Moral Hazard problems involve asymmetric information existing between two individuals which economists call the Principal and the Agent. The Principal and Agent have a relationship from which they both benefit (e.g. owner and employee, or insurance agency and policy holder), where the benefits to the Principal depends on how much effort the Agent exerts (e.g. working hard to increase profits or going outside instead of smoking cigarettes in bed.). The Agent, though, doesn't like exerting the effort and would rather shirk – not exert the amount of effort the Principal would like. Moral Hazard problems arise when the Principal can only see the final result (e.g. profit or whether or not the house burned down) and can't figure out how much effort the Agent exerted.

So consider the owner of a car dealership (Pamela - The Principal) and her employee (Alan - The Agent). **Both Pamela and Alan are risk neutral**. Alan can either choose to **Work Hard** and try to get people to buy cars or **Shirk** at his job and pretend he doesn't see the customers walking around the car lot.

In addition, the profits of the business depend on whether or not a lot of people want to buy cars. Demand for cars might be Low, Medium or High with an equal chance of each.

Action of Alan	Low Demand	Medium Demand	High Demand
Work Hard	$100,000	$150,000	$200,000
Shirk	$50,000	$100,000	$150,000

Profits for Pamela (before subtracting the wages she has to pay to Alan) are given by the above table. So, for example, if Alan chooses to work hard, demand for cars is medium and Pamela pays Alan $30,000, Pamela's profits are $150,000-$30,000=$120,000. Pamela only cares about her own profits.

Alan on the other hand cares about two things. He cares about how much money Pamela pays him and how hard he has to work. Alan's "profit" is given by the wage he is paid by Pamela minus $10,000 if he has to work hard. So, if Pamela pays Alan $35,000 and Alan works hard, his "profit" is $35,000-$10,000=$25,000. If on the other hand, Pamela still pays him $35,000, but he shirks his duties, his "profit" is $35,000-$0=$35,000.

In order to get Alan to work for her, Alan's "profit" must be at least $30,000 on average (incentive programs might change how much Alan gets paid in certain situations.)

1. If Pamela pays Alan $30,000 no matter what happens, how much money will Pamela make on average?
If Pamela offers Alan a fixed wage, he will have no incentive to Work Hard. If he shirks, Pamela's expected profits are 100,000-30,000=70,000.

2. After looking at other firms' compensation schemes, Pamela decides to introduce a reward for Alan if he sells a lot of cars. Specifically, Alan will now be paid $120,000 if Pamela's profit, before she pays Alan's salary, is $200,000 (ie. If he works hard and demand is high). If Pam's profit before paying Alan's salary is less that $200,000, he only gets $30,000. Is this a good idea for Pam?

If Pamela offers this scheme, Alan's payoff if he chooses to work hard is now (120,000+30,000+30,000)/3 – 10,000=50,000 while his payoffs from shirking is 30,000. Thus he will work hard and Pamela will make 150,000-50,000=100,000 in expectation, which is better than the 70,000 she was making before.

3. What would be the smallest bonus wage, like the one in question 2, which would get Alan to Work Hard, assuming if he didn't get the bonus wage, his wage would be $30,000?

The lowest bonus which would get Alan to work hard would be that which just compensated him for the cost of the additional effort. If hard work "costs" Alan $10,000, the wage in the High Demand/Hard Work state which would elicit hard work would be $60,000. Note: Hard work payoff = (60k+30k+30k)/3-10,000=30,000.

4. Would your answer in question 3 change if Alan were risk averse, instead of risk neutral? Explain.

Assuming Alan's non-bonus wage was $30,000, Pamela would have to pay him a higher bonus wage to continue to work hard, since Alan's "profit" is more risky