THE EVOLUTION OF GLOBAL FINANCIAL MARKETS AND NEW FINANCIAL INSTRUMENTS

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Keywords: Eurocurrency loan, Eurobank, on-shore funds, off-shore funds, LIBOR, LIBID, effective domestic cost of funds, effective external cost of funds, outward arbitrage, inward arbitrage, arbitrage tunnel, Euronotes, financial innovation, deficit units, surplus units, spanning theorem, zero-coupon bonds, withholding tax.

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Summary

This entry examines theoretical approaches to the growth of global financial markets. We begin with a study of the Eurocurrency markets, or external money markets, that have grown from their inception in the late 1950s to become the largest arena for international financing among developed countries. The Eurocurrency markets survived their infancy because regulatory authorities did not nip them in the bud, and grew largely because of restrictions on borrowing and lending opportunities in on-shore (domestic) capital markets. Central to the growth in all cases was the possibility of obtaining higher returns on lending, and lower costs for borrowing, funds that otherwise would not be in demand in the domestic economy. We describe a model that shows this

effect directly. We also show how these opportunities have been built into the pricing of Eurocurrency loans.

The model of Eurocurrency markets presented here has both a static and a dynamic formulation. We examine both in detail. The entry also provides examples of market pricing instruments, drawing on the theoretical structure given in the first part.

We then turn to a general analysis of financial innovation. This is broader than the model for the Eurocurrency markets, but for precisely this reason cannot deliver specific conclusions. Our focus, however, is on the determinants of the demand for, and supply of, financial innovation. We observe that the deficit and surplus units of an economy have different motivations. They seek financial innovations for differing purposes. We explore many of these motivations.

Finally we review two key approaches to analyzing the complex financial instruments that have emerged with the growth of international financial markets. Relying on a powerful theorem in theoretical finance, the building-block approach breaks complex, or hybrid, financial instruments into simpler elements that are separately priced in developed capital markets. The value of the whole instrument can then be calculated from the values of the building blocks. The second approach, the functional method, attempts to understand how the value of a complex financial instrument varies with the values of relevant economic variables. This approach also seeks to understand how to predict the prices of new and emerging financial assets and liabilities.

1. Introduction

The entry "*Multinational Banking and Global Capital Markets*" contains a comprehensive review of the historical and institutional features of the evolution of the global capital markets in the twentieth century. It is useful hre to outline the analytical underpinnings of this historical review, to show the common elements that encouraged the astonishing growth of the markets and that may lead to further growth in the future.

2. Analysis of Eurocurrency Deposit and Loan Pricing

We develop two versions of the model, each intended to show how the Eurocurrency loan market identifies the existence of funds for insertion in the market, and how the loan rates are set in equilibrium. The first version is static, explaining why a given level of funds might be moved offshore by a "Eurobank." The second version is dynamic, providing insights into when funds may move on-shore or offshore over time. Both versions assume that the principal agents are rational and respond to expected rates of return or costs for given levels of risk in their investments, whether they be deposits or loans.

2.1 A Static Model

Suppose we have two financial centers, New York and London. Let us consider just one currency, the US dollar. We wish to explore the pricing of the funds that may be available from New York in London in US dollars. Let the on-shore (US) market demand D for funds depend on the required rate of return on available projects r. The on-shore supply S of funds depends on individuals' rates of time preference. In equilibrium this matches the rate of return on available projects. We assume that the function $D(r)$ has a negative slope ($D'(r) < 0$), and that the slope of the supply function is positive ($S'(r) > 0$). We also assume that each function is monotonic in its argument. If there are no transactions costs, then equilibrium occurs at $D(r) = S(r)$, establishing an equilibrium interest rate r_e. The equilibrium volume of loans made is $Q_e = D(r_e) = S(r_e)$.

In actual markets, banks incur costs collecting deposits and servicing loans. These costs include required reserves at central banks, possible insurance costs on deposits, costs of credit reviews and audits, risk management for assets and liabilities, taxes, and administrative overheads. We denote the sum of these costs by C.

To cover these additional costs (i.e., C), banks must limit their lending to the extent that they create a gap between their cost of funds given by $S^{-1}(r)$ and the price they can charge for funds $D^{-1}(r)$. In constrained equilibrium this gap is equal to C, so that $D^{-1}(r) - S^{-1}(r) = C$. This gives rise to a new equilibrium interest rate r_0 with associated volume of loans $Q_0 < Q_e$. The interest rate on loans made at this volume Q_0 is r_L; and the interest rate paid on deposits is r_D; and $r_L > r_D$ such that $r_L – r_D = C$.

We now posit that the Eurodollar market emerges to meet the unsatisfied demand for loans $Q_e - Q_0$ using the unutilized lending from the New York banks. Analytically this happens along two new functions, the demand for offshore funds $D_o(r)$ and the supply of offshore funds $S_o(r)$. Each echoes its on-shore "parent" function. For $r = r_L$, $D_o(r_L) = 0$. That is, if the rate charged on a loan to the offshore market equals that on-shore, no funds will be loaned to the offshore market. Similarly $r = r_D$, $S_o(r_D) = 0$: no funds can be borrowed for offshore lending if the return is the same or less than that on-shore. An equilibrium occurs at the intersection of $D_o(r)$ and $S_o(r)$ if there are no transactions costs.

We now observe the existence of transactions costs C^o even on these Eurodollar activities. The costs constrain the loan volume below that of the volume set by $D_o(r) = S_o(r)$. As with the introduction of the costs C, the existence of costs C^o produces a spread between the lending rate in the Eurodollar market r'_L and the deposit rate r'_D. Existence of a feasible equilibrium in this market, however, requires that the costs C^o be strictly less than C. If they are, then the volume of loans made offshore is positive. If the C^o costs exceed C, there is no incentive for the banks to move funds offshore.

Intuitively this result states that the costs for banks to engage in the Eurocurrency markets must be lower than the costs of their work in the domestic banking market. What sorts of "Euro-costs" exist for banks? Banks operating in the Eurocurrency markets are not required to hold reserves with a central bank, but do usually hold some precautionary reserves. These may earn market rates of return, however, to offset the holding costs. In the domestic market, central banks that hold the bank reserves rarely pay market rates on these funds. In addition, for US banks there are no explicit insurance fees charged by the monetary regulators for Eurocurrency holdings. Domestic US banks that are members of the FDIC pay insurance fees.

Banks in the Eurocurrency markets usually lend only to entities with well-established credit records. In large part this is due to the absence of regulatory support. Because of the selectivity of lenders, the cost of credit evaluation is lower for lending in these markets.

Banks in the Eurocurrency markets also operate extensively in the wholesale part of the market, dealing as much with large scale loans to other financial intermediaries as with loans to ultimate corporate borrowers. This wholesale activity tends to work with narrower margins or spreads on loans than those applying to ultimate borrowers or lenders. The narrower intermediate spreads on funds produce lower transactions costs for the banks than in the domestic markets.

In the institutional terms of the Eurocurrency model we have posited, the rate r_L would represent the New York on-shore prime rate. The rate r'_L represents the rate at which banks in London lend to each other (the London Interbank Offer Rate, LIBOR). The rate r'_D is the London Interbank Bid Rate (LIBID); and r_D is the domestic deposit rate in New York. It is the case in this model that $r_L > r'_L > r'_D > r_D$.

Effectively, we say that the offshore market is attractive because it provides a similar financial service to on-shore borrowers but at a lower cost. The difference r'_D - r_D measures an additional compensation that is paid to depositors for bearing additional risk or taxes or other forms of inconvenience with having their deposits held outside their home country. The difference r_L - r'_L represents an incentive for borrowers to gain acceptance in the offshore market where there may be other barriers to entry such as size of borrower and credit quality. We expect that the two interest differentials respond to market forces, financial innovation and learning by the markets about the agents. We expect that the difference r'_D - r_D diminishes if financial deregulation occurs on-shore; and r_L - r'_L declines over time as active corporate treasurers seek lowest cost funds on a worldwide basis.

This model is useful for identifying the principal forces that induce funds to move offshore, in our example from New York to London. The flow of funds, however, is not unidirectional. Funds flow back from the offshore markets to their domestic markets at various times. The static version described above has difficulty allowing for this dynamic of funds flows. An adjusted model is required to capture the possibilities that funds may flow on-shore as well as offshore as circumstances change in the capital markets. We provide such an adjusted model below.

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Biographical Sketch

Christopher Adam is currently Professor of Finance at the Australian Graduate School of Management, and Associate Dean-Faculty for the AGSM. The new AGSM was created in 1999 as a joint venture between The Graduate School of Business at The University of Sydney and the graduate management school of the University of New South Wales. Chris came to The Graduate School of Business at Sydney University in 1992 as its Professor of Finance. He became the Acting Director of The GSB in 1998 on the retirement of the Foundation Director, as well as continuing in the role of Head of the Department of Management Studies for The University. From 1989 to 1992 Chris was Associate Dean for Academic Affairs and Associate Professor of Economics at Bond University. Before being invited to become a member of the Bond University foundation faculty in 1989, Chris taught and researched at the Australian Graduate School of Management in the University of New South Wales. He had come to that School in 1977 as one of its inaugural faculty members. Chris holds a Bachelor of Economics degree with First Class Honours from the University of Western Australia (1974) and earned his MA and PhD degrees in Economics from Harvard University in the USA (1977). He has been an editor of the *Australian Journal of Management*, the *Bond Management Review* and the *Journal of Applied Finance and Investment*. He was a book review editor for *The Economic Record*. Chris has also been Director of the AGSM MBA Program (1984-87, and 1999-2000); and, as foundation Director of the Bond University MBA, established this degree for the University. He has also been Director of the MBA Program at The University of Sydney.