

Quiz 1

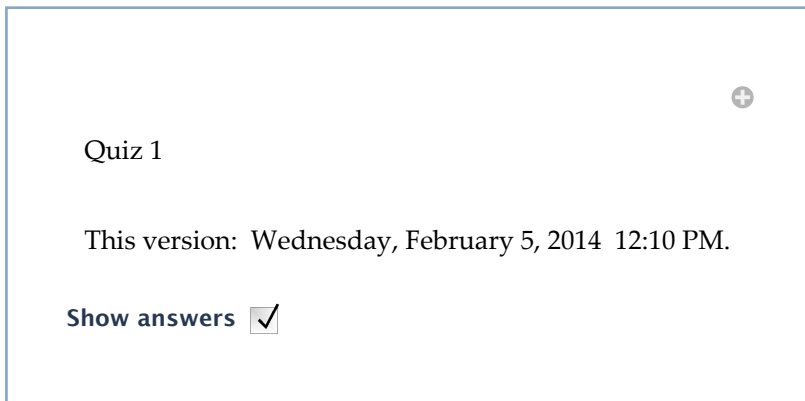
Building Economic Models

COMM 220 G & H • Winter 2014

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About the quiz

The deadline is posted on our message board. Submit your answers at Pareto.



Part 1 – Stock performance

The table shows 31 monthly closing prices for five S&P 500 companies. You can copy and paste the data into a spreadsheet or import the comma-delimited data file in the Assignment folder, "Quiz 1 Data.csv," which has prices for 109 companies. All questions in this part are based on percentage returns.

	ABT	F	PCLN	PCP	RAI
31 Dec 2008	48.58	2.29	73.65	59.3	16.88
30 Jan 2009	50.83	1.87	67.09	64.76	15.99
27 Feb 2009	43.4	2.	84.86	55.27	14.06
31 Mar 2009	43.73	2.63	78.78	59.76	15.4
30 Apr 2009	38.72	5.98	97.09	74.68	16.32
29 May 2009	41.69	5.75	110.11	82.37	17.18
30 Jun 2009	43.52	6.07	111.55	72.88	16.96
31 Jul 2009	41.99	8.	129.62	79.65	19.11
31 Aug 2009	42.22	7.6	153.98	91.1	20.07
30 Sep 2009	46.17	7.21	165.82	101.7	19.92
30 Oct 2009	47.58	7.	157.79	95.37	21.69
30 Nov 2009	51.27	8.89	214.12	103.5	22.35
31 Dec 2009	50.8	10.	218.41	110.19	24.1
29 Jan 2010	50.18	10.84	195.35	105.1	24.2
26 Feb 2010	51.45	11.74	226.71	112.59	24.02
31 Mar 2010	49.93	12.57	255.	126.56	24.97
30 Apr 2010	48.9	13.02	262.05	128.19	24.71
28 May 2010	45.46	11.73	191.16	116.56	24.12
30 Jun 2010	44.71	10.08	176.54	102.83	24.54
30 Jul 2010	47.34	12.77	224.4	122.08	27.22
31 Aug 2010	47.6	11.29	291.48	113.08	25.68
30 Sep 2010	50.39	12.24	348.34	127.27	28.4
29 Oct 2010	49.92	14.13	376.81	136.49	31.05
30 Nov 2010	45.24	15.94	394.05	137.98	29.59
31 Dec 2010	46.6	16.79	399.55	139.15	31.68
31 Jan 2011	44.33	15.95	428.52	142.93	30.89
28 Feb 2011	47.22	15.05	453.88	141.69	33.33
31 Mar 2011	48.15	14.91	506.44	147.15	35.04
29 Apr 2011	51.57	15.47	547.01	154.49	36.6
31 May 2011	51.78	14.92	515.19	157.07	39.23
30 Jun 2011	52.15	13.79	511.93	164.65	37.05

Question 1

Which stock earned the highest average monthly return?

- A. ABT B. F C. PCLN D. PCP E. RAI

Answer → B. F had an average monthly return of 8.29893 per cent. Here are the mean returns for all five stocks.

ABT	F	PCLN	PCP	RAI
0.00403349	0.0829893	0.0756398	0.0387008	0.0283217

Question 2

Which stock was riskiest? Measure risk by population standard deviation of return.

- A. ABT B. F C. PCLN D. PCP E. RAI

Answer → B. F had a monthly standard deviation of 25.5117 per cent. Here are the standard deviations for all five of the stocks.

ABT	F	PCLN	PCP	RAI
0.0569227	0.255117	0.136087	0.0912726	0.0597434

Question 3

PCLN and PCP are the two stocks whose returns are least correlated.

- A. Yes B. No

Answer → B. ABT and PCLN are the least correlated. Here is the correlation matrix.

	ABT	F	PCLN	PCP	RAI
ABT	1.	-0.353133	0.0604043	0.221272	0.364866
F	-0.353133	1.	0.361607	0.535971	0.319745
PCLN	0.0604043	0.361607	1.	0.401211	0.0674461
PCP	0.221272	0.535971	0.401211	1.	0.489241
RAI	0.364866	0.319745	0.0674461	0.489241	1.

Why should we care about correlation? Good question to ask in class or at the tutorials.

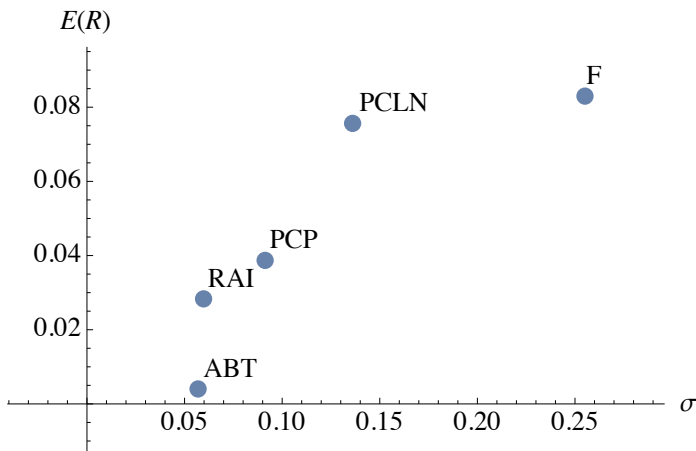
Question 4

If people like return but dislike risk and if only one stock can be chosen, is there one that everyone wants?

- A. Yes B. No

Answer →

B. If people like return but dislike risk, which is not unreasonable, then everyone will prefer the stock that offers the highest return and lowest risk. It would plot to the left and above all others. Any point that lies to the right and above any other creates a tradeoff: more return at the cost of more risk. The choice between the two is then a question of taste. Of course, it would be silly to invest in just one stock. But that brings us back to the question of correlation.



Question 5

What would have been your average monthly return for the period if you have invested \$40,000 in ABT and \$60,000 in RAI?

- A. $\leq 1.46\%$ B. $\leq 1.64\%$ C. $\leq 1.82\%$ D. $\leq 2.00\%$ E. $> 2.00\%$

Answer →

D. $1.86064\% = 0.0186064 = .40(0.00403349) + .60(0.0283217)$. The expected (average) return on a portfolio is a weighted average of the returns on the assets in it, where the weights are the fractions of your wealth invested in each. Now, if you compounded that \$100,000 investment by 1.86064% for the 30 months, would the answer give you the amount your investment had grown to?

Part 2

What, bookkeeping? I flunked accounting class four times (no, wait, I think it was eight times).

Revenue (R)	\$160,000
Expenses (E)	\$100,000
Marginal tax rate (T)	20%

Question 6

What is your after-tax cash flow (what goes into your pocket) if you can deduct expenses as usual when computing your taxes?

- A. $\leq \$44,940$ B. $\leq \$46,380$ C. $\leq \$47,820$ D. $\leq \$49,260$ E. $> \$49,260$

Answer \rightarrow D. \$48,000.

Question 7

Now some algebra. After-tax cash flow is...

- A. $T \times E$
 B. $(R - E)T - E$
 C. $(R - E)(1 - T)$
 D. $R - E(1 - T)$
 E. $R \times T - E$

Answer \rightarrow C. $(R - E)(1 - T)$. Expand the right-hand side and interpret it.

Question 8

What would be your after-tax cash flow if, for some strange reason, Canada Revenue Agency did *not* allow you to deduct your expenses?

- A. $\leq \$27,389$
 B. $\leq \$29,832$
 C. $\leq \$32,275$
 D. $\leq \$34,718$
 E. $> \$34,718$

Answer → B. \$28,000. Taxes of \$32,000 and \$100,000 in expenses.

Question 9

A *tax shield* is the amount you save in income tax from being allowed to deduct various expenses. The tax shield here is...

- A. $\leq \$21,111$
- B. $\leq \$22,889$
- C. $\leq \$24,667$
- D. $\leq \$26,445$
- E. $> \$26,445$

Answer → A. \$20,000. The difference in after-tax cash flow in questions 6 and 8.

Question 10

Let's get algebraic again. The tax shield is...

- A. $(R - E)(1 - T)$
- B. $(R - E)T - E$
- C. $T \times E$
- D. $R \times T - E$
- E. $R - E(1 - T)$

Answer →

- C. $T \times E$. The tax shield is equal to your marginal tax rate times your deductions (both legal and fraudulent). Look at your expansion in question 7.

The tax shield is sitting right there as a positive term!

Question 11

What is your after-tax return (from question 6) on revenue?

- A. $\leq 31.68\%$
- B. $\leq 38.38\%$
- C. $\leq 45.07\%$
- D. $\leq 51.77\%$
- E. $> 51.77\%$

Answer → A. 30.0000%. After-tax cash flow divided by revenue.

Question 12

If r is your before-tax rate of return on revenue, then $r(1 - T)$ must be your after-tax rate of return.

A. Yes B. No

Answer → A. Your before-tax return on revenue is 37.500%. Multiply that by $1 - T$.

Part 3—Behavioural economics

Some loftier ideas. So much more civilized,
no? Read “Behaviourists at the Gate,” *The Economist*, May 8, 2003.

Question 13

Roughly stated in the article, the assumption
by neoclassical economists that people are rational means...

- A. we always have the right answers.
- B. we favour liberal policies.
- C. that the consumer surplus is always maximized.
- D. we use mathematics to solve our problems.
- E. our choices are consistent because our tastes are consistent.

Answer → E. our choices are consistent because our tastes are consistent. From the article

Question 14

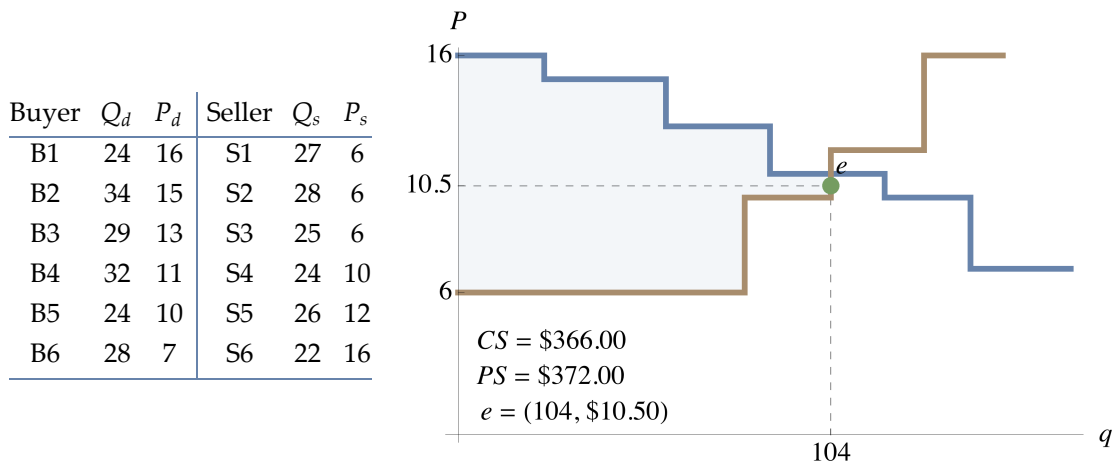
Behavioural economics differs from neoclassical economics in that...

- A. it makes no use of mathematics or equations.
- B. it is built on observations of how people actually
make decisions, and does not assume we always behave rationally.
- C. it recognizes that blues music is vital to a civilized society.
- D. it favours anti-globalization policies.
- E. it advocates less government interference in the economy.

Answer → B. it is built on observations of how people actually make
decisions, and does not assume we always behave rationally. From the article

Part 4—Equilibrium in a call market

Take a shot at drawing supply and demand schedules that are step functions. You'll be seeing this again in Quiz 3. Assume, as we did in class, that equilibrium price is determined by the mid-point of the marginal bid and marginal ask.



Question 15

What is the equilibrium quantity?

- A. ≤ 86.5 B. ≤ 93.5 C. ≤ 100.5 D. ≤ 107.5 E. > 107.5

Answer → D. $Q^* = 104$. See the answer plot.

Question 16

What is the equilibrium price?

- A. $\leq \$7.13$ B. $\leq \$8.92$ C. $\leq \$10.73$ D. $\leq \$12.53$ E. $> \$12.53$

Answer → C. $P^* = \$10.50$. See the answer plot.

Question 17

What are the total gains from trade? Sum the consumer and producer surpluses.

- A. $\leq \$760$ B. $\leq \$819$ C. $\leq \$878$ D. $\leq \$938$ E. $> \$938$

Answer → A. $CS + PS = \$366.00 + \$372.00 = \$738.00$. See the answer plot.

Part 5—The endowment effect

Read Kahneman, Daniel; Knetsch, Jack; Thaler, Richard, 1991, "The Endowment Effect, Loss Aversion, and Status Quo Bias," *Journal of Economic Perspectives*, 5(1): 193–206.

Question 18

The status quo bias is attributed to...

- A. overseas excursion.
- B. loss aversion.
- C. greed.
- D. French immersion.
- E. political subversion.

Answer → B. From the article.

Question 19

Motorists in New Jersey were offered the option of switching from a cheap automobile insurance policy that restricts the right to sue, which is the default plan, to a more expensive one with an unrestricted right to sue. The majority of motorists...

- A. called Geico.
- B. stayed with the default plan.
- C. stopped driving and began using public transit.
- D. switched.
- E. cancelled their insurance policies.

Answer → B. From the article.

Question 20

An outcome of the endowment effect is that people respond less negatively to the imposition of a surcharge than they do to a reduction in a discount.

- A. Yes
- B. No

Answer → B. From the article.