Inflation and Financial Statement Analysis in the International Accounting Classroom

DIANE A. RIORDAN and MICHAEL P. RIORDAN
James Madison University, Harrisonburg, Virginia, USA

This article provides an exercise for students to contemplate the effects of inflation during financial statement analysis. Even small amounts of inflation accumulating over time can grow to distort a company's reported financial position and results of operations. The growing economies in emerging markets, the international market for oil, and other economic factors threaten to increase inflation rates in the future. As a result of changing global conditions, interest in inflation accounting is expected to increase. The exercise we suggest in this article provides an efficient tutorial on the potential effects of inflation on financial statement analysis and on the application of International Accounting Standard 29 in hyperinflationary environments.

KEYWORDS inflation, hyperinflation, general price level accounting, IAS 29, financial ratio analysis

INTRODUCTION

Research studies investigating international accounting curricula identify the topics of inflation and financial statement analysis as important areas of study at the undergraduate and graduate levels (Sands & Pragasam, 1997, p. 194). As would be expected, the relative importance of the topic of inflation varies in perceived importance with the extent of overseas operations in countries experiencing high levels of inflation (Sands & Pragasam, p. 198). The International Monetary Fund (IMF) reports that,
although the recent rise in inflation can be expected to reverse in industrialized countries, inflationary pressures are mounting for emerging and developing economies. Inflation is being fueled by soaring commodity prices, above-trend growth, and macroeconomic policies (Dyer & Guha, 2008, p. 3). We encourage accounting faculty to introduce their students to the topic of inflation to prepare them for the challenges of financial statement analysis in this global business environment.

Adhikari, Flanigan, and Tondkar (1999) surveyed 194 U.S. schools and 70 non-U.S. schools and report a strong consensus among all respondents that the major obstacles to internationalization of accounting classes are an overcrowded curriculum and lack of faculty expertise. Zarb and Jagolinzer (2008) cite similar difficulties in internationalizing accounting classes, including a lack of adequate textbooks. Accounting faculty need assistance with teaching materials and time management in the classroom—not just words of encouragement—when adding international topics, such as inflation, to their lesson plans.

In this article we present an exercise we have developed for an International Accounting class to highlight the significant features of International Accounting Standard No. 29 (accounting for hyperinflation) and demonstrate the impact of inflation on financial statement analysis. The exercise can be introduced into general financial accounting classes, as well as the international financial accounting course. This flexibility is important because most accounting programs do not dedicate an entire course to international accounting and are integrating international topics into existing accounting classes as international financial reporting standards (IFRS) gain popularity in practice. The endorsement of IFRS for cross-listing purposes by the International Organization of Security Commissions and the European Union’s decision to require domestic-listed companies to use IFRS for consolidated accounts have provided a major boost to worldwide adoption of IFRS (Doupnik & Perera, 2009, p. 98). More than 100 countries now permit or require the use of IFRS for companies traded on their stock exchanges.1

U.S. accounting instructors have been slow to embrace any international topics in their classrooms (Beed & Shooshtari, 1998). Accountants lag behind the other business disciplines because until recently the Financial Accounting Standards Board (FASB) did not play an active role in working towards internationalization of financial standards. However, on August 27, 2008, the U.S. Securities and Exchange Commission (SEC; see http://www.sec.gov/news/press/2008/2008-184.htm) announced a proposal to develop a roadmap for U.S. users to adopt international financial accounting standards (Sogoloff, Madla, & Wolfe, 2008). One of the milestones in implementing IFRS will be education and training on IFRS in the United States and elsewhere.
Our exercise on IAS 29 that is currently used in the international accounting class as part of our international business major will also contribute to the internationalization of the accounting curriculum. Results can be achieved by devoting one class period and one exercise to exploring the impact of inflation with an abbreviated set of financial statements. This efficiency is important because current research provides evidence that instructors are pressed for time. Using an electronic spreadsheet as a tool to perform the computations is appropriate but optional because of the small number of calculations required to complete the exercise.

THE HISTORY OF INFLATION ACCOUNTING

Our tutorial begins with a brief history of inflation accounting. The history of standard setting across the globe provides evidence that interest in accounting for inflation wanes during periods of price stability. In 1979 the U.S. Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standard No. 33 (SFAS 33) requiring supplementary disclosures on both general purchasing power and current cost bases. By 1986, SFAS 33 was no longer mandatory in the United States after a cost-benefit analysis of applying the standard and a decline in the rate of inflation (Radebaugh & Gray 2002, p. 296). Statement of Financial Accounting Standard No. 89 on Financial Reporting and Changing Prices (SFAS 89) still provides an opportunity for companies to voluntarily illustrate the effects of general price level or specific price changes, but few companies make this election (Haskins, Ferris, & Selling, 2000, p. 425).

International standards experienced a similar history. As described by Doupnik and Perera (2007, p. 351), International Accounting Standard No. 15 (IAS 15) requiring supplementary disclosure on the effects of inflation was issued in 1981, made optional in 1989, and withdrawn in 2003. Adhikari et al. (1999), in the results of their survey of academic institutions, observed a similar waning of interest in the topic of inflation by international academics during the 1990s.

The U.S. Securities and Exchange Commission (SEC) only recently (2008) proposed a roadmap toward U.S. acceptance of International Accounting Standards (IFRS). However, as reported by Adhikari et al. (1999), as early as 1994 the SEC had decided to accept three international accounting standards on the topics of cash flow, hyperinflation, and business combinations for cross-border stock filings (Roberts, Weetman, & Gordon, 1998).

THE PURPOSE OF IAS 29

The purpose of IAS 29 is to establish standards for reporting in the currency of a hyperinflationary environment. When financial statements are not
restated for inflation, the company’s financial position and results of operation are misrepresented. Assets recorded at historical costs and expenses will be understated. According to Choi and Meek (2008, p. 248), distorted financials can lead to increases in taxation; pressure for increased dividends for shareholders and wages by workers; and other disadvantageous actions by host governments. If a company distributes its assets to meet these demands, it may not keep enough resources to continue its operation.

When restating historical costs to reflect inflation adjusted numbers, price level changes are measured by a cost ratio constructed of price indices. An index is used to translate sums of money paid in past periods to their purchasing power equivalents at the date the financial statements are prepared. The sales price of a basket of goods at the beginning of the year is used as the base for the relationship.

If a basket of goods sells for $15,000 at the beginning of the year and $20,000 at the end of the year, the year-end price index is $20,000/$15,000 or 1.33, and the base year index is 1. Price-level adjusted accounts do not represent the actual current cost of the specific items represented in the accounts. The historical cost numbers are restated in the new unit of measure based on general purchasing power at the end of the period. As explained by Choi and Meek (2008), when transactions occur uniformly throughout a period, a shortcut-price level adjustment can be used by using the ratio of the year-end index to the average general price level index for the year (p. 251).

The consumer price index is one of the most widely used general price level indices around the world, but because it is consumer-oriented, it may not reflect how inflation directly impacts a particular company (Radebaugh & Gray, 2002, p. 292). Some companies apply conversion factors based on changes in wholesale price indices. Applying any general price level index in performing the adjustment is one of the acknowledged limitations of general price level adjusted models.

WHERE HAS INFLATION PRESENTED IN THE PAST?

Major problems facing developing countries are: (a) high rates of inflation; (b) unstable national currencies; (c) heavy national debts and deficit spending; and (d) politicization of the decision-making process for development projects (Iqbal, 2002, p. 490). Iqbal explains that these problems actually are interrelated. Deficit spending fuels inflation; inflation leads to currency instability. When these conditions exist, they are not favorable to foreign capital. When foreign investors lose confidence they may withdraw investments and negatively impact the government’s ability to meet debt obligations. As examples, this phenomenon occurred in Mexico in 1994 and in many Asian countries in mid-1997.

South American countries have experienced episodes of hyperinflation, including Bolivia in 1985 and Argentina in 1989. Rates of inflation in Brazil have often exceeded 100% (Radebaugh & Gray, 2002, p. 289) and have been as high as 2,076% (Choi & Meek, 2008, p. 248). In 1976, a Brazilian company law required general indexation to restate historical costs in terms of current purchasing power (Radebaugh & Gray, p. 298). The index used was defined by law as the index recognized by the government for adjusting its own debt. Reflecting a pattern of withdrawing standards dealing with inflation in time of greater price stability, Brazil withdrew these requirements in 1996.

The economies of Eastern Bloc countries suffered high rates of inflation while transitioning from centrally-planned to market-based economies. For example, Poland experienced unprecedented change after 1989 (de la Rosa, Crawford, & Franz, 2004) as it moved from a centrally planned to a market-based economy. In general, extremely high rates of inflation destroy the value of a nation’s currency over a short period of time. In its 1991 currency reform, one new Polish zloty was exchanged for 10,000 old zloty. The story ended well for Poland, however, and as a result of its market reorganization, Poland became the first country in the region to rebound from transformational recession (Spillan & Ziemnowicz, 2001).

Significant pockets of inflation threaten economies worldwide. For example, Zimbabwe’s inflation rate topped 1,000% in 2006 (Choi & Meek, 2008, p. 248). Beta (2008) reports a current inflation rate for Viet Nam of more than 25%. However, even small amounts of inflation accumulating over time can affect the usefulness of the valuation methods provided by historical financial statements.

WHAT IS THE ECONOMIC CONDITION OF “HYPERINFLATION” THAT REQUIRES APPLICATION OF IAS 29?

Hyperinflation is the condition in an economy in which there is such an extreme rate of inflation that historically-based accounting statements become useless. Although no strict definition of hyperinflation exists, economists generally reserve the term to describe episodes where the monthly inflation rate is greater than 50% (Salemi, 2008). The threshold to
identify hyperinflation described in the international accounting standard is considerably lower.

Under IAS 29, hyperinflation is not an absolute determination, but rather is defined as a matter of judgment. The definition is guided by the following characteristics (Doupnik & Perera, 2007, p. 351):

- The general population prefers to keep its wealth in nonmonetary assets or in an alternative relatively stable currency.
- Credit transactions take place at prices that include expectations of a loss of purchasing power.
- Transactions between creditors, employees, and customers may become linked to price indices.
- The cumulative inflation rate over 3 years approaches or exceeds 100%.

During a period of inflation, holders of monetary assets (such as cash) suffer losses in purchasing power and holders of liabilities enjoy gains because they will pay back in ‘cheaper’ dollars. This gain or loss from holding monetary items is reported as an increment of gain or loss on the income statement prepared in a set of financials adjusted for the effects of general price level changes.

WHAT ARE THE REQUIREMENTS OF IAS 29?

Many countries, including the United States and Japan, prepare statements primarily on the historical cost basis which assumes the monetary unit is reasonably stable. When beginning with historical cost financial statements, all items in the income statement are restated by applying the change in the general price index from the dates when the items were initially recorded.

The gain or loss on net monetary position (net asset or liability) is included in net income. A monetary item on the balance sheet is either cash or another asset or liability that will be received or paid out in a fixed number of monetary units (Iqbal, 2002, p. 87). The monetary items are not restated in the balance sheet; rather these items are shown at their current or nominal amounts. Holding monetary assets, such as cash and accounts receivable, results in purchasing power losses during times of inflation. Liabilities, on the other hand, result in purchasing power gains. These purchasing power gains or losses are reported as part of the calculation of net income.

Nonmonetary items on the balance sheet are restated by applying the changes in the index to the carrying values since the date of acquisition or fair values on dates of valuation. The results of the exercise are demonstrated in Table 1 (restated financials). The steps required to restate the balance sheet to reflect general price level changes are:

1. Identify monetary and nonmonetary items on the balance sheet. (Note: At this point the instructor should explain how the purchasing power of
monetary assets is eroded during periods of inflation. The simple example of hiding cash under the mattress until it has lost its original value works quite well.)

2. Extend Monetary Items at their face (nominal) values to the restated balance sheet. Do not make any adjustments to these items for inflation prior to their presentation in the balance sheet.

3. Adjust the Nonmonetary Items for the change in general price level by multiplying each account by the adjustment ratio (Current Index/Historical Index). (Note: Nonmonetary items are not restated if they are shown at net realizable value, fair value, or recoverable amounts as of the date of the financials.)

4. Solve for Retained Earnings as a “plug.”

The steps required to restate the income statement to reflect general price level changes are:

1. Adjust items that occur evenly throughout the year, such as sales and purchases, using an adjustment ratio (usually Current Index/Average Index for the Period).

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**TABLE 1** Solution for Financial Statements Restated for General Price Level Changes

<table>
<thead>
<tr>
<th>Valdo Balance Sheet as of 12/31/X1 (in Bulgarian New Levs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BGN’s</strong></td>
</tr>
<tr>
<td><strong>Equipment</strong></td>
</tr>
<tr>
<td><strong>Accumulated Depreciation</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
<tr>
<td><strong>Payables</strong></td>
</tr>
<tr>
<td><strong>Contributed Capital</strong></td>
</tr>
<tr>
<td><strong>Retained Earnings</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Values for the general price level index during the year were 100 on January 1 and 125 on December 31.

**Income Statement**

| Revenues | 300,000 | × 125/112.5 | 333,333 |
| Depreciation Expense | 100,000 | × 125/100 | (125,000) |
| Other Expenses | 150,000 | × 125/112.5 | (166,666) |

**Net Income Before Purchasing Power Loss** | 41,667 |

**Purchasing Power Loss*** | (16,667) |

**Net Income After Purchasing Power Loss** | 25,000 |

*Monetary Assets – Monetary Liabilities 150,000

150,000 × (125/112.5) = 166,667

166,667 – $150,000 = 16,667
2. Compute depreciation expense based on the inflation adjusted cost of the depreciable assets (the same indices used for adjusting these items in the balance sheet).
3. Calculate the purchasing power gain or loss from holding monetary items. These items are the accounts that were designated as monetary when restating the balance sheet and, therefore, were not restated in that financial statement.

UNDERSTANDING THE IMPACT OF INFLATION-ADJUSTMENTS ON FINANCIAL STATEMENT ANALYSIS

Without adjustment for significant inflation, financial information will not reflect the company's position or provide results that are comparable to earlier times. Book values for long-lived assets will be understated. Monetary items and results of performance will not be comparable to other years. The following steps help us to understand the impact of inflation on financial information:

1. Restate historical financial statements to reflect changes in general price levels as outlined above. (Note: Although a spreadsheet is a helpful tool to accomplish the mathematical adjustments in the restatement, its use is optional because this assignment is short.)
2. Compute selected financial ratios with historical information prior to restatement. Compare the results of those calculations with ratios computed from restated account balances (restated for changes in general price level).
3. Reflect on the differing portraits provided by the two sets of ratios.

EXERCISE TO RESTATE FINANCIALS FOR HYPERINFLATION

The following exercise provides a simplified illustration of the application of IAS 29.

FACTS: Valdo (a fictitious company established on 1/1/X1) is a foreign subsidiary that operates in Bulgaria. Bulgaria has experienced severe economic difficulties at times while transitioning to a free market economy. In 1999 Bulgaria substituted the old lev with a new lev at a ratio of 1,000:1, which was equal to .51 Euros and .55 U.S. Dollars. Bulgaria entered the European Union in January 2007. The lev has been in circulation since 1881, and is now pegged to the Euroland Euro. The plan is to transition to the Euro. Transport and pipeline projects will connect the Black Sea with heart of Europe. Balance sheets for Valdo prepared in local currency follow.

Requirements:

1. Restate the financials prepared on an historical basis to reflect inflation-adjusted amounts. You may find a spreadsheet helpful in this analysis.
2. Calculate the following ratios under both historical and inflation-adjusted bases: current ratio (Current Assets/Current Liabilities), debt ratio (Total Liabilities/Total Assets), profit margin (Net Income/Net Sales), and return on assets (Net Income/Total Assets).

3. Comment on these differences with specific attention to how the restated financials improve the reporting process.

Table 1 displays the restated financials. Table 2 reports the results of ratio analysis based on both the historical numbers and the restatement. The final section of this article provides a discussion of the ratios. This discussion is a synthesis of the solutions prepared by students completing this project. Their conclusions provide evidence that, after completing this exercise, they understand the benefits of adjusting the financials for inflation.

**SUMMARY OF LESSONS LEARNED IN THE VALDO ANALYSIS**

Inflation does not have to reach the point of hyperinflation to affect the valuation of a company. Even small amounts of inflation accumulate over time. If ratios are computed to analyze financial statements that have been prepared on a historical basis and the company is operating in an inflationary environment, the results may be misleading. Comparing the ratios computed with historical information to the same computed in the
The paragraphs below summarize the comments made by our students who computed the restatement and ratios for comparison. Our comments are provided as Notes. In general, reporting financials without adjusting for inflation impairs asset valuation. During periods of inflation, nonmonetary assets on financial statements prepared on an historical basis are understated. This condition leads to an understatement of depreciation and other expenses, and an overstatement of profit.

**Current Ratio**

In general, the Current Ratio is a measure of the firm’s liquidity that provides information on the company’s ability to meet current payments, including short-term debt. Specifically, the Current Ratio assesses the firm’s ability to pay short-term obligations as they come due. The ratio expresses working capital in a ratio format.

The Current Ratio remains the same in this exercise because the balance sheet does not restate monetary items, and the construction company is holding no inventory. (Note: The static comparison forces the student to contemplate that the balance sheet is restating only the nonmonetary items. For Valdo, the Current Ratio is 8.50 and indicates that the company is...
well-positioned to meet its short term debt obligations [8.5 times as many current assets as current liabilities]. In fact, the high current ratio is the first indication that Valdo may experience a purchasing power loss from holding excess monetary assets.

If Valdo had inventory, the current ratio would have changed as a result of the restatement of inventory, a nonmonetary asset. However, because the components of Valdo’s current ratio are all monetary accounts [and monetary accounts are not changed in the balance sheet upon restatement for inflation], no adjustment to these accounts is required on the restated balance sheet. Therefore, the ratio remains constant; no additional information is provided to the users beyond the historical cost ratio in the restatement of the balance sheet. In both scenarios [historical and restated data] the ratio of 8.5:1 is very high relative to the 2:1 rule of thumb for adequate liquidity.

Machinery and equipment at Valdo are undervalued prior to the restatement. Understated assets may impact negatively on a company’s ability to borrow because the assets used as security are understated. In Valdo’s case, the company should exercise its debt capacity because the company has no long-term debt in its capital structure. The company will benefit from holding a net liability position during times of inflation because the obligation will be satisfied in “cheaper” currency.)

Debt Ratio

The debt ratio is a measure of solvency. The ratio indicates the extent to which assets are financed by liabilities. This relationship is overstated in the historical cost financials when assets are understated due to inflation. An inflation factor greater than one will cause the denominator of this ratio (total assets) to increase while the numerator (debt) remains unaffected. As a result of the increasing denominator, the ratio decreases.

The debt ratio usually improves in an inflationary environment because of the components of the Debt Ratio. Debt (as a monetary account) will not be restated; therefore, it will represent a smaller proportion of total assets when those accounts are adjusted for inflation. Restating for inflation has the effect of decreasing this ratio, and this result is preferable because the company has a lower ratio of debt to total assets than under historical cost.

(Note: In the Valdo case, the lower ratio continues to provide evidence that Valdo is in an excellent position to meet its current debt obligation. The restated debt to assets ratio indicates a superior position to the ratio based on historical data, but ratios under both the historical cost and restated presentations are low because Valdo owns a lot of assets and has few liabilities. With its high current ratio and low debt ratio, Valdo is in a position to take advantage of financial leveraging. In its current position, Valdo will experience a purchasing power loss. Presenting inflation adjustments with a
company without long-term payables emphasizes the impact of purchasing power losses resulting from net asset positions.)

**Profit Margin**

Profit margin is the measure of a firm’s profitability relative to sales. It is the portion of each unit of currency available after meeting expenses of the accounting period for shareholders or expansion. Under the restated financials, profit margin is 9.2% (16.7–7.5) lower than under the historical basis.

Profit margin is net income divided by sales. Net income adjusted for inflation gives a more realistic view of Valdo’s results of operations for the year. Both of these components are subject to adjustment in the restatement for inflation. Sales were understated prior to adjustment, and net income was overstated prior to adjustment. Overstated income (without adjustment for inflation) also can result in increased taxes.

The reason for the adjustment to net income is that assets were revalued upwards and net income decreased as a result of increased depreciation. Also, a purchasing power loss arose during the period due to holding cash in a period of inflation.

(Note: By using the restated ratio, managers, creditors, and shareholders have more information about the returns earned on sales. The lower profit margin can reset expectations of these parties. In Valdo’s case, this relationship provides additional information that Valdo’s performance would improve with additional debt. A monetary position of excess liabilities would result in a purchasing power gain, and Valdo’s current ratio and debt ratio provide evidence that Valdo is in a position to take on more debt obligations.)

**Return on Assets**

Return on Assets (ROA) measures how efficiently assets are used to generate net income. This ratio is the most comprehensive measure of profitability. ROA can be compared with alternative investments and to other divisions within the company to measure planning and control. Again, by using the restated ratio, users of the financial information have more useful information on the return generated from assets when restated for inflation. Not adjusting those numbers for inflation can inflate performance.

**CONCLUSION**

International accounting standards are now required for certain companies in the European Union, and overall are permitted or required in more than 100 countries (http://wwwiasplus.com). IAS 21 (The Effects of Foreign Exchange
Rates) requires that a subsidiary translate its financial statements at the reporting
date prior to consolidation, and apply IAS 29 (Financial Reporting in
Hyperinflationary Economies) to restate financials using general price level
accounting in the presence of hyperinflation prior to applying IAS 21. Purchasing
power is changing so rapidly in a hyperinflationary economy that failing to restate would prohibit meaningful comparisons. However, even small
amounts of inflation can accumulate over time and affect financial analysis.

Our approach to teaching IAS 29 and the impact of inflation on financial
statements is an attractive option for integrating the topic into the
international accounting curriculum because we provide instructors with
an efficient exercise to:

1. help students discover the effects of inflation at any level on business
   reporting through financial ratio analysis;
2. teach students to apply the fundamentals of IAS 29;
3. explain the nature of hyperinflation; and
4. enhance student functioning in the current global business environment.

Some geographic areas, such as South America and Asia, have a long history
of inflation. Recent political conditions, such as Poland’s transitioning toward
a free market economy, have resulted in periods of hyperinflation. Understanding how to account for hyperinflation and the effects of inflation
of financial statement analysis are important skills for the business
curriculum. The accounting curriculum is already overcrowded. An efficient
approach to introducing this topic should encourage instructors to explore
the subject of inflation with their students.

ENDNOTES

2. One of the authors of this manuscript was employed preparing such reports for a large U.S.
   company during this time period.
3. It is also possible to begin with statements reflecting current value, but this would not be the
case under U.S. SFAS 52.

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