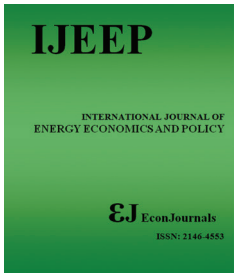

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Harnessing the Power of Globalization: A Study of the Association between Globalization, Transportation Energy, and Insurance and Financial Services in Europe and Central Asia

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ABSTRACT

The increasing globalization and information communication associated with commerce are confronted with the risk experienced over the years in the various production sectors of the economies. The research studied the influence of ICTs capital goods exports, industrial value addition, transportation energy, and globalization on insurance and financial services in a panel of 29 selected European and Central Asian nations. The research spanned from 2012 to 2021 and used a Panel quantile regression model. It was shown that insurance and financial services increased dramatically between the 0.40th and 0.90th quantiles due to technological progress. In addition, for quantiles between 0.10th and 0.90th, industrial value added is positively correlated with increased insurance and financial services. Quantile 0.10^{t} show a negative and significant association between transportation energy and insurance risks. In contrast, quantiles between 0.40th and 0.90th show a positive and significant relationship, indicating a U-shaped relationship between these two variables. The causality findings validated the technology-led industrialization and transportation energy, while a bidirectional association was identified between globalization and transportation energy across nations. The variance decomposition results suggested that industrial value added, globalization, and technological advancement would exert greater variance shocks on the insurance and financial services sector over time. The study concludes that the progression of technology contributes to the maintenance of insurance performance in the age of globalization. This performance might be enhanced by developing more effective transportation energy services and industrial production.

Keywords: Insurance Services, Technological Advancement, Globalization, Transportation Energy, Industry Value Added, Quantile Regression
JEL Classifications: C33, L91

1. INTRODUCTION

Insurance coverage refers to a policy's protection and financial compensation for covered losses (Melnikova and Shokhnekh, 2020). Different types of insurance, such as health, auto, home, and life, each protect against specific risks (Linnerooth-Bayer et al., 2019). Technology can improve coverage by helping insurers collect and analyze data, leading to tailored and effective coverage (Liu et al., 2022; Dahiya et al., 2022). Globalization can increase availability and competition among insurers, improving options and lower prices

(Jha et al., 2023; Zaman, 2023a). Transportation and industrialization can also improve insurance by making it more accessible for policyholders and insurers (Ma, 2022; Zhao, 2022). The insurance company will pay for repairs or replacements of damaged goods up to the stated value while they are in transit from the loading port to the ultimate destination (Kusumawati et al., 2022).

The rising economy is not immune to the hazards associated with it, which include substantial uncertainty and potentially adverse effects. Understanding scientific-technological, socio-political, or regulatory developments in many areas of the economy may help guard against risks and uncertainties and allow people to carry out their missions to the best of their ability (Khan, 2023). Insurance protection may be offered against losses due to fire, developing hazards, agricultural risks, and other company losses, as stated by Inyang and Okonkwo (2021). These risks are associated with people, companies, nonprofit-creating organizations, and government agencies (Zaman, 2023b). When demand rises, competition among insurers rises, and the insurance business's technological standards and ICTs landscape play a role. The many economic output sectors are exposed to greater risk as globalization progresses (Zaman, 2023c). Increases in technology and innovation have improved the advancement of ICTs connected to the risks associated with the insurance industry's dynamic growth, expansion, and complexity. According to Chen and Sivakumar (2021), businesses were able to expand while minimizing their exposure to risk due to technological advancements. Bottom-up investments become more costly due to credit, liquidity, and operational risks and their ripple effects across industries.

Financial and insurance risks in various parts of the globe were given a significant boost by the COVID-19 crisis of this century, according to a worldwide review of the insurance industry (Global Data, 2022; Sadiqa, 2023). The insurance sector on the worldwide market will generate assets worth US$197.56 billion, and by 2026, those assets will be worth US$260.83 billion, a compound annual growth rate of 7.8%. North America and Western Europe account for 32.5% and 20% of the anticipated US$ 1,127.57 billion in insurance industry income generation provided by ICTS. In addition, 11% of the market is anticipated to come from the Middle East, Africa, Central and Eastern Europe, and South and Central America. There has been a rise in both the frequency and severity of assaults on the economy and society, contributing to a more volatile insurance market and more severe risk management. To maintain a healthy equilibrium between market profitability and risk, a stable insurance market is essential for offering a full spectrum of cyber goods to meet the needs of a growing digital consumer base (Aqib and Zaman, 2023). Zarei and Hamedani (2022) state that the use of technological innovation in the insurance sector ensures better financial services and the expansion of new businesses that have joined the field of competition by producing excellent, unique value.

Based on the discussion, the study formulated the following research hypotheses:

H_1: It is the likelihood that there is an increase in ICTs capital good exports increase the insurance and financial services in a panel of selected European and Asian countries.

H_2: Globalization will likely increase financial and insurance coverage across countries.

H_3: Transportation energy infrastructure and industrial progress are likely to way forward towards increasing insurance coverage.

Using ICTs has greatly aided the development of the insurance and financial service industries. They have made it easier for clients to access and control their insurance and financial data. Companies' competitiveness has been boosted because of their capacity to innovate and produce new goods and services thanks to these factors (Khan and Imran, 2023). When taken as a whole, the growing use of ICTs in various sectors has resulted in more creativity, more productivity, and broader access to international markets (Imran et al., 2022; Anser et al., 2022).

The insurance and banking industries have been profoundly impacted by globalization, and greater economic integration and connectivity have opened up new avenues for the worldwide growth of these sectors. Insurance and financial firms have benefited from the increased accessibility to international trade by opening branches in newly developed economies. There is a higher need for specialist insurance and financial services since the number and complexity of cross-border transactions have risen due to globalization (Olasehinde-Williams and Balcilar, 2020).

In addition, technology has been crucial in allowing insurance and financial services to expand internationally. Companies may now function remotely thanks to digital platforms and the internet, lowering entrance barriers and expanding their worldwide consumer base. Because of this, competition has increased, which has down costs and raised standards across the board (Lee et al., 2022; Baloch et al., 2021). As a result of globalization, insurance and financial firms now have more chances to grow internationally, leading to more creativity and improved consumer offerings.

1.1. Research Questions

The study aims to investigate the impact of technological advancement and globalization on the insurance industry in a selected panel of European and Central Asian economies. Specifically, the research will address the following questions:

i. How do technological advancements influence the availability and quality of insurance coverage in these economies?
ii. To what extent does the increase in global trade and industrial production affect the insurance sector, particularly regarding the volume of goods exported? And
iii. Does the growth of transportation energy in the services sector lead to an expansion of insurance and finance coverage across economies?

By exploring these questions, the study hopes to provide valuable insights into the insurance industry's current state and future developments in the selected economies.

1.2. Research Objectives

This study aims to understand the relationship between technological advancement, globalization, and the insurance industry in a selected panel of European and Central Asian economies. To achieve this goal, the study has formulated the following research objectives:

i. To evaluate the role of transportation energy and industrialization in enhancing insurance and financial coverage for individuals and businesses in these economies, and
ii. To investigate the linkages between globalization and the availability and quality of insurance services across the countries in the panel.
iii. To achieve these objectives, the study adopted a panel quantile regression approach. This method allows the study to handle possible heterogeneity and autocorrelation issues by analyzing the regression estimates at different quantiles distribution and providing a complete understanding of the subject matter.

Overall, the study hopes to contribute to the academic and policy-making communities by providing new insights into the insurance industry dynamics in the selected economies.

2. THEORETICAL FRAMEWORK

Theories of economic and financial principles, such as economic development theory, financial intermediation theory, portfolio theory, and agency theory, all point to the importance of transportation infrastructure in fostering economic growth and development, expanding access to financial services, lessening risk, and raising coverage levels for those who need them.

Theoretically, the growth and development of a nation's economy are intrinsically linked to its transportation network (Schumpeter and Backhaus, 2003). Trade, commerce, and the linking of firms and customers are all bolstered by this notion because of the importance of transportation infrastructure. The demand for insurance and banking services might rise if firms have easier access to new markets and consumers have more options in the products and services they purchase (Miozzo and Soete, 2001).

The financial intermediation theory (Pyle, 1971) provides a valuable framework for understanding this phenomenon. Banks and other financial institutions are lauded for their crucial role in connecting savers and borrowers. Access to financial services is aided by improved transportation infrastructure, which allows financial institutions to expand their clientele and the range of services they provide.

The portfolio theory (Constantinides and Malliaris, 1995) may also be connected since it explains the connection between investment risk and return. The financial industry may benefit from better transportation infrastructure since it lowers the inherent risk of doing business in a particular area. The availability of credit and other financial services to individuals and businesses can be increased as the risk associated with lending to them is reduced. Financial institutions' ability to monitor borrowers' financial health and enforce loan agreements improves thanks to improvements in transportation infrastructure.

In addition, the agency theory (Shapiro, 2005) can be utilized; this theory describes the dynamic between a principal (the lender or insurer) and an agent (the borrower or insured), in which the principal entrusts the agent with resources and assets and anticipates a specific level of performance from the agent in exchange. The agency costs associated with monitoring and enforcing loan agreements may be reduced with better transportation infrastructure, which can boost financial intermediaries' performance.

3. LITERATURE REVIEW

The insurance and financial service industries have become more dependent on technology in recent years. There is evidence that technology increases client access to services in specific sectors while improving efficiency and effectiveness. Using panel data from many provinces in China, Wang et al. (2022) set out to investigate the connection between science and technology (S&T) insurance and local innovation. Based on metrics like patent applications and R&D spending, the research revealed that S&T insurance had a positive and statistically significant effect on regional innovation. The research also indicated that provinces with greater economic growth and human capital benefitted more from S&T insurance's effect on regional innovation. Incorporating a large and detailed dataset, the research helps demonstrate the favourable effect of S&T insurance on regional innovation in China. This research was conducted only in China. Thus its findings may not apply outside of that country. Furthermore, the research does not investigate other possible innovation metrics, such as commercialization or product development, but focuses solely on the influence of S&T insurance on patents and R&D investment. According to Feng et al. (2022), this research aimed to investigate the connection between decentralized environmental policy, digital finance, and new developments in green technology in China. According to the results, green technological innovation benefits from environmental decentralization and digital finance. However, the research found that digital finance has a greater impact than environmental decentralization, indicating that it may be a more successful strategy for supporting the development of new green technologies. This research is helpful because it sheds light on the interplay between decentralized environmental policy, digital finance, and developing cutting-edge green technologies in China. However, it is essential to note that this research was conducted only in China. Therefore, its findings may not apply outside of that country or area. It would be fascinating to analyze the possible causes for the larger influence of digital finance, which is not covered in this study. Planned oocyte cryopreservation (POC) was studied by Yeshua et al. (2022), who analyzed the correlation between POC use and insurance coverage via one's place of employment in the United States. Employer-based insurance coverage was shown to dramatically boost POC use, showing that insurance coverage for POC may be an effective strategy for expanding access to this technology. Proof of the beneficial effect of employer-based insurance coverage on POC usage in the US is provided by this research. The research was conducted in the United States. Thus the findings may not apply to other nations or locations. It would be interesting to evaluate the probable causes for the effect of insurance coverage on POC usage, which was not investigated in this study.

The role that financial institutions play in reducing dangers in the road transport complex is investigated by Bubnova et al. (2022). The study argues that banks and other financial organizations

may help reduce the dangers of road transportation by offering a range of services, including insurance, credit, and guarantees. The research shows that these financial services may improve road travel in a number of ways, including lowering costs, raising productivity and security, and encouraging creativity. This research sheds light on how banks might help reduce risks in the road transport complex. However, it is narrow in scope since it only considers financial service supply rather than other possible risk-mitigation techniques such as regulation or infrastructure development. Additionally, a detailed case study or sample of financial institutions already involved in this industry would have been interesting. Patel et al. (2022) investigate how access to emergency medical services (EMS) is affected by whether or not a child's family can afford health insurance. Compared to insured children, uninsured ones were more likely to need EMS transport due to severe injuries, according to the research. The study's findings show that kids without health insurance are more likely to have catastrophic injuries, which drives up healthcare expenses. This research is helpful because it brings attention to the possible harm that might result from children not having access to health insurance after sustaining a traumatic injury. However, it is narrow in scope, including just pediatric trauma cases and not touching on how the absence of insurance affects other health outcomes. More information would have helped analyze the economic effects on families and examine the long-term effects of not having coverage on children.

Koch et al. (2022) learn how community-based health insurance (CBHI) affects women's risk of financial ruin after having a caesarean section performed at a rural hospital in Rwanda. The research revealed that those with CBHI had a considerably lower risk of experiencing financial disaster than women without CBHI. The results of the research show that CBHI has the potential to be a valuable strategy for shielding women from financial difficulty after a C-section. This research is helpful because it draws attention to the possible sound effects of community-based health insurance in preventing financial hardship for women. On the other hand, this research was conducted only among a select group of people in rural Rwanda. Therefore, the findings may not apply to a broader population or other contexts. More data on the CBHI program's cost-effectiveness for this operation or the whole healthcare system would have also been welcome.

This research is interesting since it analyses a group of European and Central Asian nations to determine how technological development, transportation, globalization, and insurance coverage interact. Unlike earlier studies that have examined these concerns in a broader or worldwide framework, our regional emphasis offers a unique perspective on how these variables may affect the insurance business in certain nations (Ekici et al., 2022; Hussain et al., 2022; Mavi et al., 2022). By analyzing the effects of variables, including technological development, transportation energy infrastructure, globalization, and industrial value added on insurance availability and quality, this research aims to provide novel insights into the dynamics of the insurance sector in the European and Central Asian area. It will also be used to assess how the development of transportation and industry has impacted the availability of insurance and banking services for residents and enterprises in developing nations. To further illuminate how growing global commerce and industrial output may affect the insurance sector; this research investigates the connections between globalization and the availability and quality of insurance services across the nations in the panel. In addition, the study used a panel quantile regression strategy, which allows for the treatment of potential heterogeneity and autocorrelation concerns by examining regression estimates over a range of quantiles.

The study's overarching goal is to aid academics and policymakers by illuminating the insurance sector's past, present, and potential future throughout Europe and Central Asia.

4. MATERIALS AND METHODS

Using alternative data sources in addition to World Bank (2022) data can improve the study's validity, reliability and robustness by providing a more comprehensive and nuanced understanding of the economic conditions in the countries in the panel. The study cross-checks each country's data results and ensures that results are consistent. Panel data were utilized to analyze 2012-2021 in 29 different European and Central Asian nations, namely, "Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and United Kingdom." Insurance and financial services (% of commercial service imports, denoted by IFS) is the response variable, and the predictor variables are:

- Technological development (measured by ICTs capital good exports as% of total goods exports, denoted by TECH)
- Industry value added (including construction, measured as a percentage of GDP, denoted by IND)
- Transport energy services (measured as a percentage of service exports, denoted by TRANS), and
- Globalization (measured by the interaction term of TECH and TRANS, denoted by GLOB).

4.1. Model Specification

Panel quantile regression was utilized throughout the investigation to help achieve the goals set out for the research. Koenker and Bassett (1978) pioneered the use of quantile regression as a solution to the issue of dealing with heterogeneity and the effects of variables. Quantile regression is a statistical method for elucidating the association between a dependent variable and a set of independent variables over a range of quantiles, i.e., 25th, 50th, 75th, and 90th quantiles. Different conditional quantiles of the "t"th observation and the "I"th cross-sections are used to transform Eq. (1) into quantile regression, i.e.,

$$Q_{yit}(\tau \perp \text{vi}\, Y_{it} X_{it} = v_i + \pm(\tau) Y_{it} + X_{it} \quad (1)$$

Where τ shows unconditional quantiles, "X" is the set of explanatory variables, and "Y" is the response variable.

The research further confirms the fitness of quantile regression estimators by testing the equality of quantile slopes at various

conditional and symmetric quantiles using Wald F-statistics. The following is the study model presented in equation (2):

$$\begin{aligned}
IFS_{0.25,i,t} &= \tau_{0.25,i,t} + \tau_{0.25,i,t} TECH + \tau_{0.25,i,t} TRANS + \\
&\quad \tau_{0.25,i,t}\, GLOB + \tau_{0.25,i,t} IND + \varepsilon_{0.25,i,t} \\
IFS_{0.50,i,t} &= \tau_{0.50,i,t} + \tau_{0.50,i,t} TECH + \tau_{0.50,i,t} TRANS + \\
&\quad \tau_{0.50,i,t}\, GLOB + \tau_{0.50,i,t} IND + \varepsilon_{0.50,i,t} \\
IFS_{0.75,i,t} &= \tau_{0.75,i,t} + \tau_{0.75,i,t} TECH + \tau_{0.75,i,t} TRANS + \\
&\quad \tau_{0.75,i,t}\, GLOB + \tau_{0.75,i,t} IND + \varepsilon_{0.75,i,t} \\
IFS_{0.90,i,t} &= \tau_{0.90,i,t} + \tau_{0.90,i,t} TECH + \tau_{0.90,i,t} TRANS + \\
&\quad \tau_{0.90,i,t}\, GLOB + \tau_{0.90,i,t} IND + \varepsilon_{0.90,i,t} \qquad (2)
\end{aligned}$$

Where; "t" shows time period, i.e., 2007-2021, "I" shows the number of countries.i.e.,29 countries, and ε_{it} represents the residual of quantile distribution. Furthermore, the research used multivariate regression, which seeks to locate values for the model's parameters that minimize the sum of squared differences between the actual and projected responses. The residual sum of squares (RSS) is the objective function to be minimized. The least squares technique is a popular optimization tool for determining which parameter estimations result in the smallest RSS. This technique may be utilized if the errors follow a normal distribution with a constant variance. Cross-panel techniques also become popular in recent years (Zaman, 2023d).

5. RESULTS AND DISCUSSION

The variables' descriptive statistics shows that the distribution of insurance coverage is positively skewed and has a high kurtosis value, with a mean of 8.206% and a range of 1.334-57.158%. The spread of new technologies, the expansion of international trade in services, and the spread of globalization have all led to more skewed distributions, with mean values of 5.063%, 24.144%, and 125.214%, respectively. Negative skewness and high kurtosis characterize the distribution of industrial value-added, which has a mean of 22.703% and a range from 40.223% to 0.299%. It can be seen from the trend value that as technology improves, transportation options expand, manufacturing gains value, and international trade grows, so too does the need for insurance.

The panel correlation matrix shows that insurance and finance are positively correlated with estimates of technological advancement, industrial value addition, transit of exported services, and globalization. A favorable correlation between globalization and IFS, IND, TRANS, and TECH was also found. The data shows that insurance premiums are higher than they would be without the aforementioned causes, highlighting the need for practical and novel approaches to lowering the probability of loss and expanding the pool from which policyholders may draw maximum benefits in certain nations.

Essential diagnostics looks at the model's normality, serial correlation, heteroskedasticity, and stability assumptions. If the model does not conform to the specified OLS assumptions, statisticians might turn to an extension of linear regression known as quantile regression. It was discovered via this research that the model does not hold to its declared OLS assumptions. Therefore, the optimal choice is the quantile regression model that avoids the OLS assumptions and generates BLUE estimates.

Quantile and multivariate regression estimates for the panel are shown in Table 1; they reveal a positive and statistically significant association between the export of technological items and the provision of insurance cover at quantiles ranging from 0.40 to 0.90. According to the data, sending more capital items abroad raises the likelihood of being insured. Previous research by Campello et al. (2010), Singhal et al. (2022), Rienstra-Munnicha and Turvey (2002), Akinlo and Apanisile (2014), and Ogiriki and Pabraebiowei (2022) confirms the importance of maintaining the pliable conditions that increase insurance activities and impact economic growth. They also highlight the importance of expanding new structures within the insurance industry to facilitate growth and reduce uncertainty in various geographical areas. As the economy grows, insurance prospects improve, largely thanks to the aggressive measures implemented. Automation software for the insurance and financial services industries is utilized for handling claims and setting out policies. There will be fewer mistakes and more productivity, which will benefit the clients via increased quality of service and improved protection (Brophy, 2019). Technology facilitates the collection of consumer information, which can then be used to design insurance and financial services uniquely suited to each client. In some instances, this may lead to more thorough protection that is ideally tailored to the person (Tereszkiewicz and Południak-Gierz, 2021). With technology, customers may make better choices about their insurance and financial products, which gives them quick access to details about their coverage and possibilities (Nayak et al., 2019). In general, clients will benefit from more coverage options and easier access to services as insurance and financial institutions increase their use of technology.

A positive and statistically significant correlation between insurance risks and industrial value added was also found for quantiles ranging from 0.10 to 0.90. The research found that a rise in the value of industrial output was associated with a corresponding rise in the availability of insurance. The findings corroborated earlier research by Malik (2011), Ullah et al. (2016), and Zulfiqar et al. (2020) on how financial managers and business investors determine which factors are most influential when setting a company's market value. In addition, we looked at the overarching features of risk and profitability to aid with incentive problem relief and to provide light on corporate governance policies and their links to insurance businesses' performance and behaviour.

Moreover, at quantile distributions between 0.10 and 0.20, there is a negative and significant relationship between transport of energy services exports and insurance risks. At quantile distributions between 0.40 and 0.90, there is a positive and significant relationship between transportation energy services exports and insurance coverage. According to the findings, there is a U-shaped correlation between the two variables; initially, insurance risk decreases as more nations participate in the transportation of service exports. However, as time passes, the risk rises as more countries join the fray. Past research by Abedini and Darabi (2015)

Table 1: Panel Quantile regression estimates

Variables	τ_{10}	τ_{20}	τ_{30}	τ_{40}	τ_{50}	τ_{60}	τ_{70}	τ_{80}	τ_{90}
TECH (Prob.)	0.080 (0.522)	0.243 (0.110)	0.266 (0.128)	0.658 (0.000)	0.980 (0.000)	1.184 (0.000)	1.029 (0.000)	1.587 (0.000)	1.799 (0.000)
IND (Prob.)	0.174 (0.000)	0.173 (0.000)	0.173 (0.000)	0.148 (0.000)	0.122 (0.002)	0.092 (0.038)	0.136 (0.005)	0.161 (0.010)	0.187 (0.026)
TRANS (Prob.)	−0.033 (0.072)	−0.013 (0.560)	0.001 (0.942)	0.048 (0.085)	0.098 (0.002)	0.153 (0.000)	0.211 (0.000)	0.252 (0.000)	0.367 (0.000)
GLOB (Prob.)	−0.004 (0.283)	−0.011 (0.033)	−0.012 (0.037)	−0.027 (0.000)	−0.040 (0.000)	−0.047 (0.000)	−0.047 (0.000)	−0.067 (0.000)	−0.080 (0.000)
Wald and symmetric quantiles estimates									
Wald test value	**Chi-sq. statistic**	**Chi-sq. d.f.**	**Prob.**		**Symmetric quantiles test**	**Chi-sq. statistic**	**Chi-sq. d.f.**	**Prob.**	
	1.960	32	(0.000)			224.034	20	(0.000)	
Panel granger causality estimates and VDA estimates									
Causal relationship	**Causality direction**	**Hypothesis**	**VDA estimates**	**Years**	**IFS**	**TECH**	**TRANS**	**IND**	**GLOB**
TECH→IND	Unidirectional causality	Technology-led industrialization		2025	97.287	1.287	0.180	0.954	0.289
TECH→TRANS	Unidirectional causality	Technology-led transportation of goods and services		2028	94.916	1.420	0.468	2.116	1.076
GLOB↔TRANS	Bidirectional causality	Globalization causes transportation services and vice versa		2031	91.913	1.435	0.823	3.719	2.107
Multivariate regression Estimates									
Variables	**Coefficient**	**SE**	**t-statistic**	**Prob.value**	**Statistical tests**	**R^2**	**0.979**	**Adjusted R^2**	**0.978**
Ln (TECH)	0.895	0.050	17.866	0.000		F-statistics	2372.255	Prob. value	0.000
Ln (IND)	0.571	0.015	37.004	0.000		D.W	2.110	AIC	3.572
Ln (TRANS)	−0.546	0.051	−10.550	0.000		SIC	3.654	HQ	3.605
Ln (GLOB)	−0.235	0.032	−7.228	0.000		S.E of regression	1.427	SSR	517.565

Source: Author's estimate based on World Bank (2022) database

and Balcilar et al. (2020) suggested that the presentation of the traded flow of goods reduces the marginal productivity of firms related to risk premium and is driven by a positive or negative joint reaction of domestic firms' performance and households' consumption to foreign shocks. Investors are afforded robust risk mitigation thanks to the policy environment's emphasis on minimal risk performance across globalization, political institutions, and financial liberalization. The research uncovered many strategies that both private citizens and commercial enterprises may use to lower their vehicle insurance premiums and improve the efficiency of their transportation systems. Taking the bus or carpooling with friends is one way to avoid driving alone. Telematics devices are also helpful since they allow insurance firms to reward cautious drivers with lower rates (Ziakopoulos et al., 2022).

Quantile distributions from 0.20 to 0.90 indicate a negative and statistically significant association between globalization and insurance risks. The research findings indicate that an increased degree of globalization between the studied countries resulted in an increased risk for insurance. The previous research conducted by Barrot et al. (2019) and Lee and Lin (2016) suggested that there is a greater need for structural development for capital management risk. An urgent need for insurance companies to increase their size by increasing their asset base, as well as an improvement in the factors that influence their competitive power and financial performance. The similar results were obtained from multivariate regression across countries. Insurance and financial protection may benefit or suffer from globalization. One good effect of globalization is that it may make insurance and other financial services more accessible to those in developing nations who previously may not have had access to them. Competition among insurance and financial firms may be boosted by globalization, resulting in lower premiums and lower out-of-pocket costs for customers (Sun and Liang, 2021). However, insurance and financial protection may be negatively impacted by globalization. For instance, because of the increased interdependence of financial markets, the collapse of a single financial institution may have far-reaching consequences for the health of the whole financial system. Because of this, it may be harder for consumers to get insurance and other financial services since businesses may be less inclined to accept risks in times of economic unpredictability (Min and Borch, 2022). Local insurance and financial sectors may also suffer due to globalisation since more giant international corporations can provide more cost-effective goods and services. The local economy and insurance/financial system may suffer, leading to employment losses (Yeganeh, 2019).

According to the equality slope test findings, there is a consistent slope between the studied variables at each of the quantile values. The symmetric quantile test illustrates the symmetric connection between the quantile estimates obtained from the research model's various distributions. As a result, the research demonstrated that the quantile slope equality and the symmetric quantile connection between the aforementioned variables are valid across various quantile distributions.

Further, Table 1 shows the results of Granger causality estimates, which confirm the direction of causation from technological innovation to industrial value-added and transportation energy services. This means that capital goods export tends to boost industrial production, necessitating an increase in transportation services to ensure the region's continued growth. However, the fact that globalization and transportation services have been shown to have a mutually reinforcing connection suggests that globalization is a competitive period in which countries can only thrive with continually upgraded transportation infrastructure. In addition, commerce and transportation have helped integrate economies throughout the globe, making the world seem more like a village. Globalization, capital goods exports, and transport in services exports were estimated to have the largest variance shocks of 2.107%, 1.435%, and 0.823% over time, respectively, while the VDA estimates showed that industry value added would likely have the largest variance shocks of 3.719% on insurance risk in the year 2031.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

The study examined the correlation between factors such as globalization, technological development, transportation infrastructure, and industrial value added with insurance policies in 29 nations across Europe and Asia, using panel quantile regression from 2012 to 2021 to address serial correlation and heterogeneity.

The results of the study show:

- Positive and significant correlation between exports of technological items and insurance coverage at specific quantiles (0.40-0.90)
- Positive correlation between industrial value-added and insurance risks in specific quantiles (between 0.10 and 0.90).
- Negative correlation between exports of transport energy services and insurance coverage at specific quantiles (below 0.10^{th} percentile) and a positive correlation at others (0.40^{th} and 0.90^{th} percentiles).
- Negative correlation between globalization and insurance risks across specific quantiles (0.20-0.90)

It also found a two-way causal link between globalization and transportation in terms of value added to industries and modes of transportation driven by technological advancements. Industrial value addition was found to have the highest impact on insurance services. The study recommends focusing on digital infrastructure to minimize risk and collaborating with ICTs sectors to strengthen the insurance industry. It suggests that the approach to redesign strategies and adopt basic ICTs facilities is to reduce risk in insurance financial investment activities.

The study argues that insurance firms should prioritize customer pleasure and brand integrity in an increasingly interconnected world. The need for insurance firms to effectively convey information and provide extensive coverage to customers at home and abroad has increased due to technological developments. Organizations should consider becoming global, using technology to enhance service delivery, and personalizing their products and services for each customer. Boosting the efficiency and efficacy

of their operations will put them in a better position to compete on a global scale. There are several ways in which improvements in transportation and manufacturing might contribute to expanding access to insurance:

- Better roads, highways, and public transit networks boost accessibility to insurance services and may stimulate economic growth and demand for these products and services
- Insurance firms may benefit from safer roads and fewer claims by investing in transportation infrastructure upgrades
- The need for new forms of insurance may rise as the industry expands and modernizes.

Some possible policy implications based on the research findings include:

- Encouraging the implementation of digital technologies and infrastructure to enhance communication and accessibility of insurance services to local and overseas customers, increasing coverage and customer satisfaction.
- Boosting economic growth and insurance needs may be achieved by incentivizing and supporting investments in transportation infrastructure.
- Foster economic expansion by supporting the emergence of new sectors that may generate a corresponding uptick in demand for various forms of insurance.
- Collaborating with technology firms may help the insurance sector anticipate the effects of developing technologies like machine learning and automation and prepare for them.
- Improve the competitiveness and efficiency of insurance services by investing in education, training, or infrastructure to foster a more competent workforce that can adapt to a changing technological and industrial environment.
- To detect any possible adverse effect of globalization on the domestic insurance industry and to take actions to remedy any concerns that may occur, such as encouraging local insurance businesses to grow into overseas markets, monitoring and regulation are necessary.

Overall, developments in transportation, technology, globalization, and industry may boost the need for insurance services while also making them more accessible and affordable to more people.

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