

## Answers to Problem Set 5 (Check figures also)

### Multiple Choice

- I. B We know that an increase in expected future nominal interest rates will decrease the expected present discounted value of profits. Our formulation in class stated that investment depends positively on this, thus it will cause investment to decrease.
- II. D We postulated a general equation for consumption,  $C = C(\text{total wealth}, Y - T)$ . Basing consumption on total wealth, in particular human wealth relies heavily on the assumption that one can borrow on future income. If borrowing is more difficult, then consumption will be more effected by current income. The same reasoning applied to investment behavior. Even if there is a good investment opportunity, if firms are constrained in borrowing, their investment will be less dependent on present dicounted value of a project. These issues are contained in the book.
- III. B This problem is simple. Compare the present discounted value of the machine with the current cost of it.
- IV. A Remember, when one is deciding whether to hold bonds or money, one simply cares about the relative return on each and allocates one's wealth accordingly. Future events have no effect on this decision.
- V. D Using the formula from the book of the price of a stock, this question is trivial. All the other answers are wrong.

### Short Answer

- I. FALSE. While we use the convenient expression for a stock current value as the present discounted value of expected future dividends, we must not forget that there are speculators which will purchase stocks causing the price to rise just based on the belief that it will in fact rise. This is known as bubbles in the stock price.
- II. FALSE. Remember that expectations has been the focus of the course recently. Any change that is known about in advance will be known to effect future output and interest rates and hence will have an effect on the present discounted value of income and profits. This will have an effect on today's activity, i.e. at the time of the announcement.
- III. UNCERTAIN. If the economy expects future government spending increases, in the future IS-LM we expect interest rates to rise and output to increase. Remember the current period IS curve relation:  $Y = A(Y, T, r, Y^{le}, T^{le}, r^{le})$ . Thus, higher future interest rates will cause current IS to shift in through its reduction in present discount value of profits and income. Future output rises, this will cause the current IS to shift out for similar reasons. The overall effect is ambiguous and depends on the sensitivity to these parameters.

## Long Question

- a. The correlation between construction activity and business expenditures is 0.9828, which signifies a very strong relationship between the variables. Also, just by sight they seem to move together.
- b. The correlation between undistributed pre-tax profits and business expenditures is 0.9492, which signifies a very strong relationship between the variables. Also, just by sight they seem to move together.
- c. The correlation between undistributed pre-tax profits and GDP is 0.9674, which signifies a very strong relationship between the variables.
- d. If the government guaranteed payments on all investment contracts this would remove the uncertainty associated with investment. Thus, we should expect investment to be higher given any level of profits. This would not be a wise course of action, because agents or firms would invest in very risky projects and the government would eventually incur huge losses. Think of the savings and loan crisis.
- e. The theories presented in this course basically may be summed up as follows:  $I = I(V(\Pi_t^e), \Pi_t)$ . Thus, investment depends on both current profits and the expected present discounted value of future profits. One of the indicators of future profits is future output. The scatter plots show that business expenditures for new plant and equipment is strongly related to current profits. Thus, this theory is in line with the evidence. We also showed that profits are related to the GDP of the economy so that if one expects future output growth, one should invest more today, since the present discounted value of future profits will be higher. So indeed they are useful theories. After all, if they weren't we might all be surfing in California instead!!