Value Vs. Size

in The Real Estate Market

BY MICHAEL WOLFF

Value varies with size in the real estate market, like value varies with quantity in the marketplace for goods and services. Using real life examples, this article will demonstrate how and why.

Real Estate Examples

Over the years, I have had the opportunity to appraise not only many properties, but also many different kinds of properties. These appraisals necessitated the use and analysis of many comparable sales data sets. Often, depending upon assignment particulars, the comparables might number in the dozens or even over 100. For some special analyses, such as time trends, I have used even more. The use of such large data sets breaks with the traditional appraisal comparables analysis methodology of narrowing data sets into a few, say four or five, so called "best" comparables and then adjusting for differences. This "best few" comparables

methodology, although simpler to understand for most people does not sufficiently portray larger market trends, substitutability of comparables, and other price/value relationships as well as large data sets do. Once refined to reflect the overall character of a subject property, a large data set has much greater statistical strength. As a result of all these analyses, I have observed that there is a definite relationship pattern between size and value; a pattern that occurs over and over again, be it land, buildings, etc. Further, similar price/value patterns exist also in relation to quality, age, etc. The real life examples that follow illustrate this relationship and are being offered as proof.

Example 1: Subdivision Lots

Several years ago, I had the opportunity to appraise a vacant (but otherwise finished) residential subdivision. The owner/developer died just as it was completed, and a value was needed for probate purposes. It consisted of 22 lots, ranging in size from 18,000 to 25,000 square feet. It was located in a residential area of homes similar in quality to the Marshall & Swift "average" and "good" classifications. As a part of this appraisal, I estimated each individual subject retail lot value from comparable sales.

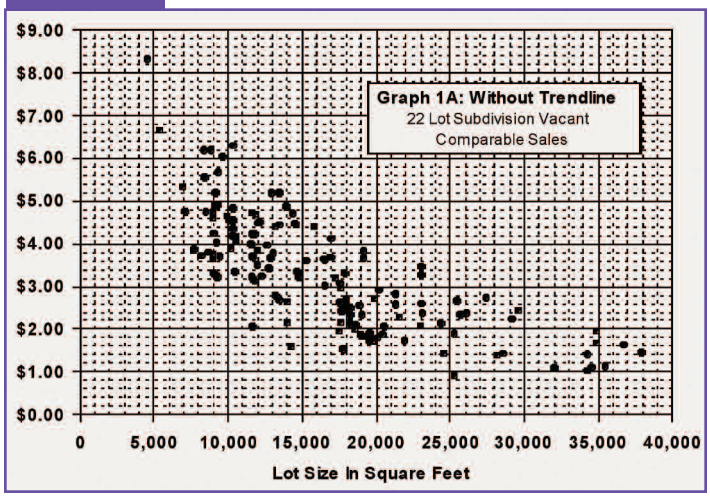
From an initial data search of several hundred potential comparable sales, I found 151 recent sales of vacant subdivision lots that were similar in character to (and very substitutable with) the subject lots. These were then evaluated on a per square foot basis to see how the sale price varied with lot size. Graph 1A below shows the results of this analysis. Keep in mind that this is a refined data set, not a manipulated one, of comparable sales very similar and substitutable to each other and to the subject properties, except for size; typical buyers would very likely substitute any one for another.

Graph 1A is shown without a trend line included; this was done so that you can see the raw data without being influenced by my interpretation. However, on Graph 1B, which represents the same data set as shown on Graph 1A, I have included a trend line to aid in interpretation.

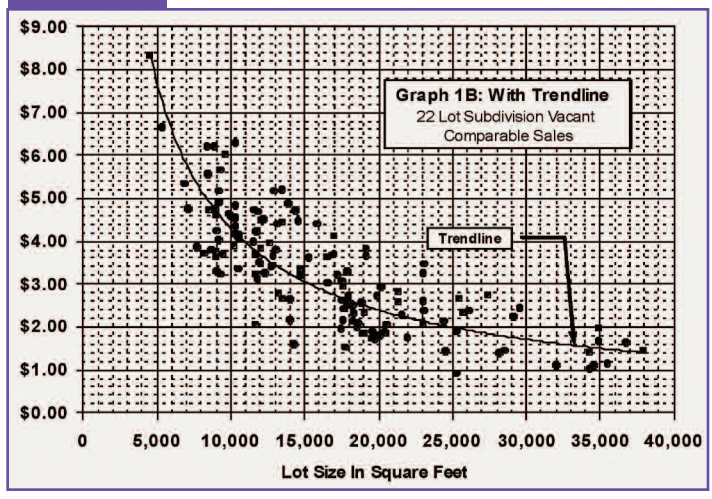
Even without a trend line, it is clear that the data points in Graph 1A have a definite pattern. This pattern suggests that, as size increases, value in relation to that size decreases and vice versa. Please keep in mind that this is a refined data set of lots very similar to the subject lots and to each other. No conscience effort was made to manipulate or to choose comparables that fit a pattern. In fact, the data was not plotted until after a thorough one-by-one analysis was made of each comparable first.

Using Graph 1B, one can estimate the value of many different sized lots that are otherwise very similar. For example: a 30,000 sq. ft. lot, whose character is typical of this data set, has a most likely value of approximately $51,000 (30,000 sq. ft. x $1.70/sq. ft.). A 20,000 sq. ft. lot's value would be approximately $48,000 (20,000 sq. ft x $2.40/sq. ft.). A 10,000 sq. ft. lot is approximately $43,000 (10,000 sq. ft. x $4.30/sq.ft.), and so on. The value difference between a 30,000 sq. ft. lot and a 20,000 sq. ft. lot is $3,000 ($51,000 less $48,000).

GRAPH 1A



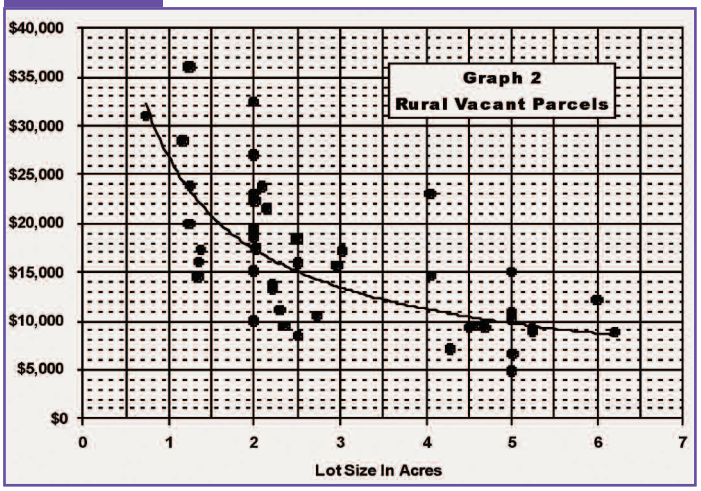
GRAPH 1B



Example 2: Rural Vacant Lots

The sales used in Graph 2 are located in a valley, which is trending in character from rural (formerly cattle grazing) to suburban. All these parcels are approximately flat to slightly sloping with similar access and utilities. Wells, septics and dirt roads are typical in this valley. The high price range of parcels measuring one to two acres are likely the result of buyer/seller knowledge and motivation issues, rather than from actual physical or character differences. Nevertheless, an overall trend is still apparent from this data set of 46 sales. As size increases, unit value decreases. This too is a refined data set of like for like.

GRAPH 2

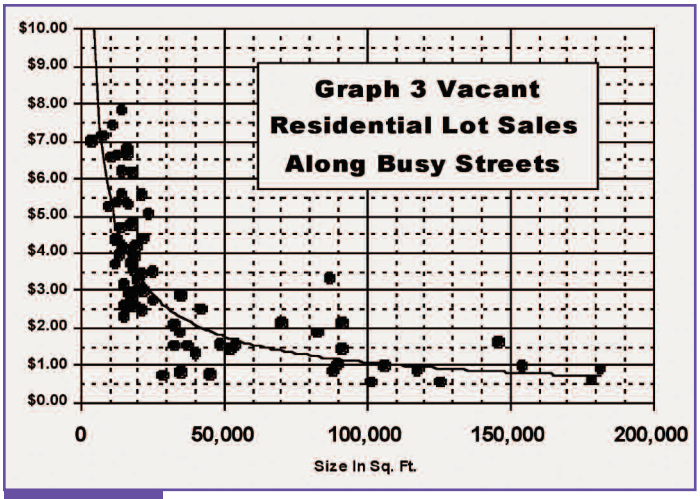


Example 3: Vacant Residential Lots For Condemnation

This data set was developed for a road expansion project and subsequent condemnation acquisition of various rights to property, including temporary construction easements, drainage easements, slope easements and fee simple pieces. No full takings were needed. Other than some landscaping elements, no significant property improvements, such as houses and garages, were impacted.

There were almost 100 parcels impacted by this project and all were residential. The roadway project was approximately two miles long. The east end had a high traffic count, dwindling to average counts at the west end. The subject area was a former naturally occurring forest of tall pines that had, over the years, become suburbanized. Still, this natural forest character was retained.

Even though only a handful of subject parcels were vacant at the time of this project, vacant land values were needed to establish the starting points for subsequent analyses of partial taking impacts. After an initial search resulting is several hundred potential sales, 71 were found useful for establishing vacant lot values for the parcels in the road expansion area. All the comparables have highly substitutable characteristics, between themselves and relative to the project impacted parcels. Their price/size relationship is shown in Graph 3.



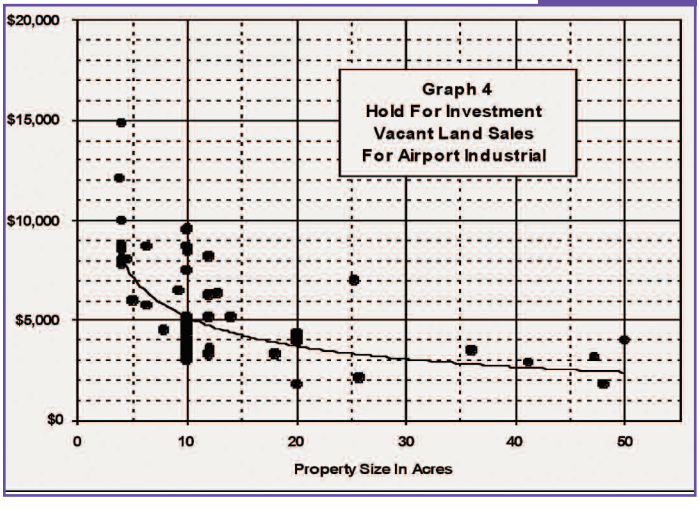
GRAPH 3

Example 4: Diverse Vacant Lands

The subject property for which this data set was developed is very unique. It is situated northwest of a local airport in an area that would naturally trend to small acreage rural residential ranchettes (if it weren't for several other important issues). It has dirt road vehicular access with no reasonable availability of utilities. In fact, legal access runs through a periodic wash that flowed heavy enough to halt ingress/egress. Near term development of the subject was not likely. Analysis was complicated by the fact that the subject was zoned industrial. Highest and best use was estimated to be "hold for investment."

Because of the subject's odd character, detailed analysis from a few best comparables with adjustments for differences was not practical. Many of the comparables were located several miles away, with some as far as 30 miles. Even so, the 61 sales used in this analysis still suggest a downward sloping value/size trend. Graph 4 shows these sales.

GRAPH 4

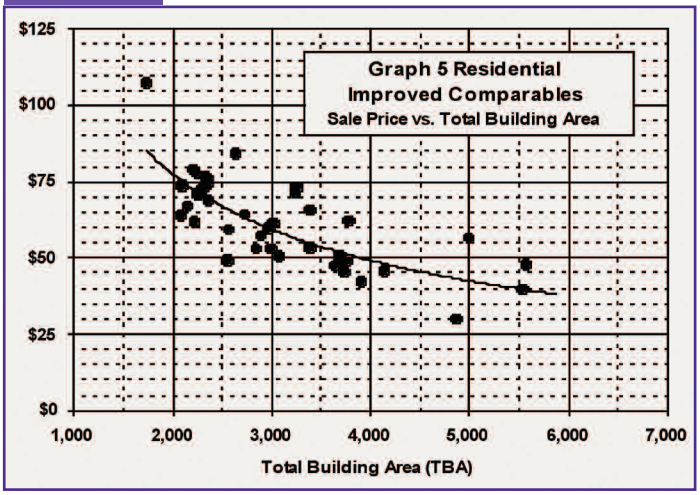


Example 5: Improved Residential Sales

An analysis was made of improved residential sales. Total sale price (land and improvements) was compared to total building area (house + garage + other significant structures), rather than total lot area.

This is a refined data set of comparable sales; all improvements are of similar age and quality and all vacant lot value equivalencies are approximately the same also. There are 38 sales included in this data set. These comparables are in an area of flat to rolling range land that has become suburbanized.

GRAPH 5



Here again there is an apparent downward sloping curvilinear relationship: as size gets larger, the unit value gets smaller and vice versa, even when many components are considered at the same time. The tightness of the data points suggests good similarity between the comparables.

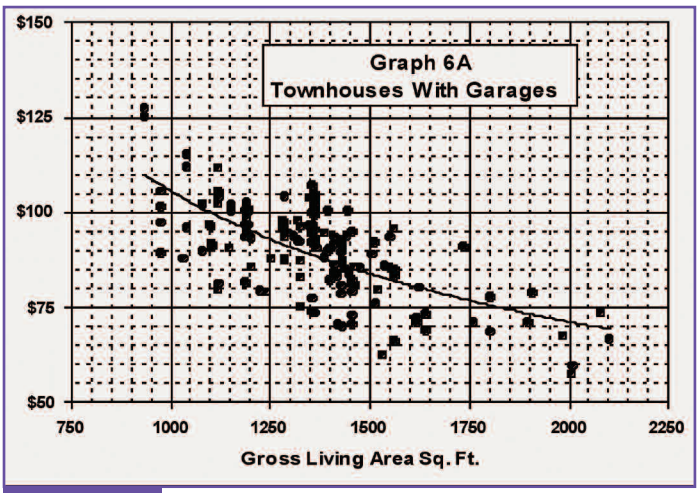
Example 6: Townhouses

Several years ago I had to evaluate the feasibility of a proposed townhouse project in a small northern Arizona community. No existing townhouses or condominiums existed within this community and, beyond it, there were only rural lands for many miles. Vacant land sales were plentiful locally. The proposed townhouse project consisted of two styles of dwelling units: some with individual garages and some with open parking.

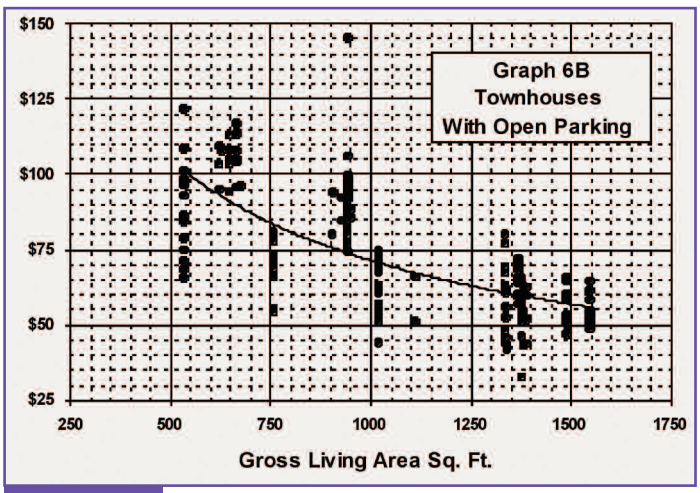
Because there were none locally, townhouse comparable sales for this analysis included those that were approximately 30 to 175 miles away. At first glance, one might ask how comparables as far away as 175 miles could reflect the local subject market adequately. However, there were several common elements that made them all useful. Driving time from metropolitan Phoenix was roughly equivalent. All comparable communities could be considered vacation or getaway areas from the hustle and bustle of the big city. All have a similar small hometown atmosphere, and all have a cool climate. All have similar community amenities, including schools, shopping, police and fire protection, employment, as well as cultural, recreational, and political activities. They were all similar comparables in similar communities. Further, I found that, as a result of doing appraisals throughout northern Arizona for many years, including this townhouse analysis, that prices are surprisingly consistent for similar properties in spite of their distance.

A total of 383 townhouse sales were used for this feasibility analysis, 178 with garages and 205 with open parking; each group was evaluated separately. This is a refined data set coming from a much larger initial search. The two graphs below show the results of comparing total sale price per square foot of living area, including amenities, to total living area.

As geographically diverse as these data sets are, the same downward sloping curvilinear relationships are still apparent; that is, as size increases, the value per square foot tends to decrease and vice versa.



GRAPH 6A



GRAPH 6B

Example 7: Other Value/Size Relationships

Up to this point, we have discussed how value varies with size and have found that this relationship tends to form a downward sloping curvilinear shape as size or quantity gets larger. But is this always true? Is the value/size relationship always a downward sloping curve, or can it sometimes be a straight line or even increase with size?

To answer these questions, let's consider the situation in the abstract. Graph 7 shows four relationship possibilities. The intersection of the lines is of no evaluative consequence here. Instead of four separate graphs, all relationship lines are shown on one graph for convenience, and each is a standalone relationship. Of course, more relationship lines could be drawn, but the ones shown should portray enough situations for an adequate understanding of how the value/size relationship normally occurs.

Line "A" is the analytical conclusion of this article and is shown here for comparative purposes. Lines "B", "C", and "D" are hypothetical and are included for discussion and elucidation.

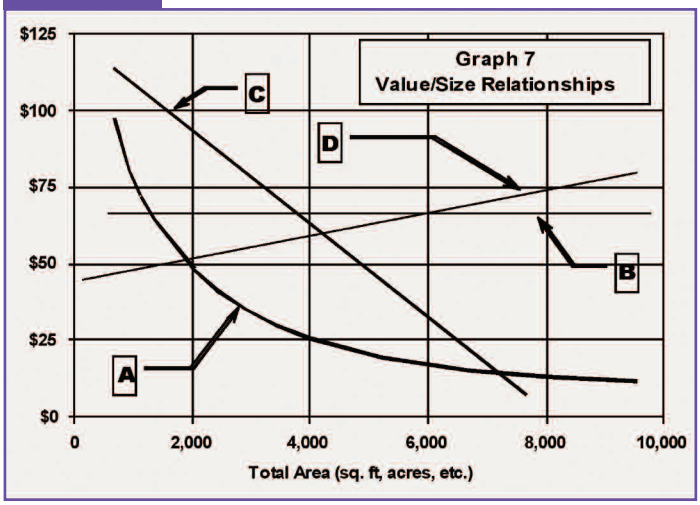
Relationship Trend - Line A: This is the typical downward sloping curve already extensively discussed in examples 1-6. It shows that, as size (or quantity) gets larger, in a normal competitive marketplace where there are many buyers and sellers and where each market participant can act freely, the price per unit tends to get smaller, approaching the horizontal axis. And as size gets smaller, the unit value tends to get larger, approaching the vertical axis. The resulting curved shape approximates a hyperbola. Of course, in the real world, this curve does not approach infinity like a true hyperbola would, but instead stops short, depending upon the reality of the situation, and it never actually intersects the vertical or horizontal axes. In this scenario, buyers are telling sellers, if you sell for less, we will buy more, and the sellers are telling the buyers, if you buy more we will sell for less.

Relationship Trend - Line B: This trend is portrayed as a flat horizontal line. Taken to extremes, it would intersect the vertical axis at approximately $65 per unit area in this example; in other words, regardless of size or quantity, the unit price would remain the same. 100 acres would sell for the same price per acre as one acre. A thousand apples wold cost the same per apple as one apple. Retail prices would equal wholesale prices. Everybody would pay the same unit price, no matter how much they might buy. Plainly, such a value/size relationship line does not exist, because it does not make sense and because it does not naturally exist. The mere fact that retailers and wholesalers exist in the real economic world suggests that a horizontal price to quantity relationship line does not exist. Would a retailer buy in quantity at one price only to sell to the consumer piecemeal for the same price? Further, the patterns represented graphically by the hard data in this article suggest curvilinear price/size trends, not straight lines. Can price be unaffected by supply or demand?

Relationship Trend - Line C: This trend is portrayed as a straight line, which declines steadily from the vertical axis to the horizontal axis and when extended, it would intersect the vertical axis at approximately $125 per unit and the horizontal axis at approximately 8,000 units. It is not logical for the trend line to intersect both axes; certainly 8,000 units would not likely be "sold" for zero dollars and certainly no one would pay $125 for nothing. This line also does not take into account sale transactions larger than 8,000 units; if a sale occurred at, say, 20,000 units, this trend line would not only be of no use, it would also be incorrect. Further, the patterns represented graphically by the hard data in this article suggest hyperbolic curvilinear price/size trends, not straight lines.

Relationship Trend - Line D: This trend is portrayed as a straight line that intersects the vertical axis at about $45. From this point, it rises steadily, with unit value increasing as size/quantity increases. Certainly there is no quantity discount here; in fact, buyers are effectively penalized for buying more. This arrangement defies logic and what normally occurs in the free enterprise market place. Buyers typically want a better deal if they buy more; the opposite is portrayed here.

GRAPH 7



The illogic of relationships B, C, and D further supports Relationship Trend - Line A as the best and most typical price to value relationship.

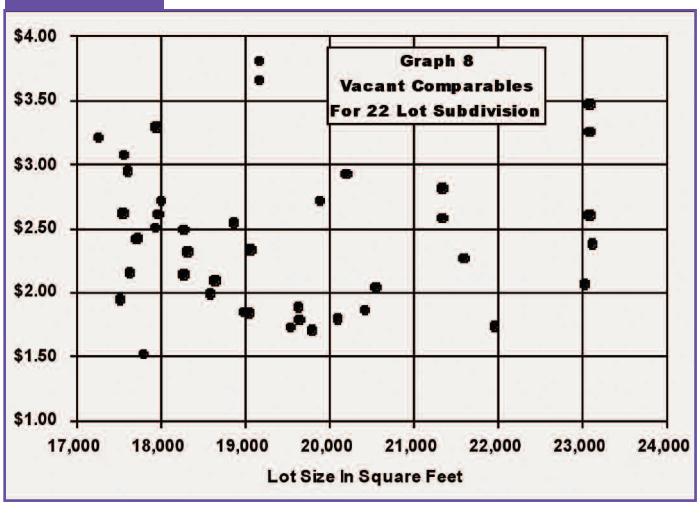
Example 8: The Uncritical Use Of Data

It is important to know how value and size relate to each other. Without this knowledge, incomplete and/or unrefined data sets can lead to misleading trend conclusions.

Graph 8 shows a portion of Graph 1A. If one looks only at the data shown on this graph, one might conclude (1) the data is too disparate and spread out to represent any central tendency, (2) the data may be gradually trending upward as size increases, (3) the trend line is wavy, and sometimes goes up and sometimes goes down, and/or (4) the sales are not similar enough to each other

to represent any trend at all. However, as can be seen from Graph 1B, there is in fact a definite trend line sloping from approximately $2.75 per square foot at 17,000 square feet to $2.05 at 24,000 square feet. Thus, with larger data sets, trends can be more easily visible.

GRAPH 8



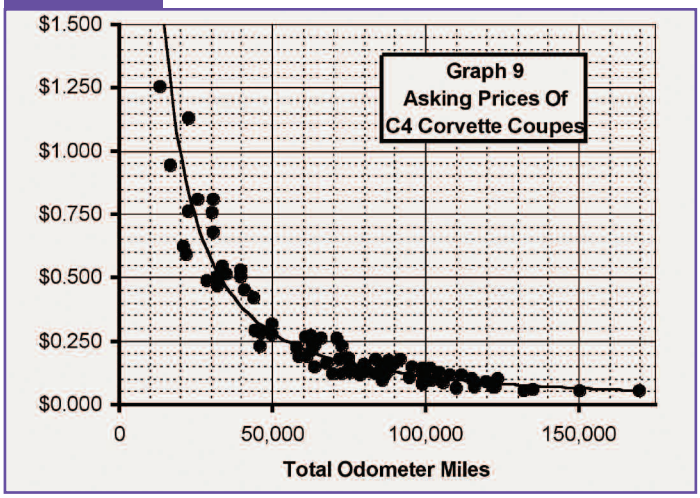
Bonus Example: Corvette Asking Prices

I have found that value can vary for reasons other than size or quantity, for example, quality or age, and that clear trend patterns will emerge when a data set is refined accordingly. To illustrate this, an analysis was made of asking prices for C4 Corvettes (those built between 1983 and 1997). Graph 9 shows this analysis.

The data for this set was taken from asking prices for C4 Corvettes from the autos for sale on Yahoo.com in November 2005. Only hardtops were included (no convertibles) within an area approximating Arizona geographic region. 89 offerings were found.

This data set was evaluated by comparing asking price per mile driven versus miles driven. Miles driven was based on the odometer reading stated in each ad. Thus, a relationship between value (asking price) and quality (miles driven) could be derived. Please keep in mind that these are asking prices, not actual sales, and that quality can vary not just with miles driven, but also maintenance, etc.

GRAPH 9



I was surprised to see such a clear and tight dot pattern when I graphed these data. In fact the pattern is so tight, it is almost as though the various sellers conspired together somehow to set prices.

As usual, the trend line represents the central tendency of the data set for any given unit of measure, in this case, odometer mileage. Thus, at 50,000 miles, for example, for a C4 Corvette in typical condition, an asking price of about $.27 per mile could be anticipated or about $13,500 total.

Summary And Conclusion

Each data set used in each example was a refined data set, that is, all the comparable sales within each are very similar in character, except for size, to each related subject property and also to each other. In no case was there a conscience effort on my part to manipulate the data sets. Let me emphasize this point: the data sets were refined in order to establish like-for-like comparisons, not manipulated to prove preconceived notions.

From the example data sets, a repetitive and consistent pattern emerged, and from these, some general inferences can be made about the price/size relationships shown in the graphs:

1. The best-fit trend lines represent the most probable price of a given data set for any given size/quantity.
2. The best-fit trend lines represent the central tendency of the data set relative to size, with approximately half the data points above the line and half below.
3. The further away a sale is from the trend line, either above or below, the less probable its occurrence will be.
4. Sales above the trend line may reflect more or better amenities/features.
5. Sales below the trend line may reflect fewer or inferior amenities/features.
6. Sales above the trend line may reflect above average buyer motivation.
7. Sales below the trend line may reflect above average seller motivation.
8. The value/size relationship is curvilinear.
9. Where the data points used do not present a clear pattern, (1) the data set has probably not been properly refined, i.e. the sales are probably not similar and or substitutable enough to each other; and/or (2) the size quantity range is not large enough (see graph 8 and associated discussion) for a pattern to be visible.
10. It is not logical for a trend line to intersect the vertical or horizontal axes. Refined data sets will curve away from the vertical and horizontal axes.