

National Economic Challenges under International Conflicts, Digitalization, and Climate Shifts: A Triangular Resilience Balance-Sheet Model

Henriett Karolyi¹, Liudmyla Akimova², Oleksandr Akimov³

¹PhD Student, Doctoral School of Management and Business Administration, John von Neumann University, Kecskemet, Budapest, Hungary, ORCID: <https://orcid.org/0009-0006-1480-7245>

²D.Sc. in Public Administration, Professor of the Department of Human Resources and Entrepreneurship, National University of Water and Environmental Engineering, Rivne, Ukraine; Cyprus University of Technology, Limassol, Cyprus, ORCID: <https://orcid.org/0000-0002-2747-2775>

³D.Sc. in Public Administration, Professor of the Department of Public Administration, Interregional Academy of Personnel Management, Kyiv, Ukraine; Scientific and Methodological Center for Personnel Policy of the Ministry of Defense of Ukraine, Kyiv, Ukraine, ORCID: <https://orcid.org/0000-0002-9557-2276>

Citation:

Karolyi, H., Akimova, L., & Akimov, O. (2026). National Economic Challenges under International Conflicts, Digitalization, and Climate Shifts: A Triangular Resilience Balance-Sheet Model. *Economics, Finance and Management Review*, (2(26), 21–35.

<https://doi.org/10.36690/2674-5208-2026-2-21-35>

Received: June 02, 2026

Approved: June 29, 2026

Published: June 30, 2026



This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY-NC 4.0\) license](#)



Abstract. National economies increasingly face complex and overlapping economic challenges caused by international conflicts, accelerated digitalization, and climate shifts. International conflicts disrupt trade, energy security, investment flows, fiscal priorities, migration processes, and financial stability. Digitalization creates opportunities for productivity growth, innovation, public-sector modernization, and economic competitiveness, but also deepens structural inequalities between digitally advanced and digitally excluded states. Climate shifts intensify economic vulnerability through extreme weather events, infrastructure damage, food and water insecurity, displacement, productivity losses, and rising adaptation costs. The objective of this article is to analyse the economic challenges faced by individual states under the simultaneous influence of international conflicts, digitalization, and climate change and to propose a model for assessing national economic stress and resilience. The study applies a conceptual and analytical methodology based on academic literature and verified statistical evidence from the International Monetary Fund, World Bank, International Telecommunication Union, World Meteorological Organization, INFORM Risk Index, ND-GAIN, and Germanwatch Climate Risk Index. The article develops the Triangular National Economic Resilience Balance-Sheet Model, which compares three structural liabilities of a state: conflict liability, digital transition gap, and climate exposure, with its resilience buffer. The results show that national economic vulnerability is determined not only by the strength of individual shocks but also by their combination. The model calculations demonstrate that Germany has a resilience surplus, Ukraine faces high vulnerability due to conflict liability, India experiences elevated pressure because of the interaction between digital gap and climate exposure, Egypt faces elevated combined pressure, and Brazil remains manageable but close to elevated pressure. The article concludes that national economic security increasingly depends on integrated resilience planning. States should not treat conflicts, digitalization, and climate change as separate policy fields. Future research should test the proposed model using full country-level datasets, expand the sample of countries, introduce sectoral indicators, and conduct sensitivity analysis of resilience-buffer components.

Keywords: national economy; international conflicts; digitalization; climate change; economic resilience; economic security; geopolitical risk; digital divide; climate risk; fiscal vulnerability; structural shocks; state capacity.

JEL Classification: F51; F52; H12; O33; Q54; O11.

Formulas: 5; **fig.:** 2; **tabl.:** 4; **bibl.:** 34

Introduction. Individual states increasingly face economic challenges that do not arise from one isolated source. Contemporary national economies are influenced by the interaction of international conflicts, accelerated digitalization, and climate shifts. These three forces reshape the conditions under which governments manage growth, fiscal policy, employment, infrastructure, investment, trade, social stability, and economic security.

International conflicts affect national economies through trade restrictions, sanctions, commodity-price volatility, defence spending, migration, reconstruction costs, food insecurity, capital outflows, and weakened investor confidence. The International Monetary Fund emphasizes that a longer or broader conflict, worsening geopolitical fragmentation, renewed trade tensions, and uncertainty surrounding artificial-intelligence-driven productivity could weaken growth and destabilize financial markets (International Monetary Fund [IMF], 2026). The IMF also notes that higher defence spending may support short-term activity but can increase inflationary pressure, weaken fiscal and external sustainability, and crowd out social spending (IMF, 2026).

Digitalization creates a second group of challenges. It can improve productivity, expand access to services, modernize public administration, and support innovation. At the same time, digitalization creates a structural divide between states that can use digital technologies for competitiveness and states that lack sufficient connectivity, skills, cybersecurity systems, innovation infrastructure, and regulatory capacity. The International Telecommunication Union reported that 5.5 billion people, or 68% of the global population, were online in 2024, while 2.6 billion people remained offline (International Telecommunication Union [ITU], 2024). ITU later estimated that approximately 6 billion people, or 74% of the world's population, were using the Internet in 2025, leaving 2.2 billion people still offline (ITU, 2025). These figures show that digital transformation is global, but its benefits remain unevenly distributed.

Climate shifts create the third group of challenges. Extreme weather events affect infrastructure, agriculture, labour productivity, public health, migration, insurance costs, and fiscal stability. The World Meteorological Organization reported that 2024 was the warmest year in the 175-year observational record and emphasized the economic and social upheavals caused by extreme weather, record ocean heat, and sea-level rise (World Meteorological Organization [WMO], 2025). The WMO also reported that extreme weather events in 2024 led to the highest number of new annual displacements since 2008, destroying homes, critical infrastructure, forests, farmland, and biodiversity (WMO, 2025).

The relevance of this topic is reinforced by the World Bank's assessment that downside risks to the global economy include escalation of geopolitical tensions, weaker global demand, tighter financial conditions, renewed inflationary pressures, and weather-related shocks (World Bank,

2026). The World Bank also warns that emerging market and developing economies that cannot provide the ecosystem and policy environment needed for widespread AI adoption risk falling further behind (World Bank, 2026).

The problem addressed in this article is that international conflicts, digitalization, and climate shifts are often studied as separate economic challenges. However, at the level of individual states, these forces interact. A country exposed to conflict may also suffer from weak digital infrastructure and climate vulnerability. Another country may have high digital readiness but face energy shocks, defence-spending pressure, and climate adaptation costs. Therefore, there is a need for a model that evaluates these challenges as a combined national economic stress structure.

Literature Review. The literature on national economic vulnerability has traditionally developed through several separate research streams. The first stream focuses on geopolitical risk, conflicts, and geoeconomic fragmentation. Caldara and Iacoviello (2022) demonstrate that geopolitical risk affects investment, stock prices, economic expectations, and macroeconomic performance. International conflicts may damage production capacity directly, but they also create indirect effects through uncertainty, inflation, supply-chain disruption, capital flows, public debt, and defence expenditure. At the national level, these effects influence fiscal sustainability, foreign investment, social spending, and long-term growth.

The IMF's recent analysis reinforces this perspective. It emphasizes that conflicts and fragmentation can weaken growth, destabilize financial markets, increase inflationary pressures, and create difficult macroeconomic trade-offs (IMF, 2026). The World Bank similarly identifies geopolitical tensions and weather-related shocks as major downside risks to growth (World Bank, 2026). These institutional assessments show that international conflict is not only a security issue. It is also a structural economic variable that affects state capacity and national development trajectories.

The second research stream focuses on digitalization. Digital transformation is widely associated with productivity growth, innovation, financial inclusion, public-service modernization, and improved market access. However, the literature also emphasizes the digital divide. Countries with limited connectivity, weak digital skills, insufficient cybersecurity, and low institutional readiness may experience digital exclusion rather than digital acceleration. The ITU's global statistics confirm that connectivity has expanded rapidly, but billions of people still remain offline (ITU, 2024, 2025).

Digitalization also affects national economic resilience. States with higher digital connectivity and stronger digital public infrastructure can respond more effectively to shocks through online public services, digital payments, remote work, early-warning systems, crisis communication, and data-driven policy design. However, digitalization may also create

cybersecurity risks, labour-market disruption, platform dependence, and inequality between firms and households. Therefore, digitalization is both a resilience asset and a structural challenge.

The third research stream focuses on climate risk and adaptation. Climate change affects national economies through direct and indirect channels. Direct effects include damage to infrastructure, crops, housing, transport, water systems, and health systems. Indirect effects include insurance-market stress, food inflation, labour productivity loss, migration, fiscal burdens, and weaker investment. The WMO's State of the Global Climate report confirms that climate impacts now generate major economic and social disruption (WMO, 2025).

Germanwatch's Climate Risk Index 2026 shows that climate-related extreme weather events affect countries very unevenly. India ranked ninth among the countries most affected over 1995-2024, with nearly 430 extreme weather events, almost USD 170 billion in inflation-adjusted economic losses, nearly 1.3 billion affected people, and more than 80,000 fatalities (Germanwatch, 2026). The report also shows that in 2024, the most affected countries included Brazil, India, Nigeria, Thailand, and Spain, among others (Germanwatch, 2026).

The fourth stream concerns disaster risk and state capacity. The INFORM Risk Index is a global open-source tool for assessing the risk of humanitarian crises and disasters. It combines hazards and exposure, vulnerability, and lack of coping capacity, and provides country risk profiles (INFORM, 2026). INFORM reports that over the last ten years, global risk has increased because improvements in coping capacity have been offset by rising exposure to hazards and vulnerability. It also identifies conflict, displacement, COVID-19, food-system disruption, and escalating armed conflicts after 2022 as key drivers of rising global crisis risks (INFORM, 2026).

The fifth stream concerns climate adaptation readiness. The Notre Dame Global Adaptation Initiative combines climate vulnerability with readiness to improve resilience. Its Country Index ranks countries by their vulnerability to climate change and readiness to adapt, with Norway, Finland, Switzerland, and Denmark among the highest-ranked countries in the available ranking (ND-GAIN, 2026). This perspective is important because climate exposure alone does not determine economic damage. The final economic impact depends on infrastructure, governance, finance, health systems, technology, and institutional capacity.

Despite these contributions, several research gaps remain. First, many studies examine conflict, digitalization, and climate risk separately, although national economies experience them simultaneously. Second, digitalization is often treated only as a growth opportunity, while less attention is paid to the digital gap as a national economic vulnerability. Third, climate risk is often measured through physical exposure, but insufficient attention is given

to its interaction with fiscal constraints, conflict exposure, and digital capacity. Fourth, many models focus on macroeconomic forecasts but do not clearly show how shocks accumulate on the “economic balance sheet” of the state. Fifth, there is a need for a visually distinct and transparent model that can help compare national economic challenge structures across countries.

These gaps justify the development of a Triangular National Economic Resilience Balance-Sheet Model.

Aims. The aim of this article is to analyse the economic challenges faced by individual states under the combined influence of international conflicts, digitalization, and climate shifts and to propose a model for assessing national economic stress and resilience.

The objectives of the article are to systematize the main economic channels through which international conflicts affect national economies; to explain the dual role of digitalization as both an economic opportunity and a source of structural inequality; to examine the economic implications of climate shifts for states with different levels of resilience; to compare selected verified indicators related to conflict, digitalization, and climate exposure; and to develop a new model that evaluates national economic challenges through the interaction of structural liabilities and resilience capacity.

Methodology. The article applies a conceptual and analytical methodology. The conceptual part is based on a structured review of academic and institutional literature on geopolitical risk, digital transformation, climate economics, disaster risk, economic resilience, and state capacity. The analytical part uses verified statistical evidence from the World Bank, IMF, ITU, WMO, INFORM Risk Index, ND-GAIN, and Germanwatch Climate Risk Index.

The article does not propose a traditional econometric model because the aim is not to estimate one dependent variable from a single dataset. Instead, it develops a structured diagnostic model that can be used to compare national economic challenge profiles. The model is designed as a triangular balance-sheet framework. It treats conflict, digitalization, and climate shifts as three groups of economic liabilities and compares them with the resilience capacity of the state.

The empirical indicators used in the article include global growth risk assessments, Internet penetration rates, climate risk rankings, disaster-risk frameworks, and adaptation-readiness rankings. Internet-use data are used as a proxy for digital inclusion. Climate Risk Index data are used to identify realized climate impacts. INFORM is used as a conceptual basis for crisis and disaster risk. ND-GAIN is used as a conceptual basis for adaptation vulnerability and readiness. The calculations presented in the article are model-based and illustrative, but the indicators used for calibration are drawn from verified international sources.

Results. The article begins the results section with a conceptual balance-sheet map. Unlike previous models that measured probability, scenario pressure, or investor alignment, this article presents the state as an economic system that accumulates liabilities and requires resilience assets to absorb them.

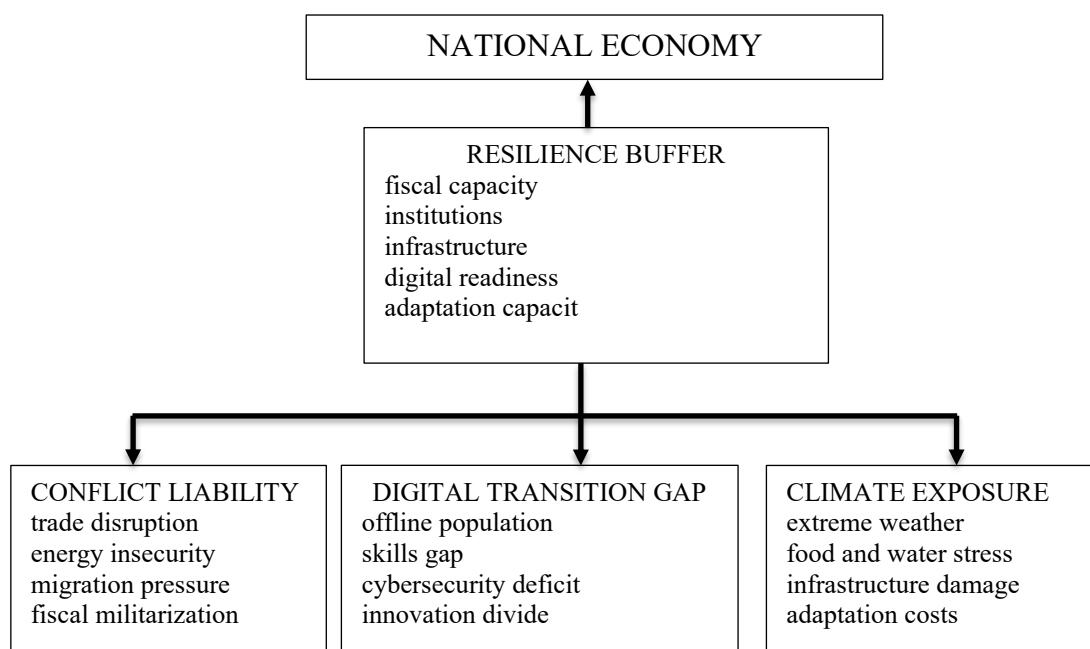


Figure 1. National Economic Challenge Triangle

Source: developed by the authors based on IMF (2026), World Bank (2026), ITU (2024, 2025), WMO (2025), INFORM (2026), ND-GAIN (2026), and Germanwatch (2026).

Figure 1 shows that national economic challenges are not linear. Conflict, digitalization, and climate shifts create different forms of pressure, but they interact through public finance, infrastructure, trade, labour markets, investment, institutional quality, and technological capacity. A country becomes highly vulnerable when these liabilities grow faster than its resilience buffer.

Verified statistical background. The article uses verified international statistics to support the analytical model. Table 1 summarizes selected indicators relevant to the three dimensions of the national economic challenge triangle.

Table 1 demonstrates that national economic challenges are multidimensional. International conflicts create macroeconomic and fiscal pressure; digitalization creates both productivity opportunities and exclusion risks; and climate shifts create physical and financial losses that may exceed the coping capacity of some states.

Table 1. Verified indicators relevant to national economic challenges

Dimension	Verified evidence	Interpretation for national economies
Global conflict and fragmentation risk	IMF identifies broader conflict, worsening geopolitical fragmentation, renewed trade tensions, and AI-productivity uncertainty as major downside risks	States face weaker growth, financial instability, fiscal pressure, and policy uncertainty
Conflict impact on low-income countries	World Bank expects LIC growth to reach 5.4% in 2026, 0.3 percentage point lower than previous forecasts, partly reflecting the impact of the Middle East conflict	Conflict creates spillovers beyond the battlefield
Global Internet use, 2024	5.5 billion people online, equal to 68% of the world population	Digitalization is global but incomplete
Global Internet use, 2025	Approximately 6 billion people online, or 74% of the world population; 2.2 billion still offline	Digital exclusion remains a major structural constraint
Climate conditions, 2024	2024 was the warmest year in the 175-year observational record	Climate shifts are already affecting economic systems
Extreme weather impact, 2024	Extreme weather led to the highest number of new annual displacements since 2008	Climate shocks affect labour, infrastructure, housing, agriculture, and public finance
INFORM global risk trend	Global humanitarian crisis and disaster risk increased over the last decade	National resilience has not kept pace with rising exposure and vulnerability
ND-GAIN adaptation ranking	ND-GAIN combines vulnerability and readiness to assess climate adaptation capacity	Economic impact depends on both exposure and state capacity

Source: compiled by the authors based on IMF (2026), World Bank (2026), ITU (2024, 2025), WMO (2025), INFORM (2026), and ND-GAIN (2026).

Digital inclusion differences among selected countries. Digitalization is one of the most measurable dimensions of national resilience. Countries with high Internet use usually have stronger foundations for digital public services, e-commerce, remote work, digital payments, education technology, and crisis communication. Countries with lower Internet use face a larger digital transition gap.

Table 2. Internet users as a proxy for digital inclusion

Country	Year	Internet users per 100 inhabitants	Digital transition gap
Germany	2024	93.5	6.5
Ukraine	2023	82.4	17.6
Brazil	2024	84.5	15.5
Egypt	2023	72.7	27.3
India	2022	55.9	44.1

Source: compiled by the authors based on ITU data presented by the German Federal Statistical Office. Germany had 93.5 Internet users per 100 inhabitants in 2024; Ukraine had 82.4 in 2023; Brazil had 84.5 in 2024; Egypt had 72.7 in 2023; India had 55.9 in 2022.

Table 2 shows that digitalization creates different starting conditions for national economic resilience. Germany has a relatively small digital transition gap, while India's gap remains much larger. Brazil and Ukraine have intermediate positions, and Egypt shows a wider gap than Brazil and

Ukraine. This does not mean that Internet use alone determines digital competitiveness, but it provides a useful proxy for digital inclusion.

Climate impact differences among selected countries. Climate shifts affect states unevenly. Some countries experience repeated and highly damaging events, while others face lower realized losses or stronger adaptation capacity.

Table 3. Selected climate-risk evidence

Country or group	Verified evidence	Economic interpretation
India	Ranked 9th among countries most affected by extreme weather over 1995-2024; nearly 430 events, almost USD 170 billion in inflation-adjusted losses, nearly 1.3 billion affected people, and more than 80,000 fatalities	High long-term realized climate impact and large macro-social exposure
Brazil	Included among the 20 most affected countries in 2024	Recent climate impact creates fiscal, infrastructure, agricultural, and social risks
Spain	Included among the 20 most affected countries in 2024	Climate impact is not limited to low- and middle-income economies
Ukraine	Ranked 143rd in 2024 and 85th over 1995-2024 in the Climate Risk Index table	Climate pressure exists but conflict risk dominates the current economic challenge profile
Global South	Six of the ten most affected countries over 1995-2024 were from the lower-middle-income group	Climate shocks disproportionately affect countries with lower coping capacity

Source: compiled by the authors based on Germanwatch Climate Risk Index 2026

Table 3 confirms that climate risk cannot be interpreted only as an environmental issue. It creates direct economic costs, human losses, infrastructure damage, and social instability. It also interacts with digital and conflict-related vulnerabilities. A country exposed to climate shocks but equipped with strong institutions and digital systems may respond faster than a country with weaker capacity.

Triangular National Economic Resilience Balance-Sheet Model.

The article proposes the Triangular National Economic Resilience Balance-Sheet Model. The model evaluates national economic stress as the difference between three accumulated structural liabilities and the state's resilience buffer.

The first formula defines the national challenge vector:

$$NEC_i = (CL_i, DG_i, CE_i) \quad (1)$$

where CL_i is conflict liability, DG_i is digital transition gap, and CE_i is climate exposure of country i .

The second formula defines digital transition gap:

$$DG_i = 1 - \frac{IU_i}{100} \quad (2)$$

where IU_i is the number of Internet users per 100 inhabitants.

The third formula defines the combined shock load as a geometric magnitude:

$$CSL_i = \sqrt{(CL_i^2 + DG_i^2 + CE_i^2)} \quad (3)$$

where (CSL_i) is the Combined Shock Load.

This formula is intentionally different from weighted-sum index models. It treats conflict, digital gap, and climate exposure as three coordinates of a structural stress space. A country becomes more vulnerable when stress accumulates simultaneously across several dimensions.

The fourth formula defines the resilience buffer:

$$RB_i = \frac{(IC_i + FC_i + AR_i + DI_i)}{4} \quad (4)$$

where (IC_i) is institutional capacity, (FC_i) is fiscal capacity, (AR_i) is adaptation readiness, and (DI_i) is digital infrastructure capacity. Each indicator is normalized from 0 to 1.

The fifth formula defines the National Economic Challenge Balance:

$$NECB_i = CSL_i - RB_i \quad (5)$$

where $(NECB_i)$ is the final national economic challenge balance. If $(NECB_i > 0)$, the country's structural liabilities exceed its resilience buffer. If $(NECB_i \leq 0)$, the country has sufficient resilience to absorb the combined pressure.

Interpretation scale of the model. The model's visual logic differs from previous articles because it is not based on probability, a linear pressure index, or investor-value alignment.

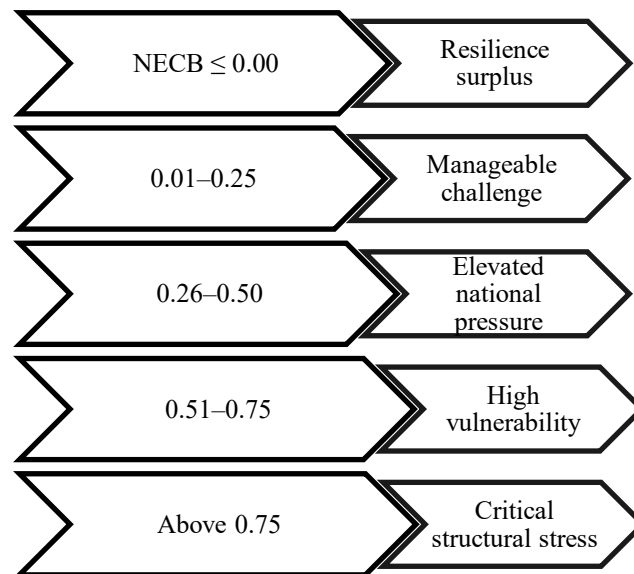


Figure 2. National Economic Challenge Balance interpretation

Source: developed by the authors

It is a balance-sheet model: national economic liabilities are compared with national resilience assets.

Demonstration of model calculations. To demonstrate the model, this article uses five country profiles based on verified evidence and normalized analytical scores. Digital transition gaps are calculated directly from verified Internet-use statistics. Conflict liability and climate exposure are normalized from 0 to 1 using verified institutional evidence on conflict exposure, crisis risk, and climate impact. Resilience buffer scores are analytical normalizations based on institutional capacity, fiscal capacity, digital infrastructure, and adaptation readiness.

Table 4. Demonstration of the Triangular National Economic Resilience Balance-Sheet Model

Country profile	CL	DG	CE	CSL	RB	NECB	Interpretation
Germany	0.25	0.065	0.35	0.434	0.78	-0.346	Resilience surplus
Ukraine	0.95	0.176	0.35	1.028	0.42	0.608	High vulnerability
Brazil	0.35	0.155	0.70	0.798	0.55	0.248	Manageable but close to elevated
Egypt	0.55	0.273	0.55	0.827	0.48	0.347	Elevated national pressure
India	0.35	0.441	0.85	1.004	0.52	0.484	Elevated national pressure

Source: calculated by the authors based on the Triangular National Economic Resilience Balance-Sheet Model, with digital gap calculated from ITU Internet-use data and climate/conflict exposure calibrated from IMF, World Bank, INFORM, WMO, ND-GAIN, and Germanwatch evidence.

The calculation for India is as follows:

$$\text{DG India} = 1 - 55.9/100 = 1 - 0.559 = 0.441$$

$$\text{CSL India} = \sqrt{(0.35^2 + 0.441^2 + 0.85^2)} = 1.019549 \approx 1.020$$

$$\text{NECB India} = 1.020 - 0.52 = 0.500$$

Thus, the National Economic Challenge Balance for India is approximately 0.500, which places the country at the upper boundary of elevated national pressure.

The result places India in the category of elevated national pressure. This reflects the combination of a relatively large digital transition gap and high climate exposure, even though direct conflict liability is not the dominant factor. The result is consistent with Germanwatch evidence that India is among the countries most affected by extreme weather over the long term and with ITU data showing that India's Internet-use rate remains lower than that of the other selected countries in Table 2.

The calculation for Ukraine is as follows:

$$\text{DG Ukraine} = 1 - 82.4/100 = 1 - 0.824 = 0.176$$

$$\text{CSL Ukraine} = \sqrt{(0.95^2 + 0.176^2 + 0.35^2)} = 1.027607 \approx 1.028$$

$$\text{NECB Ukraine} = 1.028 - 0.42 = 0.608$$

Thus, the National Economic Challenge Balance for Ukraine is approximately 0.608, which places the country in the category of high vulnerability. The result places Ukraine in the category of high vulnerability. In this profile, conflict liability is the dominant factor. The digital transition gap is not the main source of pressure because Ukraine has a relatively high Internet-use rate compared with many emerging economies. However, conflict-related fiscal, demographic, infrastructure, trade, and reconstruction pressures substantially increase the combined shock load.

The calculation for Germany is as follows:

$$\text{DG Germany} = 1 - 93.5 / 100 = 1 - 0.935 = 0.065$$

$$\text{CSL Germany} = \sqrt[3]{(0.25^2 + 0.065^2 + 0.35^2)} = 0.434999 \approx 0.435$$

$$\text{NECB Germany} = 0.435 - 0.78 = -0.345$$

Germany therefore has a resilience surplus. This does not mean that it is free from risk. Rather, it means that the country's fiscal, institutional, digital, and adaptation capacities are comparatively stronger than its combined structural shock load.

Classification of national economic challenge profiles. The model allows countries to be grouped not only by income level, but also by their challenge structure.

Table 5. Types of national economic challenge profiles

Profile type	Main source of pressure	Typical policy priority
Conflict-dominant economy	War, sanctions, displacement, trade disruption, fiscal militarization	Reconstruction, fiscal stabilization, security, social protection
Digital-gap economy	Low connectivity, weak skills, low digital public infrastructure	Digital inclusion, broadband, e-government, digital skills
Climate-exposed economy	Repeated extreme weather, agriculture risk, infrastructure damage	Adaptation finance, resilient infrastructure, food and water security
Multi-shock economy	Conflict, digital gap, and climate stress overlap	Integrated resilience strategy and international support
Resilience-surplus economy	Strong institutions and capacity absorb shocks	Strategic investment, innovation, adaptation leadership

Source: developed by the authors

The classification shows that countries should not use identical economic strategies. A conflict-dominant economy requires reconstruction and fiscal stabilization. A digital-gap economy requires infrastructure and skills. A climate-exposed economy requires adaptation finance and resilient infrastructure. A multi-shock economy requires integrated policy coordination because isolated measures cannot address the full challenge structure.

Discussion. The findings confirm that national economic challenges are increasingly multidimensional. International conflicts, digitalization, and climate shifts do not operate independently. They interact through fiscal

policy, infrastructure, labour markets, social protection, investment, trade, and institutional capacity.

The proposed model contributes to the literature by presenting national economic vulnerability as a balance-sheet problem. Conflict, digital gaps, and climate exposure are treated as liabilities because they create costs, constraints, and risks. Resilience capacity is treated as an asset because it determines how much pressure a state can absorb without long-term economic deterioration.

This approach provides several insights. First, a country may be highly vulnerable even when only one shock is extreme. Ukraine illustrates this logic because conflict liability dominates the national challenge balance. Second, a country may face elevated pressure because two medium-level challenges overlap. Egypt illustrates this pattern because regional conflict exposure, digital transition gaps, and climate stress combine into a significant burden. Third, a country may have strong growth potential but still face structural pressure if its digital gap and climate exposure are large. India illustrates this profile. Fourth, advanced economies may face climate and geopolitical risks but remain resilient if their institutional, fiscal, and digital capacities are strong. Germany illustrates this case.

The model also demonstrates that digitalization must be interpreted differently from conflict and climate exposure. Digitalization is not only a challenge. It is also part of the resilience buffer. A country with strong digital infrastructure can improve tax administration, early-warning systems, social transfers, health services, education continuity, and crisis communication. However, if Internet access and digital skills are uneven, digitalization becomes a source of inequality and weaker shock response.

For policymakers, the main implication is that national economic strategy should move beyond sectoral crisis management. Ministries of finance, economy, digital transformation, environment, defence, infrastructure, education, and social policy need integrated resilience planning. The same budget decision may influence several dimensions of resilience. For example, investment in digital public infrastructure can support economic competitiveness, disaster response, fiscal transparency, and social inclusion.

For international organizations and donors, the model suggests that assistance should be based on the structure of national challenge balances. A country with high conflict liability requires different support from a country with high climate exposure or a large digital transition gap. However, the most vulnerable countries may need combined packages that include reconstruction finance, digital inclusion, adaptation infrastructure, debt management, institutional reform, and social protection.

Conclusions. The article analysed economic challenges faced by individual states under the combined influence of international conflicts, digitalization, and climate shifts. The findings show that these challenges are

interconnected and should not be studied separately. International conflicts create fiscal, trade, financial, demographic, and infrastructure pressures. Digitalization creates productivity opportunities but also exposes countries to digital gaps and inequality. Climate shifts generate economic losses, displacement, food insecurity, infrastructure damage, and adaptation costs.

The article proposed the Triangular National Economic Resilience Balance-Sheet Model. The model differs from previous models because it does not estimate probability, scenario pressure, or value alignment. Instead, it compares three national economic liabilities — conflict liability, digital transition gap, and climate exposure — with a resilience buffer composed of institutional capacity, fiscal capacity, adaptation readiness, and digital infrastructure capacity.

The model calculations show that Germany has a resilience surplus, Ukraine faces high vulnerability due to conflict liability, India faces elevated pressure due to the interaction of digital gap and climate exposure, Egypt faces elevated pressure from combined regional, digital, and climate-related stress, and Brazil remains manageable but close to elevated pressure because of recent climate exposure and moderate digital transition gaps.

The main conclusion is that national economic security increasingly depends on integrated resilience. States should not treat conflicts, digitalization, and climate change as separate policy fields. They should develop national economic strategies that connect fiscal stability, digital transformation, climate adaptation, institutional quality, infrastructure resilience, and social protection.

Future research should test the proposed model using full country-level datasets from INFORM, ND-GAIN, World Bank, ITU, IMF, and climate-risk databases. Further studies may expand the country sample, introduce sectoral indicators, compare regional patterns, and conduct sensitivity analysis of resilience-buffer components. Another important direction is to examine how artificial intelligence, digital public infrastructure, and climate adaptation finance can reduce national economic vulnerability under multi-shock conditions.

Conflict of interest. The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest, except where separately disclosed in the manuscript.

Funding. The authors declare that the publication of this article was funded by the author. The research was conducted without separate funding.

Ethics statement. All procedures performed in this study complied with institutional and international ethical standards.

Generative AI statement. The authors declare that no Generative AI was used in the preparation of this manuscript unless otherwise explicitly stated in the manuscript.

Author contributions. All authors contributed equally to the development of the study concept, writing the text, and approving the final version of the manuscript.

Publisher's note. All claims expressed in this article are solely those of the author's and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References:

1. Aiyar, S., Chen, J., Ebeke, C. H., Garcia-Saltos, R., Gudmundsson, T., Ilyina, A., Kangur, A., Kunaratskul, T., Rodriguez, S. L., Ruta, M., Schulze, T., Soderberg, G., & Trevino, J. P. (2023). *Goeconomic fragmentation and the future of multilateralism*. International Monetary Fund. <https://doi.org/10.5089/9798400229046.006>
2. Akimova, L., Akimov, O., Mihus, I., Koval, Y., & Dmitrenko, V. (2020). Improvement of the methodological approach to assessing the impact of public governance on ensuring the economic security of the state. *Financial and Credit Activity: Problems of Theory and Practice*, 4(35), 180–190. <https://doi.org/10.18371/fcaptp.v4i35.221969>
3. Auffhammer, M. (2018). Quantifying economic damages from climate change. *Journal of Economic Perspectives*, 32(4), 33–52. <https://doi.org/10.1257/jep.32.4.33>
4. Baldwin, R. (2016). *The great convergence: Information technology and the new globalization*. Harvard University Press.
5. Baldwin, R., & Freeman, R. (2022). Risks and global supply chains: What we know and what we need to know. *Annual Review of Economics*, 14, 153–180. <https://doi.org/10.1146/annurev-economics-051420-113737>
6. Bobrovska, O. Y., Lysachok, A. V., Kravchenko, T. A., Akimova, L. M., & Akimov, O. O. (2021). The current state of investment security in Ukraine in the context of COVID-19 and its impact on the financial and economic situation of the state. *Financial and Credit Activity: Problems of Theory and Practice*, 1(36), 233–242. <https://doi.org/10.18371/fcaptp.v1i36.227770>
7. Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.
8. Caldara, D., & Iacoviello, M. (2022). Measuring geopolitical risk. *American Economic Review*, 112(4), 1194–1225. <https://doi.org/10.1257/aer.20191823>
9. Dell, M., Jones, B. F., & Olken, B. A. (2014). What do we learn from the weather? The new climate-economy literature. *Journal of Economic Literature*, 52(3), 740–798. <https://doi.org/10.1257/jel.52.3.740>
10. Germanwatch. (2026). *Climate Risk Index 2026*. Germanwatch. <https://www.germanwatch.org/en/crri>
11. Hallegatte, S., Rentschler, J., & Rozenberg, J. (2019). *Lifelines: The resilient infrastructure opportunity*. World Bank. <https://doi.org/10.1596/978-1-4648-1430-3>
12. INFORM. (2026). *INFORM Risk Index 2026*. European Commission Disaster Risk Management Knowledge Centre. <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk>
13. International Energy Agency. (2024). *World Energy Outlook 2024*. IEA. <https://www.iea.org/reports/world-energy-outlook-2024>
14. International Monetary Fund. (2026). *World Economic Outlook, April 2026: Global economy in the shadow of war*. IMF. <https://www.imf.org/en/Publications/WEQ>
15. International Telecommunication Union. (2024). *Facts and Figures 2024*. ITU. <https://www.itu.int/itu-d/reports/statistics/facts-figures-2024/>
16. International Telecommunication Union. (2025). *Statistics: Internet use*. ITU. <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>
17. Kose, M. A., & Ohnsorge, F. (Eds.). (2023). *Falling long-term growth prospects: Trends, expectations, and policies*. World Bank. <https://doi.org/10.1596/39497>
18. Kostiukevych, R., Mishchuk, H., Zhidebekkyzy, A., Nakonieczny, J., & Akimov, O. (2020). The impact of European integration processes on the investment potential and institutional maturity of rural communities. *Economics and Sociology*, 13(3), 46–63. <https://doi.org/10.14254/2071-789X.2020/13-3/3>
19. Manyika, J., Lund, S., Bughin, J., Woetzel, J., Stamenov, K., & Dhingra, D. (2016). *Digital globalization: The new era of global flows*. McKinsey Global Institute. <https://www.mckinsey.com/capabilities/tech-and-ai/our-insights/digital-globalization-the-new-era-of-global-flows>

20. ND-GAIN. (2026). *Country index rankings*. Notre Dame Global Adaptation Initiative. <https://gain.nd.edu/our-work/country-index/>
21. Novak, A., Pravdyvets, O., Chornyi, O., Sumbaieva, L., Akimova, L., & Akimov, O. (2022). Financial and economic security in the field of financial markets at the stage of European integration. *International Journal of Professional Business Review*, 7(5), e0835. <https://doi.org/10.26668/businessreview/2022.v7i5.e835>
22. OECD. (2024). *OECD Digital Economy Outlook 2024*. OECD Publishing. <https://doi.org/10.1787/a1689dc5-en>
23. OECD. (2025). *Climate adaptation and resilience policy*. OECD Publishing. <https://www.oecd.org/climate-change/>
24. Rodrik, D. (2018). *New technologies, global value chains, and developing economies*. Pathways for Prosperity Commission Background Paper Series. <https://pathwayscommission.bsg.ox.ac.uk/>
25. Sachs, J. D., Lafortune, G., Fuller, G., & Drumm, E. (2023). *Sustainable Development Report 2023: Implementing the SDG stimulus*. Dublin University Press. <https://doi.org/10.25546/102924>
26. Schwab, K. (2016). *The fourth industrial revolution*. World Economic Forum.
27. Stern, N. (2007). *The economics of climate change: The Stern review*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511817434>
28. Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40–49. <https://doi.org/10.1016/j.lrp.2017.06.007>
29. United Nations Conference on Trade and Development. (2025). *Trade and Development Report 2025*. UNCTAD. <https://unctad.org/publications>
30. United Nations Development Programme. (2024). *Human Development Report 2023/2024: Breaking the gridlock: Reimagining cooperation in a polarized world*. UNDP. <https://hdr.undp.org/content/human-development-report-2023-24>
31. Van der Ploeg, F., & Rezai, A. (2020). The risk of policy tipping and stranded carbon assets. *Journal of Environmental Economics and Management*, 100, 102258. <https://doi.org/10.1016/j.jeem.2019.102258>
32. World Bank. (2026). *Global Economic Prospects*. World Bank. <https://www.worldbank.org/en/publication/global-economic-prospects>
33. World Economic Forum. (2025). *The Global Risks Report 2025*. WEF. <https://www.weforum.org/publications/global-risks-report-2025/>
34. World Meteorological Organization. (2025). *State of the Global Climate 2024*. WMO. <https://wmo.int/publication-series/state-of-global-climate/state-of-global-climate-2024>
35. Zenghelis, D. (2021). Climate change and the macroeconomy. *Oxford Review of Economic Policy*, 37(4), 875–899. <https://doi.org/10.1093/oxrep/grab034>