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Translation Gain and Loss Computations in Financial Accounting

Timo Salmi

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Translation Gain and Loss Computations in Financial Accounting*

1. Introduction

When foreign currency exchange rates are not constant, and foreign currency financial statements have to be translated (i.e. measured and expressed in the home country currency), translation gains or losses can occur. Managers and accountants not familiar enough with translation may find the outcomes of translation confusing. Therefore knowledge is needed about the methods which can be used to calculate and analyze a translation gain or loss. It also is necessary to understand the underlying nature of the translation gain or loss in financial accounting. This paper considers the computation and the underlying nature of these translation gains and losses. The purpose is to explore and reconcile alternative translation gain and loss computations for financial accounting. The alternatives to be considered will be seen to give the same final outcomes, but to differ in their information content.

In the process of translation the data gathered for previous translations can be utilized. The difference between proceeding with a first translation and the subsequent translations will be briefly discussed in connection with presenting the translation of significant foreign balance sheet and income statement items. The paper at hand makes use of a numerical example of translating the income statement and the balance sheet of a foreign subsidiary into the currency of the home country of the parent company. The same numerical example is also utilized in illustrating the translation gain and loss computation alternatives for financial accounting. The temporal method of translation advocated in the Statement of Financial Accounting Standards No. 8, by FASB (Financial Accounting Standards Board, USA) in October 1975, is used as the translation method throughout.

*In writing this paper I have benefited from discussions with Professor Michael Adler from Columbia University, and from parallel discussions on inflation accounting problems with Professor Klaus-Peter Kistner from the University of Bielefeld. Any errors and inadequacies are, nevertheless, my sole responsibility.
In this paper, it is assumed that the reader has some preliminary knowledge of foreign currency translation.\textsuperscript{1}

The theoretical validity of the translation procedures (and the related exposure concepts) used for financial accounting purposes has lately been severely criticized, often with supporting arguments from economics and finance.\textsuperscript{2} Although I personally tend to agree with the criticism on the rationality of the pertinent financial accounting definitions, I shall omit a discussion of these justifiable arguments in this paper. Instead, I shall proceed along the traditional financial accounting lines in respect to translation and exposure concepts. I do this because, unless financial accounting standards are radically changed, foreign financial statements are being translated, and translation gains and losses calculated, in accordance with the criticized procedures of financial accounting.\textsuperscript{3}

2. Of the Temporal Method of Translation

In this paper, we shall be involved in translating a foreign currency balance sheet and income statement into the base currency,\textsuperscript{4} and the concomitant computation and analysis of translation gains and losses, which may arise in the translation. The temporal method of currency translation, which is imposed on U.S. multinational companies by FASB, will be applied.

The essence of the translation problem is the selection of the translation rates to be applied on foreign currency balance sheet and income statement items. The criteria used for selecting the translation rates applied give rise to the different translation methods. The most prevalent methods used for financial accounting purposes in company practice are the closing rate method, the current/noncurrent method, the monetary/nonmonetary method, and the temporal method.\textsuperscript{5} When applied, the monetary/nonmonetary method and the temporal method lead to almost identical translation procedures under the present generally accepted accounting principles. Their theoretical foundations differ, however. Although it seems that the Scandinavian (which I personally am interested in) official accounting bodies, and company practice, may adopt the monetary/nonmonetary method, the temporal method is imposed on U.S. multinational companies by FASB.

\textsuperscript{1}For a review of foreign currency translation, a Finnish reader with no previous knowledge of translation is first referred to Veikko Jääskeläinen & Timo Salmi, "Nään käännetään markoiksi ulkomaisen tytäryhtiön tase," \textit{Talouselämä}, October 14, No. 29, 1977, pp. 26ff. Alternatively see Lennart Eriksson, "Valutakursförändringar i koncernbokslutet," \textit{Balans}, No. 2, 1975, pp. 8–12, 21.

\textsuperscript{2}See especially Aliber & Stickney. See also Wyman, pp. 555–558, and Aggarwal. It also has been argued, from a pure accounting point of view, that the commitment basis of accounting might be a more suitable background for translation than the accrual basis of accounting, if the company is involved in long-term projects (such as shipbuilding). See Jääskeläinen & Salmi (II), Sections 53–55. The commitment basis is rejected in FASB 8, Paragraphs 116–118, and 207.

\textsuperscript{3}The same stand is taken in FASB 8 (Paragraphs 110–111).

\textsuperscript{4}The expressions "the home country currency", "base currency", and "the reporting currency" can be used interchangeably.

\textsuperscript{5}For a good summary of the methods see FASB 8, Paragraph 121.
method arguments, I shall use the temporal method arguments in this paper.\footnote{In Sweden the monetary/nonmonetary method is advocated by the Swedish Institute of Certified Public Accountants in their recommendation. See FAR, pp. 96–99. In Finland, however, no stand whatsoever has been taken so far. This seems strange, because, at the time of writing this paper, a new corporate act with consolidation requirements is pending in Finland. For a draft of this act see Proposal (27/77).} I do this because I find the temporal method theoretically the more appealing of the two.

The following reasoning can be seen in the temporal method.\footnote{The temporal method was suggested in 1972 by Leonard Lorensen in a study for the American Institute of Certified Public Accountants. See Lorensen and FASB 8, Paragraphs 123–125. The method was officially imposed on U.S.-based companies from the beginning of the 1st of January, 1976, in FASB 8.} It is known that originally each item in the foreign accounts to be translated has been expressed in the foreign currency in terms of some particular measurement basis. This measurement basis can always be regarded as related to some specific point of time. For example, an item recorded at historical cost is actually measured in terms of the foreign monetary unit relevant on the historical transaction date. The fundamental idea of the temporal translation method is to translate each item at the exchange rate in effect on the date corresponding to the unit of measurement used. Hence, for example, inventories carried at (historical) cost are translated at the historical rates in the temporal method.\footnote{"Cost is measured in dollars at the transaction date, and that cost does not subsequently change as a result of [exchange]rate changes." FASB 8, Paragraph 89. For further justification see FASB 8, Paragraphs 89–91.} To take another example, the item "cash" on the foreign balance sheet is translated at the current rate, i.e. at the foreign exchange rate prevailing on the closing date. This is done because, on the closing date, cash is naturally measured in the foreign monetary unit of the closing date. Similar argumentation can be extended to all the items of the foreign currency balance sheet and income statement. A great potential advantage of the temporal method is that it could be used for translation under different measurement bases, such as replacement cost, for instance.

It seems logical that the ideal procedure of translation should produce the same translated financial statements directly from the foreign currency statements as would have been derived if the foreign accounts had been translated into the base currency at the relevant rates transaction by transaction and the statements had been derived from this set of dual accounts. This approach is not applicable for pragmatic reasons. The reason is the vast amount of duplicate accounting work that would be involved. Therefore various averaging procedures, and simplifications, have to be utilized.\footnote{The rules in FASB 8, Paragraphs 7, 12, and 38–52, regulating the selection of the translation rates, can be seen as a consequence of the discussed "temporal principle of translation".} The example to be considered of translation, and translation gain and loss assessment, will involve several averaging procedures.

\begin{itemize}
  \item \footnote{The averaging is sanctioned by FASB 8, Paragraphs 13 and 29.}
\end{itemize}
3. Data Needed for Translation

The primary sources of data needed in translation are the foreign currency balance sheet and the foreign currency income statement, the previous translated balance sheet (with relevant background figures), and the information about the exchange rate development during the accounting period under observation. If the translation being made is a first translation, then the previous foreign balance sheet with the history of the items reported there, and the earlier history of the exchange rate development are needed.

3.1 Foreign Currency Financial Statements

A numerical example will be introduced in this chapter to illustrate the translation procedure for the financial statements of a foreign subsidiary of a multinational company, and the assessment of the translation gain or loss. For convenience we shall refer to the base currency as the U.S. dollar ($) in our example. The foreign currency will be referred to as FC. The translation is thus to take place from FC to $. (The exchange rate at the end of the accounting period will be 0.76$/FC in our numerical illustration.) The foreign currency financial statements to be translated are given shortly in this section. They can be considered fictitious, although in fact they simulate a certain business firm.

As is known, in financial accounting the objective of translation can be considered twofold. It is to measure and express the foreign statements in the base currency (dollars), as well as to present these statements in conformity with the accounting principles of the home country (USA). In translating the financial statements of a foreign subsidiary, any distortions resulting from differences between the home country and the host country accounting conventions must be resolved in the foreign currency statements before the translation. For example, a difference in inventory valuation methods may have to be reconciled prior to the translation. In our numerical example we shall assume that these required corrections have already been made. Also another adjustment must be made before the actual translation. Those items on the foreign financial statements which are actually denominated in a third currency must first be adjusted by the appropriate exchange rate. In our numerical example we shall assume that all the foreign currency items are not only expressed, but also denominated in the foreign currency (FC) under observation. These simplifications are made for expository

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11The translation of the financial statements of a foreign subsidiary is considered here, since this is the most general case of foreign currency translation. The prevalent case of foreign currency transactions (e.g. exports/imports of a domestic company) can be regarded as a special case.
12A Finnish reader should mentally substitute Fmk for $ in all the illustrations of this paper.
13See FASB 8, Paragraph 6. See also Paragraph 79.
14As required by FASB 8, Paragraph 10. For the justification see Paragraphs 80–82.
15As required by FASB 8, Paragraph 11.
convenience, and in order to focus on the main theme of translation gain and loss computations. Neither of the simplifications made is excessively restrictive, since their inclusion in the discussion would only add to the number of details, but would not involve any conceptual issues of interest in this paper.

The initial and the ending foreign currency balance sheets for the accounting period under observation are given below.

<table>
<thead>
<tr>
<th>Financial assets</th>
<th>Dec. 31, 19X0</th>
<th>Balance sheet</th>
<th>Dec. 31, 19X1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Foreign currency)</td>
<td></td>
<td>(Foreign currency)</td>
</tr>
<tr>
<td>Financial assets</td>
<td>210</td>
<td>310</td>
<td></td>
</tr>
<tr>
<td>Inventories</td>
<td>170</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Fixed assets</td>
<td>450</td>
<td>490</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>830</td>
<td>890</td>
<td></td>
</tr>
</tbody>
</table>

| Liabilities      | 580           | 630           |
| Stock capital    | 100           | 100           |
| Retained earnings| 150           | 160           |
| Total            | 830           | 890           |

The inventories are carried at cost.

The foreign currency income statement for the year is in our example:

<table>
<thead>
<tr>
<th>Income statement</th>
<th>Dec. 31, 19X0 – Dec. 31, 19X1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Foreign currency)</td>
</tr>
<tr>
<td>Net sales</td>
<td>780</td>
</tr>
<tr>
<td>Variable expenditures</td>
<td>240</td>
</tr>
<tr>
<td>add decrease in inventories</td>
<td>+ 80</td>
</tr>
<tr>
<td>Fixed expenses</td>
<td>300</td>
</tr>
<tr>
<td>Depreciation</td>
<td>50</td>
</tr>
<tr>
<td>Other expenses, interest, income taxes</td>
<td>60</td>
</tr>
<tr>
<td>Net income for the year</td>
<td>50</td>
</tr>
</tbody>
</table>

Direct costing and the first in first out (FIFO) inventory method have been applied. Furthermore, it is known that a dividend of 40 FC has been distributed on the 31st of March, 19X1.

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Here we intentionally have an immaterial inconsistency, since in reality absorption costing should be applied for U.S. purposes. Since a Finnish reader probably is more comfortable with direct costing in financial accounting, we shall accept this minor inconsistency.
3.2 Exchange Rate Development

In order to be able to assess the current and historical exchange rates needed in translation, information must be gathered about the relevant exchange rate development.

In our numerical example the current rate on the closing date is 0.76$/FC, and the exchange rate at the beginning of the year was 0.80$/FC. This implies a deterioration of 5.3% of the foreign currency in relation to the base currency, i.e. the dollar. Thus 0.76$/FC will be used as the current rate for translating those foreign balance sheet items which can be defined as exposed to changes in currency exchange rates.

In addition to the current rate, the historical rates are needed for translating foreign income statement items, and those items on the foreign balance sheet which can be defined as unexposed to changes in currency exchange rates. The information given in our example so far on the exchange rates is inadequate, since the transactions giving rise to translation at historical rates have naturally not occurred on the same date.

For averaging purposes the development of the exchange rates during the accounting period under observation has to be approximated with a fitting regularity assumption. In our numerical example it is assumed that the deterioration of the exchange rate from 0.80$/FC to 0.76$/FC has with reasonable accuracy taken place evenly throughout the year. Were this approximation not good enough for translation purposes, it would be necessary to subdivide the year into sections with approximately regular exchange rate behavior.

When a translation is to be made for the first time without any supporting information from previous translations available, the information has to be gathered starting from the earliest transaction date relevant to the financial statements to be translated. Thus historical translation rates are to be determined for items acquired before the current accounting period (e.g. for plant, equipment, raw materials, etc.). In our numerical example it will simply be assumed that the exchange rate before the current accounting period has for a long period been about 0.80$/FC. A contrary assumption is not difficult to accommodate, in principle. At this stage it would, however, add to the number of details of our numerical example. A more general case with changes in the exchange rates prior to the current accounting period will be considered later in this paper.

Figure 3-1 below summarizes the exchange rate development, which is, for the time being, assumed to be a reasonable approximation of the true development in our example.

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17A Finnish reader not familiar with the concept of exposure (accounting exposure to changes in currency exchange rates) is referred to Jääskeläinen & Salmi (1), Section 21, and Salmi, pp. 58–67. In short, in financial accounting an exposed asset or liability is an item whose value, when measured in the base currency, changes as a result of a currency exchange rate change.
Translation means changing the unit of measurement of the foreign currency financial statements. Thus, in translation it is these statements that are worked on. The basis of translation is in the measurement of the underlying entries giving rise to the foreign financial statements to be translated.

As was mentioned earlier in this paper, it is impractical (or even impossible) to go down to the level of individual transactions in the process of translation. Nevertheless, knowing the aggregate transactions resulting in the foreign financial statements to be translated is useful in translation. Furthermore, it will be seen that this information is needed in one of the alternatives for computing translation gains and losses. We shall therefore reconstruct the aggregate accounting entries for the accounting period under observation in our numerical example. These entries are reconstructed below on the basis of the foreign financial statements given earlier. Hence, only a rearrangement of the given data is being made. Should a more refined aggregation be needed in a real-life application, it would be necessary to resort to the accounting data underlying the foreign financial statements. It should be obvious that the aggregation is one form of averaging utilized for translation purposes.

All the entries in the reconstructed accounts below are denominated in the foreign currency (FC). BB and EB mean the beginning and the ending balance respectively.
### Fixed assets (unexposed)

<table>
<thead>
<tr>
<th></th>
<th>BB</th>
<th>EB</th>
</tr>
</thead>
<tbody>
<tr>
<td>New machinery</td>
<td>450</td>
<td>490</td>
</tr>
</tbody>
</table>

### Liabilities (exposed)

<table>
<thead>
<tr>
<th></th>
<th>EB</th>
<th>BB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>630</td>
<td>580</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

### Stock capital (unexposed)

<table>
<thead>
<tr>
<th></th>
<th>EB</th>
<th>BB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### Increase in stock capital (unexposed)

<table>
<thead>
<tr>
<th></th>
<th>EB</th>
<th>BB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

### Retained earnings (balancing account)

<table>
<thead>
<tr>
<th></th>
<th>BB</th>
<th>EB</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB</td>
<td>160</td>
<td>150</td>
</tr>
<tr>
<td>Dividends</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

### Income statement account (income calculation)

<table>
<thead>
<tr>
<th>Income statement account</th>
<th>BB</th>
<th>EB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of goods sold</td>
<td>320</td>
<td>780</td>
</tr>
<tr>
<td>Fixed expenses</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Other expenses</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

---

4. **Translation of the Foreign Financial Statements**

In this chapter I demonstrate the translation of the initial and ending balance sheets and the income statement into the base currency.

It is in order to state an additional limitation. Forward exchange contracts are a common feature of foreign operations. They are nevertheless omitted in this paper. Thus we shall assume in our translation example that no forward exchange contracts have been made.

For our numerical example we shall use the following generalized translation scheme. It summarizes the central features of translation rate selection.

---

18. For forward exchange contracts in translation see FASB 8, Paragraphs 22–28, and Lorensen, pp. 62–64. We can also use the ground rule that when an exposed item is covered with a forward exchange contract, the item becomes unexposed. See, however, FASB 8, Paragraphs 207–212.

19. This scheme is simplified for the purposes of generalization. A reader interested in the translation rates for the individual items of a full-blown set of financial statements is referred to Watt, and FASB 8, Appendix A.
Balanee sheet

<table>
<thead>
<tr>
<th>Item</th>
<th>Translated at</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial assets</td>
<td>Current rate</td>
</tr>
<tr>
<td>Inventories, at cost</td>
<td>Historical rates</td>
</tr>
<tr>
<td>Inventories, at market</td>
<td>Current rate</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>Historical rates</td>
</tr>
<tr>
<td>Liabilities</td>
<td>Current rate</td>
</tr>
<tr>
<td>Stock capital</td>
<td>Historical rates</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>Calculated as the residual</td>
</tr>
</tbody>
</table>

Income statement

All items Historical rates

4.1 Initial Balance Sheet

The translation of the initial balance sheet (Dec. 31, 19X0) is straightforward in our illustration. The reason for this is that, for the time being, we assume that the exchange rate prior to the initial balance sheet date has been approximately constant for a long period. Hence all items, except retained earnings, are translated at a single historical rate of 0.80$/FC. The retained earnings are calculated as the residual figure needed to balance the translated assets and equities sides of the balance sheet.

```
<table>
<thead>
<tr>
<th>Balance sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 31, 19X0</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Financial assets</td>
</tr>
<tr>
<td>Inventories</td>
</tr>
<tr>
<td>Fixed assets</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Liabilities</td>
</tr>
<tr>
<td>Stock capital</td>
</tr>
<tr>
<td>Retained earnings</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
```

Had the exchange rates not been approximately constant prior to the initial balance sheet date, inventories, fixed assets, and stock capital would have been translated at varying historical rates. This feature will be discussed shortly. In the translation of the ending balance sheet (Dec. 31, 19X1), varying translation rates are used.

\[20\]In the absence of preceding exchange rate changes, the retained earnings, too, in fact become translated at 0.80$/FC in our example.
4.2 Translating Inventories and Cost of Goods Sold

When the exchange rates have changed during the period under observation, translation becomes more complicated. In this section the translation of foreign inventories, and the concomitant item of cost of goods sold, are discussed.

If cost is "the lower of cost or market", the translated value of inventories is calculated as follows in the temporal method. Each item is reported at the cost in the foreign currency multiplied by the historical exchange rate prevailing at the date of purchase or manufacturing. For practical reasons companies faced with translation utilize averaging procedures, as has been indicated before. When market is the "lower of cost or market" the current exchange rate is used in translation instead of historical rates.

Consider, again, our example. The first in first out (FIFO) inventory valuation method is applied. A simplifying assumption is made to facilitate averaging. We assume that it is reasonable to say that the items in the inventories are replenished, and used, at approximately even rates throughout the accounting period. Figure 4-1 elucidates the behavior of the inventories in our example.

FIGURE 4-1

---

21 In writing this section I got useful advice on inventory turnover derivations from Professor Kistner.
22 For rules to assess the lower of cost or market in connection with translation see FASB 8, Paragraphs 48–49.
The ending inventories on Dec. 31, 19X1 are made up by the units acquired last, at the cost of 90FC. These units have approximately been acquired during the last 90/240 years = 0.375 years = 4.5 months of the accounting period under observation.\textsuperscript{23} The average currency exchange rate for that period is 0.76$/FC + (2.25/12) (0.80 - 0.76) $/FC = 0.7675$/FC. Figure 4-2 elucidates the currency exchange rate development assumed.

\textbf{FIGURE 4–2}

![Graph of exchange rate $/FC]

The translated value of the ending inventories, to be entered on the translated Dec. 31, 19X1 balance sheet, is 0.7675$/FC x 90FC = $69.08.

The above computations give the translated value of the inventories under several simplifying assumptions made to avoid a prohibitive amount of information-gathering for the translation. The simplifications made in our numerical example may, however, be excessive, especially if marked seasonal fluctuations in inventories have occurred and/or the exchange rate behavior has shown considerable irregularities. In such cases a better fitting method of approximation is necessary.

In our numerical example the translation of the initial inventories (Dec. 31, 19X0) was overly trivial (see Section 4.1), because the exchange rate had stayed approximately the same (0.80$/FC) during the acquisition of the initial inventories. Had this not been the case, the calculations would have been made in the same manner as was demonstrated above for the ending inventories.\textsuperscript{24}

Cost of goods sold is discussed next. The translated cost of goods sold is needed in the translation of the income statement. For this purpose it is necessary to know the translated cost of goods manufactured or purchased during the accounting period, as well as the translated values of the beginning and ending inventories. The derivation of the translated value of the ending inventories has already been demonstrated above (for valuation at cost and FIFO). The translated value of the initial inventories can be obtained from the previous translated balance sheet, if earlier translations are available. Otherwise the figure has to be calculated in the manner discussed.

\textsuperscript{23}A different figure is arrived at if we use the average inventory turnover rate. In that case we would have ((170+90)/2)/320 years = 0.41 years.

\textsuperscript{24}Thus we see that using a numerical example with an assumption of a constant rate of exchange prior to the current accounting period is quite sufficient for illustrative purposes.
It is necessary to translate the cost of goods manufactured or purchased during
the accounting period in order to derive the translated cost of goods sold. (In our
illustration the item to be translated for this reason is the variable expenditure of
240FC on the foreign currency income statement.) Since, in our illustration, we
accepted that the goods are manufactured or purchased evenly throughout the
year, and, furthermore, that the currency exchange rate changes evenly through-
out the year, we can calculate the translated cost of goods sold as follows.

\[
\begin{align*}
\text{Initial inventories} & \quad 170 \quad 0.80 \quad 136.00 \\
+ \text{Variable expenditures} & \quad 240 \quad 0.78 \quad 187.20 \quad \text{decrease} \\
/. \text{Ending inventories} & \quad 90 \quad 0.7675 \quad 69.08 \quad \$66.92 \\
= \text{Cost of goods sold} & \quad 320 \quad 136.00 \quad 254.12 \\
\end{align*}
\]

In accordance with our assumptions, the variable expenditures have been
translated at the average currency exchange rate for the year, i.e. at 0.78$/FC (c.f.
Figure 4-2).

4.3 Translating Fixed Assets and Depreciation

Foreign fixed assets are translated at the rate of exchange prevailing on the date of
acquisition. Depreciation is translated at these same historical rates.

Consider our numerical example. In Section 3:3 the entries for the accounting
period were reconstructed. The aggregate entries on the foreign fixed assets
account show that new fixed assets (called new machinery) have been acquired by
90FC (reported at cost). Let us assume that, on the average, the new fixed assets
have been bought at the middle of the year. Then we can use the average historical
rate of the year (0.78$/FC) for translating the new foreign fixed assets.

It is also seen, on the basis of the aggregate entries on the foreign fixed assets
account, that a depreciation of 50FC has been made. Before it is possible to
translate this figure, it must be broken down to its components. This is necessary,
because different translation rates have to be applied on depreciation of foreign
fixed assets of different ages (providing that the rates of exchange have changed).
Under the simple structure of the historical currency exchange rates in our
numerical example it is necessary to distinguish between old and new fixed assets
only. Assume that we ascertain from the accounting records that the depreciation
of the old foreign fixed assets is 40FC for the current accounting period. Conse-
quently we can translate the fixed assets items on the foreign financial statements
as is shown below.

\[
\begin{align*}
\text{Fixed assets, Dec. 31, 19X0} & \quad 450 \quad 0.80 \quad 360.00 \\
+ \text{Net additions during 19X1} & \quad 90 \quad 0.78 \quad 70.20 \\
/. \text{Depreciation, for old} & \quad 40 \quad 0.80 \quad 32.00 \\
/. \text{Depreciation, for new} & \quad 10 \quad 0.78 \quad 7.80 \quad \text{39.80} \\
\text{Fixed assets, Dec. 31, 19X1} & \quad 490 \quad / \quad / \quad 390.40 \\
\end{align*}
\]
The translation of foreign fixed assets, and the concomitant depreciation, is straightforward, in principle. It involves, however, the practical problem of keeping track of the different items of fixed assets and the respective depreciation. In a first translation more effort is required (ceteris paribus) than in the subsequent translations. This is because in the case when preceding translations are available, it is necessary to translate the changes only. Depreciation of old assets can be assessed by directly applying the relevant depreciation method to the pertinent group of translated fixed assets.\textsuperscript{25}

A reader interested in a numerical example may wish to observe what would have happened in our illustration in a more general case. To be brief, consider anew only the translation of the fixed assets on the initial balance sheet. Assume, for the moment, that they actually are composed of three items. Suppose that the original costs of the three items have been 300FC, 200FC and 250FC. The accumulated depreciation for the items is 250FC, 50FC and 0FC, respectively.

The currency exchange rates on the acquisition dates have been 0.83$/FC, 0.79$/FC and 0.80$/FC. In that case the translated fixed assets in the initial balance sheet would have been

\begin{center}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
FC & FC & $/FC & $ & $ & $ \\
\hline
Original cost & Accumulated depreciation & & Original cost & Accumulated depreciation & Translated fixed assets \\
300 & 250 & 0.83 & 249 & 207.50 & 41.50 \\
200 & 50 & 0.79 & 158 & 39.50 & 118.50 \\
250 & 0 & 0.80 & 200 & 0.00 & 200.00 \\
\hline
\end{tabular}
\end{center}

\textbf{4.4 Ending Balance Sheet}

When the necessary information has been gathered and processed as discussed in previous sections, the ending balance sheet and the income statement can be translated into the base currency.

In our example we have the following translated ending balance sheet for the accounting period.

\begin{center}
\begin{tabular}{|l|c|c|c|}
\hline
Balance sheet & FC & rate & $ \\
Dec. 31, 19X1 & & & \\
Financial assets & 310 & 0.76 & 235.60 \\
Inventories & 90 & 0.7675 & 69.08 \\
Fixed assets & 490 & several & 390.40 \\
Total & 890 & & 695.08 \\
Liabilities & 630 & 0.76 & 478.80 \\
Stock capital & 100 & 0.80 & 80.00 \\
Retained earnings & 160 & residual & 136.28 \\
Total & 890 & & 695.08 \\
\hline
\end{tabular}
\end{center}

\textsuperscript{25}By a pertinent group I here mean a subset of fixed assets with the same depreciation method and rate applicable.
4.5 Income Statement

In principle the foreign income statement items should be translated by translating each underlying transaction at the rate of exchange prevailing on the date of transaction. The need for averaging procedures for pragmatic reasons has already been discussed at length in this paper. The translation of cost of goods sold and depreciation have already been demonstrated. In order to translate net sales, fixed expenses, and the other expenses we assume in our example that these items have been incurred evenly throughout the year. Thus we have

<table>
<thead>
<tr>
<th>Income statement Dec. 31, 19X0 — Dec. 31, 19X1</th>
<th>FC</th>
<th>rate</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>780</td>
<td>0.78</td>
<td>608.40</td>
</tr>
<tr>
<td>Variable expenditures</td>
<td>240</td>
<td></td>
<td>187.20</td>
</tr>
<tr>
<td>add decrease in inventories</td>
<td>+ 80</td>
<td>320</td>
<td>several</td>
</tr>
<tr>
<td>Fixed expenses</td>
<td>300</td>
<td>0.78</td>
<td>234.00</td>
</tr>
<tr>
<td>Depreciation</td>
<td>50</td>
<td>several</td>
<td>39.80</td>
</tr>
<tr>
<td>Other expenses</td>
<td>60</td>
<td>0.78</td>
<td>46.80</td>
</tr>
<tr>
<td>Net operating income for the year</td>
<td>50</td>
<td></td>
<td>33.68</td>
</tr>
</tbody>
</table>

The total net income for the accounting period is the sum of the net operating income (above) and the translation gain or loss. The computation of the translation gain or loss is demonstrated in the next chapter.

5. Alternative Arrangements of Translation Gain or Loss Computations

If the exchange rates change during an accounting period when foreign assets and liabilities are held, translation gains and losses occur in the temporal method of translation. In this chapter different methods of calculating the translation gains and losses are considered. At the same time it will be seen why these gains and losses arise in financial accounting.

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27I use here the term "translation gains or losses" instead of "exchange gains and losses", which is used in FASB 8 (c.f. Paragraph 16). The latter term includes conversion gains and losses in the settlement of foreign receivables and payables, which are not discussed separately in the paper at hand.
28The translation gain or loss computation alternatives to be discussed are applicable in all the ordinary translation methods in addition to the temporal method. (In the closing rate method no gains or losses occur.)
5.1 Derivation of Translation Gain or Loss from the Change in Translated Retained Earnings

The translation gains and losses result from holding exposed foreign assets and liabilities. As is known, an exposed asset or liability is an item whose value, when measured and expressed in the base currency, is dependent on the relevant currency exchange rate. Thus, for example, when the net exposure position of a company is positive in a falling currency, the company incurs a translation loss in financial accounting.\(^{29}\)

The duality between retained earnings and the income statement makes it possible to calculate the income for an accounting period either starting from the change in retained earnings or directly from the income statement. In translated financial statements, however, the two income figures do not necessarily agree.\(^{30}\) This results from the fact that the change in the translated retained earnings includes translation gains and losses, while the net "operating" income figure on the translated income statement does not.

The first alternative for assessing the translation gain or loss for an accounting period is to calculate it as the residual between the two translated income figures discussed above. The advantage of this alternative is that it requires a minimum amount of computational effort. The definite disadvantage of this alternative is that it does not give the components of the translation gain or loss. Furthermore it demonstrates rather poorly (except technically speaking) the underlying nature of the translation gain or loss being calculated.

To illustrate the alternative being discussed, consider our numerical example again. We know on the basis of the reconstructed foreign aggregate retained earnings account (see Section 3.3) that the only intraperiod entry on it is the distribution of a dividend of 40FC. The dividend was distributed on the 31st of March 19X1, when the currency exchange rate was 0.79$/FC. If we calculate the translated retained earnings figure for Dec. 31, 19X1 without the translation gain or loss we have the following result.

\[
\begin{array}{ccc}
\text{Retained earnings Dec. 31, 19X0} & \text{FC} & \text{Source or rate} \\
\text{add net operating income} & 150 & \text{initial bal. sheet} \\
\text{less dividends distributed} & 50 & \text{income statement} \\
\text{Retained earnings Dec. 31, 19X1} & 40 & 0.79 \\
\text{without translation gain or loss} & 160 & 31.60 \\
\end{array}
\]

\[
\text{FC} \quad \text{Source or rate} \quad \$ \\
150 \quad \text{initial bal. sheet} \quad 120.00 \\
50 \quad \text{income statement} \quad 33.68 \\
40 \quad 0.79 \quad 31.60 \\
160 \quad \text{without translation gain or loss} \quad 122.08
\]

On the other hand the translated balance sheet of Dec. 31, 19X1 shows a translated retained earnings figure of $136.28 (see Section 4.4). The difference between the two figures is a translation gain of $136.28 - $122.08 = $14.20 for the accounting period under observation. We can now reconstruct the change in the

\(^{29}\)This can be illustrated by considering what happens in terms of U.S. dollars if a U.S. citizen buys Brazilian cruzeiros and holds them while the cruzeiro deteriorates against the dollar. 
\(^{30}\)C.f. FASB 8, Paragraph 168.
translated retained earnings as follows. The result can be augmented on the translated balance sheet or income statement.31

<table>
<thead>
<tr>
<th>Source or rate</th>
<th>Retained earnings Dec. 31, 19X0</th>
<th>FC</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>initial bal. sheet</td>
<td>150</td>
<td>120.00</td>
<td></td>
</tr>
<tr>
<td>income statement</td>
<td>50</td>
<td>33.68</td>
<td></td>
</tr>
<tr>
<td>residual</td>
<td>-</td>
<td>14.20</td>
<td></td>
</tr>
<tr>
<td>residual</td>
<td>0.79</td>
<td>31.60</td>
<td></td>
</tr>
<tr>
<td>Retained earnings Dec. 31, 19X1</td>
<td>160</td>
<td>136.28</td>
<td></td>
</tr>
</tbody>
</table>

If we treat the translation gain as the unknown variable in the above and solve for it in terms of the other items, we have a formula for calculating the translation gain for an accounting period: it is calculated as the residual needed to balance the translated retained earnings account.

In our numerical example the translation gain for the year is highly significant. Almost one third of the total profit is made up by this gain, which is a consequence of the 5.3 per cent deterioration in the exchange rate of the foreign currency (FC). According to discussions on translation methods, and exposure management, significant translation gains and losses are not unusual in multinational companies. The frequency of the occurrence, and the absolute magnitude, of the translation gains and losses reported in financial accounting by firms with multinational operations is, however, an empirical question outside the scope of this paper.

5.2 Derivation of Translation Gains and Losses from Exposure

As has been pointed out, the translation gain or loss in financial accounting results from the changes in the translated values of exposed foreign assets and liabilities. Reconsider our numerical example. In our simplified framework the financial assets, and liabilities (''debt'') are regarded as exposed, while the other items are not. The reconstructed aggregate accounts (see Section 3.3) can be utilized in calculating translation gains and losses by an alternative arrangement of calculations. Consider the entries on these two exposed accounts together with the rates used in translating them. We then have

31FASB 8 requires immediate recognition of both translation gains and losses as a component of the current income. See paragraphs 183–199 for justifications. A discussion on the question of including the translation gain or loss in the total net income of the accounting period or, alternatively, deferring it, is, however, outside the scope of this paper. For information on this aspect see the FASB 8 paragraphs referred to above, and e.g. Jääskeläinen & Salmi (II), Section 42, and Salmi, Section 4.3.
The initial net exposure was 210FC - 580FC = -370FC on the 31st of December, 19X0. Had no transactions taken place during the accounting period, the translation gain would obviously have been (0.76$/FC - 0.80$/FC) (-370FC) = $14.80. This gain would have resulted from a decrease of $14.80 in the company's net foreign obligations (= 370FC), when measured in the base currency.

Transactions influencing the net exposure have occurred during the accounting period. Therefore the translation gain of $14.80 on the initial exposure must be adjusted for the changes in the net exposure during the accounting period.

Consider first the influence of the net sales on the exposure, and the pertinent translation gain. Sales have approximately been made evenly throughout the year. The translated value of the net sales is 780FC x 0.78$/FC = $608.40. On the other hand the value of the financial assets (an exposed item) brought in by the sales deteriorates. It is only 780FC x 0.76$/FC = $592.80 at the end of the year. This indicates a translation gain (loss) of (0.76$/FC - 0.78$/FC) x 780FC = -$15.60. It can be regarded as a result of an increase in exposure due to net sales.

We see in the above that the foreign net sales entail two components. The first is the "operating revenue" component. It amounts to $608.40 in our illustration. The second is the "translation loss" component. In our illustration it amounts to $15.60. The other items can be analyzed in a similar manner. The tableau above gives translation gain or loss components for the various transactions which have taken place during the accounting period. (The operating revenue or expense components are given by the translated income statement.)

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32These items could be omitted, since they cancel each other. Actually, only transactions debited/credited on an exposed account and simultaneously credited/debited on an unexposed account affect the net exposure. Transactions with both sides of the entry made on exposed accounts, or both made on unexposed accounts, do not affect the net exposure.
In our illustration the increases in the net exposure during the accounting period give rise to translation losses amounting to $16.60, while the decreases give rise to translation gains totalling $16.00.

The translation gain $14.20 for the accounting period is thus made up of a gain of $14.80 on the initial net exposure, and a loss of $0.60 on the intraperiod changes in the net exposure.

The alternative method for computing the translation gain or loss which has been given in this section, is obviously more informative than computing it through the change in the translated retained earnings account. The translation gain or loss is broken down to its components, and is thus analyzed. The underlying nature of translation gains and losses may be more clearly understood in this alternative. More accounting effort is, however, required than in the first alternative discussed.

Finally it should be stressed that although the two arrangements discussed for calculating the translation gain or loss may seem different, they are based on the same concepts of translation. Thus, in principle, they are equivalent, and should never fail to give identical translation gain and loss figures. This fact can, of course, be conveniently utilized for cross checking the calculations.

5.3 Adapted "Source und Use Method" of Inflation Accounting

The arrangement presented in the previous section for translation gain and loss computation is by no means restricted to translation only. General price-level gain or loss is calculated for general price-level adjusted financial statements in a manner closely resembling the arrangement for calculating translation gain or loss from exposure.\textsuperscript{33} We shall resolve below the translation gain in our numerical example by using an arrangement, which I have adapted from a presentation of price-level gain or loss computation.\textsuperscript{34} Since no new principles are actually involved I shall give the calculations without further explanation.

\begin{tabular}{lrrr}
\textbf{Net exposed items:} & Dec. 31, 19X0 & Dec. 31, 19X1 \\
Financial assets & FC & $ & FC & $ \\
210 & 168.00 & 310 & 235.60 \\
(580) & (464.00) & (630) & (478.80) \\
(370) & (296.00) & (320) & (243.20) \\
\end{tabular}

\textsuperscript{33}The similarity between foreign currency translation and general price-level accounting is referred to e.g. by Lorensen, p. 13, and Kieso & Weygandt, p. 1106.

\textsuperscript{34}Kieso & Weygandt, pp. 1106-1121. The arrangement discussed has earlier been derived by Lorensen. See Lorensen pp. 52-43.
Net exposure, Dec. 31, 19X0 (370) 0.80 (296.00)
Add (sources):
  Net sales 780 0.78 608.40 608.40
Deduct (uses):
  Variable expenditures 240 0.78 187.20
  Fixed expenses 300 0.78 234.00
  New machinery 90 0.78 70.20
  Other expenses 60 0.78 46.80
  Dividends distributed 40 0.79 31.60 (569.80)
Net exposed items at historical rates (from above) (257.40)
Net exposed items at current rate (320) 0.76 (243.20)
Translation gain for 19X135 $14.20$

5.4 Purchasing Power Parity and Disparity Components of Translation Gains and Losses

The purchasing power parity theorem postulates that the currency exchange rate between the domestic and a foreign currency is the inverse of the ratio of the domestic and foreign commodity price levels.36 Robert Aliber and Clyde Stickney have presented empirical evidence supporting the purchasing power parity theorem in the long-term context, but showing significant short-term deviations.37 Harold Wyman has suggested that the translation gain or loss should be divided into two distinct components.38 The first one gives the gain or loss due to currency exchange rate changes which are congruent with the purchasing power parity. The second component reflects the impact of currency exchange rate changes deviating from the purchasing power parity.

The analysis suggested by Wyman is easily applied to the individual items affecting the translation gain or loss. To illustrate, consider our example once more. As is recalled, the foreign currency weakened by about 5.3 during the accounting period under observation. Assume that the domestic rate of inflation has been 10% during that time, while the foreign inflation has been 19%. According to the purchase power parity theorem the currency exchange rate should have changed by $(1.10/1.19 - 1) \times 100\% = -7.6\%$ instead of $-5.3\%$ only. This means that, in our example, the foreign currency exchange rate has somewhat underadjusted. Had the foreign currency exchange rate reacted in congruence with the purchase power parity theorem, we would have expected a current rate of 0.74$/FC$ instead of 0.76$/FC$. As discussed by Wyman, it may be useful, also from the managerial point of view, to know the breakdown of the translation gain or loss

35Net exposed items at current rate less net exposed items at historical rates.
36See, e.g. Aliber & Stickney, pp. 52–54.
37Aliber & Stickney.
38Wyman.
into components due to an expected exchange rate change, and due to the failure of the rate of exchange to adjust as expected on the basis of the relative price levels.

Consider the analysis of the translation gain on the initial net exposure of $-370FC. The perfect purchasing power parity component of the relevant translation gain item is \((0.74$/FC - 0.80$/FC) (-370FC) = 22.20\). The respective disparity ("failure of the rate to adjust properly") component is \((0.76$/FC - 0.74$/FC) (-370FC) = 7.40\). The other items influencing the total translation gain for the year can be analysed in a similar manner, as shown below.

<table>
<thead>
<tr>
<th>FC transl at rate</th>
<th>PPP rate</th>
<th>current rate</th>
<th>Gain on exposure</th>
<th>PPP disparity</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial assets</td>
<td>210</td>
<td>0.80</td>
<td>0.74</td>
<td>0.76</td>
<td>(12.60)</td>
</tr>
<tr>
<td>Liabilities</td>
<td>(380)</td>
<td>0.80</td>
<td>0.74</td>
<td>0.76</td>
<td>34.80</td>
</tr>
<tr>
<td></td>
<td>(370)</td>
<td></td>
<td></td>
<td></td>
<td>22.20</td>
</tr>
<tr>
<td>Net sales</td>
<td>780</td>
<td>0.78</td>
<td>0.74</td>
<td>0.76</td>
<td>(31.20)</td>
</tr>
<tr>
<td>Variable expenditures</td>
<td>(240)</td>
<td>0.78</td>
<td>0.74</td>
<td>0.76</td>
<td>9.60</td>
</tr>
<tr>
<td>Fixed expenses</td>
<td>(300)</td>
<td>0.78</td>
<td>0.74</td>
<td>0.76</td>
<td>12.00</td>
</tr>
<tr>
<td>New machinery</td>
<td>( 90)</td>
<td>0.78</td>
<td>0.74</td>
<td>0.76</td>
<td>3.60</td>
</tr>
<tr>
<td>Other expenses</td>
<td>( 60)</td>
<td>0.78</td>
<td>0.74</td>
<td>0.76</td>
<td>2.40</td>
</tr>
<tr>
<td>Dividends distributed</td>
<td>( 40)</td>
<td>0.79</td>
<td>0.74</td>
<td>0.76</td>
<td>2.00</td>
</tr>
<tr>
<td>Translation gain or loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.60</td>
</tr>
</tbody>
</table>

6. Conclusion

The main theme of this paper was the computation of translation gain or loss for translated financial statements. Also translation itself was discussed at length as a prerequisite of the discussion on the translation gain or loss assessment.

We first observed how translation gain or loss can be derived from the change that has taken place in the translated retained earnings. Next we saw how the translation gain or loss can be explained in terms of exposure to currency exchange rate changes. At the same time we could derive the components of the translation gain or loss by utilizing aggregate transactions reconstructed from the foreign financial statements. The components were due to the gains and losses on the initial exposure and on the changes in the exposure, which take place as a consequence of the intraperiod transactions. Furthermore, we discovered that the intraperiod transactions can thus entail an operating component and a translation gain or loss component. We also noticed the similarity between the translation gain or loss computations and the computation of price-level gain or loss in inflation accounting. Finally, we observed how translation gains and losses can be further subdivided into components explained by purchasing power parity and disparity, along the lines of thought developed by Aliber & Stickney, and Wyman.
A numerical example was utilized throughout the presentation in order to reach a wider circle of readers.

REFERENCES


