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60 Using real-world applications to policy and everyday life to teach money and banking

Dean Croushore

Teaching a course in money and banking can be simultaneously challenging and easy. It is challenging because teaching the course well often requires a fair amount of institutional knowledge, which an instructor may not have acquired in graduate school. However, it is easy because the course can be geared to the coverage of current events, so economic data releases and the state of the economy help the instructor develop a new course every semester and produce an interesting lecture every day.

There are many different ways to teach a course on money and banking. At most schools, the only prerequisite is principles of economics, so the course typically covers financial markets and institutions, present value, principles of banking, basic macroeconomic concepts, institutional details of central banking, and key concepts concerning monetary policy. At some universities, students take a course in intermediate macroeconomics before they take money and banking, so students can see how monetary policy operates in the context of a detailed macroeconomic model. At other universities, especially those without finance courses, the course may be geared more to the microeconomics of financial markets, and may contain more detailed discussions of institutions and the determination of asset prices.

COURSE GOALS

Depending on which of the structures described in the preceding paragraph is relevant, an instructor will want to establish a corresponding set of goals for the course. For the most basic course, where students only have taken principles of economics as a prerequisite, and where the instructor plans to work with current economic data as a major component of the course, the goals might be something like this:

This course takes a policy-oriented approach to analyzing the financial and monetary systems of the US economy. Our focus will be on the Federal Open Market Committee (FOMC) and the major decisions it makes about setting monetary policy. We will examine the financial system and the role of money; financial markets and instruments; financial institutions; selected elements of macroeconomics, including a discussion of international economics and the importance of exchange rates; and monetary policy, including the money supply process and the conduct of monetary policy in the United States, with an emphasis on current policy issues. We will discuss current economic events and how they affect financial markets and monetary policy. By taking this course, you will: (1) learn the fundamentals of the financial and monetary systems of the US economy; (2) understand how economic news affects financial markets and how it influences the decisions of policymakers; (3) understand how to think analytically, using economic theory to solve problems; (4) study several topics in greater depth than provided by the textbook.

Modest modification of these goals can be used to satisfy other course structures. For a course geared to macroeconomic modeling, the goals might include “studying monetary policy in the context of the AS-AD/IS-LM model from your intermediate macroeconomics course.” (Alternatively, “dynamic” may be substituted for “AS-AD/IS-LM,” depending on what intermediate macroeconomics textbook the students used.) For a course geared to greater detail on financial markets, goals might include “to understand the details of financial institutions and the pricing of financial securities.”

Most standard money and banking textbooks will cover all the basic elements needed to meet any of these goals. For emphasis in particular areas, the instructor may need to develop additional materials to meet these goals. For example, for a course that includes the details of the pricing of financial securities, the instructor may want to develop a set of notes that pull material from more advanced finance courses, because derivative pricing is not often included in standard money and banking textbooks.

Following current events is a natural part of any money and banking course. The challenge for the instructor is to keep on top of everything that is going on. The most interesting money and banking class that I taught was in fall 2008, during the financial crisis, when we would spend as much as half of each class period discussing all the events of the previous few days, and watch how much the stock market would fall each day while we were in class. But not every semester will be as dynamic as that one, so to fulfill my second course goal (understand how economic news affects financial markets and how it influences the decisions of policymakers), I require the following:

Current Events Report and Memo: Early in the semester, you will be assigned one particular macroeconomic variable to follow throughout the semester. Each variable is released monthly. When your variable is released, you are to prepare a short (two-minute maximum) oral report on your variable and show at least one graph that you have prepared yourself using Excel. In your oral report, you must be clear and concise: (1) describe the new numbers that were released and any revisions to prior data; (2) put the new data in historical perspective; (3) explain the implications of the data for our understanding of the economy and its implications for monetary policy. Your graph must use data on your variable to illustrate recent trends in your data. At the end of the semester, you are to write up your analysis of each release over the semester in a brief (three-page text maximum; extra for charts) memo that summarizes your oral reports and provides an overall evaluation of what the data mean for the analysis of the economy and for monetary policy. In your memo, you must prepare at least two explanatory graphs or tables (using Excel).

This assignment is actually one that students are at first a bit fearful of, but come to enjoy by the end of the semester and it promotes learning in a number of ways. First, it keeps all of them (and the instructor) aware of the current state of the economy in every imaginable dimension. Second, students get practice using Excel to illustrate their data, and I will give the students suggestions on how to make the graph more informative. For example, they tend to want to plot the levels of the variable, when growth rates might be much more informative. Students also tend to plot very volatile series, so I show them how to smooth a series out to see the trend more clearly. Third, they get to practice their oral presentation skills, making three presentations during the semester, and they see how to discuss a graph as a point of focus. In the case of a large class, this exercise is easily modified by splitting the class into teams, requiring each team member to present once during the semester. Strictly enforcing the two-minute time limit challenges students to be concise, while also allowing for a greater number of such presentations.

For the final goal (study several topics in greater depth than provided by the textbook), there are a number of ways to proceed. The instructor could require them to write a report on some additional readings found in the textbook, or to do research on some element of the course that they found particularly interesting. Because I emphasize monetary-policy issues in my money and banking course, I collected a set of Federal-Reserve articles and I require the students to do an extra assignment:¹

I will post a list on Blackboard of extra readings for each chapter, along with questions to answer about each reading and possibly data-related questions. You must pick three readings during the semester and write a one-page memo for each. Only one reading may come from each chapter. Each memo should provide a brief synopsis of the reading and answer the questions related to it. Each memo is due within one week after we complete discussion of the chapter in class.

When I first made this assignment, I worried that the students might minimize the time spent on it, doing just the bare minimum to answer the questions and to summarize the article. I found, to the contrary, that this assignment became one of their favorite parts of the course and they spent many hours on it. Many of them came to ask me questions about the details of the article or the research behind it. In the end-of-year student evaluations of the course, many indicated that this was one of the most valuable things they did, in part because it let them explore an area of interest to them and to go beyond the textbook's standard discussion. The structure of this assignment also imposes little cost on the instructor as the one-page memo is quickly graded.

TEACHING PHILOSOPHY

In teaching money and banking, I stress three ideas: (1) understanding the economy today; (2) the value of the concepts that are useful for everyday life; and (3) analytical thinking.

Making the class relevant to economic issues of the day helps the students see the importance of the theory they are covering. When they read an interview with a member of the Federal Open Market Committee (FOMC) that appeared in the *Wall Street Journal* and we discuss it in class, along with graphs showing what that FOMC member has been focusing on, the students realize that this is not some abstract theory, but that the theory affects policy decisions, which affects the interest rates they observe in the market. Tying theoretical discussions to data helps students see that, without theory to help them interpret the data, the data are not very informative.

One of the best examples of how theory can help students interpret data is the term structure of interest rates. Students, especially those interested in finance, are often intrigued by the term structure of interest rates, but often begin with very faulty ideas about it. There is a popular video on a finance web site showing how the term structure has changed over time and what it looks like in economic recessions and expansions.² But without understanding the expectations theory of the term structure, combined with the concept of a term premium, students' interpretations of the term structure are often incorrect. Once they learn how to decompose the data on the term structure into pieces, part reflecting the term premium and part representing the expected future

path of short-term interest rates, they begin to understand why you need theory to help explain data.

In teaching money and banking, it is vital to show students how the information in the class is helpful for their everyday lives. There are many ways to do this, including how to invest efficiently, how economic growth affects their incomes, and how to calculate the optimal amount of cash to keep in their wallets. My favorite example, however, shows students how to take an abstract equation, the present-value formula, and use it to help them when they buy or lease a car. With a few assumptions, one can use the formula to approximate the monthly payment for either a car purchase or lease, and check whether the car dealer's calculations are correct, or if they have added in some fees surreptitiously. Students recognize that they will be buying or leasing cars on their own soon, if they haven't done so already, and they understand that they can't just rely on someone to tell them the truth – especially a car dealer who has an incentive to cheat them.

A course in money and banking should provide students with the ability to engage in analytical thinking. Many students take money and banking fairly early in their college years, perhaps after having only principles of economics, so they haven't been exposed to much analytical thinking or done very much problem solving. One of the best ways to teach students how to think about complicated problems is to work through present-value problems, where it is critical to set up the problem correctly, not to blindly apply a formula.

COURSE CONTENT

What concepts should be covered in a course in money and banking? As with any course, the content must depend on the course goals and prerequisites, and the course's place in the curriculum. For a course in money and banking, these can vary widely. However, there are some basic elements that I think are essential in any money and banking course. The main elements are: money and the financial system; fundamentals of banking; macroeconomic concepts; and monetary policy.

Money and the Financial System

A discussion, usually lasting three to four weeks in a 15-week semester, of money and the financial system develops the institutional building blocks for the course. Topics are likely to include the structure of the financial system in the economy, the role played by money compared with other financial assets, the present-value concept, the term structure of interest rates, real interest rates, and fundamentals of the stock market. Many students may have already had a course on the financial system and they may have learned about the role of money in the economy from their economic principles courses, so the instructor may review this information fairly quickly. Although much of this material is institutional in nature, the instructor can build on the institutional details in those sections in two ways: describing an investor's decisions in terms of return and risk, showing how a market can aggregate the decisions of individual investors, and making students think about the role of money in an economy when most payments are made with credit cards or electronic payments, and not with cash.

In this first section of the course, by far the most important concept is that of present value. It is a building block for everything done in finance and for much of the discussion of returns and interest rates that will follow. Finance majors who may be enrolled in the course often have the most difficult time with present value because they have learned what buttons to push on their financial calculators to solve a problem that fits neatly into their calculator's canned programs, but they are less skilled at solving more complicated analytical problems. Ask them to calculate the present value of \$1000 received today and they will actually reach for their calculators and want to know the interest rate, instead of realizing that it must be \$1000 because that is what present value means.

For many students, the course in money and banking is the only place they will encounter two concepts: the term structure of interest rates and the concept of the real interest rate. As mentioned above, the theory of the term structure is crucial for understanding data on interest rates on securities with differing times to maturity. Getting students to understand the expectations theory and the concept of a term premium is vital to developing their ability to understand data on interest rates. After going through the theory and looking at the historical patterns in the data, I then like to illustrate the combination of theory and data by showing the class how to use term spreads to predict the probability of a recession.

Students often don't realize that real interest rates, not nominal interest rates, are the key equilibrating variable in many economic models. Students may wonder why economic models are driven by a variable that is not even observable! But the theory behind the real interest rate should be clear, and they need to understand why the concept is needed, for the same reason that real GDP is the key macroeconomic aggregate, rather than the observable nominal GDP. I like to illustrate the concept of the real interest rate by examining the interaction between inflation and taxes, which shows how after-tax real returns received by investors can be very small, even when nominal interest rates are high. When students see how the after-tax real interest rate can be negative, even with inflation rates that are not much higher than they are currently, they become very concerned about the costs of inflation.

Fundamentals of Banking

The second key section of a money and banking course concerns the fundamentals of banking. This is often a difficult area for many instructors, especially those whose background is in macroeconomics and who may not know very much about the institutional details of banking. One way to handle this part of the course is to focus on theory rather than institutional details. The instructor can spend a fair amount of time discussing asymmetric-information problems, a critical theoretical concept in banking. If students gain a solid understanding of both adverse selection and moral hazard, they will be able to comprehend why bankers do what they do.

Another fundamental area of banking that students must understand is regulation and supervision. This is inherently an area that depends on institutional details, of which the instructor must be aware. Fortunately, most textbooks have good discussions of the institutional details, so rather than lecture on these details, instructors can focus on solving problems, such as working through bank balance sheets and the determination of required reserves. I like to discuss the way in which regulators analyze bank mergers,

so I talk about the Herfindahl-Hirschman index and how it is determined. This provides both an opportunity to discuss regulation and also a formulaic approach to analytical problems.

Overall, unless the instructor knows a lot about the microeconomics of banking, I suggest that the instructor focus on concepts that are important in terms of their macroeconomic consequences. That's why I spend more time on banks' balance sheets and the calculation of excess reserves, which helps students understand open-market operations and how they work to affect the overall quantity of money in the economy, as well as the determination of interest rates.

Macroeconomic Concepts

The third major section of a money and banking course is macroeconomics. Again, the degree to which an instructor covers this area is a function of personal preference and how the course fits into the curriculum. If the course requires intermediate macroeconomics as a prerequisite, then this section of the course can be streamlined. Since most money and banking courses don't require intermediate macroeconomics, an introduction to aggregate supply and aggregate demand, or dynamic models of money, is useful. I don't recommend trying to develop a full-blown IS-LM analysis because it takes too much time away from other topics, such as monetary policy. It is more important that students get a basic understanding of business cycles and how monetary policy can influence the cycle. In particular, they should gain a sense of the main debate among macroeconomists about the efficacy of policy. To provide a balanced presentation, the instructor can discuss both the activist view that the government (and central bank) can and should intervene to smooth out the business cycle and the non-activist view that government action is potentially counterproductive and destabilizing.

The other key component of the macroeconomics discussion is exchange rates. Because this is a difficult topic for students to understand without substantial class time, the instructor should avoid trying to cover all the nuances. Critical issues relevant to money and banking are the effect of a change in the exchange rate on the prices of imported and exported goods, the effect of international trade and investment on exchange rates, how inflation affects the nominal exchange rate, and the concept of the real exchange rate. The instructor may wish to discuss purchasing-power-parity concepts, but should recognize that most models based on those concepts perform poorly in forecasting exchange rates.

Monetary Policy

The final major section of the money-and-banking course is monetary policy. The instructor may wish to introduce basic monetary policy concepts during the first week of class, and follow all the events related to monetary policy, especially FOMC decisions, throughout the semester. Even though students are not likely to understand why the Fed is taking particular actions early in the semester, by the end of the course they will come to understand the Fed's actions in context. Such an integrated discussion of policy issues whets students' appetite for this final section of the course.

There are four main areas of monetary policy that are vital to understanding how

policy works: (1) the structure of the central bank; (2) how the central bank controls the money supply and interest rates; (3) the goals and accomplishments of monetary policy, and the tradeoffs that policymakers face; and (4) the debate about rules versus discretion.

A brief introduction to the structure of the central bank is crucial, though the instructor can assign much of this as background reading. If the instructor has had the good fortune to have worked within the Federal Reserve, students always enjoy hearing an insider's view. Key elements to convey are how a central bank is set up, how power is divided within the central bank, and how decisions are made. Many students (and journalists) pay too much attention to which policymakers are voting members of the FOMC, rather than understanding the generally collegial nature of the discussion. The power of the Fed chairman is substantial compared with the power of other members, yet the chairman is constrained by having to convince other members that his proposed policy is sensible. A chairman who does not lead by consensus is not likely to last very long as chairman.

Students find the discussion of how the Fed controls monetary policy to be the most challenging in the course. This was especially true from 2008 to 2011, when the Fed engaged in extraordinary policy measures. Students should gain an understanding of how the market for reserves works, so they can see how increases in the supply of reserves leads to a decline in the federal funds interest rate, and vice versa. Then the instructor can illustrate the impact of open-market operations, changes in the discount rate, changes in reserve requirements, and changes in the interest rate on bank reserves.

Of course, the analysis of the market for reserves is just a short-run analysis and it is crucial for students to get a longer-run view by learning about the goals and strategy of the central bank. To understand these, the instructor needs to give them a long-run perspective by examining time-series data on output, unemployment, and inflation. Some discussion of the history of monetary policy will help them understand successes and failures, especially the Great Inflation of the 1970s and the Great Moderation from the mid-1980s to the mid-2000s. This discussion allows the instructor to bring up the Phillips curve and tradeoffs the Fed faces in the short run, which will help students understand why policy decisions are subject to so much debate.

The last major issue in discussing monetary policy is the debate over rules versus discretion. In this section, the instructor can bring up the concept of the time inconsistency of optimal plans and get students to understand how a well-meaning central bank can make major errors despite its own good intentions. The instructor should also discuss the lags inherent in monetary policy, especially the long and variable effectiveness lag. Then the instructor can discuss rules for monetary policy, starting with suggestions by monetarists to keep the growth rate of the money supply constant. The instructor must discuss the Taylor rule, noting its popularity in recent research, in part because it is a rule, though an activist one; it also provides the opportunity to point out how difficult such a rule is to implement in real time, mainly because of the problems of measuring the output gap. Finally, the instructor might discuss inflation targeting as a strategy that is not formally a rule, but has certain desirable long-run characteristics, like those of rules for monetary policy.

In this last section on monetary policy, students are more likely to develop an understanding of how policy works if the instructor can relate the theory being discussed to current policy actions. This real-world connection is easy to develop during a crisis and

its aftermath (as was the case from fall 2008 to spring 2011), when monetary policy is the center of discussion in the daily news. The course is less exciting in normal times, such as most of the 1990s, when policy just doesn't do very much. Thus, providing a historical perspective of policy during crises will help students understand how policy works in a more interesting environment.

COMMON MISPERCEPTIONS

The most common misperception of students taking money and banking is that monetary-policy decisions are obvious. Many students need to gain an appreciation for the difficulty in making monetary-policy decisions in real time. To give them some understanding of that, I like to discuss data and how data revisions can affect policy decisions. My favorite example comes from my days as an economist at the Federal Reserve Bank of Philadelphia. I remember in the late 1990s during a briefing of our bank's president before an FOMC meeting how we noted that the personal saving rate had turned negative "for the first time in history," which was a bad sign for investment. But then a year later, I looked at current data that showed the saving rate turning negative "for the first time ever." It turns out that the personal saving rate is often revised, and during the 1990s and early 2000s, the revisions generally increased the measured personal saving rate. So, one could accurately have reported for many years in a row that the savings rate had become negative for the first time ever!

Another way to show the uncertainty about monetary-policy decisions comes from looking at output gap data. At the time that a monetary-policy decision is made, a policymaker really does not have a very good idea about the level or growth rate of potential output, so does not have a very precise notion of whether expansionary policy or contractionary policy is needed. Even though a discussion of the optimal policy in the face of uncertainty is beyond the mathematical ability of most students, an instructor can still give students a sense of the difficulties faced by policymakers in formulating policy when they don't know precisely where the economy is. Most importantly, talking about this issue gives students a better idea of why there is a policy debate and why the central bank's decisions require a great deal of thought and analysis.

The other common misperception in the money and banking course comes at the micro level. Many students come into the class with preconceived notions about the evil nature of bankers or participants in financial markets. They think that greed and avarice are the common traits of those participants and they don't think they play any useful role in society. The money and banking course helps them to understand that those financial market participants play a useful role in society, even if some of them behave in what appears to be an evil way.

DIFFICULT TOPICS

The two most difficult topics to teach in a money and banking course, in my experience, are: (1) the present-value formula when there is more than one payment each year; and (2) the market for bank reserves when the Fed pays interest on reserves and when banks

can borrow from the discount window at a penalty rate over the fed funds target interest rate.

In the first case, when there are multiple payments each year, the present-value formula can be modified easily, assuming students understand how the formula works when there is one payment at the end of each year. For an interest rate compounded n times per year, the same present-value formulas can still be employed, using as the discount rate a number equal to the annual rate of interest divided by n , and treating each period of length $1/n$ in place of the number of years in the formula. This procedure prevents students from having to learn more complicated formulas.

In the second case, the market for bank reserves is more difficult to handle. The Fed's decision to allow banks in good condition to borrow substantial amounts at the discount window puts a ceiling on the federal funds rate equal to the primary credit discount rate, causing the supply curve of reserves to be kinked. The Fed's payment of interest on reserves puts a lower bound on the federal funds rate in normal times, constraining the demand curve for reserves. Thus, the federal funds rate must be somewhere between the interest rate on reserves and the primary credit discount rate, in normal times. (However, during the financial crisis of 2008 and its aftermath, this constraint failed to hold, but only because of the odd institutional feature that Fannie Mae and Freddie Mac could lend in the federal funds market but were not eligible to earn interest on their reserves.) The instructor can then draw a diagram of demand and supply in the reserves market, allowing students to see how the market for bank reserves works on a daily basis.

CONCLUSION

The course in money and banking is a delight to teach. Instructors can base the course on real-world applications to policy and to everyday life. Many students find the course to be the one that helps them the most in their future careers.

My recommendations are that instructors consider the development of clear and concise learning goals for the course (a function of where the course fits in the curriculum), stress three main ideas (understanding the economy today, concepts that are useful for everyday life, and analytical thinking), and develop four main topic areas (money and the financial system, fundamentals of banking, macroeconomic concepts, and monetary policy). Instructors should realize that the difficult part of teaching this course is that the material is in a constant state of flux, depending on what happens in the economy. The financial crisis that began in 2008 led to many changes in the financial system and regulation of banks, as well as innovations in monetary policy. So instructors of money and banking must be on constant alert for changes in the material. While this may seem difficult, these constant changes actually make the course easy to teach because nearly every day's newspaper provides new course material.

NOTES

1. These articles can be found on my web site (<https://facultystaff.richmond.edu/~dcrousho/docs/Readings%20from%20the%20Federal%20Reserve%20with%20RQs%2010Jan.doc>) and also on the web

site of the publisher of *M&B*, Cengage Learning, Mason, OH, 2010 (http://www.cengage.com/cgi-wadsworth/course_products_wp.pl?fid=M20b1&product_isbn_issn=9780538745871) (accessed 10 April 2011).

2. <http://www.smartmoney.com/investing/bonds/the-living-yield-curve-7923/> (accessed 10 April 2011).