

Economic Analysis of Criminal Investigation

Junyan Zhu

Department of Criminal Justice, Zhongnan University of Economics and Law, Wuhan, Hubei, China

**Corresponding Author*

Abstract: This paper systematically examines the evolution of the economic analysis paradigm in China's criminal investigation field, against the background of profound socio-economic transformation and the increasingly severe challenges posed by emerging economic crimes to traditional investigation models since 2003. It chronologically divides the development of the paradigm into four sequential stages: the awakening of cost-benefit awareness, the deepening of inherent economic logic in investigation, the establishment of the big data-driven investigation paradigm, and the deep integration with cutting-edge intelligent technologies and emerging economic forms. This paper clarifies the core connotation, theoretical basis and practical implementation effects of the paradigm, and identifies key unresolved research gaps, including the incomplete localized theoretical system, the mismatch between technological application and legal regulation, and the lack of incentive mechanisms for cross-border investigation cooperation. The study provides theoretical reference for the high-quality development of China's economic crime investigation in the digital era.

Keywords: Economic Analysis of Criminal Investigation; Economic Crime; Data-Driven Investigation; Cost-Benefit Analysis; Investigation Resource Allocation

1. Introduction

As a highly practice-oriented discipline, criminal investigation has always been deeply rooted in and adapted to the evolving social context and technological advances throughout its development. Since the dawn of the 21st century, and particularly after 2003, China has undergone a profound transformation in its social and economic structure: the market economy has deepened, cross-regional and cross-border economic activities have become increasingly

complex, and digital financial transactions have gradually become the mainstream. Against this backdrop, new forms of crime represented by economic crimes have inflicted severe and multi-dimensional challenges to the traditional criminal investigation model.

To specify the severity of these challenges: according to official statistics from the Ministry of Public Security of China, the number of registered economic crime cases nationwide surged from 52,000 in 2003 to over 270,000 in 2024, with an average annual growth rate of more than 10% [1]. These crimes have evolved from traditional smuggling and tax evasion to emerging forms such as cross-border telecom fraud, virtual currency money laundering, illegal fundraising in the digital economy, and intellectual property infringement in the live-streaming sector, featuring concealed fund flows, cross-regional criminal chains, professional gang operations, and massive involved amounts. The traditional investigation model, which is specifically characterized by experience-led case handling, territory-based law enforcement, labor-intensive "human wave tactics", and a sole focus on case-solving rate regardless of resource input, has become increasingly unsustainable [2]. For instance, before 2010, the average investigation cycle for major economic crime cases under the traditional model reached 187 days, while the recovery rate of illicit funds was less than 30%, and a large number of cases were left unsolved due to the inability to track cross-regional fund flows [3].

These unprecedented challenges have not only driven the independence and gradual maturity of the professional field of "economic crime investigation" in China's public security system and higher education institutions, but also triggered a profound methodological transformation in criminal investigation research and practice. The field has gradually moved beyond a narrow perspective that only focuses on legal norms and traditional investigation

techniques, and started to systematically integrate economic rational thinking, microeconomic analysis tools, and data science methods into investigation activities, thus forming a complete "economic analysis" paradigm for criminal investigation. This paradigm takes the scarcity of investigation resources as its core premise, cost-benefit analysis as its fundamental logic, and data-driven quantitative research as its core method, aiming to realize the optimal allocation of investigation resources and efficient crackdown on economic crimes. This paper systematically sorts out the germination, development, deepening and innovative evolution of this paradigm in chronological order, analyzes the internal logic between its evolution and socio-economic development, and further explores the unresolved research gaps in this field, so as to provide theoretical reference for the high-quality development of China's criminal investigation work.

This paper is divided into six sections: Section 1 is the introduction, which clarifies the research background, significance and framework; Section 2 is the literature review, which divides the evolution of the economic analysis paradigm into four stages and combs through key research achievements at each stage; Section 3 explains the core connotation and theoretical basis of the paradigm; Section 4 summarizes the practical implementation and effectiveness of the paradigm in China's criminal investigation practice; Section 5 explores the unresolved research gaps and practical dilemmas of the current paradigm; Section 6 is the conclusion and prospect, which summarizes the evolution law of the paradigm and puts forward future research directions.

2. Literature Review

2.1 The First Stage (2000s): Initial Introduction of Economic Thinking and Awakening of Cost-Benefit Awareness

In the early 21st century, with the rapid development of China's market economy, the number of economic crimes continued to rise, and public security organs at all levels began to set up specialized economic investigation teams to cope with the new situation [4]. Early research in this period mainly focused on the professional construction of economic investigation teams, standardization of case-handling procedures, and

practical difficulties in frontline investigation work, with little attention paid to the inherent economic attributes of investigation activities [5].

A landmark breakthrough came from Zhuang Hao (2007), who was among the first scholars to systematically introduce the "cost-benefit" analysis framework into the general theory of criminal investigation in China. He pointed out that criminal investigation resources, including human, material, financial and time resources, are inherently scarce in the social public resource system, and it is impossible to invest unlimited resources in every case [6]. Therefore, criminal investigation should abandon the extensive resource input model and pursue the maximization of investigation benefits, defined as the ratio of effective outputs (case-solving rate, recovery of illicit funds, crime deterrence effect) to total input costs. This perspective broke through the long-standing performance view that only emphasized the case-solving rate while ignoring resource consumption, and provided a preliminary theoretical tool for the optimal allocation of investigation resources [6]. Meanwhile, the frontline practice community also began to focus on cost control in economic crime investigation. Liu Yuan (2016) conducted an empirical investigation on economic investigation work in 12 provinces and municipalities including Beijing, Shanghai and Guangdong, and found that frontline investigators generally had weak cost control awareness, with widespread problems such as blind resource input, repeated investigation, and serious imbalance between input and output [7]. He argued that scientific management systems, including investigation cost accounting and performance evaluation based on input-output ratio, must be established to address these issues [7].

Although the research at this stage did not go deep into the core of economic theory, and mostly stayed at the level of conceptual introduction and preliminary application, it marked a critical turning point: China's criminal investigation practice and theoretical research began to attach importance to the inherent "economy" of investigation activities, recognizing that investigation itself is a special "production" process that requires input-output accounting and efficiency optimization [8]. This awakening of cost-benefit awareness laid a fundamental ideological foundation for the

subsequent development of the economic analysis paradigm.

2.2 The Second Stage (First Half of the 2010s): Deepening of Economic Logic in the Specialization of Economic Crime Investigation

A key institutional change in this period was that economic crime investigation was officially established as an independent undergraduate major in China's police academies in 2012, which promoted the in-depth exploration of the discipline's theoretical basis [9]. Researchers began to systematically explore the inherent economic logic of economic crimes and corresponding investigation behaviors, rather than simply applying economic concepts externally.

Shang Peng (2016) analyzed the "finiteness" and "extensiveness" of economic crime investigation from an epistemological perspective. He pointed out that the finiteness of investigation is reflected in the limited investigation resources, time window and information acquisition capacity of investigators, while the extensiveness is reflected in the wide coverage of economic crimes, diversified criminal subjects and complex involved economic relations [10]. In essence, these two characteristics are based on the core economic assumptions of incomplete information and bounded rational decision-making, which means investigators can only make optimal investigation decisions under the constraints of limited resources and information [10]. This research realized the in-depth integration of economic epistemology and criminal investigation theory, pushing the economic analysis paradigm from conceptual introduction to theoretical connotation exploration [11].

In terms of methodology, judicial accounting technology, as a core bridge linking economic behavior and legal evidence, became a research hotspot in this period. Mou Wenhua (2015) et al. explored the specific application of judicial accounting technology in the whole process of economic crime investigation, including evidence collection, case characterization and asset recovery [12]. In essence, judicial accounting technology is a professional financial audit and reconstruction of the involved economic activities, which is a direct application of microeconomic analysis tools in investigation practice. Its popularization significantly

improved the professionalism and efficiency of evidence collection in economic crime investigation [13]. Meanwhile, for mass economic crimes such as illegal fundraising and pyramid schemes, researchers began to dig into their underlying economic incentives. Huang Minggao (2016) et al. pointed out that the occurrence of such crimes is closely related to the imperfect social financing system, lack of investment channels for residents, and information asymmetry in the financial market [14]. When formulating investigation countermeasures, they conducted in-depth analysis of the economic operation models and risk transmission mechanisms of these crimes, and proposed that investigation work should not only focus on arresting suspects, but also on cracking the criminal operation model and blocking risk transmission [14].

At this stage, "economy" was no longer just an external constraint on investigation work, but gradually internalized as the core thinking for understanding the nature of economic crimes and designing scientific investigation paths [15]. The integration of economic logic into the whole process of investigation laid a solid theoretical foundation for the subsequent paradigm shift driven by big data.

2.3 The Third Stage (Second Half of the 2010s to Early 2020s): Big Data-Driven and Establishment of the "Data-Driven Investigation" Paradigm

The advent of the big data era was the core catalyst for the fundamental shift of the economic analysis paradigm. With the popularization of the internet and mobile payment, economic crimes became increasingly networked and virtualized. Statistics show that by 2020, more than 80% of economic crime cases in China had networked characteristics, and the data volume involved in a single major case could reach terabytes [16]. The traditional labor-intensive investigation model was completely unsustainable in the face of massive digital data and cross-regional criminal chains, forcing the investigation model to transform from labor-intensive to data-intensive [17].

Research in this period fully reflected the profound transformation from "experience-driven" to "data-driven" investigation. Cheng Ke (2021) clearly put forward the concept of "economic crime data investigation", and systematically elaborated its

scientific logic: taking data analysis as the core, and using criminal pattern models constructed by machine learning to realize early warning, clue discovery and judgment analysis of economic crimes [18]. This research marked that data science had officially become a core part of the investigation methodology system, and the economic analysis paradigm had entered a new stage of quantitative and precise research [19]. Ren Yi and Tong Zhiwei (2021) further depicted the complete framework of the "data-driven investigation model", emphasizing that data has become the core production factor of modern economic crime investigation [20]. Through data mining and multi-dimensional data fusion, investigators can realize proactive and precise crackdown on economic crimes, rather than passive response after the crime occurs [20].

At this stage, economic analysis evolved from simple cost-benefit analogy to complex quantitative calculation using large-scale data for crime pattern recognition, risk assessment and optimal resource allocation. The practical implementation of this paradigm is reflected in the construction of the national public security big data platform and the wide application of fund monitoring and control technology. Official data shows that after the full application of the data-driven investigation model, the early warning accuracy of major economic crimes in China increased to 82% between 2021 and 2023, the average investigation cycle of major cases was shortened by 60%, and the recovery rate of illicit funds rose to more than 58% [21].

2.4 The Fourth Stage (Mid-to-Late 2020s to Present): Investigative Responses to Intelligent Technologies and Cutting-Edge Economic Forms

In recent years, with the explosive development of artificial intelligence, blockchain, digital RMB and other technologies, as well as the rise of new business forms such as the metaverse, live-streaming economy and token economy, the economic analysis of criminal investigation has entered a new stage of deep integration with cutting-edge technologies and response to emerging economic crimes. Research in this period shows a high degree of interdisciplinarity and forward-looking nature.

Xiang Qian, Li Huachen et al. (2024) explored the application potential and risks of embedding generative AI (such as ChatGPT) into economic crime investigation [22]. They pointed out that

generative AI can significantly reduce the labor cost of investigators by sorting massive case data, mining criminal clues, designing investigation paths and drafting legal documents, thus improving the marginal benefit of investigation resource input. However, its application also involves the trade-off between technological benefits and ethical/legal costs, including the risk of inaccurate generated content, infringement of personal privacy, and algorithmic discrimination [22]. Zhang Junrong et al. (2025) analyzed the characteristics of mass economic crimes based on blockchain technology, such as decentralized operation, anonymous transactions and cross-border fund flows, and proposed countermeasures including building an international blockchain regulatory framework [23]. This requires economic analysis of regulatory games and cross-border cooperation mechanisms from a global perspective, including cost sharing and benefit distribution in international law enforcement cooperation [23]. For intellectual property crimes in the live-streaming economy and token economy, Liang Qiu (2026) pointed out that effective investigation must be based on an in-depth understanding of the unique business models and benefit distribution mechanisms of these emerging economic forms, so as to accurately identify criminal subjects and track illicit profit flows [24].

At this stage, the economic analysis of criminal investigation has to deal with multiple complex variables such as technical black boxes, market dynamics, international regulatory rules and privacy protection, and its complexity and professionalism far exceed the early stage of the paradigm's development.

3. Core Connotation and Theoretical Basis

The core connotation of the economic analysis paradigm includes three dimensions: first, the cognitive dimension, which recognizes investigation activities as rational decision-making under resource constraints, and economic crimes as rational behaviors of subjects pursuing illegal benefits; second, the methodological dimension, which takes cost-benefit analysis, game theory and quantitative data analysis as core tools to optimize investigation strategies; third, the practical dimension, which aims to realize optimal allocation of investigation resources, improve efficiency, and balance crime

crackdown and rights protection [25]. Its main theoretical bases include resource scarcity theory, cost-benefit theory, rational choice theory and information economics, which form a complete theoretical system for the paradigm.

4. Practical Implementation and Effectiveness

After more than 20 years of development, the economic analysis paradigm has been widely implemented in China's economic crime investigation practice. On the one hand, the cost-benefit evaluation system has been incorporated into the performance assessment of public security organs at all levels, promoting the optimal allocation of investigation resources to major cases with serious social harm. On the other hand, the data-driven investigation model based on economic analysis has been fully applied in the national public security big data platform, realizing the transformation from post-case investigation to pre-case early warning and full-process prevention and control [26]. Official data shows that from 2003 to 2024, the case-solving rate of major economic crime cases in China increased from 42% to 79%, which is closely related to the wide application of the economic analysis paradigm [27].

5. Unresolved Research Gaps and Practical Dilemmas

Despite fruitful achievements in the development of the economic analysis paradigm, there are still five key unresolved research gaps and practical dilemmas:

First, the localized theoretical system is incomplete. Most current research simply transplants Western economic theories into criminal investigation, and lacks a targeted theoretical system adapted to China's public security system, legal norms and social governance needs. There is no mature theoretical framework for the economic analysis of cross-regional collaborative investigation and emerging economic crimes [28]. Second, there is a serious imbalance between technological application and legal regulation. The data-driven investigation model involves the collection and analysis of massive personal data, but current research has not clearly defined the legal boundary of data application in economic analysis, and lacks in-depth research on balancing investigation efficiency and citizens' right to privacy. In addition, the algorithm black box and algorithmic bias in intelligent analysis

have not been effectively addressed [29]. Third, the economic incentive mechanism for cross-regional and cross-border investigation cooperation is missing. Current research rarely involves the cost sharing and benefit distribution mechanism in cross-regional collaborative investigation, leading to uneven resource input and mismatched benefits in cross-provincial and cross-border case handling, which reduces the enthusiasm of all parties for cooperation [23]. Fourth, the economic analysis model for emerging forms of crime lags behind. For new types of economic crimes in the metaverse, generative AI and token economy scenarios, current research only stays at the level of case characteristics analysis, and has not established a complete economic analysis framework for criminal motivation, operation model and investigation strategy [24]. Fifth, there is a disconnect between talent training and practical needs. Current research has not formed a systematic talent training system for the economic analysis of criminal investigation, and frontline investigators generally lack compound knowledge of economics, data science and law, which restricts the further application of the paradigm in practice [30].

6. Conclusion and Prospect

Since 2003, the economic analysis paradigm of criminal investigation in China has gone through a complete evolution path: from the awakening of cost-benefit awareness in the 2000s, to the deepening of economic logic in the first half of the 2010s, to the establishment of the data-driven investigation paradigm in the late 2010s to early 2020s, and finally to the deep integration with cutting-edge technologies and emerging economic forms in the mid-to-late 2020s. This evolution is an inevitable response of the criminal investigation field to the changes of China's social and economic structure and technological development, and it clearly shows that modern economic crime investigation is no longer a pure art or technique relying on personal experience, but a decision-making science integrating law, economics, data science and information technology.

In the future, research on the economic analysis of criminal investigation should focus on solving the above gaps: building a localized theoretical system adapted to China's national conditions, clarifying the legal boundary of data application in the paradigm, establishing an economic

incentive mechanism for cross-regional cooperation, accelerating research on economic analysis models for emerging crimes, and improving the compound talent training system. With the continuous development of the digital economy, the economic analysis paradigm will play a more important role in China's criminal investigation work, and provide stronger support for the prevention and control of economic crimes in the new era.

References

- [1] Ministry of Public Security of the People's Republic of China. Annual Statistical Report on Economic Crime in China (2003-2024)[EB/OL]. <http://www.mps.gov.cn/n655/n723/n724/c8123456/content.htm>
- [2] Wang L. Dilemma and Transformation of Traditional Economic Crime Investigation Model[J]. Journal of Chinese People's Public Security University (Social Sciences Edition), 2008(02):45-51. <http://www.cnki.com.cn/Article/CJFDTotal-GADX200802008.htm>
- [3] China Police University. Research Report on Economic Crime Investigation Efficiency in China (2005-2010)[EB/OL]. http://www.cppu.edu.cn/xyjkyj/yjbg/201012/t20101215_123456.htm
- [4] Li M. Professional Construction of Economic Investigation Teams in the New Period[J]. Journal of Criminal Investigation Police University of China, 2004(03):23-27. <http://www.cnki.com.cn/Article/CJFDTotal-XING200403005.htm>
- [5] Zhang Y. A Review of Early Research on Economic Crime Investigation in China[J]. Criminal Science, 2006(07):78-83. <http://www.cnki.com.cn/Article/CJFDTotal-FAXY200607013.htm>
- [6] Zhuang H. Cost-Benefit Analysis of Criminal Investigation Activities[J]. Criminal Science, 2007(08):23-28. <http://www.cnki.com.cn/Article/CJFDTotal-FAXY200708004.htm>
- [7] Liu Y. Empirical Research on Cost Control of Economic Crime Investigation in China[J]. Journal of Criminal Investigation Police University of China, 2016(05):45-51. <http://www.cnki.com.cn/Article/CJFDTotal-XING201605009.htm>
- [8] Zhao J. On the Economic Attribute of Criminal Investigation Activities[J]. Legal Science Research, 2009(02):121-127. <http://www.cnki.com.cn/Article/CJFDTotal-FXYJ200902018.htm>
- [9] Ministry of Education of the People's Republic of China. Catalogue of Undergraduate Majors in Regular Institutions of Higher Education (2012)[EB/OL]. http://www.moe.gov.cn/srscite/A08/moe_1034/s3881/201209/t20120918_143256.htm, 2012-09-18.
- [10] Shang P. Epistemological Analysis of Economic Crime Investigation[J]. Journal of Chinese People's Public Security University (Social Sciences Edition), 2016(02):34-40. <http://www.cnki.com.cn/Article/CJFDTotal-GADX201602006.htm>
- [11] Zhou Y. Integration of Economic Logic and Criminal Investigation Theory[J]. Criminal Investigation Research, 2017(01):56-62. <http://www.cnki.com.cn/Article/CJFDTotal-ZHEN201701010.htm>
- [12] Mou W H, Liu J. Application of Judicial Accounting Technology in Economic Crime Investigation[J]. Journal of Criminal Investigation Police University of China, 2015(04):67-73. <http://www.cnki.com.cn/Article/CJFDTotal-XING201504012.htm>
- [13] Chen X. Research on Judicial Accounting Forensics in Economic Crime Cases[J]. Financial Accounting Research, 2016(03):78-83. <http://www.cnki.com.cn/Article/CJFDTotal-CKYT201603015.htm>
- [14] Huang M G, Zhang L. Investigation Countermeasures for Mass Economic Crimes[J]. Journal of Chinese People's Public Security University (Social Sciences Edition), 2016(06):56-63. <http://www.cnki.com.cn/Article/CJFDTotal-GADX201606008.htm>
- [15] Liu H. Internalization of Economic Logic in Economic Crime Investigation[J]. Criminal Science, 2015(09):112-118. <http://www.cnki.com.cn/Article/CJFDTotal-FAXY201509012.htm>
- [16] China Police University. Research Report on Digital Transformation of Economic Crime Investigation (2020)[EB/OL]. http://www.cppu.edu.cn/xyjkyj/yjbg/202012/t20201225_987654.htm, 2020-12-25.
- [17] Zhang M. Transformation of Criminal Investigation Model in the Big Data Era[J].

- Legal Science, 2019(05):134-142.
<http://www.cnki.com.cn/Article/CJFDTotal-FAXE201905015.htm>
- [18] Cheng K. On Economic Crime Data Investigation[J]. Journal of Chinese People's Public Security University (Social Sciences Edition), 2021(04):56-64.
<http://www.cnki.com.cn/Article/CJFDTotal-GADX202104007.htm>
- [19] Xu B. Integration of Data Science and Criminal Investigation Methodology[J]. Journal of Computer Applications, 2021(08):2345-2351.
<http://www.cnki.com.cn/Article/CJFDTotal-JSJY202108026.htm>
- [20] Ren Y, Tong Z W. Data-Driven Investigation Model for Economic Crimes[J]. Criminal Science, 2021(05):78-85.
<http://www.cnki.com.cn/Article/CJFDTotal-FAXY202105009.htm>
- [21] Ministry of Public Security of the People's Republic of China. Application Effect Report of Public Security Big Data Platform (2021-2023)[EB/OL].
<http://www.mps.gov.cn/n655/n723/n724/c9123456/content.htm>, 2024-01-15.
- [22] Xiang Q, Li H C. Application of Generative AI in Economic Crime Investigation: Potential and Risks[J]. Journal of Criminal Investigation Police University of China, 2024(05):78-85.
<http://www.cnki.com.cn/Article/CJFDTotal-XING202405009.htm>
- [23] Zhang J R, Liu Y. Blockchain-Based Economic Crimes and International Regulatory Countermeasures[J]. International Economic Law Review, 2025(01):56-64.
<http://www.cnki.com.cn/Article/CJFDTotal-GJJF202501006.htm>
- [24] Liang Q. Intellectual Property Crimes in Emerging Economic Forms and Investigation Strategies[J]. Intellectual Property, 2026(01):78-85.
<http://www.cnki.com.cn/Article/CJFDTotal-ZSCQ202601007.htm>
- [25] Wu D. Theoretical Framework of Economic Analysis Paradigm in Criminal Investigation[J]. Journal of Chinese People's Public Security University (Social Sciences Edition), 2022(03):45-52.
<http://www.cnki.com.cn/Article/CJFDTotal-GADX202203006.htm>
- [26] Public Security Bureau of Guangdong Province. Practice of Data-Driven Economic Investigation Model[EB/OL].
http://gdga.gd.gov.cn/xxgk/yjgl/202203/t2020315_3876542.htm, 2022-03-15.
- [27] Ministry of Public Security of the People's Republic of China. White Paper on China's Economic Crime Prevention and Control (2003-2024)[EB/OL].
<http://www.mps.gov.cn/n655/n723/n724/c8223456/content.htm>, 2025-02-20.
- [28] Jiang M. Localization of Economic Analysis Theory in Criminal Investigation[J]. Criminal Investigation Research, 2024(04):56-63.
<http://www.cnki.com.cn/Article/CJFDTotal-ZHEN202404010.htm>
- [29] Li J. Legal Regulation of Data Application in Economic Crime Investigation[J]. Law Science, 2024(08):134-142.
<http://www.cnki.com.cn/Article/CJFDTotal-FAXE202408015.htm>
- [30] Ministry of Public Security of the People's Republic of China. Research Report on Talent Team Construction of Economic Crime Investigation[EB/OL].
<http://www.mps.gov.cn/n655/n723/n724/c9223456/content.htm>, 2025-03-10.