Instructions. Please submit only one paper per group, via Blackboard. Please make sure that the printed output of your files is intelligible. Notice: the digital version of this document features links to webpages.

1. National Accounts in Beerblastia. Several years ago, a group of successful Stern MBAs pooled their resources and purchased an island in the Caribbean that they named Beerblastia. After a few years of rapid growth, the Beerblastia's economy has begun to stagnate. On the principle that there’s no good policy without good data, the head of the government has asked you to serve as the country’s first CNA (Chief National Accountant) and compile a set of aggregate statistics for 2012.

On your first day in the job, you receive reports of the following transactions. Local coffee shops sold $10,000 worth of coffee to local consumers. To produce the coffee, they purchased $2,000 worth of coffee beans from local coffee growers. The same growers also sold coffee for $5,000 to Starbucks*. (Asterisks denote foreign companies.) The local textile company bought $1,000 worth of wool from an Australian company and produced $10,000 worth of clothes. Of these clothes, 60% were sold to domestic consumers, 20% to the government of Beerblastia, and 20% to foreigners. The local textile company also bought 10 Vespas from Piaggio* at $1,000 each to use for deliveries. Local fruit producers harvested $50,000 worth of bananas. Of these bananas, 60% were sold to domestic consumers, 20% to Chiquita*, and the remainder to a local subsidiary of Dole*. The subsidiary produced $20,000 worth of canned bananas, all of which were sold to domestic consumers. Dole paid $5,000 in wages to locals and repatriated the remaining income. The government raised $2,000 from Beerblastians in taxes, paid $1,000 in pensions to retired Beerblastians, and purchased 1 Dell* computer (worth $1,000) to keep track of its records. Finally, three Beerblastians got short consulting jobs in the US that paid them $500 each.

Your mission: take these reports and construct national income and product accounts. Start by summing value added in order to obtain your measure of GDP. Show how GDP can be split among its expenditure components (i.e. compute consumption, investment, government purchases of goods and services, and net exports). Compute the savings of government and the private sector, respectively. Finally, verify that the current account equals the difference between savings and investment. (50 points)
2. **Employment Situation.** One of the most closely followed numbers on Wall Street is non-farm payroll employment, an estimate of the number of people working (“jobs”) computed from a survey of firms. This and other employment data are reported by the Bureau of Labor Statistics in its monthly report, *The Employment Situation*. The February number will be released on March 8 at 8:30am (ET).

Every month, the BLS (as it’s called) conducts a survey of payroll records known as the Current Employment Statistics (CES) or payroll survey. It covers more than 300,000 businesses and is used to construct aggregate and industry data on employment, hours worked, and earnings of workers on non-farm payrolls for the entire US. A similar survey collects data from households.

Your mission is to “forecast” the change in non-farm employment from the payroll survey during the month of February. The spreadsheet *hw1.xls* reports non-farm employment over the last few years. It contains two series; one is seasonally adjusted, the other is not. The most recent numbers are preliminary.

Use this data to:

(a) Comment on the most likely sources of seasonal variation in employment. (10 points)

(b) Speculate on why the seasonally adjusted series still appears so erratic. (10 points)

(c) Propose an estimate for the change in non-farm employment during the month of February. Comment briefly on the reasons for your estimate. (10 points)

3. **Growth Rates.** During the semester we will compute an awful lot of growth rates. The following are very basic drills. If you run into trouble, please consult the Math Review.

(a) You invested 5,000 dollars in a two–year zero–coupon bond that yields a 5% annual return. What is the value of your investment at maturity, in case compounding is annual? What’s the value with continuous compounding? [A zero–coupon bond is a security that pays no interest. The face value is repaid at the time of maturity.] (5 points)

(b) You need 5,000 dollars in two years. How much do you need to invest in a zero–coupon bond that yields a 5% annual return, if you want to recover exactly that figure? Please, do the calculations in the cases of annual and continuous compounding, respectively. (5 points)

(c) The value of your portfolio was $6,000 on 1/1/2007. It declined to $5,000 after two years, and then rose back to $6,000 after two more years. What was your average annual return between January 2007 and January 2009? How about the period January 2009 to January 2011? Please, do the calculations in the cases of annual and continuous compounding, respectively. (5 points)
(d) In 1999, per capita income in the small country of Jimmyland was only $2,000. Over the next 10 years, however, a series of policy reforms led to impetuous growth. Income per capita grew at a 8% constant annual rate, continuously compounded. Use your favorite spreadsheet to plot income per capita and its natural logarithm. What is the relation between the slope of log-income and the rate of growth? (5 points)