Chapter 14

14-1

The optimal cash balance using the Baumol model is $\sqrt{\dfrac{2(500)100}{.06}}$ =$1291 million.

If selling securities were costless and without any lag, then the firm should hold all of its cash in the form of interest-bearing securities and simply sell them whenever cash was required.

14-2
a. Optimal Balance using Baumol Model = $204,124
b. If the firm were able to earn 3% on cash, the annual interest rate can be lowered to 9%.
Optimal Balance using Baumol Model = $235,702

14-3
If interest rates increase, I would expect the cost of holding non-interest bearing cash to increasing leading to a drop in optimal cash balances.

14-4
Optimal Cash Balance = $100 million
Opportunity cost = 10%
Cost per transaction = $125
Annual Cash Usage Rate = $400 million
Weekly Cash Usage Rate = $7.69 million

14-5
a. Spread between upper and lower cash limits = $120,498

b. The average cash balance will be between $60,249 : half of $120,498

c. If there is a safety balance of $50,000,
Upper Limit = $50,000 + $120,498 = $170,498
Average Balance will increase to $110,249

14-6
If the standard deviation doubled:
New Spread between upper and lower cash limits = $191,279
The firm will need much more of a cash cushion if there is variability in cash usage.

14-7
a. The initial outlay is (0.02)250 = $5. One year from now, the incremental outlay will be (.02)(250)(.06) = 0.3; the present value of the yearly incremental outlays is 0.3/(.12 - .06) = $5. The total decrease in value is $5+$5 = $10 less any value that the firm might obtain from having the cash balances.
b. If it is able to reduce its cash balance to 1% of revenues, the immediate decrease in the cash balance would be (0.01)(250 = $2.50; the incremental outlay one year from now will

be (.01)(250)(.06) = 0.15, for a present value of 0.15/(.12-.06) = $2.5; hence firm value will jump by $5 million.

c. If the reduced cash balance makes the firm riskier, then the value of the firm would jump by less by $10 million, and it might even decrease. This is because, first, the present value of the annual savings would be lower; and second, the present value of the other operating cashflows, themselves, would be lower due to the higher discount rate.

14-8
a. Processing float = $5 (4) = $20 million
b. Disbursement or payment float = $4 (5) = $20 million
c. Net Float = 0
d. If the number of days it takes to clear checks is reduced to three,
  Processing Float = $5 (3) = $15 million
  Net Float = $20 million - $15 million = $5 million.
e. The value of the firm will also increase by $5 million.

14-9
a. The annualized returns are:
i) 6-month T-bill: The price of a T-bill with a face value of $100 is 100(1-.056/2) = 97.2; hence the annualized return is $(100/97.2)^2$ or 5.844%
ii) commercial paper: $(1.0298)^2$-1 or 6.0488
iii) repo agreement: $(1.0292)^2$-1 or 5.9253%

b. There is least risk in the T-bill; the commercial paper is riskiest because it is issued by private corporations with a non-negligible default risk. The repo agreement has better security but there is still the possibility of default. The returns on the three securities are consistent with their different riskinesses.

c. I would check to see if any of these were misvalued; if so, I would buy that security. Assuming that all of these securities were properly priced, I would look at the cost of converting them into cash. As a corporate treasurer, this is probably what is most important for me.

14-10
a. The value of the noncash assets is (5000)(0.2)/[.06+1.2(.055)] = $7936.51 million.
b. The value of the cash assets is simply $1 billion. Hence the firm value is $8.93651 billion.
c. The firm's accounting return on equity would be [5000(20) + 1000(6)]/6000 = 17.67%. Paying a dividend of $500 million would increase the return on equity to [5000(20) + 500(6)]/5500 = 18.727%. The value of the firm would decrease, after the dividend payment by $0.5 billion.
d. Stockholder wealth would be unaffected.

14-11
If Chimera invests it's cash at 3%, then the value of its cash assets would be $1(.03)/(.06) = $0.5 billion. The value of the firm would be7.936 + 0.5 = $8.436 billion.

The firm's accounting return on equity would be [5000(20) + 1000(3)]/6000 = 17.167% before the dividend payment, and [5000(20) + 500(3)]/5500 = 18.4545% after the dividend payment. The value of the firm would decrease by only 0.25 billion, even though $0.5 billion would have been paid out.

14-12
The market value of Seven Seas is $10000(0.15)(1.05)/(.12-.05) = $22,500 million. Even if the fund didn't grow at all, it's current market value would be 10000(0.15)/.12 = $12.5 billion; however, in addition to this, it expects to grow 5%.

14-13
a. Intel is paying a premium of 1.5/[(0.2)(5)] - 1 or 50% for it's 20% stake.
b. Let x be the after-tax cashflow that Intel will earn on it's invested $1.5 billion. The net present value of the cashflows would be x1-1.12^{-5}]/.12 = 0.5 billion. The after-tax cash flow (x) would have to be $138.70 million a year.
14-14
If the fund managers constently earn a return that is less than what they are expected to make (negative excess returns), the market value of $25 billion in stockholdings could be less than $25 billion.