

**Managerial Economics:
A Problem-Solving Approach
5th Edition**

End-of-Chapter Individual Problems - Key

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Chapter 1

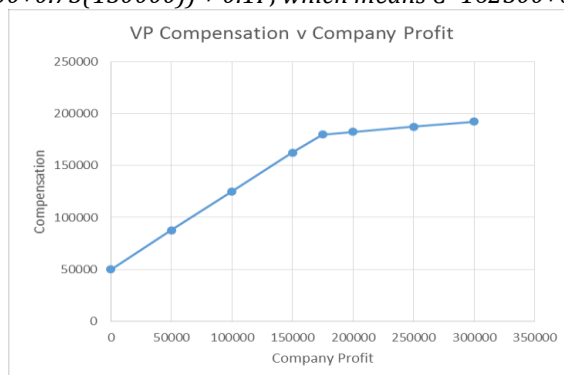
Short Answer Key:

1-1 Goal Alignment at a Small Manufacturing Concern

The owners of a small manufacturing concern have hired a manager to run the company with the expectation that he will buy the company after five years. Compensation of the new Vice President is a flat salary plus 75% of the first \$150,000 profit, then 10% of profit over \$150,000. Purchase price for the company is set at 4.5 times earnings (profit), computed as average annual profitability over the next five years.

- a. Plot the annual compensation of the vice president as a function of annual profit.

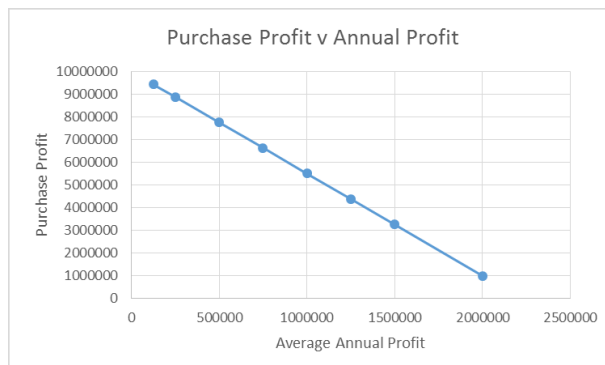
Assume for now the VP has a base salary of 50,000. If so, when $P \leq \$150,000$, his compensation can be determined by the equation $C = 50,000 + 0.75(P)$. When $P \geq 150,000$, compensation is determined by the equation $C = (50,000 + 0.75(150,000)) + 0.1P$, which means $C = 162,500 + 0.1P$. The plot for compensation can be seen below.



Company Profit	VP Compensation
0	50000
50000	87500
100000	125000
150000	162500
175000	180000
200000	182500
250000	187500
300000	192500

- b. Assume the company will be worth \$10million in five years. Plot the profit of buying the company as a function of annual profit.

The purchase price will be 4.5x earnings, calculated as 4.5x average annual profitability. Therefore, the profitability of the purchase can be seen by the equation $P_{\text{purchase}} = 10,000,000 - 4.5(P_{\text{annual}})$. The plot of this equation can be seen below.



Annual Profit	Purchase Profit
125000	9437500
250000	8875000
500000	7750000
750000	6625000
1000000	5500000
1250000	4375000
1500000	3250000
2000000	1000000

1-2 Goal Alignment at a Small Manufacturing Concern (cont.)

Does this contract align the incentives of the new vice president with the profitability goals of the owners?

No. Both the purchase price and the profit sharing create perverse incentives. The VP keeps \$0.75 of each dollar earned up to \$150,000, but only \$0.10 of each dollar earned after \$150K. Since earning more requires more effort (increasing marginal effort), he has little incentive to earn more than \$150,000. And every dollar the VP earns raises the price that he will eventually pay for the company by \$4.50, effectively penalizing him for increasing company profitability.

1-3 Goal Alignment at a Small Manufacturing Concern (cont.)

Re-design the contract to better align the incentives of the new vice president with the profitability goals of the owners.

One approach would be to establish a purchase price at the initiation of the contract. This would encourage the VP to make the company as profitable as possible, as it the increases to his marginal wealth of 10% above 150000 are not offset by the dramatic increases in purchase price. Also, this encourages him to make the company as profitable as possible as it will ultimately be his once the 5 years have passed.

1-4 Goal Alignment at New York City schools

1,800 New York City teachers who lost their jobs earlier this year have yet to apply for another job despite the fact that there are 1,200 openings. Why not?

New York is the only city in the U.S. where teachers are guaranteed pay for life even if their school closes and they no longer have a permanent job. The policy costs DOE more than \$100 million per year in salary and benefits. Those teachers go into the Absent Teacher Reserve pool, where they can be used as substitutes. The average salary for an ATR pool teacher? \$82,000, with some making \$100,000. Some teachers have been in the pool since 2006.

1-5 Goal Alignment between Airlines and Flight Crews

Planes frequently push back from the gate on time, but then wait 2 feet away from the gate until it is time to queue up for take-off. This increases fuel consumption, and increases the time that passengers must sit in a cramped plane awaiting take-off. Why does this happen?

Airlines are often evaluated and measured by their "on time" performance metrics. As this refers to boarding times rather than the time of actual departure, airlines would rather board the planes on time and wait on the tarmac than leaves passengers waiting at the gate.

1-6 Goal Alignment between Hospitals and the British Government

In 2008, the Labour party in Britain promised that patients would have to wait for no more than four hours to be seen in an emergency room. How is the National Health Service meeting this performance goal?

To meet this performance goal, seriously ill patients are being kept in ambulances. Thousands of people a year are having to wait outside the emergency departments because the trusts will not let them in until they will be able to be treated within four hours in accordance with the Labour pledge and government targets. In addition to keeping people outside, this also has reduced the ability of the ambulances to respond to emergency calls, leading to serious problems throughout the region.

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*Interactive HW Questions
(solutions to end-of-chapter multiple choice questions)*

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Chapter 1

1. Why might performance compensation caps be bad?
 - a. Different pay rates promote dissent. [A compensation cap is a maximum salary limit, it does not necessarily produce varied pay rates]
 - b. **Compensation caps can discourage employees from being productive after the cap. [correct;** at least with regards to salary, the employee is not rewarded for further productivity beyond the amount that produces the cap value]
 - c. Compensation caps can discourage employees from being productive before the cap. [employees are incentivized to reach the value of the cap, encouraging productivity prior to its achievement]
 - d. Both b and c
2. What is a possible consequence of a performance compensation reward scheme?
 - a. It creates productive incentives. [As pay is tied directly to performance, such a policy may motivate workers to improve their performance for the additional compensation]
 - b. It creates harmful incentives. [Such a policy may create incentives to manipulate the performance indicators or outputs, or view that performance metric exclusive from the overall interests of the firm]
 - c. **Both a and b [correct;** could produce productive or harmful incentives depending on the situation and the character of the person being rewarded]
 - d. Neither a nor b [Performance compensation schemes will produce some kind of incentives]
3. Which of the following is NOT one of the three problem solving principles laid out in Chapter 1?
 - a. **Under whose jurisdiction is the problem? [correct;** This is NOT one of the key problem solving principles].
 - b. Who is making the bad decision? [This is one of the key problem solving principles]
 - c. Does the decision maker have enough information to make a good decision? [This is one of the key problem solving principles]
 - d. Does the decision maker have the incentive to make a good decision? [This is one of the key problem solving principles]
4. Why might it be bad for hotels to not charge higher prices when rooms are in higher demand?
 - a. Arbitrageurs might establish a black market by reserving rooms and then selling the reservations to customers. [This black market allows the arbitrageurs to capture the value of the increased demand rather than the hotels who are providing the rooms as well as creating a less reliable system for the consumer]
 - b. Rooms may be rationed. [If demand increases but prices do not, demand for rooms may exceed supply, forcing the hotel to ration the rooms and turn customers who would have been willing to pay higher rates away]
 - c. Without the profit from these high demand times, hotels would have less of an incentive to build/expand, making the long run scarcity problem even worse. [Such a policy essentially creates a performance cap on the hotels, limiting their profitability to the number of rooms rather than overall demand]
 - d. **All of the above. [correct;** all of these are potential negative impacts of hotels not adjusting prices to accommodate demand]

5. The rational-actor paradigm assumes the people do NOT
 - a. Act rationally. [The *rational* actor paradigm does assume that people act rationally]
 - b. **Use rules of thumb. [correct;** the rational actor paradigm assumes people will act rationally, optimally and self-interestedly. Rules of thumb will only be used if they meet those three specific parameters]
 - c. Act optimally. [The rational actor paradigm does assume people will act optimally, selecting or creating the outcome that provides them with the most benefit]
 - d. Act self-interestedly. [The rational actor paradigm does assume that people will act in their own best interest]

6. The problem-solving principles analyze firm problems,
 - a. **from the organization's point of view. [correct;** considering a problem from the view of the overall organization will help ensure all elements and impacts are considered.]
 - b. from the manager's point of view. [Managers are also employees of the organization, thinking of a problem from only their perspective may overlook its impact on the company as a whole]
 - c. from the worker's point of view. [Thinking about a problem only from the employee's point of view risks missing the fundamental problem of goal alignment with the overall organization]
 - d. from society's point of view. [Society does not have the same goals and incentives as the firm.]

7. Why might welfare for low income households reduce the propensity to work?
 - a. It will not. [It can if working can only provide similar benefits to those that can be received from welfare without working]
 - b. **It reduces the incentive to work. [correct;** those receiving welfare may have less incentive to work if the benefits of working are similar to or worse than those that are received without it. Additionally, welfare may reduce the value of working for higher income workers who have to support the system, also reducing their incentives]
 - c. It is unfair. [Perception of fairness alone will not alter the propensity to work unless it also impacts the value of that work for the individual, which would impact his overall incentives]
 - d. It encourages jealousy. [Jealousy itself will not alter the propensity to work unless it also impacts the perceived value of that work, which changes the incentives]

8. Why might a "bonus cap" for executives be a bad policy for the company?
 - a. It isn't. Executives shouldn't make more than a certain amount. [Just like other types of employees, setting a maximum value for executives eliminates the ability to separate, reward and motivate them based on their performance]
 - b. It would sow discontent. [Even if discontented, the rational actor paradigm indicates executives would still perform to reach the cap value in order to maximize their bonus]
 - c. **It would encourage shirking after the executives reached the cap. [correct;** limiting the bonus may reduce the incentive of executives to continue improving or performing once it is achieved]
 - d. The cap could be set too high, so execs may work too hard and not reach it. [This is a problem not with the cap itself, but with the level, which can be adjusted as needed]

9. What might happen if a car dealership is awarded a bonus by the manufacturer for selling a certain number of its cars monthly, but the dealership is just short of that quota near the end of the month?
- a. **It may sell the remaining cars at huge discounts to hit the quota. [correct; the loss of income from the reduced rate will be offset by the manufacturer's bonus]**
 - b. It creates an incentive to sell cars from different manufacturers. [the dealership is more inclined to sell cars from the manufacturer providing the bonus]
 - c. It would ruin the relationship between dealer and manufacturer. [The dealer is working to meet the requirements of the manufacturer to achieve the bonus]
 - d. Potential buyers will lose buying power at the dealer. [Potential buyers would gain buying power in this scenario since the dealership has incentive to lower prices]
10. Why might a supermarket advertise low prices on certain high profile items and sell them at a loss?
- a. It is a way for companies to be charitable. [The rational actor paradigm tells us the firm will act in its own self-interest]
 - b. **The store will sell other groceries to the same customers, often at a markup. [correct; by using the discounted items to bring consumers into the stores, the supermarket can profit by increasing the prices on the other items they will purchase while they are there.]**
 - c. They would not. [Actually, they do quite often. Can you think of why this may be?]
 - d. This reduces the incentives of trade. [Trade incentives do not apply in this case]