Bloomberg Terminals as a Hands on Learning Tool for Applied Financial Analysis

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Abstract

Bloomberg terminals are widely used by traders of financial instruments. Recently, Fairleigh Dickinson University leased twenty-four Bloomberg Terminals, twelve each for its two New Jersey campuses. This paper discusses the introduction of these terminals in several finance courses at the university and then describes more fully an example of using these terminals in a Financial Markets and Institutions course to analyze the relation between the yield curve and monetary policy.

Key Words: Yield Curve, GDP, Monetary policy, Bloomberg Terminals.
JEL Classification: E40, E43, E59, E65

I. Introduction

In the financial world, Bloomberg terminals are widely used by traders of financial instruments. Recently, Fairleigh Dickinson University leased twenty-four Bloomberg Terminals, twelve for each of the two New Jersey campuses. The authors of this paper began to use these terminals in two courses: Intermediate Financial Analysis and Financial Markets and Institutions. There is evidence (see Scott (2010) and Coe (2007)) that the introduction of Bloomberg terminals in finance education is welcome by both students and faculty alike.

The Silberman College of Business at Fairleigh Dickinson University requires all the students in the finance and accounting B.S. programs to take Intermediate Financial Analysis. In this course, students are introduced to the Bloomberg terminals and asked to become Bloomberg Market Concepts (BMC) certified. This certification provides all students in accounting and finance with a good initial exposure to the Bloomberg terminals and ensures familiarity with navigating the terminals.

Finance students must take seven additional finance courses. The first required course beyond Intermediate Financial Analysis is Financial Markets and Institutions, which is a prerequisite for most of the other finance courses. Most courses in financial markets and institutions discuss interest rates, the yield curve, and monetary policy. In this course, the instructor begins with a discussion of these three topics before moving on to bank management and regulation, the financial crisis, the equity markets and other topics.

The instructor of the course believed that the Bloomberg Terminals could be used to analyze the yield curve and monetary policy in ways that would help students to better understand the links between the term structure, the monetary policy and the economy. This paper details an assignment created for the Bloomberg Terminals with that goal in mind. Section II of this paper provides context for the exercise. Section III discusses Bloomberg, describing its use at Fairleigh Dickinson University and more specifically how the materials on the terminal are organized and which materials are used in this yield curve project. Section IV describes more fully how students were encouraged and taught to do the yield curve exercise and some of their responses to the assignment. Section V is a summary and conclusion.

II. The Yield Curve

In the discussion of the term structure of the interest rates or yield curve, the focus is on the relation between spot rates and forward rates, emphasizing that this relation is purely

algebraic and completely unrelated to human behavior. The topic then moves on to the relation between forward rates and expected future spot rates. This of course depends almost totally on human behavior, in particular whether investors or borrowers are able and willing to move along the yield curve to maximize holding period returns (or minimize financing costs) as their expectations about future spot rates deviate from the forward rates embedded in the yield curve. Assuming enough investors and borrowers move along the curve, the yield curve should reflect expectations about the economy and monetary policy.

While all of this is more or less second nature to professional economists and investors, the instructor usually has had difficulty driving home the notion that the yield curve, in line with the expectations hypothesis, indeed reflects expectations about the economy and monetary policy. Many students learn the basics about the yield curve and the role of expectations, and even more learn about how the Federal Open Market Committee conducts monetary policy. But most students fail to relate the yield curve to the economy and monetary policy in the experience of the course instructor.

This is not because economists and policy makers have not focused considerable attention on the relation between monetary policy and the yield curve. Most recognize that the Federal Reserve can directly affect short-term rates, most notably the Federal Funds rate. (This of course assumes a more normal state of affairs, such as before the financial crisis in 2008, which forced the Fed to lower the funds rate essential to zero, or a target of 0.00-0.25%.) Under normal conditions with a non-zero funds rate, short-term rates fall when the Fed lowers their funds-rate target to stimulate the economy and rise when the Fed raises the target to restrain the economy.

Much of the confusion concerns long-term rates. All students recognize that a given change in short-term rates in response to Fed policy will exert a much smaller effect on long-term rates. Moreover, other factors, such as long-term inflation expectations, affect long-term rates. In this case, the effect of monetary policy actions on long-term rates may be offset by other factors causing long-term rates not to move or even to move oppositely to the change in short term rates.

Two examples illustrate this tendency. One example relates to periods of high inflation and inflation expectations such as the 1970s and early 1980s. A drop in the funds-rate target and lower short-term rates causes downward pressure on long-term rates through a liquidity effect. At the same time, particularly during an inflationary period, the lower short-term rates and associated Fed stimulus may suggest stronger growth that may increase inflation and inflation expectations. This price-expectations effect, causing long rates to rise, may prevent long-term rates from falling and may even dominate the liquidity effect, causing long-term rates to rise or move oppositely to short-term rates.

The other example relates to the 2004-2006 interval when the Fed raised the funds-rate target from 1.0% to 5.5%. During this interval, long-term rates fell slightly resulting in a dramatic shift in the slope of the yield curve. As then Fed chairman Ben Bernanke indicated in a March 20, 2006 speech before the Economic Club of New York, the persistently low long-term rates may reflect a drop in the liquidity premium in which case the Fed should continue to tighten, raising short-term rates further. On the hand, if the low long-term rates indicate anticipations of an economic slowdown, the funds rate target should be lowered to stimulate the economy further.

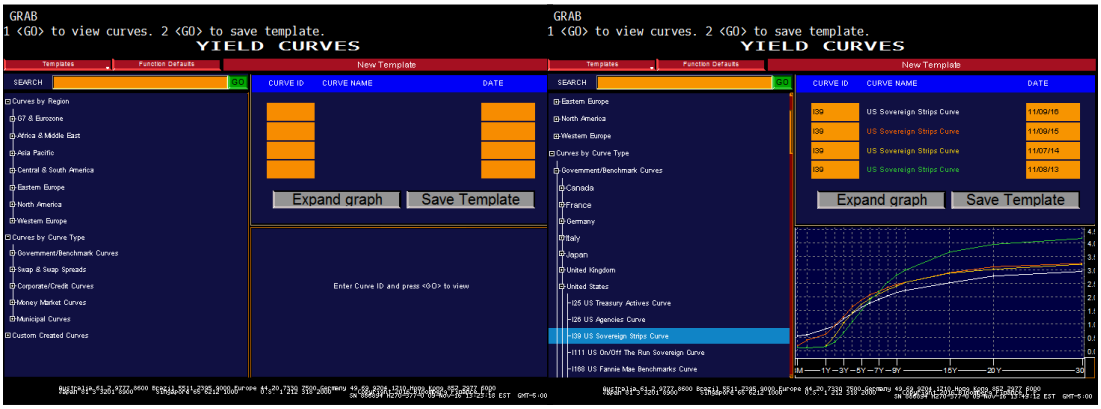
Because of the difficulty linking macro-economic variables to long-term rates, Litterman and Scheinkman (1991) emphasized looking directly at the yield curve: at the absolute levels of short- and long-term rates; at the relative levels of short- and long-term rates (or the slope of the curve); and at changes in both the level and the slope of the curve. Others have recognized the usefulness of direct yield curve analysis but have tried to relate these patterns to macro variables. (See Fuhrer and Moore, 1995, Wu, 2001, and Ang and Piazzesi, 2001).

III. Bloomberg Terminal, the Economy and the Yield Curve Analysis

Students receive IDs enabling them to enter the Bloomberg room 24/7. For this particular exercise, there were two in-class sessions first to review the overall use of the terminals and then to show how the terminals could help to analyze the yield curve, the economy and monetary policy.

Information about the yield curve, the economy and the Federal Reserve are accessed on Bloomberg as follows:

The Yield Curve: Bloomberg has a main menu where international fixed income markets are listed on the left. (**Figure Yield Curve**). To access this screen one has to choose YCRV. On the left of the YCRV screen there is a menu that lists several options. One needs to choose "Curves by Curve Type", "Government" and from there United States. Out of all the possibilities we require that students choose I39, the US Sovereign Strips Curve, I39. The sovereign strip yield curve for this date will appear on the screen. As shown below, it is possible to show yield curves for multiple dates on the same screen (**Figure Four YC**).

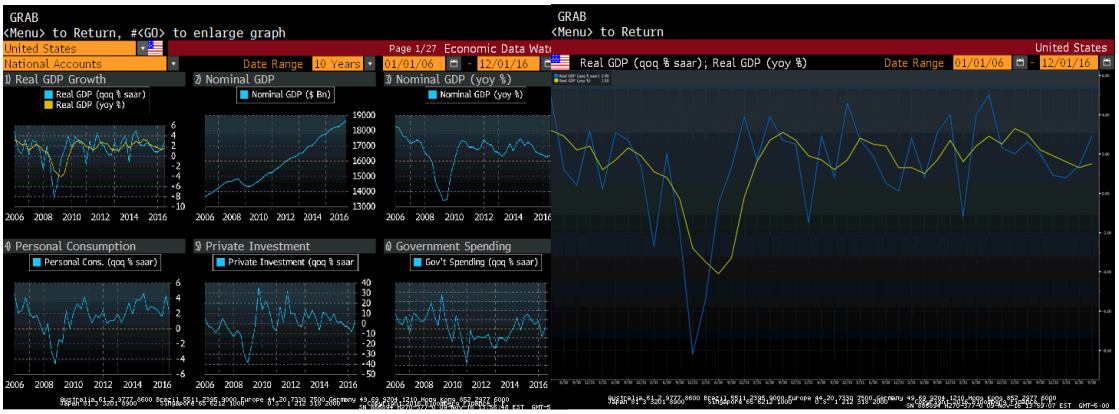


Yield Curve **Four Yield Curves**

The I39 Sovereign Strips curve is the continuous, on-the-run yield curve series widely used in the financial world. Unfortunately, on-the-run, or currently issued securities, are not available for all maturities. For example, the treasury does not issue four, seven or twenty year maturities, so a continuous on-the-run series necessarily involves interpolation between rates for the available maturities. Rates for all maturities are of course available for off-the-run outstanding securities, but issues of comparability arise because of differences in coupons and other features. For a discussion of how to overcome some of the problems creating a yield curve and why the strip curve is a better representation see Zaretsky (1995).

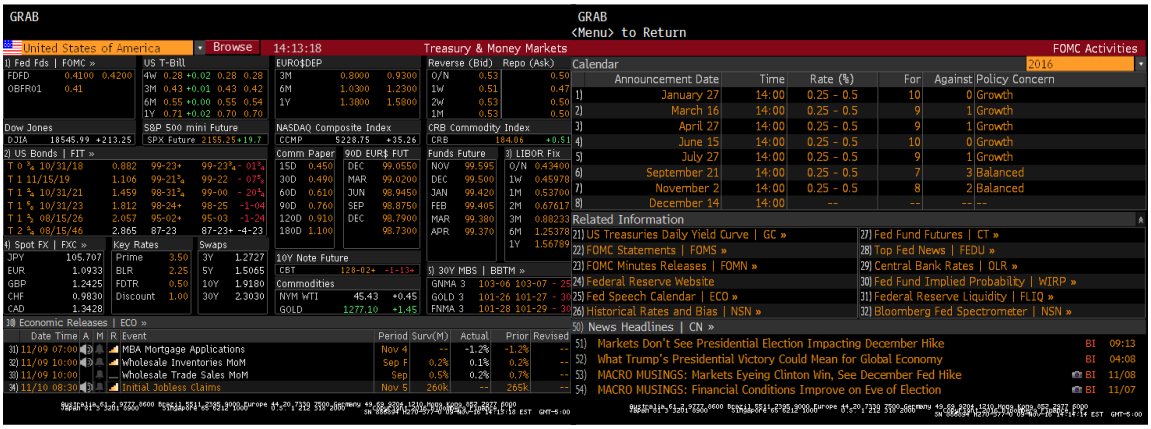
The economy: For the economic analysis screen, choose ECOW. (**Figure ECOW).** At the top of the screen, choose 1) Chart. On the right, choose a beginning date and length of interval such as one year, ten years, etc. A large number of macro variables are charted, such

as real growth quarterly or annually, production, employment and prices. By varying the variable and interval lengths, it is possible to explore a wide range of macro data easily. For example, one could observe real GDP growth quarterly and annually from 2006 through 2016. **(Figure GDP.)**



ECOW **GDP**

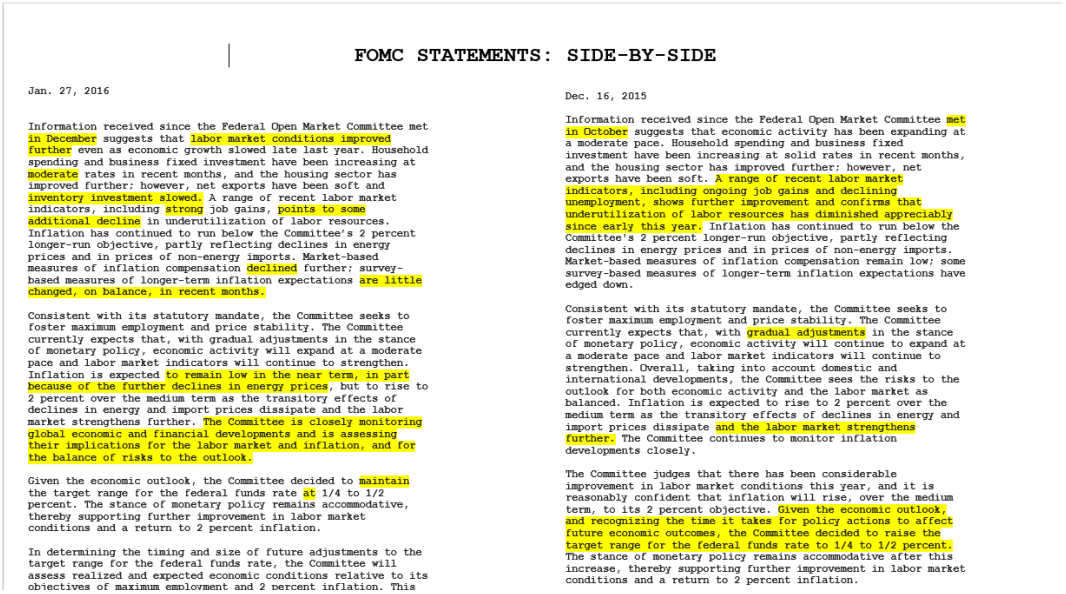
Monetary policy: Bloomberg has an entire menu about monetary policy. A good place to start is the BTMM menu. (**Figure BTMM**.) The upper left column includes past Federal Open Market Committee statements (**Figure FOMC**) including a side-by-side comparison of successive FOMC policy statements. (**Figure Side by Side**). These side-by-side comparisons may help students to understand the significance of particular policy decisions and explain some of the behavior of the yield curves.



BTMM **FOMC**

IV. Students and the Bloomberg Terminal

In Financial Markets and Institutions, students typically learn the basics about the yield curve and the role of expectations, and also learn about how the Federal Open Market Committee conducts policy. The purpose of the Bloomberg-yield curve assignment was for students to understand how the level of the yield curve, the slope of the yield curve, and changes in the level and slope reflect actions of the Federal Reserve and expectations (and changes in expectations) about the future path of the economy.



FOMC STATEMENTS: SIDE-BY-SIDE

Jan. 27, 2016

Information received since the Federal Open Market Committee met in December suggests that labor market conditions improved further even as economic growth slowed late last year. Household spending and business fixed investment have been increasing at moderate rates in recent months, and the housing sector has improved further; however, net exports have been soft and inventory investment slowed. A range of recent labor market indicators, including strong job gains, points to some additional decline in underutilization of labor resources. Inflation has continued to run below the Committee's 2 percent longer-run objective, partly reflecting declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation declined further; survey-based measures of longer-term inflation expectations are little changed, on balance, in recent months.

Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee currently expects that, with gradual adjustments in the stance of monetary policy, economic activity will expand at a moderate pace and labor market indicators will continue to strengthen. Inflation is expected to remain low in the near term, in part because of the further declines in energy prices, but to rise to 2 percent over the medium term as the transitory effects of declines in energy and import prices dissipate and the labor market strengthens further. The Committee is closely monitoring global economic and financial developments and is assessing their implications for the labor market and inflation, and for the balance of risks to the outlook.

Given the economic outlook, the Committee decided to maintain the target range for the federal funds rate at 1/4 to 1/2 percent. The stance of monetary policy remains accommodative, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.

In determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee will assess realized and expected economic conditions relative to its objectives of maximum employment and 2 percent inflation. This

Dec. 16, 2015

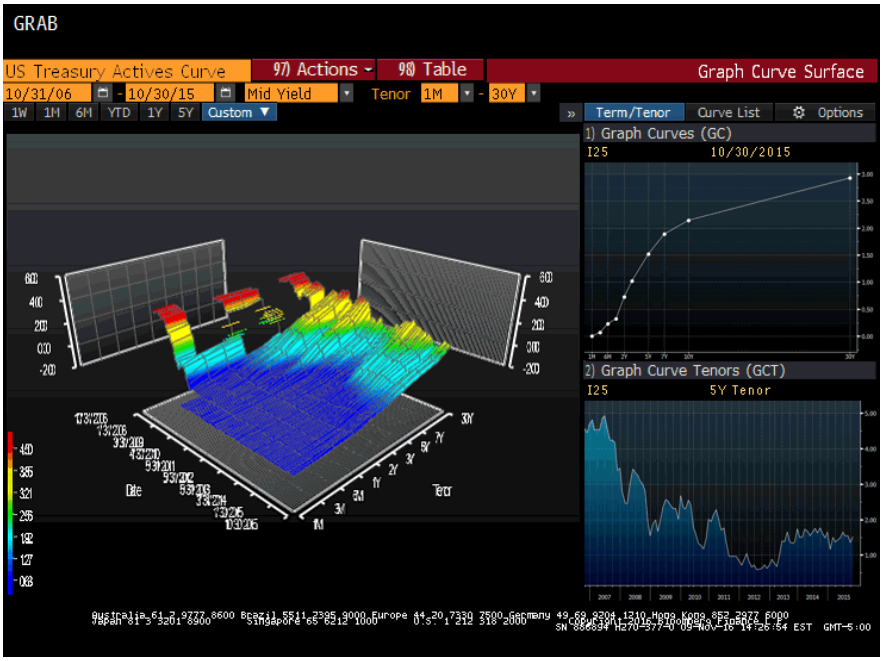
Information received since the Federal Open Market Committee met in October suggests that economic activity has been expanding at a moderate pace. Household spending and business fixed investment have been increasing at solid rates in recent months, and the housing sector has improved further; however, net exports have been soft. A range of recent labor market indicators, including ongoing job gains and declining unemployment, shows further improvement and confirms that underutilization of labor resources has diminished appreciably since early this year. Inflation has continued to run below the Committee's 2 percent longer-run objective, partly reflecting declines in energy prices and in prices of non-energy imports. Market-based measures of inflation compensation remain low; some survey-based measures of longer-term inflation expectations have edged down.

Consistent with its statutory mandate, the Committee seeks to foster maximum employment and price stability. The Committee currently expects that, with gradual adjustments in the stance of monetary policy, economic activity will continue to expand at a moderate pace and labor market indicators will continue to strengthen. Overall, taking into account domestic and international developments, the Committee sees the risks to the outlook for both economic activity and the labor market as balanced. Inflation is expected to rise to 2 percent over the medium term as the transitory effects of declines in energy and import prices dissipate and the labor market strengthens further. The Committee continues to monitor inflation developments closely.

The Committee judges that there has been considerable improvement in labor market conditions this year, and it is reasonably confident that inflation will rise, over the medium term, to its 2 percent objective. Given the economic outlook, and recognizing the time it takes for policy actions to affect future economic outcomes, the Committee decided to raise the target range for the federal funds rate to 1/4 to 1/2 percent. The stance of monetary policy remains accommodative after this increase, thereby supporting further improvement in labor market conditions and a return to 2 percent inflation.

Side by Side

To gain this understanding, we asked students to compare and contrast yield curves from three different dates. An initial point of departure is to look at the GC3D screen which provides an overall perspective of the yield curve for different periods. **(Figure 3D YC).**



3D Yield Curves

Along with the GC3D, we suggested that students look at yield curves from the YCRV screen, economic data (real GDP growth, inflation, production, employment, unemployment) for various frequencies and intervals from the ECOW menu, and the Press Releases of the Federal Open Market Committee from the Federal Reserve/monetary policy menu. Obviously information from other sources could also be used to help select dates.

As students simultaneously analyze yield curves, economic data and Federal Reserve policy, the first objective is for students to understand how monetary policy most directly affects the yield curve. In line with this objective, students quickly realize that monetary policy affects the yield curve whenever the Federal Reserve changes its Federal Funds rate target. The change in the funds rate target could affect the level of the yield curve but not the slope if the Fed move caused short- and long-term rates to move together and by the same amount. If long-term rates move by less, not at all, or even oppositely to the change in short-term rates, the more important yield curve effect of the policy action is on the slope rather than the level of the yield curve.

The second objective was for the students to see how expectations about the future growth of the economy affect the curve, sometimes by even more than the direct actions of the Federal Reserve. This is especially true for long-term rates, which can move by sizable amounts more or less independently of Fed actions.

The third objective was for students to see how monetary policy affects the curve not only through the immediate effect on short-term rates but also through the effect of policy on long-rates as monetary policy affects expectations about future growth of the economy.

With regard to the first objective, many students focused on the tragedy of 9/11 and the financial crisis of 2008. In 2001, the Federal Reserve lowered their funds rate target to 1.75% in January of 2002 from 3.5% just before 9/11/01. In the fall of 2008, the Fed lowered the funds rate target to 0.00-0.25% from 2.00% just before the Lehman bankruptcy and a peak of 5.50% in 2006-7. From these two episodes, students saw the clear and direct effect of monetary policy on short-term rates and, given the much smaller changes in long-term rates, the effect of monetary policy on the slope of the curve.

With regard to the second objective, some students focused on the late 1990s and dot.com bubble in 2000. On May 3, 1999, the yield curve was upward sloping, from a one-year rate of 5.7% to a ten-year rate of 6.18%. One student noted an even higher and more positively sloped yield curve in August 1997. The yield curve on August 28, 2000 was relatively flat, sloping slightly downward. From this comparison, the students were able to see how the slope of the yield curve changed in response to altered expectations about future economic activity. In August 1997 and May 1999, when the yield curve sloped upward, virtually all indicators appeared positive. In early 2000, when the yield curve was slightly downward sloping, the dot.com bubble had burst and stock prices had fallen sharply. The students observed the change in the slope of the curve in response to the much less positive economic outlook.

With regard to the third objective**,** student focus on the behavior of long-term rates in the aftermath of 9/11 and the financial crisis was highly instructive. As mentioned in discussing the first objective, students easily observed and understood the sharp drop in short-rates as the Fed sharply lowered its funds rate target. They also observed the changes in the slope of the yield curve as the long-term rates changed much less than short-term rates. Of greater interest, perhaps, and certainly more subtle, were changes in the yield curve over time following the initial sharp drop in the short-term rate.

Following 9/11, the Federal Reserve, as mentioned above, dropped the federal funds rate to 2.5% from 3.5% immediately and then to 1.75% in January 2002. The yield curve steepened considerably as long-term rates fell only to 5.5% in January 2002 from 5.8% on 9/11/01.

One student indicated that the considerable steepening—the miniscule decline in the long-term rate when the funds rate fell by almost two percentage points—occurred because investors expected the economy to rebound and that the major reason investors expected this rebound was the aggressive easing by the Fed.

A similar change in the slope of the yield curve occurred in 2008 following the drop of the funds rate target virtually to zero. In November 2008, the yield curve was considerably lower but quite upward sloping, with short-term rates down almost to zero but long-term rates holding around 4.75%. As in January 2002, when the Federal Reserve lowered the funds rate dramatically, investors in November 2008 expected the economy to rebound.

However, this late 2008 expectation of a rebound weakened steadily over the next several years as the economy repeatedly underperformed expectations of the Federal Reserve and most private economists. As short-term rates remained close to zero from early 2009 until 2016, long-term rates fell. The ten-year rate fell from 4.76% in late 2008 to 2.75% in October 2013 and to 1.9% in October 2016. Several students noted that the progressively flatter or less steep yield curve occurred as investors still expected some recovery but more gradual than expected immediately after the crisis.

These examples from individual student work show how the Bloomberg-yield curve assignment helped them to understand how the level of the yield curve, the slope of the yield curve, and changes in the level and the slope of the yield curve are systematically related to monetary policy actions and expectations about the future course of the economy. However, the excellent and insightful responses to the online assignment described above came mostly from the stronger students in the class. A number of students had difficulty even though, following an initial meeting to show how to navigate to the necessary Bloomberg screens, the instructor went through an actual yield curve example using the necessary screens. What the instructor did not do was explicitly identify the three objectives, feeling it better for the students to figure this out themselves. In the next courses, some additional guidance short of fully identifying the three objectives may be offered.

VI. Summary and Conclusions

Bloomberg terminals are widely used by traders of financial instruments. Recently, Fairleigh Dickinson University leased twenty-four Bloomberg Terminals, twelve each for its two New Jersey campuses. This paper discussed the introduction of these terminals in several finance courses at the university and then described more fully an experiment using these terminals in a Financial Markets and Institutions course to analyze the relation between the yield curve and monetary policy.

In the experiment, students were asked to compare and contrast yield curves from three different dates. Three objectives for students were (1) to understand how monetary policy most directly affects the yield curve, (2) to see how expectations about the future growth of the economy affects the curve, and (3) to see how monetary policy affects the curve not only through the immediate effect on short-term rates but also through the effect of policy on long-rates as monetary policy affects expectations about future growth of the economy.

Perhaps not surprisingly, students focused on three periods: the dot-com bubble in 2000, the tragedy of 9/11, and the financial crisis in 2008. Some did a before-and-after comparison; others viewed these incidents in a longer time frame. Many were able to understand and to show some of changes in the level and slope of the yield curve before, during and after these

episodes and to relate these changes to the three major objectives. However, the excellent and insightful responses to the online assignment described in Section III came mostly from the stronger students in the class. A number of students had some difficulty even though, following an initial meeting to show how to navigate to the necessary Bloomberg screens, the instructor went through an actual yield-curve example using the screens. What the instructor did not do was explicitly identify the three objectives, feeling it better for the students to figure this out themselves. Next semester, some additional guidance short of fully identifying the three objectives may be offered.

Such exercises in the introduction of Bloomberg terminals for financial education in our college open the avenue of extending such usage in other courses. For example, Lie and Li (2012) discussed the usage of Bloomberg Terminals for security analysis and portfolio management and this could serve as a starting point in considering how to augment our respective classes with Bloomberg Terminals.

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