

Week 4 – Portfolio Optimisation

A manager must decide how to invest \$100,000 in different financial products. Her goal is to maximise earnings while avoiding high-risk exposure. The financial products available are given in the following table:

Financial Product	Market	Return (%)
1	Cars (Germany)	10.3
2	Cars (Japan)	10.1
3	Computers (USA)	11.8
4	Computers (Singapore)	11.4
5	Appliances (Europe)	12.7
6	Appliances (Asia)	12.2
7	Insurance (Germany)	9.5
8	Insurance (USA)	9.9
9	Short-term bonds	3.6
10	Medium-term bonds	4.2

The investment requirements are

1. No more than \$30,000 in the car options
2. No more than \$30,000 in the computer options
3. No more than \$20,000 in the appliance options
4. At least \$20,000 in the insurance options
5. At least \$25,000 in the bonds
6. At least 40% of the amount invested in medium-term bonds must be invested in short-term bonds
7. No more than \$50,000 in Germany options
8. No more than \$40,000 in USA options

The manager would like to know

- a) What investment portfolio will maximise earnings?
- b) What are the average earnings on the portfolio? What are the marginal earnings?
- c) How much would the optimal earnings improve if we could put more than \$20,000 in the appliance options?
- d) How much higher would the return on Appliances (Asia) have to be before it became part of the optimal portfolio?
- e) How much higher would the return on Insurance (Germany) have to be before it became part of the optimal portfolio?