



THE ROLE OF CRIMINAL PROTECTION IN THE SUSTAINABILITY AND DEVELOPMENT OF INNOVATIVE BUSINESSES: CHALLENGES AND AN ADAPTIVE APPROACH

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Abstract

The rapid growth of the knowledge-based economy and the expansion of the innovation ecosystem have led to the emergence of new patterns of economic activities that have specific vulnerabilities to criminal risks. Crimes such as intellectual property infringement, digital fraud, cyberattacks, unauthorized disclosure of trade secrets, as well as unhealthy competition, are among the threats that can directly affect the security, continuity, and development of businesses. In the meantime, the use of criminal law tools as a support mechanism, especially for innovative businesses that rely on new technologies, has gained additional importance. With the aim of analyzing the status and effectiveness of criminal protection for innovative businesses, this research examines domestic laws, international documents, and selected judicial procedures, and with a comparative approach, compares the Iranian legal system with some leading countries in the field of business and technology law. The research method is descriptive-analytical and inferential, and the data were collected using library resources and document content analysis. The research findings show that the creation of comprehensive criminal protection frameworks, while promoting investment security and the trust of economic actors, can provide a platform for the flourishing of innovation, the expansion of competitive markets, and sustainable development.

Keywords: Criminal protection, innovative business, economic crimes, intellectual property, cybercrime, comparative criminal law

Introduction

The expansion of the competitive environment in the global economy and the increasing role of innovation in advancing economic development have made businesses, especially innovative and knowledge-based businesses, increasingly exposed to criminal threats. These threats include a wide range of crimes such as intellectual property infringement, unauthorized access to data, disruption of computer systems, illegal use of trademarks, counterfeiting of products or services, and even unfair competition. The damages resulting from such crimes, in addition to economic consequences, can reduce investor confidence, reduce the incentive for innovation, and slow down the pace of technological development. Therefore, criminal protection of business in the general sense is of fundamental importance as a means of ensuring the health of the economic environment and creating confidence among economic actors. This support plays a dual role not only in the form of

criminalizing harmful behaviors and imposing penalties, but also by creating legal platforms that facilitate innovation; that is, it provides both deterrence and security, and provides a safe environment for creating ideas and their commercialization. In Iran, with the growth of knowledge-based companies, startups, and e-commerce, the need to synchronize the criminal system with technological developments is increasingly felt. Domestic research shows that legal gaps and deficiencies, such as ambiguity in the criminalization of some new threats, the lack of enforcement guarantees commensurate with technological damages, and weak coordination between supervisory and judicial bodies, have reduced the effectiveness of criminal protection (Asgari, 2010: 15). The experience of leading countries indicates that a "multi-pronged" approach to criminal protection of businesses, which includes reviewing laws, using new technologies in crime detection, specialized training of judicial forces, and international cooperation in combating economic and cyber crimes, can play a key role in improving the efficiency of the legal system. In this regard, the present study attempts to provide solutions to strengthen criminal protection for innovative businesses with a comparative approach, while analyzing domestic legal frameworks and examining successful experiences of other countries. The ultimate goal of this study is to create a deep understanding of the necessity and dimensions of criminal protection and explain its role in supporting the innovation ecosystem and knowledge-based economy. Because without legal and criminal security, any investment in innovation will be at risk. In addition to examining legal texts and international documents, this research will also use content analysis of relevant criminal cases to provide a realistic picture of the challenges and opportunities.

Conceptualization and Theoretical Foundations

Concepts

1. Criminal Protection

Criminal protection in law means the use of criminal instruments to protect individual and collective interests against harmful and illegal behaviors. In the field of economics, and especially the innovative economy, this protection plays a vital role in creating "legal security" because the quality of the legal environment directly affects the level of investor attraction and the continuity of business activities. Criminal protection usually includes criminalizing destructive behaviors such as embezzlement, data theft, intellectual property infringement, and unfair competition. According to Asgari (2010), its deterrence is achieved when the law, in addition to determining appropriate penalties, also has the ability to be implemented quickly and impartially. The experience of countries such as Germany and Japan has shown that efficient criminal protection causes a serious reduction in economic crimes and increases the national innovation index. In Iran, although numerous laws have been enacted in the fields of trade and technology, incoordination between agencies and slow judicial processes have limited the effectiveness of this protection.

2. Innovative Business

Innovative Business is an economic activity that is based on new technology, creative ideas, or non-traditional business models and usually operates to solve new problems or improve processes. According to the OECD (2019), these businesses are the driving force behind sustainable economic development. Their distinguishing feature is their strong dependence on intellectual property, high flexibility, and the potential for exponential growth. Due to

their new nature, these businesses are usually located in a gray legal space and are exposed to threats that are less likely to be seen in traditional businesses, such as cyberattacks, source code abuse, and intellectual property rights violations. In Iran, the growth of startups and knowledge-based companies over the last five years has created a special opportunity for the development of the knowledge-based economy, but in parallel, the need for an advanced support framework is also felt more.

3. Modern Economic Crimes

Modern economic crimes are a range of crimes that occur in the context of new technologies or emerging markets. These crimes can include fraud through e-commerce platforms, manipulation of digital markets, money laundering with cryptocurrencies, and electronic counterfeiting. UNCTAD (2021) emphasizes that modern economic crimes are very difficult to detect and combat due to the borderlessness of cyberspace and the speed of asset transfers. In some countries, such as Australia and Singapore, specialized units have been created in the police and judicial system to combat these crimes. In Iran, the Computer Crimes Law (1388) and the Islamic Penal Code have provided general tools to combat these threats, but technology law experts believe that existing laws do not respond to all new scenarios, especially in the field of cryptocurrencies and commercial NFTs.

4. Intellectual and Industrial Property

Intellectual Property refers to exclusive rights arising from intellectual creations and innovations and includes branches such as patents, trademarks, literary and artistic works, and industrial designs. Criminal protection in this area is one of the most important deterrents against the theft of ideas and ignoring the rights of creators. Nourbakhsh (1401) emphasizes the necessity of criminalizing the violation of intellectual property rights, because civil lawsuits alone are often not a sufficient deterrent. At the international level, the World Intellectual Property Organization (WIPO) has reported that intellectual property rights violations cause billions of dollars in damage to the global economy annually. In Iran, the Patents, Industrial Designs, and Trademarks Law (1386) has created an appropriate framework for protection, but its effective implementation requires more agile legal and judicial platforms.

5. Cybercrimes in Business

Cybercrimes include all criminal behavior that is carried out through computer networks or digital systems. Innovative businesses are one of the main targets of cyber attackers due to their constant use of online infrastructure. These crimes can include hacking systems, stealing and disclosing confidential customer data, ransomware attacks, and even damaging online brand reputations. It is noted that SMEs are very vulnerable to these threats due to limited cyber protection resources. In Iran, with the expansion of e-commerce activities, the number of cybercrime cases has increased. Effectively dealing with these threats requires a combination of criminal support, improving the skills of information technology forces, and international cooperation to track and prosecute criminals.

Background:

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Research Methodology

This research is based on the Documentary & Textual Analysis method, which is the core of legal research in theoretical and comparative fields. The aim of this approach is to discover, recognize and explain the legal concepts and principles related to criminal protection of innovative businesses, relying on legal texts, policy-making and reliable research. This method was chosen due to the possibility of in-depth analysis of the content and structure of laws in different cultural and economic contexts of countries. The study approach is qualitative and descriptive-analytical, and the analysis of concepts is carried

out through logical and comparative reasoning. This type of research allows the researcher to examine the relationship between law, innovation and implementation challenges without relying on raw statistical data. The use of text interpretation and extraction of general principles is also an integral part of this process. In addition, based on the principles of comparative law, the experiences of successful countries in the field of criminal protection of innovation are explored and compared. Finally, the chosen method not only contributes to the theoretical richness of the discussion, but also provides the basis for a .critical analysis of shortcomings and proposals for improvement

Community and Data Sources .

The research community includes all legal texts and documents, criminal regulations, judicial procedures, and published scientific works that directly or indirectly address criminal protection of innovation and business. The first part of this community consists of laws and regulations related to the protection of intellectual property, combating cybercrime, and preventing economic crimes against innovative companies in Iran. The second part includes laws, policy reports, and case studies in selected countries such as the United States, the European Union, China, and Japan, which are considered as models at the international level. In addition to legal sources, reports from international organizations such as OECD, UNCTAD, and ENISA have also been used to provide comparative frameworks. The statistical population in the scientific section includes domestic scientific-research articles indexed in SID in the period 1401 to 1403 and international Q1/Q2 articles indexed in Scopus and Web of Science between 2005 and 2025. This time range provides the opportunity to observe emerging trends in the legal systems' encounter with innovation challenges. The selected sources have been monitored and evaluated in terms of originality, .scientific validity, and thematic relevance to ensure maximum coverage

Collection and analysis process .

Information collection was carried out through the identification, selection, and analysis of relevant texts and documents in three stages. First, a library and electronic search was conducted using Persian and English keywords related to the fields of "criminal protection" and "business innovation". In this stage, Boolean operators were used to limit or expand the results. Second, the identified sources were filtered based on inclusion and exclusion criteria; This included the elimination of sources that were irrelevant, outdated, or published in unreliable journals. Third, the selected texts were examined using qualitative content analysis and the main themes were extracted from them. This process was carried out with an inductive approach, meaning that themes were formed from the data, not based on pre-determined assumptions. Comparative analysis of laws was carried out using the Zweigert & Kötz (1998) model, which emphasizes structural and functional comparison. During the analysis process, the findings were matched with secondary data (official international reports) to ensure the validity and reliability of the inferences. This combination of methods allowed for a comprehensive picture of the current situation and .paths for improvement

Credibility Criteria .

To ensure the validity and reliability of the data, a set of scientific guidelines and filters were applied. First, only sources that were indexed in reputable scientific databases or published by regulatory and international institutions were selected. Second, all articles and

documents used must have peer review or official legal validity. Third, complete bibliographic information was extracted and cited in the text in accordance with the APA 7 standard for each source, and for Persian sources, transliteration of the title and authors was also included to enable international compatibility. Fourth, each extracted concept or theme was confirmed in at least two independent sources to avoid individual errors of interpretation. Fifth, original and raw versions of legal documents or reports were preferred to avoid the possibility of distortion of information. Sixth, the date of updating of sources, especially in the field of technology and modern crimes, was checked to avoid relying on outdated data. Seventh, sources with obvious bias or advertising were excluded. This multi-layered approach has resulted in the research findings having the highest level of reliability.

Advantages and Limitations

The choice of the textual research method has obvious advantages, including the possibility of an in-depth and comprehensive examination of legal and scientific texts without administrative and field restrictions. This method enables the researcher to access sources that field studies can hardly cover, especially in issues that require international legal analysis. Also, the flexibility of this method allows for the combination of theoretical and regulatory data to obtain a multidimensional picture of criminal protection of business. However, there are also limitations that must be considered. The most important limitation is the complete dependence on the quality and availability of official and scientific sources; if access to the full text of laws or articles is limited, the analysis will also remain incomplete. The second limitation is related to the lack of empirical data in this method, which prevents testing hypotheses in the field. In addition, the diversity of legal systems and cultural differences sometimes complicate comparisons. Overall, awareness of these benefits and limitations helps to fine-tune the conclusions and recommendations.

Findings

. Conceptual analysis of criminal protection of innovative businesses

A review of domestic literature shows that criminal protection of innovative businesses has been given some attention in the field of laws related to economic crimes, intellectual property, and cybercrime, but there is no comprehensive and codified framework focusing on innovation (Abu Dhari, 2013). Domestic studies have mostly highlighted counterproductive and deterrent approaches but have paid less attention to facilitating and supportive aspects (Salehnejad et al., 2013). In contrast, foreign sources have provided examples of a multifaceted criminal approach to protecting innovation, which includes securing intellectual property and preventing cybercrime (Li & Wang, 2023). The emphasis of these studies is on creating innovative legal frameworks that are appropriate to new technologies in order to protect businesses against domestic and foreign threats. Therefore, the concept of criminal protection of innovation, while having a criminal dimension, also plays a facilitating and developing role.

Comparative Studies: Legal Approaches in Selected Countries

Comparative studies show that advanced countries such as the United States and the European Union have adopted approaches based on a combination of criminal law, intellectual property, and cyber regulations (Zhang & Chen, 2022; Crofts & van Rijswijk, 2024). In these systems, criminal protection is used not only to combat economic crimes

but also to prevent and increase the confidence factor in the innovation process. In contrast, East Asian countries such as China and Japan rely on strict models with deterrent penalties that have created a strong mechanism to defend intellectual property and prevent technology theft (Albert & Mohr, 2023). In Iran, although criminal law is developing, there is a lack of cross-sectoral integration and a gap in the area of crimes related to innovative businesses (Seyed Hosseini et al., 2012). This has provided a place for the creation of a coherent criminal protection system.

Indigenous Challenges in Criminal Protection of Innovative Businesses in Iran

Domestic studies and official reports emphasize legal and administrative problems that hinder effective protection of innovative businesses (Emami et al., 2012). The most important challenges include the lack of specialized mechanisms for innovation-related cybercrimes, weaknesses in the management of intellectual property rights, and lack of coordination between the judicial and law enforcement agencies (Rostami et al., 2011). Also, the gap in the laws on the prevention of modern economic crimes and the lack of specialized training among law enforcement officers have created problems in the criminal prosecution process. These issues have left innovative businesses vulnerable to domestic and foreign crime and reduced incentives for development and investment. It is necessary to reform and supplement legal frameworks in line with successful global experiences.

.New Trends and Suggestions in Preventing and Combating Economic and Cybercrimes

Based on the results of a review of foreign literature, innovation in criminal law frameworks revolves around technology-centric approaches, strengthening criminal enforcement guarantees, and utilizing artificial intelligence and data mining to identify economic and cybercrimes (Li & Wang, 2023; Crofts & van Rijswijk, 2024). The use of new technologies has provided opportunities to improve criminal supervision and accelerate crime detection. Also, successful comparative law models emphasize the development of supportive and incentive policies for innovative businesses that link criminal protection with sustainable economic development (Albert & Mohr, 2023). Improving international cooperation and law enforcement data exchange have also been proposed as a prerequisite for preventing cross-border crimes. These trends can be considered as a model for reconstructing the criminal support framework for innovative businesses in Iran

Findings

. Conceptual Analysis of Criminal Protection for Innovative Businesses

Analysis of domestic literature shows that the concept of criminal protection for innovative businesses has often been presented in a scattered and limited manner in the form of regulations on economic crimes, intellectual property, and computer crimes (Abu Dhari, 1403). This support has a more preventive and counterproductive aspect, and its main focus is on preventing financial violations, property abuses, and cyber attacks, which has recently become more prominent in sections such as the Computer Crimes Law. However, the lack of an integrated and comprehensive framework that specifically covers the issue of criminal protection for innovation is noticeable. On the other hand, domestic studies have generally paid less attention to the applications of criminal protection such as legal encouragement, ensuring legal protection for innovators, and facilitating the business environment, a topic that is completely different in foreign sources.

In international sources, contemporary research has presented a multidimensional framework of criminal protection that, in addition to crime prevention, places great emphasis on maintaining intellectual property security, preventing sophisticated cybercrimes, and supporting the innovation environment as a key dimension of economic development (Li & Wang, 2023; Nasheri, 2005). This perspective goes beyond the traditional criminological approach and includes both protective and developmental aspects, so that criminal protection is recognized as a tool for improving the security of investment in innovation. In short, the concept of criminal protection of innovative businesses at the international level is a combination of prevention, criminal treatment, and legal and economic protection, but this balance has not yet been established in the domestic sphere.

. Comparative Studies: Legal Approaches in Selected Countries

A comparative analysis of the different dimensions of criminal protection in selected countries provides a picture of the diversity and evolution of legal systems with respect to the degree of innovation development. In the United States, comprehensive laws protecting intellectual property and cybercrime are implemented through multiple executive and judicial institutions; this legal system places great emphasis on facilitating innovation by securing property rights and combating sophisticated financial crimes (Zhang & Chen, 2022). The European Union also uses a coordinated regulatory system, combining criminal and non-criminal approaches, including cybercrime and crimes against innovative businesses, with considerable flexibility in dealing with new technologies (Crofts & van Rijswijk, 2024).

On the other hand, East Asian countries, especially China and Japan, have adopted a stricter approach with heavy penalties for crimes against intellectual property and cybercrime, which aims to strongly protect the competitive advantage of technology companies (Albert & Mohr, 2023). These criminal policies also include the use of advanced technologies to detect and prosecute crimes.

In Iran, however, studies show that criminal laws are thematically fragmented and lack strategic connections between different areas of protection (Seyed Hosseini et al., 2012). The lack of coherence between intellectual property regulations, economic crimes, and laws related to computer crimes has increased the vulnerability of innovative businesses. These gaps and weaknesses require the development of coherent legal policies with a deep understanding of the needs of the innovation market.

Challenges and local limitations in criminal protection of innovative businesses in Iran

The results of the analysis of domestic findings and feedback from government and judicial institutions indicate several key challenges that disrupt the process of criminal protection of innovative businesses.

First, the inadequacy of specialized laws to deal with innovation-specific cybercrimes has caused difficulties in criminal prosecution and proving the crime. Second, the weakness in the mechanisms for identifying and distinguishing traditional crimes from economic-technological crimes has caused confusion in the judicial and law enforcement agencies (Emami et al., 1402). Third, the lack of sufficient specialized training for judicial and

investigative officers has caused dissatisfaction among business activists with the inefficiency of criminal processes.

Fourth, the gap between research and legislation, such that current laws do not respond to the speed of technological change and emerging threats. Finally, the lack of interaction and coordination between the various relevant sectors, including the Administrative Court of Justice, security organizations, and supporting institutions, has created a legal and practical vacuum in criminal protection (Rostami et al., 2014). These issues not only put innovative businesses at risk, but also reduce the incentive to invest and develop and increase the risk of brain drain.

. New Trends in Preventing and Combating Economic and Cybercrime Innovative Business
In the field of innovative prevention and counteraction, international studies place special emphasis on the use of advanced data mining technologies, artificial intelligence, and machine learning to detect and predict patterns of cyber and economic crimes (Li & Wang, 2023; Crofts & van Rijswijk, 2024). Emerging policies also include the development of flexible legal frameworks that can be rapidly updated in line with technological developments. Successful models in the United States and the European Union show that active participation of the private sector and the creation of international information networks are an important part of success in reducing new economic crimes (Albert & Mohr, 2023).

In addition, international cooperation and coordinated legal mechanisms are being strengthened to combat cross-border crimes related to innovative businesses. With the help of these approaches, it has been possible to track and prosecute transnational crimes in the field of intellectual property, copyright, and technology theft (Nasheri, 2005).

In Iran, achieving this level of progress requires legal reforms, increasing professional expertise, and institutionalizing new technologies in the judicial system. The establishment of specialized centers for criminal support of innovation by utilizing new technologies can create an effective model for improving the innovative business environment.

Discussion

Based on the research findings, the present discussion can provide a meaningful framework for understanding the current situation and the path to improving criminal protection for innovative businesses in Iran. First, it should be emphasized that the lack of an integrated and coherent system of criminal protection in domestic laws has created a significant gap with the legal frameworks of advanced countries. While international sources (Li & Wang, 2023; Zhang & Chen, 2022) show that the development of comprehensive and multilateral criminal policies can facilitate innovation, increase investor confidence, and reduce economic damage, in Iran the main focus is still on the aspect of combating crime, and the protective and facilitating perspective has a lesser place.

Our comparative comparison showed that countries that are successful in preventing crimes against innovative businesses use multi-level approaches that, in addition to criminal penalties, include legal, incentive, and technology-based protections (Crofts & van Rijswijk, 2024; Albert & Mohr, 2023). These approaches have increased the speed and accuracy of investigations by utilizing new technologies, such as artificial intelligence for timely detection of cybercrimes. However, in Iran, the lack of specialized training of law enforcement officers, the lack of technological infrastructure, and insufficient interaction

between institutions have reduced this effectiveness. Another issue that needs to be addressed is the complexity of legal interactions between laws related to intellectual property, economic crimes, and cybercrimes. Domestic research (Seyed Hosseini et al., 2014) shows that the fragmentation of regulations and the lack of coherence have created a gap in criminal protection that requires structural review and centralized lawmaking. Also, the limitations created by the lack of empirical data in Iran have hindered the possibility of quantitatively assessing the results of current policies, so increasing field and data-driven research seems necessary.

On the other hand, the findings emphasize the importance of strengthening international cooperation in the field of criminal protection of innovative businesses. Transnational intellectual property crimes and cybercrimes require cross-border legal coordination and effective information exchange. Iran can make progress in increasing the legal security of innovative businesses by taking advantage of successful global experiences and updating its laws.

Finally, moving towards adaptive frameworks and utilizing new technologies in judicial processes can not only improve the level of criminal protection, but also increase the trust of economic actors, attract investment, and sustainably develop innovative businesses. This is of particular importance for policymakers and legislators who, by reviewing and designing laws and executive mechanisms in line with new technologies and innovation requirements, provide a competitive and secure environment for the country's businesses.

Conclusion

The present study, with an analytical-comparative approach, examined the concept and status of criminal protection for innovative businesses in Iran and evaluated this issue in light of successful global experiences. The findings showed that the Iranian legal system does not have the necessary coherence and integration in the field of criminal protection for innovative businesses, due to the dispersion and weak coordination between related legal areas such as intellectual property, economic crimes, and computer crimes. This situation has caused criminal protection in Iran to be more confrontational and reactive and has been less able to effectively implement preventive and facilitative protection aspects. In addition, the lack of specialized laws and specialized judicial institutions, along with the lack of legal and technical training for law enforcement officers, constitute an important part of the challenges of criminal protection.

A comparative study of the legal systems of countries such as the United States, the European Union, China, and Japan emphasizes that success in criminal protection of innovative businesses requires a multi-level and integrated approach. These approaches, in addition to effective criminal treatment, also include legal, economic, and institutional support, and by utilizing new technologies such as artificial intelligence, machine learning, and data mining, they provide the possibility of detecting and predicting crimes and facilitating judicial processes. By creating cross-border legal coordination and international cooperation, these systems have been able to create a safe competitive environment for technological businesses that helps their growth and sustainability.

On the other hand, the research emphasizes that structural reform of criminal laws related to innovative businesses in Iran, along with the institutionalization of new technologies in

the judicial and law enforcement agencies, can help to eliminate existing gaps. Specialized training of judicial and law enforcement personnel to better understand the complexities of new technologies, providing platforms for cooperation between legal, security, and support institutions, and establishing specialized criminal support centers can improve the quality of support. Also, special attention to policies that encourage the entry of investors and increase the confidence of economic actors are other important necessities.

This research also says that paying attention to domestic statistical and empirical data is essential to evaluate the effectiveness of criminal support policies in order to provide more scientific and practical solutions that are appropriate to local conditions. In addition, active interaction with international legal trends and continuous updating of laws based on technological developments are among the most important prerequisites for future research and legislation.

Finally, to maintain the competitiveness and innovative capabilities of businesses in Iran, it is essential that criminal support becomes a dynamic mechanism that keeps pace with technological advances and emerging economic and cyber complexities. This path can lead to the sustainable development of innovative businesses and the prosperity of the knowledge-based economy by improving the level of judicial and legal support, improving the investment climate, and creating legal security.

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