

Answer Outline

ECONOMICS 353

L. Tesfatsion/Fall 06

EXERCISE 3: Six Questions (8 Points Total) DUE: Tuesday, September 19, 2:10pm

****IMPORTANT REMINDER: LATE ASSIGNMENTS WILL NOT BE ACCEPTED
– NO EXCEPTIONS****

EXERCISE INSTRUCTIONS:

- (1) Please **fill in your name and student ID number** on Side 1 of your bubble sheet and write **Econ 353-Ex3** in the top margin of Side 1.
- (2) Use a number 2 pencil to **mark your answers** on Side 1 of the bubble sheet to the first five questions Q1 through Q5, below, which are in multiple choice format.
- (3) The sixth question Q6 is a Web Exercise that asks you to prepare data charts using an Excel spreadsheet, analyze the data charts, and print out the data charts. Please put your **name and student ID number** at the top of your answer sheet(s) for Q6 along with **Econ 353-Ex3:Q6** and **separately** hand in the answer sheet(s) for Q6 in addition to your bubble sheet answers for questions Q1 through Q5.
- (4) Each question Q1 through Q5 is worth 1 point, and Q6 is worth 3 points.

Q1 (1 point). Which of the following can be described as DIRECT FINANCE?

- A. You take out a mortgage from a bank.
- B B. You borrow \$6000 from your uncle.
- C. You buy shares of a common stock on the New York Stock Exchange.
- D. You buy shares in a mutual fund.

Q2 (1 Point). Which of the following are NOT traded in a capital market?

- A. Corporate bonds.
- B. U.S. government agency securities.
- C. State and local government bonds.
- D D. Repurchase agreements
- E. Common stock shares

Q3 (1 Point). Federal funds are

- A.** funds raised by the federal government in the bond market.
- B.** loans made by the Federal Reserve System to banks.
- C.** loans made by banks to the Federal Reserve System.
- D D.** loans made by banks to each other.

Q4 (1 Point). Bonds that are sold in a foreign country and are denominated in a currency other than that of the country in which they are sold are known as

- A A.** Eurobonds
- B.** Foreign investment
- C.** Negotiable bonds
- D.** Transferable bonds

Q5 (1 Point). In the 1980's a Texas Bank developed a reputation for readily providing loans to borrowers at a standard low interest rate for the purpose of exploring for oil deposits. Many of these loans were never repaid, because the bank's loan policy created

- A.** a free-rider problem.
- B.** a principal-agent problem.
- C C.** an adverse selection problem.
- D.** a moral hazard problem.

**SEE THE FOLLOWING PAGE FOR
Q6: WEB EXERCISE**

Q6: Web Exercise (3 Points Total): Stock Return Volatility Redux

Key On-Line References:

1. L. Tesfatsion, “Measuring the Volatility of Stock Returns: Points to Ponder,”
<http://www.econ.iastate.edu/classes/econ353/tesfatsion/StockVolatility.pdf>
2. The Financial Forecast Center, <http://www.forecasts.org/data/index.htm>

NOTE: Turn in the chart prepared for Q6:A and the two charts prepared for Q6:C (just the charts, not the data!) together with your standard deviation calculations (with comparison) for Q6:B and your verbal answer for Q6:C. **If you use more than one answer sheet for Q6, please put your name and “Econ 353-Ex 3:Q6” on each sheet and staple these sheets together before turning them in.** Turn in your answer sheet(s) for Q6 together with your bubble sheet answers for Q1 through Q5 – but please do not staple or otherwise attach the bubble sheet to your Q6 answer sheet(s).

PART A (1 Point): Following the same general steps for preparing an Excel chart as outlined by Mishkin in his sample Web exercise in Chapter 1 (pages 15-17), prepare a chart as follows.

Step A.1 Visit <http://www.forecasts.org/data/index.htm> and click on “Stock Index Data” at the VERY TOP of the page.

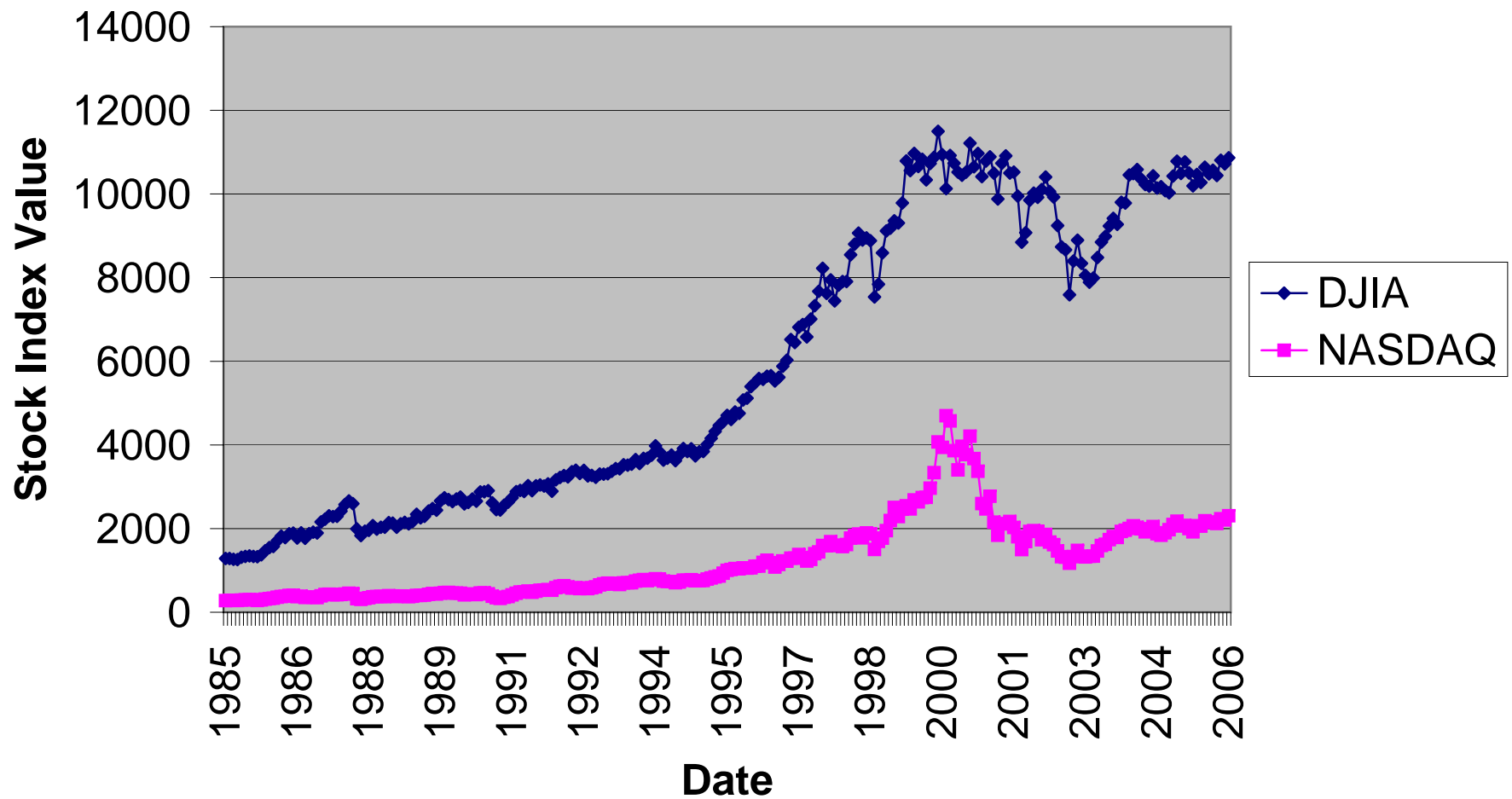
Step A.2 Next click on “U.S. Stock Indices-Monthly.”

Step A.3 Next, using the menu on the left, copy and past into an Excel worksheet the dates 1985.01 through 2006.01 ONLY in a lead column and copy and paste the corresponding values for the DJIA and the NASDAQ Composite stock indices in the next two columns for these same dates (1985.01 through 2006.01 ONLY), being careful to properly match up the year/month time periods yyyy.mm across the three columns.

Step A.4 Next prepare an Excel chart (using a “line diagram”) that displays the time series for the two stock indices as two “Y” series on the same chart, with the horizontal axis “X” series given by the time periods 1985.01 through 2006.01. Label the chart “DJIA and NASDAQ Composite Comparisons (1985-2006),” label the Y-axis “Stock Index Value” and the X-Axis “Date”, and label the two Y series “DJIA” and “NASDAQ” respectively. **NOTE: Be sure to choose colors/markers for the graphed DJIA and NASDAQ Composite stock index values so that they are easily distinguished from each other on a black-and-white print-out.**

Answer Outline for Part A: See attached chart.

DJIA and NASDAQ Composite Comparisons (1985-2006)



PART B (1 Point): Next, referring to the key reference [1] above for the definition of “sample standard deviation,” calculate the *volatility* of each stock index in Part A as follows, where the *volatility* of a stock index is defined to be the sample standard deviation of its return rate over a given sample period.

Step B.1 Let $DS(t)$ denote the DJIA stock index in time period t , where t ranges from 1985.01 through 2006.01. Similarly, let $NS(t)$ denote the NASDAQ Composite stock index in time period t , where t ranges from 1985.01 through 2006.01. Define the return rate $RDS(t)$ for the DJIA stock index in time period t as

$$RDS(t) = [\ln DS(t+1) - \ln DS(t)] , \quad (1)$$

i.e., as the difference in the natural logarithm of the DJIA stock index between time period $t+1$ and time period t . Similarly, define the return rate $RNS(t)$ for the NASDAQ Composite stock index in time period t as

$$RNS(t) = [\ln NS(t+1) - \ln NS(t)] , \quad (2)$$

i.e., as the difference in the natural logarithm of the NASDAQ Composite stock index between time period $t+1$ and time period t .

Step B.2 Next use your Excel spreadsheet data from Q6:Step A.3 and the Excel math function \ln for natural logarithm to CALCULATE the return rates $RDS(t)$ and $RNS(t)$ for each time period t from 1985.01 through 2006.00. (Note that you have to end in time period 2006.00 to calculate these return rates, not 2006.01, since you only have stock index data through 2006.01 and you would need stock index data for 2006.02 to calculate the return rates for 2006.01.)

Step B.3 Next use the Excel statistical function STDEV for (sample) standard deviation to separately calculate: (a) the sample standard deviation of the return rates for the DJIA stock index over the time periods 1985.01 through 2006.00; and (b) the sample standard deviation of the return rates for the NASDAQ Composite stock index over the time periods 1985.01 through 2006.00. Report these two sample standard deviations, indicating which one is greater in value.

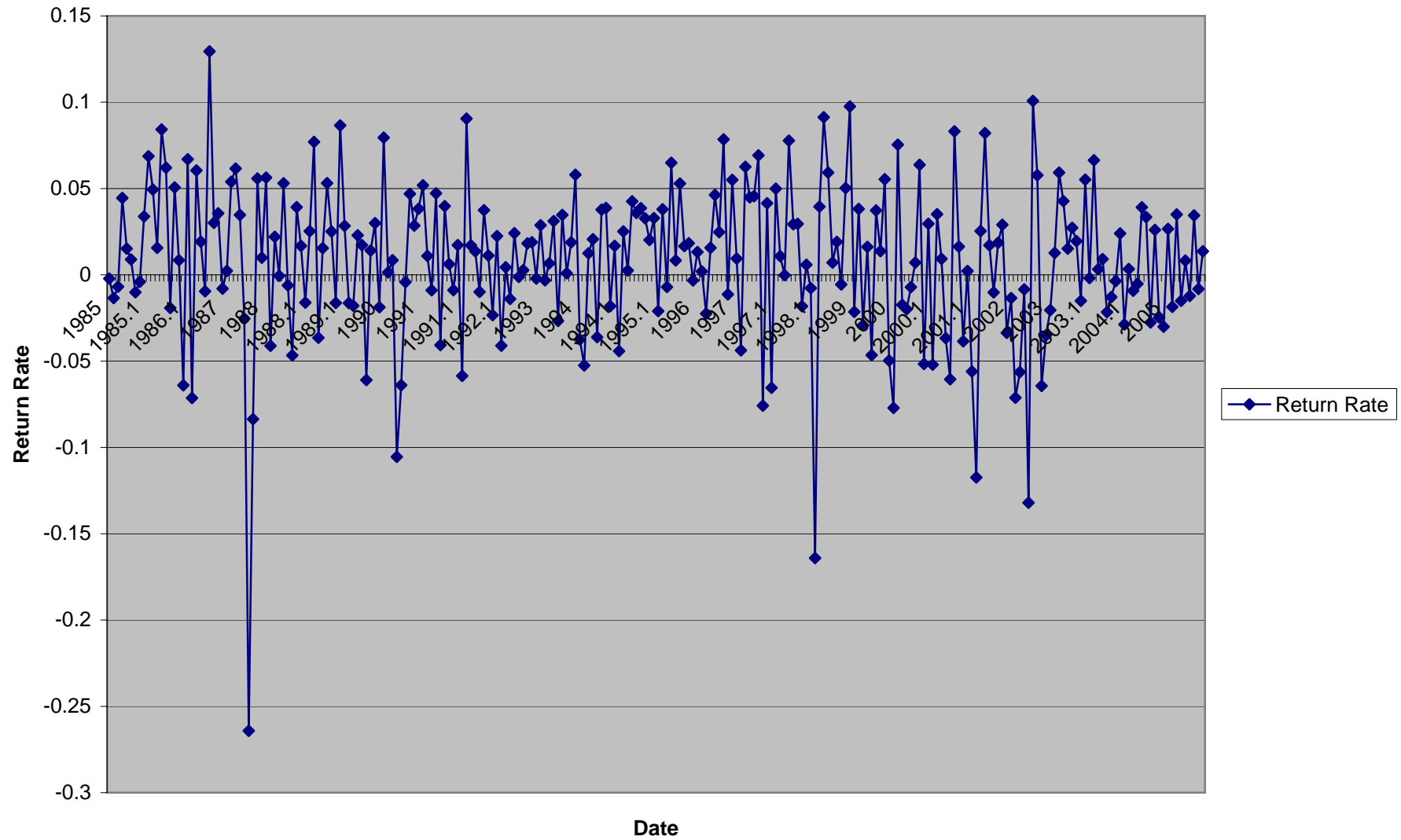
Answer Outline for Part B: As calculated from the indicated data, the sample standard deviation for the return rates for the NASDAQ Composite is 0.070 and the sample standard deviation for the return rates for the DJIA is 0.045. Thus, as measured by sample standard deviation, the return rates for the NASDAQ Composite showed greater volatility over 1985.01 through 2006.00 (equivalently, 2005.12).

PART C (1 Point): Finally, prepare two charts (“line diagrams”) separately displaying the return rates for the DJIA stock index and the NASDAQ Composite stock index over the time periods 1985.01 through 2006.00. Is it obvious from these two charts which stock index has the greater “volatility” over these time periods as measured by sample standard deviation? Explain.

Answer Outline for Part C: The two required charts are attached. It is certainly not easy to get any direct quantitative estimate of the differences in standard deviations from these two charts. The return rates for both stock indices fluctuate around zero with great frequency. However, the *amplitude* of the fluctuations for the NASDAQ Composite extends over a wider range (from -0.32 to 0.20) than the *amplitude* of the fluctuations for the DJIA (-0.27 to 0.14). The greater amplitude of fluctuations for the NASDAQ Composite index is particularly evident during the dot.com bubble burst period 1999 through 2001 and even several years beyond (through 2003).

Additional Remarks: The NASDAQ Composite Index measures all NASDAQ domestic and international based common type stocks listed on The Nasdaq Stock Market. The NASDAQ Composite currently includes over 3,000 companies, more than most other stock market indices, but it is heavily tilted towards technology stocks. In contrast, the Dow Jones Industrial Average (DJIA) is an index for thirty “blue-chip” stocks that are generally the leaders in their industry. Although the NASDAQ Composite includes the stocks of many more companies than the DJIA, it is not as diversified by type. The NASDAQ Composite’s relatively heavy weighting on technology stocks appears to be the reason why it experienced a much greater drop in value during the dot.com bubble burst than the DJIA.

DJIA Return Rate (1985-2005)



NASDAQ Composite Return Rate (1985-2006)

