Zeppelin's

Real Estate Tech April 2002

A Newsletter by Zeppelin Real Estate Analysis Limited of the Zeppelin Group
Phone (852) 2401 6611 Fax (852) 2401 3084 E-mail stephenchung@zeppelin.com.hk

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We are pleased to announce our real estate articles and content have been carried and published in **China Daily**, one of the most established and prominent news media in China. In addition, our service capabilities have also been strengthened via an expanded professional network and further identification of data sources, especially with reference to the markets in China. By no means does this imply we can always offer solutions to each and every real estate research, analysis or investment strategy challenge, yet the possibility of providing an independent service or second opinion has increased and / or improved. Give us a call to see if we can help.

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We are very honored to have **Dr. Anthony Ko**, PhD, Open University of Hong Kong, to share his experience and views on the Hong Kong real estate market, particularly in terms of seeking a good price tracking (and forecasting) tool. We would also like to hear from prospective readers / writers who wish to share their real estate knowledge and experience with us.

This quarterly (January, April, July and October) newsletter is circulated freely to around **8,000** real estate developers, investors, owners / users, financiers, top executives, senior managers, prominent academics and related professionals from Hong Kong and abroad. Our articles are / have also been used by the **China Daily**, **Hong Kong Economic Journal** (a Chinese daily), **21st Century Business Herald**, the **Surveying Newsletter** of the Hong Kong Institute of Surveyors, **Centanet.com, Netvigator.com, Hongkong.com, Red-dots.com, Realtradex.com, FrogPondGroup.com, Soufun.com** and **House18.com**. We had also been quoted in the **Asian Wall Street Journal**. This newsletter is now into its **6th year** and **21st** issue.

Zeppelin Real Estate Analysis Limited is involved in real estate development, investment, and asset management with a focus on **independent analysis**, investment strategy, and portfolio management. It can also assist in setting up real estate analytical computer systems, software applications and content development. It is part of the Zeppelin Group of Companies which collectively also offers project management, architecture, facility, and capital management services.

GDP As A Tool To Track Hong Kong Residential Real Estate Prices

By Dr. Anthony Ko, PhD, The Open University of Hong Kong

Real Estate Tech, April 2001

Zeppelin Real Estate Analysis Limited Phone (852) 24016611 Fax (852) 24013084 stephenchung@zeppelin.com.hk

Common sense suggests that the general level of economic activity is a major factor affecting property prices. This argument is supported statistically by the result of regressing property price index against GDP. In laymen terms, over 90% of changes in property prices follow changes in GDP. The relationship holds even if the contribution of property ownership is taken out of the GDP figures. The practical implication of this is that predicting the direction of GDP movement is key to predicting property prices.

However, because GDP typically does not change drastically from year to year in percentage terms, the 5-10% movements in property prices that movements in GDP cannot account for may have great practical significance. This is illustrated by the graph showing the ratio of property price index to an index of GDP (with contribution from ownership of property taken out). The fluctuation of this curve represents the movements of property prices that are independent of movements of GDP.

Two attributes of this curve are noteworthy. **First**, there is no clear upward or downward trend. This suggests that the general upward trend (over five-fold increase) of property price over the last 21 years was due to economic growth as represented by growth in GDP. **Second**, it can be seen that the ratio fluctuates between 86 (1984) and 182 (1981) during the period 1980 to 2001 (1989=100). While this cannot be translated to the magnitude of fluctuation of property prices precisely (because all these are index figures), it is likely to be significant. Thus, it would be useful to understand what causes such fluctuations. Common sense suggests that the level of rent and interest rates should have some impact. Regression results provided some support to that.

Assuming that the level of economic activity and the rental yield relative to interest rate are the major drivers of property prices, **how does the current situation compare** to other points in time in the last 2 decades?

The estimated ratio of property price index to the GDP (less property ownership) index of 86.4 for 2001 is actually the lowest in the last 22 years (1989=100). The last period of time in which the ratio was around this level was 1984-1987.

The ratio of rental yield index to an index of best lending rate stood at 77, up from 41-43 in 1997 and 1998 (1989=100). This 70-level was last seen in 1993 (72), 1991 (75), 1984 (81), 1983 (74) and 1982 (71).

These figures may seem to suggest that, provided the economy is doing fine, the upside potential may be greater than the downside. Before we accept this argument, we must see if there are major differences in situation between now and the mid 80' s or early 90' s.

- Due to the depreciation of HK dollar and the benefit of low labor costs across the border, HK was enjoying an export boom. The strength of the economy was testified by the fact that rental level held up very well during the whole of the 80' s.
- Currently, we are not so sure that HK still has the competitiveness (in manufacturing as well as in trade services) to capture a good share of the benefits brought about by the expected improvement in US economy and the continued growth of the mainland economy.
- Mortgage related debt relative to GDP is much higher now than in the 80' s. I suspect that this reflects a much higher level of home ownership now than in the

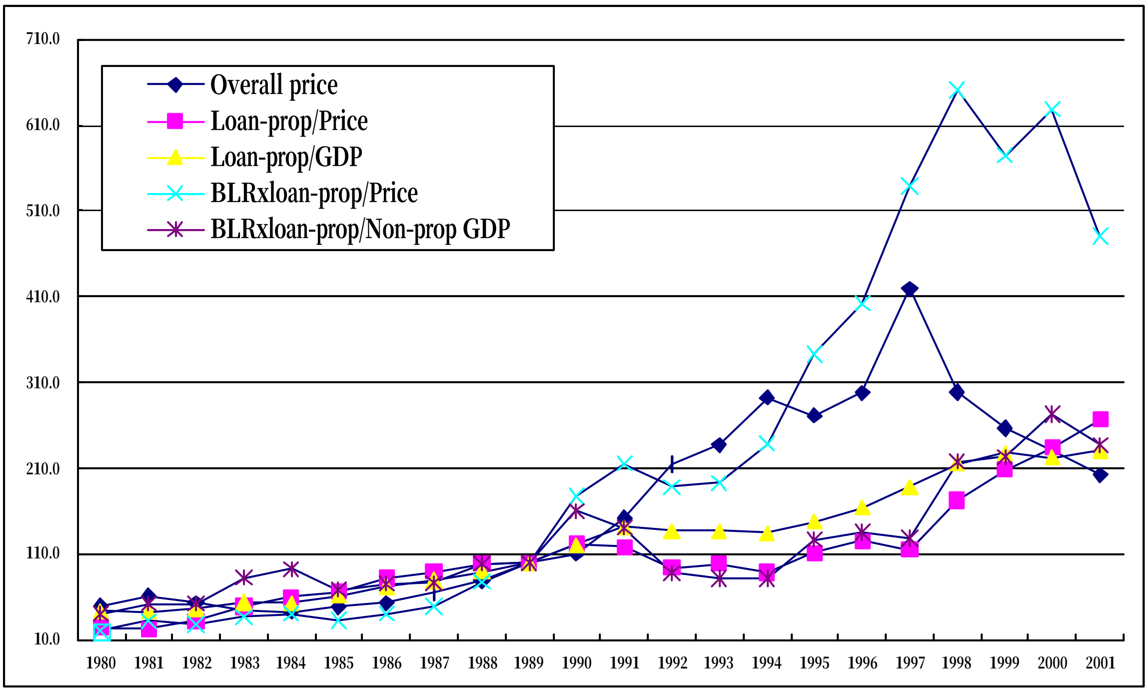
80' s. Unfortunately, I don' t have any statistics on this. A piece of indirect evidence is that the rental yield index (rental index over price index) has been falling from 1982 to 1997. If this is true, it is likely that the net flow of capital into property ownership is likely to be lower than in the 80' s even if the economy is doing well.

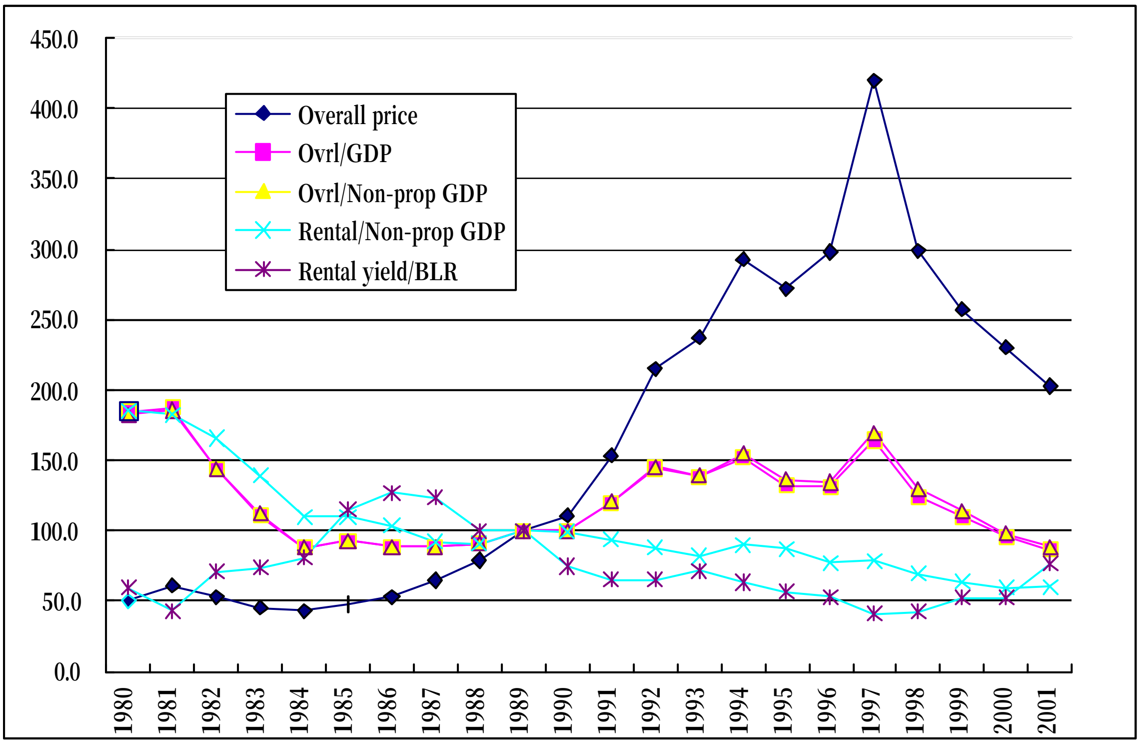
Additional analysis:

<u>HSI and property price index</u>: Simple regression using <u>1983-95</u> figures shows a high correlation with adjusted R-squared in the 91% range (96% with non-prop GDP). When the 1981-2000 period is used, both regressions return adjusted R-squared of around 91%. This is not surprising as Hang Seng index also follows GDP. This also means that using both is redundant.

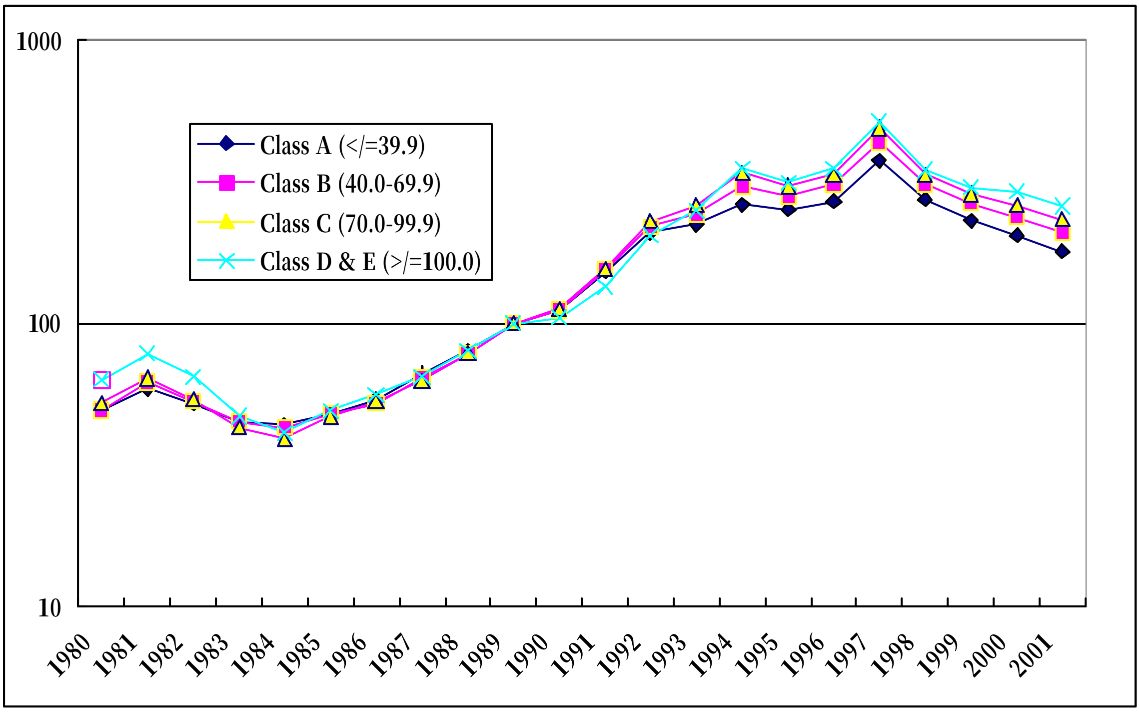
<u>Regressing property price index against non-property GDP</u> for the period 1997-2001 resulted in a much lower R-squared of 36.5%. The lower correlation is expected if we look at the plots. The R-squared for 1981-85 is 49%. We should not draw too much implication from differences in R-squared figures and suggest that the relationship between GDP and property price had broken down. First, the regression with so few data points is not reliable. Second, the strong correlation shown in the longer period does not mean that there are no significant deviations within the period.

Editor' s Note: It may be interesting to perform similar calculations using figures of the last 5 or 10 years despite being a bit short in terms of length of time.

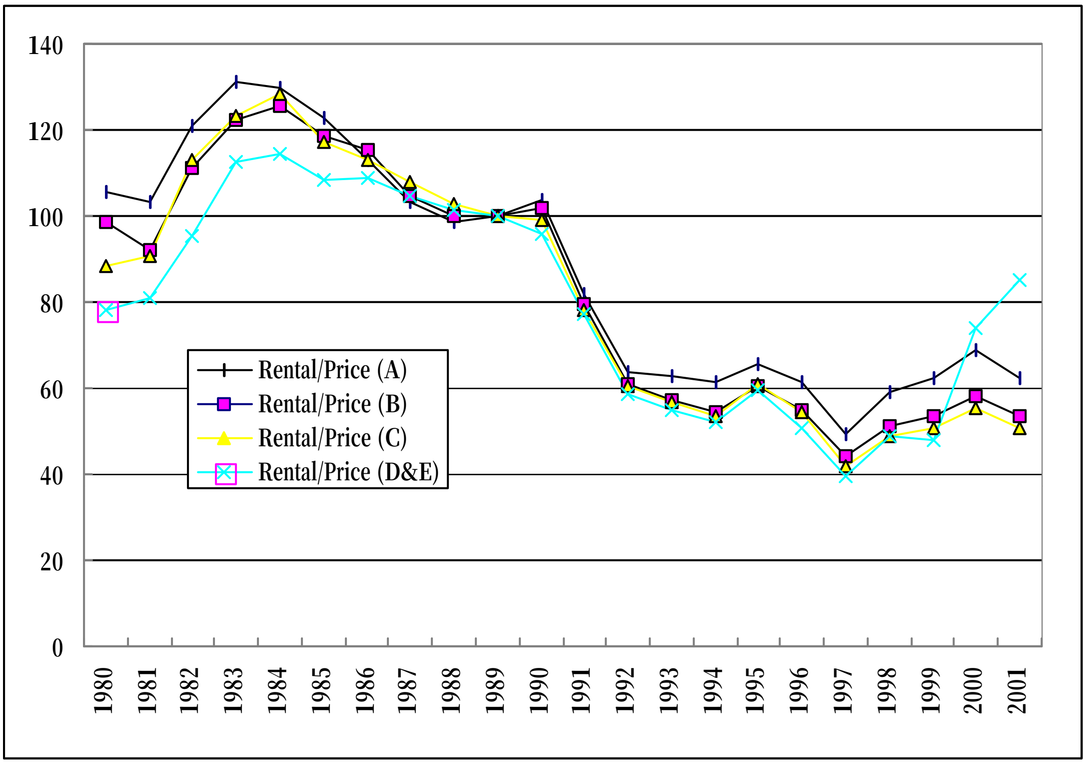




450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Overall price
Ovrl/GDP
Ovrl/Non-prop GDP
Rental/Non-prop GDP
Rental yield/BLR
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001



1000
100
10
Class A (</=39.9)
Class B (40.0-69.9)
Class C (70.0-99.9)
Class D & E (>/=100.0)
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001



140
120
100
80
60
40
20
0
Rental/Price (A)
Rental/Price (B)
Rental/Price (C)
Rental/Price (D&E)
1980
1981
1982
1983
1984
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1988
1989
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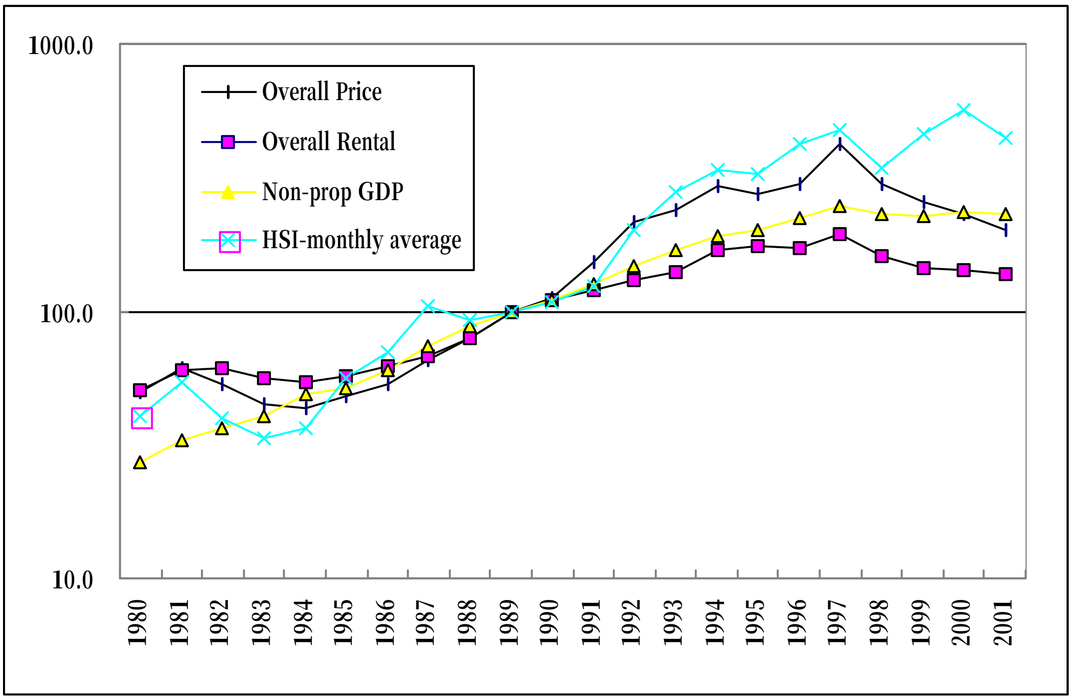
2000
2001



1000.0
100.0
10.0
Overall Price
Overall Rental
Non-prop GDP
HSI-monthly average
1980
1981
1982
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2001

8,000,000 x 800 ft2 Floor Area @ Residential Units

Real Estate Tech, April 2002

Stephen Chung BS BBldg(HKU) MS in Real Estate(MIT) MRICS AHKIS MAACE NAREIT FPFM PQS RPS-QS
Zeppelin Real Estate Analysis Limited - Phone (852) 24016388 / Fax (852) 2401 3084 stephenchung@zeppelin.com.hk

According to published data and information, China is now building some 600,000,000 square meters (m2) of residential floor area, or in the American scale, around **6,456,000,000 square feet (ft2)**. IF we assume that the average residential unit is to be roughly 800 ft2* in floor area, then the number of units that are being constructed will roughly be 8,000,000. This amounts to around 2% of the total number of households, and is not a small number by any standards. The following are some of our **observations**:

A) **China can be roughly divided into 3 regions**: 1) Coastal or Eastern Region, 2) Central Region, and 3) Western Region:

1) Coastal / Eastern Region = such as Beijing, Shanghai, Guangdong, Hainan, Shandong, Hebei, Jiangsu, Fujian etc
2) Central Region = such as Hunan, Shanxi, Jilin, Anhui, Jiangxi, Henan, Heilongjiang etc
3) Western Region = such as Chongqing, Sichuan, Guizhou, Yunnan, Xisang, Shaanxi, Qinghai, Ningxia, Xinjiang Uygur etc

B) **Total Residential Floor Area now under construction** amounts to more than 600,000,000 m2, of which 290,000,000 m2 are newly commenced construction. There is also another 230,000,000 m2 of newly completed construction.

C) Irrespective of whether the floor area is under construction, newly commenced or newly completed, **the proportions between the 3 regions** are more or less the same:

1) Coastal / Eastern Region occupies 60% to 65% of such floor areas
2) Central Region occupies another 18% to 22%
3) Western Region generally accounts for around 17% to 18%.

D) **Most residential developments are still occurring in the Coastal / Eastern Region** and of these many have to do with the 4 major cities of Beijing, Shanghai, Guangzhou and Shenzhen. These 4 cities collectively occupy around 20% to 25% of the total construction floor area.

E) **Irrespective of which regions, the volume of newly commenced construction is higher than the volume of newly completed construction** by close to 1.30 times, i.e., there is a very good possibility that one may see supply in terms of floor area constructed increases in the next few years.

F) **In terms of sales volume**, the allocation is even more imbalanced. While overall the sales figure for commodity residential housing sold for year 2001 was around 380,000,000,000 RMB (Chinese currency: roughly 8.30 RMB to US$1.00), **the Eastern Region accounts for around 80%** of the total while the remaining two regions share 10% each.

G) **In terms of price per floor area** (RMB / m2 floor area), the overall average is roughly RMB 2,070 / m2. Nonetheless, the average for the Eastern Region is RMB 2,500 / m2 while those for the remaining two regions are RMB 1,300 / m2 each.

H) **Cities with average RMB / m2 higher than the overall average are not too many** and include Beijing (RMB 4,700 / m2), Shanghai (RMB 3,500 / m2), and the Guangdong Province which in turn includes Guangzhou and Shenzhen (RMB 3,300 / m2). Naturally, if only Guangzhou and Shenzhen are counted, their averages will be around RMB 4,500 / m2. Tianjin is on the same par as the overall average while the remaining regions and cities are below the overall average. This implies the average reflects mostly the real estate price trends of the several major cities.

The above gives a fairly quick reference to the residential markets on a macro scale though for individual projects, further detail analysis is required. It is also stressed that economic development in emerging economies can occur quite rapidly, rendering related information to be somewhat outdated quite quickly at times.

*800 ft2 is assumed for mathematical tidiness and for ease of memory only. It is NOT meant as the average floor area or size of residential units, which may be higher or lower than 800 ft2. In any event, the averages for individual cities may vary.

Market Descriptions Could Be Misleading

Real Estate Tech, April 2002

Stephen Chung BS BBldg(HKU) MS in Real Estate(MIT) MRICS AHKIS MAACE NAREIT FPFM PQS RPS-QS
Zeppelin Real Estate Analysis Limited - Phone (852) 24016388 / Fax (852) 2401 3084 stephenchung@zeppelin.com.hk

From time to time, the author is asked how he feels about a certain real estate market, in particular his views on whether the market, or a certain sector of it, can expect to see prices rising up or going down. If he says or indicates a high possibility of increasing price levels, he would be branded as being "optimistic" about the market, otherwise, he would be regarded as being "pessimistic" about the market. While this is quite understandable, **linking what one expects real estate prices to be with how one feels about the market (or its investment worth) could be very misleading**, i.e. a rising market does not automatically imply the market is worth investing and vice versa (note also it does NOT automatically mean a rising market is NOT worth investing or vice versa). Here's why:

A) **Rising markets sometimes mean higher risks** and increasingly lower possibility of price increases or vice versa = Most if not all real estate markets (and their economies) move in a cyclical pattern rising up and down albeit at different frequency, intensity and volatility. Comparatively speaking, some markets move more obviously with larger peaks and troughs while others look relatively dead albeit there are usually still detectable movements. Irrespective of how real estate markets move, there will come a point beyond / above which the market price levels no longer make sense based on current / future fundamentals and thrive for instance on continuing injection of liquidity due to in many instances good sentiment. The market has become riskier while the chance for having similar past observed gains has become slimmer. In short, the return to risk ratio is becoming less and less attractive though the market may continue going up should somehow sentiment holds up and more money is injected into it. Assuming the latter case, your author as a humble analyst will have to report he expects prices to go up yet it is another matter if he really feels 'optimistic' about the market or if it is worth investing further. On the other hand, a real estate market which your author expects prices to go down does not automatically translate into investment unworthiness especially in the longer run.

B) **Different investors with different resources and expectations in different circumstances** = While certain market periods may favor investing (buying) or disinvesting (selling), it does not automatically imply all / most investors and participants should follow suit (if so, there would probably be no markets as all were either buying or selling). There are times when the best possible option (next best alternative to no alternative) for a particular investor is to do the opposite, willingly or unwillingly, of what the market situation offers. For instance, an investor on the bankruptcy edge is forced to sell at dirt cheap price levels even if the market is about to pick up soon. Likewise, an investor already loaded with a huge real estate portfolio may not be able to acquire more even if an extremely good opportunity arises without affecting his / her original return and risk profiles. Whether the market is "optimistic" or "pessimistic" etc has little bearing on these investors.

C) **Real estate investing involves more** than just expecting which markets go up and which markets go down = Especially for investors with a sizable portfolio, the overall resource, return and risk parameters are also concerns. Sometimes, in order to achieve a certain return and risk profile, investing into less volatile mature markets offering smaller price appreciations is essential to balance off the riskier portion of the portfolio. This may mean investing into markets that are classified as lackluster or even pessimistic.

D) **Capital / Price appreciation versus income yield** = Generally, rising real estate markets offer smaller rental income yields though larger expectations in price appreciation and vice versa. For the risk takers, price appreciation may be all that matters. For the risk-adverse, getting a good stable income stream and yield looks more appealing. There are no right or wrong inclinations though there are better or worse alternatives assuming a certain return and risk profile.

Investing, including real estate investing, involves consideration of many potentially ‘ gray’ areas and aspects, and sometimes the solutions or choices are not just in ‘ black’ or ‘ white’ though having a consistent well decided set of resource, return and risk parameters helps quite a bit in seeking, evaluating and managing viable real estate opportunities. While simple market descriptions such as ‘ optimistic’ and ‘ pessimistic’ can give a quick market reference, viewing markets on such generalized terms leads to over-simplification at times. While simplifying a detail researched view is one thing, having a simpleton view is another matter.

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