1. The Federal Reserve Bank of St. Louis maintains a database of macroeconomic variables for the United States at: http://research.stlouisfed.org/fred2/. Using data obtained from this web site, calculate the four main expenditure components of real GDP as a fraction of real GDP. Go back as many years as you can (some series go farther back in time than others). Use seasonally adjusted quarterly series expressed in chain-weighted 2000 dollars. (If you need to choose between a “decimal 1” series and a “decimal 3” series, pick “decimal 1”.) In addition, calculate national saving as a fraction of real GDP. (National saving is not one of the series in the database, but you can compute it from other series using the definition of national saving.)

Graph the five fractions on a single graph as a function of time, where each time period corresponds to one-quarter of a year. (You can download the data in the form of an Excel spreadsheet and then use the graphing commands in Excel.) Describe any significant patterns that you see as the these fractions evolve over time. Explain why it is possible for investment to exceed national saving in some time periods.


3. Consider a world economy with two countries, the U.S. and France. Both countries make wine and (empty) wine bottles. In addition, France makes wine casks. The production of wine requires bottles, wine casks, and labor (to keep things simple, we’ll ignore the grapes and wine presses!). The production of bottles and the production of wine casks require labor only. There are two businesses operating in the U.S., both owned by Americans: USWine makes wine and USBottle makes wine bottles. There are three businesses operating in France, all owned by Frenchmen: FrenchWine makes wine, FrenchBottle makes wine bottles, and FrenchCask makes wine casks. There are six workers in this economy, one American and one Frenchman who work in the U.S., and one American and three Frenchmen who work in France.
In 2004, USWine buys $200 worth of bottles from USBottle and $100 worth of bottles from FrenchBottle. USWine pays the French worker (working in the U.S.) $200 in wages and (at the beginning of the year) buys 5 wine casks from FrenchCask at $100 each. Each wine cask lasts for 10 years, depreciating at the rate of $10 per year. USWine begins the year with an inventory of (bottled) wine worth $600 and produces $1000 worth of wine during the year. It sells $200 worth of wine to French consumers and sells $1200 worth of wine to American consumers.

In 2004, USBottle pays the American worker $50 in wages and sells $200 worth of bottles to USWine and and $400 worth of bottles to FrenchWine.

In 2004, FrenchWine buys $400 worth of bottles from USBottle and $300 worth of bottles from FrenchBottle. FrenchWine pays one of the French workers $150 in wages and (at the beginning of the year) buys 10 wine casks from FrenchCask, again at $100 each. FrenchWine begins the year with an inventory of wine worth $700 and produces $3000 worth of wine during the year. It sells $1200 worth of wine to American consumers and sells $1600 worth of wine to French consumers.

In 2004, FrenchBottle pays the American working in France $200 in wages and one of the French workers $100 in wages. It sells $300 worth of bottles to FrenchWine and $100 worth of bottles to USWine.

Finally, in 2004, FrenchCask pays the last French worker $400 in wages, and sells 5 wine casks to USWine and 10 wine casks to FrenchWine, at $100 each.

Your task is to construct the national income accounts for both countries. Use both the expenditure approach and the income approach. That is, for each country construct the counterparts of Tables 2.1 and 2.2 (located on pp. 33 and 35, respectively, in the textbook). Finally, for each country verify that national saving is equal to investment plus the current account. (Note: As explained on p. 30 in Chapter 2 of the textbook, changes in inventories are counted as investment in the national income accounts. You may assume that all bottles are used—filled with wine—in the year in which they are purchased.)