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".....change always comes bearing gifts...."
Price Prichett

APUBEF
The Association of Pennsylvania University Business and Economic Faculties

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of
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A New Initiative for Dissemination of Business and Economic Conceptions

Professional conferences as forums for the dissemination and discussion of new ideas are important. The Association of Pennsylvania University Business and Economics Faculties (APUBEF) is a nonprofit organization representing the faculties of the Pennsylvania State System of Higher Education. Each year APUBEF holds a conference and publishes the proceedings and a journal. The *Pennsylvania Journal of Business and Economics* is published in the Fall and this is its fourth issue. This editorial section will briefly describe the aim and the scope of the journal, APUBEF, and editorial policies and practices.

APUBEF has been formed for the purpose of:

(1) Fostering economic and business scholarship and fellowship among business and economic faculties in the State System of Higher Education in Pennsylvania (SSHE).

(2) Speaking publicly and objectively on behalf of the economic and business conditions in Pennsylvania and acting as a spokesperson for the condition of economic and business education in Pennsylvania.

(3) Encouraging perfect freedom of economic and business discussion.

(4) Fostering professional development of SSHE faculties, by encouraging them to engage in research and submitting papers for presentation to the annual meetings of the Association. Selected refereed papers will be published in the *Pennsylvania Journal of Business and Economics*, which will be a broad-based forum to present scholarly research and views on a variety of business and economic topics such as: human resource management, management information systems, organizational behavior, decision sciences, international management, accounting, finance, and economics. It publishes original articles relating to field research, business surveys, networks, and position articles on significant issues having recent technological advances of applied value.

High priority is given to the studies that address and emphasize the problems or issues deemed significant to Pennsylvania. Current reviews on issues concerning inflation, unemployment, taxation, economic development, technology transfer/ diffusion in other countries, cultural and societal diversity, systems, telecommunications, marketing, and case studies of scholarly research are specially welcomed. Manuscripts with a dual focus on theory and practice are highly encouraged.

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To ensure the high quality of published material, APUBEF uses its Editorial Review Board members, who are experts in their field, to review submitted manuscripts. Through blind-referred process, each manuscript is subjected to a minimum of two independent blind reviews. The reviewers evaluate manuscripts on the bases of their value-added contribution to theory development and practical needs of practitioners of business or pedagogy.

The following criteria will be used for reviewing:

a) The degree of originality;

b) The quality of analysis and logical consistency of arguments;

c) The importance of issue(s) addressed.

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Manuscripts must be written according to the guidelines of the latest edition of the *Publication Manual of the American Psychological Association*. Manuscripts that do not adhere to these guidelines will be returned for revision.

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An Application of a Mixed Formula Methods for Simulation of Enterprise's Value Estimation

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ABSTRACT

The paper explores the possibility of using mixed formula methods for estimation of an enterprise's value in the process of privatization of Polish firms. Several principal groups of valuation methods are presented. Given the substantial number of available approaches, the authors selected a synthetic mathematical formula that can be used for this purpose. A brief example of the use of the Microsoft's Excel 5.0 package for simulation of enterprise's value has also been provided. The size of annual profits of the firm, a level of a discount rate, residual value of an enterprise, and net asset value of a firm are included in this simulation.

INTRODUCTION

In the literature of the subject, popular journals and newspapers, and in the practice of business management several categories of an enterprise's value estimation can be found. Depending on the objectives of such valuation, it can include firm's assets (asset approach), enterprise's ability to generate income (income approach) or other synergistic interplay of asset and non-asset componentes to define an enterprise's value (mixed approach - asset-income). The complexity and multi faceted nature of the latter suggests a need for its wider applications in the practice of enterprise valuation in Poland. Both theoretical and practical development and growth of the above concept has led into creation of a plethora of mixed method of enterprise valuation. Especially, the countries with highly developed and refined market economies have created a rich source of firm's value assesment techniques. Due to the relatively modest experiences of Polish enterprises in the field of valuation, as well as practical application of the aforementioned methods, there is a clear need for utilization of other countries' experiences and adaptation of suitable solutions into Polish conditions.

THEORETICAL FRAMEWORK

In the literature on the valuation methods, the enterprise's value is often defined as a sum of profits that are expected to be gained by the owners over the period of the firm's existence. To include the changes in the value of the capital over time, the profits in the consecutive years are subject to discounting at the moment of valuation. This approach to the value of an enterprise in

known as an income approach. Accordingly, an enterprise's value equals (Brealey & Myers, 1991, pp.29-35; Lee, 1987, pp.95-98)[1]:

$$W = \frac{Z}{r} \qquad (1)$$

where: W - value of an enterprise,
Z - average net profit,
r - discount rate.

Taking under consideration that the firm's value includes both the value of its assets and the value of non-assets elements (known in English literature as „Goodwill", and in Poland as the „reputation value"), the formula (1) can be presented as:

$$M + G = \frac{Z}{r} \qquad (2)$$

where: M - net asset value of the firm,
G - reputation value,
- remaining components as above.

Transforming this formula we arrive at:

$$(M + G)\, r = Z \qquad (3)$$

Thus

$$M\, r + G\, r = Z \qquad (4)$$

Then it can be concluded that a yearly profit of an enterprise equals the sum of the interest rate of the assets of the firm and interest rate of its reputation's value. It also shows that the profits represent a sum of two components evolving from significantly divergent points of origin.

Therefore, it can be noted that:

$$Zm = M\, r \qquad (5)$$

and

$$Zg = G\, r \qquad (6)$$

where: Zm - profit from assets equal to ordinary interest rate on the value of assets,
Zg - profit from the value of reputation, so called annual rent on value of reputation,
- other designates as above.

Incorporating formulas (5), (6) into equation (1) and (2), the formula for valuation of the enterprise can be expressed as follows:

$$W = \frac{Zm}{r} + \frac{Zg}{r} \qquad (7)$$

From the formula (7) the value of a firm can be defined as a sum of discounted profits, equal the value of its assets ($\frac{Zm}{r}$=M) and discounted profits from the value of firm's reputation. The income method of firm's valuation assumes an infinitely long period of profit generation from both aforementioned sources. While, with certain degree of approximation, the first assumption of the above formula can be accepted (ordinary rate of return on the invested capital - based on the

[1] It is the simplest formula for income value of an enterprise based on a relative stability of yearly profits and infinitely long capacity of the firm to generate those profits (then $n \to \infty$ and therefore $\lim[\frac{Z}{r}(1-\frac{1}{(1+r)^n})] = \frac{Z}{r}$.). More expended formulas for income-based estimation utilizing to fundamental components: sum of the discounted profits from several recent years and discounted residual value (ReV), take form: $\sum_{t=1}^{n} Z_t \frac{1}{(1+r)^t} + ReV \frac{1}{(1+r)^n}$. Comp. more on the subject in: Borowiecki (Ed.), 1995, pp.89-90, 160-161.

market's interest rate), the application of the similar assumption in respect to the second part of the equation may and does raise several objections. They mainly stem from the fact that the value of the firm's reputation is influenced, for example, by the number as well as size and advancement of the productive potential of competitive enterprises on the market.

Taking under consideration the above concerns, the theory and practice of enterprise valuation has created methods incorporating profits from value of reputation for only few recent years (Helbling, 1991, pp.103-105). Then, the value of reputation takes form:

$$G = \sum_{t=1}^{n} (Z\text{-}Zm) \frac{1}{(1+r)^t} = \sum_{t=1}^{n} (Z - r\,M) \frac{1}{(1+r)^t} \qquad (8)$$

where: n - time period used for computing profits from reputation's value,
- remaining notations as above.

Utilizing the formula for the sum of n-element geometrical progression, and after suitable transformation the result is:

$$G = (Z - r\,M) \left[\frac{1}{r}\left(1 - \frac{1}{(1+r)^n}\right)\right] \qquad (9)$$

The second component of the above product which constitutes the sum of n-consecutive discount coefficients is called the coefficient of combined discount or the coefficient of value of actualized annuity (present value of ordinary annuity) at the discount rate „r" (Bowlin, Martin, & Scott, 1980, pp.96-97; Block & Hirt, 1987, pp.253-256).

If:

$$\frac{1}{r}\left(1 - \frac{1}{(1+r)^n}\right) = a_n \qquad (10)$$

the result is:

$$G = a_n\,(Z - r\,M) \qquad (11)$$

Incorporating the computed value of reputation into the formula for enterprise's value, the following appears:

$$W = M - G = M - a_n\,(Z - r\,M) \qquad (12)$$

The above presentation of the reputation's value constitutes a component of the, so called, U.E.C.-method of computing the enterprise's value, and, when completed by the asset value (notation (12)) offers in effect a total value of the firm. The U.E.C.-method, also known as „anglo-saxon", assumes the period of three to eight years as an appropriate time zone for computing a present value of the reputation's worth of an enterprise („Empfehlung," 1991, pp.533-534).

Two other methods of reputation's assessment suggest similar approaches: the Year's Purchase technique (Jahrkaufmethode) and the Stuttgart method (Stuttgarter Verfahren). The first one - frequently used in the USA - recommends supplementing the asset value of the firm by the ordinary sum of profits from reputation's value over the period of several consequent years. Then, the enterprise's worth becomes:

$$W = M + n(Z - r\,M) \qquad (13)$$

As can be seen from the formula (13), the difference between the U.E.C.-method and the above lies in ignoring of the time factor. It only takes a straight sum of non-discounted profits from the value of firm's reputation for the subsequent years, however the recommended length of the inclusion period remains unchanged.

Also the second method mentioned above, the Stuttgart method, does not require discounting of the profits from the reputation's value, and only introduces the rent from the total value of the enterprise, which is presented in the following form:

$$W = M + 5(Z - r\,W) \qquad (14)$$

Replacing:

$$Z = r\,D \qquad (15)$$

where: D - enterprise value computed via income method (in accordance with formula (1),
- the other notation as above.

Thus:

$$W = M + 5(r\,D - r\,W) = M + 5r(D - W) \quad (16)$$

The value of the firm's reputation is considered here as a specific „reputational surplus" of the enterprise's value computed by the income method (income value of the firm) over its worth according to the Stuttgart technique. Multiplying this value by the interest rate (r) gives an average annual profit on the value of reputation (Zg). It is clear then that the Stuttgart method includes the value of firm's reputation in the form of five year average annual profits (non-discounted) on the mentioned „reputational surplus". To finally compute the firm's value, the transformation of the formula (16) produces:

$$W = M + \frac{5r}{1+5r}(D - M) \quad (17)$$

These methods of firm assessment present the reputation value of an enterprise in a diversified form. Taking into consideration the comparative factor, those methods limit the length of computing profits form this part of firm's value into the period of just a few nearest years. A different approach to this problem consists of using higher discount levels for profits on reputation's value. Then, the formula (7) changes into:

$$W = \frac{Zm}{r} + \frac{Zg}{r+\Delta r} \quad (18)$$

where: Δr - magnitude of discount rate increase (for profits on reputation value),
- other notations as above.

Since:

$$Zm = r\,M \quad (19)$$

and

$$Zg = Z - r\,M \quad (20)$$

then (Jacob, 1960, p.140):

$$W = M + \frac{Z - rM}{r+\Delta r} \quad (21)$$

Obviously, the period of profits on reputation value inclusion can also be limited. According to the formulas (8) and (9):

$$W = M + (Z - r\,M)\left[\frac{1}{r+\Delta r}\left(1 - \frac{1}{(1+r+\Delta r)^n}\right)\right] \quad (22)$$

If $r+\Delta r$ is substituted by r' ($r'>r$) then, in conjunction with formulas (10) and (22), the value of an enterprise will be:

$$W = M + a'_n\,(Z - r\,M) \quad (23)$$

where: a'_n - present value of ordinary annuity at the discount rate „r'" and „n" years of allocating profits on reputation value,
- other notations as above.

When arriving at the enterprise value the methods: Stuttgart, Year's Purchase and the method allowing for discounting profits on reputation value at higher discount rate, take as a starting point basis value of the firm's assets. This value is then increased by (computed in different ways) the value of enterprise's reputation. On a top of the mentioned above methods, there are also other, which, in more direct fashion lead into assessing the value of the firm.

With this group of methods (among which are the bettter known such as the German or Swiss average value methods) belong other methods, including one depreciation allotments from the reputation value. Depending on the length of amortization of the reputation value one can distinguish between a continuous amortization technique and the method based on a well defined

write-off period. The first method deducts from the average, annual profit the sum acquired from dividing of the reputation value by the period of its amortization. Only then, this corrected profit gets discounted and summed-up. In accordance with formula (1) it shows that (Helbling, 1991, p.110; Jacob, 1960, pp.134-135):

$$W = \frac{Z - \frac{G}{m}}{r} = \frac{Z}{r} - \frac{(W - M):m}{r} \qquad (24)$$

where: m - number of years during which the value of reputation is being amortized,
- remaining notations as above.

Annual amortization of the reputation's value is caused by its perpetual „wearing-out", or a need for an extra renewal expenditures. However, after a certain period of time (equals „m" years), it will become completely depreciated, although, according to the formula (24) it will be still written-off, diminishing this way the value of the firm. To correct this evident shortcoming of the above method, a new, corrective method has been developed which allows amortization write-offs only to the moment of a final depreciation. Therefore, the sum of write-offs consists of „m" components. Applying here the present value of ordinary annuity for „m" years, the value of the enterprise can be presented as follows (Helbling, 1991, p.110; Jacob, 1960, pp.135-137):

$$W = \frac{Z}{r} - a_m \frac{W - M}{m} \qquad (25)$$

The value of the firm, according to this method (known as Gref's method, after the name of its creator) can also be computed by:

$$W = (Z - \frac{W - M}{m})a_m + \frac{Z}{r}\frac{1}{(1+r)^m} \qquad (26)$$

The first component of the formula (26) consists of a sum of discounted profits from „m" years, reduced annually by the value of the write-offs from the value of the firm's reputation. The second element constitutes the sum of profits starting from the year „m+1" discounted at the time of valuation.

The above presented review of the mixed methods of enterprise valuation became the starting point for creation of a comprehensive system for assessment of firm's value. The variety of variables (parameters of an assessment) influencing its value according to the presented methods, requires and mandates the development of specific analytical approaches which will facilitate further monitoring of the value and differentiation of business firms. This calls for even more precise unification of mathematical formulas used in the process, and even introducing one universal formula applicable to all, or at least the majority of, assessment methods.

There is a clear possibility of achieving of this challenge by using, as a starting point, the followig equation:

$$W = M + x(D - M) \qquad (27)$$

where: W - value of an enterprise,
M - net asset value of an enterprise,
D - value of an enterprise according to the income method (income value of the firm),
x - computational parameter of the equation describing the degree of incorporating by the method the value of the firm's reputation, $x \in \langle 0;1 \rangle$.

If parameter „x" takes on value:

$$x = \frac{1}{2} \qquad (28)$$

then

$$W = \frac{D + M}{2} \tag{29}$$

which corresponds to the German method.

In turn:

$$x = \frac{2}{3} \tag{30}$$

which gives:

$$W = \frac{2D + M}{3} \tag{31}$$

as presented in the Swiss method.

Also the U.E.C.-method can be transformed into the formula (27). After transformation it becomes:

$$W = M + [1 - \frac{1}{(1+r)^n}] \cdot (\frac{Z}{r} - \frac{r \cdot M}{r}) = M + (1 - \frac{1}{(1+r)^n})(D - M) \tag{32}$$

The Year's Purchase and Stuttgart methods also can be written into an universal form. Then, the descriptive formulas take on the following shape:

$$W = M + n\,r(D - M) \tag{33}$$

and

$$W = M + \frac{5r}{1 + 5r}\,(D - M) \tag{34}$$

The subsequent methods of the firm evaluation brought together into formula (27) can be presented in the following ways:

- the discounting method based on the higher discount rate:

$$W = M + \frac{r}{r'}\,(D - M) \tag{35}$$

or

$$W = M + \frac{r}{r'}(1 - \frac{1}{(1+r')^n})(D - M) \tag{36}$$

- the method of continuous write-offs from the reputation value:

$$W = M + (\frac{1}{1 + \frac{1}{r \cdot m}})(D - M) \tag{37}$$

- the Gref's method:

$$W = M + [\frac{1}{1 + \frac{1}{r \cdot m}(1 - \frac{1}{(1+r)^m})}](D - M) \tag{38}$$

CONCLUSIONS

On the basis of the synthetic formulas for assessing the firm's value, a spread-sheet analysis program was used. For this purpose the Excel 5.0 package was selected (Excel, 1993). It enables a precise simulation of changes in a firm's value not only in the form of final estimates based on an application of the various methods (presented in this article) but also via observing the influences of various variables and parameters on these estimates. Particularly the following elements were included:

- size of annual profits of an enterprise (Z),

- level of a discount rate (r),
- residual value of the enterprise (ReV),
- net asset value of an enterprise.

The attached printouts (Table 1) show one of the computations prepared for a selected firm. The limited scope of this paper allowed for a presentation of, outside of income methods (D), only three most popular (and therefore most frequently used) mixed methods of enterprise valuation: German, Swiss and U.E.C.

REFERENCES

Block, S.B., Hirt, G.A., Foundations of Financial Management, Homewood, IRWIN, 1987.

Borowiecki, R. (Ed.), Metody Wyceny Przedsiębiorstw i Przykłady Ich Zastosowania, Warszawa, TWIGGER, 1995.

Bowlin, O.D., Martin, J.D., Scott, D.F., Guide to Financial Analysis, New York, McGraw-Hill, 1980.

Brealey, R.A., Myers, S.C., Principles of Corporate Finance, New York, McGraw-Hill, 1991.

Empfehlung der U.E.C.: „Vorgehenweise von Wirtschaftspruefern bei der Bewertung ganzer Unternehmen" In C.Helbling, Unternehmensbewertung und Steuern, Duesseldorf, IdW-Verlag, 1991.

Excel (Software) 5.0, Microsoft Corp., 1993.

Helbling, C., Unternehmensbewertung und Steuern, Duesseldorf, IdW-Verlag, 1991.

Jacob, H., Die Methoden zur Ermittlung des Gesamtwertes einer Unternehmung, Zeitschrift fuer Betriebswirtschaft, Nr. 3, 1960.

Lee, T.A., Income and Value Measurement, Berkshire, Van Nostrand Reinhold (UK), 1987.

Table 1: SIMULATION OF ENTERPRISE'S VALUE ESTIMATION

	1996	1996	1997	1998	1999	ReV I	ReV II	r
NET PROFIT	290	440	510	510	570			
DISCOUNT COEFF. 1	0,86956522	0,75614367	0,65751623	0,571753	0,497177	3800,00	4892,50	0,15
DISCOUNT COEFF. 2	0,85470085	0,73051355	0,62437056	0,53365	0,456111	3352,94	4193,57	0,17
DISCOUNT COEFF. 3	0,84745763	0,71818443	0,60863087	0,515789	0,437109	3166,67	3914,00	0,18
DISCOUNT COEFF. 4	0,83333333	0,69444444	0,5787037	0,482253	0,401878	2850,00	3453,53	0,20
DISCOUNT COEFF. 5	0,81967213	0,6718624	0,55070689	0,451399	0,369999	2590,91	3090,00	0,22
DISCOUNT COEFF. 6	0,8	0,64	0,512	0,4096	0,32768	2280,00	2668,84	0,25
DCF1	252,17	332,70	335,33	291,59	283,39			
DCF2	247,86	321,43	318,43	272,16	259,98			
DCF3	245,76	316,00	310,40	263,05	249,15			
DCF4	241,67	305,56	295,14	245,95	229,07			
DCF5	237,70	295,62	280,86	230,21	210,90			
DCF6	232,00	281,60	261,12	208,90	186,78			
DISCOUNTED RESIDUAL VALUE						1889,27	2432,44	
						1529,31	1912,73	
						1384,18	1710,85	
						1145,35	1387,90	
						958,63	1143,30	
						747,11	874,46	
INCOME METHOD								
D1						3384,47	3927,83	
D2						2949,18	3332,60	
D3						2768,55	3095,22	
D4						2462,73	2705,28	
D5						2213,93	2398,60	
D6						1917,50	2044,85	
ASSET-BASED METHOD						2645,00	2645,00	
(D-M)1						739,47	1282,83	
(D-M)2						304,18	687,60	
(D-M)3						123,55	450,22	
(D-M)4						-182,27	60,28	
(D-M)5						-431,07	-246,40	
(D-M)6						-727,50	-800,15	
REPUTATION VALUE - GOODWILL								
GERMAN AVERAGE METHOD						369,73	641,32	
						152,09	343,80	
						61,77	225,11	
						-91,13	30,14	
						-215,53	-123,20	
						-383,75	-300,07	
SWISS AVERAGE METHOD						492,98	855,09	
						202,78	458,40	
						82,37	300,14	
						-121,51	40,18	
						-287,38	-164,27	
						-485,00	-400,10	
U.E.C.- METHOD						371,62	644,94	
						165,44	373,98	
						69,54	253,42	
						-109,02	36,05	
						-271,57	-155,23	
						-469,11	-403,49	
TOTAL VALUE OF AN ENTERPRISE								
GERMAN AVERAGE METHOD						3014,73	3286,32	
						2797,09	2988,80	
						2706,77	2870,11	
						2553,87	2675,14	
						2429,47	2521,80	
						2281,25	2344,93	
SWISS AVERAGE METHOD						3137,98	3500,09	
						2847,78	3103,40	
						2727,37	2945,14	
						2523,49	2685,18	
						2357,62	2480,73	
						2160,00	2244,90	
U.E.C.- METHOD						3016,62	3289,94	
						2810,44	3018,98	
						2714,54	2898,42	
						2535,98	2681,05	
						2373,43	2489,77	
						2155,89	2241,51	

A Factor Analysis of Indian Tamil Wives' Terminal and Instrumental Values Measured with a Modified Rokeach Instrument

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G. K. Ganesh
University of North Texas

ABSTRACT

This study factor analyzed RVS data, measured with a Likert scale, in a sample of Indian Tamil wives, examined the viability of the shortened RVS proposed by Munson and McQuarrie, and the interpretability of the factor structure with the full 36 item- and the shortened Munson and McQuarrie 24 item-versions of the RVS, measured on a Likert scale. The full 36-item RVS version performed better than the shortened version on a sample of foreign consumers. Although the underlying structure did not support universal factors, it did have many similarities with structures examined by other researchers.

Although researchers have found that personal values do vary within and across cultures and do influence consumer behavior (Henry 1976), work is still progressing on the search for underlying values structures and on the measurement of these values -- including the modification of existing scales common in domestic consumer research. One such scale is the two set inventory of 18 terminal and 18 instrumental values by Rokeach (1973), which Munson and Mcquarrie shortened for use with U.S. consumers (1988). Values researchers are concerned with the length and composition of the RVS (Rokeach Value Scale); the difficulty of the task facing the respondent, the apparent irrelevance of some of the values listed to the consumption context, and the substitution of rating for ranking.

Rokeach asked each respondent to rank 18 values within each set and compared the median rankings and of values across subgroups in the U.S. population as well as samples in Canada, Australia, and Israel. Although his purpose was not factor analysis, he used it to explore the structure of human values since the average intercorrelation within each set of 18 items was small (p. 43). The combined set of 36 values to 7 factors accounted for 41 percent of the variance for the U.S. sample (p. 45): immediate vs. delayed gratification, competence vs. religious morality, self-constriction vs. self-expansion, social vs. personal orientation, societal vs. family security, respect vs. love, and inner- vs. other-directed (p. 47).

During the 1980s, the Rokeach Value Scale (RVS) has been applied to U.S. subcultures, but with the substitution of a Likert scale rating instead of ranking each value (Valencia 1989) or with a reduction in the number of values (Munson and McQuarrie 1988) to simplify the research task for the respondent. Munson and McQuarrie (1988) shortened the RVS from 36 to 24 to focus on values that influence consumer behavior instead of all behavior. Others have developed alternative inventories of values (Mitchell 1983), or have sought the underlying structure of values through factor analysis, whether with some form of the RVS or other inventories (e.g., Hofstede 1983, Braithwaite and Law 1985, Bond 1988).

Some work cross-culturally to find a universal structure to values (e.g., Hofstede 1983, Schwartz and Bilsky 1987, Bond 1988). After expanding the RVS to include 4 more values, Bond found 4 factors explaining 25.2% of the variance: competence versus security, personal morality versus success, social reliability versus beauty, and political harmony versus person sociability (pp. 1012-1013).

Braithwaite and Law (1985) expanded the RVS inventory, added multiple measures, modified the rating scale, and, identified these factors: international harmony and equality, national strength and order, personal growth and inner harmony, physical well-being, secure and satisfying interpersonal relationships, social standing, social stimulation, traditional religiosity, religious commitment, positive orientation toward others, competence and effectiveness, propriety in dress and manners, assertiveness, and getting ahead (p. 262).

Schwartz and Bilsky (1987) used the RVS to examine the underlying structure of values within 8 domains with Israeli and German samples: security domain (RVS items are inner harmony, family security, national security, world at peace); achievement domain (RVS items are capable, ambitious, social recognition); self-direction domain (RVS items are imaginative, independent, intellectual, and logical); restrictive-conformity domain (RVS items are obedient, polite, clean, and self-controlled); prosocial domain (helpful, forgiving, loving, and equality); social power domain (no direct item from RVS, but social recognition indirectly); and the maturity domain (RVS items are wisdom, broadminded, mature love, world of beauty, and courageous).

This study will factor analyze RVS data, measured with a Likert type scale, on an homogeneous sample of foreign consumers, Indian Tamil wives. In addition, this study will examine the cross-cultural viability of the shortened RVS proposed by Munson and McQuarrie (1988) for use with U.S. consumers. This study will also examine the interpretability of the factor structure with the full 36 item- and the shortened 24 item-versions of the RVS and the performance of the two values sets separately and (18 and 18 versus 13 and 11).

Two hundred Indian Tamil wives were interviewed by mail in Tamil Nadu with the snowball technique of eliciting names from relatives in U.S. Tamil families. Although not a probability sample, the group's cohesiveness in marital state and in gender will more clearly focus on shared perceptions instead of on demographic differences. One hundred forty seven respondents answered all 36 RVS questions. There is an upscale bias in the educational level, occupational types, and income groups for these households. Over half of the husbands and wives have graduated from college and over half of the husbands have professional, technical, managerial, or administrative jobs. Over one-third of the households earn more than 8K rupees (1 rupee = 1/30 US $ at the time of the study). The families are also very likely to have at least one child at home (87.8%), and their living arrangements frequently include others--including relatives and domestic servants. If anything, these characteristics would be likely to heighten the already strong Asian cultures' importance of group orientation versus individual orientation. These common characteristics would, however, also heighten the percent of common variance explained.

Table 1 presents the rotated factor solutions with all 36 values combined. Values which Munson and McQuarrie (1988) dropped from their shortened instrument are underlined. The five most highly rated terminal values are: family security, happiness, peace, self respect, and wisdom. The five most highly rated instrumental values are: honest, loving, polite, responsible, and self-controlled.

In the full aggregated analysis, there are 10 factors explaining 65.4% of the variance. When the 36 value set is disaggregated, performance is about the same. For the 18 terminal values alone, 6 factors explained 63.2% of the variance. For the 18 instrumental values alone, 4 factors explained 58.4%. Although there were 6 factors explaining 58.2% of the variance in the shortened, aggregated terminal and instrumental values set, no varimax rotation could be found to reduce the number of split loadings. In the disaggregated, shortened factor solution, for the 13 terminal values alone, 3 factors explained only 50.9% of the variance. For the 11 instrumental values alone, 3 factors explained 59.6%. The best solution is the full, combined 36-item scale, presented below. The factors do not line up exactly with other research, but some similarities exit.

TABLE 1
ROTATED FACTOR SOLUTION--FULL RVS, ALL 36 VALUES COMBINED

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
Independent	.75	.09	.05	.07	.05	.06	-.04	.08	.12	.17
Logical	.69	.07	-.01	-.11	.17	.16	.04	.18	.00	-.07
Intellectual	.68	.15	.27	.02	-.01	.08	.01	.01	.04	-.26
Imaginative	.67	.09	-.01	.27	.08	.24	.26	-.09	.14	-.11
Capable	.67	.20	.18	.12	.07	.06	.17	.01	-.15	.29
Courageous	.56	.08	.36	.08	.06	.11	.25	-.06	.17	.19
Friendship	.44	.28	.06	.29	.32	-.05	-.04	.26	-.05	-.11
Broad-Minded	.42	.26	.19	-.29	.12	.29	.07	.23	-.00	.03
Polite	.06	.77	.10	.18	.03	.08	.19	.11	-.01	-.10
Obedient	.06	.73	.18	.18	.03	.03	.13	.11	.11	-.01
Self-Controlled	.31	.67	.06	.00	.05	.07	.14	-.02	-.04	.37
Responsible	.38	.59	.10	-.08	.27	.03	-.01	.01	.07	.18
Loving	.06	.49	.06	.31	.41	-.07	.26	.31	-.08	-.17
National Security	.00	.19	.68	-.00	.29	.08	-.07	.05	.00	.20
Equality	.31	.21	.66	-.00	.18	.14	-.05	.16	.06	-.16
Beauty	.19	.03	.65	.31	.04	.10	.26	.08	.08	-.06
Pleasure	.03	.12	.09	.77	.02	.01	.01	.04	.11	.09
Social Recognition	.08	.19	.05	.60	-.02	.38	-.16	.18	.01	-.07
Self Respect	.30	.01	.31	.31	.09	.25	-.05	.25	-.02	.31
Happiness	.05	.20	.04	.14	.70	.04	.14	.33	.14	.02
Mature Love	.02	.02	.48	.07	.66	.00	.07	-.22	.00	-.10
Inner Harmony	.23	.01	.12	-.13	.59	.09	.21	.10	.14	.03
Freedom	.25	-.09	.25	.09	.51	.23	-.31	.15	.00	.15
Accomplishment	.32	.15	.13	-.11	.01	.71	.11	.06	-.02	.04
Exciting Life	.34	-.02	.13	.25	.06	.63	.08	-.17	-.00	-.21
Comfortable Life	-.05	.02	.03	.39	.16	.61	.04	.06	.18	.16
Forgiving	.19	.26	.14	-.04	.11	.07	.68	.12	.21	-.03
Helpful	.24	.42	.00	-.01	.15	.15	.63	.05	.03	.02
Cheerful	.21	.12	-.02	.41	.21	.21	.44	.17	-.22	.17
Ambitious	.27	.43	.02	.14	.00	.28	-.43	.09	.31	-.07
Family Security	-.04	.07	.02	.22	.18	.05	.04	.75	-.10	.02
Peace	.23	.25	.46	-.08	-.01	-.00	.06	.54	.14	.15
Honest	.25	.10	.32	-.01	.10	-.02	.09	.53	.30	-.08
Salvation	.09	.05	.09	.12	.14	.06	.08	.03	.84	.03
Clean	.10	.25	.08	.39	.07	.00	.13	-.01	.19	.52
Wisdom	.41	.18	.10	.06	.15	.06	.20	-.05	.22.	-43
% of Variance Explained	26.7	6.7	6.0	5.6	4.3	3.7	3.5	3.1	3.0	2.8
= 65.4										

Factor one, competence/self-direction (independent, logical, intellectual, imaginative, capable, courageous, friendship, broad-minded, and wisdom), includes the values receiving high positive loadings for Bond's factor labeled competence (intellectual, independent, capable, logical, and imaginative) and those receiving high positive loadings for Rokeach's factor also labeled competence (logical, imaginative, intellectual, and independent). However, it also includes the values receiving high loadings for Rokeach on self-expansion (broad-minded and capable). Competence may be perceived as a

continuous process of personal development. There is also some similarity with Schwartz and Bilsky's self-direction domain, but very little similarity with Braithwaite and Law's Goal and Social Values Inventory or with their Mode Values Inventory.

Factor two, group orientation (polite, obedient, self-controlled, responsible, loving, helpful, and ambitious), shares most of the values receiving high positive loadings for Rokeach's factor labeled self-constriction (obedient, polite, and self-controlled), and all of the values receiving high positive loadings for Bond's factor labeled social reliability (responsible, polite, self-controlled, obedient), but it also includes being loving, helpful and ambitious. It overlaps with items in both the restrictive conformity and prosocial domains for Schwartz and Bilsky. For Braithwaite and Law, it is closest to their modes value inventory factor--a positive orientation to others.

Factor three, harmony/security (national security, equality, beauty, mature love, peace), shares most of the high positive loadings on Rokeach's social orientation factor (peace, national security, equality, and freedom) and some on his societal security factor (beauty, equality, helpful, imaginative), as well as some of Bond's political harmony factor (equality, peace, social justice). In this sample, some of the responses to security appear to be included with the drive to achieve it. It overlaps parts of the security and prosocial domains for Schwartz and Bilsky. It is closest to Braithwaite and Law's factors of international harmony and equality and of national strength and order.

Factor four, pleasure in being/enjoyment (pleasure, social recognition, cheerful), does not equate with any factor in either of the solutions by Rokeach or Bond. Perhaps this is a distinctive dimension in the Tamil environment. It is like Schwartz and Bilsky's domains of enjoyment and achievement.

Factor five, love (loving, happiness, mature love, inner harmony, and freedom), includes Bond's love factor (mature love, loving), but does not equate well with Rokeach's factors. It overlaps with parts of several domains of Schwartz and Bilsky's--maturity, self direction, enjoyment, and security. It has some items of Braithwaite and Law's factor on positive orientation to others.

Factor six, immediate gratification (accomplishment, exciting life, comfortable life), partly equates to Rokeach's immediate gratification factor (comfortable life, pleasure, clean, exciting life), but does not equate to any of Bond's factors. Again, it shares parts of several of Schwartz and Bilsky's domains--self direction, achievement, and enjoyment. It is like social stimulation and individual rights factors for Braithwaite and Law.

Factor seven, empathy (forgiving, helpful, cheerful, and the opposite of ambitious), shares some of Rokeach's religious morality factor (forgiving, salvation, helpful, clean), and some of Bond's personal morality factor (forgiving, helpful, honest, courageous). It shares items with Schwartz and Bilsky's prosocial and enjoyment domains, but is closest to Braithwaite and Law's factor of positive orientation to others.

Factor eight, family security, (family security, peace, honesty), is similar to Rokeach's security factor (family security, peace), but does not equate well to any of Bond's factors. It blends the security and prosocial domains of Schwartz and Bilsky and is closest to Braithwaite and Law's factors of honesty and international harmony and equality.

Factor nine, salvation (salvation), is part of Rokeach's religious morality factor (forgiving, salvation, helpful, clean) but does not equate to any of Bond's factors.

Salvation/belief in God loads on the prosocial factor for Schwartz and Bilsky and is part of Braithwaite and Law's traditional religiosity.

Factor ten, spiritual development (clean, wisdom), is part of Bond's personal sociability factor (cheerful, clean, loving), and a small part of Rokeach's immediate vs. delayed gratification factor. It is split in two of Schwartz and Bilsky's domains--restrictive conformity and maturity. Braithwaite and Law splits it into personal growth/inner harmony and propriety factors.

Clearly, there is still room for further exploration of the underlying structure of values, as well as the composition and scaling of the inventories of values themselves. Because of the lack of comparability in the composition of scales, it is difficult to assess similarities or differences. Although the underlying structure did not support a universal set of factors, it did have many similarities with the structures examined by other researchers.

REFERENCES

Bond, M. H. (1988). Finding universal dimensions of individual variation and multicultural studies of values: The Rokeach and Chinese value surveys. Journal of Personality and Social Psychology, 55, 1009-1015.

Braithwaite, V. A., & Law, H. G. (1985). Structure of human values: Testing the adequacy of the Rokeach value survey. Journal of Personality and Social Psychology, 49, 250-263.

Henry, W. (1976). Cultural values do correlate with consumer behavior. Journal of Marketing Research, 13, 121-127.

Hofstede, G. (1984). Culture's consequences: International differences in work-related values (abridged edition). Beverly Hills, CA: Sage Publications.

Mitchell, A. (1983). The nine American lifestyles. New York: Warner.

Munson, J. M., & McQuarrie, E. (1988). Shortening the Rokeach value survey for use in consumer research. Advances in Consumer Research, 15, 381-386.

Rokeach, M. (1973). The nature of human values. New York: Free Press.

Schwartz, S. H., & Bilsky, W. (1987). Toward a universal psychological structure of human values. Journal of Personality and Social Psychology, 53, 550-562.

Valencia, H. (1989). Hispanic values and subcultural research. Journal of the Academy of Marketing Science, 17, 23-28.

Price Liberalization of Necessary Goods After Transition in Central and East European Countries

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ABSTRACT

Price liberalization of necessary goods should be a long-run policy target, and eligible households must be subsidized as along as supplies have not responded to market demand or when there is a downward pressure on real income. A social emergency program and systemization of coverage are also required in order to shelter the less fortunate members of the society from the inevitable rigor of the adjustment to marketization. A radical acceleration of reform toward a market economy is neither a solution for unsuccessful pre-reform conditions nor a prescription for future successful transformation when the preconditions for marketization do not exist.

INTRODUCTION

Administrative prices keep commodities out of normal distribution channels. They produce disequilibrium and a distorted economy. Many goods were underpriced in the former socialist countries. Underpricing caused rationing, and so collecting bribes from the rationed firms became common among the ministries. In some cases, the ministries created shortages by setting prices to maximize the value of bribes (Shleifer and Vishny, 1992). Basic and necessary goods, such as milk and bread, were usually sold at a loss (i.e., goods were subsidized and had negative turnover taxes) for ideological and political reasons, while luxuries were considered less important and were not only hard to come by, but also relatively expensive because of high taxes. For instance, in former Czechoslovakia, there were a total of 1,400 possible tax rates on goods ranging from -291 percent to +88 percent (Myant, 1993). Subsidies and taxes influences households' and enterprises' behaviors, and generated micro-levels of disequilibrium in the market both for necessities and for luxury goods, creating excess demand for the former and excess supply for the latter commodities. Pressures for subsidies are stronger before transition, and they are one crucial element of budget softness. The bulk of expenditure in a centrally planned economy was linked to subsidies provided to inefficient state-owned enterprises (SOEs) and to heavy subsidies to support the real income of entire population, although the real incidence of the subsidies to SOEs is often overestimated.

PRICE LIBERALIZATION AND INFLATION

To begin planning to soften the effects of marketization, government planners should distinguish between the one-off jump in absolute and relative prices that would occur as a result of price liberalization; and the massive relative price shock that would bring structural adjustment and reallocation of resources. They should realize that increases in relative prices can be caused by several factors: (a) price liberalization and elimination or sharp reduction of subsidies; (b) failure of supply reactions to

marketization or market liberalization; (c) adjustment problems accompanying political and economic reform; and (d) a unification of exchange rates and devaluation of currency. When relative prices are liberalized and the macroeconomic environment is stabilized, the private sector will succeed, leaving only the memory of social control planning (Sachs, 1992).

Domestic retail prices in shortage economies have little relation to natural prices in market or mixed economies. Since most of the countries in question were subject to a highly controlled internal pricing system without a substantial reaction to any exogenous shocks, aggregate measures of inflation are neither accurate nor informative of internal imbalances in the economy. The officially reported inflation rates before transition in the former Soviet Union (FSU) and Central and East European Countries (CEECs) understated true rates because the index had been heavily weighted toward basic necessities whose prices were directly administered by the government. In the 1990s, CEECs have been faced with galloping inflation and shrinking economies which are rooted in the countries' past economic and political institutions (See Table 1). The history of price formation, monetizing deficits, incompetent macroeconomic management, unconstrained monetary policy, economic and political institutions, hidden inflation, levels of excess demand in consumer goods, and wage-price inflexibilities in the past are among the reasons for the present inflation rate in CEECs. Furthermore, in most of these countries "hidden" inflation prevailed in its obscured form -- rationing of essential consumer goods, more expensive substitutes, empty store shelves, longer lines, bribes, deteriorating product quality, and so on.

TABLE 1. Inflation Rates in Eastern Europe 1989-94

COUNTRY	1989	1990	1991	1992	1993	1994
Bulgaria	6	26	334	83	129	
Czech Republic	1	10	58	11	10.9	10.7
Hungary	17	28	35	23	17	19.5
Poland	251	586	70	43	34.3	36.1
Romania	1	4	161	210	81	
Former USSR	2	5	91	1408	699.7	203.7

Sources: Economic Outlook, 1992, OECD, Paris, table 19, p. 25. The Economists, October 16, 1993, p. 123, and March 19, 1994, p. 130, December 16, 1994, p. 128.

Formal and informal rations could be eliminated after transition and price liberalization. However, if suppliers do have monopoly power after transition, unconstrained pricing and lack of competition would permit producers to attain monopoly rents of marked-up pricing. This occurred in Poland after the "Big Bang" in January, 1990 (Frydman, Willisz and Kolodko, 1990, and Koford, Miller and Collander, 1993). While monopoly pricing may have been prominent in

the past, it would fade gradually in the passage of time as a result of greater elasticity of supply.[1]

Reduction in real wages as the result of price increase (i.e., "post-price shock") and nominal wage bill ceilings or a lack of income policy will cause income redistribution, burdening some individuals and preventing them from obtaining certain basic necessities.[2] The governments might be forced to partially compensate for the scheduled price increase through wage increases as disbursements for unemployment benefits grow. It is politically difficult to resist offsetting the distributional impact of price decontrols which hit low income groups hardest. In general, any shock therapy (e.g. abolishing price controls) will result in a decline in real wages, especially for the lowest income groups, including pensioners.

Price liberalization is consistent with theoretical logic and with the features of classical economy, but its implementation encounters many difficulties. When advocates of privatization argue for price liberalization in CEECs, they refer to adoption of market prices, elimination of complete subsidies and lifting of tariffs and barriers to international trade. The immediate aftermath of such macroeconomic changes is soaring prices and falling real incomes. Advocates should argue for gradual price adjustment rather than adoption of world prices, because following the reform there will be a reduction in the production of many goods, in particular goods with more inelastic demand curves, i.e. "necessities."[3] The production of goods with elastic demands, i.e. "luxuries," will not fall as much as necessities, and may even rise (Schnytzer and Weiss, 1992). Complete or total price liberalization and rationalization, elimination of subsidies and adoption of world prices for necessities should be long-run goals. For instance, in the Czech Republic, by policy design, the prices of many goods and services (communications, energy, heating, public transportation, rents, etc.) are still tightly controlled by the government.

1994
10.7
19.5
36.1
203.7

SUBSIDIES AS A PUBLIC POLICY

The combination of price liberalization and income policies has led to sharp falls in real wages in all CEECs. Not only will this adversely affect households' incomes, but it will lead to pressures on government to provide explicit or implicit subsidies either to consumers or producers. If the consumers are not subsidized, the large price increase would prevent many households from obtaining basic products. In this regard, the result of informal rationing (i.e. demand-side congestion) and price liberalization (supply-side reduction) are the same. In both cases, some people end up below the optimal level of basic necessities. Reduction in consumer surplus and standard of living would continue, unless supply plays a more active role in the long-run.

Explicit or direct subsidy to the consumer is preferred to an implicit or an indirect one because producers might inflate average costs of production as the result of imperfect monitoring. Thus, as a public policy, the government in the market period or short-run should either temporarily subsidize eligible citizens for consumption of necessary goods or regulate the industries. Price liberalization necessitates the creation of a realistic poverty line in order to bring working poor families' real income up to the

benchmark level. The cash or in kind benefit should (a) go to those who are eligible and whose incomes and asset levels are below the minimum amounts that are set by the government, (b) be timely, accurate and not subject to abuse, and (c) be administered as efficiently as possible subject to (a) and (b) targets (Barr, 1993). Marginalists prefer cash subsidies to price-distorting subsidies, because the latter encourage recipients to consume beyond the point where marginal social benefit equals to marginal social cost. Furthermore, depending on the family's situation, a cash subsidy may be preferable to a price distorting subsidy, providing more choices and satisfaction. However, from the public policy perspective, income is not a satisfactory index of well-being, nor does it reflect the incidence of poverty among different groups of the population (Palmer, et.al., 1988).

SUMMARY AND CONCLUSIONS

While price fixing and central planning led to a vast distortion in the economy, "wild capitalism" and runaway inflation could lead to expressive distortions as well (Alexeev, Gaddy and Leitzel, 1992). Price liberalization of necessary goods should proceed slowly because the socio-economic and political structures in some CEECs are not yet conducive to radical reform schemes. The pace and implementation of meaningful reform depend on the laws, institutions and infrastructure of a market economy. Further, reform requires economic agents with a sense of business culture, and this is a time-consuming learning process. Price liberalization of basic goods should be a long-run policy target, and eligible households must be subsidized as long as supplies have not responded to market demand or when there is a downward pressure on real income. Subsidies could be neither pervasive nor permanent because financial resources are extraordinarily limited. The three main components of economic transition, privatization, liberalization and stabilization, impose financial restrictions on economic agents through tough fiscal and monetary policies.

END NOTES

[1]For instance, in Poland, the evidence for monopolistic price setting behavior is rather weak, while there are domestic semi-monopolistic producers in the Czech Republic (Schaffer, 1992, PlanEcon Report, February 10, 1994).

[2]For instance, in Bulgaria the real wage in 1991 was 34 percent below the end of the 1990 level and in 1993 the real wage in Bulgaria and Romania declined 9.5 (almost three times as fast as the GDP drop) and 12.7 percent respectively (despite a one percent rise in GDP) (Bogetic and Fox, 1993, PlanEcon Report, February 10, 1994). However, analyzing changes in real wages during transition is problematic because of the lack of accurate data and underestimation of actual wages.

[3]There are some who argue that partial reforms are useless and that price liberalization should take the form of a big bang, with all prices being freed at the same time (Murphy, Shleifer and Vishny, 1992 and Goves, et.al., 1994).

REFERENCES

Alexeev, M., Clifford, G., Gaddy, C. and Leitzel, J., "Economics in the Former Soviet Union," Journal of Economic Perspectives, 6(2), 1992, 137-148.

Barr, N., "Income Transfers in Russia: Problems and Some Policy Directions," The Economics of Transition, 1(3), 1993, 317-344.

Bogetic, Z., and Fox, L., "Incomes Policy During Stabilization: A Review and Lessons from Bulgaria and Romania," Comparative Economic Studies, 35(1), 1993, 39-43.

Frydman, R., Wellisz, S., and Kolodko, G., "Stabilization in Poland: A Progress Report," Columbia University, Department of Economics, Discussion Paper, 481, May, 1990.

Grove, T., Hong, Y., McMillian, J., and Naughton, B., "Autonomy and Incentives in Chinese State Enterprises," The Quarterly Journal of Economics, 109(1), 1994, 183-209.

Haririan, M., "State-Owned Enterprises in a Mixed Economy: Micro Versus Macro Economic Objectives," Westview Press, 1989.

Koford, K. J., Miller, J.B., and Collander, D.C., "Application of Market Anti-Inflation Plans in the Transition to a Market Economy," Eastern Economic Journal, 19(3), 1993, 379-393.

Kolodko. G. W., and Rutkowski, M., "The Problem of Transition from a Socialist to a Free Market Economy: The Case of Poland," The Journal of Social, Political and Economic Studies, 16, 1991, 159-179.

Murphy, K. M., Shleifer, A., and Vishny, R. W. "The Transition to a Market Economy: Pitfalls of Partial Reform," The Quarterly Journal of Economics, August, 1992, 889-906.

Myant, M., "Transforming Socialist Economies: The Case of Poland and Czechoslovakia," 1993, Edward Elgar Publishing Company, Vermont.

OECD, Economic Outlook, Paris, December, 1992.

Palmer, J., Smeeding, T. M., and Jencks, C., "The Limits of Income Comparison," In Palmer, J., Smeeding, T., and Torrey, Barbara B., "The Vulnerable," The Urban Institute Press, Washington, D.C.

PlanEcon Report, "Economic Recovery in the East," 9(49,50,51,52), February, 1994.

Sachs, J., "The Economic Transformation of Eastern Europe: The Case of Poland," Economics of Planning, 25, 1992, 5-20.

Schaffer, M. E., "The Polish State Owned Enterprise Sector and the Recession in 1990," Center for Economic Performance, London School of Economics, Working Paper 191, February, 1992.

Shleifer, A., and Vishny, R. W., "Pervasive Shortages Under Socialism," Rand Journal of Economic, 9, 1992.

Schnytzer, A., and Weiss, A., "The Failure of Supply Repose in Transition: A Market-Based Explanation," Economic Systems, 16(2), 189-203, 1992.

The World Bank, "EBRD Evaluates Transition Performance: Some Countries Leap Forward," Transition, 5(8), October, 1994, 11-12.

Systems Contracting, JIT, and Cost Accounting

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ABSTRACT

This paper demonstrates that the inventory control philosophy of Just-in-Time (JIT) has great power when applied to eliminating waste throughout an organization. The paper shows that the use of JIT as a global technique to eliminate waste was foreshadowed by the Systems Contracting Technique developed by Bolton in 1966. The authors conclude that an organization's management must involve employees in decision making to eliminate waste.

Just-in-Time (JIT) has historically been viewed as an inventory control technique which attempts to minimize the amount of inventory on hand in the production cycle. The lowering of inventory levels leads to minimization of total costs and to increased flexibility of the production facility.

There are two overriding JIT objectives:

1) To eliminate waste (unnecessary activities).
2) To involve employees in eliminating waste.

The objectives are simple and easily understood and generally thought to be applicable to the production facility. We would argue that the principles of JIT, however, have more universal benefits beyond the factory floor. This contention is an outgrowth of the historical development of JIT concepts. An interested reader may survey our references for a partial development of the JIT philosophy in the literature.

Bolton (1986) introduced the concept of Systems Contracting (a forerunner of JIT) which he defined as:

> . . . a simplified system that describes a method of procurement . . . designed to assist the buyer and seller to improve the reordering of repetitive-use materials or services with an absolute minimum of administrative expense and with maintenance of adequate business controls. The objective of systems contracting is to simplify reordering procedures and contribute to corporate profits . . . it must be emphasized that it is the end cost or value of the buy that is important . . .

Bolton discussed how to buy maintenance-repair-operating supplies by letting those who needed the item requisition it under a contractual arrangement negotiated by Purchasing. This lead to a simplified system which eliminated wasteful activities.

What Bolton understood was that if an organization eliminates waste on the factory floor but does not eliminate waste in the office, or in its procedures, it is not going to be able to be fully effective. Waste, in this context, may be defined as any unnecessary activity performed by employees, particularly indirect employees. It is information flow which is confused and nonlinear. It is having the wrong person do the right thing. It is bogging

down in unnecessary detail. Bolton's Systems Contracting was a forerunner of JIT in that it proposed the systematic elimination of waste in procurement procedures.

One of the authors of this article did negotiate many System Contracts during the early 1970's when he worked as a Buyer. He used his Systems Contracting experience to develop what we would view today as a JIT response to a particular acquisition problem. The case is as follows:

The author was working for a well known New England manufacturer of firearms as a buyer of Maintenance, Repair, and Operating Supplies (MRO). One of his responsibilities was to place orders for the Machine Tool Repair Shop (MTRS) which was charged with repairing all operating machine tools. As one can imagine, to the MTRS, speed in acquiring needed supplies was critical to maintaining material flow through the shop.

One day the Buyer was asked by the Purchasing Manager to respond to a complaint that requisitions from the MTRS were taking two weeks to be placed with a vendor. The Buyer readily agreed this was the case due to the sheer volume of MRO requisitions for which the Buyer was responsible. The Buyer did agree to meet with the MTRS Foreman to determine what could be done to alleviate the problem.

During the visit with the foreman, the Buyer determined the following. First, the foreman was spending a considerable amount of time in contacting suppliers to determine the exact tool needed to repair a machine tool. Second, in the foreman's contacts with the suppliers (which were highly technical and beyond the Buyer's expertise) he established price and availability of the required items. Third, the foreman then sent a purchase requisition to the Buyer who, as previously mentioned, placed the order in an untimely fashion due to the sheer volume of requisition's received. Because the tools requisitioned were specialty tools, the Buyer rarely, if ever, changed the supplier specified. Fourth, all tools needed were charged against the MTRS budget over which the Buyer had neither control or responsibility. And, fifth, the company had a policy that Buyers were to sign every purchase order placed by the company - an attempt to insure that honest purchasing practices were maintained.

Consequently, the Buyer determined that he was the stumbling block to getting the required tools in a timely fashion. He decided to analyze the situation utilizing Systems Contracting principles he had applied in earlier negotiations. The buyer asked and answered this series of questions:

Q: Who needed what?
A: The MTRS needed specialty tools.
Q: When did they need it?
A: As soon as possible.
Q: What was causing the delay for MTRS?
A: Purchasing's workload.
Q: What value did MTRS add to the process?
A: MTRS identified the supplier, the price and the availability.
Q: What value did Purchasing add to the process?
A: Since it rarely, if ever, made a change Purchasing did not add value in order processing. Rather it caused a time delay which increased cost by delaying production. It did add value in monitoring the process much as internal auditors add value by insuring correct procedures.
Q: If budgets were overspent, who was responsible?
A: MTRS had budgetary responsibility for the items it ordered, therefore it answered to management for the inappropriate utilization of its budgetary accounts.

The buyer began to understand that the MTRS was his customer (his buyer) and that the buyer was the seller of his service and was not servicing his customer. It was clear to the buyer that better results could be achieved by assigning to the foreman of MTRS a set of purchase orders which the foreman would use to place orders with suppliers. Integrity would be maintained by the Buyer countersigning the purchase orders after the fact to insure that illegitimate activities were not talking place and by recognizing that budgetary control remained in place which insured that MTRS remained accountable for its use of funds. The Buyer recommended the change and it was successfully implemented within days. The program was so successful that it was extended to other foreman in other departments for a variety of inexpensive items.

What the Buyer had done was to extend Systems Contracting to a level consistent with the goals of JIT - the elimination of waste and the involvement of people in eliminating that waste. The waste eliminated was the unnecessary purchasing department activities which delayed receipt of necessary material. The people involvement was the recognition that the MTRS was responsible for its expenditures, not Purchasing. Accountability was clearly given to the MTRS. Once people are held accountable, they will perform more effectively. The question for managers is how to apply accountability when we are dealing with services between departments?

From this case we believe we can generalize with JIT principles that Bolton's model can be applied to all interdepartmental or interorganizational transactions to eliminate waste as well as improve the costing information within the organization. A good example would be a department that provides services to another department. Extending the Systems Contracting model, we propose that the service providing department would be the "seller" (i.e. Purchasing) while the department receiving the service would be the "buyer" (i.e. MTRS). Then, the buyer could purchase the services of the seller, paying a predetermined charge for each unit of service consumed. This has impact upon the cost accounting recovery system.

The predetermined charge and the amount of service to be consumed are agreed upon by the buyer and seller through a negotiation process (obviously with significant managerial input). This becomes a working contract between the two departments. This type of system can provide significant contributions to the overall efficiency and effectiveness of the organization. The benefits include:

1) improved costing -- under System Contracting, the costs of resources provided are directly traceable to the consumption of resources, eliminating the arbitrary cost allocations.

2) enhanced value and added focus -- since the buyer could conceivably go outside the organization to purchase the resources, the seller must assess his/her activities from a **value-added perspective** (i.e., which of the activities we are engaged in provide value to our customers and which ones do not?). In addition, the buyer must assess the value-added aspects of the use of the resources acquired (i.e., what resources do we really need and how best can they be used?)

3) improved cost and resource management -- there is motivation for both the buyer and seller to better manage the resources consumed and the activities that consume them. This leads to improved management of the costs of the resources.

4) increased communication -- the negotiation process and the consumption/cost reports provide mechanisms for increased communication and cooperation throughout the organization. In addition, this process provides increased knowledge and

understanding of other operating areas within the firm and of the costs involved.

5) improved competitive advantage -- improved cost tracking and cost management leads to better product costing. Better product costing leads to more competitive pricing and a better understanding of product profitability.

6) improved performance evaluation -- performance evaluation and reporting processes are improved because the information is easier to track. In addition, the contract provides a benchmark for assessing how well resources were provided and used.

7) improved cost information -- better cost tracking provides better cost information and better cost reports. In addition, the cost of the related accounting would be reduced because the accounting workload would be reduced.

The cost system used in conjunction with System Contracting/JIT principles should be one that tracks, analyzes, and reports information to aid management in measuring the success of policies that have been implemented. In many instances these policies will focus on activities within organizational units. Thus, according to Turney and Reeve (1990), activity-based accounting should prove to be as valuable beyond the factory floor as it has been within production units.

These concepts are consistent with Plenert's (1990) view of JIT when he suggested that there are three stages of JIT:

1) **Kanban:** a factory floor control tool.
2) **Production planning:** the elimination of detailed planning techniques and total reliance on a shorter planning horizon.
3) **Global Management Philosophy:** the belief in eliminating waste in all aspects of the organization rather than only in the production process[1].

Operationally, extending System Contracting/JIT beyond the factory floor is quite easy if one applies Plenert's Global Management Philosophy. First, organizations need to create a series of buyer/seller departments. Second, organizations need to analyze which activities add value to the product of interest between departments. Third, organizations must make those who request inputs be responsible for control of resources through budgetary constraints aided by the cost accounting recovery system.

This paper has shown that the application of JIT has moved from a factory floor technique of Kanban to a business philosophy that seeks to eliminate waste throughout the organization. JIT is a powerful business philosophy which requires managers to redefine their role in organizations. Management must be bold enough to involve employees in decision making to eliminate those activities that create waste. This means that a JIT philosophy, which was foreshadowed by Systems Contracting, will be applied and efficiencies will flow and the organization will be substantially improved.

REFERENCES

Ramón L. Alonso and Cline W. Frasier, "JIT Hits Home: A Case Study in Reducing Management Delays." Sloan Management Review (Summer 1991): 59-67.

Charles B. Ames and James D. Heavacek, "Vital Truths About Managing Your Costs." Harvard Business Review 1 (January February 1990): 140-147.

[1]This approach certainly echoes the philosophy developed by Bolton with Systems Contracting.

Bill Belt, "MRP and Kanban - A Possible Synergy." Production and Inventory Management Journal 28 (First Quarter 1987): 71-80.

Thomas J. Billesbach, "A Study of the Implementation of Just-In-Time in the United States." Production and Inventory Management 32 (Third Quarter 1991): 1-4.

Ralph A. Bolton, Systems Contracting: A New Purchasing Technique American Management Association, Inc., 1966.

Kenneth L. Campbell, "The First Question of Inventory Control." Production and Inventory Management 8 (October 1967): 56-58.

Robin Cooper and Robert S. Kaplan, "Measure Costs Right: Make the Right Decision." Harvard Business Review 5 (September - October 1988): 96-103.

_____, "Profit Priorities from Activity-Based Costing." Harvard Business Review 3 (May - June 1991): 130-135.

Leon B. Crosby, "The Just-In-Time Manufacturing Process: Control of Quality and Quantity." Production and Inventory Management 25 (Fourth Quarter 1984): 21-33.

Kenneth L. Campbell, "The First Question of Inventory Control." Production and Inventory Management 8(October 1967): 56-58.

Lee M. Finkel, "'Just-In-Time' Principles Can Strengthen Dispute Resolution Processes." Employment Relations Today (Summer 1991): 167-173.

Robert W. Hall, "Zero Inventory Crusade - Much More Than Materials Management." Production and Inventory Management 24 (Third Quarter 1983): 1-9.

Michael Hammer, "Reengineering Work: Don't Automate, Obliterate." Harvard Business Review 4 (July - August 1990): 104-112.

Hugh C. Haynsworth, "A Theoretical Justification for the Use of Just-In-Time Scheduling." Production and Inventory Management 25 (First Quarter 1984): 1-3.

Jin H. Im, "How Does Kanban Work in American Companies?" Production and Inventory Management 30 (Fourth Quarter 1989): 22-24.

H. Thomas Johnson and Dennis A. Loewe, "How Weyerhaeuser Manages Corporate Overhead Costs." Management Accounting (August 1987): 20-26.

Gerhard Plenert, "Are Japanese Production Methods Applicable in the United States." Production and Inventory Management 26 (Second Quarter 1985): 121-129.

_____, "Three Differing Concepts of JIT", Production and Inventory Management Journal 31 (Second Quarter 1990): 1-2.

Gerhard Plenert and Thomas D. Best, "MRP, JIT, and OPT: What's Best?" Production and Inventory Management 27 (Second Quarter 1986): 22-28.

James W. Rice and Takeo Yoshikawa, "A Comparison of Kanban and MRP Concepts for the Control of Repetitive Manufacturing Systems." Production and Inventory Management 23 (First Quarter 1982): 1-14.

Ashok Rao and David Scheraga, "Moving From Manufacturing Resource Planning to Just-In-time Manufacturing." Production and Inventory Management 28 (First Quarter 1988): 44-49.

Richard J. Schonberger, "Selecting the Right Manufacturing Inventory System: Western and Japanese Approaches." Production and Inventory Management 24 (Second Quarter 1983): 33-44.

Mohan V. Tatikonda, "Just-In-Time and Modern Manufacturing Environments: Implications for Cost Accounting." Production and Inventory Management 28 (First Quarter 1988): 1-5.

Bernard W. Taylor, III and K. Roscoe Davis, "Increasing Productivity Thru Work-In-Process Management." Production and Inventory Management 18 (First Quarter 1977): 80-87.

Peter B. B. Turney and James M. Reeve. "The Impact of Continuous Improvement on the Design of Activity-Based Cost Systems." Journal of Cost Management (Summer 1990): 43-50.

Jay A. Vora, Jayant V. Saraph and Dietrich L. Peterson, "JIT Implementation Practices." Production and Inventory Management 31 (Third Quarter 1990): 57-59.

Glenn T. Wilson, "Kanban Scheduling - Boon or Bane?" Production and Inventory Management 26 (Third Quarter 1985): 134-142.

The Economic Impact of In-Substance Defeasance of Corporate Debt

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ABSTRACT

In-substance defeasance allows a company to remove debt from its balance sheet by creating an irrevocable trust to service the debt. Research issues addressed are whether the defeasance is associated with (1) an abnormal price reaction in the firm's common stock, or (2) a change in the risk of the firm's stock, and (3) whether the firms showed evidence of the financial effects of the defeasance. Results indicate an insignificantly small negative stock price reaction in the sample firms and no significant shift in total risk; however, some shifts in the systematic risk of individual firms are indicated, consistent with an hypothesized shift in risk from bondholders to stockholders. Additional tests indicate that the firms show a temporary decline in cash flow in the year of defeasance. We conclude that the defeasance is coincidentally associated with temporary corporate weakness, but not the cause.

INTRODUCTION AND BACKGROUND

The use of "off-balance-sheet" financing, which permits a company to keep certain debt from being presented in the body of the financial statements, has been controversial for many years. During the 1980s new and innovative financing techniques for off-balance-sheet financing became popular. The primary purpose of many of these techniques was to keep significant debt from being recognized in the financial statements. Although the extent to which lenders and creditors either use or ignore information about off-balance-sheet debt may depend on several considerations, including the nature and extent of disclosure, it is clear that the management of many companies believe that such financing is not considered to be debt by users of the statements. Since the capital structure of the firm affects its risk, serious questions have been raised about the adequacy of accounting disclosure in this area. The Financial Accounting Standards Board (FASB) has paid increasing attention to the accounting for such financial maneuvers since the late 1980s. Accounting policy will continue to develop in this area throughout the 1990s.

The Nature of In-Substance Defeasance

Security sales, restructurings and recapitalizations are common business strategies that alter a corporation's mix of debt and equity. Retirement of debt prior to maturity may involve the invocation of the bond's call provision, the repurchase of the securities in the open market, a swap of equity for the debt, or the more recently developed strategy called in-substance defeasance. The FASB issued Statement of Financial Accounting Standards (SFAS) 76, "Extinguishment of Debt," in November 1983 to clarify the accounting treatment. While an orthodox debt extinguishment involves the payment of the claims of all holders of the debt issue, an in-substance defeasance is accomplished through the creation of a third-party trust containing risk-free securities with cash flows matching the firm's bond claims. The debt is, "in-substance," retired and is removed from the balance sheet. The indicated

corporate financial structure then would consist of less debt and relatively more equity.

Under SFAS 76 a corporation must irrevocably place in a third-party trust monetary assets which are "essentially risk-free," securities that are obligations of the U.S. government, guaranteed by the U.S. government, or backed by U.S. government obligations. These assets must provide cash flows approximately coincident with the cash payments on the debt being extinguished.

Motivation for an In-Substance Defeasance

A variety of reasons may explain the use of in-substance defeasance. For a firm that wishes to retire outstanding debt, in-substance defeasance offers an attractive method in comparison to other means of accomplishing the retirement. Specifically, substantial transaction costs may be avoided, since no fees or costs associated with contacting bondholders and actually repurchasing the debt will be incurred. The defeasance transaction is flexible in that it can be applied to a variety of debt instruments, including capital leases. Portions of debt issues may be retired as well. The transaction is not costless however, since trustees' services are presumably not free. Additionally the higher cost of acquiring the riskless government securities in comparison to a direct repurchase of the debt must be considered.

FINANCIAL IMPLICATIONS OF IN-SUBSTANCE DEFEASANCE

Research on in-substance defeasance is rather limited. Weil (1983) and Pari and Caks (1988) both discuss the financial impact of the transactions. In addition, Peterson, Peterson and Ang (1985) describe a variety of potential implications and made comparisons of in-substance defeasance to alternative methods of retiring debt. While the in-substance defeasance boosts reported earnings and reduces debt on the balance sheet, the real effect is more difficult to assess. Arguments can be advanced on several fronts in favor of either a positive or a negative impact on shareholder wealth. In addition, the risk of the firm may be affected by the use of in-substance defeasance.

Shareholder Wealth

The attractiveness of a defeasance is enhanced if the general level of interest rates has risen and currently exceeds the coupons of both the firm's risky debt and similar maturity government bonds, as was the case during the mid 1980s when defeasance was popular. While not necessary, the optimum scenario of an in-substance defeasance finds the seasoned bonds selling at a discount to their par value. Given an increase in the general level of interest rates since issuing their risky debt, the firm gains from an in-substance defeasance by purchasing U.S. government bonds at a discount.

Consider a firm which begins to generate net cash flow in excess of their operating requirements and any positive net present value investment opportunities immediately available. Since corporate managers are assumed to be rational wealth maximizers and risk averters, these excess funds will be held in short term money market assets. As the firm continues to generate excess cash, alternative uses of those funds can be considered. These possibilities include:

1. Investing the excess funds in short term, low risk money market securities and receiving some random nominal risk free return, r_f,

2. Purchasing long term U.S. government bonds of a specific issue yielding, r_{us}, with full call protection that are selling at a discount to par value to defease their outstanding bonds, or

3. Investing in some risky, positive net present value investment projects and receiving some random expected return, r_{fa}.

Given a two-dimensional linear tradeoff between risk and expected return, $E(r_f) < E(r_{us}) < E(r_{fa})$.

If the firm elects to retain the excess funds in money market assets, the unearned interest income is taxed at the ordinary corporate tax rates. If the firm defeases the outstanding bond issue by purchasing similar duration U.S. government bonds, part of the r_{us} is liable to be taxed as unearned interest income and some eventually as a long term capital gain. If the firm invests in risky positive net present value fixed assets, the expected pretax return r_{fa} will exceed those of the other two alternatives. The firm is better off having purchases the government bonds to defease than it would have been by retaining the funds in risk-free assets; however, assuming a fully arbitraged yield curve, both bonds are zero net present value investments. Clearly the firm is less well off in either case than it would be had it purchased positive net present value assets. Nonetheless investors and shareholders could be fooled by the shift of corporate funds to higher yielding assets; the immediate impact of the in-substance defeasance under this scenario is predicted to be positive and the equity of the firm should rise. We call this the yield enhancement hypothesis.

Cash Flow Implications of an In-Substance Defeasance

An in-substance defeasance may precipitate a negative market reaction if the announcement signals additional and unfavorable information to the market. Many studies have established that whenever corporate managers possess information not known to shareholders and other market participants, their subsequent actions convey information to uninformed and interested parties (Leland and Pyle, 1977; Ross, 1977; Miller and Rock, 1985). Others have integrated the condition of asymmetric information, financing needs and investment opportunities into a theory of capital structure (Myers, 1984; Myers and Majluf, 1984).

By defeasing the firm's seasoned debt, the managers use the firm's liquidity for purposes other than investing in risky positive net present value projects. While its apparent goal is a capital structure alignment, an in-substance defeasance can actually be seen as an investment portfolio rebalancing. McConnell and Muscarella (1985) report a market reaction of equity returns that is proportional to a firm's announced changes in capital expenditures, a finding consistent with the hypothesis that managers seek to maximize the market value of the firm with asset investment plans. This is important in that a defeasance may be seen as a less than optimal or value-maximizing strategy of the firms' managers. Corporate managers, therefore, may inform the market with an announcement of a defeasance that positive net present value projects are not available, or if they are, the managers have chosen not to invest. Because the manager's implicit forecast of future cash flows is perceived to be reduced, the market is predicted to assess negatively the in-substance defeasance and revalue the firm's

equity downward. We call this the negative information hypothesis; the obverse is that the market is fooled by the paper profit, or that the defeasance is a neutral mutation and the market does not react negatively.

Firm and Shareholder Risk

A related effect from the defeasance is a possible change in the risk of the firm. The exact nature of the risk change, if any, is unclear. When the transfer of government bonds to the trustee is completed, the financial statements of the corporation will show less debt and relatively more equity, thus the apparent financial leverage is reduced. Evidence presented by Hamada (1972) and Bowman (1979) suggests a relationship between financial leverage and the systematic risk of the firm's common stock. If the investors rely solely on such accounting-based indicators of financial risk, the corporation may have reduced its risk. However, the firm which accomplishes an in-substance defeasance has essentially fully collateralized a risky corporate issue with a risk-free stream of income. The defeased bonds should immediately become less risky, and, it can be argued, the risk has been transferred from the holders of the defeased bonds to the stockholders.

Alternative reasons for shifts in risk associated with in-substance defeasance may hold as well. Masulis (1980) refers to a "secondary redistribution effect" that may result when the firm alters its capital structure and induces a change in its investment policy. While an in-substance defeasance is not exactly the same phenomenon, the same principle applies. Since the firm forgoes any future investments in risky positive net present value assets, investors should perceive the in-substance defeasance as a signal of reduced variability of operating profits. The firm's defeased bonds should be perceived immediately as less risky because of the trust creation. Given that a lowered rate of return would discount the income stream of the bond, its value should increase and the bondholders' wealth grow.

Finally, if the firm has any additional debt issues outstanding, the defeasance should affect those assets positively. Several explanations may hold. The seniority status of the other outstanding bonds may be enhanced by the defeasance. The indicated interest coverage ratios may increase indicating a greater firm debt capacity. This could further increase the attractiveness of the outstanding bonds. The total value of the firm has no reason to increase and the value increase would likely not be of unilateral form. If the risk is a reasonable explanation, any value shift should occur from the shareholders to the bondholders. Therefore, the market effect of a defeasance may be observed as a simultaneous shift in value from shareholders to bondholders. This final explanation we call the wealth realignment, risk-reduction hypothesis.

RESEARCH DESIGN AND METHOD

Sample of Firms

A sample of firms which completed an in-substance defeasance was identified in two steps. Initially, a search of the AICPA's National Automated Accounting Research (NAARS) database provided the annual report disclosure of the firm's defeasance for firms which completed the transaction during the years 1982 through 1985. In many cases, but not all, the firms disclosed in a footnote the exact date on which the firm completed the defeasance, the issue of debt

defeased, the carrying value of the debt defeased, and the reported profit on the transaction. Next, additional data of that nature was gathered from a mail survey of the chief financial officers of the companies involved. Because of the research methods and design, firms not disclosing all of this data were deleted from the sample. This resulted in a sample total of 32 in-substance defeasance transactions, involving 31 firms, from the years 1982 to 1985. Security price data was obtained for these firms from the Center for Research in Security Prices (CRSP) database. In addition, we obtained cash flow data from the Value Line Guide.

TABLE 1
SUMMARY OF SAMPLE FIRM CHARACTERISTICS
N = 32
(dollar amounts in thousands)

Firm Size (total assets)	$7,640,472	$62,963,000 to $195
Carrying Value of Debt Defeased	$65,904	$515,000 to $180
Book Value of Debt Defeased as a Percentage of Total Book Value	0.86%	6.30% 60 0.01%
Reported Gain	$9,406	$132,000 to ($4,600)
Gain as a Percentage of Carrying Value	14.30%	43.60% to (7.30%)

INDUSTRY DISTRIBUTION

Mining	6
Construction	2
Manufacturing	7
Transportation	1
Utilities	8
Wholesale and Retail Trade	2
Finance and Insurance	3
Service	2
Conglomerate	1
Total	32

The defeasance transaction characteristics summarized in Table 1 reveal a wide range of values across the 32 observations. The average carrying value of the debt defeased was about $7.6 billion indicating that relatively large firms dominate this financial strategy. The distribution, however, is not symmetrical around the mean since the median is only $2.2 billion. Additionally, on a relative basis, firms defease an average of only 0.86% of their stated total capitalization. While the average defeasance profit is almost $10 million, this average is 14.3% of the bonds' face value, which can easily be adjusted to 16.7% of the bonds' indicated market value. We conclude that the average defeasance is profitable in an accounting sense, but the total commitment is small relative to the firms' total capitalization.

Research Methods and Hypotheses

Three research issues are addressed: Whether the defeasance is associated with (1) an abnormal price reaction in the firm's common stock, or (2) a change in the risk of the firm's stock, and (3) whether the firms showed evidence of the financial effects of the defeasance.

Hypothesis 1. The well known one-factor market model was used to test for a price reaction to the in-substance defeasance transactions. Daily returns from the CRSP database were used in an analysis of residuals. The residual or excess return for a day in the test period is the actual return less the predicted return from

the estimated market model. We estimated the model using 150 days of data from the period prior to the event. The residuals are calculated over a test period of 21 trading days which included the 10 days before and the 10 days after the defeasance. The average residuals were calculated across the sample, and the cumulative average residuals were calculated as the sum of the average residuals. In this case, the null hypothesis is that no excess returns are found after the defeasance, and is tested with a t-statistic, as discussed by Brown and Warner (1980). We test this against an alternative hypothesis of a negative market reaction.

Hypothesis 2a. The volatility of the stock returns, or the total risk of those securities, was tested using the approach taken by Ohlson and Penman (1985). They test the difference in return volatility between sub-periods before and after an event using a non-parametric approach which relies on very few assumptions about security returns, a direct test estimating the binomial probability statistic: $Pr(R_2^2 > R_1^2) = 0.5$. This is accomplished by matching pre-defeasance and post-defeasance returns for the companies and calculating the number of times that the squared post-defeasance return (R_2^2) exceeds the squared pre-defeasance return (R_1^2). The null hypothesis is no difference between the sub-periods.

Hypothesis 2b. In assessing whether a change in systematic risk has occurred as a result of the in-substance defeasance, the Chow test method was used. This method, first described by Chow (1960), has been applied in accounting research by Simonds and Collins (1978) and others. This tests specifically for statistically significant shifts in the coefficients of a linear time series regression between two non-overlapping time periods. The event date is the day the defeasance was completed. The regressions incorporated a dummy variable to allow the intercept to vary between the sub-periods. We test the null hypothesis of no change in the coefficient of systematic risk between the sub-periods.

Hypothesis 3. Finally, we test whether the sample firms' cash flow exhibits a discernible pattern around the time of defeasance. Since the sample size is necessarily small, simple correlation tests could identify any cross-sectional bias. This procedure is not only valuable, but also prudent. Various annual cash flow information was collected and restated on a relative basis before, coincident with and after the year of defeasance. The initial test was a calculation of the first order correlation coefficient of the sample firm cash flow measures. Next a zero order correlation between a proxy of the average firm cash flow and the sample of firms was calculated. Last, a control group was identified and tested against the defeasance sample to determine any industry effect. The Pearson correlation coefficients were tested with a null hypothesis of zero correlation.

RESEARCH RESULTS

Capital Market Price Reaction

Hypothesis 1. The performance of the firms around the date of the defeasance is presented in Table 2. We detected a noticeable but rather weak downward shift in the average residuals occurring at the beginning of the test period. Clearly, the strongest reaction takes place on day 0, although this movement is small and somewhat less than 1%. The predicted reaction continues on day +1 and the stock returns thereafter are mostly random. This finding, although consistent with our predictions, is not statistically significant,

and we therefore cannot reject the null hypothesis of no capital market reaction to the defeasance transactions.

While this may lead to the conclusion that the market does not recognize the implications of an in-substance defeasance, several other explanations may hold as well. Although we were careful to identify the exact date of the defeasance, it is possible that information about the transaction was not publicly disseminated in some cases until well after the event. Likewise the relatively small amount of debt defeased in several cases may not have been considered material.

TABLE 2
PERFORMANCE OF FIRMS AROUND DATE OF DEFEASANCE

DAY	AVERAGE RESIDUAL	CUMULATIVE AVERAGE RESIDUAL	t-STATISTIC	NUMBER NEGATIVE	NUMBER POSITIVE
-10	-0.0033	-0.0033	-0.263	16	15
-9	-0.0006	-0.0039	-0.039	14	17
-8	0.0002	-0.0037	0.015	16	15
-7	-0.0006	-0.0043	-0.033	17	14
-6	-0.0039	-0.0096	-0.200	17	14
-5	-0.0014	-0.0096	-0.097	17	14
-4	0.0037	-0.0059	0.259	13	18
-3	-0.0004	-0.0063	-0.025	14	17
-2	0.0028	-0.0036	0.143	15	16
-1	-0.0000	-0.0036	-0.001	14	17
0	-0.0047	-0.0083	-0.221	16	15
+1	-0.0039	-0.0122	-0.274	18	13
+2	-0.0006	-0.0128	-0.038	15	16
+3	0.0014	-0.0113	0.083	12	19
+4	-0.0021	-0.0135	-0.163	19	12
+5	-0.0023	-0.0158	-0.111	16	15
+6	-0.0025	-0.0182	-0.176	19	12
+7	0.0010	-0.0172	0.059	14	17
+8	0.0036	-0.0136	0.262	12	19
+9	0.0020	-0.0117	0.090	14	17
+10	-0.0024	-0.0141	-0.165	17	14

Risk Shifts

We tested for shifts in both total risk and systematic risk of the firms' stock. Neither set of tests indicate a consistent or strong market reaction to the defeasance transactions.

Hypothesis 2a: Tests of Changes in Volatility. In Table 3 we present the results of the tests for increases or decreases in the volatility of the stock returns surrounding the date of the defeasance. Overall, we found that the estimated $Pr\{R_2^2 > R_1^2\}$ was only .518, and thus not significantly different at any reasonable level from .5 under the null hypothesis. We must therefore conclude that the defeasance transactions did not increase the overall volatility of firms' stock nor its total risk. In conjunction with the results discussed previously, this further supports the conclusion that the stock market does not react strongly or consistently to in-substance defeasance transactions.

TABLE 3
SUMMARY OF SQUARED RETURN COMPARISONS

Comparisons	$R_1^2 > R_2^2$	$R_2^2 > R_1^2$
1164	562	602
	$Z = 1.232$	

Hypothesis 2b: Tests for Shifts in Systematic Risk. Results of the tests in systematic risk are presented in Table 4. Because these tests focused on individual firm rather than aggregate performance,

and required daily data for both a pre-event and post-event subperiod, sufficient data for 12 of 32 defeasance transactions was unavailable. Of the remaining 20 cases the results were mixed.

TABLE 4
SUMMARY OF CHOW TESTS AND BETA CHANGES
N = 20

BETA CHANGES		SIGNIFICANT* BETA CHANGES	
Positive	Negative	Positive	Negative
12	8	6	2

*significant at .05 level

The Chow tests indicate statistically significant shifts in risk for 8 of the 20 firms. These results are not fully consistent, however, since 6 of the 8 shifts are increasing, and 2 are decreasing. While intervening factors, such as the size of the sample and estimation errors inherent in using daily return data, necessitate caution in interpretation, we nevertheless note that these findings are compatible with an hypothesized shift of risk to stockholders from bondholders.

Cash Flows

Hypothesis 3. Finally we tested the correlation of the event occurrence and sample firm cash flow figures. Firm cash flow data were obtained from the Value Line Guide, and then converted from absolute per share data into relative terms. Relative cash flows were defined for our sample of firms for the fiscal years preceding (FCFBD), coincident (FCFD) and following the defeasance (FCFAD). For comparison, we identified a control group by matching each defeasance firm with a company within the same 4 digit SIC code. Within the SIC code, firms were matched on a size variable, total market value of equity. Next, the relative cash flows were defined for the fiscal years preceding (CCFBD), coincident (CCFD) and following the defeasance (CCFAD). Finally, we obtained aggregate economy cash flow numbers from the Statistical Abstract of the United States to proxy the corresponding aggregate economy-wide cash flows (ECFBD, ECFD, and ECFAD).

TABLE 5
CORRELATION MATRIX OF SAMPLE FIRM CASH FLOWS AND ECONOMY AVERAGES
(probabilities in parentheses)

	FCFBD	FCFD	FCFAD	ECFBD	ECFAD	ECFAD
FCFBD	1.0000 (.0000)					
FCFD	0.2461 (.2159)	1.0000 (.0000)				
FCFAD	-0.5557 (.0018)	-0.4551 (.0171)	1.0000 (.0000)			
ECFBD	0.1887 (.3269)	-0.0364 (.8569)	-0.3124 (.0990)	1.0000 (.0000)		
ECFD	-0.0201 (.9172)	0.1788 (.3721)	0.1632 (.3977)	-0.3890 (.0370)	1.0000 (.0000)	
ECFAD	-0.1730 (.3979)	-0.0638 (.7619)	0.2921 (.1476)	-0.8004 (.0001)	-0.2241 (.2710)	1.0000 (.0000)

The correlation matrix in Table 5 reveals no definitive relationship between the operating success of the defeasance firms and the aggregate economy. More interesting, however, are the sample firm time series autocorrelations. The p(FCFBD,FCFD) is small, positive

and insignificant indicating that the average operating performance of the sample firms has no meaningful trend before the event year. The p(FCFD,FCFAD) and p(FCFBD,FCFAD) are significantly negative at a very high probability, indicating a reversal of the pre-defeasance cash flow. This finding implies that the defeasance transaction is not the initial information that signals the diminished results to the market.

TABLE 6
CORRELATION MATRIX OF SAMPLE FIRM CASH FLOWS AND CONTROL FIRM CASH FLOWS
(probabilities in parentheses)

	FCFBD	FCFD	FCFAD	CCFBD	CCFAD	ECFAD
FCFBD	1.0000 (.0000)					
FCFD	0.2461 (.2159)	1.0000 (.0000)				
FCFAD	-0.5557 (.0018)	-0.4551 (.0171)	1.0000 (.0000)			
CCFBD	0.2803 (.1408)	0.3594 (.0656)	-0.1417 (.4633)	1.0000 (.0000)		
CCFD	0.2687 (.1587)	0.4695 (.0135)	-0.2041 (.2883)	-0.0004 (.9986)	1.0000 (.0000)	
CCFAD	-0.1124 (.5617)	0.2611 (.1883)	-0.0213 (.9496)	-0.3940 (.0345)	0.3130 (.0983)	1.0000 (.0000)

An interesting comparison of the defeasance sample cash flows over the three years (FCFBD, FCFD, and FCFAD) with the control sample cash flows (CCFBD, CCFD, and CCFAD) is presented in the correlation matrix in Table 6. Similar to the defeasance firms' experience, the p(CCFBD, CCFAD) is significantly negative, but at a lower level than the defeasance firm counterpart. The positive sign of p(CCFD,CCFAD) contrasts remarkably, however, with the corresponding defeasance firms' statistic. This data implies relatively weak financial performance of the defeasance firms in comparison with the control sample. The only significant correlation, p(FCFD,CCFD), is significantly positive and indicates a similar trend in cash flow during the year of defeasance. These findings imply that, on a relative basis, the defeasance firms' cash flows deteriorate greatly, but recover more than the control firms.

Finally, in Table 7 we present the results of cross-sectional regressions of the several defeasance firm cash flow measures on selected other variables. The important results are found in two regressions. Regressions 5 and 7, FCFAD on FCFD and FCFD on CCFD respectively, were significant although interpretation must be cautious since the intercepts were not significant. However, the slope coefficients were of the expected sign, indicating weaker financial operating performance of the defeasing firms relative to the control firms in the year of defeasance and further supporting the conclusion that the defeasing firms performance in the year of the defeasance declines and subsequently recovers.

CONCLUSION

This study has considered the economic effects resulting from in-substance defeasance of corporate debt after its sanction by the FASB in 1983. When the FASB approved in-substance defeasance with the issuance of SFAS 76, critics argued that the instant gain recognized and reduction of debt was fallacious, and that the real result was a shift in risk from the holders of the defeased debt to

the stockholders which was not recognized. Our findings do not support a conclusion that the market reacts strongly to in-substance defeasance. At best, we find only weak evidence of a market reaction, and only for a few firms.

TABLE 7
OLS PARAMETERS AND STATISTICS FOR VARIOUS RELATIONSHIPS
BETWEEN SAMPLE FIRMS AND COMPARISON GROUPS
(standard errors in parentheses)

Y	INTERCEPT	SLOPE	X	R^2	F STATISTIC
1. FCFBD	0.1145 (0.7000)	2.0429 (2.0458)	ECFBD	.0356	0.997
2. FCFD	-0.0559 (0.0906)	0.0906 (0.3118)	ECFD	.0320	0.826
3. FCFAD	-0.1458 (0.1727)	1.4924 (0.9404)	ECFAD	.0853	2.519
4. FCFD	0.0009 (0.0506)	0.0214 (0.0169)	FCFBD	.0606	1.612
5. FCFAD	0.0809 (0.1008)	-1.0419 (0.3923)	FCFD	.2071	7.053
6. FCFBD	0.2929 (0.5674)	2.4542 (1.6174)	CCFBD	.0786	2.302
7. FCFD	-0.0238 (0.0431)	0.5857 (0.2203)	CCFD	.2204	7.069
8. FCFAD	0.0694 (0.1157)	-0.0329 (.05155)	CCFAD	.0002	0.004

While our findings are not conclusive, we can offer several explanations for them. Market reaction may be diffused as a result of incomplete or lagged information about the nature and the timing of such transactions. Many companies seem to have treated information about these transactions as proprietary. In addition, while the amount of debt defeased varied widely from firm to firm, in many cases the amount was small relative to the size of the firm. It may be that this relative immateriality dampened market reaction in some cases. Further research could explore these issues.

This research should prove useful to corporate decision makers as well as financial statement users as the FASB continues to make policy in the area of financial instruments and off-balance-sheet financing during the 1990s. As better understanding of the consequences of using innovative financial strategies emerges, accountants can better serve financial statement users by providing more relevant information.

REFERENCES

Bowman, R. (1979). The Theoretical Relationship Between Systematic Risk and Financial (Accounting) Variables. Journal of Finance, 34, 617-630.

Brown, S. J., & Warner, J. B. (1980). Measuring Security Price Performance. Journal of Financial Economics, 8, 205-258.

Chow, G. T. (1960). Tests of the Equality Between Two Sets of Coefficients in Two Linear Regressions. Econometrica, 27, 561-605.

Financial Accounting Standards Board. (1983). Statement No. 76: Extinguishment of Debt, Stamford, Connecticut: Author.

Hamada, R. S. (1972). The Effects of the Firms' Capital Structure on the Systematic Risk of Common Stocks. Journal of Finance, 27, 435-452.

Leland, H., & Pyle, D. (1977). Information Asymmetries, Financial Structure, and Financial Intermediation. Journal of Finance, 32, 371-387.

Masulis, R. W. (1980). The Effects of Capital Structure Change on Security Prices: A Study of Exchange Offers. Journal of Financial Economics, 8, 139-178.

McConnell, J. J., & Muscarella, C. J. (1985). Corporate Capital Expenditure Decisions and the Market Value of the Firm. Journal of Financial Economics, 14, 399-422.

Miller, M. H., & Rock, K. (1985). Dividend Policy Under Asymmetric Information. Journal of Finance, 40, 1031-1051.

Myers, S. C. (1984). The Capital Structure Puzzle. Journal of Finance, 39, 575-594.

_____, & Majluf, N. S. (1984). Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. Journal of Financial Economics, 13, 187-222.

Ohlson, J. A., & Penman, S. H. (1985). Volatility Increases Subsequent to Stock Splits: An Empirical Aberration. Journal of Financial Economics, 14, 251-266.

Pari, R., & Caks, J. (1988). A Note on Bond Defeasance. The Financial Review, 23, 233-236.

Peterson, P., Peterson, D., & Ang, J. (1985). The Extinguishment of Debt Through In-Substance Defeasance. Financial Management, 14(1), 59-64.

Ross, S. A. (1977). The Determination of Financial Structure: The Incentive-Signaling Approach. The Bell Journal of Economics, 8, 23-40.

Simonds, R. R. & Collins, D. W. (1978). Line of Business Reporting and Security Prices: An Analysis of an SEC Disclosure Rule. The Bell Journal of Economics, 9, 646-658.

Weil, R. L. (1983, December 5). De- or Misfeasance? A Look at the New FASB Ruling. Barron's, pp. 50, 76-77.

An Analysis of Forecasting Procedures Using British Historical Data: Gross National Product Estimates

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ABSTRACT

Current academic research in economic history has increasingly become more empirical in nature. As a consequence, questions concerning the reliability of historical economic time series and subsequent revisions present serious criticisms of the existing literature. This paper represents an initial inquiry by concentrating on measuring the reliability of British gross national product estimates commonly used in historical research. It is shown that current revisions of this data are more precise when forecast error is used as the measurement criterion. In addition, it is found that Bayesian methods of forecasting outperform other standard forecasting specifications.

INTRODUCTION

This paper explores two important problems observed in the current economic literature. One concern involves the use and reliability of historical economic time series while the other concentrates on the econometric choice between alternative forecasting specifications. Typically, these two avenues of thought would be considered separate disciplines in an academic setting. Many economic historians, however, have attempted to duplicate empirical results observed in the contemporary literature by utilizing historical data in their research. The current analysis will address the validity of this development in addition to testing some common econometric beliefs concerning economic forecasting.

In empirical work covering any discipline it is vitally important to utilize accurate data. Published data, however, are to some extent inaccurate because of incomplete coverage, the use of simple estimates rather than census values, and the existence of various data processing errors. Presumably, ongoing data revisions will minimize this type of data reporting error and any concern over such information. As a consequence, studies of contemporary economic conditions typically do not include a defense of the data utilized. This luxury, unfortunately, is not equally afforded to studies employing historical data series. The availability and reliability of historical data has limited the amount of empirical work observed in the economic history literature. While it is important to analyze economic conditions and paradigms over different time horizons in order to test the validity of economic theories, it is not usually feasible to precisely reproduce the current empirical literature using historical data. Therefore, the costs of undertaking economic research using historical data involve limitations resulting from data accuracy and availability.

Historical data on various economic series such as output, prices, employment, and industrial production are readily available for the industrial economies of the nineteenth and twentieth centuries. This is especially true for Britain. One reason much of the research in economic history concentrates on the British economy is that the British government and industrial leaders in the nineteenth century were extremely proficient at tabulating and recording volumes of economic data. In other industrialized economies of the time, including the United States, this was not the case. It must be emphasized, however, that once long lists of data series are systematically displayed in neat tables they tend to convey a wholly spurious air of precision. Much of the data used in economic history are estimates of past economic conditions made by contemporary economic historians. Feinstein and Pollard (1988), for example, point out that capital and output estimates used in empirical studies of British industry may be off by as much as ten percent. An ability to test the reliability of a data series is useful in this context. This paper will produce forecasts of Gross National Product (GNP) using historical data estimates often used in the literature. Specifically, GNP estimates provided by Feinstein (1972) and later updated by Feinstein, Matthews, and Odling-Smee (1982) will be compared in terms of forecasting accuracy of recent GNP values. If one series is truly an improvement on another, then the use of the updated series should provide better forecasts.

This paper will also present results in terms of choosing between various forecasting models. The basic forecasting problem is one of utilizing all relevant information to effectively minimize errors in predicting future values of economic time series. Consequently, there is considerable scope for choosing alternative forecasting strategies in terms of the structural form of the model and the information set to consider in devising the forecast. Much of the debate in this area, consequently, has been directed toward determining which type of model specification elicits the most accurate forecasts. Cooper (1972), Zarnowitz (1979), Litterman (1984) and McNees (1986) all analyzed forecast performance under various model specifications for aggregate U.S. data. A common theme in each of these studies lies in the claim that recent forecasts distributed by econometricians have been highly inaccurate. Each paper presents an alternative model specification and shows it to be superior to existing forecasts of aggregate U.S. economic series. Despite the fact that this area of research is still a source of debate among econometricians, little attention has been placed on model specification and performance of forecasts using historical data series. Presumably, current results concerning the choice of optimal forecasts will be more robust if they provide similar conclusions using historical data.

This paper will focus on four general types of forecasting models. As a starting point the first model studied will be a naive trend forecast. Intuition predicts that this model should not perform well in comparison to more sophisticated approaches. The second model studied will be a univariate autoregressive moving average (ARMA) representation commonly used in the forecasting literature. The third model this study utilizes is a vector autoregression (VAR) model as proposed by Sims (1980). A Bayesian vector autoregressive model (BVAR) representation similar to that discussed in Doan, Litterman, and Sims (1984) and outlined in Todd (1984) is the fourth model under consideration. Based on forecast error measures on British GNP, it is shown that BVAR models generally outperform standard trend, ARMA, and VAR specifications using British historical time series. In addition, it is shown that the GNP updates of Feinstein, Matthews, and Odling-Smee (1982) provide more reliable estimates of GNP than using data provided by Feinstein (1972). This would suggest that the data revisions on GNP do represent an improvement.

GENERAL FORECASTING METHODOLOGY AND MODELS

A critical stage in any empirical analysis is determining which model specification to employ and the content of the information set to use. At this point, the model is developed to filter information from the data set which is relevant to the variables of interest. The primary debate at hand is whether to use economic theory and develop a model which represents this, or to rely strictly on the existing data structure. In addition to judging the accuracy of historical data series, this study is also concerned with properties involving time series estimation techniques. The basic strategy in using a pure time series approach in forecasting is to allow the data to suggest the structure of the model to use. Rather than adding equations to improve the forecast, the time series analyst will increase the lag length of each series. The process by which the optimal lag structure is determined for each series using an ARMA representation is outlined in Box and Jenkins (1976). In VAR and BVAR representations the lag length is either fixed or optimally chosen using a procedure outlined in Sims (1980). This general methodology for determining an optimal lag length in a VAR system help diminish the chance of overparameterization in the model.

The first model utilized in this study is a simple trend model in which the dependent variable, GNP, is regressed on a linear trend term and a constant. Owing to its relative simple structure, one would expect this model to provide poor forecasts in terms of estimation errors. The ARMA specification presumably represents a significant improvement in forecasting technique. The early development of ARMA models can be traced back to Box and Jenkins (1976) who proposed a method of using the data alone to identify a suitable model to estimate. This model involved a lag structure on the variable as well as a correlation between error terms. The general form of an ARMA(p,q) model on the series x with an autoregressive order p and

moving average order q is

$$x_t = \alpha + \sum_{i=1}^{p} \theta_i x_{t-i} + \mu_t - \sum_{j=1}^{q} \gamma_j \mu_{t-j} \qquad (1)$$

where t is time, θ_i is the autoregressive coefficient on lagged x, γ_j is the coefficient on moving average terms, α is a constant, and μ_t is a normally distributed random error term with a zero mean and constant variance σ^2. Lag lengths on these models are determined by observing the autocorrelation function and the partial autocorrelation function for the data. Using this approach, an ARMA(2,1) is found for the GNP data discussed above. Cryer (1986) presents a detailed description of how autocorrelation and partial autocorrelation functions are used to determine ARMA specifications.

The VAR representation is an extension of the ARMA model in as that lagged values of the dependent variable are included in the structural equations. The VAR model, however, relies on beginning with a system of dynamic, linear equations where all variables are interrelated and endogenous. This equation system can be written as

$$x_{i,t} = \sum_{i=1}^{k} \sum_{s=1}^{L} \beta_{is} x_{i,t-s} + \epsilon_{it} \qquad (2)$$

where k is the number of variables in the system, L represents the maximum number of lags, and ϵ_{it} is a normally distributed error term with zero mean and constant variance. The parameter β_{is} is the coefficient on variable i lagged s time periods. Therefore, the VAR representation is simply a system of simultaneous equations of endogenous, interrelated variables. Given the choice of variables in the system and the lag length employed, a VAR model will incorporate all possible correlation between lagged variables. An ARMA model will only consider a univariate subset of these correlations and, therefore, employ less information using the data. As a result of this difference, VAR models typically require relatively large data sets, but generally avoid the arbitrary restrictions of economic theory and allow the data itself to govern the forecast. Placing economic theory aside and fully concentrating on the data, however, ignores the expertise of the forecaster and represents a serious oversimplification of the economic system. Litterman (1984) presents this tradeoff between overparameterization and oversimplification as an information filtering process. He points out that when an important variable is left out of the model, as done in the traditional approach to forecasting, a potential channel for extracting information in the data is eliminated. On the other hand, when too many variables are included in the model, as possible in the VAR approach, the noise in the data will obscure the signal and the filtering process will not provide a reliable forecast. A Bayesian approach to forecasting allows for a bridge between the tradeoff illustrated above by employing time series techniques and including a forecasters subjective beliefs. This approach to estimation requires the interpretation of a parameter as a random variable rather than as a fixed number. This is a major difference between the classical approach to econometrics and a Bayesian approach. This procedure allows the researcher to introduce his or her prior beliefs about the structure of the model in producing time series estimates or forecasts. This discussion will present the Bayesian estimation approach and the BVAR forecasting model outlined in Zellner (1985) and Doan, Litterman, and Sims (1984).

A distinctive feature of Bayesian inference is the combined use of sample and prior information by the econometrician. Prior information is coupled with current sample information by the use of Bayes Theorem to produce a posterior distribution of the parameter of interest. The prior probability function contains all possible values of the parameters prior to observing the sample. According to the likelihood principle, the likelihood function incorporates the sample information and transforms the prior to a posterior probability function. The prior can either be informative or diffuse as outlined in Zellner (1985). The method for determining the prior in this study is identical to that outlined in Todd (1984). The representation used for the prior distribution serves as an approximation to the posterior means and follows a simple univariate VAR process in which lag length has been optimally determined. The minimum loss function or the best forecast procedure is determined by within sample forecast analysis. Consideration of the within sample forecast errors as a function of movement in these dimensions of the

model is then used to find the optimal forecasting specification. In effect, this process is used to fine-tune the prior information and extract as much information from the data as possible. In addition, a Kalman filter is used to re-estimate coefficients period by period allowing this underlying process to evolve over time rather than assuming the process remains stationary one time period to the next. Presumably, added information introduced by the prior distribution should improve the accuracy of the forecast.

Once a forecast model has been selected it is important to measure the true forecast errors to determine which model exhibits the greatest accuracy. Three common measures of forecast accuracy are the root mean squared error (RMSE), the mean error (ME), and the mean absolute error (MAE). The further these measures drift from zero, the less accurate the forecast. Theil U statistics are also utilized in this paper as additional measures of forecast accuracy.

EMPIRICAL RESULTS

The annual data from 1855 to 1914 on GNP provided by Feinstein (1972) and Feinstein, Matthews, and Odling-Smee (1982) is used in this study. Initially this data is regressed on a constant and a trend term for the simple trend model forecast. The ARMA model derived for this forecast analysis is of a simple univariate variety requiring only past GNP values. The autocorrelation and partial autocorrelation functions provide evidence of an ARMA(2,1) specification for both GNP series. Initially, an AR(2) was suspected but did not result in residuals with correct statistical properties. The VAR and BVAR require other economic time series to form a forecast. In this paper, the VAR and BVAR representations will be five variable systems where all variables in the system are dynamically estimated and forecast. The prior distribution in the BVAR is initially diffuse and updated sequentially. The five variables chosen for the system are GNP, consumer prices, population, change in fixed capital formation, and the unemployment rate. The latter four variables in the system are all presented in Mitchell (1984). A lag length of three years was used for each variable in the system. Each of the four models were estimated and used to forecast GNP from 1953 to 1972. Actual values and forecasts for GNP are produced in Tables 1 and 2 below.

Table 1: Forecasts of GNP using Feinstein (1972) (Millions of British Pounds)

YEAR	ACTUAL	TREND	ARMA	VAR	BVAR
1953	14877	7125	10078	10583	10971
1954	15726	7149	10278	10909	11308
1955	16867	7172	10479	11235	11646
1956	18264	7195	10682	11561	11983
1957	19369	7219	10887	11888	12321
1958	20196	7242	11095	12214	12659
1959	21248	7265	11305	12541	12998
1960	22633	7288	11517	12868	13336
1961	24213	7312	11731	13195	13675
1962	25279	7335	11948	13522	14014
1963	26878	7358	12167	13850	14353
1964	29187	7382	12388	14177	14692
1965	31156	7405	12613	14505	15032
1966	33057	7428	12839	14834	15371
1967	34835	7452	13069	15162	15711
1968	37263	7475	13301	15491	16051
1969	39168	7498	13535	15820	16392
1970	42788	7522	13773	16149	16732
1971	48159	7545	14013	16479	17073
1972	53848	7568	14257	16808	17414

Table 2: Forecasts of GNP using Feinstein, Matthews, and Odling-Smee (Millions of British Pounds)

YEAR	ACTUAL	TREND	ARMA	VAR	BVAR
1953	14877	7422	10517	11290	11595
1954	15726	7446	10721	11617	11938
1955	16867	7470	10926	11945	12280
1956	18264	7494	11134	12272	12623
1957	19369	7517	11344	12598	12966
1958	20196	7541	11557	12924	13309
1959	21248	7565	11772	13250	13652
1960	22633	7588	11989	13575	13996
1961	24213	7612	12208	13899	14339
1962	25279	7636	12430	14223	14683
1963	26878	7660	12655	14547	15027
1964	29187	7683	12882	14870	15371
1965	31156	7707	13112	15193	15715
1966	33057	7731	13344	15516	16059
1967	34835	7755	13579	15838	16404
1968	37263	7778	13817	16160	16748
1969	39168	7802	14058	16481	17093
1970	42788	7826	14301	16802	17438
1971	48159	7850	14548	17123	17783
1972	53848	7873	14798	17444	18128

It is immediately obvious that the forecasts are considerably different from the actual values of GNP during the forecast period. Specifically, the actual GNP values appear to be substantially underestimated for each of the forecast models. This result is not surprising in that one would not expect the dynamics of the British economy to be the same in the middle twentieth century and the late nineteenth century. It is also readily obvious that the forecasts derived from the naive trend model fall considerably short relative to the other time series models. In order to compare the relative accuracy of the different model specifications the statistical measures

discussed above must be calculated. These forecasts and actual values of GNP allow for the calculation of the forecast performance measures discussed in the previous section for this particular forecast horizon. Values for these statistics are presented below in Tables 3 and 4.

Table 3: Measures of Forecast Performance Using Feinstein (1972) Estimates

	TREND	ARMA	VAR	BVAR
RMSE	23934.1	19226.6	17556.4	17098.7
ME	-21403.8	-16652.9	-15061.1	-14564.0
MAE	21403.8	16652.9	15061.1	14564.0
U1	0.6286	0.4483	0.3941	0.3796
U2	0.7789	0.6257	0.5714	0.5565

Table 4: Measures of Forecast Performance Using Feinstein, Matthews, and Odling-Smee

	TREND	ARMA	VAR	BVAR
RMSE	23664.2	18791.0	16981.5	16517.0
ME	-21102.8	-16166.0	-14372.1	-13893.1
MAE	21102.8	16166.0	14372.1	13893.1
U1	0.6166	0.4332	0.3755	0.3613
U2	0.7702	0.6116	0.5527	0.5375

The statistical results in Tables 3 and 4 clearly show that the naive forecast is much less accurate than the other three techniques. In addition, it appears that the BVAR technique is slightly more accurate than the VAR or ARMA models in forecasting GNP. This conforms with results in the current literature studying the accuracy of various forecasting techniques on contemporary macroeconomic data. The Theil U statistics show that the three time series approaches are substantially more accurate than the simple trend line analysis. The BVAR appears to be slightly superior to the VAR and ARMA specifications. It must be noted that these statistics measuring forecast accuracy are relatively high as a result of the long forecast horizon.

Comparing results of Tables 3 and 4 show that the error statistics on predicting GNP using the 1982 updates are lower than the 1972 GNP estimates. This would imply that the 1982 update of GNP is relatively more reliable when using forecast accuracy as a benchmark. Even though the difference is not substantial, these results would suggest that research utilizing the GNP data of Feinstein, Matthews, and Odling-Smee (1982) would provide more reliable results.

CONCLUSION

This paper presents preliminary work in testing the reliability of data often used in research by economic historians. The accuracy of econometric forecasts is used as a criterion addressing this important issue. Using two British GNP estimates it was shown that more recent updates provided better forecasts than dated versions of the time series. In addition, the success of the BVAR model specification observed using current macroeconomic time series appears to hold when using British GNP estimates dating back to 1855.

While these results represent an interesting starting point for future research, they must be viewed with guarded optimism. The choice of GNP as the relevant time series studied and the forecast horizon of 1953 to 1972 may be significant to these results. The choice of other economic time series or forecast horizons may provide significantly different conclusions. In addition, the GNP values presented by Feinstein, Matthews, and Odling-Smee (1982) are consistently higher than those derived in Feinstein (1972). This alone could cause the updated version of GNP to exhibit better forecasting performances in models which consistently underestimate actual values over the forecast horizon.

Finally, the improvement witnessed by the BVAR and VAR specifications over an ARMA approach must also be viewed with caution. The VAR and BVAR representations involve systems of economic variables whereas ARMA models are univariate analyses. One of the variables included in the equation system for the VAR and BVAR models is the change in fixed capital for the British economy. This variable displayed rapid growth after 1900 and could be the cause for the more rapid growth rate in GNP predicted by the VAR and BVAR models. Consequently, the positive forecast error results for these models may be dependent on the choice of economic variables included in the system rather than the model specification itself. Regardless, this area of research is important in determining the reliability of data used in economic history research and provides an area of future investigation.

REFERENCES AVAILABLE UPON REQUEST

Student Perceptions of Effective Pedagogy in a Business Ethics Course

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ABSTRACT

Students majoring in business administration at two state universities were surveyed to determine their attitudes toward the teaching of a business ethics course. The study found strong support for offering business ethics as part of the curriculum. Respondents felt that teaching people to do the right thing was the major purpose of this course while differing opinions among students and professors was the chief difficulty. Participants favored integrating business ethics into a number of core business courses and believe business persons are best qualified to teach this course.

INTRODUCTION

Ethics in the business community has been and continues to be a topic of considerable discussion. In light of extensive media coverage of ethical breaches of companies such as Union Carbide, Exxon, Salomon Brothers and E. F. Hutton, this is not surprising. It is also only reasonable to expect that some attention will be directed to schools of business to determine what higher education is doing to teach future business leaders about ethical behavior and expectations.

LITERATURE REVIEW

Interest in ethics among educators and students is not new. Between 1975 and 1990 several studies were conducted in an attempt to clarify the position of higher education with respect to the teaching of business ethics (McMahon, 1975; Bucholz, 1979; Huber, 1979; George, 1987). The general consensus of academicians is that the subject of business ethics should be presented in the classroom environment (Arlow & Ulrich, 1988; Frederick, 1988; Burton, Johnston & Wilson, 1991). In addition, support for including ethics related material is found in the published curriculum standards of the American Assembly of Collegiate Schools of Business (1990-1992).

The overwhelming support for adding business ethics to the curriculum does not, however, prove that such instruction has long-term benefits. There continues to be debate on this issue. Furthermore, it is suggested by some authors that the moral standards of the students may already be established by the time they enter a university (Carruth, P. J. & Carruth, A. K., 1991) and therefore, instruction at this point in life is not worthwhile. However, LaRue Tone Hosmer (1988), a proponent of business ethics education, provides two reasons why such instruction is desirable. He states that although ethical analysis may not result in a single answer to a managerial dilemma, it does lead to some answers that are more right

or just than others. Secondly, ethical analysis can lead to an examination of subjective moral standards and an examination of supporting personal criteria.

The purpose of this study was to determine the attitudes of university students toward the teaching of business ethics. Students can be an important source of information when making business ethics curriculum decisions. One reason for focusing on student opinion is that at many colleges and universities student evaluation of faculty teaching plays a critical role in promotion and tenure decisions. Since business ethics courses are relatively new offerings at many schools of business, the authors felt it would be helpful from a pedagogical standpoint to at least consider student input when designing a business ethics course. Student input can also alert faculty members to special problems that may be encountered when teaching this course. This is especially important since many faculty who offer business ethics are teaching outside their traditional disciplines.

METHODOLOGY

Students majoring in business administration at two state universities in the northeast were surveyed to determine their attitudes toward the teaching of a business ethics course. There were 954 usable questionnaires. Only a few questionnaires had to be omitted from the survey findings. Students were initially asked if a business ethics course was an important element of the curriculum and, if so, how and when it should be introduced. Respondents were also asked to specify the major purposes and limitations of a business ethics course. Students were also queried about the instructional techniques they felt would be most effective. In addition, participants were asked to indicate which type of person was most qualified to teach business ethics. And finally, student's perceptions of ethical practices of various industries and professions were assessed.

RESULTS

This study found strong support for offering business ethics as part of the curriculum. Over 85% of the study participants agreed that ethics is an important subject for study. Only 4% disagreed and the remainder either did not respond (1%) or indicated they did not know (10%).

When respondents were asked, "What do you consider to be the major purpose(s) in teaching business ethics?" the answers revolved around three main issues: (a) to teach people to do the right thing (n = 313); (b) to increase understanding of ethical matters (n = 220); and (c) to improve practices in the business world (n = 155). Thirty-three respondents indicated that a major purpose in teaching business ethics was to improve the image of business and business people.

The major problems and difficulties associated with teaching business ethics were identified as follows: (a) differing opinions among students and professors (n = 338); (b) student indifference or lack of interest in the topic (n = 90); (c) confusing and vague nature of the material (n = 67); and (d) instructor inadequacy (n = 56). Other problems which were identified included the constantly changing nature of the subject (n = 28); inadequate course materials (n = 22); and difficulties associated with grading (n = 3).

Participants were also asked if they thought business ethics could best be taught by integrating it into a number of core business courses or by introducing it as a separate compulsory unit or as an elective. The overwhelming majority (n = 625) favored integrating it into a number of core courses. A separate required course was preferred by 183 respondents and an elective course was recommended by only 140.

The response patterns were also quite clear with respect to the point at which business ethics should be offered in the curriculum. The sophomore (n = 253) and junior (n = 318) years were preferred over the freshman (n = 170) and postgraduate (n = 19) years.

Participants were also asked, "Who should teach a course in business ethics?" Respondents were provided with a list of six categories of professionals plus an "other (please specify)" option. A "1" was used to designate the most preferred category and a "7" for the least preferred. A weighted average was used to determine the overall rankings. The results may be seen in Table 1.

Table 1
Ranking Preferred Instructor Category

1.	Businessperson
2.	Philosopher/ethicist
3.	Academic (any qualifications)
4.	Lawyer
5.	Accountant
6.	Minister

As Table 1 indicates, business persons were perceived as being the best type of person to teach a business ethics class. This group was followed by philosophers and academics. Ministers came in last.

An open-ended question asked students to indicate what kinds of instructional methods they would consider to be most effective for a business ethics course. The findings showed that the use of case studies of real or hypothetical companies and situations was the most preferred method (n = 204). The method ranked second was lectures (n = 110) and discussion was the third most frequently mentioned teaching method (n = 43). Other recommended approaches included films, role playing, group interactions, guest speakers, reading assignments, projects and out of classroom activities. But fewer than 35 students indicated a preference for each of those methods.

The authors were also interested in knowing how students perceived the ethical practices of certain industries. The results are shown in Table 2. As Table 2 indicates, the ratings of the industries show at least 50% of the survey participants believe that higher education, medical, religious, accounting, high school and banking organizations are ethical. Politics had the highest perceived level of unethical practices (69.92%).

Table 2
Perceptions of Ethical Practices of Certain Industries

	Ethical (%)	Unethical (%)
Higher education	70.86	11.22
Medical	62.47	21.17
Religious organizations	62.37	14.47
Accounting	58.18	17.19
High School (secondary)	56.39	18.97
Banking	51.15	22.22
Law enforcement	47.90	33.33
Legal	40.36	42.66
Real estate	37.42	26.42
Govt. (public servants)	31.55	42.24
Bldg./Construction	32.08	31.55
Insurance	28.30	43.19
Entertainment	28.09	41.61
Politics	16.35	69.92

NOTE: For each of the industries examined there were respondents who expressed no opinion - they either answered "Don't Know" or failed to indicate a choice. This explains why the given percentages total less than 100% for the individual industries in the table above.

A related question asked participants to report their perception of the ethical practices of 18 professions. The results are shown in Table 3.

Table 3
Perceptions of the Ethical Practices of Certain Professions

	Ethical (%)	Unethical (%)
Nurses	72.54	5.24
Physicians	65.30	11.53
Academics	64.99	7.34
Clergy	63.00	9.96
Bank tellers	60.80	7.76
Small business owners	59.75	12.26
Engineers	57.44	6.39
Accountants	56.50	14.05
Bank managers	56.29	12.58
Architects	52.52	9.54
Law officer	47.69	30.50
Lawyers	42.87	34.60
CEOs	42.66	23.17
Athletic coaches	42.45	26.83
Tradesperson	41.82	25.89
Govt. employees	36.29	30.19
Contractors	32.91	27.46
Politician	14.15	66.67

NOTE: For each of the professions there were respondents who expressed no opinion - they either answered "Don't Know" or failed to indicate a choice. This explains why the given percentages total less than 100% for the individual professions in the table above.

As this table reveals, the professions which received the most favorable ratings on perceived ethical practices were nurses, doctors, academics, clergy and bank tellers. Politicians received the least favorable rating.

DISCUSSION

The strong support for including business ethics in the curriculum is consistent with the increased interest in and concern about ethical breaches in business. Interest in ethics has been apparent for some time now among professionals, educators and students. It seems evident that few professors or students would argue against including discussions of values and ethical dilemmas in the educational process.

The study findings also showed that participants believe instruction in business ethics can help to teach people to do the right thing, to increase their understanding of ethical matters and to improve practices in the business world. According to Jennings (1992), every business that lacks an ethical commitment will eventually bring about its own downfall. Jennings (1992) further states that "a business without a strong sense of values and adherence to those values is a business that has forgotten its mission of earning a profit" (p. 32).

Respondents identified some interesting problems and difficulties associated with the teaching of a business ethics course. The most frequently cited difficulty was differing opinions among students and professors. A related problem was the confusing and vague nature of the material. It appears that fairness in grading is an underlying concern even though only three study participants directly addressed this issue. Students who express reservations about holding an opinion different from the professor's and who are anxious about studying issues they perceive to be vague are often indirectly expressing uncertainty and concern over how their grades will be determined. It is, therefore, especially important that the grading criteria be clearly specified. Students should be advised that the thoroughness, clarity and logic of their arguments will be the determining factor in deciding their grades.

It was somewhat surprising to learn that students preferred having business ethics integrated into existing core business courses rather than having the course offered as either a separate elective or separate required course. One reason students may prefer an integrated approach is that such an approach would allow them to learn business ethics in context. However, it is also possible that students may fear having an additional course introduced into the existing curriculum. This would present another hurdle they must overcome in completing their graduation requirements.

The responses to the question, "Who should teach a course in business?" were also somewhat surprising. The students felt a business person was the best choice. Evidently there is the expectation that someone who has real world experience could best discuss the types of ethical dilemmas a business person is likely to face. It is true that someone with business experience is likely to have some interesting anecdotal experiences to share with the students. However, the argument could also be made that business persons are part of the problem rather than part of the solution. Philosophers/ethicists were ranked second. These individuals were apparently perceived as having the necessary knowledge and expertise to adequately teach business ethics. Academics, regardless of background, were a close third choice. Lawyers were fourth. Legal professionals would at least be

knowledgeable regarding what is legally required although legal stipulations are not necessarily synonymous with ethical expectations. Accountants were likely a lesser preferred choice because most students would perceive the accounting field as one that deals with black and white issues. Many students would not realize that accountants must interpret the data they examine and this does, at times, present them with ethical dilemmas. It appears that students are least happy with the prospect of ministers teaching business ethics. Evidently students do not want someone "preaching" to them about what is "right" or "wrong." This can also be seen in the question that asked about the most preferred teaching method. Cases were by far the preferred approach. Students apparently want the opportunity to discuss alternative approaches rather than have someone tell them what is right.

The professions and industries that were most often perceived as being ethical revolved around higher education, medical and religious organizations. It seems other groups could learn from them. Some might argue that those institutions generally do not exist for profit making reasons and therefore do not face the same pressures as businesses do. However, doing the right thing in business is certainly not inconsistent with doing the profitable thing.

CONCLUSION

It appears that if students are going to benefit from instruction in the area of business ethics they must be given the opportunity to freely express their concerns and opinions. The role of the instructor is to allow ideas to be exchanged and to focus on strengths and weaknesses of alternate approaches to addressing ethical dilemmas in the workplace. Through guided discussion the professor can show students that certain options are qualitatively better than others.

REFERENCES

American Assembly of Collegiate Schools of Business. (1990-1992). Accreditation Council Policies, Procedures and Standards, p. 32.

Arlow, P., & Ulrich, T.A. (1988). A longitudinal survey of business school graduates' assessments of business ethics. Journal of Business Ethics, 7, 295-302.

Bucholz, R. A. (1979). Business environment and public policy: A study of teaching and research in schools of business and management. Saint Louis, MO: Washington University.

Burton, S., Johnston, M.W. & Wilson, E. J. (1991). An experimental assessment of alternative teaching approaches for introducing business ethics to undergraduate business students. Journal of Business Ethics, 10, 507-517.

Carruth, P. J. & Carruth, A. K. (1991). Education in ethics: The role of higher education. Journal of Education for Business, 66, 168-171.

Frederick, W. C. (1988, August). An ethics roundtable. Management Review, 48-50.

George, R. J. (1987). Teaching business ethics: Is there a gap between rhetoric and reality? Journal of Business Ethics, 6, 513-518.

Hosmer, L. T. (1988, July/August). Adding ethics to the business curriculum. Business Horizons, 9-15.

Huber, C. E. (1979) The promise and perils of business ethics. Washington, D.C.: American Association of Colleges.

Jennings, M. M. (1992). How ethical are you? Business Credit, 32-33.

McMahon, T. (1975). Report on the teaching of socio-ethical issues in collegiate schools of business. Chicago, IL: Loyola University.

Economic Damage Awards: Procedures and Methods

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ABSTRACT

This paper reviews the generally utilized methods of calculating economic loss, including a number of models proposed as general standards, reviewing the general issues involved, an explanation of common practices, and comparison of each.

INTRODUCTION

The American judicial system is undergoing an explosion of tort litigation that threatens to seriously impair an already overburdened court system. The rapid rise in the volume of tort litigation impacts a wide spectrum of interests and social systems. Plaintiffs wrongfully injured as a result of the negligence of others rightfully deserve to be fully compensated. Yet personal injury suits can be extremely complex, often involving multiple defendants and intricate evidentiary presentation involving sophisticated technical, scientific, and economic analyses.

The assessment of damage awards thus has important individual and social/economic consequences, and the calculation of economic loss, or future wages lost by an injured party who has been partially or completely disabled, represents a crucial portion of possible damage a plaintiff may receive. Determining economic losses therefore serves to strike a balance among fairness to both the plaintiff and defendant, accuracy, and ease-of-use.

DAMAGE AWARDS AND ECONOMIC LOSS

The recoverable elements of damage include non-economic elements, such as pain and suffering, loss of consortium (to the spouse of the injured party), compensation for the future loss of enjoyment of life, and punitive damages awarded as a social statement on the undesirability of negligent behavior (Epstein, 1990, 732). Economic losses may include direct costs such as medical expenses, legal fees, and other costs associated directly with the injury in question, the loss of earnings, direct and fringe benefits incurred by the plaintiff's inability to work in the future, and in-kind dollar losses such as the plaintiffs family's welfare losses for which no monetary compensation has actually been made, including the value of household services that were previously provided by a member of the family before her injury and must now be paid to others to perform.

However, generally utilized methods of the calculation of lost future income remain highly speculative, and subject to the vagaries of contention regarding the evidence used to generate these estimates, which may include long range forecasts of economic, social, and technological trends. The courts struggle with economic theory and evidentiary problems: one court has gone so far as to describe its tort litigation as being "converted into a graduate seminar on economic forecasting."[1]

The basis of calculating economic loss is the generation of an estimated stream of income -- an estimate of what earnings will be in future years, over the life of the injured party, approximating his work career had it not been impaired or ended. The current wages of the injured party form the basis for all future estimates of lost earning capacity. However, different jurisdictions handle differently the treatment of increases that may have occurred during the plaintiff's career, had it not been cut short. No wages remain constant; however, the source of wage increases may be the subject of considerable litigation. Real wage increases may be the result of promotions, experience, and general capability, or specific talents of the injured, expressed as increases in salary over time. Real wage increases may also be attributable to negotiated wage increases as a part of a contractual obligation with an employer. *Societal factors* relating to wage increases over the career of an individual may be attributable to inflation, in the form of general cost-of-living adjustments, or the result of productivity increases that may raise wages for workers across an industry because of technological or broader economic forces.

Estimating the income stream must also take into account the probable work life of the plaintiff, that is, how long he/she could be expected to continue working had the accident not occurred. Retirement age in this portion of the estimate has usually been assumed in most jurisdictions, with the burden falling to the plaintiff to prove that he/she may have planned, and been able, to remain in the work force longer. The level of disability determines the percentage of the income stream to be paid to the plaintiff. Under U.S. tort law, most jurisdictions require that if the plaintiff is capable of employment after injury, she must mitigate the damage award by seeking the employment of which she may be capable. If the injury is determined only to partially affect the plaintiff's capacity to work in the future, the lost income award will reflect this fact by discounting the award for the level of disability.

The second major element of traditional income stream analysis includes the effects of inflation upon future wages earned by the plaintiff'. Inflationary rises in prices devalues income earned, so that damage awards for lost income must be compensated upward appropriately.

Since the award is made in a lump sum at the end of the trial, it must be *discounted to present value*. Present value states the concept that $1.00 paid now will be worth more in the future if invested, and forms the most contentious element of lost future wage estimates. "The theory of award calculation is that the plaintiff should be awarded a sum which, through investment, would yield over time a series of payments that mirror or replicate the lifetime earning capacity of the tort victim that was lost due to the tortious conduct of the defendant" (Depperschmidt, 1996). Awarding

the plaintiff with the *full* monetary value of her projected stream of income would be to award her a windfall, on the assumption that this money may receive a return on investment over and above the actual income. If awarded the full value of her estimated future income stream, the plaintiff would enjoy both the value of the award, and any interest earned on it.[2] Remember, the goal of the award is to place the plaintiff in *exactly* the same position she would have been were it not for the accident.

The rate at which an award must be discounted, or *discount rate*, rests on the determination of future interest rates, or the expected rate of return which the plaintiff can expect from her award. If interest rates are overestimated, the discount rate utilized will rise and the plaintiff may be under compensated if actual interest rates do not approximate the interest rate assumed in the calculation. Mathematically, the award value (AV) may be presented as:

$$AV=\sum_{i=1}^{n}\left[W_o*\left(\frac{1+g_w}{1+d}\right)\right]*SL$$

Where:

W_0 = actual annual wage prior to time of loss.

g_w = actual annual wage growth rate.

d_{TB} = actual 3-Month Treasury Bill

n = number of years of working life remaining.

SL = the joint probability of being alive, and in the labor force.

In 1967 the "total offset" method, often called the "Alaska" method, was first introduced in *Beaulieu v. Elliott* (Mukatis and Widicus, 1986, 1131). *Beaulieu* held that no discount rate should be applied to damage awards, as market interest rates were offset completely by price inflation and real wage inflation; in the judgment of the court interest rates and inflation fluctuated, but remained nearly equal to one another. Alaska was the first state to require total offset as a matter of law. The total offset method simplifies the calculation of expected loss to wages of the injured at the time of injury multiplied by the expected work life and percentage of disability. A number of states followed suit, reasoning that by eliminating any discount to present value, the interests of litigants and a speedy trial could be maintained. The Alaska courts subsequently refined this method in *State v. Guinn*,[3] allowing future earning increases to be entered as a component of lost earning estimates.

Pennsylvania utilizes a variation of the Alaska method developed under *Guinn*. In *Kaczkowski v. Boulbasz*,[4] the Pennsylvania courts first asserted that inflation and future interest rates offset each other completely, but allowing for future productivity, real and social, to be included in the income stream. The Pennsylvania method has also allowed taxes and work related expenses

(transportation, special clothing, etc.) to be taken out of the total future income stream estimate.

The estimation of income stream may include projections or forecasts of the injured's future earning potential, changes in productivity or other macroeconomic forces that affect wage income, and future interest and inflation rates over the estimated work life. The authors recognize that under-compensating injured individuals and their families is not in the best interests of justice. However, consistently overcompensating injured plaintiffs may have long term negative economic consequences in the form of additional social costs.

THE COURTS AND LOST INCOME ESTIMATION METHODOLOGY

The formulae and evidentiary approaches used to estimate lost income vary between jurisdictions, and although generally the product of state case law, have received special attention from the federal courts. Although differences in application may be significant, the conceptual problems involved are identical to all methods. Also, certain jurisdictions mandate the calculation methodology, and evidence allowed at trial, while others remain flexible (Mukatis and Widicus, 1986, 1131). Three approaches define the evolution of accepted estimation methodologies: the traditional, middle ground, and evidentiary approaches.[5] The traditional approach barred the impact of further inflation and productivity from all consideration of lost earning capacity, typified in Johnson v. Penrod Drilling Company.[6] Johnson has since been overruled.

The "middle ground" approach allowed the introduction of the effects of productivity and inflation on lost future earnings, but prohibited the plaintiff from utilizing expert testimony to defend his/her use in the estimation, leaving these considerations to the trier of fact - judge or jury - (James, 1984). Evidentiary methods, accepted throughout most states, and at the federal level, permitted the use of wage growth, interest rates, and inflation, bolstered by expert testimony.

The primary source of contention regarding determination of lost future income centers on the determination of offset, or the discount rate applied to the award . Though a plaintiff may gain additional income through investing an award (thereby requiring a discount to present value), inflation continually eats away at the interest payments. As interest rates go up, an accurate award makes a larger discount to present value, conversely, as inflation rates rise, the award must be increased. The relationship of these opposing economic forces must be accounted for in a proper award settlement.

Inflate-discount approaches perform separate forecasts of both market interest rates and inflation, in independent series. The evaluation is typically based on historical analyses, and the difference between the two rates, or offset, is used to calculate a discount factor which is then applied to the estimates of wage growth and work life for the injured plaintiff.

CONCLUSION

The calculation of lost future income remains highly speculative, and subject to the vagaries of contention pertaining the evidence used to create these estimates, which may include long range forecasts of economy, social and technological trends. A statistical comparison of a number of methods demonstrates the wide latitude of values possible when compared against a baseline of real earnings over time. Comparing alternative methods begins with constructing an individual wage earner, who we will assume has been completely disabled, and shows her real wage growth through a twenty year period. Though for an individual these wage rates would depend on individual factors, for the sake of comparison, these average rates are used in all methods requiring actual wage data.

END NOTES

[1]Doca v. Marina Mercante Nicaraguense, South America 634 F.2d 30, 39 (C.A. 2, 1980).

[2]The present value formula is as follows: *Where:* PV equals the present value of $1.00, n the number of years until payment is made, and i the uniform rate of interest applicable during the period. *See* Epstein, 1990, p. 748.

[3]555 F.2d 530 (Alaska 1976).

[4]491 Pa. 561, 421 A.2d, 1980, p. 1027.

[5]Prince v. Lot, 369 Mich. 606, 120 N.W. 2d 780 (1963), cited in William P. Jennings & Penelope Mercurio, "Selection of an Appropriate Discount Rate in Wrongful Death and Personal Injury Cases, Journal of Contemporary Law, Vol. 14, 1988, pp. 195-1991.

[6]510 F.2d 234 (C.A. 5, 1975), overruled by Culver V. Slater Boat Co., 688 F.2d 280 (C.A. 5, 1982).

REFERENCES

Depperschmidt, T. O., "The Problem of Inflation and the Offset 'Solution' in Tort Damage Awards," Memphis State University Law Review, July, 1986.

Epstein, R. A., "Cases and Materials on Torts," Little Brown & Company, 1990.

James, A., "Inflation: Where is Its Place in the Damages Equation?" 13 Brief 27, The American Bar Association, 1984.

Mukatis, W. A., and Widicus, W., "Toward Just Compensation: A Statistical Comparison of the Total Offset Method of Valuing Lost Future Earnings Awards and United States and Supreme Court Methods," Temporary Law Quarterly 1131, 59, 1986, 1131.

Accounting for the Impact of Subsidiary Stock Transactions

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ABSTRACT

Two alternative methods, the bonus and the parent-transaction-equivalent methods, are described and illustrated here to account for the impact of subsidiary stock transactions. In addition to providing a coherent link between accounting for partnerships and accounting for corporations, the bonus method provides support for the traditional equity adjustment and the parent-transaction-equivalent method supports the increasing popular gain/loss recognition for the impact.

INTRODUCTION

Despite call by accountants (see Nemec, 1973) for its resolution by the financial accounting authorities, accounting for the impact of a subsidiary's stock transactions remains an unresolved issue. The Financial Accounting Standards Board (FASB) is currently addressing the issue in its 1991 Discussion Memorandum, "Consolidation Policy and Procedures". Traditionally, a balance sheet approach is adopted by treating the impact as an equity adjustment. However, the accounting profession currently is leaning toward an income statement approach by recognizing a gain/loss. This latter trend is also reflected in the more recent editions of advanced accounting textbooks (Fischer and Taylor 1995; Jensen, Coffman, Stephens & Burns, 1994; Pahler & Mori 1994). The two methods introduced here will shed some light on why this is an important and thorny issue.

The textbooks traditionally use what might be called the before-after method which entails the computation of the parent's interests in the book values of the subsidiary's net assets both immediately before and after a transaction. The difference is treated as equity adjustment. This method is simple and direct but provides no insight about the nature of the impact, let alone how it should be treated. The objective of this paper is to describe and illustrate the bonus and the parent-transaction-equivalent methods that offer some insights about the nature as well as the components of the impact. These two methods also call into question the purchase differential as determined under the before-after approach.

To focus attention on the concepts to be discussed, it will be assumed in the following that no unexpired purchase differential exists immediately prior to the transaction under consideration. The remainder of the article is organized in the following way. The next two sections describe and illustrate the bonus method and the parent-transaction-equivalent method in sequence. The final section presents the concluding remarks.

THE BONUS METHOD

The bonus method as it relates to partnership accounting is well covered in advanced accounting textbooks (see Engler, Bernstein & Lambert, 1995) and, hence, will not be discussed here. Under this method the parent and the minority are considered as partners of the consolidated entity; the method makes it explicit that subsidiary stock transactions are capital transactions, and as a result, offers support for equity adjustment. This view is consistent with economic unit consolidation theory and is in accord with the FASB's position

(1985, para.254). This method will be described and illustrated for the sale of additional shares by a subsidiary to both its parent and other parties.

When a subsidiary sells additional shares, the book value per share after the sale equals the weighted average of the sale price per share and the pre-sale book value per share. The equity of the new shares (BVN) equals the number of shares sold multiplied by the book value per share after the sale. The total bonus involved in the transaction equals the difference between the proceeds and the BVN. No bonus is involved if the sale price per share equals the pre-sale book value per share. If the sale price per share is greater, there is a bonus paid to the old shares by the new shares. On the other hand, if the sale price per share is less, there is bonus paid to the new shares by the old shares. These are illustrated in Table 1.

Table 1

Bonuses at various Sale Price per Share (sp)

	Sale Price per Share		
	$ 40	$ 50	$ 60
New book value per share[a]	$ 48	$ 50	$ 52
Proceeds from new shares	$10,000	$12,500	$15,000
Equity of new shares	12,000	12,500	13,000
Bonus to old (new) shares	$(2,000)	$ 0	$ 2,000

Note. Assume that company S has 1,000 shares issued and outstanding with book value of $50 per share. Company P owns eighty percent of these shares acquired at book value. S issues 250 additional shares.
[a]((50*1000+sp*250)/1250)

The impact on the parent will be illustrated only for the case where the sale price exceeds the pre-sale book value. Notice that, in this case, there is bonus paid to the old shares by the new shares. The purchase differential of the parent's new shares, i.e., the excess of the proceeds paid over the equity of its new shares, equals the bonus paid by its new shares. The parent's investment and equity account should be increased by the bonus received by its old shares. However, the change in the parent's equity in the subsidiary equals the equity of its new shares plus the bonus received by its old shares. Thus, under the before-after approach, the purchase differential for the parent's new shares will equal the difference between the bonus paid by its new shares and the bonus received by its old shares. When the parent purchases more than its pro rata share, the bonus paid by its new shares exceeds the bonus received by its old shares and a positive purchase differential results. On the other hand, if the number of new shares purchased by the parent is less than its pro rata share, the bonus received by its old shares will exceed the bonus paid by its new shares. Hence, a negative purchase differential results! This is obviously counter-intuitive since the price per share paid exceeds its book value. Of course, if the number of shares purchased by the parent equals its pro rata share, then the two bonuses exactly offset each other, no purchase differential results under the before-after method. These points are illustrated in Table 2.

Table 2

Bonus Method and Before-after Method

	Percent of new shares issued to P		
	40%	80%	90%
S's equity prior to new issue	$ 50,000	$ 50,000	$ 50,000
Proceeds from new issue	15,000	15,000	15,000
S's equity after new issue	$ 65,000	$ 65,000	$ 65,000
Bonus Method			
Proceeds paid by P	$ 6,000	$ 12,000	$ 13,500
P's new shares' equity	$ 5,200 [a]	$ 10,400 [b]	$ 11,700 [c]
Purchase differential	$ 800	$ 1,600	$ 1,800
Bonus received by P's old shares[d]	$ 1,600	$ 1,600	$ 1,600
Bonus paid by P's new shares	$ 800 [e]	$ 1,600 [f]	$ 1,800 [g]
Before-after Method			
Proceeds paid by P	6,000	12,000	13,500
P's equity in S:			
prior to new issue[h]	$ 40,000	$ 40,000	$ 40,000
after new issue	$ 46,800 [i]	$ 52,000 [j]	$ 53,300 [k]
Increase	$ 6,800	$ 12,000	$ 13,300
Purchase differential	$ (800)	$ 0	$ 200

Note. Assume that company S has 1,000 shares issued and outstanding with book value of $50 per share. Company P owns eighty percent of these shares acquired at book value. S issues 250 additional shares at $60 per share.

[a]$65,000*8% [b]$65,000*16% [c]$65,000*18% [d]$2,000*80%
[e]$2,000*40% [f]$2,000*80% [g]$2,000*90% [h]$50,000*80%
[i]$65,000*72% [j]$65,000*80% [k]$65,000*82%

PARENT-TRANSACTION-EQUIVALENT METHOD

This method treats each subsidiary's transaction of its own stock to be equivalent to the parent's sale (purchase) of a portion of the subsidiary's net assets to (from) external party. Consequently, it offers support for the gain/loss recognition recommended by the AICPA (1980) and the Securities and Exchange Commission (SEC, 1983, 1989). This approach is consistent with the proportionate consolidation theory. This method is briefly illustrated in the advanced accounting textbooks by Beams (1988, p.321) and Fischer and Taylor (1995, pp.492-4) for the special case when subsidiary sells new shares to minorities only; However, neither indicates whether the method is applicable in other situations. In fact, in Beams' discussion of "Treasury Stock Transactions by a Subsidiary", he reverts to the traditional before-after approach. On the other hand, Fischer and Taylor (1995, pp.499-501) actually treat a subsidiary's treasury stock purchase to be identical to the parent's purchase of additional interest and ignore its impact on the minority interest. This treatment will result in misstatement of the interests of both the parent and the minority.

The equivalence between a subsidiary's stock transaction and the parent's transaction in its ownership interest in the subsidiary can indeed be established for all subsidiary stock transactions and the accounting treatment given by Fischer and Taylor, Kemp and Phillips

(1989, p.471), and Larsen (1991) can be shown to be inappropriate. However, the method will be described and illustrated only for the sale of additional shares by a subsidiary to both its parent and other parties at above book value.

The transaction is treated as both a sale and a purchase from the parent's perspective. The purchase part is obvious. The parent, being an owner of existing shares, is considered to have sold a portion (equalling the reduction of percent of interest due to the increase in total shares) of its old ownership interest in return for its ownership interest in the proceeds obtained from the new shares. There is a gain from the implicit sale. The reporting of a gain could cause uneasiness among some accountants because, in appearance, the parent is making a purchase only. The purchase differential of the its new shares is, by definition, the difference between the proceeds paid and its new shares' equity in the subsidiary. Under the before-after method, the gain is netted against the actual purchase differential and the difference is treated as the purchase differential of the new shares. If the parent purchases its pro rata share of the new shares, then it can be demonstrated that the gain equals the purchase differential and, consequently, there will be no purchase differential under the before-after approach. This is illustrated in Table 3.

Table 3

Parent-Transaction-Equivalent Method

	Percent of new shares issued to P		
	40%	80%	90%
P's old shares' equity in S's old net assets:			
prior to new issue[a]	$ 40,000	$ 40,000	$ 40,000
after new issue[b]	32,000	32,000	32,000
Decrease	$ 8,000	$ 8,000	$ 8,000
Proceeds shared by P's old shares[c]	(9,600)	(9,600)	(9,600)
Old shares' gain	$ (1,600)	$ (1,600)	$ (1,600)
Proceeds paid by P	$ 6,000	$ 12,000	$ 13,500
P's new shares' equity	5,200	10,400	11,700
Purchase differential	$ 800	$ 1,600	$ 1,800

Note. Please see the note to Table 2.
[a]$50,000*80% [b]$50,000*64% [c]$15,000*64%

This concludes the discussion of the methods. The two approaches are intrinsically equivalent. However, they adopt different views and interpretations of a subsidiary's stock transactions. As a result, different accounting treatment is supported by each approach.

CONCLUDING REMARKS

In this paper the accounting for the impact of subsidiary stock transactions is examined from two different conceptual approaches. It is seen that the bonus method is consistent with the entity theory's view of consolidation and as such, favors the equity adjustment. The parent-transaction-equivalent method, on the other hand, is consistent with the proprietary theory's view and as such, favors the gain/loss recognition. Since the view of consolidation for current accounting practice is a hybrid of the two, small wonder that controversy exists with respect to how to account for the impact. Davis and Largay (1988, 1989) provided some empirical evidence of manipulation of income by parent company's management through subsidiary stock transactions. The equity adjustment approach could prevent such manipulation, and is consistent with the FASB's position. Thus, the bonus method, which entails equity adjustment, is the preferable choice to account for the impact of subsidiary stock transactions.

REFERENCES

AICPA Accounting Standards Executive Committee (1980). Accounting in Consolidation for Issuance of a Subsidiary's Stock. Issues Paper.

Baker, R. E., V. C. Lembke and T. E. King (1994). Advanced Financial Accounting (2nd ed.). New York: McGraw-Hill Book Company.

Beams, F. A. (1988). Advanced Accounting (4th ed.). Englewood Cliffs, New Jersey: Prentice Hall.

Davis, M. L. and J. A. Largay III (1988), "Reporting Consolidated Gains and Losses on Subsidiary Stock Issuances," The Accounting Review, 348-363.

—— and ——. (1989, June 12), "SAB 51, Where Are You?" Barron, 16-17.

Engler, C., L. A. Bernstein and K. R. Lambert (1995). Advanced Accounting (2nd ed.). Homewood, IL: Richard D. Irwin, Inc.

Financial Accounting Standards Board (1985). Elements of Financial Statements (Statement of Financial Accounting Concepts NO. 6). Stamford, Connecticut.

Financial Accounting Standards Board (1991) Consolidation Policy and Procedures (DISCUSSION MEMORANDUM, Financial Accounting Series No. 107-A).

Fischer, P. M. and W. J. Taylor (1995). Advanced Accounting (6th ed.). Cincinnati, Ohio: South-Western Publishing Co.

Jensen D. L., E. N. Coffman, R. G. Stephens and T. J. Burns (1993). Advanced Accounting (3rd ed.). New York: Random House.

Kemp, P. S. and M. E. Phillips (1989). Advanced Accounting, New York: Wiley & Sons, Inc.

Nemec, M. J. (1973), "Reporting in Consolidated Statements the Sale of Subsidiary Stock," CPA Journal, 214-217.

Pahler, A. J. and J. E. Mori (1994). Advanced Accounting (5th ed.). Chicago, IL: Harcourt Brace Jovanovich, Publishers.

SEC Staff Accounting Bulletin. No.51, 1983 & No.84, 1989.