



利率衍生产品发展： 条件分析与机制设计

The Development of Interest Rate Derivatives:
Conditions Analysis & Mechanism Design



王敬 著

与其他衍生产品一样，利率衍生产品的基本功能也包括套期保值、套利、投机、价格发现和资源配置。
但作者以为，这五种功能在性质上是有区别的。
前三种功能基于特定需求而产生，具有内在性，
并直接体现了利率衍生产品的作用机理。
而
具
发

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摘 要

就利率衍生产品发展而言，中国刚刚开始不久的实践在性质上不同于国外尤其是西方发达国家的自发性产生与发展模式，其在很大程度上由政府主导和推动，因此需要首先从理论上对利率衍生产品发展所需的条件和相应的运行机制加以系统分析，然后结合中国的实际进行论证。本书基于这一基本逻辑思路展开研究，力求为中国发展利率衍生产品的实践构建起一套较为完整的分析框架。

1. 本书的主要内容

全书分为前言和正文两个部分。前言部分首先阐述了本书选题的国内外背景和研究意义，然后对选题的国内外研究现状从利率衍生产品产生与发展的动因、市场主体对利率衍生产品的需求特性、利率衍生产品发展的条件及运行机制、利率衍生产品的定价和利率衍生产品的风险管理及监管五个方面做了综述，最后对本书在研究方法上的特点、主要创新或贡献以及有待进一步研究的问题进行了阐述。

正文部分共分为五章。第一章是利率衍生产品的功能及作用机理解析——首先对利率衍生产品的概念及分类加以界定，然后在剖析利率衍生产品的套期保值、套利和投机三大基本功能的作用机理的基础上对不同类型的利率衍生产品在发挥这些

功能时的风险与成本收益加以比较。本章是全书研究的逻辑起点,为后面各个逻辑环节的论证奠定了必要的理论基础。

第二章是利率衍生产品的需求分析。由于一种产品能否形成市场并持续发展终归离不开供求两个方面,因此,发展利率衍生产品需要哪些条件的问题自然也就分解为需求条件和供给条件两个方面,本章即是就需求条件所做的分析。但本章并不纠缠于“是否存在需求”的讨论,而是分别对各类市场主体对利率衍生产品的需求特性进行分析,得出了关于久期错配程度、规模、资本水平和信用状况等因素如何影响利率衍生产品需求的结论,并通过对国外利率衍生产品产生过程与发展状况的分析进一步印证需求对利率衍生产品产生与发展的作用。最后,利用有关数据对中国金融机构的利率衍生产品需求特性进行计量分析,由此落脚到关于中国利率衍生产品需求条件的实践分析层面上。

第三章是利率衍生产品发展的环境条件分析。承接第二章的需求分析,本章着重从制度环境和市场环境两个方面对利率衍生产品发展所需的供给条件进行分析。就制度环境条件而言,本章首先从理论上论证了发展利率衍生产品需要一定程度的利率市场化和适合的交易制度,然后通过对国外相关实践的分析进行实证检验,并落脚到对中国的相应制度环境条件的分析上。就市场环境条件而言,本章分别从交易者结构、原生产品市场规模、基准利率和供给主体四个方面进行了论述,并穿插国内外实证分析作为检验。至此,本章与第二章的内容一同构成了关于利率衍生产品发展所需条件的理论体系。

第四章是利率衍生产品的运行机制设计。中国的利率衍生产品实践所具有的自上而下推动的性质决定了在运行机制设计的环节上首先需要解决一个策略选择的问题,然后才是产品本身运行机制的设计问题。本章的内容即是按照这一思路来安排

和展开的。对于发展利率衍生产品的策略选择,本章首先论述了如何根据先简单后复杂、顺应市场需求、原生产品市场发展成熟、供给条件具备和风险易于控制五条原则进行顺序选择的问题,然后分别从金融机构和监管当局的角度分析了时机选择的问题,最后论述了如何在权衡运行效率和风险管理的基础上进行场所选择的问题。对于利率衍生产品的运行机制设计,本章从合约设计和交易机制设计两个方面进行了详细探讨。

第五章是利率衍生产品的风险管理与监管,这也是全书的最后一章。由于利率衍生产品本身所具有的风险性,因此无论是就持续稳定发展的保障还是运行机制的完善而言,自然延伸的一个逻辑环节就是对有关风险管理及监管问题的讨论。本章的研究目的和思路是根据利率衍生产品的风险特性探讨如何从市场主体内部管理和外部监管两个方面防范和控制风险。基于此,本章首先对利率衍生产品的主要风险及其成因、特性进行了界定和分析,在此基础上,着重对市场风险、信用风险和操作风险的度量、控制和市场主体内部风险管理体系的构建进行了论述,最后从监管体制、监管机构的监督检查、资本充足要求、信息披露和国际合作五个方面就利率衍生产品的外部监管问题进行了探讨。

2. 本书的主要创新或贡献

本书可能的创新或贡献主要体现在以下几个方面:

首先,在理论研究层面上,本书多角度剖析了不同类型的市场主体对利率衍生产品的需求特性,多方面论证了发展利率衍生产品所需的制度和市场环境条件,从而构建了一个关于利率衍生产品发展所需条件的理论分析框架。另外,关于各类利率衍生产品发展的顺序选择、利率衍生产品合约和交易机制设计一般原则的论证,以及将一般性的风险管理及监管机制与利率衍生产品的特性结合起来的分析,都是本书所做的尝试性研

究,体现了本书对相关理论体系的贡献。

其次,在实践研究层面上,本书利用有关数据进行计量分析,对中国金融机构的利率衍生产品需求特性及其与利率衍生产品运行状况之间的关系进行了初步的探讨,从而为深入了解中国利率衍生产品所面临的需求状况和进一步发展的策略选择提供有价值的参考。另外,本书利用广泛收集和整理的数据或案例,就国外利率衍生产品的市场需求状况、发展顺序、运行机制、风险管理及监管等进行了大量实证研究,这一实证体系与上述的理论体系相结合,能够为今后的类似研究提供一个可资参考的分析框架。

最后,本书在一些主要观点上体现出一定的创新性或者贡献:

(1) 规模是影响市场主体利率衍生产品需求的一个重要因素,并表现为正向影响,其原因主要是利率衍生产品业务中规模效应的存在。这一观点得到了理论分析和国外实证研究的证明。但本书研究发现,国内金融机构对利率衍生产品的需求不存在规模效应,说明国内的大型金融机构参与利率衍生产品交易的力度还较小。

(2) 发展利率衍生产品并不一定需要以完全的利率市场化这样一种状态为前提,但必须以实现利率市场化的过程为条件,因为在实现利率市场化的过程中市场利率和管制利率都会产生波动,从而引致对利率衍生产品的需求。

(3) 发展利率衍生产品必须以足够规模的原生产品市场为条件,而鉴于中国在2007年末短期国债与GDP之比超过了大多数国家在推出首只短期利率期货时的水平,可以认为中国推出短期利率期货已具备了比较成熟的原生产品市场条件。

(4) 发展利率衍生产品在顺序选择上应遵循先简单后复杂、顺应市场需求、原生产品市场发展成熟、供给条件具备和风险

易于控制五条原则，权衡这些原则大致可以得出远期利率协议—利率互换—OTC 利率期权—利率期货的发展顺序选择。

(5) 利率衍生产品的合约设计应兼顾流动性与风险控制，其中就合约期限而言，OTC 利率衍生产品中的远期利率协议期限不宜过长，利率互换和利率期权的期限可以较长，而在交易所利率衍生产品中，交割结算价格的决定方式使得短期利率期货可以较长期利率期货有更远的交割月份。

关键词：利率衍生产品 条件 机制 风险

Abstract

As to development of interest rate derivatives, Chinese practice which began not long ago, and has been guided and pushed forward by the government to a great extent, is different in essence from the pattern of overseas, especially the western developed countries. Therefore it is necessary to analyze first theoretically and systematically the conditions and relevant running mechanism, and then demonstrate according to Chinese reality. The book studies on the basis of the above logical line, trying to establish a relatively completed analyzing frame for Chinese practice of developing interest rate derivatives.

1. Main Contents

The book includes two parts of preface and text. The preface first sets forth foreign and domestic backgrounds and significance of the subject, then reviews foreign and domestic studying state about the subject from such five aspects as emerging and developing impetus of interest rate derivatives, characteristic of market principals' demands for interest rate derivatives, conditions and operational mechanism for developing interest rate derivatives, pricing of interest rate derivatives and risk management and supervision for interest rate derivatives. Finally it expounds features of studying methods, main innovation or

contribution and some topics waiting for continuous studying.

The text contains five chapters. Chapter I is the analysis of function mechanism of interest rate derivatives. It first identifies the notion and classification of interest rate derivatives, then, basing on analyzing the mechanism of their three types of functions, hedge, arbitrage and speculation, compares the risk, cost and yield between different interest rate derivatives emerged when they provide those functions. This chapter is the logical starting point of the whole text, which establishes necessary theoretical foundation for the latter logical segments.

Chapter II is demand analysis of interest rate derivatives. Because whether a product can form a market and develop continuously depends eventually on two factors of supply and demand, the issue of what conditions are necessary for developing interest rate derivatives is naturally decomposed into supply conditions and demand conditions. However, this chapter is not entangled in discussion of whether or not the demands exist, but analyzes separately demand characteristics of various types of market principals. It obtains some conclusions about how such factors as duration mismatch, sizes, capital level and credit affect the demand for interest rate derivatives, which are proved further through analyzing the foreign emergence and development of interest rate derivatives. Finally, it analyzes quantitatively the demand characteristics of Chinese financial institutions using relevant data, so as to settle to practical analysis of demand conditions of interest rate derivatives in China.

Chapter III is the analysis of environmental conditions for developing interest rate derivatives. Following the demand analysis of Chapter II, this chapter focuses on two aspects of supply conditions, the in-

stitutional environment and market environment of interest rate derivatives development. In terms of conditions on the institutional environment, the chapter first theoretically demonstrates that the development of interest rate derivatives requires a certain degree of market-oriented interest rate and suitable trading systems. Then an empirical testing is done through analyzing the related foreign practice, and the chapter settles into the analysis of corresponding conditions on the institutional environment of China. In terms of conditions on the market environment, the chapter gives discussion separately from the structure of traders, the size of native market, the benchmark interest rates and the market suppliers. So far, this chapter together with chapter II establishes a theoretical system of conditions on the development of interest rate derivatives.

Chapter IV is the operational mechanism design of interest rate derivatives. The topdown nature of Chinese interest rate derivatives practice determines that it is necessary in the operational mechanism design to resolve the problem of strategy selection first, then that of the operating mechanism design of the product itself. The contents of this chapter are arranged just in accordance with this line. As for the strategy selection, the chapter first discusses how to select order according to such five principles as “easy-to-complex”, “meeting market demand”, “having a mature native market”, “holding the supply conditions” and “easy to control risks”. It then discusses the timing selection separately from the points of view of the financial institutions and regulatory authorities, and finally discusses how to select location based on weighing operational efficiency and risk management. As for the operating mechanism design of the product itself, the chapter explores in detail from the contract design and trading mechanism de-

sign.

Chapter V, which is the last chapter of the book, is risk management and supervision of interest rate derivatives. Because of the riskiness of interest rate derivatives themselves, a naturally extended segment is the discussion about risk management and supervision, viewing whether from the guarantee of continuous and steady development or from the improvement of operating mechanism. The chapter aims to explore how to prevent and control risk through internal management and external supervision according to the characteristic of risk of interest rate derivatives. Based on this, the chapter first defines and analyzes the main risks and their causes and characteristics of interest rate derivatives, then focuses on the measurement and control of market, default and operating risk and establishment of internal risk management system. Finally, the chapter explores the topic on external supervision of interest rate derivatives from regulatory regime, regulatory supervision and inspection of institutions, capital adequacy requirements, disclosure of information and international cooperation.

2. Main Innovation or Contribution

The main innovation or contribution of the book may reflect in the following aspects:

First, as for the theoretical research, the book analyzes the characteristics of various market players' demand for interest rate derivatives from multiple angles and demonstrates systematically the conditions of institutional environment and market environment for the development of interest rate derivatives from various aspects, thus establishes a theoretical system about the conditions for the development of interest rate derivatives. In addition, both the demonstration about order selection and general principles of the contract design and trading

mechanism design, and the general analysis combined with the characteristics of interest rate derivatives, are trial studying carried out by the book, which reflects its contribution to relative theoretical system.

Second, as far as the practice research is concerned, the book, using relevant data and by quantitative analysis, probes initially the demand characteristics of Chinese financial institutions for interest rate derivatives and the relations between the demand characteristics and the running status of interest rate derivatives, thus provides a valuable reference for understanding deeper the demand situation faced by interest rate derivatives in China and for strategy selection for further development of interest rate derivatives. Additionally, using extensive collection and collation of data or cases, the book carries out a number of empirical studies on foreign market demand conditions, the development order, operating mechanisms, risk management and regulatory of interest rate derivatives. By means of the combination of this empirical system with the above-mentioned theoretical system, a useful analytical framework can be provided for future similar studies.

Finally, the book's innovation or contribution reflects on some of the main view points.

1) Size is an important factor affecting the market principals' demands for interest rate derivatives and shows positive effects, mainly due to the existence of scale effects in interest rate derivative business. This view point has been proved by theoretical analysis and foreign empirical studies, but does not apply to the demand of Chinese financial institutions for interest rate derivatives. This situation implies that large Chinese financial institutions participate in interest rate derivatives yet to a lower extent.

2) The development of interest rate derivatives does not need the

premise of complete market-oriented interest rate, but need the condition of implementation process of market-oriented interest rate. This is because both the market-oriented and controlled interest rates fluctuate in the implementation process of market-oriented interest rate, thus causing demands for interest rate derivatives.

3) The development of interest rate derivatives must be conditioned by enough scale of native markets. Considering that the ratio of Chinese short-term government bonds to its GDP in the end of 2007 exceeded the level of most countries when they launched the first short-term interest rate futures, a conclusion can be drawn that China has possessed relatively mature conditions of native markets for launching short-term interest rate futures.

4) The order selection of the development of interest rate derivatives should abide by such five principles as “easy-to-complex”, “meeting market demand”, “having a mature native market”, “holding the supply conditions” and “easy to control risks”. Weighing all of these principles, an order can be selected as forward rate agreement, interest rate swap, interest rate option and interest rate futures.

5) When the contract design of interest rate derivatives is made, both the liquidity and risk control should be taken into consideration. As for the contract period, forward rate agreement should not have too long period, but interest rate swap and option may have relatively long period. The way of determining final settlement price makes the short-term interest rate futures possibly have further delivery month than long-term interest rate futures.

Key words: interest rate derivatives condition mechanism
risk

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0 前言

0.1 选题背景及研究意义

0.1.1 选题背景

0.1.1.1 全球利率衍生产品迅猛发展，正负效应皆现

自1975年10月美国芝加哥期货交易所（CBOT）^①推出首只利率期货——政府国民抵押协会抵押凭证期货以来，全球利率衍生产品获得了爆发式的增长。据国际清算银行（BIS）统计，截至2007年末，全球场外交易（Over The Counter, OTC）利率衍生产品^②的未偿名义价值达393.14万亿美元，是1998年末50.01万亿美元的7.86倍，年均复合增长率达到25.7%。而据美国期货业协会（FIA）统计，全球交易所利率衍生产品的年交易量从1998年的8.89亿张合约上升到2007年的37.41亿张合约，增长了3.2倍。实际上，不仅是利率衍生产品，其他金融衍生产品也同样出现了快速增长，如外汇衍生产品的未偿名

① CBOT已于2007年7月与芝加哥交易所（CME）合并为CME集团。

② 利率衍生产品按照交易场所的不同分为场外交易（Over The Counter, OTC）利率衍生产品和交易所利率衍生产品两大类，后文将对此做进一步论述。

义价值从1998年末的18.01亿美元增长到2007年末的56.24亿美元，年均复合增长率为13.5%，而信用衍生产品更是异军突起，从2004年末的6.4万亿美元增长到2007年末的57.89万亿美元，年均复合增长率高达108.4%。图0-1显示了1998—2007年全球OTC利率衍生产品的增长情况。除了增长的快速，从图中可以明显看到的一点是，就市场规模而言，利率衍生产品明显超过其他几类金融衍生产品而居于首位。

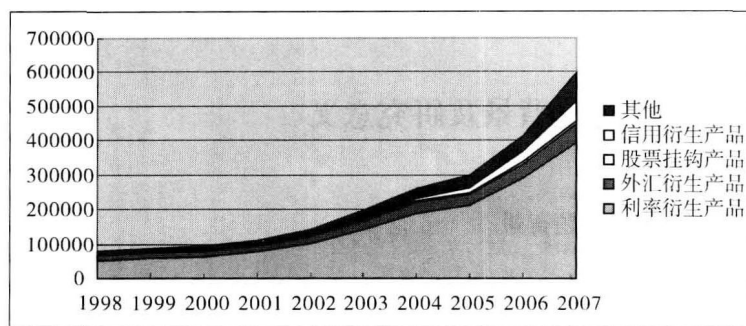


图0-1 全球利率衍生产品的增长

资料来源：根据国际清算银行（BIS）官方网站数据整理绘制

全球利率衍生产品迅猛发展背后的原因是值得深入思考和研究的，而可以看到的现实是，利率衍生产品的产生与发展确实为各类金融机构和非金融企业提供了灵活而有效的套期保值型的风险管理工具，提供了多样化的套利和投机的盈利手段，同时也通过发挥价格发现功能为固定收益证券及其他债务工具提供了定价依据，从而大大促进了全球金融市场的发展。但另一方面，在利率衍生产品的发展过程中，也伴随着风险事件的不断发生，如：1992—1994年多家公司在与银行家信托公司（Bankers Trust）的利率互换交易中遭受巨额损失，1995—1996年英国国民西敏寺银行在利率期权交易上遭受巨额损失，