Cash Management

(Text reference: Chapter 28)

- importance of cash management
- reasons for holding cash
- appropriate target cash balance
- collecting and disbursing cash efficiently
- investing surplus cash

Importance of Cash Management

- some observations from Business Week (April 28, 2003):
  - “...cash flow is a better way to value companies
    ...Earnings are an accounting fiction ...more cash equals more value ...
    Everything ... including how much investors are willing to pay for a stock ...
    ties back to expectations about cash ...”
  - Standard & Poor’s added liquidity analytics to its ratings in 2002; many companies have had their debt downgraded, “primarily due to cash concerns”
  - “...money is tied up when customers don’t pay their invoices, suppliers are paid too quickly or not fast enough, and inventories sit unsold ...”
  - “corporate America has more than $620 billion—35% of total sales—blocked by inefficient cash flow management”
**Reasons for Holding Cash**

- three reasons:
  - transactions motive
  - speculative motive
  - precautionary motive

- must evaluate the tradeoff between the cost of holding too much cash (opportunity cost) and not holding enough cash (trading and borrowing costs)

- proper cash management can have significant impact on the bottom line

  - e.g. text p. 791: average daily sales for Exxon are about $248 million. Suppose that the annual interest rate is 10% (with daily compounding). How much overnight interest is earned if collection is improved by one day?

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**Appropriate Target Cash Balance**

- ongoing cash transactions can vary, so the optimal target cash level may not be obvious

- Baumol model: let

  \[ C = \text{target cash balance} \]
  \[ F = \text{fixed cost of selling assets to replenish cash} \]
  \[ T = \text{total amount of cash needed over a year} \]
  \[ k = \text{opportunity cost of holding cash (annual rate)} \]

Assumptions:
- replenish cash up to \( C \) each time cash balance drops to $0
- cash balance drops uniformly (average cash on hand is \( C/2 \))
e.g. ABC Corp. expects to spend $10,000 cash each week. It pays $100 commission on sale of marketable securities and can invest idle resources at an annual rate of 7% in the money market. Using the Baumol model, by how much should ABC Corp. replenish its cash resources each time they decrease to $0? What is the total annual cost of holding cash in this case?

limitations of the Baumol model:
- assumes a constant disbursement rate
- ignores cash receipts during the period
- doesn’t allow for safety cash reserves
Miller-Orr model:
- alleviates all three limitations of the Baumol model
- based on random cash inflows and outflows
- cash balance allowed to move between an upper bound ($H$) and a lower bound ($L$)
- if $H$ or $L$ are reached, cash balance is set back to optimal cash balance ($Z$)
- lower bound $L$ is set by the firm (a desired safety margin)

\[
\begin{align*}
Z^* &= \sqrt[3]{\frac{(3 \times F \times \sigma^2)}{(4 \times k)}} + L \\
H^* &= 3 \times Z^* - 2 \times L \\
\text{average cash balance} &= \frac{4 \times Z^* - L}{3}
\end{align*}
\]

where

- $F = \text{fixed cost of buying/selling assets}$
- $\sigma^2 = \text{variance of daily net cash flows}$
- $k = \text{opportunity cost of holding cash}$
Cont’d

e.g. DEF Corp. wishes to manage its cash using the Miller-Orr model. Its expected daily net cash flow is $0, with a variance of $2.5 million. DEF Corp. can invest idle cash at an annual rate of 7%, pays $1,000 commission on all security transactions, and doesn’t want its cash level to drop below $100,000. At which cash level should DEF Corp. invest its idle resources? What amount should be invested at this level? What is the expected annual opportunity cost of idle resources?

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other factors affecting the target cash balance:

- borrowing
  - in the preceding discussion, if the firm requires cash, it gets it by selling marketable securities
  - an alternative is to borrow cash
  - borrowing may often be more expensive than selling marketable securities (though this could depend on the firm’s tax situation)

- relative costs
  - for large firms, trading costs of buying and selling securities are usually very small in comparison to the opportunity costs of holding idle cash
Collecting and Disbursing Cash Efficiently

- float is the difference between bank cash and book cash
  - positive (disbursement) float: bank balance > book balance
    (e.g. writing a cheque reduces book cash before bank cash)
  - negative (collection) float: bank balance < book balance
    (e.g. receiving and depositing a cheque increases book cash before bank cash)

- must keep track of float to know true cash on hand

- float management involves minimizing collection float and maximizing disbursement float

- electronic data interchange (EDI) may make traditional float management obsolete in the future (see text discussion p. 793)

- affects customer and supplier relationships

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- collection float is composed of:
  - mail float (time cheques are in the postal system)
  - processing float (time taken for receiver of cheque to deposit it)
  - clearing float (time taken for banking system to clear)

- float management techniques (for more details, see descriptions in text pp. 794-798):
  1. over-the-counter collections
  2. lockboxes
  3. electronic collection systems
  4. cash concentration
  5. zero balance accounts
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example: CB Inc. receives a number of cheques each day. The average amount of each cheque is $125.00. Management estimates that mail delay, processing delay, and clearing delay for these cheques are 4 days, 2 days, and 2 days respectively. CB Inc. is considering implementing a lockbox banking system. The implementation is expected to reduce mail delay by 2 days, processing delay by 1 day, and clearing delay by 1 day. The cost of the lockbox system includes an annual fee of $25,000 (payable at the start of the year) and a per cheque fee of 2 cents. If the interest rate on short term marketable securities is 4.5% compounded annually, how many cheques does CB Inc. need to receive each day in order to justify implementing the lockbox system?

Investing Surplus Cash

key security characteristics

- maturity: the time period over which interest and principal payments are due
  - the longer the maturity, the greater the interest rate risk
- default risk: the probability that interest and principal will not be paid in the promised amounts on the due dates
- government and bank issued securities generally have lowest risk
- marketability (liquidity): the ease of converting an asset into cash. Determined primarily by two factors:
  - time (how quickly an asset can be sold without a large effect on price)
  - volume (how much can be sold without a large effect on price)
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- taxability
  - interest income is heavily taxed
  - capital gains and dividends are preferred, but these arise on risky securities
- creative strategies include *dividend capture* and *floating rate preferred shares*

- which securities to hold in the money market?
  - invest in short maturity, minimal default risk, highly liquid securities:
    - government T-bills
    - banker's acceptances
    - commercial paper
    - dollar swaps