

Unraveling Imperfect Information in Global Supply Chains: The Efficacy of Real-Time Analytics in Mitigating Economic Disruptions

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Abstract. The increasing complexity of global supply chains has rendered traditional economic models inadequate in addressing market fluctuations. This paper explores the role of real-time analytics as a mechanism for improving decision-making in response to economic disruptions. Employing a mixed-methods approach, we analyze case studies from various industries to evaluate the impact of real-time data on supply chain resilience and efficiency. Our findings reveal that companies leveraging advanced analytics exhibit significant reductions in response times to market volatility, leading to enhanced economic stability. This study highlights the necessity of integrating real-time analytics into supply chain management to mitigate risks associated with imperfect information.

Keywords: Global Supply Chains, Economic Disruptions, Real-Time Analytics, Imperfect Information, Decision-Making, Supply Chain Resilience, Data Utilization, Market Volatility

Introduction

In an era marked by globalization and rapid technological advancements, the stability of global supply chains is paramount for economic resilience. As we project into 2024-2026, the complexities inherent in these supply chains—exacerbated by geopolitical tensions, climate change, and pandemics—demand innovative solutions to maintain economic

fluidity. The concept of imperfect information in economic theory suggests that asymmetries in data access can lead to suboptimal decision-making, adversely impacting supply chain efficiency and, consequently, economic performance. This phenomenon has been notably observed in recent global events, where supply disruptions have led to cascading effects across industries. In this context, the advent of real-time analytics presents a transformative opportunity: by providing timely and precise data, organizations can navigate uncertainties and enhance their operational effectiveness. This paper aims to dissect the implications of real-time analytics within the framework of global supply chains, addressing how these analytical tools facilitate informed decision-making in the face of economic disruptions. We will first examine the theoretical underpinnings of imperfect information and its manifestations in supply chain dynamics. Following this, we will present a series of case studies across diverse sectors that illustrate the practical application of real-time analytics. The findings will culminate in a discussion on the strategic integration of these technologies in supply chain management. Ultimately, this research aims to underscore the imperative for businesses to adapt to the evolving economic landscape through enhanced data utilization.

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References

1. Dimen, L., Huseynova, K., Muhammadali, A., Huseynova, A., Aslanov, E., Hajiyeva, N., & Nuta, A. C. (2026). The Relationship Between Energy Dependency, Energy Diversification, and Economic Growth: Assessing Energy Resilience in Europe. *Energies*, 19(7), 1723.
2. Huseynova, K., Hajiyeva, S., Nazarov, V., Habibova, Z., Guliyev, R., Valiyeva, K., & Teymurlu, R. (2026). DOES EMPLOYMENT STRuCTuRE DRIVE TRADE IN SERVICES AND FINANCIAL SERVICE ExPORTS?.
3. Huseynova, K., Habibova, Z., Quliyev, M. Ü. Ş. F. İ. Q., & Guluzade, F. (2026). Digital Transformation of Public Services: The Experience of Implementing E-Government in Different Regions. *Law, State and Telecommunications Review*, 31(2).
4. Papaskua, I., & Joglidze, D. (2026). Digital Transformation of Accounting Systems and Challenges of Inventory Control in Georgia. *Business and Legislation*, 19(1), 87-95.
5. Рагимов, Э. Р. (2011). Роль программных комплексов в управлении безопасностью корпоративной информационной системы. *Телекоммуникации*, (12), 4-7.
6. Алгулиев, Р. М., & Рагимов, Э. Р. (2006). Синтез архитектуры защищенной корпоративной сети. *Телекоммуникации*, (2), 19-23.
7. Рагимов, Э. Р. (2005). КЛАССИФИКАЦИЯ УГРОЗ ПО СЕРВИСАМ БЕЗОПАСНОСТИ НА ОСНОВЕ СТАТИСТИЧЕСКИХ ДАННЫХ. *Информационное противодействие угрозам терроризма*, (5), 87-92.
8. Рагимов, Э. Р. (2011). Модель идентификации безотказной работы программных средств в корпоративных сетях. *Телекоммуникации*, (2), 2-5.

9. Алгулиев, Р. М., & Рагимов, Э. Р. (2005). Об одном методе оценки информационной безопасности корпоративных сетей в стадии их проектирования. Информационные технологии, (7), 35-39.
10. Rahimov, E., & Aghayev, T. (2026). Predictive Load Balancing in Distributed Systems: A Comparative Study of Round Robin, Weighted Round Robin, and a Machine Learning Approach. Engineering Proceedings, 122(1), 26.