

Real Estate is Not a Fungible Commodity: The Legal and Valuation Implications

By

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The basic rules of law and economics recognize that all real estate is unique and thus has no other interchangeable substitute. Hence, the remedy at law for disputes in real estate transactions is specific performance, not substitution. In short, real estate is not a fungible commodity.

Fungible

“Capable of being exchanged or interchangeable; a fungible commodity is relatively indistinguishable from other items within the same category, e.g., units of currency.”

The Dictionary of Real Estate Appraisal, 3rd Edition,
(Chicago: American Institute of Real Estate Appraisers, 1993), Page 155

Fungible commodities have the common economic characteristics of being traded based on a unit price such as gold (\$/Troy oz.), gasoline (\$/gallon), crude oil (\$/barrel), corn (\$/bushel), meat (\$/lb.), milk (\$/qt.), eggs (\$/doz.), etc. An ounce of gold is exactly the same as any other ounce of gold. Their interchangeability makes them fungible commodities.

Real estate is traded based on the actual sale price, not the sale price per unit. Brokers may say that the 10-story 100,000 SF office building sold for \$10,000,000 or \$100 per square foot or \$1,000,000 per story. The price per square foot or the price per story is only descriptive information and cannot be used as a basis of valuation. This is because the value of the first floor (retail) is typically higher than the 5th floor (administrative office space) while the 10th floor (executive office space) will command a premium for view. Unlike fungible commodities, not all real estate floor areas have equal utility or value.

Many real estate appraisers often convert the actual sale price to the sale price per square foot as the basis of their valuations. As will be seen in the example below, the apparent narrow range in price per square foot creates the illusion of similarity, but distorts the nature and scale of the comparable sales and ultimately results in an erroneous value conclusion.

The example below was from an actual redacted appraisal report. It has sale prices range from \$625,000 to \$1,200,000 or a percentage difference of 100%. The sale price per square foot has a range of \$70/SF to \$105/SF or a percentage difference of 51%.

In this example, Mr. Appraiser converted the comparable sale prices to the sale price per square foot as the basis for his valuation. In order to estimate the value of the 6,190 SF subject property, he made percentage adjustments (5% gradations ranging from -10% to a +20%) to each sale for five factors (location, land area, building size, condition and functional utility).

SALES COMPARISON ADJUSTMENTS										
Estimated Values Based on Sale Price v. Sale Price Per Square Foot										
Real Estate is <u>Not a Fungible Commodity</u> Like Gold and Cannot Rely on a Unit of Value to Estimate Value										
Price Per Square Foot <u>Distorts</u> the Market Data that Results in an <u>Erroneous Value Conclusion</u>										
	Sale No. 1		Sale No. 2		Sale No. 3		Sale No. 4		Sale No. 5	
Sale Price	\$1,200,000	\$1,200,000	\$800,000	\$800,000	\$950,000	\$950,000	\$625,000	\$625,000	\$1,085,000	\$1,085,000
Sq. Ft.		14,524		9,984		9,000		8,400		15,482
\$/SF		\$82.62		\$80.13		\$105.56		\$74.40		\$70.08
	Adjustments		Adjustments		Adjustments		Adjustments		Adjustments	
	Based on Sale Price	Based on Sale Price per SF	Based on Sale Price	Based on Sale Price per SF	Based on Sale Price	Based on Sale Price per SF	Based on Sale Price	Based on Sale Price per SF	Based on Sale Price	Based on Sale Price per SF
	\$1,200,000	\$82.62	\$800,000	\$80.13	\$950,000	\$105.56	\$625,000	\$74.40	\$1,085,000	\$70.08
+ Location	-5%	-5%	-5%	-5%	-5%	-5%	-5%	-5%	0%	0%
+ Land Area	-10%	-10%	10%	10%	10%	10%	-10%	-10%	-10%	-10%
+ Building Size	20%	20%	0%	0%	0%	0%	0%	0%	20%	20%
+ Condition	-10%	-10%	0%	0%	-10%	-10%	20%	20%	0%	0%
+ Functional Utility	-5%	-5%	10%	10%	-10%	-10%	5%	5%	5%	5%
= Sub Total	-10%	-10%	15%	15%	-15%	-15%	10%	10%	15%	15%
Initial Adjusted Price	\$ 1,200,000	\$ 82.62	\$ 800,000	\$ 80.13	\$ 950,000	\$ 105.56	\$ 625,000	\$ 74.40	\$ 1,085,000	\$ 70.08
= \$ Adjustment	\$ (120,000)	\$ (8.26)	\$ 120,000	\$ 12.02	\$ (142,500)	\$ (15.83)	\$ 62,500	\$ 7.44	\$ 162,750	\$ 10.51
Adjusted Price	\$ 1,080,000	\$ 74.36	\$ 920,000	\$ 92.15	\$ 807,500	\$ 89.72	\$ 687,500	\$ 81.85	\$ 1,247,750	\$ 80.59
Adjusted Price Per Sq. Ft.	\$ 174.47	\$ 74.36	\$ 148.63	\$ 92.15	\$ 130.45	\$ 89.72	\$ 111.07	\$ 81.85	\$ 201.58	\$ 80.59
Subject Building Sq. Ft.	6,190	6,190	6,190	6,190	6,190	6,190	6,190	6,190	6,190	6,190
Adjusted Price	\$ 1,080,000	\$ 460,286	\$ 920,000	\$ 570,393	\$ 807,500	\$ 555,381	\$ 687,500	\$ 506,622	\$ 1,247,750	\$ 498,874
Net \$ Difference		\$ 619,714		\$ 349,607		\$ 252,119		\$ 180,878		\$ 748,876
Net % Difference		135%		61%		45%		36%		150%
Estimated Values										
Average Based on Sale Price per Sq. Ft.	\$520,000		\$ 84.01	Per Sq.Ft.						
Average Based on Sale Price	\$950,000		\$ 153.47	Per Sq.Ft.						

Mr. Appraiser committed the following major errors:

1. Sample Size of five (5) sales is too small a sample to calculate five (5) adjustment factors. It is mathematically impossible to derive five adjustments from five salesⁱ. The statistical mathematical formula for sample size is as follows:

	Sample Size (Number of Sales)	5
-	Constant a/k/a Intercept	1
=	Number of Sales Minus 1	4
-	Number of Independent Variables Adjustment Factors	5
=	Residual Degrees of Freedom (must be equal to or greater than 1)	-1

2. Real estate is an imperfect market and hence has a variance (statistical residual) that Mr. Appraiser failed to calculate.ⁱⁱ The test to verify the correct calculation of the variance is:

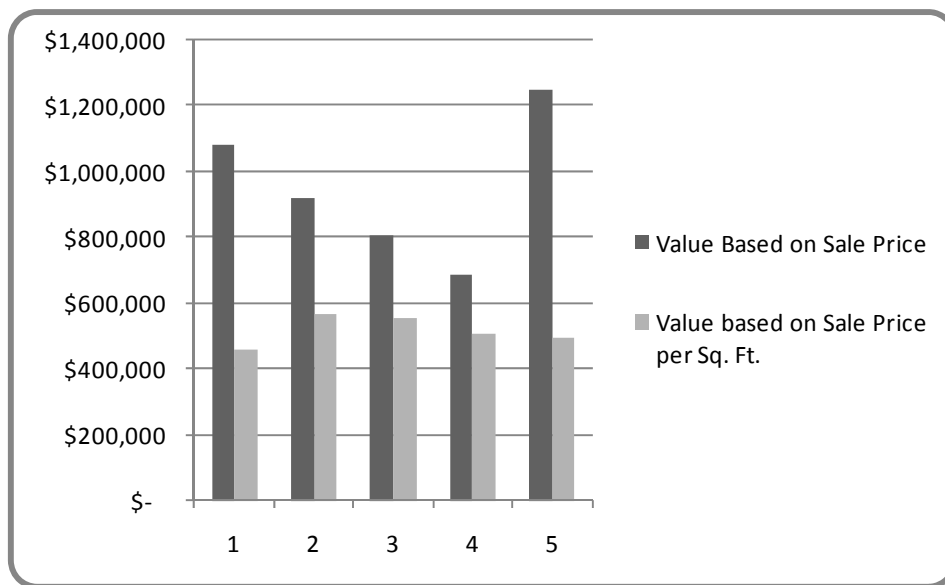
The Average & the Total of the Residuals DO NOT EQUAL ZERO hence the adjustments made by the appraiser are mathematically WRONG.

				Appraiser's Final Estimate of Value		\$ 520,000			
	Column 1		Column 2		Column 3	Column 4		Column 5	
	Sale Price (Dependent Variable)	+	Net Adjustments + or -	=	Adjusted Sale Price	Appraiser's Final Estimated Value	=	Residual + or -	
Sale # 1	\$ 1,200,000	+	\$ (739,714)	=	\$ 460,286	\$ 520,000	=	\$ (59,714)	
Sale # 2	\$ 800,000	+	\$ (229,607)	=	\$ 570,393	\$ 520,000	=	\$ 50,393	
Sale # 3	\$ 950,000	+	\$ (394,619)	=	\$ 555,381	\$ 520,000	=	\$ 35,381	
Sale # 4	\$ 625,000	+	\$ (118,378)	=	\$ 506,622	\$ 520,000	=	\$ (13,378)	
Sale # 5	\$ 1,085,000	+	\$ (586,126)	=	\$ 498,874	\$ 520,000	=	\$ (21,126)	
Total of Residuals								Must Equal Zero	\$ (8,444)
Average of Residuals								Must Equal Zero	\$ (1,689)

- The subject building area of 6,190 SF is smaller than the comparable sales, which range from 8,400 SF to 15,482 SF. Since the subject square foot is below the range of the comparable sales, such comparison has no validity.
- The adjustments are in 5% gradations ranging from -10% to a +20%, never found in any market, and appear to be fabricated without credible analysis.
- Mr. Appraiser's value conclusion of \$520,000 is distorted when he uses the price per square foot as the dependent variable.
- When valuation is correctly based on the actual comparable sales price, Mr. Appraiser's percentage adjustments result in a value estimate of \$950,000 - a net difference of 83% compared to his estimate of \$520,000 erroneously based on a price per square foot.
- The percentage adjustments applied to each comparable sale result in enormous net price and net percentage differences.

Sale No.	Value Based on Sale Price	Value based on Sale Price per Sq. Ft.	Net \$ Difference	Net % Difference
1	\$ 1,080,000	\$ 460,286	\$ 619,714	135%
2	\$ 920,000	\$ 570,393	\$ 349,607	61%
3	\$ 807,500	\$ 555,381	\$ 252,119	45%
4	\$ 687,500	\$ 506,622	\$ 180,878	36%
5	\$ 1,247,750	\$ 498,874	\$ 748,876	150%

These value differences are displayed on the following bar chart:



SUMMARY:

- Fungible commodities are interchangeable and are priced on a unit basis.
- Real estate is not a fungible commodity.
- The actual sale price of the comparable sale must be the basis of real estate valuation.
- Mr. Appraiser’s conversion to a sale price per square foot distorts the market data.
- Distortion of market data results in an erroneous value estimate for the subject property.
- Sample size of five sales is too small to derive five adjustment factors.
- The variance in the real estate market was not calculated.
- The subject building area is smaller than any of the comparable sales.
- The adjustments are in 5% gradations never found in any market, and appear to be fabricated without any market data support.

CONCLUSION

The Uniform Standards of Professional Appraisal Practice (USPAP) 2006 Standard Rule 1-1 states:

“In developing a real property appraisal, an appraiser must:

- a) Be aware of, understand, and correctly employ those recognized methods and techniques that are necessary to produce a credible appraisal;

- b) Not commit a substantial error of omission or commission that significantly affects an appraisal; and
- c) Not render appraisal services in a careless or negligent manner, such as by making a series of errors that, although individually might not significantly affect the results of an appraisal, in the aggregate affects the credibility of those results.”

In light of these USPAP standards, Mr. Appraiser’s value conclusion of \$520,000 is not credible and cannot be relied upon for any purpose.

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ⁱ Eugene Pasymowski, MAI, ***Econometric Solution for Real Estate Valuation***, Best Paper Prize 23rd Pan Pacific Congress of Real Estate Appraisers, Valuers and Counselors sponsored by The Appraisal Institute, San Francisco, September 16-19, 2006.

http://www.realstat.com/download/EconometricSolutions_english.pdf

http://www.realstat.com/download/EconometricSolutions_korean.pdf

http://www.realstat.com/download/EconometricSolutions_chinese.pdf

<http://www.appraisalinstitute.org/ppc/>

How to Discredit Most Real Estate Appraisals in One Minute by Eugene Pasymowski, MAI is published in the Spring 2007 issue of The TriState REALTORS Commercial Alliance, Philadelphia, PA.

<http://www.realstat.com/download/discredit.pdf>

ⁱⁱ ***Verify Adjustments Tool***, RealStat Valuation, Inc.

<http://realstat.com/cgi-bin/start.cgi/verify.html>