Accounting Clinic II

Financial Statement Analysis and Security Valuation

Stephen H. Penman
Accounting Clinic II

How Accrual Accounting Works

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With contributions by

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Accounting Methods for Measuring Performance

Strict cash basis of accounting.
- Revenues are recorded when cash is received and expenses are recorded when cash is paid.

Accrual basis of accounting.
- Revenues and expenses are recorded on an economic basis independently of the actual flow of cash.
## Cash Vs. Accrual Basis of Accounting

<table>
<thead>
<tr>
<th>Cash Basis</th>
<th>Accrual Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to understand.</td>
<td>Theoretically difficult.</td>
</tr>
<tr>
<td>Provides a reliable picture of the change in cash and the firm’s liquidity.</td>
<td>Provides a more reliable picture of the economic changes in wealth.</td>
</tr>
<tr>
<td>Revenues and expenses are recorded according to cash inflows and outflows.</td>
<td>Revenues and expenses are recorded according to economic change in wealth (the rules are discussed later on in this clinic).</td>
</tr>
<tr>
<td>Can be manipulated by changing the cash flows timing.</td>
<td>Can be manipulated by the changing the recognition rules.</td>
</tr>
</tbody>
</table>
Accrual Accounting: The Question

At what point of the operating cycle of the firm should revenues and their related expenses be recognized?
Accrual Accounting: Basic Rules

Revenue and expense should be recognized at the first point at which both of the following criteria are met:

1. The revenue is *earned*. The revenue-producing activity has been performed.
2. The revenue is either *realized* or *realizable*. That is, the amount of cash to be collected can be *estimated* with reasonable accuracy.
Revenue Recognition

For product sale transactions, revenue is typically recognized when title passes to the customer.

For service transactions, revenue is typically recognized when the substantial performance occurred. Because of the intangibility of services, it is often difficult to ascertain when a service consisting of more than a single act has been satisfactorily performed so as to warrant recognition of revenue.

Note: The FASB and IASB are proposing to change the criteria for revenue recognition.
Expense recognition

According to the *matching* principle, selecting a revenue-recognition basis also determines whether related costs are expensed immediately or capitalized and expensed subsequently. Generally, expenses and losses are recognized when an entity's economic benefits are used up in the process of generating revenues. We recognize the following classification of costs:
Product Vs. Period costs

**Product costs** - Costs directly related to specific revenues of the period (e.g., products sold) are considered expenses of that period, since they arise in the same transaction in which the revenue is recognized. Example are COGS and sales commissions.

**Period costs** - Costs not directly related to particular revenues but rather to a period on the basis of transactions occurring in that period (e.g., administrative salaries and headquarters rent), or costs providing no discernible future benefits. They are recognized as expenses when incurred.
Earnings and Cash Flows

Rather than matching cash inflows and outflows, earnings match revenues and expenses.

- **Revenues** = cash receipts + revenue accruals
- **Expenses** = cash disbursements – cash investments + expense accruals
- **Earnings**

The idea is to calculate a better measure of value added.

- **Earnings** = Free cash flows + cash investments + accruals – net interest
Revenue and Expense Accruals

**Revenue Accruals**
- Value added that is not cash flow
- Adjustments to cash inflows that are not value added

**Expense Accruals**
- Value decreases that are not cash flow
- Adjustments to cash outflows that are not value decreases
The Revenue Calculation

\[
\text{Revenue} = \text{Cash receipts from sales} \\
+ \text{New sales on credit} \\
- \text{Cash received for previous periods' sales} \\
- \text{Estimated sales returns and rebates} \\
- \text{Deferred revenue for cash received in advance of sale} \\
+ \text{Revenue previously deferred}
\]
The Expense Calculation

Expense = Cash paid for expenses

+ Amounts incurred in generating revenue but not yet paid

– Cash paid for generating revenues in future periods

+ Amounts paid in the past for generating revenues in the current period
Some Examples of Accrual Accounting

1. Cash investment
Accrual accounting books cash investment to the balance sheet, not as an expense to the income statement.

   Example: Plant

2. Revenue for which cash has not been received
Revenue is recognized when a sale is made to a customer, not when she pays. So, if a sale is made on credit, revenue is booked (in the income statement) and an accounts receivable is booked on the balance sheet.
Some Examples of Accrual Accounting (Cont.)

3. **An expense recognized but not paid for**

An expense is reported when recognized either as a product or a period cost. If the expense has not been paid for, a liability is recognized (as an accounts payable or accrued liability for example).

- Examples: Wages payable, Rent payable, Pensions payable
Some Examples of Accrual Accounting (Cont.)

4. *Expense paid for but not recognized.*

If cash is paid for an expense ahead of matching it with revenue, it is recorded as a prepaid expense which is then transferred to the income statement in the subsequent period when it matches against revenue.

- Examples: Prepaid wages (becomes wages expense in the future), Inventory (becomes Cost of Goods Sold in the future).
Some Examples of Accrual Accounting (Cont.)

5. **Asset used up becomes an expense**

If an investment is recorded as an asset in the balance sheet (see 1 above), its cost is subsequently transferred to the income statement as a the asset is used up in generating revenue.

- Examples: Depreciation, amortization of a patent
Navigating the Financial Statements

A. Understand what each statement is saying
   - What is recognized and what is not recognized?
   - What are the accounting principles employed?

B. Identify the sensitive issues

The financial statements are the lens on the business
The eye on the lens is the eye of the shareholder
The lens can be out of focus
Viewing the Business Through the Financial Statements

Business Activities:
- Financial Activities
- Investing Activities
- Operating Activities

Financial Activities
- Raise monies from investors

Investing Activities
- Invest in business assets

Operating Activities
- Employ assets in trading to “add value”

Return value to investors
The Financial Reports

- Management Discussion and Analysis

- The Four Financial Statements
  - Balance Sheet
  - Income Statement
  - Cash Flow Statement
  - Shareholders’ Equity Statement (required by the SEC, not GAAP)

- Footnotes to the Financial Statements
Cash Accounting

The Cash Flow Statement

Cash From Operations
- Cash investing
= Net cash from operations

- Net cash paid to investors to Shareholders to Debtholders

= Change in Cash

Cash generated by the business

Cash remaining after distributions to investors
Dell Inc.
(in millions)  
Cash Flow Statement
Year ended February 3, 2006

CASH FROM OPERATING ACTIVITIES

Net income $ 3,572

Adjustments to reconcile net income to net cash provided by operating activities:

- Depreciation and amortization 393
- Tax benefits of employee stock plan 261
- Effects of exchange rate changes on monetary assets and liabilities denominated in foreign currencies 70
- Other 188

Changes in:

- Operating working capital (67)
- Non-current assets and liabilities 422

Net cash provided by operating activities 4,839
CASH FROM INVESTING ACTIVITIES

Investments:

- Purchases: (7,562)
- Maturities and sales: 12,168 4,606
- Capital expenditures: (728)

Net cash provided by (used in) investing activities: 3,878
Dell Inc.       Cash Flow Statement
               (continued)

CASH FLOW FROM FINANCING ACTIVITIES

Repurchase of common stock  (7,249)
Issuance of common stock for employee stock plans  1,023

Net cash used in financing activities  (6,226)
Dell Inc.  
Cash Flow Statement
Summary

Cash flow from operating activity $4,839
Cash from investing activity 3,878
Net cash after investing activities $8,717
Cash from financing activity (6,226)

Net addition to cash and cash equivalents $2,491
Is Free Cash Flow a Good Measure of Business Success?

Free Cash Flow and Earnings for General Electric

In millions of dollars.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash from operations</th>
<th>Cash investments</th>
<th>Free cash flow</th>
<th>Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>30,009</td>
<td>37,699</td>
<td>(7,690)</td>
<td>12,735</td>
</tr>
<tr>
<td>2001</td>
<td>39,398</td>
<td>40,308</td>
<td>(910)</td>
<td>13,684</td>
</tr>
<tr>
<td>2002</td>
<td>34,848</td>
<td>61,227</td>
<td>(26,379)</td>
<td>14,118</td>
</tr>
<tr>
<td>2003</td>
<td>36,102</td>
<td>21,843</td>
<td>14,259</td>
<td>15,002</td>
</tr>
<tr>
<td>2004</td>
<td>36,484</td>
<td>38,414</td>
<td>(1,930)</td>
<td>16,593</td>
</tr>
</tbody>
</table>
Why Cash Accounting Does not Draw a Sensible Picture of the Business for the Shareholders

- Investments add earnings rather than reduce them
- Earnings are made (and lost) other than by cash
  - Sales on credit
  - Expenses not paid for
  - Expenses paid for in advance
  - Services paid for with stock
How Accrual Accounting Works

Focusing the lens to capture the economics of the business

Investments are placed on the balance sheet, rather than charged to current operations
- Examples:
  - Inventory
  - Property, plant and equipment

Non-cash effects on shareholder value are recognized (the accruals)
- Examples:
  - Sales on credit
    - Revenue and accounts receivable
  - Wages not paid and pensions
    - Wages expense and wages payable
    - Pension expense and pension liability
# Earnings and Cash Flows: Dell and GE (in millions)

<table>
<thead>
<tr>
<th></th>
<th>Dell 2006</th>
<th>GE 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cash from the business</td>
<td>$ 4,111</td>
<td>$(1,930)</td>
</tr>
<tr>
<td>+ Cash investments</td>
<td>728</td>
<td>38,414</td>
</tr>
<tr>
<td>+ Accruals</td>
<td>(1,267)</td>
<td>(19,891)</td>
</tr>
<tr>
<td>Net Income</td>
<td>$ 3,572</td>
<td>$ 16,593</td>
</tr>
</tbody>
</table>
Thinking about Poor Accrual Accounting

- Inappropriate “capitalization”
  - Recognizing investments as expenses rather than assets (R & D and brand building)
  - Recognizing expenses as assets

- Biased estimates of accruals

There’s the Rub!

- Accrual accounting ideally gives a better picture than cash accounting, but accrual accounting requires estimates.

- Estimates are really forecasts of the future. They will usually turn out to be wrong, but they should be an unbiased, best guess
The Accrual Accounting Picture

2005
The Balance Sheet

Assets
Liabilities
Equity

2006
The Balance Sheet

Assets
Liabilities
Equity

Report Additions to Equity

The Equity Statement

• Net Additions from share issues and payouts
• Additions from the business

The Income Statement

Revenues
- Expenses
Net income
Navigating the Income Statement

1. What the Statement is Saying
   
   Revenues = Cash receipts + revenue accruals
   - Expenses = Cash payments + investments + expense accruals
   
   = Net Income

2. Sensitive Issues

   • Misclassification of investments: the “capitalization” question
   • Estimates for revenue and expense accruals
Dell Inc.

## Consolidated Income Statement

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year ended</strong></td>
<td><strong>February 3, 2006</strong></td>
</tr>
<tr>
<td>Net revenue</td>
<td>$55,908</td>
</tr>
<tr>
<td>Cost of revenue</td>
<td>45,958</td>
</tr>
<tr>
<td><strong>Gross margin</strong></td>
<td>9,950</td>
</tr>
<tr>
<td>Operating expenses:</td>
<td></td>
</tr>
<tr>
<td>Selling, general, and administrative</td>
<td>5,140</td>
</tr>
<tr>
<td>Research, development, and engineering</td>
<td>463</td>
</tr>
<tr>
<td><strong>Total operating expenses</strong></td>
<td>5,603</td>
</tr>
<tr>
<td>Operating income</td>
<td>4,347</td>
</tr>
</tbody>
</table>
Income Statement (continued)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment and other income, net</td>
<td>227</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>4,574</td>
</tr>
<tr>
<td>Income tax provision</td>
<td>1,002</td>
</tr>
<tr>
<td>Net income</td>
<td>$3,572</td>
</tr>
</tbody>
</table>

Earnings per common share:

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>$1.49</td>
</tr>
<tr>
<td>Diluted</td>
<td>$1.46</td>
</tr>
</tbody>
</table>
Revenue Recognition: The Realization Principle

Revenues should be recognized when

1. The earnings process with respect to the revenue is complete or virtually complete.
2. The amount and timing of cash flows from the revenue are reasonably determinable.

The first criterion means that the entity has substantially accomplished what it must do to be entitled to the benefits represented by the revenue (usually cash inflow). For most firms, this criterion is satisfied at the time of delivery (by delivering the merchandise or service, the firm has performed at least most of what it is suppose to do to be entitled to the revenue).

The second criterion requires that revenue be recognized in the income statement only if cash has already been collected or the amount and timing of cash to be collected can be estimated with reasonable precision.
Implications of the Realization Principle

If the firm sold and delivered a product, it should recognize revenue even if it did not collect cash, as long as there is reasonable certainty of collection.

If the firm collected cash but has not delivered the product yet, it should not recognize revenue.

If the firm delivered the product but cannot determine with sufficient precision when and how much cash will be collected, it should not recognize the revenue.
Revenue Recognition: Multiple Deliverables

Dell: Equipment and services

- Equipment delivery
- Service period
- End of contract
- Warranty servicing

The Key Questions: Is revenue recognition aggressive or conservative?
Are warranty liabilities aggressive or conservative?
Revenue Recognition: Dell

Revenue Recognition - Net revenue includes sales of hardware, software and peripherals, and services (including extended service contracts and professional services). These products and services are sold either separately or as part of a multiple-element arrangement. Dell allocates revenue from multiple-element arrangements to the elements based on the relative fair value of each element, which is generally based on the relative sales price of each element when sold separately. The allocation of fair value for a multiple-element software arrangement is based on vendor specific objective evidence (VSOE) or in absence of VSOE for delivered elements, the residual method. In the absence of VSOE for undelivered elements, revenue is deferred and subsequently recognized over the term of the arrangement. For sales of extended warranties with a separate contract price, Dell defers revenue equal to the separately stated price. Revenue associated with undelivered elements is deferred and recorded when delivery occurs.
Revenue Recognition: Dell (continued)

Product revenue is recognized, net of an allowance for estimated returns, when both title and risk of loss transfer to the customer, provided that no significant obligations remain. Revenue from extended warranty and service contracts, for which Dell is obligated to perform, is recorded as deferred revenue and subsequently recognized over the term of the contract or when the service is completed. Revenue from sales of third-party extended warranty and service contracts, for which Dell is not obligated to perform, is recognized on a net basis at the time of sale. Dell defers the cost of shipped products awaiting revenue recognition until the goods are delivered and revenue is recognized. In-transit product shipments to customers totaled $420 million and $430 million as of February 3, 2006 and January 28, 2005, respectively, and are included in other current assets on Dell’s consolidated statement of financial position.
Revenue Recognition: Dell (continued)

Warranty - Dell records warranty liabilities at the time of sale for the estimated costs that may be incurred under its limited warranty. The specific warranty terms and conditions vary depending upon the product sold and country in which Dell does business, but generally includes technical support, parts, and labor over a period ranging from 90 days to three years. Factors that affect Dell’s warranty liability include the number of installed units currently under warranty, historical and anticipated rates of warranty claims on those units, and cost per claim to satisfy Dell’s warranty obligation. The anticipated rate of warranty claims is the primary factor impacting the estimated warranty obligation. The other factors are less significant due to the fact that the average remaining aggregate warranty period of the covered installed base is approximately 20 months, repair parts are generally already in stock or available at pre-determined prices, and labor rates are generally arranged at pre-established amounts with service providers. Warranty claims are relatively predictable based on historical experience of failure rates. If actual results differ from the estimates, Dell would adjust the estimated warranty liability. Each quarter, Dell reevaluates its estimates to assess the adequacy of its recorded warranty liabilities and adjusts the amounts as necessary.
Expense Recognition: The Matching Principle

The matching principle requires that each cost be reported as an expense in the same period in which the revenues that the cost helped generate are recognized.

To implement the matching principle, management should first apply the realization principle and decide which revenues to recognize. Then, it should identify all the costs that helped generate those revenues and report them as an expense in the same income statement together with the revenues.

Implications:
- Expenditures that generate future revenues are investments
- Costs that generate current revenues are expenses

For example:
- Inventory cost is recognized when goods are sold (as cost of goods sold)
- Depreciation is recognized over the service life of an asset
- Mismatching: the WorldCom Con

The Key Questions:
- Is the capitalization of expenses appropriate?
- Have all costs to generate current expenses been recognized?
Navigating the Balance Sheet

What the statement is saying?

Assets

Liabilities

Equity

Equity = Asset – Liabilities

Assets represent
• probable future benefits
• measurable with reasonable reliability
• resulting from past transaction or events

Liabilities represent
• probable future sacrifice of economic benefits
• measurable with reasonable reliability
• resulting from past transaction or events
Dell Inc.

Consolidated Balance Sheets

February 3, 2006

**ASSETS**

Current assets:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash and cash equivalents</td>
<td>$7,042</td>
</tr>
<tr>
<td>Short-term investments</td>
<td>2,016</td>
</tr>
<tr>
<td>Accounts receivable, net</td>
<td>4,089</td>
</tr>
<tr>
<td>Financing receivables, net</td>
<td>1,363</td>
</tr>
<tr>
<td>Inventories</td>
<td>576</td>
</tr>
<tr>
<td>Other</td>
<td>2,620</td>
</tr>
</tbody>
</table>

Total current assets                  | 17,706  |
### Balance Sheet (continued)

<table>
<thead>
<tr>
<th>Asset</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property, plant, and equipment, net</td>
<td>2,005</td>
</tr>
<tr>
<td>Investments</td>
<td>2,691</td>
</tr>
<tr>
<td>Long-term financing receivables, net</td>
<td>325</td>
</tr>
<tr>
<td>Other non-current assets</td>
<td>382</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>$23,109</strong></td>
</tr>
</tbody>
</table>
Balance Sheet (continued)

LIABILITIES AND STOCKHOLDERS EQUITY

Current liabilities:
Accounts payable $ 9,840
Accrued and other 6,087

Total current liabilities 15,927
Long-term debt 504
Other non-current liabilities 2,549

Total liabilities 18,980
Balance Sheet (continued)

Commitments and contingent liabilities (Note 8) -

Stockholders equity:
Preferred stock and capital in excess of $.01 par value; shares issued and outstanding: none -
Common stock and capital in excess of $.01 par value; 9,540
shares authorized: 7,000; shares issued: 2,818 and 2,769, respectively (18,007)
Treasury stock, at cost; 488 and 284 shares, respectively 12,746
Retained earnings (103)
Other comprehensive loss (47)

Total stockholders equity 4,129

Total liabilities and stockholders equity $ 23,109
Recognition in the Balance Sheet

1. The *probable* criterion means some assets and liabilities are omitted
   - Knowledge assets (R & D), unless acquired
   - Brand assets
   - Contingent liabilities - product liabilities
     - environmental liabilities

2. The *past transaction* criterion removes some executory contracts
   - long-term employment contracts
   - operating (non-capitalized) leases

3. The *reasonable reliability* criterion removes assets and liabilities with uncertain consequences
Measurement in the Balance Sheet

Historical Cost Accounting
- Original cost adjusted for accruals to recognize revenues and expenses
  - PPE: historical cost less accumulated depreciation
  - Unearned revenue
  - Accrued expenses
  - Capitalized costs

Fair Value Accounting
- Marking assets to market
  - “Trading” and “available-for-sale” securities
  - Derivatives
- Quasi or estimated fair value
  - Receivables
  - Pension liabilities
- Conditional fair valuing: impairment
  - Inventory: lower of cost or market
  - PPE
  - Goodwill
Measurement in the Balance Sheet: Dell

At Fair Value
- Cash and Cash Equivalents: $7,042 million
- Short-term investments: 2,016
- Long-term investments: 2,691
- Accounts Payable: 9,840

Quasi (Estimated) Fair Value
- Accounts Receivable, net: 4,089
- Finance receivables: 1,688

Conditional Fair Value is applied to the following historical cost items:
- Inventories: 576
- PPE: 2,005

Historical Cost but usually Close to Fair Value:
- Long-term debt: 504

All other assets and liabilities are at historical cost, adjusted for accruals

Also, a lot of missing assets:  P/B = 17.5
The Balance Sheet: The Key Questions

Recognition:
• Are liabilities missing? If so, is there transparent footnote disclosure?
• What are the contingencies?
• What are the executory contracts not recognized?

Measurement
• Are mark-to-market prices from liquid markets?
• Are estimated fair values unbiased?
• Have impairments been made? Are they unbiased?
• Are accruals unbiased?
The Articulation of the Balance Sheet and the Income Statement

2005
The Balance Sheet

| Assets | Liabilities | Equity |

2006
The Balance Sheet

| Assets | Liabilities | Equity |

Report Additions to Equity

The Equity Statement

- Net Additions from share issues and payouts
- Additions from the business

The Income Statement

Revenues
- Expenses
Net income
The Balance Sheet and Income Statement Articulate: What Affects the Income Statement Must Also Affect the Balance Sheet

Equity = Assets – Liabilities

Change in Equity = Change in Assets – Change in Liabilities

= Net transactions with + Comprehensive Shareholders Income

Usually affects cash

Affects cash and other assets and liabilities

Examples:
Credit Sales increase accounts receivable
Wages not paid increase a liability (accrued expenses or pension liabilities)
Marking securities to market increases unrealized gains or losses