

Cash Management III

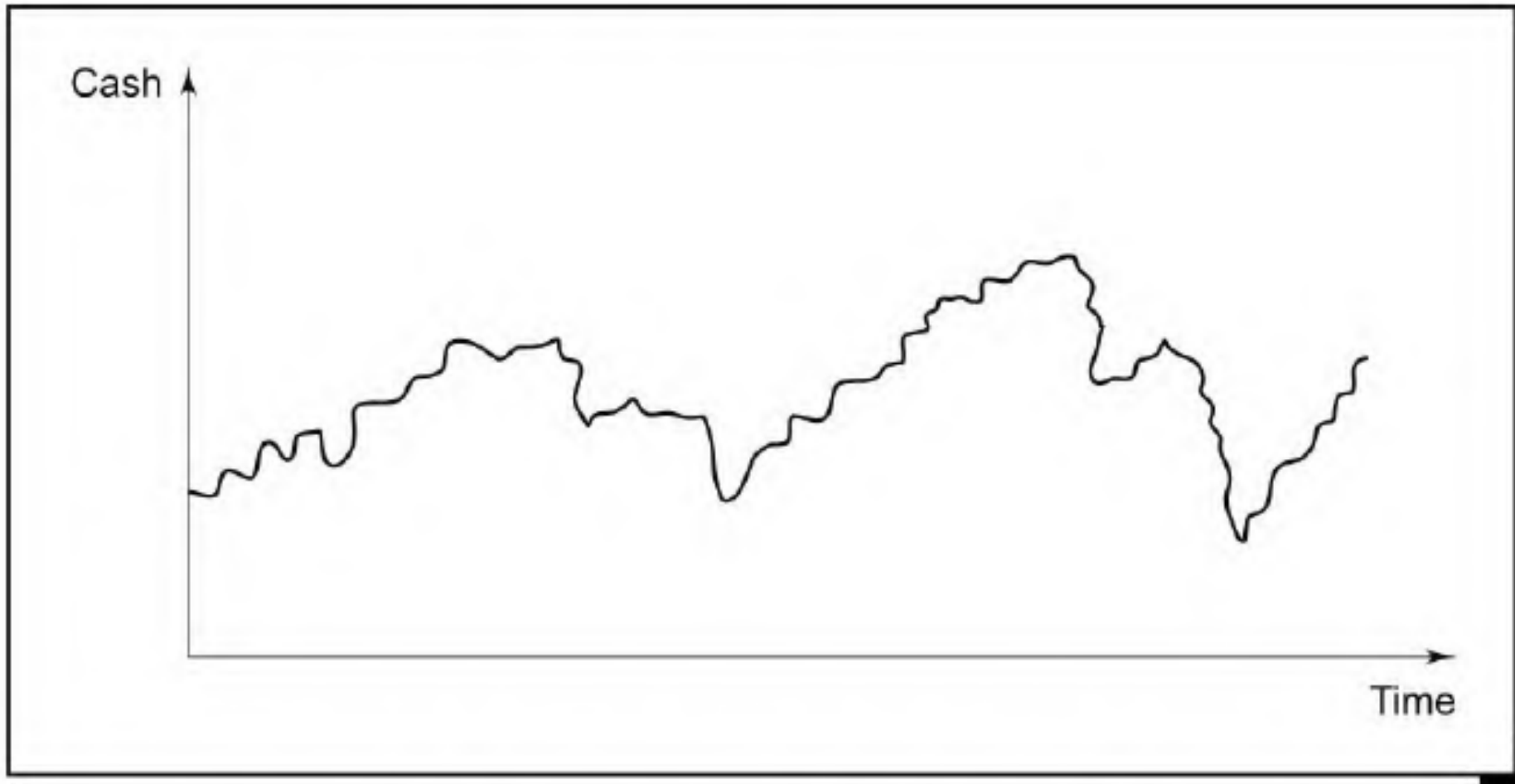
Cash Management Models

Miller-Orr Model

Miller-Orr Model

- It is an improvement over Baumol's model.
- On the basis of empirical data, Miller and Orr argued that the cash balances fluctuate randomly. It does not follow a constant consumption rate.
- Baumol model tells how much to be the optimum transaction size but it does not talk about treatment of surplus cash balance. When is the surplus of cash balances?

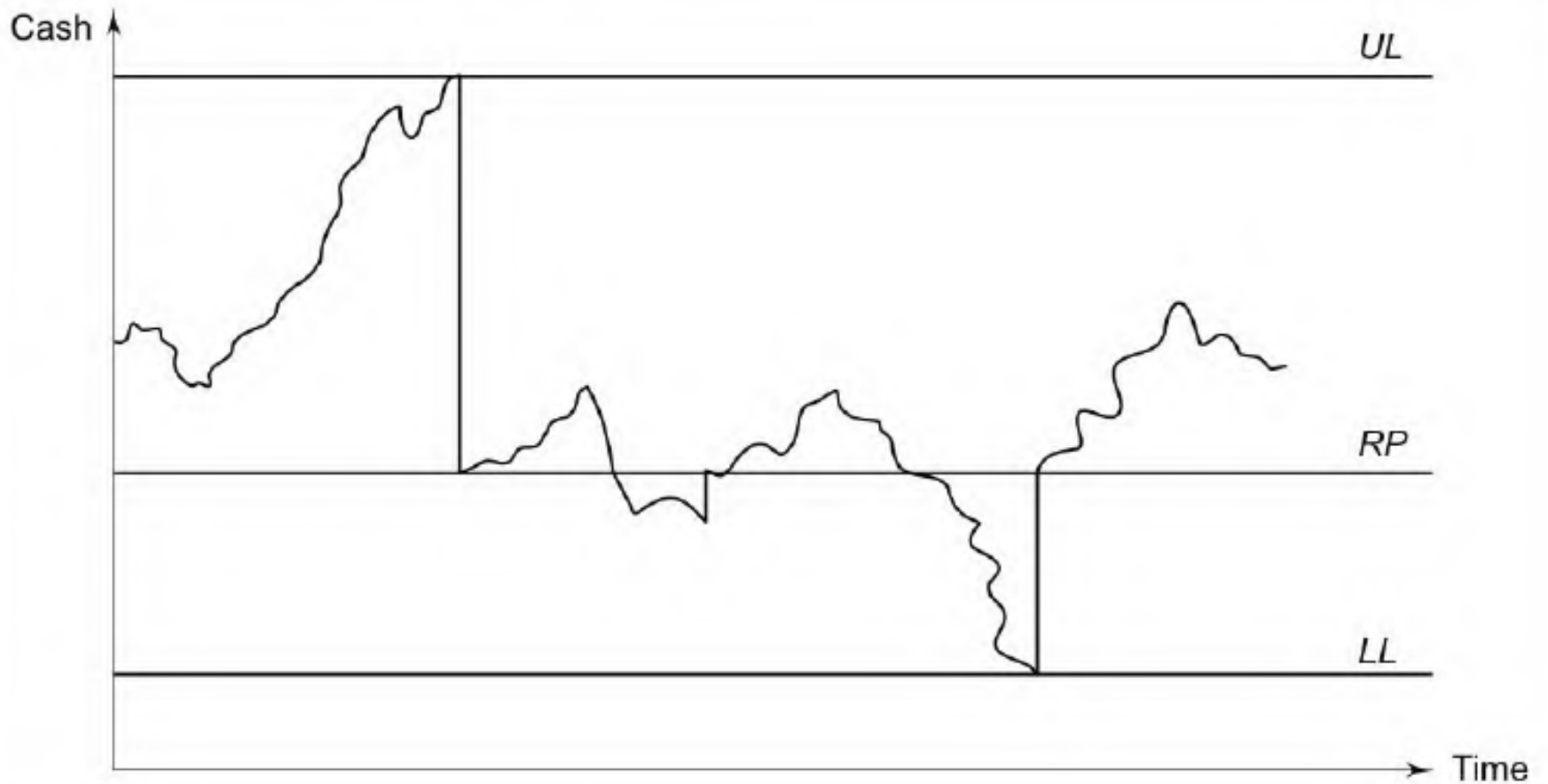
Cash balance movement



Assumptions

- The changes in cash balances are random. This is applicable for cash inflows as well as for cash outflows.
- There are opportunities for transaction of marketable securities.
- Transaction of marketable securities has transaction cost.
- Holding of cash has opportunity cost as well.
- The firms maintain a minimum level of cash balances.

Miller-Orr model



Estimation of Return Point and Upper Limit

$$RP = \sqrt[3]{\frac{3b\sigma^2}{4I}} + LL$$

$$UL = RP + [2 \times (RP - LL)]$$

$$UL = 3RP - 2LL$$

where RP is the return point, b is the fixed cost per transaction for converting marketable securities into cash,

I is the daily interest rate earned on marketable securities, σ^2 is the variance of daily changes in the expected cash balance,

LL is the lower control limit, and UL is the upper control limit.

An Illustration

- KSK Limited provides the following information about its cash management system.
- The annual yield on marketable securities is 15 percent.
- The fixed cost of per transaction of marketable securities transaction is Rs. 2000.
- The standard deviation of the change in daily cash balance is Rs.5,000.
- The minimum cash balance is Rs.50,000.
- Calculate RP and UL.

Solution

$$\begin{aligned} RP &= \sqrt[3]{\frac{3 \times 2000 \times 5000^2}{4 \times 0.0004167}} + 50000 \\ &= 44814.05 + 50000 = 94814.05 \\ UL &= (3 \times 94814.05) - (2 \times 50000) \\ &= 184442.10 \end{aligned}$$

Lower Limit = 50000

Return Point = 94814.05

Upper Limit = 184442.10

Question for you

- NKM Manufacturer provides the following information about its cash management system.
- The annual yield on marketable securities is 20 percent.
- The fixed cost of per transaction of marketable securities transaction is Rs. 1500.
- The standard deviation of the change in daily cash balance is Rs.4000.
- The minimum cash balance is Rs.40000.
- Calculate RP and UL.

For any query
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