MEASURING CAPITAL AND INCOME

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Measuring Capital and Income*

Three major questions arise in studying accounting measurement models for use in determining income and financial position:

1) How to value net assets?[1]

2) What measurement unit to employ?[2]

3) What concept of capital to employ?

It is important to realize that these are independent problem areas - any net asset valuation method can be used with any measurement unit and any capital concept.[3] The traditional historical cost model emphasizes the use of past entry prices for asset valuation, uses money as the measurement unit and employs a financial capital maintenance concept but you can change any one of these without having to change the other two. The first two questions are better discussed and understood in the literature, although answers are not agreed upon, than the third. This article investigates the third question - the alternatives, recent international developments and some implications.

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[1]See the ARC's Current Value Discussion Paper (CVDP), August, 1976, Chapter 4, for a discussion of valuation alternatives. This question also includes the problem of whether and how to separate realized and unrealized income.

[2]Alternatives include units of money, units of general purchasing power (GPP) or units of more specific purchasing power, e.g., industry or firm specific. At present, only money and GPP units are being seriously considered by the accounting profession.

[3]This point was emphasized by Rosen in his CICA study, Current Value Accounting and Price-Level Restatements, 1972.

Alternative Capital Concepts

Although most accountants accept the definition of income usually attributed to Hicks[1], i.e., income is the excess you have at the end of a period after ensuring that you are as well off at the end of that period as you were at the beginning, a problem is faced in deciding what "well-offness" should mean. Suggested concepts of well-offness or capital include defining income as the amount available for distribution and/or reinvestment after maintaining capital in terms of:

1. Money - the amount of dollars of shareholder's equity at the beginning of the period

2. General purchasing power (GPP) - the amount of purchasing power represented by the shareholder's equity at the beginning of the period.

3. Productive capacity - the amount required to maintain the firm's ability to provide the same amount of goods and services that it was capable of providing at the beginning of the period.

4. Other concepts - these may be variants of concepts listed above and include;
   i) maintenance of a firm's market share within a particular industry
   ii) maintenance of the ability to pay the same level of dividends in future periods as is being paid currently.[2]

An FASB Discussion Memorandum, has suggested that only two main concepts of capital exist:[3]

1. Invested financial capital - capital is the dollar value of assets invested by owners directly and through retention of earnings. Income is ultimately the difference between cash paid and cash received (holding gains are included in income) although the amount of income differs depending on the measurement scale employed and the timing of income differs depending on the asset valuation attribute selected.

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[1] But which can be traced back at least to Adam Smith (See Hanna, Accounting Income Models, Special Study No. 8, Society of Industrial Accountants, 1974, page 10).

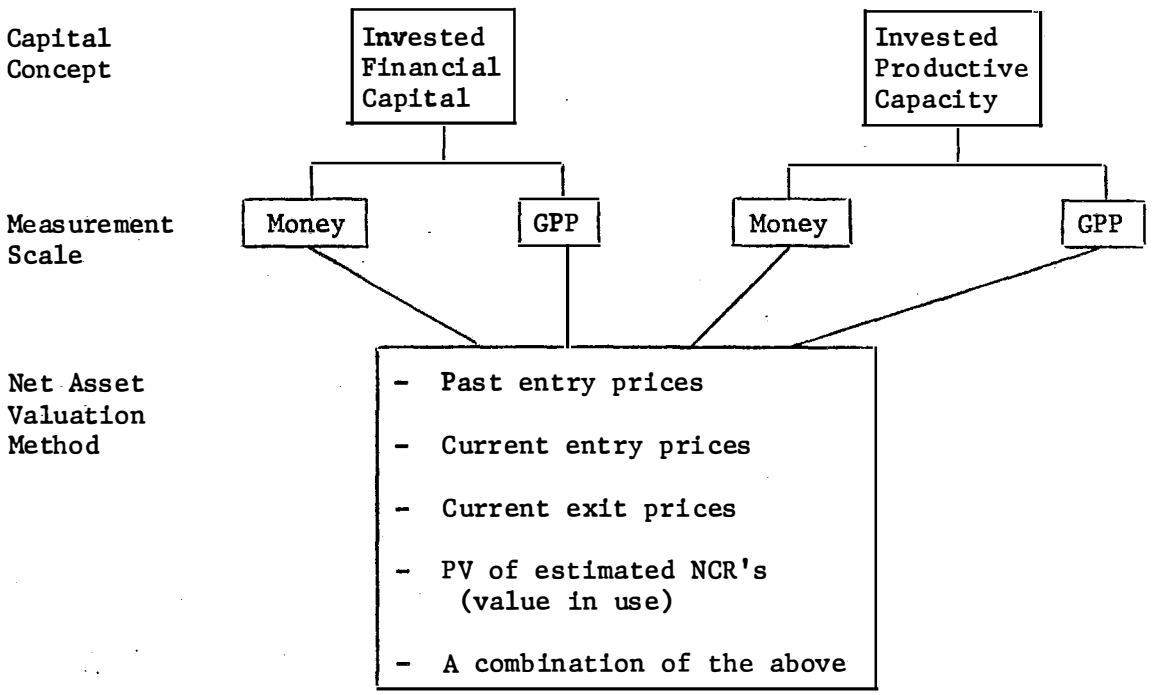
[2] See J. R. Hicks, Value and Capital, Oxford, 2nd Edition, 1939, page 174.

[3] FASB, Conceptual Framework for Financial Accounting and Reporting, Discussion Memorandum, December 2, 1976, pg. 125.

2. Invested productive capacity - the capital to be maintained is the productive capacity of the enterprise (the ability to provide the same level of goods and services).

Since capital is expressed in financial or money terms in both of these FASB concepts, it can be expressed in either unit of measurement, dollars or dollars of general purchasing power and combined with any net asset valuation method(s), (see Figure 1).

Figure 1



Invested financial capital (IFC)

Current practice and early North American proposals for accounting for changing prices have focused on the invested financial capital concept as set out in Table 1 although SEC Accounting Series Release #190 stated a decision had not been made yet concerning the question of whether holding gains are part of income.

TABLE 1

ACCOUNTING MEASUREMENT MODEL	CAPITAL CONCEPT	MEASUREMENT UNIT	ASSET VALUATION METHOD
TRADITIONAL HISTORICAL COST	IFC (Money maintenance)	MONEY	EMPHASIS ON PAST ENTRY PRICES (H.C.) BUT SOME USE OF CURRENT ENTRY AND EXIT PRICES[1]
CONSTANT DOLLAR HISTORICAL COST (CANADIAN, AND U.S. GPP EXPOSURE DRAFTS)	IFC (GPP maintenance)	GPP	SAME AS ABOVE
CURRENT VALUE (CANADIAN DISCUSSION PAPER)	IFC (GPP maintenance via short-cut O/E restatement, see CVDP page 41-44)	MONEY	A COMBINATION OF VALUES EMPHASIZING CURRENT ENTRY PRICES
CURRENT VALUE (SEC's ASR #190)	NOT DECIDED	MONEY	CURRENT ENTRY PRICES

In most cases, the IFC concept is straight forward once the scale of measurement and asset valuation methods are selected. If the measurement unit is money, IFC at the beginning of the period is determined by valuing net assets using the valuation approach selected. This opening capital (adjusted for new capital invested and dividend payments, if any) is the amount of money well-offness that must be maintained at the end of the period before any income is earned. The traditional historical cost model employs this capital concept in combination with a money unit of measurement.

If the measurement unit is GPP, the GPP of the IFC at the beginning of the period must be maintained before income is earned.

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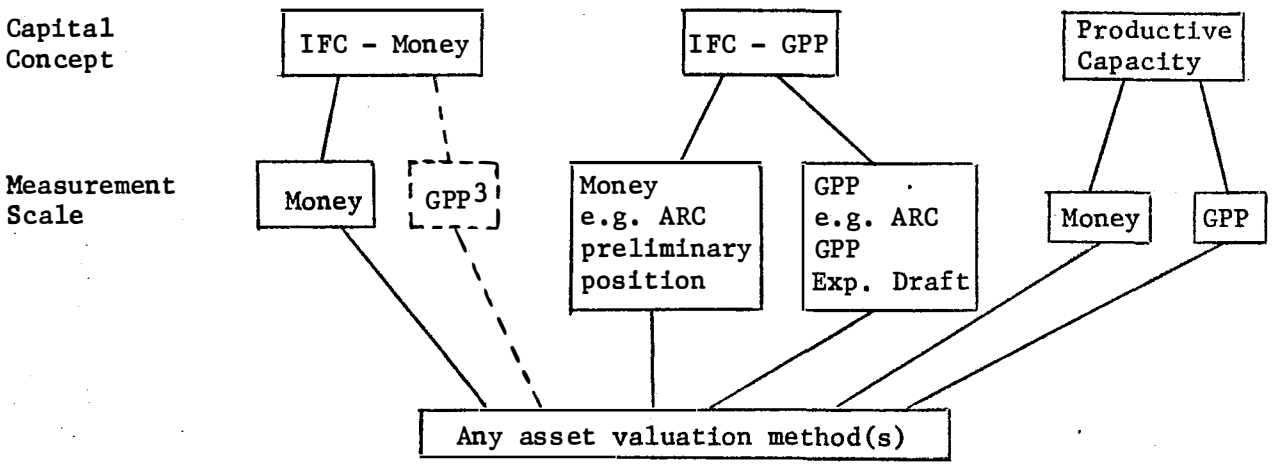
[1] For example, the general use of lower of cost or market for inventories and the frequent use of current selling prices for finished goods of mining companies in Canada.

In the more common cases discussed above, IFC-money maintenance went with a money measurement unit and IFC-GPP maintenance went with a GPP measurement unit. A less straight forward method is advocated in the CVDP preliminary position - a combination of IFC-GPP maintenance using a "Restatement of shareholders equity only" approach[1] and a money measurement unit instead of a GPP measurement unit. This approach is intended to permit use of a GPP capital maintenance concept without having to restate all financial statement items, calculate purchasing power gain or loss, restate prior years figures, etc. Under any current value net asset valuation method, this approach achieves the same net income result as complete restatement because opening owner's equity (capital) is reported in constant dollars of purchasing power.[2] This method is said to be less likely to confuse financial statement users than complete restatement while still excluding the effect of changes in the purchasing power of the dollar (inflationary profits) from income.

Since IFC can be maintained in GPP with a money or GPP measurement unit, the FASB's categorization of capital maintenance concepts as set out in Figure 1 is incomplete. Figure 2 attempts to rectify this deficiency by dividing IFC into two separate concepts, IFC-money (IFC-M) and IFC-GPP.

Figure 2



[1] Chapter 5, B-II, page 41-44.

[2] See Basu and Hanna, Inflation Accounting: Alternatives, Implementation Issues and Some Empirical Evidence, Society of Industrial Accountants, 1975, pages 18-19. This short-cut "restatement of opening shareholder's equity only" approach will not work for the historical cost model because opening owner's equity represents a mixture of different dollars at any date. Opening shareholder's equity can be restated into constant dollars at the beginning of the year by doing a complete restatement of the historical cost balance sheet (assets - liabilities restated equals restated owner's equity) and then the short-cut procedure can be used for all subsequent years because opening equity will be in constant dollars of purchasing power.

[3] An IFC-Money concept combined with a GPP measurement unit is difficult to conceptualize since opening capital would have to be restated for inflation under a GPP measurement unit and, thus, would no longer be a "money" concept.

Productive capacity capital (PCC)

According to proponents of the PCC concept, income can be recognized only after the beginning capacity of the firm to produce goods and services has been maintained. While many variants of this concept exist, a conceptually complete concept would recognize that:[1]

i) the productive capacity of all productive assets, both physical and monetary, must be maintained and;

ii) to the extent assets are financed by debt, this should be taken into account in determining the income earned by the owners of the business.

While a PCC concept can be combined with any measurement unit and asset valuation method, advocates of PCC are almost universal in employing a money measurement unit and a current entry price (usually called current cost) dominated net asset valuation method. Moreover, it is generally agreed that two measures of income should be reported - income to the enterprise and income to the owners (common equity).

Well-offness of an enterprise is not maintained unless provision has been made to replace the productive capacity of all assets, monetary and non-monetary. New Zealand's Richardson Committee states:

> .... it must be recognized that the effects of inflation are specific in relation to monetary assets just as they are to non-monetary assets. ... In order to see whether the operating capacity of monetary assets has been affected, it is necessary to examine the enterprise's reasons for holding monetary assets ... and then to see if the prices relevant to those assets have changed during that period. If there has been a change then this requires adjustment to recognize the effect this has had on the operating capacity of the monetary assets" (page 124)

For example, if selling prices of the enterprise's products increase on average by 10%, then 10% more must be invested in accounts receivable to maintain the same level (quantity) of credit sales by the enterprise.

In addition to maintaining the productive capacity of all operating assets, maintenance of the well-offness of the common shareholders should consider the impact of debt financing since, to the extent replacement of assets can be financed by debt, owners do not have to finance their replacement.

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[1] The Report of the Committee of Inquiry into Inflation Accounting (Richardson Committee) Government Printer, Wellington, New Zealand, 1977, Ch. 4, presents a good discussion of a complete PCC concept.

An Example

The factors discussed above can best be considered by referring to a simple example of a firm operating in a steady state - neither expanding or contracting its productive capacity - during a period of stable prices. All transactions occur on 12/31 of each year (i.e. sales and purchases made on account; prior year's receivables collected, and payables paid; fixed assets purchased; interest, taxes and other expenses paid) and all cash at the close of business at 12/31 is paid as a dividend. The year 19-0 financial statements (current cost = historical cost under a steady state) follow:[1]

12/31/19-0 Balance Sheet:

Accounts receivable	$ 6,000	Accounts payable	$ 2,000
Inventory	2,000	10% Long Term debt	4,000
Fixed assets - cost	5,000	Common stock	5,000
Accumulated depreciation	(2,000)	Retained earnings	0
	$11,000		$11,000

Income Statement for 19-0

Sales		$ 6,000
Cost of sales	$ 2,000	
Depreciation	1,000	
Other expenses	600	
Interest	400	4,000
Income before tax		$ 2,000
Tax (50%)		1,000
Net Income		$ 1,000

Cash Flow Statement for 19-0

Sources:	
Collection of A/Rec.	$ 6,000
Uses:	
Purchase fixed assets	$ 1,000
Other expenses	600
Interest	400
Taxes	1,000
Pay accounts payable	2,000
Dividend	1,000
	$ 6,000

[1] Since the company is operating in a steady state with no specific or general price changes, the financial statements for the previous year are identical to those for 19-0.

On January 1, 19-1 assume prices increase as follows:

Inventory - 10%
Other expenses (paid in cash each year) - 10%
Fixed assets (5 machines costing $1,000 each and replaced at the rate of 1 machine per year) - 20%
Selling price of firm's product - 15%

Traditional historical cost financial statements for 19-1, assuming a FIFO inventory flow assumption, are:

12/31/19-1 Historical Cost Balance Sheet:

A/receivable (115% x 6,000)	$ 6,900	A/payable (110% x 2,000)	$ 2,200
Inventory (FIFO 110% x 2,000)	2,200	10% L.T. debt	4,000
Fixed assets - cost (4 x 1,000 + 1,000 x 120%)	5,200	Common equity (Plug)	6,100
Accumulated depreciation (2,000 - 1,000 + 1,000)	(2,000)		$12,300
	$12,300		

Historical Cost Income for 19-1

Sales (6,000 x 115%)		$6,900
Cost of sales-FIFO	$2,000	
Depreciation	1,000	
Other expenses (600 x 110%)	660	
Interest	400	4,060
Income before tax		$2,840
Taxes on income (50%)		1,420
Net income		$1,420
Less dividends paid		320
Income reinvested		$1,100

Cash flow statement for 19-1

Sources:		
Collection of A/Rec.		$6,000
Uses:		
Payment of A/pay	$2,000	
Purchase of fixed asset	1,200	
Interest paid	400	
Other expenses paid	660	
Taxes paid	1,420	5,680
Difference paid as dividend on 12/31 -		$ 320

Given a stable level of operations and the information concerning price changes supplied above, a current cost balance sheet for 19-1 can be easily prepared:

12/31/19-1 Comparative Current Cost Balance Sheet

	Calculation	12/31/19-1	12/31/19-0
Accounts receivable	115% x 6,000	$ 6,900	$ 6,000
Inventory	110% x 2,000	2,200	2,000
Fixed assets - gross	5 x 1,200	6,000	5,000
Accumulated dep'n	40% used x 6,000	(2,400)	(2,000)
		$12,700	$11,000
Accounts payable	110% x 2,000	$ 2,200	$ 2,000
10% L.T. debt	no change	4,000	4,000
Common equity	plug	6,500	5,000
		$12,700	$11,000

IFC - money concept

Using an equity change approach, income under an IFC-M concept can be calculated as:[1]

$$\text{Income} = O/E_{12/31/19-1} - O/E_{12/31/19-0} + \text{Dividends} - \text{New Investment}$$

$$\text{Income} = 6,500 - 5,000 + 320 - 0 = \$1,820$$

Income for 19-1 under an IFC-M concept would treat all increases in prices (holding gains) as income. Journal entries at 1/1/19-1 to reflect the specific price changes would be:

		DR	CR
1.	Inventory	$200	
	Holding gains on inventory		$200
2.	Fixed assets - gross	$1,000	
	Accumulated depreciation - 40%		$400[2]
	Holding gains on fixed assets - 60%		$600

[1] Dividends determined based on cash available at close of business on 12/31 as per cash flow statement provided.

[2] At 1/1/19-1 the fixed assets are 40% used and holding gains are only 60% of the gains that would accrue if the fixed assets were new.

	DR	CR
Fixed asset entries at 12/31/19-1 would be:		
1. Depreciation expense (1/5 x 6,000)	$1,200	
Accumulated depreciation		$1,200
To record current cost dep'n		
2. Fixed assets	$1,200	
Cash		$1,200
To record purchase of new asset		
3. Accumulated depreciation	$1,200	
Fixed assets		$1,200
To record retirement of fixed asset		

A traditional style income statement for 19-1, assuming taxes are based on historical cost income, would be:

Current Cost Income Statement for 19-1

Sales revenue (115% of 6,000)		$ 6,900
Current cost of sales (110% of 2,000)	$ 2,200	
Current cost depreciation	1,200	
Other expenses (110% of 600)	660	
Interest	400	4,460
Current operating income		$ 2,440
Holding gains on inventory	$ 200	
Holding gains on fixed assets	600	800
Income before taxes		$ 3,240
Taxes		1,420
Net Income		$ 1,820

Current cost net income is $400 higher than historical cost income in this case because higher current cost of sales and depreciation, $400, are less than holding gains of $800 which are included in income under this concept.

The owner's equity section of a current cost balance sheet at 12/31/19-1 would be disclosed as follows:

Owner's equity

Capital	$5,000
Retained Earnings	1,500
	$6,500

IFC-GPP concept

Note that since the Current Cost Balance Sheet at 12/31/19-1 values all net assets in 12/31/19-1 dollars of GPP, capital is also in constant dollars of 12/31/19-1 GPP. To determine income using the IFC-GPP capital concept, opening capital must be maintained in terms of the GPP it represented at 12/31/19-0. Assuming the general price level increased 10% on 1/1/19-1, $5,500 (5,000 x 110%) are needed at 12/31/19-1 to maintain the shareholder's opening "well-offness" or capital. Income for 19-1 can be calculated as:

Income = 6,500 - 5,500 + 320 = $1,320

If a money unit of measurement is used, the entry to restate opening capital at 12/31/19-1 is simply:

Loss re impact of inflation on capital	$500	
Capital adjustment		$500

The loss would be deducted in the income statement lowering income $500 below that calculated under the IFC-M capital concept and owner's equity would be disclosed as:

Owner's equity

Capital - 12/31/19-0	$ 5,000	
Capital adjustment to maintain GPP	500	$ 5,500
Retained earnings		1,000
		$ 6,500

If a GPP measurement unit is employed, however, the corporation's 19-1 comparative balance sheet would require complete restatement of the 19-0 amounts:

12/31/19-1 Comparative Current Cost Balance Sheet
(in 12/31/19-1 constant dollars)

	12/31/19-1	12/31/19-0	
Accounts receivable	$ 6,900	6,000 x 1.10	$ 6,600
Inventory	2,200	2,000 x 1.10	2,200
Fixed assets - gross	6,000	5,000 x 1.10	5,500
Accumulated dep'n	(2,400)	2,000 x 1.10	(2,200)
	$12,700		$12,100
Accounts payable	$ 2,200	2,000 x 1.10	$ 2,200
10% L.T. debt	4,000	4,000 x 1.10	4,400
Owner's equity			
Capital	5,500	5,000 x 1.10	5,500
Retained earnings	1,000		
	$12,700		$12,100

Income would include only "real" holding gains as income, i.e. holding gains reflect only the extent to which the specific prices of items held during a period increase above the increase in the general price level. Inflationary or fictitious gains, the portion of price increases offset by changes in the GPP of the dollar, are eliminated under the IFC-GPP concept.

Holding gains at 1/1/19-1 would be calculated after restating 12/31/19-0 accounts to reflect the 10% drop in the purchasing power of the dollar on 1/1/19-1 and would be:

Inventory - no holding gain because current cost of $2,200 = restated 12/31/19-0 figure (2,000 x 1.10 = $2,200), i.e. the specific price increase was just enough to protect the GPP invested in inventory items

Fixed assets - holding gains = current cost less 12/31/19-0 cost restated into 1/1/19-1 dollars
= $3,600 - (3,000 x 1.10) = $300

A traditional style income statement for 19-1 would be:

Current Cost Income Statement for 19-1
in constant dollars at 12/31/19-1

Sales revenue		$ 6,900
Current cost of sales	$ 2,200	
Current cost depreciation	1,200	
Other expenses	660	
Interest	400	4,460
Current operating income		$2,440
Purchasing power gain or loss on monetary items		Ø[1]
Holding gains on fixed assets		300
Income before taxes		$2,740
Taxes		1,420
Net Income		$ 1,320

[1] Note that purchasing power gains offset losses on 1/1/19-1 because monetary assets (6,000) equal monetary liabilities (2,000 + 4,000).

Productive capacity capital (PCC) concept

Under a PCC concept, a firm earns no income until it has maintained capital in terms of its ability to produce goods and services, i.e. to maintain the same level of operations. To operate at the same level in 19-1 as it did in 19-0, our example firm needs more capital because of the price increases that took place on 1/1/19-1. Specifically capital has to be increased to reflect:[1]

1. The capital increase needed to continue the same level of sales on account,
   15% of the 12/31/19-0 balance of 6,000 = $900

2. The capital increase needed to carry the same quantity of inventory items,
   10% of the 12/31/19-0 balance of 2,000 = $200

3. The capital increase needed to carry the same quantity (productive capacity) of fixed assets,
   20% of the 12/31/19-0 net fixed asset balance of 3,000 = $600

Total capital increase required to maintain productive capacity $1,700

Note, however, that $200 of the increase needed to maintain operating capacity comes from increasing accounts payable since inventory purchases are made on account. Assuming no change in the amount of long term debt, a net amount of $1,500 (1,700 - 200) must be added to owner's capital to maintain productive capacity given the change in the level of accounts payable.

Restated opening capital of $6,500 (5,000 + 1,500) can then be used to determine income under a PCC concept by using the equity change method:

Income = 6,500 - 6,500 + 320 = $320

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[1] Note that a PCC concept requires maintenance of the productive capacity of only essential monetary and nonmonetary assets. If a firm holds marketable securities or idle land as an investment not essential to normal operations, price changes for these assets do not affect the ability of the firm to produce goods and services. Rather, such price changes can be taken to income for nonmonetary asset value increases and no charge against income is required to maintain the productive capacity of non-essential monetary assets. Note also that many early PCC concept proposals and discussions suggested maintenance of the productive capacity of only nonmonetary or "physical" assets (often only inventory and fixed assets) - see, for example the CVDP, Ch. 5. Most recent proposals attempt to maintain the productive capacity of the enterprise (all assets) rather than just the productive capacity of selected assets.

Journal entries to record the restatement of capital differ depending on whether the capital adjustment relates to a monetary or nonmonetary item:

		Dr	Cr
1.	Provision to maintain level of credit sales	$900	
	Capital increment		$900
	To reduce 19-1 income for the increased capital required to maintain credit sales given a 15% increases in selling prices		
2.	Capital increment	$200	
	Funds provided by increasing accounts payable		$200
	To reflect portion of capital increment for 19-1 financed by trade creditors		
3.	Inventory	$200	
	Capital increment		$200
	To record increase in current cost of inventory on hand at 1/1/19-1		
4.	Fixed assets - gross	$1,000	
	Accumulated depreciation		$400[1]
	Capital increment		$600
	To record increase in current cost of fixed assets on hand at 1/1/19-1		

The entries for nonmonetary assets increase inventory and net fixed assets on hand by the amounts of specific price increases at 1/1/19-1 as was done under the IFC-M concept. However, the credits go to a capital account instead of an income account (holding gains) because the increased values of non-monetary assets are not available for distribution without impairing productive capacity. In addition, provision must be made to reduce income by any amount which must be added to accounts receivable in order to maintain the same level of credit sales, since monetary assets (unlike nonmonetary assets) are not subject to specific price changes. Similarily, the increase in the accounts payable monetary liability account allows $200 of the increased asset prices to be financed by short-term creditors instead of owners.

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[1] Many current PCC concept proposals adjust fixed assets this way. Other writers, however, suggest "capital increment" should include the full increase in the replacement cost of a new asset, i.e.:

Fixed assets - gross	$1,000	
Capital increment		$1,000

The "catch up" or "backlog" depreciation necessary to adjust accumulated depreciation to the correct amount should then be charged separately to either retained earnings or current income (see CVDP, pp. 15-16):

Retained earnings or depreciation expense	$400	
Accumulated depreciation		$400

Assuming no change in L.T. debt, a traditional style income statement for 19-1 using a PCC concept would be:

Current Cost Income Statement for 19-1
(Productive Capacity Capital Concept)

Sales		$6,900
Current cost of sales	$2,200	
Current cost depreciation	1,200	
Other expenses	660	
Interest	400	4,460
		$2,440
Deduct provision to maintain level of credit sales	$ 900	
Less funds provided by increasing accounts payable	(200)	700
Income before taxes		$1,740
Taxes		1,420
Net Income		$ 320

The owner's equity section of the 12/31/19-1 balance sheet would be:

Owner's equity

Capital invested	$5,000
Capital increment required to maintain productive capacity	1,500
Retained earnings	0
	$6,500

Various writers have pointed out, however, that the increasing costs of productive capacity should be financed by both long term creditors and shareholders if unnecessary conservatism is to be avoided.[1]

These writers point out that the 'L.T. debt to L.T. debt + equity' ratio will be continuously reduced towards zero if prices continue to increase and L.T. debt is kept at present levels. In terms of the above example, this ratio falls from 4:9 at 12/31/19-0 to 4:10.5 at 12/31/19-1. It is argued that a more reasonable PCC concept would maintain a constant ratio of 4:9, thereby financing 4/9 of the 1,500 capital restatement by issuing L.T. debt and only 5/9 of $1,500 by a charge to owner's capital.

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[1] See, for example, the Report of the Committee of Inquiry Into Inflation Accounting (Richardson Committee), Government Printer, New Zealand, 1977, page 134.

Assuming L.T. debt is issued at 12/31/19-1 to maintain a constant 4:9 ratio, the following entries would be appropriate:[1]

		Dr	Cr
1.	Cash	$667	
	L.T. debt (4/9 x 1,500)		$667
2.	Capital increment	$667	
	Portion of capital increment financed by L.T. debt		$667
3.	Retained earnings	$987	
	Cash		$987
	To record payment of dividends equal to cash on hand at close of business on 12/31/19-1 (320 + 667)		

PCC financial statements that maintain a constant L.T. debt to L.T. debt + equity ratio are:

Comparative Current Cost Balance Sheet at 12/31/19-1
(Productive Capacity Capital Concept
with constant L.T. Debt to L.T. debt + Equity Ratio

	12/31/19-1	12/31/19-0
Accounts receivable	$ 6,900	$ 6,000
Inventory	2,200	2,000
Fixed assets - gross	6,000	5,000
Accumulated depreciation	(2,400)	(2,000)
	$12,700	$11,000
Accounts payable	$ 2,200	$ 2,000
L. T. debt	4,667	4,000
Owner's equity		
Invested capital	5,000	5,000
Capital increment required to maintain productive capacity (1,500 - 667)	833	0
Retained earnings	0	0
	$12,700	$11,000

[1] Realize that LT debt of $667 does not have to be issued at 12/31/19-1. The important entry is #2. As long as it is intended to maintain a 4:9 ratio in the long run, entry #2 should be made whether or not additional debt is issued and dividends of $987 are paid at 12/31/19-1. Dividends of $987 can be paid without impairing the productive capacity of the enterprise if desired.

Current Cost Income Statement for 19-1
(PCC Concept with Constant L.T. Debt to L.T. debt + Equity Ratio)[1]

Sales		$6,900
Current cost of sales	$2,200	
Current cost depreciation	1,200	
Other expenses	660	
Provision to maintain level of credit sales less funds provided by increasing accounts payable (900 - 200)	700	4,760
Current cost operating profit		$2,140
Less interest	$ (400)	
Add portion of capital increment financed by L.T. debt	667[2]	267
Income before taxes		$2,407
Taxes		1,420
Net income		$ 987

Advocates of the PCC concept stress that the $987 of net income as determined above is a true measure of distributable income - the amount of dividends that can be paid while maintaining "well-offness" in terms of productive capacity.

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[1]The format of the income statement has been changed slightly to reflect the suggestion that the portion of capital increment for the period that is financed by L.T. debt should be offset against interest expense to better reflect the true cost of borrowed funds. See, for example, the Richardson Committee, page 153 and Skinner, Memorandum on the Significance of Debt Financing During an Inflationary Period, paper prepared for the Ontario Committee on Inflation Accounting No. 2, 1977.

[2]Another way to view this adjustment is to realize that it results in:

a) including the portion of holding gains financed by debt in income (4/9 x 600 re fixed assets + 4/9 x 200 re inventory)	$356
b) canceling 4/9 of the provision to maintain the level of credit sales less the portion financed by accounts payable (4/9 of 700)	311
	$667

Instead of preparing a traditional style income statement, some recent PCC proposals suggest a reconciliation format that would begin with historical cost income and reconcile to PCC concept income as follows:

Historical cost net income for 19-1			$1,420
Deduct:			
Excess of current cost of sales	$2,200		
Over historical cost of sales	2,000	$200	
Excess of current cost depreciation	$1,200		
Over historical cost depreciation	1,000	200	
Provision to maintain productive capacity of accounts receivable	$ 900		
Less funds provided by increasing accounts payable	200	700	1,100
PCC net income (L.T. debt constant)			$ 320
Add : portion of capital increment financed by L.T. debt			667
PCC net income (constant LT debt to LT debt plus equity ratio)			$ 987

To better compare the results of the alternative capital concepts, this reconciliation can be continued to derive the other capital concept measures of income:

PCC net income as above	$ 987
Add: capital increment financed by equity	833
IFC-Money net income	$1,820
Deduct: GPP adjustment to restate opening capital (.10 X 5,000)	500
IFC-GPP net income	$1,320

Other Considerations under the PCC Concept

A number of questions arise under the PCC concept that have not been discussed above - many of them indicating the subjectivity that attends this concept:

1. What L.T. debt to L.T. debt plus equity ratio is appropriate?

   a) What should be done if a firm decides to change from a, say, 4:9 to a 6:9 ratio? Can the proceeds of the additional debt issue be regarded as distributable income to shareholders? At a minimum, since the capital increment account adjustment in prior periods was based on the old ratio, should capital increment be adjusted by a charge or credit to income to bring it in line with the new ratio?

b) What ratio should be used? The actual ratio at the beginning of the period is advocated most frequently but possibly a target ratio should be used if it is substantially different.

2. What happens to the capital increment account if assets become non-essential?

Firms sometimes make major changes in their operations. Should capital increment relating to assets that become non-essential be transferred to income? Many writers suggest that this would be appropriate since there is no longer a need to maintain the productive capacity of such assets.[1] In effect, it can be argued that income over the life of an enterprise is the same under the PCC and IFC-M concepts but the timing of income is considerably different since the capital increment adjustment account (holding gains on nonmonetary assets and provision for maintenance of productive capacity of monetary assets, to the extent financed by shareholders) is taken to income only when assets become nonessential, i.e. the firm no longer intends to replace the assets. A more reasonable suggestion might be to transfer only the "real" portion of capital increment relating to such assets, since to the extent prices of such assets have only kept pace with inflation, no gain has really occurred.

3. How should the productive capacity of assets be determined?

Various factors, such as technological change, make it difficult to determine the productive capacity of nonmonetary assets but monetary assets present even greater problems. What should be done in real-life cases where, unlike the simple steady-state example above, product mix, sales volume, credit policy, etc. are changing? How should items such as cash be restated? The Richardson Committee recommended use of a general price index instead of a "weighted average of the specific indices of all non-monetary assets held and dealt in by the enterprise..." because "...considerably more work needs to be done before an adjustment on such a weighted specific index basis could be recommended". (page 151)

4. How should the portion of capital increment that is financed by creditors be determined?

In the example above, the portion of capital increment deemed to be financed by long term debt was determined on a proportionate basis using the ratio of LT debt to LT debt plus equity. Other accountants have suggested that specific assets should be associated with specific sources of financing. For example, a German proposal suggests that shareholder funds are used first to finance fixed assets and second to finance inventories. Conversely, debt is used first to finance monetary assets, second inventory and last fixed assets.[2] To the extent price changes for fixed assets,

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[1] See, for example, the CVDP, page 54.

[2] Accounting for the Purpose of Maintaining the 'Substantialistic Value' of an Enterprise, Institut der Wirtshaftsprufer in Deutschland, November, 1975.

inventories and other assets differ during a period, different allocation rules will affect the amount of capital increment and the determination of income.

Comparison of alternative concepts

To facilitate comparison of the alternative capital concepts discussed above, Exhibit 1 shows the calculation of net income for all concepts using an equity change approach. PCC income is calculated for the two cases discussed: first, where capital increment needed to maintain productive capacity is financed 100% by shareholders and, second, where the capital increment needed to maintain productive capacity is reduced to reflect the portion financed by L.T. debt. Note that this second case PCC calculation assumes no additional issue of L.T. debt on 12/31/19-1. Rather, only 5/9ths of the required capital increment is used in adjusting capital at 12/31/19-0 on the assumption that the remainder (4/9ths) can be financed by L.T. debt if desired without impairing the productive capacity of the enterprise. This treatment permits easier comparison of all four measures of income since capital at 12/31/19-1 is $6,500 in all cases.

Note that the restated amounts for individual asset and liability items in columns 2 and 4 of Exhibit 1 are not required to calculate net income under these concepts. It is easier to calculate restated opening capital under the IFC-GPP concept by simply taking 110% of opening capital as reported at 12/31/19-0 (110% of $5,000). Restated opening capital for the PCC concept in column 4 is easily accomplished by taking 5/9ths of the capital increment calculated in column 3 and adding this to opening capital as reported at 12/31/19-0 (5/9 x 1,500 + 5,000 = $5,833).

The restatements of individual opening asset and liability items are necessary, however, if comparative balance sheets are to be prepared showing previous year figures restated for either changes in GPP or changes in costs of productive capacity. Restatement of prior year figures into current year-end dollars is advocated by most accounting authorities where GPP statements are prepared.[1] A similar restatement approach could be used for PCC concept approaches. For example, using the information in columns 3 and 4, comparative balance sheets at 12/31/19-1 with 19-0 figures restated to show the 12/31/19-1 current cost of productive capacity at 12/31/19-0 are:

Column 3 - PCC with capital increment financed 100% by shareholders:

	19-1	19-0		19-1	19-0
Accounts receivable	$ 6,900	$ 6,900	Accounts payable	$ 2,200	$ 2,200
Inventory	2,200	2,200	10% L.T. debt	4,000	4,000
Fixed assets - net	3,600	3,600	Common equity	6,500	6,500
	$12,700	$12,700		$12,700	$12,700

[1] See, for example, the ARC's July 1975 Exposure Draft.

EXHIBIT 1

Calculation of Equity Change Net Income for 19-1 and Resultant Owner's Equity Disclosure for Alternative Capital Concepts

Capital Concept:	IFC-M	IFC-GPP		PCC			
				(a) Capital increment financed 100% by shareholders		(b) Capital increment reduced by portion financed by L.T. debt	
1. Income for 19-1:							
Capital at 12/31/19-1 (per current cost balance sheet at 12/31/19-1)	$6,500		$6,500		$6,500		$6,500
Deduct Capital 12/31/19-0							
Accounts receivable	$6,000	6,000 x 1.10	$6,600	6,000 x 1.15	$6,900	6,000 + 5/9 (15% x 6,000)	$6,500
Inventory	2,000	2,000 x 1.10	2,200	2,000 x 1.10	2,200	2,000 + 5/9 (10% of 2,000)	2,111
Fixed assets - net	3,000	3,000 x 1.10	3,300	3,000 x 1.20	3,600	3,000 + 5/9 (20% of 3,000)	3,333
Accounts payable	(2,000)	(2,000) x 1.10	(2,200)	(2,000) x 1.10	(2,200)	(2,000) - 5/9 (10% of 2,000)	(2,111)
L.T. debt	(4,000)	(4,000) x 1.10	(4,400)	4,000 x 1.0	(4,000)	(4,000) x 1.0	4,000
	$5,000	5,000 x 1.10	$5,500		$6,500	5,000 + 5/9 of 1,500	$5,833
Income retained	$1,500		$1,000		Ø		$ 667
Dividends	320		320		320		320
Net income	$1,820		$1,320		$ 320		$ 987
2. Owner's Equity:							
Invested capital	$5,000		$5,000		$5,000		$5,000
Capital adjustment to maintain GPP	Ø	5,500-5,000	500		Ø		Ø
Capital increment to maintain productive capacity	Ø		Ø	6,500-5,000	1,500	5,833 - 5,000 or 5/9 x 1,500	833
Retained earnings	1,500		1,000		Ø		677
	$6,500		$6,500		$6,500		$6,500

Column 4 - PCC with capital increment reduced by portion financed by L.T. debt:

	19-1	19-0		19-1	19-0
Accounts receivable	$ 6,900	$ 6,900	Accounts payable	$ 2,200	$ 2,111
Inventory	2,200	2,111	10% L.T. debt	4,000	4,000
Fixed assets - net	3,600	3,333	Common equity	6,500	5,833
	$12,700	$11,944		$12,700	$11,944

While the writer is not aware of accountants who advocate restatements of prior years PCC concept figures as presented above, Column 3 19-0 balance sheet figures show clearly that the productive capacity of the enterprise in our steady state example has not changed during 19-1.

Two Current Proposals

Recently, different accounting rule-making bodies around the world have made a variety of differing proposals concerning methods of accounting for changing prices. While Canada's CVDP tentatively recommend an IFC-GPP concept, a number of countries have made PCC concept oriented proposals such as the Hyde Committee recommendations in the U.K.[1] or have presented proposals that offer alternatives concerning the capital concept such as the recent U.S. FASB Exposure Draft.[2] A brief review of the Hyde and FASB proposals may help to illustrate the directions currently being considered.

The Hyde recommendations

For fiscal periods ending on and after 12/31/77, it is recommended that a supplementary statement be presented that adjusts historical cost net income for three items:

1. The difference between current cost of sales and historical cost of sales;
2. The difference between current cost depreciation and historical cost depreciation; and

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[1] Inflation - Accounting - An Interim Recommendation, Accounting Standards Committee, Institute of Chartered Accountants in England and Wales, November 1977.

[2] Financial Reporting and Changing Prices, Exposure Draft, Financial Accounting Standards Board, (FASB), December, 1978.

3. A "gearing" or leverage adjustment based on net monetary items[1] that:

   a) If a firm has net monetary liabilities, reduces the adjustments in 1 and 2 by the ratio of net monetary liabilities to net monetary liabilities plus owner's equity (including capital increment); or

   b) If a firm has net monetary assets, an appropriate index (specific or general?) should be applied to the net amount to derive the proper adjustment to be deducted from historical cost income.[2]

The recommendations provide a brief description of a short-cut averaging method of calculating the cost of sales adjustment and indicate that the suggested gearing adjustment can be determined using other methods than those set out above where companies prefer an alternative calculation as long as the method used is disclosed.

The results of the Hyde recommendations applied to our steady-state example are:

Historical cost income before interest and taxes			$3,240
Less:	Excess of current cost of sales over historical cost	$200	
	Excess of current cost depreciation over historical cost depreciation	200	400
	Operating profit		$2,840
Less:	Interest	$400	
	Gearing adjustment[3]	Ø	400
	Income before taxes		2,440
Taxes			1,420
	Adjusted net income to shareholders		$1,020
Dividends			320
	Adjusted retained income		$ 700

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[1] Preferred share capital is regarded as a monetary liability.

[2] A recent Canadian report has recommended supplementary disclosures to reflect the impact of changing prices that are similar in most respects to the Hyde recommendations except that where net monetary assets exist, "The arguements in favour of providing a further adjustment in respect of the reduction in real value of net monetary assets are less compelling and no adjustment is proposed". (Report of the Ontario Committee on Inflation Accounting, Ontario Government, June 1977, page 129.)

[3] No gearing adjustment is required because average monetary assets (6,000) = average monetary liabilities (2,000 + 4,000) for 19-1. If average net

Note that the Hyde recommendations will always result in a figure for "Adjusted net income to shareholders" that is less than conventional historical cost income during periods when inventory and fixed asset costs are increasing. Historical cost income includes all realized holding gains. The Hyde recommendations reduce historical cost income by the portion of realized holding gains financed by equity and, where there are net monetary assets, by an additional charge to maintain the productive capacity of the net monetary assets.

The FASB proposal of December, 1978

For fiscal periods ending on or after 12/25/79, it is proposed that certain large, publicly held companies disclose supplementary information regarding the effects of changing prices incorporating, at a minimum:[1]

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monetary liabilities had been $2,000 during 19-1, the appropriate adjustment would be:

$$\frac{\text{Average net monetary liabilities}}{\text{Average net monetary liabilities + owner's equity}} \times \text{depreciation and cost of sales adjustments}$$

$$= \frac{\$2,000}{\$2,000 + 5,800} \times \$400 = \$103$$

Note that average owner's equity is invested capital of $5,000 plus capital increment re fixed assets ($600) and inventory ($200) resulting from the 1/1/19-1 specific increases:

> In computing the amount of ...(owner's equity)... to be used... the difference between the current values and historical cost amounts of fixed assets and, if material for stocks (inventories) should be added... (paragraph 16, Hyde Recommendations).

[1] FASB Exposure Draft, pages 7-9.

a. Either (1) Supplementary information on income from continuing operations on a current cost basis and on holding gains or losses net of inflation (real holding gains)
   or (2) Supplementary information on income from continuing operations on an historical cost/constant dollar basis;

b. The amount of the inflation gain or loss on net monetary items;

c. The amount of foreign exchange gain or loss, net of applicable taxes; and

d. A five year summary of selected financial data.

When the current cost basis required under a.(1) above is employed, historical cost income is adjusted for:

(i) the difference between current cost of sales and historical cost of sales;

(ii) the difference between current cost depreciation[1] and historical cost depreciation

(iii) the tax effect of the current cost adjustments for cost of sales and depreciation in (i) and (ii) above; and

(iv) any foreign exchange gain or loss net of applicable taxes.

The current cost basis option is to be used unless historical cost/constant dollar information better reflects the effect of changing prices on the enterprise. Where the constant dollar historical cost basis is employed, the use of a consumer price index (rather than the previously preferred GNP deflator) is required.

The results of the FASB's current cost basis option applied to our steady state example are:

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[1]Current cost depreciation is based on depreciating the current cost of the assets owned by the enterprise rather than on depreciating the "...assets that would replace those owned if replacement were to occur currently". (page iii)

Income from continuing operations per historical cost income statement		$1,420
Excess of current cost of sales over historical cost of sales	$(200)	
Excess of current cost depreciation over historical cost depreciation	(200)	
	$(400)	
Less income tax (50%) on realized holding gains	200	(200)
Current cost income from operations		$1,220
Net holding gain on inventory and fixed assets ($800) less inflation component ($500) and less income tax ($200) on realized holding gains		$ 100
Inflation gain on net monetary items		Ø

Note that the required figures presented above, when combined yield IFC-GPP concept income of $1,220 + $100 = $1,320[1] assuming net assets are valued on a current cost basis. While the FASB does not add the three items above to show IFC-GPP concept income of $1,320, it does state:

> The Board has concluded that the financial capital concept is the more useful, and it is adopted in this statement. (page 3)

Since it requires disclosure of both real holding gains or losses and inflation gain or loss on net monetary items, the IFC concept preferred by the Board seems to be clearly IFC-GPP. In Appendix C to the Exposure Draft, the FASB indicates that it would prefer a more complete "current cost/constant dollar" (IFC-GPP) method,"...the Board believes that information obtained from a comprehensive application of current cost/constant dollar accounting is likely to be useful and it encourages the presentation of that information". (page 46)

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[1]Additions of the three required items - current cost income from operations, real holding gain or loss and inflation (purchasing power) gain or loss - will not agree exactly with IFC-GPP concept income measured in end of year constant dollars for real companies because sales, other expenses, etc. have not been restated from dollars of purchasing power at the times when sales and purchases were made into year-end constant dollars.

The results of the FASB's constant dollar historical cost basis option applied to the steady-state example are:

Income from continuing operations per historical cost income statement		$ 1,420
Differences caused by changes in the general purchasing power of the dollar from the dates of transactions to 12/31/19-1[1]:		
Cost of sales ($2,000 x 0.10)	$(200)	
Depreciation (1,000 x 0.10)	(100)	(300)
Constant dollar income from continuing operations		$ 1,120
Inflation gain or loss on net monetary items		Ø

The FASB Exposure Draft emphasizes the experimental nature of the proposed techniques for reflecting the impact of changing prices. Refinements, extensions and, possibly, major changes may be required at a later date based on the FASB's analysis of the current supplementary disclosures.

Conclusion

The purpose of this paper is not to select the best capital concept for the determination of income but rather to identify and compare the major alternative concepts that are available. A clear understanding of the alternative capital concepts is needed to evaluate the many recent proposals concerning accounting for changing prices that have been made by professional accounting organizations around the world.

At the present time, two different approaches seem to be developing. The FASB in the U.S. and the ARC in Canada seem to be heading towards IFC-GPP concept approaches while countries such as the U.K., Australia, New Zealand and West Germany are moving towards PCC concept approaches. Rather than selecting one of these approaches, a preferable alternative might be disclosure of income according to each of the major capital concepts - perhaps in a reconciliation format similar to the one presented on page 18.

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[1] Sales, interest, other expenses and taxes are all in 12/31/19-1 dollars in this example, but these items would require restatement in more realistic cases.

This "full disclosure" method would accomodate financial statement users who, for example, may prefer to use PCC information in projecting future cash flows while using IFC information for return on investment calculations. It would also protect accounting rule-making bodies from complaints by advocates of approaches that are rejected since:

> Accountants...should not be held responsible for using a "wrong" method...as long as they disclose the method that was used and sufficient data to permit adjustment to the nonreported method.[1]

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[1] William H. Beaver, "What Should Be the FASB's Objectives?", Journal of Accountancy, August, 1973, page 52.

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