MID-TERM TEST

COMM 220 H • Winter 2014

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Section H

Show answers ☑

Name: _____ Student no. _____ v.1

About the test

A total of 40 points. There are 40 multiple-choice questions worth one point each.

Answering. Enter your answers on the computer scan sheet provided. You may also provide a written explanation or comment for any of the questions, and part marks may be awarded or deducted. This is optional. Write your explanations on the last page. Do not detach pages.

Aids. Ruler, translation dictionary, nonprogrammable calculator are permitted. Do rough work in empty spaces and on the two blank pages near the end.

Prohibited. Scrap paper, tattoos, Uggs, flip flops, cell phones, and anything electronic.

Tips. Read the captions to tables and figures carefully. For questions with ranges, pick the tightest range that contains the answer. The answer choice *Uncertain* means the same as *Cannot be determined* or *It depends*. It does not mean that you are uncertain. *Better off* and *worse off* refer to changes in utility.

To the serious minded. Some answer choices are just plain silly. It's comic relief—I hope.

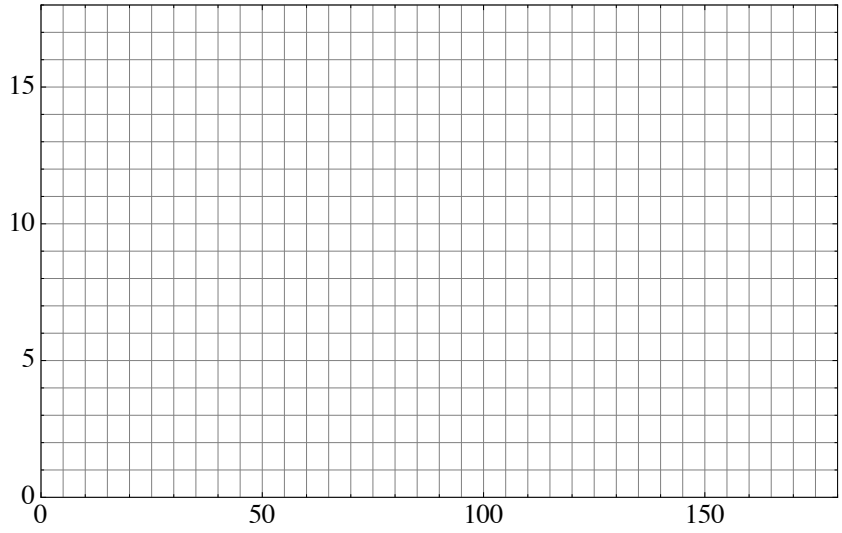
Turning in your work. Submit the computer scan sheet and this document at the end of the test. Your test will not be graded unless both are submitted.

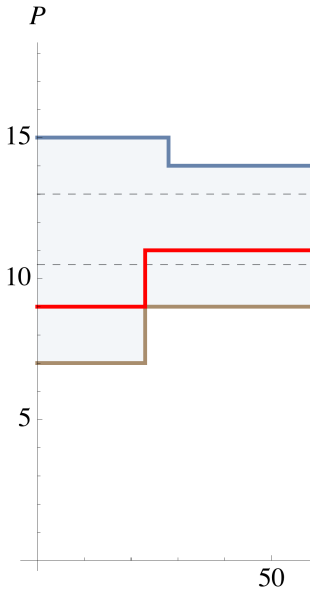
Part 1—Taxes and subsidies in a call market

Buy and sell orders in a competive call market, where the equilibrium price is the mid−point of the marginal bid and ask. You know you love it. The government is going to tax producers $2 per unit.

Buyer	Q_d	P_d	Seller	Q_s	P_s
B1	28	15	S1	23	7
B2	35	14	S2	37	9
B3	25	11	S3	31	10
B4	23	9	S4	28	11
B5	29	8	S5	33	14
B6	28	6	S6	23	16

Buyer	Q
B1	2
B2	3
B3	2
B4	2
B5	2
B6	2





Question 1

What is the equilibrium in this market before the quantity tax is imposed?

A. {83, $10.50}

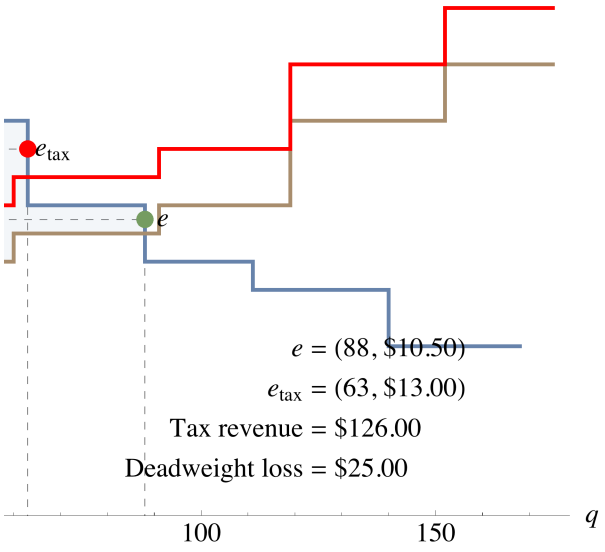
B. {87, $10.50}

C. {88, $10.50}

D. {90, $10.50}

Answer → C. See the graph.

$_d$	P_d	Seller	Q_s	P_s
8	15	S1	23	7
5	14	S2	37	9
5	11	S3	31	10
3	9	S4	28	11
9	8	S5	33	14
8	6	S6	23	16



Question 2

What is the equilibrium in this market after the quantity tax is imposed?

A. {57, $12.00}

B. {57, $15.00}

C. {63, $13.00}

D. {65, $14.00}

E. {66, $15.00}

Answer → C. See the graph.

Question 3

How much revenue will the tax raise for the government?

A. ≤ $108.28 B. ≤ $124.03 C. ≤ $139.78 D. ≤ $155.53 E. > $155.53

Answer → C. $126.00. See the graph.

Question 4

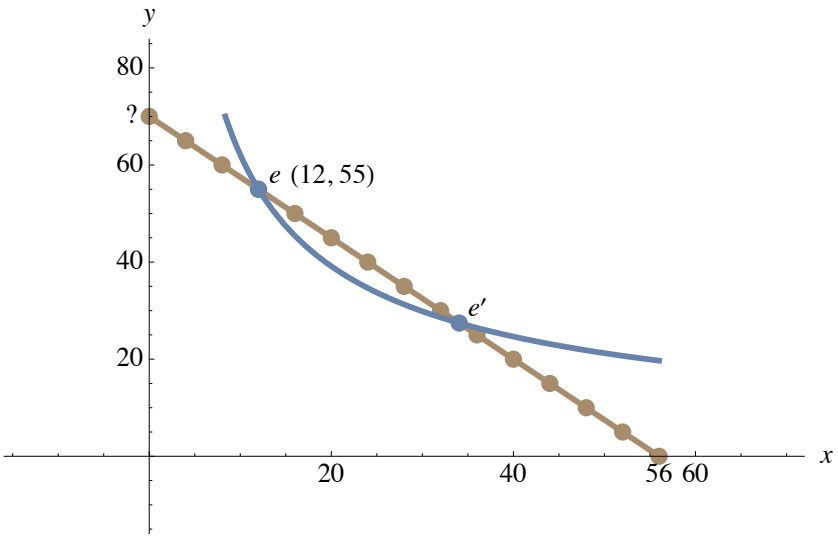
What is the deadweight loss from the tax?

A. ≤ $26.50 B. ≤ $28.50 C. ≤ $30.50 D. ≤ $32.50 E. > $32.50

Answer → A. $25.00. Look carefully at the graph. Consumers lose $12.50, producers $12.50.

Part 2—Where are your utiles?

Lucy's budget line with various points, her initial indifference curve, and her endowment, e, which is worth \$1,960. The indifference curve and budget line intersect at e and e'.



Question 5

What is the price ratio?

A. ≤ 1.2031 B. ≤ 1.2656 C. ≤ 1.3281 D. ≤ 1.3906 E. > 1.3906

Answer → B. Rise over run, $\frac{\Delta y}{\Delta x}$, from $e\{12, 55\}$ to $\{56, 0\} = \frac{5}{4} = 1.25$.

Question 6

What is the price of y?

A. ≤ \$21.25 B. ≤ \$27.25 C. ≤ \$33.25 D. ≤ \$39.25 E. > \$39.25

Answer → C. The price is y is \$28. You have two points on the budget line. Or, you can use one point and the price ratio from question 1.

Question 7

To reach her consumption optimum, Lucy will...

A. give up some y in exchange for x.

B. give up some x in exchange for y.

C. give up both x and y.

D. acquire more x and more y.

E. do nothing because e is a happy place.

Answer → A. At her endowment, Lucy values the next unit of x at more than $\frac{5}{4}$ of a y (the price ratio).

Question 8

How many of the points shown on the budget line are potential consumption optima?

A. ≤ 3 B. ≤ 4 C. ≤ 5 D. ≤ 6 E. > 6

Answer → C. There are 5 points that lie between e and e'.

Question 9

As Lucy moves towards her consumption optimum, her marginal rate of substitution will...

A. increase.

B. decrease.

C. remain the same.

D. go on strike.

E. vary randomly.

Answer → B. See question 3. Her *MRS* will decrease as x becomes relatively more abundant for her.

Question 10

At her consumption optimum, Lucy will be...

A. wealthier.

B. poorer and worse off.

C. worse off.

D. better off.

E. wealthier and better off.

Answer → D. She maximizes utility *given* her wealth.

Question 11

At her consumption optimum, what value
in units of y does Lucy place on one more or one less unit of x?

A. ≤ 1.32813

B. ≤ 1.53646

C. ≤ 1.74479

D. ≤ 1.95313

E. > 1.95313

Answer → A. $\frac{5}{4} = 1.25$, the price ratio.

Question 12

If, just before making her choice, Lucy
learned that she had inherited 7 x's and 7 y's from her uncle, she...

A. would clean her fingerprints off that jar of arsenic.

B. would be wealthier but her utility would be lower at her consumption optimum.

C. would be wealthier and her utility would be higher at her consumption optimum.

D. would be poorer and her utility would be lower at her consumption optimum.

E. would be poorer but her utility might be higher at her consumption optimum.

Answer → C. Parallel outward shift of the budget line.

Question 13

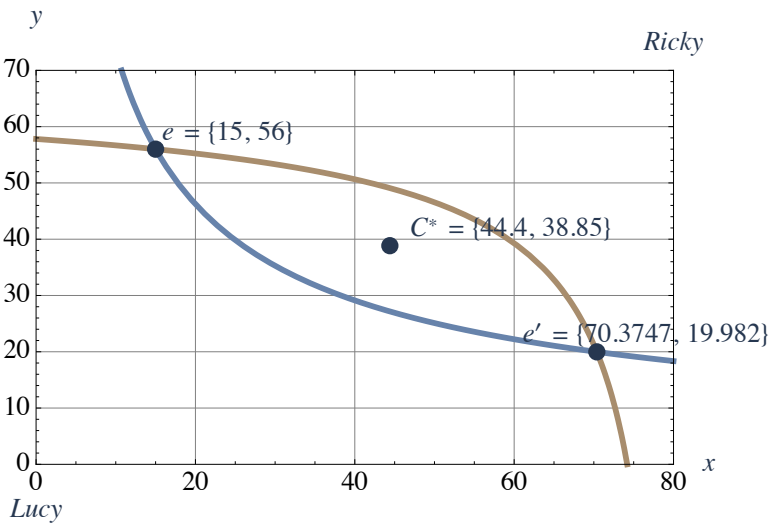
At these prices, another person with the same endowment but
different tastes from Lucy would make the same choice that Lucy will make.

A. Yes B. No C. Uncertain

Answer → B. The point of tangency must be different
if the budget line is the same but the indifference curve has changed.

Part 3—Pareto optimality

An Edgeworth box for a pure exchange economy. Lucy and Ricky's endowment is e = {15, 56}, and the Pareto optimum is C^* = {44.4, 38.85}, both with respect to Lucy's origin. Point e' = {70.3747, 19.982} is the other point of intersection of Lucy and Ricky's initial indifference curves (which, incidentally, was darn hard to find). Lucy and Ricky behave as price−takers.



Question 14

At e, who places a bigger value on the next unit of x.

A. Lucy B. Ricky C. Esther D. Raphael E. Jessica

Answer → A. Lucy's *MRS* is bigger. Personally,

I wouldn't make something like that public, but we all know Lucy.

Question 15

Who buys x in exchange for y.

A. Lucy B. Ricky C. Vincenzo D. Jie E. Selda

Answer → A. See question 10.

Question 16

What is the price ratio in equilibrium?

A. ≤ 0.692708

B. ≤ 0.838542

C. ≤ 0.984375

D. ≤ 1.13021

E. > 1.13021

Answer → A. 0.583333, which is the ratio of units of y traded for x to get them from e to C^*.

Question 17

If the endowment had been e' instead of e...

A. the consumption optimum and the equilibrium price ratio would be different.

B. the consumption optimum and the equilibrium price ratio would be the same.

C. the consumption optimum would be different.

D. the consumption optimum would be the same.

E. we cannot say whether the consumption optimum or the price ratio would be different.

Answer →

A. For the consumption optimum and price ratio to be the same, e, C^*, and e' would have to lie on the same line, which is not so in this case, and would be a coincidence in any other. But that's just math. It is important because it tells us that where we end up depends on where we start. The endowment is like the distribution of income or property in a real−life economy. Two economies can be the same size (Edgeworth box with same dimensions), and their populations having the same tastes, but they ultimately consume very differently and at very different prices because their endowments differ.

Question 18

The Edgeworth box depicts a general equilibrium because...

A. optimal consumption and the price ratio are determined jointly.

B. the price ratio is taken as given.

C. Lucy and Ricky are assumed to behave like price takers.

D. of Arrow's Impossibility Theorem.

E. the First Welfare Theorem is assumed to hold.

Answer → A. As discussed in class.

Question 19

What is a pure exchange economy?

A. An economy with producers who sell to consumers

B. An economy with all−natural ingredients, and no preservatives or added sugar

C. An economy in which the state allocates goods and services to the people

D. A continuous double oral auction market

E. An economy where there is no production, so only endowments are traded

Answer → E. Self−explanatory.

Question 20

The First Welfare Theorem is suggests that...

A. quantity taxes are really nasty if demand is inelastic.

B. free trade overcomes the problems of loss aversion.

C. no allocation can be Pareto optimal in light of Arrow's Impossibility Theorem.

D. policies that support economic freedom and competition are the best path to a Pareto optimum.

E. the deadweight loss is, well, dead.

Answer →

D. It is the best answer given that the others are so glaringly wrong or just plain silly. But it is also an answer that perhaps reads too much into the theorem because all that the theorem really says is that a competitive equilibrium *is* Pareto optimal. What matters in real life is whether the theorem continues to hold approximately for an economy that is becoming more competitive but is not textbook competitive. Does a move *towards* a more competitive economy and greater economic freedom result in a Pareto improvement? The evidence seems to suggest so, but is by no means definitive, and as you know, the road to get there can be pretty rocky. Pick your favourite emerging market.

Part 4—Risk aversion

Here is information about three gambles. You can use spread of payoffs as the measure of risk.

Gamble	Red (prob. = $\frac{5}{8}$)	Blue (prob. = $\frac{3}{8}$)	Expected payoff	Spread
G1	\$88,800	−\$103,200	\$16,800	\$192,000
G2	−\$88,800	\$192,800	\$16,800	\$281,600
G3	\$112,800	−\$130,400	\$21,600	\$243,200

Question 21

Which gamble would you choose if you were risk neutral and could choose only one?

A. G1 B. G2 C. G3 D. Geez E. Giorandola

Answer →

C. Biggest expected payoff. You don't care about risk if you are risk neutral. And being neutral means your tastes for risk won't clash with other elements of your wardrobe.

Question 22

Which gamble would you choose if you were risk averse and could choose only one? Answer choices showing more than one gamble mean that it is a question of taste for risk and return.

A. {G1} B. {G2} C. {G3} D. {G1, G2} E. {G1, G3}

Answer → E. If you are risk averse, you would never choose G2, right?

Question 23

Now suppose you could choose two gambles and form a kind of portfolio. Is there one gamble that everyone would want to include in their portfolio?

A. G1 B. G2 C. G3 D. Gee whiz E. Golly gee

Answer →

B. The payoff of G2 is perfectly negatively correlated with the payoff of the other two gambles. There are only two outcomes, so the correlation has to be perfect. When G2 wins, the others lose and vice versa. If you combine G2 with either of the other two gambles, the expected payoff of the portfolio will be a weighted average of the two, but the portfolio's risk may be less than the risk of the least risky gamble in the portfolio! Try it and see, but only under adult supervision.

Question 24

What is the risk, as measured by spread, of a portfolio whose payoff is the sum of $\frac{15}{37}$ of G2's payoff and $\frac{22}{37}$ of G1's payoff?

A. $0 B. $114,162 C. $192,000 D. $228,324 E. $281,600

Answer →

A. What, riskless? A spread of $0! How can you combine two risky things to make something that is riskless? You can if the correlation of their payoffs is perfectly positive or negative. That is diversification big time. See question question 23, and change your major to finance.

Part 5—Private information rational expectations equilibrium

Don't you just love the title of this part? Consider a market experiment, like the one in class, in which subjects trade a stock that pays a riskless dividend at the end of each of four periods named {A, B, C, D}. Different investor types receive different dividends, and that information is private. In the questions that follow, equilibrium price means theoretical price.

Investor	A	B	C	D
I	\$71	\$72	\$54	\$73
II	\$68	\$66	\$50	\$55
III	\$52	\$53	\$58	\$66

Question 25

What is the equilibrium price of the stock in period A?

A. ≤ \$229 B. ≤ \$247 C. ≤ \$265 D. ≤ \$283 E. > \$283

Answer → D. \$ 274. The sum of the biggest dividend in each period.

Question 26

What is the equilibrium price of the stock in period B?

A. ≤ \$199 B. ≤ \$217 C. ≤ \$235 D. ≤ \$253 E. > \$253

Answer → B. \$ 203. The sum of the biggest dividends remaining.

Question 27

Suppose that, in addition to the spot market, a forward market is opened in period A for delivery of the stock in period D. What is the equilibrium forward price in period A for this contract?

A. ≤ \$66 B. ≤ \$84 C. ≤ \$102 D. ≤ \$120 E. > \$120

Answer → B. ${}_AF_D = \mathrm{E}(P^*_D) = \$73$. The equilibrium forward price any time before the contract expires is equal to the expected spot price at expiry.

Question 28

How many different forward contracts could trade throughout the four periods?

A. 3 B. 6 C. 12 D. 13 E. 16

Answer →

B. $6 = \frac{4!}{2!(4-2)!}$ is the number of ways that two things, a start period and an end period, can be selected from four things. Of course, you can always just list them and count!

Contract opens in...	For delivery in..
A	B
A	C
A	D
B	C
B	D
C	D

Question 29

What is the value of the right to trade (or the potential gain from trade) as of the start of this market?

A. ≤ $7 B. ≤ $12 C. ≤ $17 D. ≤ $22 E. > $22

Answer → A. $4. This is the difference between the biggest cash flow to any one investor (maximum row total) and the equilibrium price in period A.

Part 6—Bubbles and crashes

Consider another stock market experiment, also like one we discussed in class, in which there is the following public information about the stock being traded. There is a 50–50 chance of a $25 or $40 dividend at the end of each of 10 periods. The dividends are independently distributed. Equilibrium price means the same thing as theoretical price in the questions that follow.

Question 30

What is the equilibrium price in period 8?

A. ≤ $77 B. ≤ $82 C. ≤ $87 D. ≤ $92 E. > $92

Answer →

E. $97.50. The expected dividend is $32.50, and at the start of period 8, there are three dividends remaining. The equilibrium price for any period t is $p_t = E(Div)(T - t + 1)$, where T is the total number of periods.

Question 31

A news broadcast at the beginning of period 6 reports that the distribution of future dividends will now be $28 and $43 for the remainder of the session. The probabilities will stay the same. What should happen to the price of the stock given the assumptions of the experiment?

A. Fall

B. Rise

C. Nothing if investors are risk neutral

D. Nothing given time irrelevance

E. Nothing because no one is paying attention

Answer →

B. Hmmm, good news. The dividend is expected to rise $3 to $36 with the risk unchanged. Can you say what the new price will be in period 6?

Question 32

How are prices predicted to behave in this experiment?

A. The price should rise whenever the most recent dividend was high

B. The price in any period should be equal to the sum of expected dividends

C. A bubble should occur

D. The price should be lowest during the first few periods

E. The price in any period should be greater than the sum of expected dividends

Answer → B. Unlike real life where companies are going concerns.

Question 33

The experiment can be thought of as one about semi−strong efficiency because...

A. information about future cash flow is public.

B. information about past dividends is irrelevant.

C. information about cash flow is mean reverting.

D. information about future cash flow is private.

E. there is no information that would give anyone an advantage.

Answer →

A. Some of you will be wondering why A is not the best answer. B is better because the experiment uses information about future cash flow—the high and low dividends and their probabilities—that is known to everyone at each point in time. The key is that the information is about the future, and that it is available to everyone now. The hypothesis that follows is that price is the discounted value of expected future dividends, and the implication is that no one has an edge at becoming wealthier. Answer A does not do the trick because all three forms of efficiency imply that whatever information is available (past, past and current, private) does not confer an advantage to anyone.

Part 7—Financial math

Like my father used to say, "Financial math makes you strong like ox, smart like streetcar." Well, he never really said that, but I wish he had.

Question 34

Your good friend, Insolvencia, is asking you to invest $5,153 in her three−year project. The before−tax cash flow is

End of year	1	2	3
Cash flow	$3,500	$4,000	$3,000

You'd be taxed at 40 per cent, and your opportunity cost is 2 per cent annually. Should you invest?

A. Yes B. No

Answer → A. The after−tax cash flow has a present value of $6,061.81, so an investment of $5,153 will leave you $909 richer.

Question 35

Thinking about saving? How many years will it take you to double your money if you invest it at 3 per cent compounded annually?

A. ≤ 16.9 B. ≤ 22.7 C. ≤ 28.6 D. ≤ 34.4 E. > 34.4

Answer →

C. 23.4498 years. That's a long time. Solve $(1+r)^t = 2$ for t. Or get a good approximation by using the Rule of 69 (or the Rule of 70). Divide 69 by 100 times the interest rate, $\frac{69}{3} = 23$. Where does that come from?

Part 8—Readings

Questions on the readings.

Question 36

Consider Robert Shiller's article "Speculative Prices and Popular Models." His interviews of investors about the stock market crash of 1987 revealed that the news that caught their attention most was stories about the most recent drop in prices. Which notion best describes the popular model of the stock market?

A. Mean reversion

B. Status quo bias

C. Impressario effects

D. Shortage illusion

E. A beauty contest

Answer → E. A positive feedback system where everyone is looking at prices to figure out what everyone else is thinking about prices.

Question 37

Some people do a little grocery shopping every day; others make a big grocery trip once a week. Which shopper is more likely to have more variety in the things they buy (say, types of bread) and which will have enjoyed their choices more?

A. The daily shopper will have more variety and enjoy their choices more than the weekly shopper

B. There will be no difference in the variety of what they buy or how much they enjoy it

C. The daily shopper will have more variety, but the weekly shopper will enjoy their choices more

D. The daily shopper will have less variety, but the weekly shopper will enjoy their choices more

E. The daily shopper will have less variety and enjoy their choices more than the weekly shopper

Answer →

E. See Kahneman and Thaler, "Utility Maximization and Experienced Utility." Weekly shoppers find it more difficult to predict what they will enjoy over the longer period, so they try to compensate (hedge their bets?) with more variety. This is referred to as *diversification bias*. It doesn't help. Shop a little every day if you can. You will be happier.

Question 38

The Economist story "Dismal Science, Dismal Sentence" illustrates...

A. a flaw in the efficient markets hypothesis.

B. that the stock market is semi−strong form informationally inefficient.

C. an incorrect application of the efficient market hypothesis by the courts.

D. that the stock market is weak−form informationally efficient.

E. how crime does not pay, at least not for Mr. Olis.

Answer →

C. The mistake the judge made was in attributing the price drop entirely to the news of Mr. Olis's fraud. There was other news coming out at the time that could affect the price.

Question 39

How do Camerer and Fehr, in their article "When Does 'Economic Man' Dominate Social Behavior," explain the high frequency of roughly even deals in the classic version of the Ultimatum Game?

A. There is an incentive for people to adopt substitutable strategies

B. Most people are generally selfish as assumed by economic theory

C. There is an incentive for people to adopt complementary strategies

D. Some people are affected positively or negatively by the behaviour of others

E. Some people have biased perceptions about the behaviour of others

Answer →

D. Some of us are *strong−reciprocators* or, in other words, value fairness or cooperation and are willing to enforce it. You summarized the data in quiz 2.

Question 40

How can we get people to save more for retirement? Suppose that the law requires that three per cent of every worker's pay goes into a company pension and that employers must match this contribution. Employers can allow workers to enrol in plans to contribute more than three per cent, say, to a maximum of eight per cent, with the employer matching up to six per cent. Once a year, workers are given the opportunity to enrol (opt in), to change their contribution rate, or to quit (opt out) and go back to the three per cent minimum rate.

A. Voluntary enrolment (opt in)

B. Automatic enrolment at six per cent at the start of employment with the option to opt out immediately

C. Automatic enrolment at three per cent at the start of employment with the option to opt out immediately

D. Automatic enrolment at eight per cent with no option to opt out immediately

E. Voluntary enrolment (opt in) combined with periodic distribution of educational material on saving

Answer →

B. Exploit the status quo bias. Start them at the higher contribution rate than the minimum (but not too high) and fewer will opt out then the number that would opt in under voluntary enrolment. You do not want to enrol them automatically at the minimum rate because, under the status quo bias, too few would increase their contribution above the minimum in later years!

Rough work and comments

Rough work and comments