Creative touches in financial accounting

By Dr. Teresita T. Nadurata, Chair, Accountancy Department

Have you heard of the agency theory (Watts and Zimmerman (1978))? In the business enterprise, the owner is known as the principal while the manager is known as the agent. In stewardship accounting, there is a need to control the actions and decisions of management by the owners of capital in terms of how their funds have been utilized. Stewardship accounting guarantees the physical safety of assets and proves managerial accountability.

Gray (1987) summarized the principal-agent relationship as shown in Figure 1.

![Figure 1. Principal-Agent Relationship](image)

It is the purpose of this paper to present the following:
- define creative accounting.
- cite the reasons for the use of creative accounting.
- discuss techniques of creative accounting.
- show common examples of creative accounting.
- recommend ways to eliminate the use of creative accounting.
- summarize the implications of creative accounting on the CPAs work.

Creative Accounting

Naser (1993) defines creative accounting as a process of manipulating accounting to take advantages of the loopholes in accounting rules and the choices of measurement and disclosure practices. Creative accounting is effected through the creative touch made on the transactions to produce the required accounting results rather than reporting transactions in a neutral and consistent way.

Reasons for the use of Creative Accounting.

The different reasons for the use of creative accounting are based on the following creative accounting researchers:
Pressure from big institutional investors, and the move to attract wider share ownership by more investors, may encourage the companies to manipulate their performance to satisfy the demand of the stock market. To live with stock market expectations, companies may become involved in the use of creative accounting.

2. Goodfellow (1988)
Creative accounting schemes are employed as a result of increased uncertainty in the related market elements, interest, inflation and exchange. It becomes highly motivated to adopt instruments to reduce the associated risks.

Some creative accounting techniques are designed to take advantage of the lack of accounting rules or the conflict between existing rules.

4. Argenti (1976)
Creative accounting becomes one of the symptoms of impending failure. He connected the use of creative accounting with poor management.

5. Watts and Zimmerman (1986)
The manager is likely to adopt accounting procedures that reduce the reported earnings to get away from any political pressures. They provided examples of hypotheses that explain how managers might react to restrictions.

Preparers of account, as agents in charge of company’s resources, have economic and political incentives to disclose financial information in order to maintain the confidence of the users of their account. A company can employ creative accounting to improve its financial ratios.

Techniques of Creative Accounting
Management resorts to common techniques of creative accounting. These are window dressing and off-balance sheet financing.

Window dressing refers to an arrangement of affairs so that the financial statements of concern give misleading or unrepresentative impression of its financial position. Examples of these techniques are:
- sale & repurchase of inventory
- abuse of acquisition accounting
- overnight sale and repurchase of assets
- revaluation of fixed assets
- repurchase of company’s own shares
- switching from one accounting policy to another

Off-balance sheet financing refers to the funding or refunding of a company’s operations in such a way that some or all of the financial may not be shown on the balance sheet. Examples of these techniques are:
- operating or financial lease
- non-consolidated subsidiary
- scheme to remove debt from balance sheet
- interest rate swaps
- formation of a joint venture to finance a major project
- transfer of debt with recourse to an unrelated third party

Specific examples of creative accounting
- ABC company chooses from using bad debts based on credit sales rather than bad debts based on receivables. Assume that bad debts based on credit sales produces a bigger expense than bad debts based on receivables. The company needs a greater bad debt expense to reduce earnings. The reason for the use of creative accounting here is the desire to reduce net income subject to taxation.

Creative Accounting
Naser (1993) defines creative accounting as a process of manipulating accounting to take advantages of the loopholes in accounting rules and the choices of measurement and disclosure practices. Creative accounting is effected through the creative touch made on the transactions to produce the required accounting results rather than reporting transactions in a neutral and consistent way.
ABC Company chooses using completed contract method on construction projects rather than the percentage of completion method. ABC resorts to creative accounting due to its desire to delay payment of taxes.

XYZ Company decides capitalizing interest as cost of constructed asset rather than as a cost of financing or expense. It resorts to creative accounting to improve the cost of its assets.

XYZ faces the problem of recording leases as capital or operating lease. To create off-balancing financing, it opted to treat lease as operating lease. In this case, all payments are treated as operating payments. There is deliberate recognition of liability arising from capital lease. The company resorts to creative accounting through off-balance sheet financing by not recognizing and recording the lease liability.

Bonds were issued by LMN with bond discount. Using straight-line method of amortization produces lower figures than interest method. Interest method was chosen to show a reduced amount of earnings. Manipulation of earnings is done through the choice of alternative methods.

OPQ Company switched from the straight-line method of depreciating assets to the sum of years’ digit method. Depreciation expense using straight-line method was greater than the sum of years’ digit method. OPQ Company wanted to show a higher net book value at a certain year.

FGH resorted to borrow at end of year. Given the same information for XYZ, let us see the effect of borrowing P2,500 at the end of year by FGH

<table>
<thead>
<tr>
<th></th>
<th>XYZ</th>
<th>FGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>1,000</td>
<td>1,000 + 2,500</td>
</tr>
<tr>
<td>Receivable</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Payable</td>
<td>4,000</td>
<td>4,000 + 2,500</td>
</tr>
</tbody>
</table>

Effects of this borrowing is summarized as:

- Working capital is the same.
- Cash to liabilities for XYZ is 25% while cash to liabilities for FGH is 54%.
- Current ratio for XYZ is 75% while current ratio for FGH is 85%.

Creative accounting in this example is resorted to improve its financial ratios.

Ways to eliminate the use of creative accounting.

The continued use of creative accounting distorts the purpose of the accounts and the financial statements and threatens the integrity of financial reporting.

These measures are recommended to eliminate the use of creative accounting:
- More detailed accounting legislation.

The continued use of creative accounting distorts the purpose of the accounts and the financial statements and threatens the integrity of financial reporting.

Draft 42 & Exposure Draft 49 are examples of these releases and drafts; TR 603 considers the economic substance rather than the legal from when determining the true nature of transactions. ED 42 & ED 49 are drafts requiring that the accounting treatment of transactions in assets and liabilities should reflect fairly their commercial effects in practice.

More strict standards and more standards aimed at specific problem cases. Accounting standards must be set by accounting bodies to curb these practices on creative accounting.

Greater accounting disclosures. Disclosures of transactions and manner of reporting will give auditors more chances of determining whether these transactions should be recognized or disclosed only.

Greater relevance on the concept of substance over form. Principal, management and users of financial statements should understand the feature known as substance over form. In financial accounting, the substance of a transaction should prevail over its legal or tax form. Reconciliation can be done with accounting, legal or tax methods. In accounting books and accounting reports, substance of a transaction should be considered. Users must be educated on the use of the substance over legal and tax form feature.

Summary

Knowing these creative touches used by management, the accountant and auditor must be responsible to detect these common applications of creative accounting. The accountant must continue to present the accounting information to interested users in a manner that these information will aid them in making economic decisions. The auditor must continue to verify these financial data based on generally accepted accounting principles so that users will rely on audited financial reports.

Creative accounting continues to pose a problem to us. Accounting regulations from the accounting profession will play a major role in minimizing or eliminating the use of creative accounting.

References


An application of integer programming in capital budgeting

By Ramon Enriquez, Assistant Professor, Business Management Department

Introduction
Capital budgeting in Financial Management is the allocation of financial resources to various possible investment opportunities. It requires the selection from various different investments, each having a cost/benefit pattern in future time periods, of a combination of investments that will maximize profits while remaining within cost budgets established for each of future time periods.

The decision arrived at by this problem may be through the payback period (which is the length of time required for the initial capital investments to be recovered from the incremental cash flow of the proposal), accounting rates of return (which evaluates the profitability of the proposal), net present value (which is based on the concept of cash flow analysis and time value of money) and internal rate of return (which equates the present value of the net cash inflows to the original investments).

In a real-world situation, especially in a complicated business world, these techniques are sometimes not enough in justifying an investment. Most companies would have to consider constraints which may alter the decision but cannot be observed by the above methods. One possible way of treating both theoretical and practical considerations is through the use of linear programming. Linear programming, especially integer programming, would be able to determine the optimal set of investment proposals subject to certain constraints.

In a typical and practical capital budgeting situation, the objective may be to maximize the net present value or the internal rate of return subject to the constraints of cash available for investment, limitations for particular proposals, and other constraints.

There are different techniques in solving a capital budgeting problem. However, in a replacement problem, wherein a "yes or no" decision is required, the use of integer programming is the most ideal technique.

Mathematical formulation
Consider a company planning its capital spending for the replacement of its production lines. There are N machines being considered for replacement. The existing production lines are represented by the subscripts 1, 2, ... N. On the other hand, the new lines are represented by the subscripts N+1, N+2, ... 2N.

Let \( x_j = 1 \) if the production line \( j \) is in operation
\[ 0 \] otherwise
where \( j = 1, 2, \ldots 2N \)

Let \( p \) be the net present value (NPV) of the future net cash flows (inflows) from production line 1 to production line 2N. The objective is to maximize the total net present value subject to the budget limitations and market demand.

Formulation 1
Maximize \[ \text{NPV} = \sum_{j=1}^{2N} \]
subject to \[ x_1 + x_{N+1} = 1 \]
\[ x_2 + x_{N+2} = 1 \]
\[ x_N + x_{2N} = 1 \]
Limit on project acceptance
\[ \sum_{j=1}^{2N} c_j x_j \leq M \] Budget availability
\[ \sum_{j=1}^{2N} q_j x_j \geq D \] Supply/demand constraint

Formulation 2
Maximize \[ \text{NPV} = \sum_{j=1}^{2N} \]
subject to \[ x_1 + x_{N+1} \leq 1 \]
\[ x_2 + x_{N+2} \leq 1 \]
\[ x_N + x_{2N} \leq 1 \] Limit on project acceptance
\[ \sum C_i x_i \leq M \] Budget availability

\[ \sum Q_i x_i \geq D \] Supply/demand constraint

where:
- \( P_j \): net present value of machine \( j \) over its useful life
- \( x_j \): machine/production line \( j \) that is in operation
- \( C_j \): cash outlay of machine \( j \)
- \( Q_j \): installed capacity for each machine
- \( M \): budget available for replacement
- \( D \): market demand

It should be noted that the Integer Programming formulation of the capital budgeting/replacement problem may have additional constraints aside from those indicated above depending on the resources of the company.

Application to the Sampaguita Manufacturing Company

The Sampaguita Manufacturing Company (disguised name), a leading personal and home care product manufacturer, produces detergent bars. The company has five production lines/machines which are used for production. These machines can produce a total of 625 cases of detergent bars per hour. Each case contains 48 480-gram bars; each bar can be sold at ₱8.50. The average economic life of these machines is 10 years with no resale value if sold at the end of its lifetime. The frequent use of machines increases their variable cost. However, fixed cost remains constant for all the machines.

Sampaguita Manufacturing Company has been experiencing cost overruns in the past years. Thus, management is thinking of replacing the machines. A replacement of one machine would mean a 40% reduction in the variable cost but not in fixed cost although the same quantity of detergent bars is produced. Each new machine costs ₱41,800,000 but the company has set a budget of only ₱41,440,000; hence, it cannot possibly replace all five machines at the same time.

At the present time, the management wants to determine which of these machines are to be replaced to satisfy the market demand of 28,500 ton/year given its available resources. The management is also considering the possibility of scrapping machines (that is, they intend to use fewer machines for production). Table 1 shows the ages of the machines and the corresponding costs of acquisition and Table 2 shows the yearly sales and the yearly contribution margins.

<table>
<thead>
<tr>
<th>Machine</th>
<th>Age (in years)</th>
<th>Acquisition cost (₱)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>9,000,000</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>9,500,000</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>15,000,000</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>15,000,000</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>10,000,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (₱)</th>
<th>Cont. margin (₱)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>173,700</td>
<td>45,800</td>
</tr>
<tr>
<td>1980</td>
<td>260,100</td>
<td>62,900</td>
</tr>
<tr>
<td>1981</td>
<td>294,100</td>
<td>56,100</td>
</tr>
<tr>
<td>1982</td>
<td>323,800</td>
<td>77,900</td>
</tr>
<tr>
<td>1983</td>
<td>341,000</td>
<td>610,000</td>
</tr>
<tr>
<td>1984</td>
<td>692,000</td>
<td>163,300</td>
</tr>
<tr>
<td>1985</td>
<td>628,600</td>
<td>163,300</td>
</tr>
</tbody>
</table>

The problem is solved through integer programming using the Branch-and-Bound (BAB) method. The objective is to select the proper machine to be replaced in order to maximize the total net present value of the future cash flows of all the machines in operation constrained by limited capital as well as market demand.

Certain calculations are required for the integer formulation of the replacement problem. The following are the steps in the formulation of \( x_j \)'s in the objective function. For the old machines:

1. Project sales and variable cost until 1996 using linear regression.
2. Compute the cash flow (see Table 3).
3. Compute the share of each machine to the total cash flow by multiplying the cash flow of machine \( j \) to certain weight \( W_j \), which is

\[
W_j = \frac{1}{(age \text{ of machine } j) + 1} + \frac{1}{8} + \frac{1}{4} + \frac{1}{7}
\]

4. Get the present value of individual annual cash flow using 20% as the discount rate.
have resulted in dramatic deterioration in their agriculture sectors and their external accounts. He further cites that inappropriate exchange rate policy brought about the dismal outcome of the Southern Cone (Argentina, Chile, and Uruguay) economic reforms and free-market policies during the late 1970s. Cottani, et. al. (1990), in examining how RER behavior and economic performance affect each other, indicated that a strong negative correlation across countries exists between performance indicators and two measures of RER behavior, instability and the export sector. To the extent overvaluation undermines the profitability of exports and provides a deterrent for other countries to import from the country with an overvalued rate, overvaluation strikes at the core of the development process. Exports are not only important in economies where they make up a large share of national output or employ a sizable proportion of the labor force; they are vital since, in developing countries, foreign exchange availability is considered a main determinant of the overall level of economic activity (Ghura and Grennes 1990), (Pfeffermann 1985).

Pfeffermann (1985) recognizes that overvaluation stimulates demand for foreign exchange as it is made relatively cheaper, especially when people believe that the existing overvalued rate cannot be maintained for long. This will trigger them to buy more foreign exchange to take advantage of its low price.

Furthermore, this leads to increased consumption of imported products. If increased protection results from a rise in imports, the problems of the economy exacerbates, as this would cause more overvaluation. The two are mutually reinforcing: overvaluation generates pressure for protection against imports; protection against imports perpetuates overvaluation.

It should be pointed out here that there are times when the RER is allowed to appreciate and maintained at “disequilibrium” levels in developing countries, usually when severe domestic pressures result in inflation. Since this overvalues the RER, governments must take measures to curb imports and must decide whether to reduce economic activity through restrictive monetary and fiscal policy, or through quantitative import controls.

The first option, if pursued long enough, is clearly inimical to growth while the second course of action would misallocate resources. Governments can, of course, use reserves to finance the deficit in order to accommodate the appreciated exchange rate but then this is clearly unsustainable after a time. On the
tation for the annual installed capacity is as follows:

\[
\text{Annual installed capacity (kg/yr)} = \text{No. of working days (days/yr)} \times \text{No. of working hours (hr/day)} \times \text{No. of bars per day (bars/day)} \times \text{No. of kgs. per bar (kgs/bar)}
\]

The total market demand per year which the company is wanting to satisfy is computed as follows:

\[
\text{Total market demand} = \text{Market demand (ton/year)} \times \text{Equivalent in kg (Kilogram/ton)}
\]

The capital outlay of each machine for replacement must at most be equal to the total money or capital available to the company.

<table>
<thead>
<tr>
<th>Year</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>66,452</td>
</tr>
<tr>
<td>1987</td>
<td>59,530</td>
</tr>
<tr>
<td>1988</td>
<td>59,375</td>
</tr>
<tr>
<td>1989</td>
<td>68,760</td>
</tr>
<tr>
<td>1990</td>
<td>46,999</td>
</tr>
<tr>
<td>1991</td>
<td>41,239</td>
</tr>
<tr>
<td>1992</td>
<td>36,758</td>
</tr>
<tr>
<td>1993</td>
<td>32,669</td>
</tr>
<tr>
<td>1994</td>
<td>28,909</td>
</tr>
<tr>
<td>1995</td>
<td>23,554</td>
</tr>
<tr>
<td>1996</td>
<td>20,797</td>
</tr>
</tbody>
</table>

Total

<table>
<thead>
<tr>
<th>Machine</th>
<th>Resale Value (in pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1,900,000</td>
</tr>
<tr>
<td>3</td>
<td>9,000,000</td>
</tr>
<tr>
<td>4</td>
<td>9,000,000</td>
</tr>
<tr>
<td>5</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

One machine from machine 1 and 5 must be in operation. Only one must be selected from machine 2. Since machines 3 and 4 have only been in operation for 4 years, the company is not willing to replace them at this time. Hence, the formulation of the replacement problem is as follows:

\[
\text{Maximize } Z = 72,316X_1 + 90,358X_2 + 186,693X_3 + 186,693X_4 + 103,294X_5 + 484,069X_6 + 2,384,069X_7 + 9,484,069X_8 + 9,484,069X_9 + 3,484,069X_{10}
\]

subject to

\[
25,228,800(X_1 + X_2 + X_3 + X_4) \geq 116,573,300
\]
\[
19,800,000(X_5 + X_6 + X_7) \leq 41,440,000
\]
\[
X_1 + X_2 + X_3 + X_4 + X_5 + X_6 \leq 4
\]
\[
X_5 + X_6 = 1
\]
\[
X_7 = 1
\]
\[
X_8 = 0; X_9 = 0
\]

The above model is solved using the simplex method. However, it yielded an unbounded solution. Different interim models were constructed to come up with a model that is a true representation of the capital budgeting replacement problem of the Sampaguita Manufacturing Company. In the following page is the summary of the interim models constructed.

<table>
<thead>
<tr>
<th>Interim Model</th>
<th>Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(X_1 = 0) appended to the original model.</td>
<td>Unbounded</td>
</tr>
<tr>
<td>2</td>
<td>Mutually exclusive alternative changed to a less restrictive constraint</td>
<td>Unbounded</td>
</tr>
<tr>
<td>3</td>
<td>Projected sales for the year 1996 was used as the RHS of the supply/demand constraint</td>
<td>Integer solution</td>
</tr>
<tr>
<td>4</td>
<td>Projected sales for the year 1996 was used as the RHS of supply/demand constraint</td>
<td>Integer solution</td>
</tr>
</tbody>
</table>

From interim models 3 and 4, a final model was formulated. Although the company maintained that the installed capacity is the same for both the old and the new machines, this researcher thought it logical to assume that the installed capacities would be different. Table 9 gives the assumed installed capacity for each machine.
Table 9. Assumed installed capacities for each machine

<table>
<thead>
<tr>
<th>Machine</th>
<th>Cases/hour</th>
<th>Kilograms/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>96</td>
<td>19,375,718</td>
</tr>
<tr>
<td>2</td>
<td>104</td>
<td>20,990,362</td>
</tr>
<tr>
<td>3</td>
<td>120</td>
<td>24,219,648</td>
</tr>
<tr>
<td>4</td>
<td>120</td>
<td>24,219,648</td>
</tr>
</tbody>
</table>

Table 10. Summary and Interpretation of the Final Solution

<table>
<thead>
<tr>
<th>Decision Variable</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_3 = 0 ); ( X_6 = 0 )</td>
<td>The whole line is totally scrapped</td>
</tr>
<tr>
<td>( X_3 = 0 ); ( X_7 = 1 )</td>
<td>The second machine is replaced by a new one</td>
</tr>
<tr>
<td>( X_3 = 1 ); ( X_6 = 0 )</td>
<td>The third machine is retained</td>
</tr>
<tr>
<td>( X_3 = 1 ); ( X_7 = 0 )</td>
<td>The fourth machine is retained</td>
</tr>
<tr>
<td>( X_3 = 0 ); ( X_10 = 1 )</td>
<td>The fifth machine is replaced by a new one</td>
</tr>
</tbody>
</table>

The final model for the year 1986 is formulated by changing the left hand side of supply/demand constraint of interim model 3 by the assumed installed capacity of the machine. Also, the final model for the year 1995 is obtained by changing the left hand side of the supply/demand constraint of interim model 4 by the assumed installed capacities of the machines.

Both the 2 final models yielded integer solutions similar to the solution of the interim models from which they are derived. The summary and interpretation of the final solution is shown in Table 10.

Conclusion

Zero-one programming, through its "yes or no" decision, is the ideal management science tool to solve the replacement problem in capital budgeting. Through the BAB method, the optimal replacement policy in terms of profitability was determined by looking at all the feasible combination of machines that will yield a maximum net present value.

This exercise not only determined the integer solution to the company’s replacement problem but also drew up an alternative production policy for Sampaguita Manufacturing Company. Through the use of interim models formulated one after another, the possibility of maintaining four machines instead of the usual five machines for production came out. This means that one production line is removed without any replacement and any adverse effect on production and sales.

The value of Management Science in solving day-to-day business and finance problems is no longer in doubt. This exercise using integer programming in a capital budgeting scenario is one good example. Undoubtedly, there are more of these problems that are now being addressed as can be evidenced by substantial investments of companies in Operations Research departments to accelerate the solutions to their problems.

References


NOTES

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