CHAPTER 2

Money, Bonds and Interest Rates

2.1 Introduction

We start this book on financial economics with money, bonds and interest rates. Interest rates are major determining factors for asset markets. Interest rate processes are important for credit markets, equity markets, commercial paper markets, foreign exchange markets and security pricing such as stocks, bonds and options. Interest rates are important for real activity, consumption and investment spending. Interest rate spreads and the term structure of interest rates affect asset markets as well as real activity. In this chapter we study some major issues in the theory and empirics of interest rates. We will give here only some elementary expositions.¹

We will first define what money is and how monetary theories help us to determine the interest rate. We will refer to the loanable fund theory and the Keynesian liquidity preference theory. If there are only two assets, money and bonds, either of them can be used to explain interest rates. We will define the different types of bonds and different types of monetary policy aimed at stabilizing inflation and output. In the next chapter we discuss short- and long-term interest rates and the term structure of interest rates.

2.2 Some Basics

In modern monetary economies money serves as the medium of exchange, unit of account and store of value. On the international level it also can serve as the medium of international reserve. In the latter case usually only a few currencies have been selected, for example the U.S. Dollar, the Euro or the Yen. Historically, money has developed from metallic money (gold or silver) to fiat money (paper currency) backed by the monetary authority of the country. Monetary aggregates are usually referred to as $M_1$, $M_2$ and $M_3$ money. The subsequent scheme defines those aggregates:

**Monetary aggregates:**

\[
M_1 = \text{currency} + \begin{cases} 
\text{traveller checks} \\
\text{demand deposit} \\
\text{other checkable deposits}
\end{cases}
\]

¹ A more detailed treatment of bonds and interest rates can be found in Mishkin, 1995 (Chaps. 1-7).
\[ M_2 = M_1 + \begin{cases} \text{time deposits} \\ \text{saving deposits} \end{cases} \]
\[ M_3 = M_2 + \begin{cases} \text{large time deposits} \\ \text{money market mutual funds} \end{cases} \]
\[ L = M_3 + \begin{cases} \text{short-term Treasury securities} \\ \text{commercial papers} \end{cases} \]

Hereby \( L \) represents liquidity. Monetary policy when aiming at controlling monetary aggregates usually selects one of these aggregates to stabilize inflation or output.

### 2.3 Macroeconomic Theories of the Interest Rate

Traditionally, in monetary economics, there have been two basic theories of interest rate determination. These are the loanable fund theory and the liquidity preference theory. The first theory originates in classical monetary theory of David Hume and David Ricardo. The second is based on Keynes’ work. Both give us a theory of interest rate determination. We give a brief introduction to both theories.\(^2\)

#### 1. Loanable Funds Theory

Before we define the theory of loanable fund we want to define some simple principles of bond pricing. Bonds are simple loans that are traded on the bond market. They comprise principle and interest payments. A one period coupon bond is a bond with a face value \( F \), of say 1000 that pays a fixed amount of income, say 100, so the interest rate is \( i = \frac{100}{1000} \). A one period discount bond (zero coupon bond) can be obtained at a price below the face value so that the interest rate is \( i = \frac{1000 - 900}{900} \).

The value of a console (permanent coupon payment) is given by the present value of multi period income stream from a bond, which is given for \( t \to \infty \) as a \( \frac{100}{0.1} = 1000 \). The present value of a bond is thus the solution to the following discounting problem:

\[
P_b = \frac{C_1}{1+i} + \frac{C_2}{(1+i)^2} \cdots \frac{C_n}{(1+i)^n}
\]

where \( C_t \) is an income stream of the payments, some of which can be zero. A yield of a bond, \( y \) for example for a one period bond relates the income stream to the (present) value of the bond,

\[
P_b = \frac{C}{1+y}
\]

with \( C \) the payment and \( P_b \) the price of the bond. A return on a bond is defined as

\[
R_{t+1} = \frac{(C_t + P_{t+1} - P_t)}{P_t}
\]

\(^2\) For more details of the subsequent basic description of the money and bond markets, see Mishkin 1995, Chaps. 2-7).