

# Zeppelin's Real Estate Tech

1Q 2016: A Real Estate Newsletter by Zeppelin Real Estate Analysis Limited

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The US FED finally did it! Did what? You should know. But if you don't, there is no point telling you, is there? Real estate prices in Hong Kong have gone down a few percentages overall during the latter half of last year though there was still a small gain for the whole 2015, China cities vary in property performance with some seemingly doing better than others, and challenges, not just of the economic kind, plague much of Europe still.

In this issue, we will share a handy method for picking which (Hong Kong private) housing estates to go for assuming the decision to invest is already made (whether this is a wise move at this time is not a concern here):

- **Real Estate Price Boxing: a handy method for picking the better of the two**
- **Real Estate Price Boxing: a sample analysis using actual market data**
- **Real Estate Price Boxing: a supplement to help count the scores**

**"Imperfections make life more perfect."**

We would also like to hear from prospective readers / writers who wish to share their real estate experience with us.

**This quarterly (generally published in January, April, July and October) newsletter** is circulated freely via email to over thousands of readers comprising real estate developers, investors, fund managers, financiers, owners, users, top executives, senior managers, prominent academics and related professionals from Hong Kong and abroad. Our content is / has also been published in newspapers and web portals such as the [South China Morning Post](#), [China Daily](#), [Hong Kong Economic Journal](#), [21<sup>st</sup> Century Business Herald](#), [Apple Daily](#), [Sing Tao](#), [Quamnet Magazine](#), [The Standard](#), [MITCRE Alumni Newsletter](#), [Surveying Newsletter](#), [Reidin.com](#), [Centanet.com](#), [Netvigator.com](#), [Hongkong.com](#), [E-finet.com](#), [Red-dots.com](#), [PacificProperties.net](#), [Soufun.com](#) and [House18.com](#). We had also been quoted in the [Asian Wall Street Journal](#) and interviewed by [USA Today](#), [i-Money](#), [Ming Pao](#), [Radio Hong Kong](#), [Cable TV \(Money Café\)](#), [DBC Radio](#), and [Commercial Radio](#). We also publish monthly articles and analyses in the months in between. This newsletter is now into its [20<sup>th</sup> year](#) and [78th](#) issue.

**We also operate a website [www.real-estate-tech.com](http://www.real-estate-tech.com)** through which we intend to share some of our real estate knowledge and ideas with interested parties. There are close to 1,000 content items, in English or Chinese, including analyses, articles, charts, and tables, plus spreadsheets, tutorials, e-books, and the like, the majority of which is free with some requiring a token fee. The website is regularly visited by thousands from all over the world and focuses on China / Hong Kong real estate markets.

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# Who? Me?

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- China Daily
- Hong Kong Economic Journal
- South China Morning Post
- Apple Daily
- Quamnet Magazine
- Real estate and finance websites such as Soufun.com, Finet.com etc
- Journals of professional institutes such as the Hong Kong Institute of Surveyors

**Stephen is an honorary adjunct professor** of the University of Hong Kong and has been invited to speak to audiences from:

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- Professional Institutes: such as the Hong Kong Institute of Surveyors, Canadian Institute of Quantity Surveyors, Royal Institute of Chartered Surveyors
- Business Associations: such as the Rotary Clubs

**Stephen has 3 real estate books in Chinese published to date as follows:**

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Hard copy = Real Estate Investment Know-How above 101

Most recent and hard copy = The Real Estate Market Turning Point

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## Real Estate Price Boxing: a handy method for picking the better of the two

Real Estate Tech, 1Q 2016

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Take that, and that, and that! (public domain, courtesy of Wikimedia.org)

Very often, real estate investors will face the challenge of having to choose between two (or more) residential estates: **which one is likely to offer the better investment performance** – in terms of price gain – in the foreseeable future if one is to invest now?

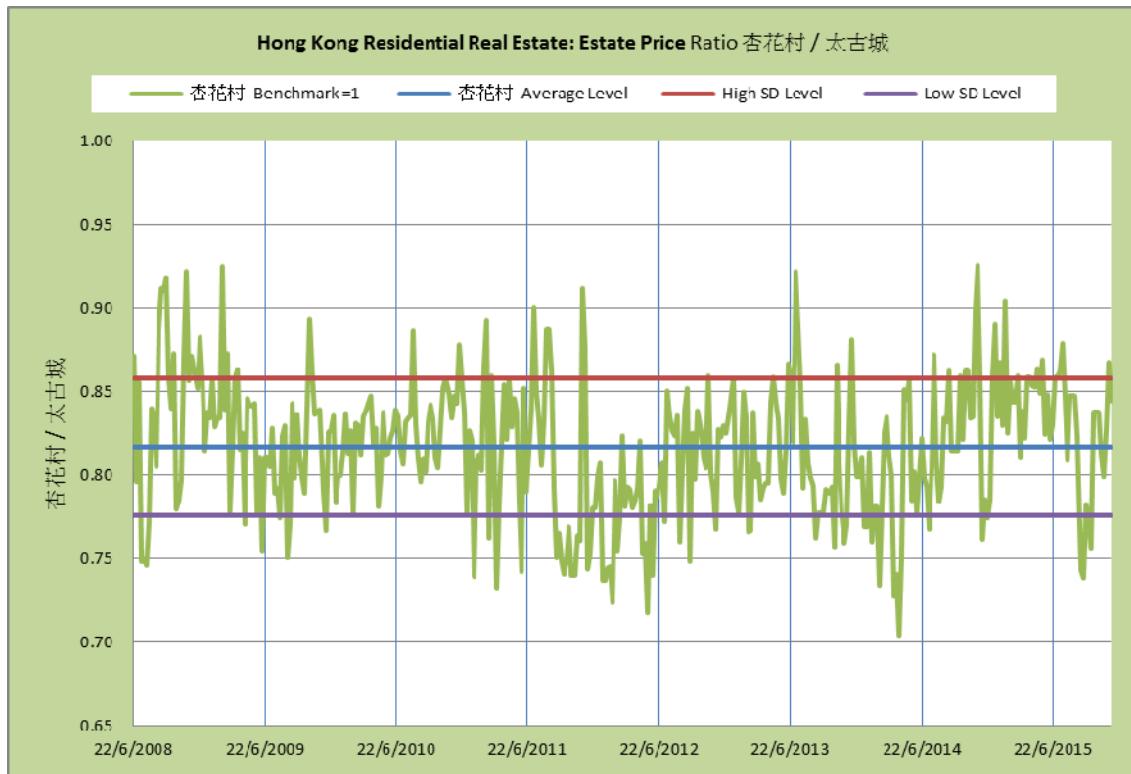
Usually, one can 1) look at the pricing levels – in this instance the HK\$ / ft<sup>2</sup> floor area - of any two residential estates being eyed at; 2) study their respective pricing trends – such as reflected in their price indexes - over time of the two residential estates; and 3) calculate their respective price fluctuations or volatilities as a measure of risk. Not to mention considering other attributes such as their locations, quality of design and construction, effectiveness of their building management, curb appeal, market popularity, and so on. Macro factors such as the overall Hong Kong economic performance are assumed to affect both estates more or less in the same way and to similar degrees i.e. they usually matter little when and if the decision to invest is set. [Side note = Macro factors are best considered BEFORE a decision to invest (or not to invest) is formed].

Yet one can still be at a loss. Knowing the price, the trend, the risk, and all relevant attributes of the residential estates in question does not guarantee a clear and concise decision will evolve from such understanding. Which estate is the better bargain, for instance? One might even have a hunch, but a degree of certainty appears to be playing truant.

Here we have come up with a simple concept – which we have named “**Real Estate Price Boxing**” - to help deal with the question. Boxing? Yes, because it does involve, IF the residential estates in question were persons, having them slugging it out to see who is a better bargain at any one point in time. **The concept elaborated:**

- a) Say there are two residential estates M and N and their respective (average or median) pricings – in HK\$ / ft<sup>2</sup> floor area – are known.
- b) We can do their price ratio on a certain date or in a particular period (day, week, or month depending on the data set). Say M is HK\$15000/ ft<sup>2</sup> and N is HK\$10000 / ft<sup>2</sup> in December 2010, so the M to N price ratio would be HK\$15000 / HK\$10000 = 1.50 in December 2010.
- c) Assuming we have a time series of their pricings, we can then find out the M to N (varying) price ratios over time. Say from December 2010 to now, the periodic ratios are 1.50, 1.55, 1.47, 1.50, 1.56, 1.39, and so on and so forth.
- d) Now we can work out the “**average**” of the price ratios observed in the period from December 2010 to now. The average reflects how the market at large views the two residential estates in the period. If say the average M to N price ratio is 1.50, then that means overall the market thinks M is worth 50% more on average than N, at least from December 2010 to now. Naturally, for any one particular date in the period, the price data might have been skewed e.g. by too few transactions, or M having a particularly overpriced or expensive transaction, or N having a particularly underpriced or cheap sale. However, given time, say over several years instead of just a few weeks, such skews might matter little.
- e) We can also work out the “**standard deviation**” of the price ratios over time. Adding this standard deviation to the average gives one the ‘high’ price ratio fluctuation level and subtracting it from the average offers the ‘low’ price ratio fluctuation level, and these two price fluctuation levels would give us an idea of the typical price ratio fluctuation range.
- f) Using the average of 1.50, if the M to N price ratio for any particular date is above 1.50, then it may infer that M is less of a bargain when compared to N on that particular date. And if the price ratio is below 1.50, then M is the better bargain compared to N.
- g) Now, one might not want to sell M when the ratio is just a tweet-bit above 1.50, say 1.51, or for that matter, buy M when the ratio hovers at 1.49. Thus begs the question: when does it make sense to contemplate selling or buying M (or N)?
- h) This is where the standard deviation kicks in: let’s say the standard deviation is 0.15, and so the high price ratio fluctuation level would be  $1.50 + 0.15 = 1.65$ , and the lower end would be  $1.50 - 0.15 = 1.35$ . As such, when one sees the M to N price ratio being above 1.65, then for those contemplating which estate of the two is the better bargain, N is. And when the price ratio is below 1.35, then M is the better bargain. Trading / investing above (1.65) or below (1.35) the price ratio fluctuation range is likely to enhance the chance of having chosen the better bargain residential estate.
- i) This is useful not only to investors looking to buy either into M residential estate or N residential estate (or selling M or N), but also to owners of M and N estates who wish to trade his residential estate for the other.** Stating the obvious, M owners wanting to sell and trade for an N unit may wish to do so when the price ratio is above 1.65 (or at least above 1.50, the average). Conversely, N owners eyeing M units may wish to sell and trade when the price ratio is below 1.35 (or at least below 1.50).
- j) Limitations and assumptions:** there are some. For instance, this is NOT a (price) predictive method nor should it be viewed as such. Stating the obvious, it has NO predictive / projective / estimative features. The method also assumes there will be no or little changes in the status between the two residential estates being compared. For example, if M is to have an incinerator built next to it, then the price ratios and fluctuations seen in the past – and thus the method, or modelling – might not remain the same or apply still. All bets will be off. No rents or rental yields are taken into account either.
- k) Back tests: we have done some random back tests to monitor the applicability of the method and so far it seems to be working fine. Not 100% without leaks but applicable enough.

i) For an idea of the method and probable results: please refer to the sample chart below. Note one can compare more than two residential estates, or for that matter, compare the estates to the 'market at large'.



For those not familiar with Chinese characters, the above chart compares two popular private residential estates in Hong Kong: Heng Fa Tsuen (HFT) and Tai Koo Shing (TKS). The ratio above represents HFT / TKS i.e. the price per ft<sup>2</sup> of HFT is divided by the price per ft<sup>2</sup> of TKS. When the ratio is above 0.86 or so, then TKS is the better bargain. When the ratio trends below 0.77 or so, then HFT is the better bargain.

Yes, it does look a bit like a heart-beat monograph and yes, the two residential estates in the chart are slugging it out...sometimes one wins, sometimes one loses, yet ouches just the same!

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## Real Estate Price Boxing: a sample analysis using actual market data

Real Estate Tech, 1Q 2016

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Blue sky = Buy?

Here we shall offer a sample of how the method described in the foregoing session can be applied:

**1) Data** = The price per ft<sup>2</sup> of gross floor area i.e. HK\$ / ft<sup>2</sup> gross weekly data series published in the website of Centaline Agency for more than a hundred popular private residential estates in Hong Kong. Here we shall adopt the data series for two of the residential estates.

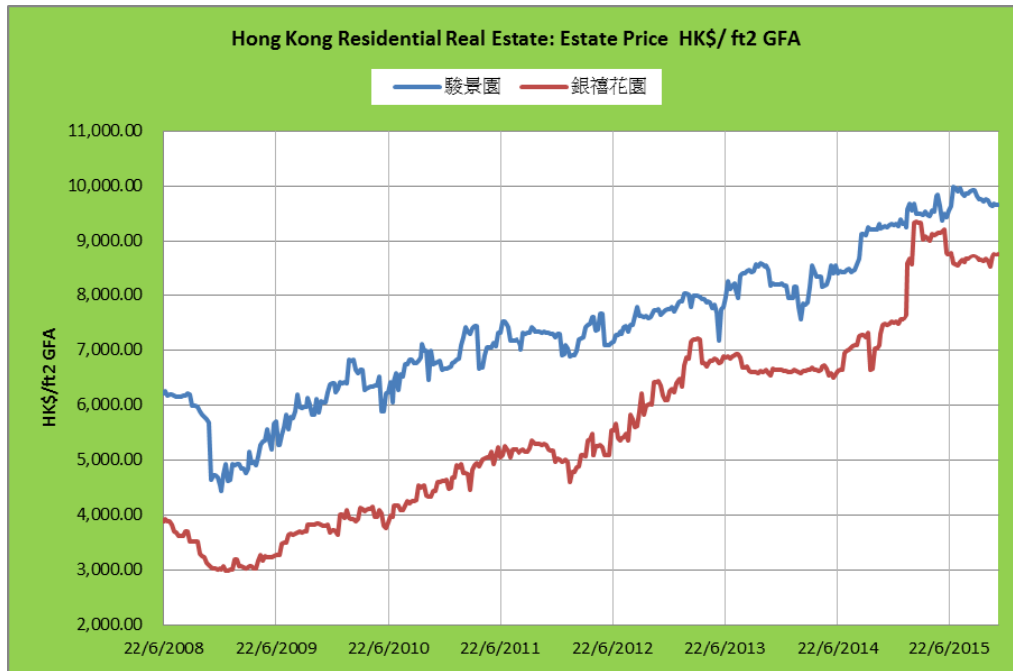
**2) Period** = starting from late June 2008 up to late November 2015.

**3) Gross floor area is used instead of Net floor area** = because older price data are available in gross floor area basis only. Price in net floor area basis is a recent thing. [For the technical orientated, the price per floor area ratio quoted on a gross floor area basis between two residential estates will likely be different from the price ratio quoted on a net floor area basis for the same two residential estates. This is because while there is a common definition for net – or saleable – floor area, there is none for the gross floor area. However, such differences do not matter in this instance. It is the changes in the price ratio which matter].

**4) Jubilee Garden [銀禧花園] vs Royal Ascot [駿景園]** = both are part of the Centaline CCL Index system and are popular private residential estates in the Shatin / Net Territories East region of Hong Kong. Both were developed by the largest real estate developers in Hong Kong; the former by Cheung Kong Holdings, and the latter by Sun Hung Kai Properties. They are right next to one another and are steps away from the Fo Tan MTR rail station. Jubilee Garden has smaller sized units while Royal Ascot offers a broader range. Both have some units facing the Jockey Club racecourse, generally considered a good view feature.

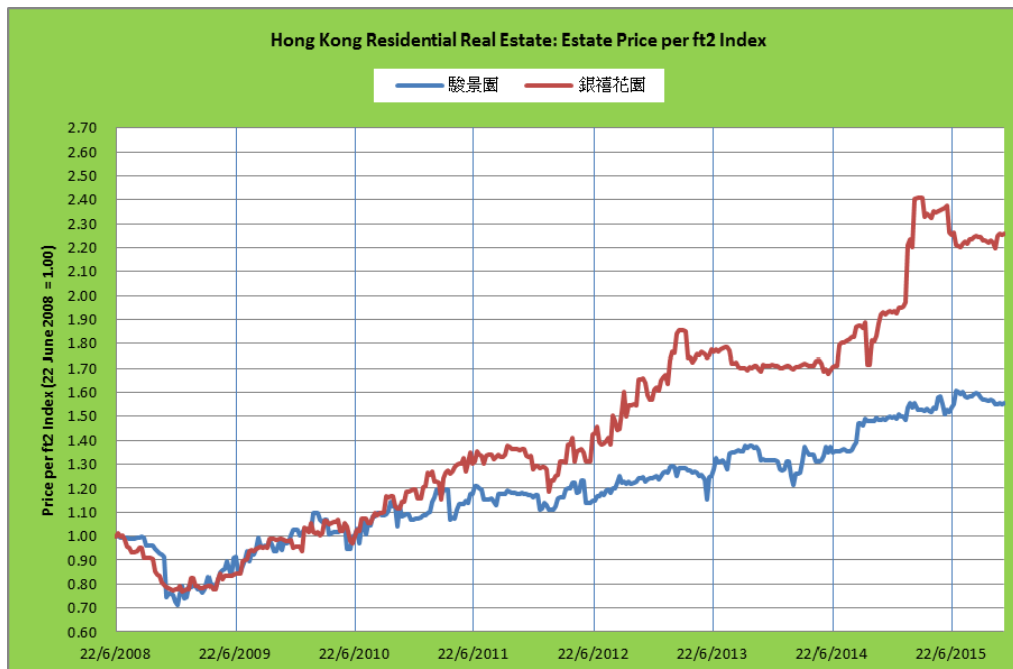
Here are some charts which tell how they compare:

### A) Price per gross floor area HK\$ / ft2 gross



Jubilee Garden prices are generally lower than Royal Ascot. However, do note the gap between them getting smaller as times goes by.

### B) Price indexes



Jubilee Garden wins over Royal Ascot by a mile during the latter part of the period.

**C) Price ratio (refer to the first article for details on the method)**



While the average price ratio of Jubilee Garden to Royal Ascot during the period is 0.74, the price ratio has also been edging upward during the period from, broadly speaking, around 0.60 to 0.90. As to why, your humble author would guess Jubilee Garden units being smaller is 'easier' to buy, complying to overall market price trends and high demand for smaller units.

**D) Price ratio – same chart as (C) with two more lines above and below the average**





Roughly speaking, Jubilee Garden was a better bargain in the earlier years – from 2008 to 2010. In recent times, Royal Ascot is a better bargain – from 2013 to 2015.

Investors contemplating which residential estate of the two to place your bet now: try Royal Ascot. Now is perhaps an opportune time for Jubilee Garden unit owners to trade for a Royal Ascot unit.

### **E) Back tests**

We have also selected rather randomly three dates to back test the method in this Jubilee Garden versus Royal Ascot example; June 2009 which suggests a Jubilee Garden better buy; June 2013 which suggests Jubilee Garden to be a worse buy than Royal Ascot; and March 2015 which says Jubilee Garden to be a worse buy too [Note these comparisons – better buys, worse buys etc - are relative].

And these suggestions are validated when we calculate the three price change percentages from the three dates to November 2015 for the two residential estates. [Technically speaking, do note such results could be different IF different time periods are used. Also whatever results only reflect the market preferences-inclinations during the time period used and market preferences-inclinations may change over time or in future].

Again, we would stress this Price Boxing method is NOT a predictive / projective / estimative tool. It cannot tell if prices would go up or down for the two residential estates in question, or for that matter, any residential estate or the market at large. It can only offer an indicative signal which residential estate might perform better – in terms of price change – based on past data in the time series. And just on prices alone, no rents are involved.

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## Real Estate Price Boxing: a supplement to help count the scores

Real Estate Tech, 1Q 2016

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How many ups, how many downs, or sideways?

When performing the Real Estate Price Boxing exercise above, we have done some real estate price indexing.

Normally, a real estate price index would deem an older / oldest date to be the start date and equate the price on this start date to 1.00 (or 100 if you like). Then prices observed in the subsequent newer dates would be divided by the price on the start date, all the way until the last or latest price in the time series. For instance, say the price on the start date of 01 December 2010 is \$10000, and the subsequent prices on 01 December 2011, 01 December 2012, 01 December 2013, 01 December 2014, and 01 December 2015 (latest date) are \$11000, 12000, 13000, 14000, and 15000, then the index curve would start from 1.00, then 1.10, 1.20, 1.30, 1.40, and finally end at 1.50. In short, the start date is fixed while subsequent dates vary with time.

Nonetheless, in part to monitor the applicability of our Price Boxing method, we have sort of done a reversed index i.e. instead of fixing the start date, we equate the end date which is the latest date in the time series to 1.00. This is AS IF a person buys and sells a property in the residential estate on the same (latest) date for the exact same price thus incurring an index value of 1.00 (no price gain, no price loss either). And the price on this latest date will be divided by the prices on all preceding dates. Using the example above, 15000 on 01 December 2015 will be divided by the prices on all 01 December 2015 way back to 2010 and thus the index for 01 December 2015 will be  $15000/15000 = 1.00$ . And for 01 December 2014 it will mean  $15000/14000 = 1.07$ , 01 December 2013 will be  $15000/13000 = 1.15$ , 01 December 2012 is thus  $15000/12000 = 1.25$ , 01 December 2011 =  $15000/11000 = 1.36$ , and 01 December 2010 =  $15000/10000 = 1.50$ .

This would show how much price gain (or loss) there is by buying at any preceding date and holding the property till the latest date – in this case 01 December 2015. Now obviously we have used very round and gradual price figures and increments in the above example. The real

world may not be that regular or smooth or one sided going up. In any event, the 'typical / likely' price performance over time – based on the latest date – of the / any residential estate can be observed and assessed.

Now imagine having done the reversed index for two residential estates with the same time frame and latest date. We can then subtract the respective index values of the two residential estates on any particular date in the time series. For instance, Estate P has 1.45 and Estate Q is 1.30 on 01 December 2012 and subtracting Q from P (or P from Q if one likes) will give =  $1.45 - 1.30 = 0.15$ . P performs better on that date than Q (or Q lags behind P via  $1.30 - 1.50 = -0.15$ ).

As such, when we finish doing the subtraction between Estate P and Estate Q price indexes on each and every date in the time series, not only can we back-test and monitor the Price Boxing method, we can also answer the following:

a) How many times in the time series has P beaten Q (i.e. P's index value being larger than that of Q), and / or Q beating P, and / or a draw between P and Q?

Say there are 100 dates-periods (periods can be weekly, monthly, quarterly, annually), and P beats Q in 66 out of the 100 dates, while Q beats P on 33 such occasions. There is one draw in the time series. Then roughly P wins 66% of the time while Q wins 33%. That is, an investor who 'randomly' buys P is more likely to gain more than an investor who also randomly buys Q – during the time period and using the latest date as the benchmark.

b) How much is the overall / total price performance difference between P and Q during the time period?

While P might win more times than Q, P may not win by much. In some cases, P might even actually be less than Q – if P wins small but more times while Q wins big but fewer times. We do this by summing the total index values of the two residential estates and observe the difference between them. For the meticulous, one can subtract the number of dates-periods from the totals to get at a 'net' value. We then divide one with the other and the closer the value is to (positive) 100%, e.g. 99% or 101%, the more insignificant their difference.

Note when the time period in terms of length or start and / or end date(s) changes, the results i.e. price performance, win-lose %, and performance gap, may (not must) be significantly different.

As for the back-testing, when the estates' price ratio suggests one of the estates is a better bargain on say a certain date (refer to the first article for details on the price ratio and its application), we would look up the subtraction between the (reversed) price indexes of the two residential estates on the same date to see if the latter supports the price ratio suggestion. To date, with the limited 'experiment' done, the correlation R seems high i.e. it seems to work nicely, though not perfectly.

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