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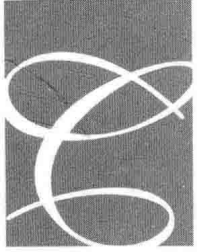
李少林 著

中国社会科学出版社



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序

国内外对产业结构演进、调整、评价与优化升级问题研究已有上百年历史，早期的亚当·斯密、大卫·李嘉图等西方古典经济学家就曾对产业结构问题进行过探讨。后来，马克思、里昂惕夫、库兹涅茨、钱纳里等经济学家从发展经济学视角对产业结构问题进行了系统性探索，大大推动了产业结构理论与政策的研究进展。20 世纪 50 年代以来，国内学者对产业结构问题的研究从未中断过，尤其是 20 世纪 90 年代以来，以林毅夫为代表的新结构经济学得到长足发展，为研究经济结构转型的决定因素提供了新古典研究方法，并提出了经济发展政策的新见解。

与西方国家产业结构问题相比，中国产业结构问题更具有特殊性。中国经济“新常态”时期是产业结构转型升级、城镇化质量提升与资源环境矛盾日益凸显并存的关键时期：一方面，全面深化改革，形成了稳增长和惠民生的有利条件；另一方面，产业结构不合理，经济增长方式转变步履迟缓，高能耗和高污染现象严重，资源环境对经济社会可持续发展的刚性约束增强，使产业结构转型升级、城镇化质量提高面临很大挑战。因此，从战略高度研究资源环境倒逼机制作用下的产业结构优化升级和城镇化质量问题具有重要理论和现实意义。

《国家新型城镇化规划（2014—2020 年）》指出，“城镇化是加快产业结构转型升级的重要抓手”，《国家中长期科学和技术发展规划纲要（2006—2020 年）》把产业、城镇化与资源环境协同发展列为科学研究的重点领域，突破资源环境双重约束已成为推动产业结构优化升级和城镇化质量提升的重要任务。因此，基于实现产业结构转型升级和城镇化质量提升目的，在考虑资源环境双重约束条件下，挖掘环境规制影响产业升级机制、定量测算最优产业结构、发挥全要素生产率增长驱动力、建构产业协同发展机制和提升城镇化质量，无疑极为重要而又十分迫切。

该书遵循从“文献评述→理论分析→实证研究→政策建议”的研究

思路，致力于构建资源环境约束下产业结构优化升级与城镇化质量提升的理论体系，为资源环境倒逼机制作用下推动产业结构转型升级和提升城镇化质量提供理论和实证依据。其主要内容包括六个部分：（1）系统考察了环境规制影响产业升级的理论机制与动态效应；（2）从资源约束视角研究了产业结构变迁空间特征；（3）从生产者和消费者双重优化动机分析切入，开发出一个能够定量测算最优产业结构的理论模型，并成功应用于中国及辽宁省最优产业结构测算；（4）全面考察了产业结构优化的全要素生产率驱动因素；（5）从产业协同发展视角挖掘了产业结构升级的内在机制；（6）从产业结构、人口密度层面对城镇化质量进行衡量，并开展了相关实证研究，由此提出资源环境约束下推动适宜城镇化进程的政策建议。

综观全书可以发现，该书分析视角新颖，作者在观察现实问题基础上，尝试从资源环境倒逼机制视角对产业结构优化升级和城镇化质量提升进行探讨，符合我国的现实国情；理论研究上有拓展，比如基于生产者和要素供给者的双重优化动机构建出产业最优名义产出增长率模型，率先实现对最优产业结构的定量测算；强调现代经济学的研究范式和方法运用，能够将理论模型与经验分析相结合，做到理论联系实际、规范研究与实证研究相结合，比如环境规制对产业升级的传导机制分析、最优服务业比重模型等均提供了基于中国数据的实证研究。从政策内涵来看，本书对于中国经济“新常态”下如何确定产业结构调整目标、环境规制强度和产业发展模式、城镇化推进模式与质量评价等方面均具有参考价值。

总体来看，该书结构严谨，行文流畅，写作规范，是目前国内研究产业结构、城镇化与资源环境关系的一部值得关注的专著。同时，这并不代表本书没有缺点，书中研究的许多问题是在前人基础上进行的尝试改进，难免存在一些争议。中国的产业结构和城镇化问题是一个古老而又常新的课题，作者在书中虽然没有将产业结构优化升级与城镇化进程的内在互动机制剖析透彻，但作为青年教师，作者在本书中表现出来的研究思维和规范研究方法的应用是值得肯定的，希望作者能够在未来研究中不断提高理论研究水准，取得更大的成绩。

李少林博士的专著《产业结构优化升级与城镇化质量：资源环境倒逼机制分析》是在他的博士毕业论文《资源环境约束下产业结构的变迁、优化与全要素生产率增长》基础上修改充实而成的，作为他的博士生导

师，我了解他的品性，他不仅为人谦虚，还勤奋好学，思维活跃，有创新意识，而且善于总结和摸索别人的成功经验。正因为如此，使他近三年来先后在《数量经济技术经济研究》、《经济理论与经济管理》、《改革》等刊物发表论文十余篇，主持国家自然科学基金、教育部人文社会科学基金等多项课题，部分研究成果获得辽宁省主要领导批示。我作为他的博士生导师，为他取得如此成绩感到由衷的高兴，并欣然为之作序。

肖兴志

2015 年 8 月

摘　要

党的十八大报告指出，“推进经济结构战略性调整是加快转变经济发展方式的主攻方向”。解决重大结构性问题事关经济与社会发展全局，是短期实现稳增长促转型目标的基础，更是长期实现经济社会可持续发展的关键。《国家新型城镇化规划（2014—2020 年）》指出，城镇化是加快产业结构转型升级的重要抓手。在当前中国经济下行压力加大的背景下，过去粗放型的增长方式在资源环境方面付出的代价已经迫切要求经济发展与资源环境相匹配，而这势必要求降低经济增长速度，着力在构建资源节约、环境友好社会的前提下，优化产业结构以释放经济潜能，并推动城镇化质量提升。本书认为，产业结构的优化升级、全要素生产率以及城镇化质量的提升是在资源环境约束下实现的，环境规制为产业结构优化升级提供了有效倒逼机制，内生于产业结构的资源约束对产业结构变迁起着重要的基础性作用，经济体的内在创新驱动对于产业全要素生产率增长、产业结构优化升级和城镇化质量提升具有关键意义。近年来，为有效配合我国经济增长方式转变顺利进行，“调结构”和“稳增长”是各级政府部门对经济工作的政策导向，走新型工业化道路、发展现代农业和现代服务业是新形势下三次产业结构发生变化的内在技术要求和促进产业结构升级的外部政策环境。环境规制与产业结构优化升级能否实现协同“双赢”？关键在于要素禀赋的结构优化视角下，我国第三产业发展模式如何选择？资源环境约束下我国最优产业结构的形成机理究竟怎么决定？基于生产者的利润最大化动机，三次产业全要素生产率增长的内在创新驱动机制如何发挥作用？资源环境约束下的城镇化质量如何提升？回答这些重要问题构成本书研究的出发点和选题依据，因此，本书将研究课题确定为“产业结构优化升级与城镇化质量：资源环境倒逼机制分析”。

产业结构的动态变迁体现出资源配置流向转移过程，产业结构在一定程度上决定了经济增长方式。作为对环境规制约束的反应，企业将会改变

生产要素的配置行为；作为产业结构的内生变量，要素禀赋结构将对产业结构变迁产生显著影响。所以，环境规制、要素禀赋与产业结构变迁是存在着紧密的内在联系。本书的研究思路是：

首先，对资源环境约束下产业结构变迁与城镇化质量的理论文献进行述评，随后分别通过机理、模型和实证，研究环境规制、要素禀赋对产业结构变迁的影响，探讨资源环境约束下我国产业结构动态和空间变迁特征，并反过来考察为实现产业结构优化升级所对应的环境规制政策工具的选择以及服务业发展的政策思路和出发点。

其次，通过对生产者和要素供给者双重优化动机分析，开发出一个能够付诸定量测算的最优名义增长率模型，对资源环境约束下我国最优产业结构进行定量测算，成功量化中国经济运行中实际产业结构偏离最优产业结构的程度，为最优产业结构研究开创一个可实证的理论框架；根据要素供给者利润最大化的前提假设，推导并建立一个全要素生产率增长的决定方程，实证研究我国三次产业全要素生产率增长动力机制的差异性，从而为产业结构优化升级提供技术创新动力的理论支撑和政策实践工具，并从新兴产业与传统产业协同发展视角，论证产业结构升级的内在机制。

最后，本书从资源环境倒逼城镇化质量提升视角对相关影响因素进行实证分析并提出政策建议。

本书核心章节的内容与结论主要有：

第三章通过需求、技术创新和外商直接投资传导机制三种途径影响产业结构升级的理论分析，考察上述三种传导机制对产业结构升级的影响方向，并采用1998—2010年我国30个省份的动态面板数据，实证研究环境规制强度对产业结构升级的影响。动态面板估计结果表明，中国总体环境规制强度对产业升级方向和路径产生了促进作用；而分区域的研究结果则表明，中西部地区环境规制强度与产业升级的关系并不显著，东部地区环境规制强度的提高能够促进产业升级的加快。中国在环境规制强度的选择上应考虑区域间的差异性，并适度放缓经济增长速度，加强人力资本建设和推进市场化改革，从而为环境规制与产业升级的协同“双赢”提供必要的政策思路和配套措施。

第四章以中国产业结构调整过程广泛存在的“大力发展服务业”现象为分析起点，构造了包括要素禀赋、技术采纳在内的最优产业结构理论模型，提出并论证了“服务业比重提高应以服务业效率改善为前提”的

重要命题，并通过建立“0—1”地理空间权重矩阵和经济距离空间权重矩阵以表示我国各省份经济的相关性，采用静态和动态空间面板计量方法，实证研究1998—2010年各地区要素禀赋、技术采纳与产业结构服务化趋势关系，主要研究结论有：①证实了省际要素禀赋、技术采纳和产业结构变动均存在显著的空间正相关性，各地区产业结构服务化趋势不是无规律的随机分布，而是依赖与其具有相似地理特征地区的要素禀赋和技术采纳战略；②要素禀赋越高的地区，服务业立体化扩张越显著，技术采纳策略促进了服务业的平推化扩张；③中国服务业立体化扩张模式滞后，从结构优化维度看，服务业立体化扩张模式显著优于平推化模式。

第五章通过对生产者的利润最大化目标和要素供给者的跨期效用最大化目标进行联合求解，推导出一个关于三次产业最优名义产出增长率方程。该方程的解释变量包括各产业资本增长率、勒纳指数（即产品需求价格弹性绝对值的倒数）和资本市场随机贴现因子。另外，该方程还包含三个待估计参数：各产业劳动产出弹性以及消费者的主观效用贴现因子和风险规避系数。基于1992—2009年三次产业消费、价格和收入的省际面板数据估计了中国三次产业产品的需求价格弹性（以收入作为控制变量）；基于1996—2002年人均资本、人均产出等投入产出变量和受教育程度、制度、地理环境等技术非效率解释变量的省际面板数据，用随机前沿分析方法估计三次产业的劳动产出弹性；基于社会商品零售总额、沪深股指、1年期定期存款利率等数据，采用GMM方法估计中国全社会的主观效用贴现因子和风险规避系数，并据此计算了我国资本市场随机贴现因子；基于产业层面的最优名义产出增长率方程对中国1992—2009年三次产业最优名义产出增长率和最优产业结构进行了测算。测算结果显示，各个产业实际增长率与最优增长率之间大致保持同向变动关系，但是二者之间仍然在不同时期存在不同程度的差距；中国的实际产业结构与最优产业结构之间也大致保持同向变动关系，同样也在不同时期存在不同程度的差距。

第六章在第五章的基础上，利用要素实际价格增长率、资本增长率、生产者价格控制能力或规模增长（以勒纳指数增量表示）和创新成本增加（用资本市场贴现率增量代表）等多个指标构建出一个技术创新动力机制模型，接着采用1992—2010年我国三次产业的相关数据估计了各产业的全要素生产率增长率，然后基于VAR模型的Bootstrap似然比检验了

三次产业全要素生产率与影响因素的相关关系，最后运用 SVAR 模型研究了三次产业各影响因素对企业技术创新的长期影响。实证研究结果表明，生产要素实际价格增长率的提高对于三个产业均构成了技术创新的推动因素；资本增长率对技术创新的影响则因产业而异。从长期来看，第一产业和第三产业资本增长率的增加都能够显著促进各自产业全要素生产率增长率的提升，而第二产业资本增长率的增加则会在长期抑制该产业的技术创新；三次产业价格控制能力增加（勒纳指数增量越大），都会伴随着全要素生产率增长率的提升，也就是说，本章的实证研究结果支持了“熊彼特”假说；资本市场贴现率增量对全要素生产率增长率的影响也因产业而异：资本市场贴现率增量的增加能够促进第一、第二产业全要素生产率增长率的提高，却会阻碍第三产业的技术创新。最后，基于三次产业的全要素生产率增长规律提出了培育中国战略性新兴产业技术创新能力的若干政策建议。

第七章在评述产业协同发展文献基础上，采用 1998—2011 年中国省际数据，对产业协同度影响因素进行空间面板计量分析。结果表明，新兴产业科技活动经费筹集额中政府资金比重对协同度无显著影响；环境规制未能抑制高污染行业增长，传统产业高能耗特征依然显著；人力资本增长提升了协同水平，而市场化改革效果并不显著。

第八章将衡量城镇居民生活水平的恩格尔系数和衡量生态环境指标的城市建成区绿化覆盖率作为城镇化质量的反映，基于 2001—2012 年中国 30 个省会城市面板数据，利用静态和动态面板计量回归模型，实证研究城市人口密度、产业结构对城镇化质量的影响，控制变量还加入反映能源消耗的电力消费量和制度环境的市场化改革指数等指标。研究结果表明，从总体来看，城市人口密度与城镇居民恩格尔系数呈“U”形关系；城镇化质量内生于地区产业结构；市场化改革对城市生态环境的影响显著为正。本章认为发挥市场机制配置资源的决定性作用是提高城镇化质量的关键。

第九章系统分析了人口城镇化率偏低与建筑业产业结构空间集聚不匹配的突出问题，指出城镇化与建筑业产业结构空间集聚联动的迫切性，在计算中国建筑业区位产业结构空间集聚度基础上，探讨了城镇化与建筑业产业结构空间集聚的关系，并提出促进两者良性联动的政策建议。

关键词： 产业结构优化升级　城镇化质量　资源环境倒逼机制

Abstract

The 18th Party Congress report points out that, "to promote strategic adjustment of the economic structure is the main direction of speeding up the transformation mode of economic development", to solve the major structural issues is related to the whole economic and social development, the foundation of realization of short - term steady growth and the goal of promoting transformation, and the key to achieve sustainable economic and social development. "National New Type of Town Planning (2014 - 2020)" points out that the urbanization is an important starting point of accelerating industrial upgrading. China's current economic is faced with increasing downward pressure, the pay for extensive growth mode in resources and environment have urgent requirement to match with the resources and environment, which is bound to have a lower economic growth rate, and under the premise of building a resource - saving and environment - friendly society, optimize industrial structure to release the economic potential. In fact, this paper maintains that changes and optimization of industrial structure and growth of TFP is under the constraint of resources and environment, environmental regulation provides effective forced mechanism for the optimization and upgrading of industrial structure, resource constraints plays a fundamental role in the evolution of industrial structure, internal innovation drive has key significance for industrial TFP growth and optimization and upgrading of industrial structure. Therefore, this paper argues that the changes and optimization of industrial structure will be influenced by the factor endowments, constraints of environmental regulation policy and the growth of TFP. In recent years, in order to effectively meet the smooth progress of China' economic growth pattern, "structural adjustment" and "steady growth" is the policy orientation of the government departments at all levels of economic work, taking a

new road to industrialization, the development of modern agriculture and modern service industry is the inherent technical requirements and the external policy environment under the new situation. Environmental regulation and upgrading of industrial structure can realize collaborative win – win? Based on factor endowments under the perspective of structure optimization, how to choose the mode of development of service industry in China? Under the restriction of resources and environment, how to decide the optimal industrial structure formation mechanism? Based on the producer' profit maximization motives, how is the role of internal innovation driving mechanism in three industries' TFP growth? To answer these important questions constitute the starting point of this research and the basic of the selected topic, so this paper will identify the research topics as "Changes of Industrial Structure, Optimization and TFP Growth Under Constraint of Resources and Environment".

A country's industrial structure changes reflect the allocation of resources in the transfer process. To the environmental constraint reaction, enterprises will change the configuration behaviors of factors; as an endogenous variable of industrial structure, resource endowments structure will have a significant impact on industrial structure. Therefore, environmental regulation, factor endowments and change of industrial structure are closely related. The idea of this study is arranged as follows: firstly, make a review of the theoretical literature on changes of industrial structure under constraint of resources and environment, and then establish and analyze mechanism, model and empirical on the effect of environmental regulation, factor endowments on transition of industry structure, and discuss the dynamic and spatial characteristics of China's industrial structure under resources and environmental constraints, and conversely discuss the environmental regulation policy tool selection problem which is corresponding to achieve the optimization and upgrading of industrial structure, and the starting point of service industry' development policies; secondly, through the dual optimization motivation analysis of producers and elements suppliers, develope an optimal nominal growth rate model which can quantitatively calculate the optimal industrial structure under the perspective of factor endowments, successfully give a quantification deviation of China's actual industrial structure from the op-

timal industrial structure, and create a theoretical framework for the research on optimal industrial structure; according to the element suppliers' profit maximization hypothesis, develop and establish a TFP growth determining equation, and empirical studies of technology innovation difference of China's three industries, and provide theories and policy practice tool for technology innovation to promote the upgrading of industrial structure, and from coordinating development of new industry and traditional industry, demonstrating the internal mechanism of industrial structure upgrading. In addition, this book finally from the forced mechanism of resource and environment to the quality of urbanization, making empirical analysis on the relevant factors and put forward some policy recommendations.

In this paper the main content and the conclusion mainly have the following several points:

In Chapter 3, Environmental regulation affects industry upgrading mainly by demand, technological innovation and international trade mechanism, this paper analyzes the mechanism effects on industrial upgrading path direction, and then use 30 Provincial Dynamic Panel Data from 1998 to 2010, we study the effects of environmental regulation intensity on industry upgrading. Dynamic panel estimation results show that, China' overall environmental regulation intensity has positive effects on industrial upgrading path direction ; and regional research results indicate that the central and western region's environmental regulation intensity is not significant with industrial upgrading, while the eastern region's environmental regulation intensity has accelerated industrial upgrading. China' environmental regulation intensity selection should consider the regional differences, and reasonably slow down the speed of economic growth, to strengthen manpower capital construction and advance marketing reform, and so provide the necessary policies and supporting measures to make sure that environmental regulation and industrial upgrading will have the collaborative win – win.

In Chapter 4, in response to the extensively existing phenomenon of "vigorously improve the proportion of service industry" in the process of industrial structure adjusting, this paper construct the optimal industrial structure model embracing factor endowments and technology choices, put forward and argues

the important proposition that "the proportion of service industry should be improved in synchronization with the service efficiency", and then we establish two kinds of spatial weight matrix to express economic dependency, using dynamic spatial panel model to test the relationship of factor endowment , the adoption of technology and industrial structure from 1998 to 2010 of every area in our country, the results are: ①confirm that the interprovincial factor endowment, technology adoption and the change of industrial structure have a significant positive correlation between the space, industry structure trend of service is not at random distribution, and rely on a similar geographic features of regions of factor endowment and technology adoption strategy; ②the higher the factor endowments, the more prominent the service industry's Three - Dimensional Expansion, technology adoption strategies promote the Horizontal Pushing; ③ Service industry's Three - Dimensional Expansion mode of China is lagged behind. From the viewpoint of structure optimization, the service industry's Three - Dimensional Expansion significantly outperforms Horizontal Pushing mode.

In Chapter 5, Through combining the optimization motivation of producers and that of element providers, we induce an equation of optimal output - growth of each industry, the whole of which is perceived as a micro - economic agent. The explanatory variables involved in the equation are each industry's output growth rate, capital growth rate, the Lerner index of each industry (which equals the inverse of the absolute value of the demand elasticity) and the stochastic discount factor (with which the whole society measure capital prices) . Moreover, the equation still includes three parameters: output elasticity of labor, subjective utility discount factor and relative risk aversion. Based on 1992 - 2009 provincial panel data (income as a control variable), we estimate the demand elasticity of price of each industry's product. Then employing the Stochastic Frontier Approach (with dependent variable being per - capita output and independent variable being per - capital and technological inefficiency factors being education, institution and geographical environment), and based on 1996 - 2002 provincial panel data, we estimate each industry's output elasticity of labor. And then we estimate the subjective utility discount factor, relative

risk aversion through GMM method and calculate the stochastic discount factors based on above estimated coefficients. Finally, according to the equation of optimal growth of industry – level output, we calculate China's three industries' optimal growth rates and optimal industrial structure from 1992 through 2009. The result indicates that there almost exists a coincidental trend shared by each industry's real growth rate and its optimal growth rate, however the gap still varies with time. A similar scenario exists in the relationship between China's actual industrial structure and its optimal industrial structure.

In Chapter 6, based on venture's motivation toward maximum profit under the basis of Chapter 5, we develop a model which determines the technological innovation with factors such as the actual growth of elements' price, the growth of capital, the change of price – controlling power or scale (represented with the change of Lerner Index), the growth of innovation cost (represented with the growth of discount rate of capital market). Then we estimate the growth of China's industry – level TFPs based on the related data during 1992 – 2010, and further investigate the impacts of influential factors of industry – level innovation with a SVAR model. The empirical results indicate that the actual growth of elements price results in the accelerating of each industry's innovation, and the capital growth and the growth of discount rate of capital market may have different influence on each industry's innovation, and the empirical results give evidence for "Schumpeterian" hypothesis. In the end we put forward some strategies for the development of China' strategic emerging industries.

In Chapter 7, systematically reviews the literature on the coordinated development of strategic emerging industries and traditional industries, and by constructing China's 30 areas of provincial data from 1998 – 2011, this book uses the static and dynamic spatial econometric analysis on "new", "old" industrial synergy degree of influence factors, the results indicate that science and technology funds in the proportion of government funds has no significant effect on the degree of collaboration; environmental regulation does not inhibit the traditional high polluting industries, and high energy consumption characteristics of traditional industry is still significant; human capital growth has significantly accelerated the realization of industrial synergy effects, market oriented reform

has no significance on industrial synergy effect.

In Chapter 8, use the Engel Coefficient to measure the standard of urban residents and the built – up area greening coverage rate to measure the ecological environment which were treated as the quality of urbanization, based on the data from 2001 to 2012 in China's 30 provincial capital city, we use static and dynamic panel data regression models to analyze the impact of city population density and industrial structure on the quality of the urbanization, the control variables also embrace consumption of energy consumption and the market reform index. The results show that, Overall, it presents "U" type relationship between city population density and Engel Coefficient of urban residents; the quality of urbanization is born in the regional industrial structure; the market reform has significantly positive impact on the cities' ecological environment. The decisive role of market mechanism in the allocation of resources is the key to improve the quality of China's urbanization.

In Chapter 9, systematically analyses the prominent mismatch problems of population urbanization and spatial concentration of construction industry, and points out that the urgency linkage between them, on the basis of calculating the spatial concentration of China's regional construction industry, we examine the interactive correlation between urbanization and construction industry's spatial concentration, and finally put forwards some policy suggestions for promoting the validity.

Key Words: Optimization and upgrading of industrial structure Urbanization quality Resources and environment forced mechanism

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