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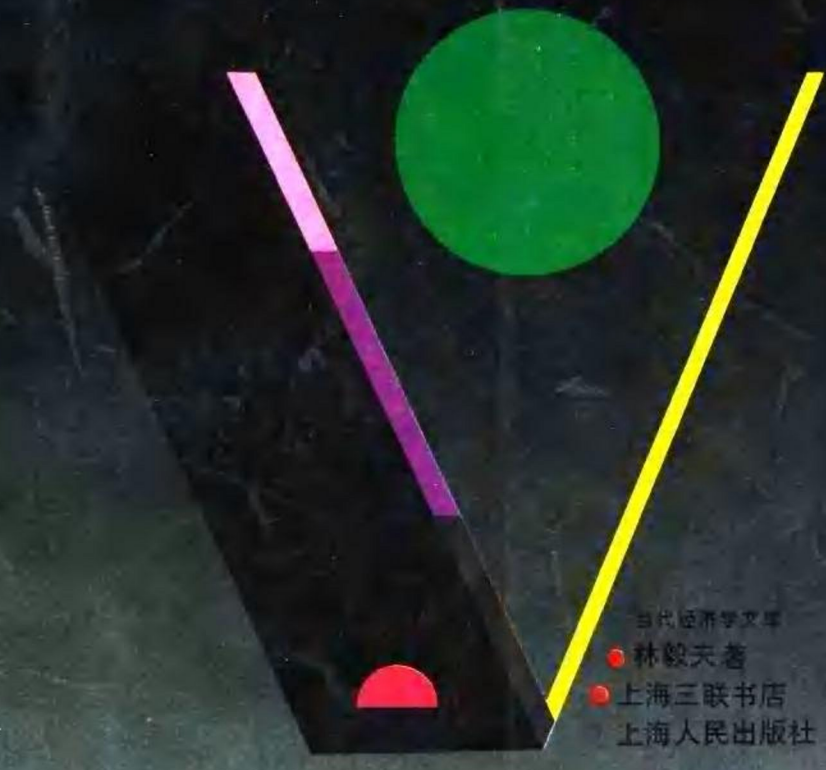

当代经济学文库

制度、技术与中国农业发展

林毅夫 著

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作者简介

林毅夫，男，1952年生于台湾宜兰县。台湾大学肄业，1978年政治大学企业管理研究所毕业，获企业管理硕士学位。1979年就学于北京大学经济系政治经济学专业，1982年获经济学硕士学位。后经诺贝尔经济学奖获得者T.W.舒尔茨教授推荐，入芝加哥大学经济系主攻发展经济学和农业经济学，1986年获博士学位。其后到耶鲁大学经济增长中心做了一年博士后研究。1987年回国，现为北京大学教授、北京大学中国经济研究中心(筹)主任、美国加州大学洛杉矶分校经济系客座副教授、澳大利亚国立大学兼职教授。近年来林毅夫在国内外重要学术杂志上发表了一系列甚有影响的论文，引起了国际经济学界的关注，被认为是国际发展经济学和农业经济学界的新秀。

出版前言

为了全面地、系统地反映当代经济学的全貌及其进程，总结与挖掘当代经济学已有的和潜在的成果，展示当代经济学新的发展方向，我们决定出版“当代经济学系列丛书”。

“当代经济学系列丛书”是大型的、高层次的、综合性的经济学术理论丛书。它包括四个子系列：(1)当代经济学文库；(2)当代经济学译库；(3)当代经济学教学参考书系；(4)当代经济学新知文丛。该丛书在学科领域方面，不仅着眼于各传统经济学科的新成果，更注重经济前沿学科、边缘学科和综合学科的新成就；在选题的采择上，广泛联系海内外学者，努力开掘学术功力深厚、思想新颖独到、作品水平拔尖的“高、新、尖”著作。“文库”力求达到中国经济学界当前的最高水平；“译库”翻译当代经济学的名人名著；“教学参考书系”主要出版国外著名高等院校80年代后

期90年代初期的通用教材；“新知文丛”则运用通俗易懂的语言，介绍国际上当代经济学的最新发展。

本丛书致力于推动中国经济学的现代化和国际标准化，力图在一个不太长的时期内，从研究范围、研究内容、研究方法、分析技术等方面逐步完成中国经济学从传统向现代的转轨。我们渴望经济学家们支持我们的追求，向这套丛书提供高质量的标准经济学著作，进而为提高中国经济学的水平，使之立足于世界经济学之林而共同努力。

我们和经济学家一起瞻望着中国经济学的未来。

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ABSTRACT

INSTITUTION, TECHNOLOGY AND AGRICULTURAL DEVELOPMENT IN CHINA

The papers collected in this book represent the author's attempt to apply the modern economic approach to analyzing development issues in Chinese agriculture with special attention directed to the issues of institutions and technology.

Economics is a science of human behavior. The main feature of the modern economic approach is the assumption of rationality. The definition of rationality is as follows: when faced with several options, a decision-maker chooses the one which gives him / her the largest satisfaction. The options available to a decision-maker are conditional on the constraints he / she faces—resources, institutions, technology, and so on. Of course, human behavior may vary in different economies. However, the difference arises not from the difference in the "rationality" on the

part of the decision-maker but from the difference in his / her available choice sets. As a research method, the modern economic approach should be applicable to the studies of the Chinese economy.

Modern economic theories, however, are mostly formulated by economists in the West with a view to understanding their own economic issues. In their research, most economists unavoidably assume the Western market institutions as the given conditions for their research. Because of the difference in the institutional structure, the conclusions from their research may not be applicable to the Chinese economy. For the purpose of understanding the issues confronting China's economic development, it is desirable to incorporate the peculiar Chinese institutions in building the theories. The papers in this book represent such an attempt.

The process of economic development is characterized by institutional as well as technological change. The attempts to apply systematically the modern economic approach to the evolution of institutions and technology did not

start until the 1960s. The papers in this book also propose to make a contribution to this new area of economics.

Except for the last one, all the papers collected in this book have been published or have been accepted for publication by various Western economic journals. The first five papers attempt to explain the reasons for China's farming institutional changes and the effect of different farming institutions on agricultural development. The succeeding four papers analyze agricultural technological choice, innovation, and diffusion in the socialist period. The last paper attempts to provide an explanation for the puzzle: why does China, a country which had an early lead in science and technology in premodern times lag so much behind in modern times ? The main contents of the papers are as follows:

1. Collectivization and China's Agricultural Crisis in 1959—1961.

The conventional explanations for the 1959—1961 agricultural crisis, which resulted in 30-million odd deaths, have been the three succes-

sive years of bad weather, bad policies, bad management in the collectives and incentive problems due to the unwieldy size of collectives. These explanations, however, are found to be inconsistent with the available empirical evidence. In this paper, a game theory hypothesis is proposed as the main cause of this catastrophe. I argue that, because of the difficulty in supervising agricultural work, the success of an agricultural collective depends on a self-enforcing contract wh ereby each one in the collective undertakes to discipline oneself. A self-enforcing contract, however, can be sustained only in a repeated game. In the fall of 1958, the right to withdraw from a collective was deprived. The nature of the collectivization thus changed from a repeated game to a one-shot game. As a result, the self-enforcing contract could not be sustained and agricultural productivity collapsed. The empirical evidence is consistent with this hypothesis. This paper was published in *Journal of Political Economy*, Volume 98, No. 6 (December 1990).

2. The Household Responsibility System in

China's Agricultural Reform: A Theoretical and Empirical Study.

The emergence and eventual prevalence of the household responsibility system, which replaces the production team system as the unit of production and accounting, has brought about dramatic changes in China's rural area since 1979. In order to investigate the causes of the shift from the production team system to the household responsibility system in China's rural areas, a model of a production team with a work point system as its compensation scheme is constructed in the paper. The supervision and cost of supervision are formally incorporated in the model. The incentive to work in a production team is found to be a function of the degree of supervision exerted by the team management. As it is too costly to provide close supervision in agricultural production, and supervision is therefore lax, the incentive to work is thus low in a production team. On the other hand, the difficulty of metering effort is overcome in the household responsibility system because each worker becomes

the residual claimant, and as a result, no metering is required. Three hypotheses are drawn from the above theoretical model and tested with the empirical data before and after the institutional reform in China. The results are consistent with the implications of the model. This paper was published in *Economic Development and Cultural Change*, Volume 36, No. 4 (Supplement, April 1988).

3. Rural Reforms and Agricultural Growth in China.

This paper employs province-level panel data to assess the contributions of household responsibility system reform, price adjustements, and other reforms to China's agricultural growth in the reform period. The findings indicate that the dominate source of output growth during the 1978—1984 period was the change from the production team systm to the household responsibility system. It is also found that change in the crop pattern away from grain to nongrain crops had a positive impact and that the decline in cropping intensity had a negative impact on growth.

However, both effects were very small in magnitude. The results also suggest that the changes in state procurement prices and market prices had a significant impact on output growth, probably through their influence on application levels of input, cropping intensity, and / or croppattern. However, not all the increase in input use during 1978—1984 could be attributed to the rise in state procurement prices; part of them came from improvements in input availabilities . This study also attempts to account for the slowdown in output growth after 1984. In addition to the fact that the effect of the household responsibility system reform had dwindled by 1984, the evidence suggests that the rapid exodus of the labor force from the cropping sector and the sharp decline in the growth rate of fertilizer usage were responsible for the stagnation and the sharp reduction in state procurement prices was probably the reason for both trends. This paper will be published in *American Economic Review*, Volume 82, No. 1 (March 1992).

4. The Determinant of Farm Investment and Residential Construction in Post-Reform China.

The paper describes the patterns of farm expenditures on productive assets, durable consumer goods and housing in four study areas in China. While the household responsibility system has stimulated production incentives, it is argued that concerns regarding the stability of the land tenure system introduced during the reform, extremely small farm sizes, and credit inadequacies hinder farm investment, and may have caused a preference for investing in non-productive assets and in non-agricultural activities. Such arguments have been advanced quite frequently by observers of China's agriculture, but there has been a paucity of empirical research to assess their validity and importance. A model of household production and investment decisions which underlies the empirical work is presented. Analyses show that the extremely small size of farms in some areas could become a factor hindering investment and productivity, as the indivisibility of capital introduces increasing returns

to scale. Regressions analyzing capital accumulation, however, indicate that capital/land ratios do not increase with farm size even in the areas where returns to scale are increasing. The shortage in variable input causes a depressed demand for farm investment, and hence the derived demand for investment credit is low. Institutional credit is a binding constraint on farm investment only in one study area where input supplies were abundant. Insecurity of land tenure does not appear to have been a significant factor affecting investment before 1989. However, as current land contracts were awarded for 15 years, investment in the years past the mid-point of the contract maturity may be more sensitive to perceptions regarding land reallocation. Since the small farm size, formal credit supply, and the land tenure insecurity are not hindrances for the farm investment, they are not the cause for the surge in the residential investment in rural China.

5. The Household Responsibility System Reform and the Adoption of Hybrid Rice in China.

The paper studies the diffusion of hybrid

rice before and after the recent institutional change from the collective team system to the household-based farming system in rural China. A simple model which treats the adoption of hybrid rice as a portfolio selection problem is presented. The model is then tested against county-level temporal series of data collected from Hunan province. The empirical evidence suggests that the diffusion of hybrid rice in the collective system was mainly a function of past experience, and that profitability did not seem to be a major concern in the adoption decision. This deviation from economic rationality probably reflects the degree of government intervention in the promotion of hybrid rice during the collective period. As is expected, the transition from the collective system to the household responsibility system has resulted in a significant structural change in adoption behavior. Unlike decision-makers in the collective system, farmers in the household responsibility system respond to the adoption problem in a way consistent with the predictions of the theoretical model. This implies that under the

household responsibility system profitability is the major factor explaining the difference in the adoption rate across regions and over time. Therefore, the transition to the household system will contribute to the diffusion of technology. However, this transition has also resulted in a downward shift in the intercept of the adoption function. If this negative effect is the result of disruption of the original extension network, the government should take measures to restore the function of the original network in the interests of efficiency of resource allocation and social welfare. This paper will be published in *Economic Development and Cultural Change.*

6. Prohibition of Factor Market Exchanges and Technological Choice in Chinese Agriculture.

Technological change is among the most important factors underlying the growth of agricultural productivity. It has been the hypothesis advanced by Hicks, Hayami, Ruttan, and Binswanger that farmers in a market economy will be induced by changes in factor prices to search for technological alternatives to substitute for