Identifying active and passive appreciation using econometric analysis
By Ashok B. Abbott, MBA, Ph.D.*

> "Marriage is among other things 'a shared enterprise or joint undertaking in the nature of a partnership to which both spouses contribute—directly and indirectly, financially and non-financially—the fruits of which are distributable at divorce.'"
> —J. Gregory, *The Law of Equitable Distribution* (1989) § 1.03 pp. 1-6.

Matrimonial attorneys representing business owners frequently need to clearly separate the total growth in value of the business during the marriage between growth attributed to efforts of spouses (active) and to external factors and market forces (passive). This issue is gaining importance as the proportion of households owning businesses keeps increasing: currently, one in six households owns and operates a closely held business;[1] one in two marriages ends in divorce;[2] and a closely held business is often the single most valuable asset in the marital estate that needs to be valued in a divorce.

Rights of non-owner/manager divorcing spouses to share in the wealth created during a marriage have been steadily expanding, as shown by the number of recent rulings handed down all over the country. These rulings generally state that increased value of separate property resulting from spousal efforts (active appreciation) becomes the property of the marital partnership, whereas increased value attributable to other sources (passive appreciation) remains separate property. As the definition of marital property subject to distribution in divorce expands, the scope of separate property becomes narrower and the burden of proof shifts to the spouse claiming separate property.

Six-step analysis for determining active and passive property

Divorce laws and their interpretations differ substantially across the states with varying degrees of emphasis on the separation of marital and non-marital portions of the value of business interests. Two important valuation issues arise when the closely held business needs to be valued in the course of a divorce action. First is to identify the separate property component of the business, and, further, to apportion the increase in business value during marriage between active and passive appreciation. The following six-step analysis is often used to identify separate property and to make a determination of the active and passive appreciation components:

(1) Whether the property, in general, is either separate or marital property;
(2) Placing a value on the non-marital property at the commencement of the action;
(3) The value of the non-marital property, before it became subject to the active and passive appreciation analysis;
(4) A calculation of the property's value at the commencement of the action, in relation to its value on the date (s) gifted or acquired;
(5) A determination as to what extent the increase in the value of the non-marital property is active appreciation or passive appreciation; and
(6) Identify the proportion of active appreciation attributable to personal efforts/contribution of the divorcing spouse.

The first four parts of this analysis are primarily an exercise in fact finding, and, valuation theories used for valuing the business at different points in time are well developed. However, the last two steps are relatively complex. One of the most troubling issues involving the active and passive appreciation doctrine is finding a viable “method” or “formula” for determining the portion of appreciation attributable to spousal efforts and the portion that results from third-party or market forces.[3]

Several cases around the country have addressed the issue of separating non-marital and marital portions of the value of a business. While the existence of passive appreciation has been recognized, in a large number of these cases, a clear and concise approach to determining the passive and active appreciation has not been defined. Appellate courts have generally tried to provide substantial flexibility and have been rather reluctant to lay down rigid guidelines. [4]

One notable exception is *Mayhew v. Mayhew*.[5] In this case, while instructing the trial court on how to proceed on remand, the appellate court provided a roadmap of the process. First, the court suggested that expert testimony identifying the reason(s) for appreciation of particular business assets would be significant. Second, the court noted that it would be helpful to compare the performance of the business to that of other similar businesses during the period of analysis. Third, the court noted that an owning spouse's contribution to appreciation may not necessarily be in proportion to the size of the owner's interest; the role(s) of other shareholders and employees in the increase in business value must also be considered.

Econometric modeling

Econometric modeling can provide significant guidance for identifying external factors and measuring their impact (passive) on the business value. A careful analysis of the industry in which the business operates can identify the external variables that are likely to impact the value of the business. Measuring the impact of those variables that are outside the control of the managers can help to quantify the proportion of appreciation that can be claimed as passive. The key lies in identifying macro economic variables that are statistically significant and applying standard statistical techniques so that the analysis is replicable and meets *Daubert* standards.

The final step in this analysis consists of identifying the individual contribution of the divorcing spouse. In a one-person show, all of the active appreciation may be attributed to the individual, but as the scale of business gets larger and more management tiers are introduced, issues of attribution become more complex. An analysis of corporate minutes, for example, may help in identifying if the divorcing owner acted as a hands-on or hands-off manager. The proportion of junior management decisions vetoed by the owner spouse would be another indication of the active influence exercised by the divorcing spouse.

Identifying and measuring external factors: Ordinary least squares (OLS)

It is very important to recognize that businesses function in their economic environment. Economic conditions outside an owner's control have significant impact on the growth and survival of the business. Determining the proportion of the increase in value of the non-marital property as active or passive, therefore, requires that two questions be answered:

(1) Which factors outside the control of the owner manager(s) of the business, if any, significantly impact the changes in value of the business?

(2) What proportion of the change in business value can be explained by these external factors outside the control of the managers?

Quantitative analysis including multivariate ordinary least squares (OLS) regression provides a valuable tool for identifying external economic factors that can explain the changes in value of the business interest. OLS has been used extensively for almost a century and is a well-established statistical tool for hypothesis testing. Such regression analysis can readily identify the significant variables affecting the value of the business and measure each variable's influence on value.

Briefly, the OLS regression procedure consists of specifying a model equation with the dependent variable (e.g., changes in value of a business) as the factor to be explained and the independent variables being the factors providing an explanation. These independent factors may include the level of economic activity, interest rates, customer demographics, regulatory changes, and other similar data. The sum of regression squares (R-square) statistic for the specified regression equation (model) measures the percentage of change in value of the dependent variable that can be explained by these external factors and therefore considered passive appreciation not subject to distribution.

Businesses offering consumer goods and services, for instance, are very sensitive to the impact of economic conditions. For example, one can use OLS regression methodology to identify the external factors explaining the changes in sales revenues for a category of business and the extent to which the variation in these sales can be attributed to the changes in these external variables (passive appreciation).

The results presented in the following section are illustrative in identifying the impact of external factors on revenues of some categories of businesses. Such analysis can be adapted for income stream, cash flows, or value of the growth for the subject business being analyzed. This analysis uses publicly available macro economic factors and retail sales data from the monthly retail trade reports prepared by the U.S. Census Bureau. [6]

Illustration of the impact of external economic factors

OLS regression methodology is used to analyze monthly data covering the retail sales activity from the U.S. Census Bureau[7] and the macroeconomic variables data from the Federal Reserve Economic data[8] . The regression results are used to identify macro economic variables significant in explaining the changes in the level of retail sales, and the percentage of passive changes in retail sales that can be explained by the changes in these external variables over which the business management would have no control.

While the impact of general economic activity captured in the level of retail sales is uniformly positive, other factors tend to differ in importance and significance for different industries. *Exhibit 1* presents the percentage of variation in sales for subject industries explained by external economic factors such as the level of retail sales, interest rates, unemployment, and prime rate of interest during 1992-2003 at the national level.

The range of explanatory power for the regression model varies between 40% for book stores to 96% for health and personal care stores. The results are statistically robust and indicate that the sales revenues for these industries are significantly impacted by external factors. These results indicate support for a large significant passive appreciation component in appreciation of such businesses during the time period 1992-2003.
One word of caution is in order. These regression results are estimated over the time period 1992-2003 using aggregate national level data. Additional, business-specific factors should be identified and regression analysis performed using national, regional, and local data, as available, for the period of analysis, to get case-specific results.

EXHIBIT 1: SALES VARIATIONS BY INDUSTRY

Industry	Adjusted R-Sq.	Rate of Unemployment	Prime rate	Monthly Inflation	Retail Excluding Industry
Health and personal care stores	96.20%	NEG	NEG	POS	POS
Pharmacies and drug stores	95.60%	NEG	NEG	POS	POS
Warehouse clubs and superstores	95.59%	NEG	NEG	NS	POS

Household appliance stores	94.01%	POS	NS	NEG	POS
Grocery stores	93.10%	NS	NS	NS	POS
Full service restaurants	92.12%	NEG	NEG	POS	POS
Furniture and home furnishings stores	90.71%	NS	NS	NEG	POS
Drinking places	86.92%	NEG	NEG	POS	POS
Used car dealers	84.87%	NEG	NEG	POS	POS
Sporting goods stores	83.41%	POS	POS	NEG	POS
Gasoline stations	82.22%	NS	NS	POS	POS
New car dealers	79.28%	NEG	NEG	POS	POS
Radio, T.V., and other elect. stores	74.36%	POS	POS	NEG	POS
Computer and software stores	69.26%	NEG	NS	NEG	POS
Discount dept. stores	67.75%	POS	POS	NEG	POS
Shoe stores	67.02%	POS	POS	NEG	POS
Women's clothing stores	55.46%	POS	POS	NEG	POS
Conventional and national chain dept stores	43.94%	POS	POS	NEG	POS
Men's clothing stores	39.96%	POS	POS	NEG	POS
Book stores	39.90%	NS	NS	NS	POS

NS= not significant

Hypothetical Illustration

A computer store was established in 1982 by John Smith with an initial investment of $100,000. The business grew and in 1987 John Smith II (JSII)joined the family business and received 5% equity in the business. Over the next five years additional annual gifts of 10% equity were made. In 1992 JS II owned 55% of the business. In 1993 JSII got married. The business was valued at $500,000 at the time of marriage. Over the next ten years the business grew in value to $5,000,000. The marriage was strained by the hard work and the time commitment that JSII had to make to the business and the couple filed for divorce in 2004. The issue in equitable distribution of the marital estate became the value of the growth in business value during the marriage. The wife claims that the entire amount of the growth in value of the 55% of stock owned at the time of marriage, from $175,000 (0.55*500,000) to $1,750,000(0.55*5,000,000) or $2,475,000 is part of the marital estate subject to equitable distribution. This essentially claims that all of the appreciation in the business is active. If the regression analysis shows that 60% of the appreciation in this particular store's case can be explained by the external economic factors, the value of the 40% active appreciation included in marital estate subject to distribution becomes $990,000. The difference in value of the required distribution between these two alternatives is $742,500.

Conclusion

Closely held businesses have been identified as the growth engine of the US economy. The need to properly identify and measure the active and passive components of the increase in value of the closely held business during the marriage is being increasingly recognized by the courts. Econometric modeling techniques can provide valuable guidance in these cases. Business valuation practitioners and parties involved in these issues will need to understand and apply these methods

*Ashok B. Abbott is Associate Professor of Finance at West Virginia University, Morgantown, West Virginia. Professor Abbott received his M.B.A. (Finance) at Virginia Polytechnic Institute and State University (VPI&SU), Blacksburg, Virginia, in 1984, followed by a Ph.D. in Finance, also at VPI&SU, in 1987. Title of his Ph.D. dissertation was “The valuation effects of tax legislation in corporate sell-offs. ” He has published extensively in scholarly and applied journals and presented his research at regional, national, and international conferences. He is a also a court-admitted expert in the valuation of businesses and is a candidate member of the American Society of Appraisers and the Institute of Business Appraisers.

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[1] Small Business Economic Indicators for 2003 www.sba.gov/advo/stats/sbei03.pdf

[2] www.cdc.gov/nchs/data/nvsr/nvsr53/nvsr53_21.pdf

[3] Deborah H. Bell, "Equitable Distribution: Implementing the Marital Partnership Theory Through the Dual Classification System," 67 Miss. L.J. 115, 147-149 (1997).

[4] One of the greatest problems with active appreciation case law nationwide is the reluctance of appellate courts to provide trial courts with guidance on resolving the difficult factual questions involved. See generally Brett R. Turner, *Equitable Distribution of Property* § 5.22 at 247-48 (2d ed. 1994).

[5] ___ W. Va. ___, 475 S.E.2d 382 (1996)

[6] http://www.census.gov/prod/www/abs/br_month.html

[7] http://www.census.gov/mrts/www/mrts.html

[8] http://www.research.stlouisfed.org/fred2