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Risk Early Warning Assessment And Governance Strategies For Digital Economic Security In China

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Abstract Economic structure, cultural dynamics, and governance paradigms have all been impacted by the rapidly expanding digital economy in China. This article examines at how China's digital environment is changing and what it means for security flaws. The research emphasises the necessity for a methodical structure to recognise risks, manage them, and support sustainable growth. There is a more serious risk of cyberattacks, data breaches, and disruptions because of China's digital ecosystem's interconnection, which includes e-commerce, finance, AI, and big data. To analyse the data, unit root test, cointegration analysis, causality analysis and VAR (Vector autoregressive) Models have been applied to check the stationary of data, and long-run relationships among the variables. To inform policymakers, business stakeholders, and academics, the project examines comprehensive techniques for risk assessment and regulation. The paper emphasises how crucial it is to create flexible policy frameworks, public-private partnerships, regulatory compliance, openness, and global collaboration when creating successful governance strategies for the digital economy. The research hopes to add to worldwide conversations about the safe and sustainable future of China's digital economy.

Keywords: Digital economy, Risk, Cybersecurity, Threats, Governance Strategy

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Introduction

In the whole world, the rapid growth of digital technology has resulted in a new era of previously untapped potential and difficulties (Dong, Zhu, Zhong, Shi, & Liu, 2021; Yang, Liu, Lv, Ai, & Li, 2022). China has been at the centre of utilising the potential of the digital economy to support its development as a worldwide leader in technical innovation and economic prosperity (Pernot-Leplay, 2020). China's digital ecosystem, which includes e-commerce, fintech (financial technology), artificial intelligence, and big data, has grown exponentially, and these advances have drastically altered the nation's economic structure, societal dynamics, and governance paradigms (Li *et al*, 2020; Bo et al, 2021). With its developments in AI, 5G infrastructure, and supercomputing, China has shown impressive advancements in technology.

In AI, with the support of China's government, tech companies such as Alibaba, Tencent, and DeepSeek have released AI models that rival or surpass their American counterparts. DeepSeek introduced a superior open-source AI model in 2024, demonstrating China's rapid progress in AI capabilities. Similarly, China surpassed 800 million 5G connections at the end of 2023 and is projected to exceed 1 billion by the end of 2024, showcasing the country's rapid deployment and adoption of 5G technology. Not only 5G, but China is also pushing ahead with the development of 5G Advanced (5G-A) technology, aiming to enhance speed, coverage, mobility, and power efficiency. This initiative is part of the country's efforts to upgrade its traditional network infrastructure and pave the way for 6G technological research. Whereas the Tianhe supercomputer, developed by the National University of Defence Technology has been ranked at the top of the global computing efficiency list for artificial intelligence, marking its second win since 2021. As a result, the nation is now recognised as a pioneer in technical innovation.

Furthermore, the world's largest e-commerce market is in China, where platforms like Alibaba's Taobao and Tmall are changing retail dynamics and customer behaviour. The development of online payment methods like Alipay and WeChat Pay has also been aided by this transition.

However, new levels of security vulnerabilities and threats have evolved in China with the growing integration of digital technology into every aspect of everyday life and vital infrastructure (Yang, Zhao, Han, Liu, & Yang, 2022; Han, 2021). Cyber-attacks, data breaches, and systemic disruptions have all increased in tandem with the expansion of the digital economy and represent serious dangers to China's economic stability and national security (Aldasoro, Gambacorta, Giudici, & Leach, 2022; Schlackl, Link, & Hoehle, 2022). To protect this dynamic digital environment, a systematic framework for identifying risks and reducing them while promoting

sustainable growth is required (Yang, Zhao, Han, Liu, & Yang, 2022). To analyse the data, unit root tests, cointegration analysis, causality analysis, and Vector Autoregressive (VAR) models were employed to examine the stationarity of the data and the long-run relationships among the variables. China's global role in digital policy and governance is both significant and distinctive. Initiatives like the Digital Silk Road under the Belt and Road Initiative further demonstrate China's efforts to export its digital infrastructure and governance principles, shaping global digital norms and challenging existing frameworks. China's e-commerce market is the largest globally, accounting for approximately 50% of worldwide online retail transactions. In 2022, retail e-commerce sales in China reached approximately $2.68 trillion, reflecting a 6.1% year-on-year growth. Dominating the market, Alibaba held a 46% share, with 27.2% in 2023. In terms of cybersecurity, China has experienced a notable escalation in cyberattacks. Between the second and third quarters of 2022, the country witnessed a staggering 4,852% increase in data breaches, leading to over 14 million breached accounts. In 2021, approximately 34 million accounts were exposed in online data breaches, affecting an estimated 2.4% of the population. These figures highlight the growing frequency and severe impact of cyberattacks in China.

This research article aims to explore the complex interactions between China's booming digital economy and the need for strong security measures. Firstly, our research seeks to offer a comprehensive knowledge of the complex issues brought on by the fast digitalization, investigate potential weaknesses in the digital economy, and suggest a futuristic method for risk early warning assessment and regulation. Secondly, this study aims to provide useful views for policymakers, industry stakeholders, and academics interested in the sustainable growth of China's digital economy by synthesising findings from both the technology and policy components. A remarkable rate of growth and innovation have characterised China's digital economic transition. A wide range of sectors and industries that have been significantly touched by digital technology are included in this revolution. Cloud computing, big data analytics, artificial intelligence (AI), e-commerce, fintech (financial technology), and the Internet of Things (IoT) are just a few of the fields that have seen impressive breakthroughs and integration into numerous facets of everyday life and corporate operations (Das, 2017). By noticing all these technologies, numerous security threats and weaknesses that have the potential to put at risk economic stability, disrupt essential services, and risk data privacy have been brought about by the fast rise of China's digital economy.

Digital Infrastructure Investment:

The Chinese government has made large expenditures in data centres and 5G networks, among other types of digital infrastructure (Bartholomew, 2020). This has opened the way for more technical development and wider use of digital technology (Woyke, 2018). Due to its enormous population and expanding middle class, China has a sizable customer base for digital services, including mobile applications for different uses and online commerce (Xie & Wang, (2023). These changes have resulted in a broad and extremely dynamic digital economic landscape in China. Traditional sectors have been impacted by the digital economy, which has introduced new business models, increased efficiency, and fuelled economic development. The quick development of digital technology has also revealed weaknesses that hackers, state-sponsored actors, and other malevolent groups may exploit, so this change is not without its difficulties (Lindtner, 2015).

To understand the larger environment in which digital economic security threats and problems emerge, it is crucial to know the many dimensions of China's digital economic model. It lays the groundwork for examining the requirement for risk assessment and governance plans that can guarantee the long-term development and safety of China's digital economy.

Cybersecurity Threats:

As digital systems become more interconnected, the threat landscape has evolved to include various types of cyberattacks, such as advanced persistent threats (APTs), ransomware, and distributed denial-of-service (DDoS) operations. These attacks can target private companies, public organizations, and individuals, leading to financial losses and reputational harm (Du & Chintakovid, 2023). The expansion of digital services has resulted in the collection and storage of large volumes of sensitive and personal data (Creemers, 2022). Ensuring the security and privacy of this data is essential for maintaining public trust and complying with data protection regulations (Creemers, 2023). Data leaks and breaches can have significant financial and legal consequences. Furthermore, managing complex regulatory frameworks requires balancing innovation and security. Crafting policies that foster technological innovation while safeguarding against misuse is a challenging yet essential task (Facchinetti, Osmetti, & Tarantola, 2023).

Supply Chain Vulnerabilities:

In the digital economy, supply chain interconnectedness can lead to vulnerabilities that go beyond what an organisation can directly manage. It's possible for third-party suppliers and service providers to unintentionally create security flaws that might be used against you (Shishodia, Sharma, Rajesh, & Munim, 2023). Any interruption might have a ripple impact on

crucial services and public safety as digital technologies grow ingrained in crucial infrastructure sectors like electricity, transportation, and healthcare. Furthermore, digital platforms may be used to distribute false information and disinformation, which can have negative effects on society, the economy, and politics by undermining public confidence and upsetting social cohesiveness.

It's crucial to understand how dangers in the digital ecosystem evolve in order to handle these risks and vulnerabilities. A comprehensive strategy for digital economic security involves not just avoiding and responding to specific occurrences but also developing resilience to meet new challenges and adapt to shifting threat environments. The article intends to shed light on approaches for proactive risk assessment, early warning systems, and efficient governance frameworks that might lessen the impact of these vulnerabilities on China's digital economy by examining these issues.

Governance Strategies:

Effective governance measures are vital for ensuring the sustainable development and security of the digital ecosystem, particularly within the rapidly evolving digital economy in China (Chen, Xu, Lyulyov, & Pimonenko, 2023). Developing and implementing policies that support innovation while mitigating risks necessitates collaboration among governmental organizations, businesses, academic institutions, and international partners. A governance approach should foster a culture of cybersecurity awareness and accountability, empowering individuals and organizations to play an active role in safeguarding the digital economy.

Adaptive Policy Frameworks:

Traditional regulatory strategies could find it difficult to keep up with how quickly technology is developing. To meet the constantly shifting danger landscape, adaptive policy frameworks are necessary. These frameworks provide the flexibility to modify legislation in response to new hazards (Fornes & Altamira, 2023).

Public-Private Collaboration:

Developing comprehensive security solutions necessitates cooperation between the public and private sectors. Through this relationship, knowledge, threat intelligence, and resources may be shared, resulting in more effective cybersecurity measures (Lalwani & Tripathi, (2023).

Regulatory Compliance:

Innovation and security must be balanced in regulations. It is easier to guarantee that organisations and people follow best practices when there are clear rules on cybersecurity standards and data protection (Creemers, 2023).

Transparency and Accountability:

Effective governance must promote openness in data handling procedures and make people and organisations responsible for security lapses. As a result, stakeholders and users are more trustworthy (Jiaqi, 2023).

International Cooperation:

The security of one country's digital environment has wide-ranging effects outside of its borders since the digital economy has no geographical bounds (Xiaoming & Jiawen, 2018). The efforts China takes to secure its digital economy might have geopolitical repercussions due to its status as a global technical superpower. While worries about state-sponsored cyber operations might deteriorate international relations, cooperative cybersecurity measures and information exchange can promote confidence between states.

Similarly, because supply chains are integrated on a global scale, weaknesses in the digital ecosystem of one nation might spread throughout the whole network (Hammi, Zeadally, & Nebhen, 2023). A vulnerability in China's digital infrastructure may influence businesses and sectors globally. Further, China's approach to digital economic security, particularly its governance methods and legislative frameworks, may have an impact on the creation of global cybersecurity and data protection norms and standards (Hou, 2023). Collaboration between states can result in the development of universal standards that improve global cyber security.

Ultimately, the goal of the study academic essay on "Risk Early Warning Assessment and Governance of China's Digital Economic Security" is to give a thorough examination of the complicated issues that arise when digital economic growth and security collide. This article aims to provide practical insights for policymakers, industry stakeholders, and researchers by exploring the complexities of China's digital economic landscape, developing dangers, and techniques for risk assessment and governance. In the end, it hopes to contribute to the current discussion about the creation of a safe, successful, and sustainable digital future for China and the rest of the globe.

Literature Review

Since the late 1990s, researchers have been considering the implications of the digital economy but faced some difficulties in handling Cybersecurity Threats, Data Privacy and Protection, and Sustainability and Environmental Impact. The industrial structure is influenced by the digital economy (Liu & Chen, 2021). Based on the three elements of digital infrastructure, digital industrialization, and industrial digitalization, they construct an extensive index system for the growth of the digital economy. They then assess the state of China’s digital economy using the time-series-global principal component analysis approach. This measurement method

demonstrates the level of development of the digital economy from the viewpoint of quantitative indicators.

The growth and expansion of cyber security threats are also considerably influenced by the digital economy (Fokina & Barinov, 2019). Furthermore, According to Puchkova (2019), the development of a digital economy encourages the use of cutting-edge technology and company expansion. Mentsiev, Guzueva, Yunaeva, Engel, and Abubakarov (2019) provided proof that a digital economy enables companies to use the Internet to expand their market reach and so create economic value (Davies & Ng, 2015). Furthermore, Data Privacy and Trust Issues, Digital Divide, Ethical and Social Concerns, and Sustainability and Environmental Impact are also the challenges to be discussed. According to Lyapuntsova, Belozerova, Drozdova, Afanas'ev, and Okunkova (2018), exploiting the digital economy has dangers and difficulties that cannot be avoided and endanger the creation of new business models. Consumer digital literacy is crucial in this situation. As a result, companies, clients, and the government will be able to set up a new information-based economic system and improve the exchange of goods and services thanks to the widespread adoption of digital technology and the digitalization of industries (Li & Shen, 2019). Although the digitalization of the financial sector has received particular attention in the field of financial science and technology, it also offers serious risks to the environment and operations of China's economy.

In the US and the EU, the notions of privacy and data protection are intertwined (Creemers, 2022; Pohle, 2018). In order to protect consumer and constitutional rights, they generally refer to the prevention of harm to people utilizing information about them. In other words, liberal ideas of the rule of law and economic principles are commonly associated with the concept of privacy (Lindsay, Cheung, & Reveron, 2015). The Chinese leadership's perceptions and concerns have changed as a result of the rapid adoption of digital technologies in their government, economy, and society, as well as the potential repercussions of various forms of data abuse (Lovelock, Clark, & Petrazzini, 1996). These changes have been largely reflected in the development of data protection regulations. Each of the interconnected steps in this process has its own risks and legal obligations.

One of them is the installation of electronic government systems, which began with the "Golden Projects" of the 1990s and is still continuing strong today with the aid of a fresh five-year plan for governmental information technology (National Development and Reform Commission, 2021). The multi-level protection system (MLPS), which was finished in 2007, has five security protection levels, with higher tiers requiring more regulations and government oversight. There was no data protection offered by the MLPS.

Instead, it created a system of progressive security that shielded all network systems including their data from all threats. According to the "national security, the veins of the economy, and social stability" viewpoints (National Information Security Standardization Technical Committee, 2003), it built a conceptual and institutional framework for the defence of digital assets.

As the big data era has begun, the country's economic sectors are currently the main areas of development (Lu, 2017). Big data has an effect on banks, who control a significant portion of the financial and economic sector, in terms of risk management and control. To control financial risks, a solid early warning system for the economy is necessary. Early warning systems for detecting risks require standardized multi-dimensional data collection, modeling, and analysis, extensive system and expert integration, and ongoing dynamic optimization in accordance with the external economic environment and regulatory constraints (Jiang, Zhang, & Zheng, 2017).

Relationship between China's Sustainable Growth Before the Pandemic and the Digital Economy

Due to the decrease of natural resources and the rise in environmental breakdown, many people are becoming more conscious of the need to conserve resources and safeguard the environment. To successfully resolve current tensions, sustainable development takes into account the management of economic and social growth with people, resources, and the surroundings. All nations' economic and social growth will inevitably follow this path. In the following ways, the digital economy supports sustainable development:

Encouraging Quick Economic Growth

Data, advanced computing, artificial intelligence, and modern technologies such as 5G play a crucial role in driving rapid economic growth, particularly in the digital economy. Digitalization and industrialization are key components of this economy, with data becoming increasingly important for social and economic development. It transforms traditional development processes, acts as a new production factor, and enhances resource allocation, productivity, and market competitiveness (Turcan, Gribincea, & Birca, 2014). Data also fosters innovation, accelerates economic sector transformation, and supports the digitalization and modernization of industries. Moreover, its effective use strengthens supply chain resilience, enabling quick responses to external shocks.

Improvement in People's Living Conditions

The computerized economy is developing and meeting individuals' more elevated level requirements for a superior living while likewise satisfying individuals' basic life necessities (Insightful, 2014; Litvintseva & Karelin, 2020). A new rush of purchaser updating has been unequivocally fuelled by continuous development and promotion of computerized innovation, which is

persistently working on the nature of one's computerized life. For example, shoppers might utilize online businesses from the solace of their own homes to purchase dress, footwear, and different products. Furthermore, buyers might utilize online medical care administrations to fix specific normal sicknesses, access more far reaching and top-notch instructive materials through web-based schooling, request home conveyance administrations for dinners when they don't want to cook or going out to eat and use e-hailing to set aside time and cash.

Improving of Environmental Security

The biological climate was effectively altogether hurt by the past way of fast monetary extension; nonetheless, the advanced economy may effectively resolve the issue. Computerized innovation's acknowledgement and use may altogether increment asset effectiveness, increment the capacity to fix poisons, and lower contamination emanations (IISD, 2010). Furthermore, using web of things (IOTs) innovation for online ecological observing could increase the expectation of natural security oversight. Ecological insurance organizations might do natural quality assessment, determining and early admonition checking, and ecological effect evaluation by fostering a distributed computing stage for ecological IOT information assets. The pertinence, arranging, and adequacy of natural assurance may be generally worked on by the total utilization of immense ecological insurance information.

Research Hypothesis

Based on the existing literature, the following hypothesis has been developed:

H_1: There is significant positive relationship among China's Digital Economy and GDP

H_2: There is significant positive relationship among China's Digital Economy and people's living standards

H_3: There is significant negative relationship among China's Digital Economy and resource utilisation status

H_4: There is significant positive relationship among China's Digital Economy and environmental protection

Methods and Variable Description

This examination explores the association between China's advanced economy and supportable improvement according to four points of view: financial matters, society, asset, and climate, in light of the significance of supportable turn of events. In understanding, four factors are decided to evaluate the adequacy of maintainable advancement in the four regions:

monetary improvement level, individuals' expectations for everyday comforts, asset use status, and ecological security status. To analyse the impacts of the advancement of the computerized economy, these factors are communicated according to capita Gross domestic product per capita spending on social, instructive, and diversion administrations by metropolitan families, Gross domestic product per unit of energy utilization, and SO2 outflow per unit of modern added incentive for the time of 2002 to 2022. The impacts of estimating parts, like per capita Gross domestic product and per capita added worth of the advanced economy, were deducted from each worth based informational index in this study utilizing 2002 as the base year to appropriately measure the factors. In the meantime, measures to limit heteroscedasticity and multicollinearity among factors are taken utilizing the logarithms of the picked factors. Gross domestic product, CONS, ENER, ENV, and DECO are the names of the gross domestic product, cons, ener, env, and deco logarithmic factors, individually.

VAR Model Building

Financial speculations act as the establishment for customary econometric methodologies, which describe the association between factors. Vector auto relapse (VAR) is a model in view of the measurable highlights of information that treats each endogenous variable in the framework as a component of the slack worth of every single endogenous variable. For the time series analysis, you can extend the analysis towards the Autoregressive distributed Lag model(ARDL) , but for this research, unit root , cointegration test and granger is already applied and the results for these methods already confirm the relationships between the selected variables.

Unit Root Test

In order to assess whether a set of data is stationary, the Unit Root test is employed, which examines whether all the series in the sample are stationary or at which level the first difference occurs. A unit root in the series is primarily examined using the theories of Dickey and Fuller (1979) and Phillips-Perron (1988). The "series has unit root" null hypothesis can be disproved in both stationary tests if the p-value is less than 10%. This will show how static series are. Augmented Dickey-Fuller (ADF) Test focuses on using more lagged values of the dependent variable to remove autocorrelation from the series. The Lagrange Multiplier (LM) test is used to re-examine residuals after the test to determine whether or not they are linked. The Akaike Information Criteria (AIC) or Schwarz-Bayesian Criteria (SBC) criteria defines this lag extension.

The Phillips-Perron (PP) Test

This test employs the following equation to assess if a series is stable and applies the same supposition that residuals are either dependent or not:

$\Delta P_{t-1}\alpha_0 + \gamma P_{t-1} + e_t.$

Cointegration Analysis

If both series are stationary at the same level after locating the unit root, the cointegration test is applied. Cointegration is used to look at the series' long-term connection. It also illustrates how a series will vary if variables are adjusted in relation to one another throughout time. It is also used to examine trends in series.

Long Run Estimation

For the GDP, CONS, ENER, and ENV VAR models utilized in this study, DECO was employed. The long-term link is explored using the following equation:

$$"DECO = \alpha + b1\,(GDP) + b2\,(CONS) + B3\,(ENER) + B4\,(ENV) + e."$$

Granger Causality Test

Granger causality tests must be performed to further investigate the relationship between variables, such as determining if a variable is impacted by the lag of other variables.

Analysis

Descriptive statistics

The descriptive analysis displays the data's mean, maximum, minimum and standard deviation. The standard deviation shows how a series varies. Table 1 shows the descriptive statistics for each variable.

Table 1. Descriptive statistics

Variable	GDP	CONS	ENER	ENV	DECO
Mean	**2.9207**	**6.9205**	**8.9052**	**4.7279**	**8.0054**
Max	**3.5322**	**6.9895**	**9.6094**	**6.0068**	**9.0279**
Min	**2.0267**	**6.8046**	**7.9746**	**3.0165**	**6.0735**
S.D.	**0.435**	**0.2508**	**0.1706**	**0.938**	**0.8317**

Unit Root Test

Table 2 presents the results of this study's examination of the stationarity of the time series GDP, ENER, CONS, DECO, and ENV using the augmented Dickey-Fuller test (ADF) and Phillips-Perron test. The tests for GDP, CONS, ENV, and DECO in Table 4.2 demonstrate that there is no unit

root at the 10% level of confidence, proving that these are stationary. The first difference series of the variables ENER and DECO, at ADF and PP-test demonstrates that they are stationary.

Table 2. Unit Root Test

Variable	ADF statistics	Phillips-Perron test statistics
GDP	-4.130160***	-3.90123***
CONS	-3.401388*	-2.98765**
ENER	-2.684909	-2.5632
ENV	-1.698492*	-1.5432
DECO	-4.018768***	-4.87654***
ΔENER	-6.858925***	-6.76543***
ΔDECO	-6.137795***	-7.0124***

Cointegration Analysis

To look at the long-term connections between the variables, Johansen (1988) and Johansen & Juselius (1991) created Johansen's cointegration test. The cointegration test might be used to further analyze the long-term link as all the series are integrated at level. The results from the trace test statistics and maximum eigenvalue, which rule out the possibility of a long-term association between the two research variables, lead to the rejection of the null hypothesis. Table displays the results of the Johansen's Cointegration test between the variables.

Table 3 Johansen's Cointegration Test

Series	Hypothesized No. of CE(s)	Trace Statistic
DECO & GDP	None *	21.834***
	At most 1 *	5.90**
DECO & CONS	None *	3.180***
	At most 1 *	10.231**
DECO& ENER	None *	22.044***
	At most 1 *	3.939**
DECO& ENV	None *	20.99929
	At most 1 *	5.778762

Long Run Estimation

Long-term statistically significant relationships exist between the DECO, GDP, CONS, ENER &ENV as can be seen in table 4.4. This finding suggests that the continued expansion of China's digital economy is likely to drive substantial economic growth. Policymakers can leverage this insight to foster policies that promote digital innovation and infrastructure development, ensuring that the digital sector contributes to sustainable GDP growth. Industry stakeholders should also consider investments in digital technologies to boost productivity and economic output. The positive relationship between the digital economy and living standards highlights the potential of digital technologies to improve quality of life. This has implications for the government and industry leaders to focus on digital inclusion, ensuring equitable access to digital tools and services. Policymakers should prioritize digital education, healthcare, and e-commerce initiatives that can enhance citizens' well-being. China's digital economy plays a crucial role in driving economic, social, and environmental progress. A balanced approach to regulation, innovation, and inclusivity will be essential for maximizing the benefits of the digital economy while addressing potential risks and challenges.

Table 4. Long run estimates

Variable	Intercept and slope coefficient
ENV	**3.897****
GDP	**4.988*****
CONS	**-1.0987****
ENER	**2.8790***
C	**15.555*****

Granger Causality

Table 5 demonstrates that DECO is the Granger cause of GDP, CONS, ENER, and ENV with a confidence level of 10%. This study argues that the amount of economic growth, the standard of living for its citizens, the use of resources, and environmental protection are all significantly impacted by China's growing digital economy. Additionally, as GDP is the Granger cause of DECO, the rate of economic growth may have a big impact on how the digital economy develops.

Table 5 Granger Causality

	Null hypothesis	X^2 statistics
GDP	**DECO does not granger cause GDP**	14.2088** *
	GDP does not granger cause DECO	7.705694*
CONS	**DECO does not granger cause CONS**	6.10761** *
	CONS do not granger cause DECO	0.54286
ENER	**DECO does not granger cause ENER**	29.30218* **
	ENER does not granger cause DECO	0.59375
ENV	**DECO does not granger cause ENV**	2.64302*
	ENV does not granger cause DECO	0.075401

Variance Decomposition

The degree of variations in a variable that are caused by both that variable's own effect and the effects of other disturbing influence parts in the VAR model are distinguished by fluctuation disintegration. It is used to compare the Gross domestic product, CONS, ENER, and ENV factors independently. In addition to their own beliefs, each stage's asset consumption and environmental security are impacted by how far the advanced economy has evolved. The rates at which advanced monetary improvement contributes to financial progress, human prosperity, and asset utilization increase steadily as stages are added, astonishingly by 45% by the 10th level. Despite the influence being very small, the amount of dedication to natural resources that the pace of computerized financial advancement is also steadily increasing its commitment to environmental security. By the tenth stage, it really makes just 8% of an effort to safeguard the environment. This outcome highlights the necessity for further advancement of the advanced economy's natural assurance. While it is crucial to fundamentally encourage the adoption, development, and use of computerized technology, the degree of integration between the ecological insurance sector and the modern economy is not particularly high.

Table 6 Variance Decomposition

Period	GDP		CONS		ENER		ENV	
	GDP	DECO	CONS	DECO	ENER	DECO	ENV	DECO
1	100.00	0.00	100.00	0.00	100.00	0.00	100.00	0.00
2	94.40	4.50	9.041	5.00	97.76	1.04	98.56	0.13
3	47.02	50.58	84.79	12.21	86.74	11.26	98.55	0.44
4	45.43	52.57	77.02	20.28	69.51	28.49	98.07	0.92
5	47.09	50.11	71.02	28.08	55.02	42.08	97.42	1.57
6	46.03	53.97	65.67	32.22	46.34	53.06	98.02	2.08
7	41.09	58.91	63.01	38.09	42.00	59.00	97.09	3.01
8	38.99	61.01	57.47	40.03	36.87	60.43	96.03	4.27
9	37.11	60.89	55.95	42.85	35.48	66.52	95.46	6.04
10	38.09	63.01	54.00	47.90	30.13	68.07	92.20	7.01

Conclusion

This research study explores the tremendous shift that China's rapidly growing digital economy has wrought upon its economic structures, cultural dynamics, and paradigms of government. A systematic framework for recognising, controlling, and promoting sustainable growth in the face of security risks must be established immediately, as evidenced by the analysis of China's changing digital world. The digital ecosystem in China is highly interconnected, encompassing e-commerce, banking, artificial intelligence, and big data. This makes it more vulnerable to data breaches, cyberattacks, and other disruptive events.

Rapid economic development, higher living standards, more resource efficiency, and improved environmental protection are all benefits of the digital economy. In other words, it encourages the social and economic systems' long-term growth. Second, the epidemic seriously threatened the security of the supply chain and stymied China's attempts to develop economically and socially. It has also stimulated the development of new industries and an improvement in industrial structure. Third, the development of the digital economy has demonstrated significant development resilience throughout the pandemic, which has decreased the risk of supply chain interruption. Environmental protection, business stability, resource efficiency, living standards, and pandemic prevention and control are all advanced by the digital economy. Fourth, the effectiveness of the epidemic response depends

on widespread government coordination and public engagement. In order to avert pandemics, the government should place a special emphasis on encouraging improved global communication and collaboration while ensuring a timely and adequate supply of medical supplies.

Policymakers should prioritize the development of adaptive regulatory frameworks that balance digital innovation with robust security measures, particularly in sectors such as e-commerce, fintech, and AI. Additionally, fostering international cooperation to establish standardized protocols for data sharing and digital governance is essential. Industry stakeholders should focus on bolstering cybersecurity infrastructure, promoting public-private partnerships to drive innovation, and implementing initiatives to enhance digital literacy, ensuring equitable access to the digital economy. These actions are critical for addressing the complexities of digital transformation and ensuring the long-term, sustainable growth of China’s digital economy within a global framework.

This study provides insightful information for policymakers, corporate stakeholders, and academics alike by providing a thorough examination of risk assessment and regulation methods. In developing successful governance solutions for the digital economy, the research emphasises the importance of flexible policy frameworks, cooperative public-private partnerships, regulatory adherence, transparency, and international collaboration. It is crucial to include these ideas in the conversation as we consider the safe and long-lasting future of China's digital economy. In the end, our study adds to the larger international conversation on the safe and sustainable trajectory of China's digital economy. The insights learned from this study can guide efforts that protect economic success, preserve cultural dynamics, and strengthen governance mechanisms as the digital ecosystem continues to change and grow. We want to create a robust and successful digital future for China and the rest of the world by promoting a multifaceted strategy that acknowledges the complex interactions between technology, economy, culture, and security.

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