offs. However, price range cut-offs pose a problem because, as homes inflate their way to above a segment’s upper price cut-off limit over time, they exclude themselves from the calculation of that segment’s average price, while new lower priced home transaction are “entering” the segment as they rise to above the segment’s lower price cut-off. Lower and higher price cut-offs can thus conceivably lead to the appearance of price deflation in a segment where there is none, because of inflation “bracket creep” leading to lower priced homes entering the segment from the “bottom” and higher priced homes leaving the segment at the top.

A solution to the effect of inflation “bracket creep” in price segments could be to raise the upper and lower price cut-offs for price segments on a regular basis. But that becomes a subjective exercise when trying to determine by how much such cut-offs should be raised.

Therefore, the decision was to keep away from segment price cut-offs, and rather to segment the market based on home title deed, characteristics in terms of room number, and size, and to largely, but not entirely, “fix” these sub-segment weightings over time.

We say “largely, but not entirely”, fix the segment weightings because we had to create a way for the weightings to very gradually adjust as the composition of residential stock changes over the longer term. While we want to fix segment weightings in the index in the short term, to prevent the distorting effect of transaction volumes fluctuating at different speeds in different segments, what we don’t want is for the fixed weightings to be grossly unrepresentative of the market’s home transaction composition a number of years down the road.

The solution was to first determine the weightings of the sub-segments by their relative transaction volumes over the past 5 years. Then, the approach was to allow the weightings to change very slowly over time by applying a 5-year moving average to each new price data point. Therefore, we should say “largely but not entirely” fixed, because updating a weighting each month based on a 5-year moving average of volumes in each segment does actually allow weighting change very slowly over the longer term.

The FNB House Price Index’s main segments are thus as follows:

- Sectional Title:
  - Less than 2 bedroom – Large
  - Less than 2 bedroom – Medium
  - Less than 2 bedroom – Small
- 2 Bedroom – Large
- 2 bedroom – Medium
- 2 bedroom – Small

- 3 Bedroom and More - Large
- 3 Bedroom and More - Medium
- 3 Bedroom and More - Small

- 2 Bedrooms and Less - Large
- 2 Bedrooms and Less - Medium
- 2 Bedrooms and Less - Small

- 3 Bedroom - Large
- 3 Bedroom - Medium
- 3 Bedroom - Small

- 4 Bedrooms and More - Large
- 4 Bedrooms and More - Medium
- 4 Bedrooms and More – Small

The size cut-offs for “small”, medium” and “large” differ per room number sub-segment. “Large” would refer to the largest one-third of homes within a particular room number segment over the past 5 year period, “Medium” to the middle one-third, and “Small” to the smallest one-third of homes within that segment.

2. The FNB Repeat Sales House Price Index.

The FNB Repeat Sales House Price Index is the 2nd of our National measures using FNB house price data.

To compile this index we make use of the “repeat sales approach”, which is based on measuring the rate of change in the prices of individual houses between 2 points in time, based on when the individual homes are transacted. This means that each house price in any month’s sample is compared with its own previous transaction value. The various price inflation rates of individual homes are then utilized to compile the average price inflation rate of the index.

The benefit of this methodology is that theoretically we’re looking at genuine price growth by comparing one home with itself at an earlier stage. The assumption is, however, that individual homes have not undergone changes in characteristics, upgrades or downgrades.

In practice, however, the issue of activity shifts is still present, with this index also depending on the price inflation rates of what gets transacted in each period. If in month Y one gets an increase in the portion of “Strong Segment” transactions in the sample compared to the previous month X, and the “Strong Market Segment’s” house price growth is significantly stronger than the “Weak market segments”, one may get higher price growth partly as a result of a relative transaction activity shift towards the stronger segment(s). Nevertheless, this approach does help to reduce the effect of activity shifts across segments.

The downside of this approach can be that there are not always that many homes that transact twice within relatively short periods of time, so this methodology is more data-intensive than simple averages or medians. In addition, one has to be careful of speculative activity when using transactions where the repeat sale came very shortly after the previous transaction on the property. Speculation can often involve a purchase and a quick upgrade before selling the property shortly thereafter for a significantly higher price, and it then becomes questionable as to whether one is comparing “apples with apples”. Speculation could thus potentially boost price inflation in an “undesirable” way if included in a repeat sales index. For this reason, we have a minimum time cut-off for repeat sales transactions of 6 months. Anything with a shorter repeat sales period is excluded from the index.

One other additional cut-off is a 10-year repeat sales time cut-off. Any repeat sales transaction that is longer than 10 years since the prior transaction is excluded from the index. The reasoning is that the longer the period between repeat transactions on a home the more likely that there have been significant alterations.
and upgrades (or downgrades?) and that one may no longer comparing the same home with itself. These cut-offs are admittedly subjective.

The FNB Repeat Sales House Price Index is smoothed with a Hodrick-Prescott smoothing function using a Lambda of 5.

When considering which of our 4 house price index methodologies to choose as our primary FNB House Price Index, the repeat sales version was a strong consideration. However, this methodology would be more “data-intensive” than our “fixed weight average” methodology, possibly requiring a larger data sample at times than what was available, and thus decided in favour of the average price methodology where sub-segments’ weights are fixed.

Nevertheless, the 2 abovementioned methodologies perform very similarly in terms of their level of “cyclicality”, and their ability to limit the impact of transaction activity shifts across segments.

3. The FNB Median House Price Index

This index is a simple median of the transactions financed by FNB, with the same data cut-offs and sample applied in the main FNB House Price Index extract.

There are no sub-indices in this index. It is a median of all of the transaction prices.

The FNB Median House Price Index is also smoothed with a Hodrick-Prescott smoothing function with a Lambda of 5.

Our median house price index would appear to be highly sensitive to activity shifts across value bands, and thus more volatile than the other 3 methodologies.

A key advantage of Median House Price indices, however, is that they are the least data-intensive. If you have a relatively small data sample, a median may become something of a “necessity”. Periodically, we use this methodology for ad hoc studies where a data sample is very small. It isn’t perfect, but you have to make do with what you have.

In addition, if there are abnormally high value or low value “outliers” amongst the data, using a median can be a way of eliminating these outliers, which risk “skewing” an average price index significantly and making it volatile.

The FNB Mean House Price Index is smoothed with a Hodrick-Prescott smoothing function using a Lambda of 5.

4. The FNB Mean House Price Index

The final of our 4 methodologies is the FNB Mean House Price Index. Constructed with the same data extract (and cut-offs) as the above 3 indices, this index is a simple average of all of the home transactions in each period.

The simple average can, similar to the median, be used when the data sample is fairly small, or when there are no property characteristics in the data with which to segment the data.

The simple average, or mean, index however suffers similarly to the median index from the shortcoming of being moved significantly by transaction volume shifts up and down the price ladder.

The impact of transaction activity shifts across price bands, however, appears to be slightly less than in the case of the FNB Median House Price Index. On the other hand, however, this index is more subject to major distorting impacts of “outliers”, which the median isn’t.

The FNB Mean House Price Index is smoothed with a Hodrick-Prescott smoothing function using a Lambda of 5.

- The Data Extract for all 4 methodologies:

- The 4 FNB House Price Indices are constructed using transaction price data from homes financed by FNB.
- The minimum size cut-off for full title stands is 200 square metres, and the maximum size is 4000 square metres
- The maximum price cut-off is R10m, and the lower price cut-off is R20,000 (largely to eliminate major outliers and glaring inputting errors). While we are not fans of price cut-offs, we are comfortable using these...
performance history of the 4 fnb national house price indices

Examining the 4 FNB House Price Indices graphically, it is obvious that the FNB Mean and Median House Price Indices show far more cyclicality than the FNB Fixed Weight Average and the FNB Repeat sales Index, most notably in the case of the Median House Price Index.

The recent past is a case in point. Through part of 2015/early-2016, house price inflation showed some short term acceleration.

From a low of 5.6% year-on-year inflation as at February 2015, the FNB Repeat sales Index accelerated to 6.9% year-on-year inflation by February 2016 before starting to slow.

By comparison, our FNB Fixed Weight House Price Index showed a broad inflation acceleration from a low of 5% in April 2015 to 7.2% in June 2016 before some slight slowing in July.

The FNB Mean (Simple Average) House Price Index showed a year-on-year growth acceleration from a low of 2.8% in April 2015 to 9.2% in May 2016, a considerably more extreme acceleration from low to high than the former 2 indices.

But the most extreme acceleration over the period was shown by the FNB Median House Price Index, which showed a year-on-year growth acceleration from a negative rate of -0.7% in April 2015 to a +10.4% rate in May 2016 before also beginning to slow thereafter.

In short, therefore, the FNB Repeat Sales and Fixed Weight House Price Indices showed far less movement in price inflation rates than did the FNB Mean and Median House Price Indices. This is a typical story.

What may have contributed to the early-2015 price growth lowpoint being especially prominent in the Mean and Median Indices? Taking Deeds data volumes segmented according to our 4 Area Value Band Segments, we saw a strong growth surge in transaction volumes in the most affordable area category known as “Low Income” Metro Areas. This appears to have played a role.

What may have then contributed to the major surge in the Mean and Median House Price Indices later in 2015 and into the 1st half of 2016? Possibly a steady slowdown in Low Income Area transaction volume growth, from a high of 15.4% year-on-year for the 6 months up to August 2015, to a negative -5.8% year-on-year decline for the 6 months to March 2016.

This slowing in transaction volumes late in 2015 and early in 2016 was far more significant than any of the other 3 higher priced area value bands, thus significantly diminishing the impact of Low Income Areas on the simple Mean and Median House Price Indices.

As soon as we fix the weightings of sub-indices, the impact of transaction volume shifts across price bands diminishes. This is true even though our “Fixed Weight” Index is compiled according to Title deed, size and room number, and not by price, because in effect certain of our segments are more typical to higher priced areas and certain of them to lower prices areas.
Another period when one could have been caught out misinterpreting a major dip in the Mean and Median House Price Indices as a severe market dip was back in 2012/13. By January 2013, the Median Index had bottomed at a sharp year-on-year decline of -13.8%, and the Mean Index at -7.2%.

But this took place at a time when the overall market was relatively solid.

One noticeable feature, looking at deeds data for transactions by individuals, was a very late recovery in transaction volumes in the Low Income Area Market, peaking at around 30% growth for the 6 months to September 2012, while the Lower-Middle, Middle and Upper Income Area Segment volume growth had peaked far earlier in 2010/11

It thus appears to have been a big relative shift in transaction volumes towards the Low Income end that took the Median and Mean Indices down into negative territory, and not market weakness.

Such are the hazards of working with and interpreting house price indices.

The table below illustrates the differences in cyclicality of “volatility” between the indices through showing their highest price inflation peaks, their lowest troughs and the difference between the two since 2008.

In the period January 2008 to July 2016, the Index with the most extreme variance between its highest inflation rate and lowest inflation/deflation rate was the FNB Median House Price Index with a variance of 36.5 percentage points. Next was the FNB Mean House Price Index with a 24.9 percentage point differential. This was followed by the FNB “Fixed Weight” Average House Price Index (our “official” national index) with a 20.1 percentage point differential, while the FNB Repeat Sales House Price Index had the lowest variance to the tune of 15.7 percentage points.

**Highest and Lowest Year-on-Year Inflation Rates - Jan-2008 - July 2016**

<table>
<thead>
<tr>
<th>FNB House Price Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest</td>
</tr>
<tr>
<td>Median</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Fixed Weight Average</td>
</tr>
<tr>
<td>Repeat Sales</td>
</tr>
</tbody>
</table>
Examining the long term performance of the indices, over varying periods those that have performed the strongest vary, making it tough to draw any conclusions regarding their different behaviors.

From January 2001, just after the start of the indices in mid-2000, to July 2016, the FNB Repeat Sales Index showed the most cumulative price growth, to the tune of 356.8%, followed by the FNB “Weighted Average” Index with 301.6%, the FNB Mean House Price Index with 292% and the FNB Mean House Price Index with 286.9% growth.

However, from January 2008, following the end of the pre-2008 boom period, the relative picture is considerably different.

The highest cumulative price inflation from January 2008 to July 2016 was shown by the FNB Median House Price Index, to the tune of 50.9%, followed by the FNB Mean House Price Index with 48.5%, the FNB Repeat Sales House Price Index with 37.9%, and the FNB “Fixed Weight” House Price Index with 36%.

CONCLUSION

The reality with house price indices is that none will ever be a 100% reflection of reality, as is the case for any data series or statistical model for that matter. The question then is what should the approach be when making use of such indices in our various models and analysis.

Our approach is to see the 4 FNB House Price Indices as but one set of important indicators of housing market direction in a wide array of indicators that FNB has developed in recent years. All 4 analysed together can be very useful. When we see the Median and Mean Indices moving away from the Repeat Sales or Fixed Weight Average it can point to the impact of a major transaction activity shift across the value bands. It is then important to analyse the transaction volume data for more confirmation of such shifts and varying segment strengths.

The reality is that drawing strong conclusions about the market from a house price index alone can be a hazardous approach.

We use our whole group of indicators to formulate our view on whether we believe that the housing market is indeed strengthening or weakening, and even then things are not always 100% clear.

Our group of indicators can be categorized under:

- House Price Indices (the 4 national indices, regional and segment indices)
- FNB Estate Agent Survey indicators
- FNB Valuers’ “survey indicators”
- General economic indicators
- Household sector and consumption-related indicators

It is conceivable that a house price index may at times not reflect the price inflation direction of a market, due to relative activity shifts across segments, meaning that it may rather be saying something about the transaction volume shifts instead. But it always reflects something about the market and the challenge is to know what that something is.
In evaluating house price inflation, our favoured 2 of the 4 FNB National House Price Indices are our FNB “Fixed Weight” National House Price Index and the FNB Repeat Sales House Price Index, because of these 2 indices ability to limit the impact of transaction activity shifts across the price bands. The choice in favour of our “Fixed Weight Average” methodology was the concern over the data intensivity of the Repeat Sales methodology at some stages when the market was “thinner” and the FNB data sample smaller, given our preference for use of FNB data over deeds data.