

The Fischer Black Method of Evaluating Accounting Alternatives Applied to Currency Translation Methods

Paul Holt, Texas A&M University, Kingsville

There is a massive foreign currency translation literature, but virtually no empirical research exists that tests alternative translation methods against normative criteria. This study compares three translation methods using the Black method of evaluating accounting alternatives. The translation method that performed best in this normative test was a price parity method, a method that has never been required or allowed under U.S. GAAP.

Black (1993) suggested that an important purpose of financial statements should be the maximization of the association between reported earnings and firm value. Reported earnings should be smoothed, through selection from among accounting alternatives, so that the time series of reported earnings would approach permanent earnings. As a result, reported earnings, scaled on price, would generate a single summary figure that would have the same implication for value across firms. Further, disclosures that could put a company at a competitive disadvantage would not be needed.

To determine which of two accounting methods is better, Black (1993) suggested the selection of the method that generates the more stable earnings/price ratio. He proposed a rank ordering of a sample of companies by earnings/price ratios. The first quartile average is divided by the third quarter average to give a measure of variation; the lower the variation, the greater the relationship between reported earnings and value.

The current study applies this methodology to the unresolved problem of which foreign currency translation method, the remeasurement method, the current rate method, or the price parity method, best associates reported earnings and value.

Unsolved Problem

Standard-setting bodies in the United States have required, at different times, four different translation methods. First, the current-noncurrent method was required; then the monetary-nonmonetary method in 1965; then a remeasurement method in 1975; and the current rate method in 1981. ASC 830 now requires either the remeasurement method or the current rate method, depending on circumstances, as described below.

Many multinational companies, domiciled in various countries, use the remeasurement method for non-integrated subsidiaries and the current rate method for subsidiaries more closely integrated with the parent company (Holt, 2003). In the United States, ASC 830 requires either the current rate method or the remeasurement method. When the functional currency is the same as the currency of the subsidiary's books and records, the current rate method is required. When the currency of the books and records of the subsidiary is not the same as the functional currency, the remeasurement method is required.

The translation policy choices for Generally Accepted Accounting Principles (GAAP) in the U.S., as well as in other countries, have always been made with virtually no empirical knowledge of just what happens to consolidated financial statements when foreign accounts are translated by different methods. Houston (1986) observed that no translation method that has been used in the past has been demonstrated to be superior to other methods in any theoretical way. Clearly there is no closure on the foreign currency translation and consolidation problem in the United States, let alone worldwide.

Obstacles to Empirical Research

The lack of understanding of the effects of alternative translation methods on the relationship between reported earnings and value is not surprising. Companies use one translation method at a time, some feasible methods have never been used, and the effects of translation are buried in consolidated accounts. Unraveling these effects for a reasonable number of sample firms, for research purposes, would be a difficult project. Moreover, the temporally referenced item-by-item data required to construct comparable results under alternative translation methods are not available.

Purpose of the Study

There are a number of possible normative criteria against which to compare accounting alternatives, but this study

focuses on the relationship between reported earnings and price to determine which translation method gives the more stable relationship between price and earnings, in accordance with the Black model. The present study overcomes the obstacles to empirical research, described above, with a unique methodology.

Previous studies have made various examinations of translation methods that, at different times, have been required by standard-setting bodies. They do not consider methods that have never been used, but which may be viable, even superior to other methods. Accordingly, the price parity method, a viable method which has never been required or allowed by standard setting bodies is included in the study.

LITERATURE REVIEW

The foreign currency translation literature is large and spans something like eight decades. Much of that literature is comprised of theories and opinions, and there are hardly any empirical studies that describe what actually happens when different translation methods are used, and there are virtually no empirical studies which test different translation methods against any normative criterion.

A small number of studies are relevant to the notion of using the relationship between reported earnings and price to determine the superiority of one accounting method over another. Beaver and Dukes (1972) used this approach with a focus on the issue of interperiod tax allocation. May and Sundem (1973) applied similar tests of accounting policy decisions. Also relevant were Beaver and Dukes (1973) and Black (1993).

During the past decade, a variety of foreign currency translation studies have appeared. Representative of these are the following:

Pinto (2002) applied game theory to observe evidence of a degree of managerial opportunism in currency translation method preferences and suggested a lack of clarity in FASB's classification scheme.

Louis (2003) empirically examined the association between changes in firm value and foreign translation adjustments for manufacturing companies. The study found that the translation adjustment is associated with a loss of value instead of an increase in value, because for firms in the manufacturing sector, GAAP for foreign currency translation generally produces results opposite to the economic effects of exchange rate changes.

Pinto (2005) tested the value relevance of foreign currency translation adjustments in an earnings and book value model and observed that foreign currency translation adjustments are significantly value relevant when their parameter estimates are allowed to vary in the cross-section.

Iatridis et al (2006) found that early adopters of the U.K. Statement of Standard Accounting Practice No. 20 "Foreign Currency Translation" were generally larger firms. Managements tended to adopt when the adverse economic consequences of adoption were likely to be minimal. They deferred adoption of the standard to influence their financial performance. The timing of the adoption is a matter related to the objectives of the managers in association with the market and economic conditions (Iatridis et al, 2005a). Income smoothing could be mitigated by appropriate standardization of accounting practice.

Iatridis (2005b) empirically studied the U.K. stock market response to the implementation of the 1983 U.K. Statement of Standard Accounting Practice (SSAP) No. 20. The stock market appeared to have anticipated the implementation of SSAP 20. There was a positive stock market response in the official year of adoption, resulting from the income-stabilizing effects of the standard. The study also observed a significant relationship between stock returns and the accounting measures in the actual adoption period of the aggregate set of adopters.

Kwon (2005) showed that foreign investors generally price exchange risk differently from local investors, and that the source and magnitude of differences in exchange risk pricing vary significantly across countries.

Liu (2006) used an accounting-based equity valuation model for multinational firms to examine the forecasting and valuation properties of foreign currency translation gains and losses. The study found that translation gains and losses could be subdivided into a core component and a transitory component. The combined effect was that translation gains and losses were more transitory than transitory earnings.

Chambers et al. (2007) provided evidence that other comprehensive income is priced by investors on a dollar-for-dollar basis. Two components of other comprehensive income, foreign currency translation adjustment and unrealized gains and losses on available-for-sale securities, were found to be priced by investors. But the study suggested that investors pay greater attention to other comprehensive information reported in the statement of changes in equity, rather than in a statement of financial performance.

Holt (2006) empirically compared the variability of reported earnings resulting from eight foreign currency translation methods. The current rate method with non-deferral of translation gains and losses resulted in the highest average variability of earnings, and price parity methods resulted in lower variability than exchange rate methods as reflected by the average coefficients of variation of the study companies. However, results were highly firm specific.

METHODOLOGY

The purposes of this study were achieved by taking the following steps:

Sixty U.S. companies were selected at random to build a data base of pre-translation financial statements. To be eligible for inclusion in the sample, a company must have had annual financial statements available for ten consecutive years ending in 2009.

The financial statements of each of the sixty U.S. companies were translated from U.S. dollars to euros, using each of the three translation methods described below, for each of the five years 2005-2009, a total of 900 financial statement translations. Pre-translation accounting numbers were needed for ten years (2000-2009) in order to generate the temporal characteristics of certain accounts, such as fixed assets.

For each of the three translation methods, the translated numbers were used to calculate the reported earnings to price ratio for each of the five years, for each of the sixty companies. The market value per share was the end-of-the-year price per common share, translated into euros at the spot exchange rate.

In each of the three translation methods studied, there is a translation gain or loss in each accounting period. This gain or loss was included in the reported earnings number for study purposes. During the SFAS #8 and SFAS #52 era, the issue was whether these gains and losses should be included in reported earnings or deferred by bypassing the income statement and reporting them on a separate line on the balance sheet. In more recent years, the translation gains and losses are shown in other comprehensive income on the income statement, following the net income number.

The present study does not attempt to resolve the issue of where these translation gains and losses should be shown on the financial statements. But it is reasonable to suppose that an efficient market would see through the location of these numbers, as long as the amounts of the gains and losses are disclosed. Including them in the reported earnings for study purposes provides appropriate numbers for comparing the three translation methods against the Black normative criterion.

For each year, and for each of the three translation methods, the reported earnings to price ratios were rank ordered and arranged into quartiles (fifteen companies in each quartile). The average of the first quartile numbers was divided by the average of the third quartile number, in accordance with the Black methodology, for each of the three translation methods, for each of the five years in the study.

Determination of Temporal Characteristics

All foreign currency translation methods require that certain accounts be translated at the historical rate, the exchange rate that was in effect at the point in time an asset was acquired, a liability was incurred, a revenue or expense was recognized, or an element of owners' equity was recorded. Such a point in time is referred to in the present study as a "temporal reference." Since some account balances (such as fixed assets and long-term debt) are the result of numerous transactions over a considerable period of time, such account balances are made up of "components," each consisting of a dollar (or other currency) amount and a temporal reference. The set of all such components is referred to in the present study as the "temporal characteristics" of a specific account balance. This set thus represents and describes a distribution of ages and related currency amounts of the account balance.

Before translating these companies' financial statements, it was necessary to determine these temporal characteristics of the pre-translation reported accounting numbers. Obtaining this information directly from the companies selected for the sample, for all the years studied, was impractical. This data problem has always been a major barrier to empirical research in foreign currency translation. This study overcame this barrier by estimating the temporal characteristics with a specially developed and tested estimation method.

Three studies, relevant to the estimation of temporal characteristics, were Petersen (1971), Davidson et al. (1976), and Parker (1977). The purpose of these models was to generate estimated general price level data. Ketz (1977) provided detailed explanations of these three models, and Ketz (1978) tested their validity. He concluded that each of the three models is sufficiently accurate for research purposes.

But the three models tested by Ketz are limited in that they estimate only the average ages of assets and liabilities. For the purposes of the present study, an estimation method that results in a distribution of ages for such accounts rather than merely an average age was desired. This estimation was most critical for fixed assets because of the relative size of fixed asset numbers. Fixed assets are translated at historical exchange rates under the remeasurement method, but at the current rate under the current rate method.

A sophisticated method of estimation of temporal characteristics was developed for this study based on the assumption that asset retirements occur in FIFO fashion and using published purchase and retirement data. Details of this estimation method are available in Holt (2012). The method was tested against 1,200 theoretical companies with the following results: 18 percent of the estimates resulted in a translation error of less than 1 percent, 79 percent in

errors of less than 5 percent, 99 percent in errors of less than 10 percent, and none of the estimates resulted in translation errors of more than 11.37 percent (Holt, 2012).

Translation Methods

This study examined two methods which encompass the history of GAAP in the United States as well as a price parity method. These three methods were as follows: the remeasurement method of ASC 830, the current rate method of ASC 830, and the price parity method.

The translations were made from U.S. dollars to euros to generate the post-translation numbers needed to calculate earnings per share under each of the three methods studied.

These three translation methods were selected for the present study because they are viable methods, not specifically because two of them are required, under different circumstances, by U.S. GAAP. Many other, mechanically possible, methods could have been tested, but such methods (such as a current / noncurrent rate method) do not have a theoretical base.

Remeasurement Method (RM): The remeasurement method is required by ASC 830 when the currency of the books and records of a foreign subsidiary is different from the functional currency. Monetary assets and liabilities are translated at the current exchange rate, whereas nonmonetary assets and liabilities and stockholders' equity are translated at the historical exchange rate. Income statement items that are related to nonmonetary assets and liabilities are translated at the same rate used for the related balance sheet translation. Other revenue and expense accounts which occur evenly over the year may be translated at the weighted-average exchange rate. The objective of the method is to preserve the underlying accounting principles of historical cost so that consolidation is possible on a consistent basis (Demirag, 1987).

Current Rate Method (CR): The current rate method is required by ASC 830 when the subsidiary's functional currency is different from the reporting currency of the consolidated entity. In this method, all balance sheet items, with the exception of owners' equity, are translated at the current exchange rate. Owners' equity is translated at historical rates. Income statement items are translated at the exchange rate that was in effect when the transactions occurred, although those that occur evenly over the year may be translated at the average exchange rate.

Price Parity Method (PP): Each of the exchange-rate-based translation methods has its supporters and detractors, and none has been shown theoretically or empirically to be superior to the others under all circumstances. Patz (1978) suggests this long-standing dilemma may result from the use of exchange rates themselves. There is no rigorous defense in existence for the use of exchange rates, and exchange rates are not related in any clear way to accounting measures. Indeed, in 1974, the Committee on International Accounting called for an investigation of the purchasing power parity (PPP) theory approach as a possible alternative to exchange rate methods. Such a PPP-based theory of translation is developed in Patz (1977) and the resulting Price Parity Method is described in full in Patz (1981).

Briefly, the PPP theory of foreign currency translation assumes that the property to be measured is local command over goods and services as expressed by currency unit accounting measures. Under the PPP system, foreign accounts are restated in the reporting currency, but using price parity relative purchasing power indices instead of exchange rates, under a temporal method approach, in an attempt to express command over goods and services with respect to the economy in which the entity functions. It is assumed that foreign subsidiaries do not exist solely for the purpose of generating cash flows to the parent, but rather for the maximization of economic power which can be defined as the size of assets held. The purpose of the existence of foreign subsidiaries is to maximize this command over goods and services in the foreign environment.

The present study applies the price parity theory of exchange rates as summarized in Officer (1982) in three propositions: (1) PPP is the principal determinant of the long-run equilibrium exchange rate, (2) the short-run equilibrium exchange rate in any current period is a function of the long-run equilibrium exchange rate in the sense that the latter variable is the principal determinate of, and tends to be approached by, the former, (3) the short-run equilibrium exchange rate in any current period is determined principally by PPP, with the former variable tending to equal the latter.

Parent Companies' Domiciles

Obtaining a meaningfully large sample of the financial statements of foreign subsidiaries prior to their translation and consolidation with the accounts of their parent companies is not practical. In this study, U.S. companies were used

as hypothetical subsidiaries of a parent company in a country that uses the euro, under the notion that there is no reason to conclude that they could not become so. Parent companies are not identified. The focus is on the subsidiary accounting numbers, resulting from three translation methods, prior to consolidation. But translation from dollars to euros would be necessary if the consolidated entity's reporting currency was the euro. Thus, the theoretical parent company could be domiciled in any of several countries which use the euro.

Several advantages attach to this approach beyond generating a sample sufficiently large to support generalization. The effects of transactions between parent and subsidiary which must be eliminated in translation and consolidation are not present. Also, any effects the actual use of a specific translation method might have in real parent/foreign subsidiary settings on management financing and operating decisions are avoided.

Some of the U.S. companies selected as hypothetical subsidiaries may themselves have foreign subsidiaries. Thus the accounts of these U.S. companies may already be affected by the currency translation of their own foreign subsidiaries. This factor is not considered a problem in the present study, inasmuch as in practice it is not at all unusual for a subsidiary to also be a parent.

The current rate method and the remeasurement method use exchange rates for translation. However, the price parity method uses relative price level data which varies from country to country, despite a common reporting currency (the euro). Accordingly, this study posits ten parent companies in each of six countries, Finland, France, Germany, Italy, the Netherlands, and Spain, which results in the application six different time series of price parity numbers. These particular six countries were selected at random from the population of countries which use the euro, and are presumed to provide a fair representation.

Results and Conclusions

Dividing the average of the first quartile's earnings/price ratios by the third quartile's earnings/price ratios, resulted in the following table, where CR is the current rate method, RM is the remeasurement method, and PP is the price parity method:

Table 1: Division of the Average of the First Quartile Earnings/price Ratio by the Average of the Third Quartile earnings/price Ratio

Year	CR	RM	PP
2005	H 2.203	2.196	L 1.928
2006	L 2.066	H 3.267	2.124
2007	2.120	H 2.208	L 1.818
2008	L 2.080	H 2.213	2.202
2009	2.119	H 2.169	L 2.110
Average	2.118	H 2.411	L 2.096

H indicates the method with the highest first to third quartile ratio for the year. L indicates the method with the lowest first to third quartile ratio for the year.

Relevant to the analysis is the fact that the time series of price parity numbers, dollars to euros, is significantly less variable than the exchange rate from dollars to euros, as indicated by the following table:

Table 2: Variances of Time Series Exchange Rates from US Dollars to Euros and Time Series of Price Parity Numbers of Six Selected Countries (Monthly Observations, January, 2001 - October, 2009)

	Exchange Rate	PP Finland	PP France	PP Germany	PP Italy	PP Netherlands	PP Spain
Variance	.0221	.0009	.0010	.0021	.0029	.0028	.0069
Rank by Variance	1	7	6	5	3	4	2

The variance of the time series of exchanges rates, dollars to euros, is clearly greater than the variance of the time series of price parity numbers of each of these six selected countries. This pre-study observation led the author to anticipate that the present study would show that the price parity method of translation would clearly be preferable, based on the Black normative criterion. This anticipated result was partially confirmed by the actual study results (Table 1), as PP appears to be the best translation method choice for three of the five study years (three years in which the use of PP resulted in the lowest first to third quartile ratio).

The remeasurement method, the translation method required in the U.S. by ASC 830, and in a number of other countries, when the currency of the foreign subsidiary's books and records differs from the functional currency, performed poorly compared to the current rate method and the price parity method. Its use resulted in the highest (least desirable) first to third quartile ratios in four of the five study years.

Limitations and Suggestions for Future Research

This study compared three translation methods, two of which are required in the U.S. by ASC 830, under differing circumstances, and one viable method, which has never been required or allowed, against only one normative criterion. Future studies should identify additional normative criteria and test translation methods against those criteria. Upon the completion of several such empirical, normative studies, it may eventually be possible to observe if one translation method consistently out-performs other methods, or if different translation methods are superior for different normative criteria. Further, because of the performance of the price parity method in the present study, price parity methods should be included in future empirical, normative studies.

REFERENCES

- Beaver, W., & Dukes, R. 1972. Interperiod tax allocations, earnings expectations, and the behavior of security prices. **Accounting Review**, 47(April), 320-332.
- Beaver, W., & Dukes, R. 1973. Interperiod tax allocation and depreciation methods: Some empirical results. **Accounting Review**, 48(July), 549-559.
- Black, F. 1993. Choosing accounting rules. **Accounting Horizons**, December, 1-17.
- Chambers, D., Linsmeier, T., Shakespeare, C., & Sougiannis, T. 2007. An evaluation of SFAS No. 130 comprehensive income disclosures. **Review of Accounting Studies**, 12(4), 557-593.
- Davidson, S., Stickney, C., & Weil, R. 1976. **Inflation accounting. A guide for the accountant and the financial analyst**. New York: McGraw-Hall.
- Demirag, I. 1987. A review of the objectives of foreign currency translation. **International Journal of Accounting Education and Research**, Spring, 69-85.
- Financial Accounting Standards Board. 1975. Accounting for the translation of foreign currency transactions and foreign currency financial statements. **Statement of Financial Accounting Standards No. 8**. Stamford, Connecticut: FASB.
- Financial Accounting Standards Board. 1981. Foreign currency translation. **Statement of Financial Accounting Standards No. 52**. Stamford, Connecticut: FASB.
- Holt, P. 2003. **International accounting**. Cincinnati, Ohio: Thomson Learning.
- Holt, P. 2006. The variability of earnings across foreign currency translation methodologies: An empirical comparison. **Southwest Business and Economics Journal**, 67-81.
- Holt, E. 2012. Estimation of temporal characteristics of accounts for empirical research. **Advances in Business Research**, 2(1), 231-237.
- Houston, C. 1986. "U.S. Management Hedging Practices Subsequent to the Adoption of SFAS No. 52 'foreign currency translation'." Unpublished Ph.D. dissertation. University of Washington.
- Iatridis, G., & Joseph, N. 2005a. A conceptual framework of accounting policy choice under SSAP 20. **Managerial Auditing Journal**, 20(7), 763-778.
- Iatridis, G. 2005b. An empirical investigation of the U.K. stock market response to the implementation of SSAP 20 'foreign currency translation'. **Investment Management & Financial Innovations**, 2(1), 108-126.
- Iatridis, G., & Joseph, N. 2006. characteristics of u.k. firms related to timing of adoption of statement of standard accounting practice No. 20. **Accounting & Finance**, 46(3), 429-455.
- Ketz, J. 1977. "A comparison of the predictability of business failure by the financial ratios of general price level statements with those of historical cost statements." Unpublished Ph.D. Dissertation. Virginia Polytechnic Institute and State University.

- Ketz, J. 1978. The validation of some general price level estimating models. **Accounting Review**, LIII(4), 952-960.
- Taek H., Bae, S., & Chung, J. 2005. Do foreign investors price foreign exchange risk differently? **Journal of Financial Research**, 28(4), 555-573.
- Liu, J. 2006. On international accounting valuation. **Journal of International Accounting Research**, 5(1), 67-87.
- Louis, H. 2003. The value relevance of the foreign translation adjustment. **Accounting Review**, 78(4), 1027-1047.
- May, R. & Sundem, G. 1973. Cost of information and security prices: Market association tests for accounting policy decisions. **Accounting Review**, 48(January), 80-94.
- Officer, L. 1982. **Purchasing power parity and exchange rates: Theory, evidence and relevance**. Greenwich, Connecticut: Jai Press.
- Parker, J. 1977. Impact of price-level accounting. **Accounting Review**, 52(1), 69-96.
- Patz, D. 1977. The state of the art in translation theory. **Journal of Business Finance and Accounting**, 4(3), 311-325.
- Patz, D. 1978. A price parity theory of translation: A reply. **Accounting and Business Research**, 44(1), 66-72.
- Patz, D. 1981. Price parity translation: Methodology and implementation. **Accounting and Business Research**, 207-216.
- Petersen, R. 1971. "An examination of the effects of changes in the general price level." Unpublished Ph.D. Dissertation, University of Washington.
- Pinto, J. 2002. Foreign currency translation method choice: Insights from game theory. **Journal of Applied Business Research**, 18(4), 25.
- Pinto, J. 2005. How comprehensive is comprehensive income? The value relevance of foreign currency translation adjustments. **Journal of International Financial Management & Accounting**, 16(2), 97-122.
-

Paul Holt is a professor of accounting at Texas A&M University, Kingsville. He received his Ph.D. in international accounting from Oklahoma State University. His current research focuses on descriptive and normative studies of foreign currency translation methodologies. He has published in *Advances in Business Research*, *American Journal of Economics and Business Administration*, *Journal of Theoretical Accounting Research*, *Southwest Business and Economics Journal*, *Accounting Forum*, and *Journal of Accounting and Finance Research*.