



THEME CHAPTER

THE IMPACT OF ARTIFICIAL
INTELLIGENCE ON THE ECONOMY

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INTRODUCTION

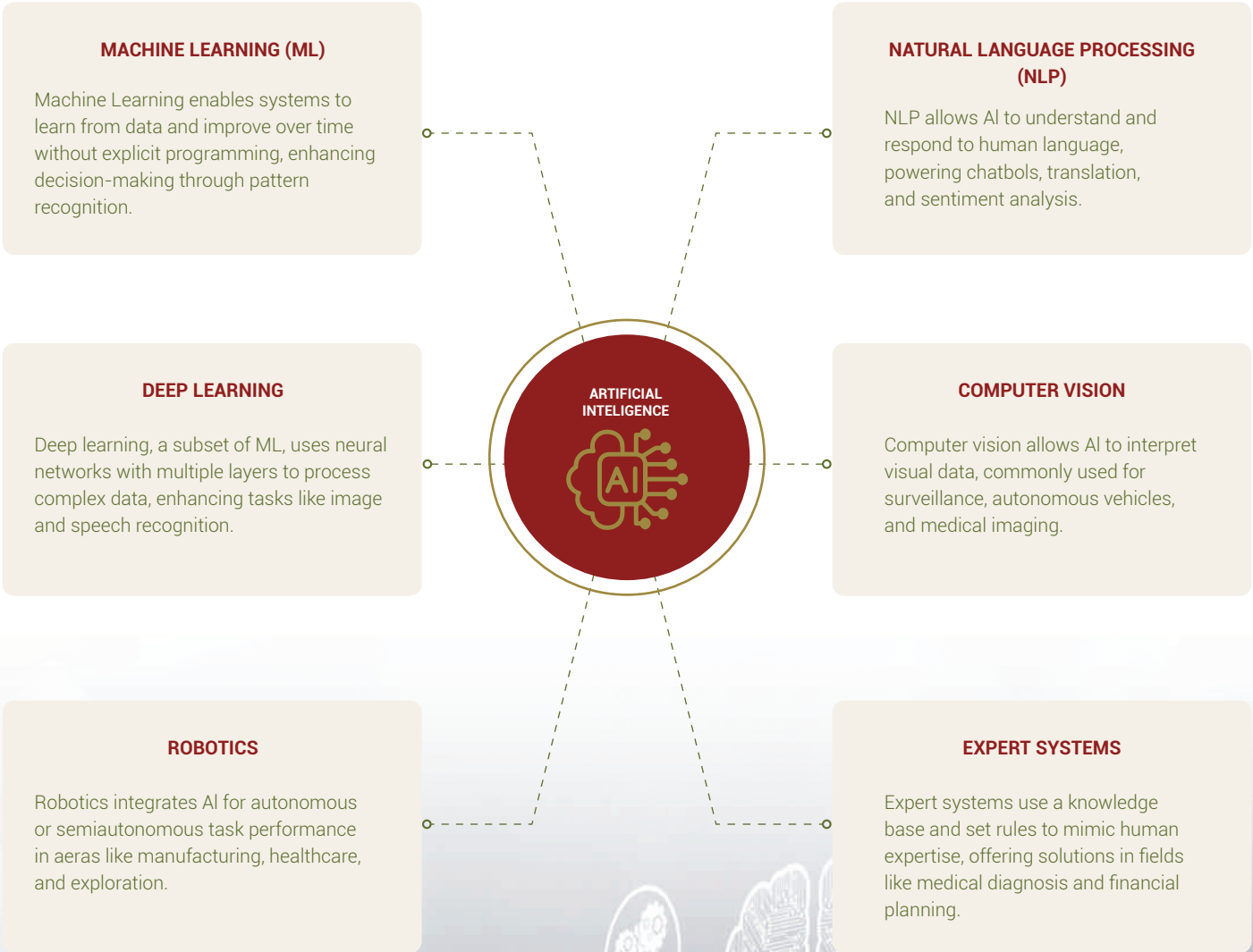
- » **The global economy is on the brink of a technological revolution that could significantly drive productivity, boost global growth and raise incomes across the world.** Nevertheless, there are also risks associated with the current wave which could also replace jobs and deepen inequality. As such, while the rapid advancement in artificial intelligence (AI) has captivated the world, it is causing both excitement and alarm and raising important questions about its potential impact on the global economy. Available research indicates that the net influence of AI is difficult to predict, given the complexities that economies will face in terms of its ripple effects.
- » **Through the advancement of AI, countries, have an opportunity to diversify their economies and drive productivity.** AI is significant in empowering personalisation, improving healthcare outcomes, enhancing safety and security measures, increasing accessibility for individuals with disabilities, contributing to sustainability exertions, aiding in decision-making processes, transforming the education system, and supporting the scientific exploration and discovery of the evolving world. AI holds the promise to reshape the future of developing countries, bringing opportunities that could transform economies, public services, and overall quality of life. With AI, these nations have a chance to diversify their economies, moving beyond traditional sectors by integrating AI into industries such as manufacturing, agriculture, and services.
- » **Thus, AI has the potential to operate as a driver of productivity and economic growth. For example, research findings suggest Emerging Market and Developing Economies face fewer immediate disruptions.** However, although AI can increase efficiency and significantly improve the decision-making process by analysing large amounts of data, it simultaneously creates serious risks of job market divergence, rising inequality, structural unemployment and the emergence of new but undesirable industrial structures.
- » **According to a study by the International Monetary Fund (IMF, 2020), the rise of AI could lead to a widening of the gap between rich and poor nations across several channels.** The study found that, given the higher wages in advanced economies, the motivation to replace the workforce with new technologies is stronger there which results in a higher demand for investment in robotics rather than traditional aspects of the economy. The IMF anticipates that AI will affect almost 40 percent of jobs around the world, replacing some and complementing others. It is therefore important to have a balance of policies to tap into its potential. The theme chapter will, therefore, unpack the benefits and the costs of AI for the economy, with specific focus on the macroeconomic impact as well as the impact on the financial sector. The theme chapter also looks at Namibia's AI Preparedness Index developed by the IMF to measures readiness.
- » **One first needs to clarify the distinction between digitisation (also referred to as digital transformation) and artificial intelligence.** Although the two terms are sometimes used interchangeably, there is a vast difference between them. Digital transformation involves the use of digital technology in a corporate entity, for example, to create a more agile, innovative, and customer-centric organisation - when done well. Digitisation, also known as digital transformation, refers to the process of utilising digital technologies to convert analogue or physical assets, processes or information into digital formats. Another way to define digitisation is the use of digital technologies to change a business model based on technologies to provide new revenue and value by producing new opportunities. Thus, in a corporate environment, digitisation involves incorporating digital tools and systems into a variety of corporate processes, including management, communication, production and customer service. Digitisation also involves the integration of digital technologies into various aspects of business operations, resulting in improved efficiency, productivity and innovation.
- » **AI, on the other hand, involves creating and using algorithms and other systems that perform tasks typically requiring human intelligence, such as learning, reasoning, problem-solving and understanding natural language.** Thus, AI is not one specific technology that empowers machines to think and work like humans. Some of the notable components of AI include machine learning, natural language processing, computer vision, deep learning, robotics and expert systems. The accompanying diagram, depicted on the next page, provides further clarification of these key components.
- » **Overall, the different parts of the digitisation and AI ecosystems enable our society and/or organisations to leverage various domains and applications to gain a competitive edge, increase efficiency and quality, and create value.** In this sense, the benefits brought about by digitisation do not differ significantly from those rendered by AI. Theme Table 1 lists the key benefits of both digitalisation and AI, showing several areas of overlap and contrast.



The IMF anticipates that AI will affect almost

40% of jobs around the world, replacing some and complementing others.

KEY COMPONENTS OF ARTIFICIAL INTELLIGENCE (AI)



Theme Chapter Table B.1

 BENEFITS OF AI AND DIGITALISATION

DIGITISATION	ARTIFICIAL INTELLIGENCE
Automation and efficiency Digitisation often involves automating manual or paper-based processes by digitising them. This automation reduces manual errors, speeds up workflows and improves operational efficiency. It also enables the integration of intelligent technologies, such as AI and machine learning, to further optimise processes.	Automation and efficiency AI enables the automation of repetitive and mundane tasks, freeing up human resources to focus on more complex and strategic activities. This leads to increased productivity, reduced errors and improved operational efficiency.
Data digitisation Digitisation focuses on digitising data, which involves capturing, encoding and storing information in a digital format. It enables data to be stored, replicated and transmitted easily across various digital systems and platforms.	Improved decision-making AI systems can analyse large volumes of data, identify patterns, and extract meaningful insights. This enables more informed and data-driven decision-making, enhancing accuracy and reducing biases.
Connectivity and integration Digitisation involves connecting and integrating various systems, devices and platforms to enable seamless data exchange and interoperability. This connectivity allows for real-time collaboration, data-sharing and integration of digital processes across different departments or entities.	Personalisation and customer experience AI can analyse customer data and behaviour to provide personalised recommendations, tailored experiences and targeted marketing campaigns. This enhances customer satisfaction, engagement and loyalty.
Enhanced data management Digitisation enables efficient data management, including storage, retrieval, analysis and security. Digital systems and databases provide capabilities for organising, categorising and analysing data, enabling organisations to derive insights and make data-driven decisions.	Enhanced productivity AI-powered tools and systems can augment human capabilities and streamline workflows. They can assist in tasks such as data analysis, content generation, customer support and process optimisation, leading to increased productivity and faster turnaround times.
Improved customer experience Digitisation allows organisations to deliver enhanced customer experiences by leveraging digital technologies. For example, digitisation enables personalised interactions, self-service options and real-time communication channels, resulting in improved customer satisfaction and loyalty.	Advanced data analysis AI algorithms excel at analysing complex and large-scale data sets. They can uncover hidden patterns, correlations and anomalies that humans might overlook. This capacity enables businesses to gain valuable insights, make predictions and identify trends for better strategic planning and decision-making.
	Innovation and creativity AI can aid in generating new ideas, designs, and solutions by leveraging large data sets and algorithms. It can therefore assist in areas such as content creation, art, music and design, inspiring innovation and creativity.

- » The unique features in both technologies can work together to enable advanced applications and processes in different domains to support companies in achieving a better level of productivity and efficiency, this Theme Chapter will focus only on the impact of AI on the economy.

The Economic Benefits of AI

- » **A key question in assessing AI's impact on the economy is judging when that impact will become sufficiently significant to show up in macroeconomic statistics.** Predicting the point at which any technology starts to become widely adopted is inherently difficult, so a range of timing assumptions are explored in this analysis. In all cases, the impact of AI on the economy is expected to be relatively modest in the near term – raising the gross domestic product (GDP) by between 0.1 and 1 percent over the next five years and the level of unemployment by up to 180,000 by 2030. By 2035, the range of outcomes is much broader – with the level of GDP 0.6 to 6 percent higher, depending on the scenario. How this plays out in practice will depend not only on the fundamental nature of AI or decisions made by private-sector firms, but also on policy decisions that have the capacity to accelerate or delay the implementation of AI. It is therefore important to determine what the macroeconomic aspects of AI are.

AI impact on Productivity and Economic Growth

- » **Studies suggest that AI has the potential to significantly impact economic growth in various ways.** At the macroeconomic level, AI-driven innovation contributes to economic growth by enhancing overall productivity, increasing capital returns, and fostering technological spillovers across industries. However, as highlighted earlier, the impact of AI on economic growth is not uniform across all sectors and regions. Some industries may experience more significant changes and growth, while others may face challenges or disruptions. Additionally, the successful adoption and integration of AI technologies need data availability, adequate infrastructure development and supportive policies, which can vary across different economies.
- » **The incorporation of AI into national economies enhances global competitiveness, facilitates the creation of high-skill employment opportunities, replaces routine and repetitive jobs and encourages foreign direct investment (FDI), thereby reinforcing economic resilience.** Additionally, AI advances long-term sustainability by facilitating the development of green technologies and smart infrastructure.
- » **A study by PricewaterhouseCoopers (PwC, 2018) estimated that global GDP may increase by up to 14 percent by 2030 as a result of the accelerating development and adoption of AI.** The report also anticipates the next wave of digital revolution to be unleashed with the help of the data generated from the Internet of Things, which is likely to be many times greater than the data generated by the current 'Internet of People'. It is expected to boost standardisation and consequently automation, as well as enhancing the personalisation of products and services.
- » **In the near term, AI will lead to productivity gains based on the automation of routine tasks.** This is likely to affect capital-intensive sectors such as manufacturing and transport. The change will also include extended use of technologies such as robots and autonomous vehicles. Productivity is destined to improve due to businesses complementing and assisting their existing workforce with AI technologies. To fully reap the expected benefits from AI will require investing in software, systems and machines based on assisted, autonomous and augmented intelligence. Such investments would not only enable the workforce to perform their tasks more effectively and efficiently, but also free up their time - allowing them to focus on more stimulating and higher-value-added activities. Thus, automation would partially remove the need for labour input, leading to productivity gains overall.

AI Impact on the labour market

- » **The widespread use of AI may significantly increase the demand for highly skilled labour in some areas, while reducing demand for low-skilled labour in others.** Much of the debate about AI and the future of work has centered on the risk that AI will replace jobs through automation. Some jobs will certainly be replaced by AI, but, according to a report by the Tony Blair Institute for Global Change (2024), it is only one of the ways that AI will affect labour demand. AI could also increase the demand for labour and create new jobs through two additional channels. For example, in the first channel, the report contends that AI could complement workers by making them more productive, which would increase economic growth and, hence, the demand for labour. In the second channel, AI could follow the pattern of previous technological waves and create new products, markets and sectors of the economy that require workers to perform new tasks and jobs – again increasing the demand for labour. The relative strength of these three forces, rather than only the first, will determine the net impact of AI on labour demand.
- » **Furthermore, although AI has the potential to increase the quantity, quality and effective deployment of labour by creating new jobs in technological fields, it will also displace routine jobs, which will in turn require workforce adaptation.** For instance, AI-enabled education could raise educational attainment and productivity growth, while AI-assisted health care could lead to a larger and more economically active labour force. AI also has the potential to improve the functioning of the labour market by more efficiently matching employers with employees, reducing frictional unemployment (the mismatch between workers and jobs) and helping to reduce the underutilisation of labour. Additionally, AI has a significant impact on skills transformation, both in terms of the skills needed to work with AI technologies and the broader skills required in a world where AI increasingly prevails.

One of the most evident effects of AI is taking over roles that involve high amounts of monotonous work. Concerning computers, the routine tasks that previously engaged workers' time can now be undertaken by AI systems so that personnel can perform more meaningful and challenging tasks instead. It has been noted that the global market of AI is projected to grow and exceed \$1.8 trillion by 2030.

- » **Lastly, AI's capacity to automate repetitive tasks has the potential to reshape the environment in which people work.** This will increase access to the workplace, including for differently-abled groups, and will facilitate better monitoring to safeguard against health-and-safety risks and to help boost productivity. This capacity is not without risks, however, as any new technology can be used both for good and ill. Nonetheless, careful adoption of AI clearly has the potential to make work more engaging, inclusive and safer, and to make workers more productive.

AI impact on income inequality

- » **AI may widen income inequality, benefiting those who can leverage it while disadvantaging those whose jobs are automated.** The rise of AI could exacerbate both within-country and between-country inequality, thus placing upward pressure on global inequality. High-income individuals and regions stand to benefit disproportionately, while lower-skill workers and resource-poor regions risk being left behind. Nations with advanced AI capabilities are pulling further ahead, deepening the global divide. That said, the cost of new AI software seems to be on a declining path, with the potential to extend the reach of this technology to a wider range of countries and users.
- » **An IMF study on the effects of AI on selected Asia-Pacific region countries found that AI could widen income inequalities in these countries.** The study indicates that most workers at risk of displacement in that region are those that work in services, sales, and clerical support roles. Meanwhile, workers who are more likely to benefit from AI typically work in managerial, professional, and technician roles that already tend to be among the better-paid professions.

Industry jobs and sectors that will mostly be affected by AI

There are several industries in which the advancement of AI can be most beneficial. These industries include healthcare, finance, retail, transportation, manufacturing and education. Nonetheless, there will be some job losses in certain types of jobs, where reskilling will be necessary. The jobs below will partly or even largely be replaced by AI advancements:

- » **Routine manual labour:** Jobs involving repetitive, manual tasks are highly susceptible to automation. This category includes jobs in manufacturing, agriculture, and even some aspects of construction. Robots and AI-powered machines can perform many of these tasks more efficiently, accurately, and tirelessly than humans.
- » **Data entry and analysis:** Jobs that primarily involve data entry, data analysis, and basic decision-making based on data are vulnerable. AI algorithms can process vast amounts of data quickly, reducing the need for human intervention in tasks like data entry, data cleaning, and statistical analysis.
- » **Customer service:** Many customer service jobs, especially those handling routine inquiries and simple problem-solving, can be automated using chatbots and virtual assistants. While AI can enhance customer service by providing instant responses, human interaction will still be essential for more complex issues.
- » **Retail and cashier positions:** The retail sector is experiencing significant automation, with self-checkout kiosks and inventory management systems increasingly prevalent. Cashier positions may become scarcer as AI-powered systems take over payment processing.
- » **Telemarketing:** AI-driven sales and marketing tools can automate cold-calling and lead-generation tasks, reducing the need for telemarketers. Human sales professionals who can provide personalised and strategic sales approaches will remain valuable, however.

On the other hand, there are jobs that will be less affected by AI. Notably, most – if not all – industries will be impacted in some way. However, certain industries will feel the impact less and in more positive ways. These industries include the arts and entertainment, human resources, social work and personal services, where AI will have to work together with human intervention. In the given areas in the list below, AI would offer advancements without replacing too many jobs – and, in some cases, it might even increase the variety of work and the number of positions available:

- » **Healthcare:** Healthcare jobs, particularly those requiring empathy, complex decision-making, and patient interaction, are less likely to be fully automated. Doctors, nurses, therapists, and other healthcare professionals will continue to play a vital role in providing care.
- » **Creative industries:** Jobs in creative fields such as art, design, writing, and entertainment rely on human creativity, emotional intelligence, and unique perspectives. AI can assist in these domains but cannot fully replicate the human creative process.

- » **Complex problem-solving:** Professions that involve complex problem-solving, critical thinking, and adapting to unforeseen challenges are less susceptible to AI disruption. Engineers, scientists, and research professionals fall into this category.
- » **Human resources and professionals' management:** These job incumbents and managers require a deep understanding of human behaviour, culture, and organisational dynamics. Human judgment remains essential in these roles, although AI can aid in recruitment and data analysis.
- » **Education:** Teaching and mentoring roles require a deep connection with students and the ability to adapt to individual needs. AI can supplement education with personalized learning tools, but educators play a unique role in shaping young minds.

A report by the World Economic Forum (WEF2025) on the future of jobs found that the most transformative trend in the future of jobs from 2025 to 2030 will be broadening digital access. According to more than 1,000 employers across different sectors, advancements in technologies, particularly AI and information processing are expected to transform jobs at a rate of 86 percent; robotics and automation at a rate of 58 percent; and energy generation, storage and distribution at a rate of 41 percent. The report also indicates that these trends are expected to have a divergent effect on jobs, driving both the fastest-growing and fastest-declining roles, and fueling demand for technology-related skills. Such skills include the proficiency in AI and big data, networks and cybersecurity and technological literacy, which are anticipated to be the top three fastest-growing skills requirement.

Also, according to the WEF report, technology-related roles are the fastest growing jobs in percentage terms. These roles include Big Data Specialists, Fintech Engineers, AI and Machine Learning Specialists and Software and Application Developers. [22] Moreover, it is expected that on average, workers can expect that 39 percent of their existing skill sets will be transformed or become outdated over the 2025-2030 period.

AI and information processing are expected to transform:

Jobs at a rate of **86%**



Robotics and Automation **58%**



energy generation, storage and distribution **41%**



THE IMPACT OF AI ON THE FINANCIAL SECTOR

AI has already been impacting financial markets for many years. This part of the economy that has been leveraging data and sophisticated analytical methods for decades to improving efficiency and enhancing returns for investors. Further advances in AI would therefore boost the benefits already being experienced, but there may also be negative impacts that need to be borne in mind.

What are the implications for financial stability?

- » **AI offers benefits such as improved operational efficiency, regulatory compliance, personalised financial products, and advanced data analytics.** There is a need to acknowledge that AI could be good news from a stability perspective. For financial institutions, AI can bring new opportunities and benefits such as productivity enhancements, cost savings, improved regulatory compliance, and more tailored offers to clients. In financial markets, technology has done a remarkable job in improving price discovery and deepening markets - often dampening volatility in times of stress. AI is likely to continue these trends as well.
- » **On the downside, AI may also potentially amplify certain financial sector vulnerabilities.** AI-related vulnerabilities in the financial sector that stand out for their potential to increase systemic risk include (i) third-party dependencies and service provider concentration; (ii) market correlations; (iii) cyber risks; and (iv) model risk, data quality and governance. Generative AI (GenAI) also increases the potential for financial fraud and disinformation in financial markets. Misaligned AI systems that are not calibrated to operate within legal, regulatory, and ethical boundaries can also engage in behaviour that harms financial stability. Moreover, from a longer-term perspective, AI uptake could also drive changes in market structure, macroeconomic conditions and energy use that could have implications for financial markets and institutions.

Are existing supervisory frameworks and tools sufficient?

- » **The AI developments will have implications for the central banks and their supervisory efforts.** Such developments impinge in two important ways. The first entails AI influencing central banks' core activities as stewards of the economy.
- » Central bank mandates revolve around price and financial stability. Because AI will affect financial systems as well as productivity, consumption, investment and labour markets, which themselves have direct effects on price and financial stability[28]. It is vital that central banks keep abreast of these developments.

- » **The second way in which AI developments have implications for central banks also relates to AI's impact on the financial system, which bears directly on central bank operations.** For one, financial institutions such as commercial banks increasingly employ AI tools; such will change how these banks interact with and are supervised by central banks. Moreover, central banks and other authorities are likely to increasingly use AI in pursuing their missions in monetary policy, supervision and financial stability.
- » **It is important to look at a few critical areas, both from a structural and a monitoring point of view.** Structurally speaking, markets continue to move faster, and industry players (including Government) need to ensure they are ready to deal with the even greater speeds that could come with AI. As AI increases the ability of markets to move quickly and react to new information, the speed and size of price moves may exceed what was previously envisioned.
- » **From a monitoring point of view, the rise of AI means that regulators will need to stay agile.** They can do so by adopting the necessary tools to track developments in these changing markets, and, importantly, the entities acting in the ecosystem. AI could mean a continuing rise in the importance of non-bank financial institutions, particularly broker-dealers, trading firms, hedge funds, and related entities who are well placed to take advantage of this new reality without the burden of intrusive supervision. A central bank may find itself facing a world where such agents will be playing a critical role in markets, despite the regulatory and supervisory authority not fully understanding who those agents are, how they are funded, or what they are doing.
- » **It is crucial, therefore, to look at the level of AI readiness in the supervisory space.** This level of AI readiness varies substantially across countries, as do the existing frameworks needed to handle these issues. Policymakers also urgently need to measure this degree of preparedness if they are to identify areas for improvement and assess the need of new tools.

Negative Impacts of AI on the Financial System

- » **The widespread adoption of AI technologies in various domains has raised significant privacy concerns.** AI systems often require vast amounts of data to train and improve their performance, and this data can contain sensitive personal information. This raises potential risks of data breaches as well as unauthorised access to and misuse of personal data. One notable area of concern is AI-powered surveillance technologies. Facial recognition systems, for example, can capture and analyse people's faces in real-time, leading to concerns about unwelcome and even unlawful surveillance contravening the right to privacy.

- » **The very nature of AI presents challenges in data management, modelling and governance.** AI could also exacerbate financial stability risks, particularly procyclicality, market volatility, market concentration and cyber-attacks. Moreover, the potential for misuse, such as information manipulation, could destabilise the financial system. Nonetheless, the potential impacts of AI remain difficult to quantify as they will depend on the scale and modalities of its adoption. Mitigating these risks will therefore require a governance framework and risk management approach tailored to AI-specific challenges. A recent case in point is the European Artificial Intelligence Act, adopted in May 2024, which is specifically designed to promote trustworthy AI.

In Namibia, cyber-attacks are already a reality. According to a report by the Communications Regulatory Authority of Namibia (CRAN), the Namibian cybersecurity landscape witnessed a significant increase in such attacks in 2024. The report noted that over two million cyber vulnerabilities and 1.1 million cyber incidents had been recorded between January and September that year alone. Two very distinct incidents constituted the ransomware attack on the telecommunications company MTC and the Bank Identification Number (BIN) attack on Mastercard holders. In the latter type of fraud, a cybercriminal uses a card's BIN to generate the rest of the card's numbers and thus gain access to the cardholder's financial information. Namibia has been developing the Cyber Crime Bill since 2013 and is yet to be passed. The bill is expected to be passed along with the Data Protection Bill and the National Cyber Security Strategy.



Fraud Incidents and Cyberattacks in Namibia

» Theme Table 2 shows that, over the years, fraud incidents have been on the rise in tandem with new technological advances. In the case of AI-powered cyber-attacks, AI or machine-learning algorithms and techniques are leveraged to automate, accelerate or enhance various phases of such attacks.

Theme Chapter Table B.2

NUMBER OF FRAUD INCIDENTS RECORDED IN NAMIBIA

	Amounts involved (N\$ 000)	Amounts lost (N\$ 000)	No. of fraud incidents
2010	14,573.79	10,351.24	N/A
2011	43,940.17	21,128.65	N/A
2012	56,476.81	7,975.98	N/A
2013	29,671.73	11,557.70	N/A
2014	47,357.20	22,913.86	N/A
2015	38,768.42	15,596.08	N/A
2016	30,866.10	13,615.04	189
2017	31,253.63	18,789.23	200
2018	56,790.79	37,049.95	251
2019	29,398.45	19,829.08	238
2020	25,709.60	20,485.28	258
2021	142,405.24	20,750.51	260
2022	41,581.94	32,595.50	370
2023	27,191.00	26,309.00	357
2024	51,160.00	47,030.00	5053

Source: Bank of Namibia

- » As cybersecurity risks and fraud activities continue to increase, AI can be used to protect customers. By integrating measures to fight financial crimes and gleaning meaningful insights from data, AI-enabled systems deliver accurate, predictive assessments that help to detect and prevent fraud. The incorporation of AI into fraud risk management not only enhances organisational resilience, but also bolsters confidence among stakeholders, strengthening the foundation of trust essential to any business's success in today's dynamic and challenging economic landscape. By utilising machine learning, predictive analytics, and behavioural analysis, banks and financial services can better protect their customers and their assets.
- » AI fraud detection is a technology-based approach that employs machine learning to identify fraudulent activities within large data sets. It This type of detection involves training algorithms to recognise patterns and anomalies that signal possible fraud. By continuously learning from new data, these machine-learning models become increasingly adept over time, improving their predictive accuracy and enabling them to adapt to evolving fraudulent tactics. This proactive defence mechanism equips businesses with a powerful tool for maintaining transaction integrity and security. Banks that have undertaken the journey to adopt AI-based solutions in areas such as watchlist screening, 'Know Your Customer' (KYC), and transaction monitoring are seeing significant improvements in their programmes.

How AI can revolutionise the banking industry

- » AI has the potential benefits of streamlining banking industry processes. For example, three years ago, payments to Government contractors previously took the Bank of Namibia more than a day to finalise; now they are processed within two minutes, using AI technologies. Another case in point is where officials needed to drive to the central bank to file documents: this role is now fulfilled by AI robots via an Internet-based Government portal. One of these robots is called Onguvi (Otjiherero for "eagle").



BOX ARTICLE

BANK OF NAMIBIA LAUNCHES A MODEL POWERED BY ARTIFICIAL INTELLIGENCE TO PROACTIVELY MONITOR NON-PERFORMING LOANS

In November 2024, the Bank of Namibia launched a pioneering artificial intelligence (AI) model for credit risk supervision – the first of its kind for the institution. The model, which is driven by AI and machine learning, is designed to enhance the supervision and monitoring of non-performing loans (NPLs). These are loans that are unlikely to be repaid in full. They arise when borrowers are more than 90 days overdue on loan principal and interest payments. Such loans pose challenges for banks, reducing profitability, necessitating additional provisions, and potentially leading to financial losses. If not effectively managed, high levels of NPLs threaten not only institutional but also overall financial stability. One way of keeping this risk in check is to monitor the so-called NPL ratio, which is the ratio of NPLs to total loans.

Economic challenges, including inflation and a high-interest rate environment, have significantly contributed to late repayments and loan defaults. In Namibia, December 2024 saw the NPL ratio nearing its early-warning regulatory threshold of 6.0 percent of total loans, as the value of NPLs reached N\$6.6 billion. This figure represented an increase of N\$565 million on the levels recorded for December 2023. This trend underscores the need for AI-enabled supervisory tools to detect early warning signs and implement timely recovery measures, effectively managing the escalating risk of loan defaults.

Previously, the Bank of Namibia relied on quarterly historical financial data to track and monitor trends in NPLs. The new NPL predictive model transformed this process by integrating key economic variables and delivering forward-looking indicators. This proactive approach enables potential risks to be detected early on, allowing for timely supervisory interventions and more effective credit risk management.

The NPL predictive model has the following features:

- » **Powered by AI and machine learning:** Developed using Python, this model integrates AI and Machine Learning to analyse historical NPL data along with key economic indicators, such as inflation, the prime lending rate, money supply, and GDP, to forecast NPL trends up to four quarters ahead.
- » **Continuous learning:** The model evolves over time as new economic data becomes available, ensuring the tool remains accurate and relevant.
- » **Visual insights:** Intuitive Power BI dashboards offer stakeholders easy access to predictions and trends.
- » **Scalable and customisable:** Built with flexibility, the model can integrate additional data sources and variables, supporting ongoing enhancement and development of other risk-specific use cases.

Model Benefits:

The NPL predictive model offers significant advantages for financial oversight and credit risk management, including the following benefits:

- » **Proactive supervision:** Supervisors can now forecast risk in real-time, allowing for early detection, monitoring, and management of credit risk.
- » **Data-Driven decision-making:** The model empowers supervisors to make informed decisions, enabling them to proactively engage banks on effective credit risk management.
- » **Trend analysis and benchmarking:** By analysing trends across the banking sector, supervisors can establish industry benchmarks for acceptable NPL levels, promoting stability across the sector.



Bank of Namibia (AI) model is designed to enhance the supervision and monitoring of non-performing loans (NPLs).

The AI model marks a significant advancement in the Bank of Namibia's ability to oversee credit risk. The model's applications are expected to expand, with potential use in liquidity risk, capital scenario analysis and stress testing. The Bank's of Namibia's commitment to leveraging advanced technologies underscores its dedication to a sound, modern, and resilient banking sector. Through innovation, agility, and collaboration, the Bank is poised to facilitate the modernisation of banking in Namibia.

- » **The Bank of Namibia and the KPMG embarked on a digital maturity assessment project, which aimed to assess the digital maturity on four major banking institutions in Namibia.** The project assessed Bank Windhoek Limited, First National Bank Namibia Limited, Nedbank Namibia Limited, and Standard Bank Namibia Limited. To assess the Namibian banking industry's progress towards customer-centricity and digital transformation, KPMG's connected enterprise framework was employed. This framework provided a valuable approach for assessing the digital maturity of the Namibian banking industry across eight key capabilities their relevant decomposed sub-capabilities. The assessment identified areas of strength and opportunities for improvement, and the recommendations provided a roadmap for each bank and the industry as a whole to continue its digital transformation journey.
- » **The main takeaways from the assessment were that there is a lack of integration between the banks and institutions, such as the Home Affairs and the Business and Intellectual Property Authority hinders the acceleration of secure digital transformation.** Furthermore, the Namibian banking industry continues to grapple and compete for scarce digital skills (e.g., cyber, data, cloud) to drive its transformation agenda. Finally, network coverage and infrastructure challenges, especially in rural areas, are obstacles to achieving the desired Namibian financial inclusion objectives.
- » **The AIPI evaluates countries based on four critical factors: digital infrastructure, human capital, technological innovation and legal frameworks.** These elements are considered crucial for the successful integration of AI into various sectors of the economy. Importantly, the index is merely an indicative measure to support policymakers in identifying areas for improvement and should not be interpreted for ranking purposes. According to the report, Namibia scores 0.08 in digital infrastructure, 0.01 in innovation and economic integration, 0.12 in human capital and labour market policies, and 0.12 in regulation and ethics. The assigned scales suggests that the country has broadly achieved important milestones in terms of a supportive environment and required infrastructure when compared to regional peers.
- » **According to the AIPI, the four dimensions are probably relevant for smooth AI adoption.** Each dimension is computed by normalising and averaging a rich set of sub-indicators. These include the presence of relevant digital infrastructure, sustained human capital investment, inclusive STEM (science, technology, engineering and mathematics) expertise, labour and capital mobility, a vibrant research-and-development ecosystem, and the adaptability of legal frameworks to digital business models.
- » **Further data from the IMF report placed Botswana and Namibia on the top 10 list, tied for ninth place with an identical score of 0.417.** Morocco and Ghana were closely matched in AI readiness, occupying the seventh and eighth spots respectively, both scoring 0.428. Rwanda demonstrated rapid progress by securing fifth place with a score of 0.449, edging out Cabo Verde in sixth place with a score of 0.438. South Africa came in third, scoring 0.491, slightly ahead of Tunisia in fourth place with a score of 0.479. The Seychelles outpaced all others on the continent in AI preparedness with a score of 0.531, significantly ahead of Mauritius, which secured second place with a score of 0.521. The AIPI index relies on a combination of objective data and subjective assessments, making it a valuable tool for policymakers to identify areas for improvement rather than serving as a definitive ranking system.

▶ NAMIBIA AI PREPAREDNESS

- » **According to the IMF's AI Preparedness Index (AIPI), in 2024 Namibia ranked ninth among African countries most prepared for the adoption of AI.** This ranking suggests Namibia has been striding ahead in developing the infrastructure and environment necessary to leverage AI technologies.

CASE STUDY: SINGAPORE AI READINESS INDEX

AI Singapore developed an AI Readiness Index (AIRI), which is an industry-focused framework for assessing such readiness. The AIRI distils the critical success factors for AI adoption based on hundreds of engagements AISG has with companies across different industries of various sizes and AI readiness levels. AIRI allows business units and organisations to assess their readiness and identify the gap between their current and desired states. The Index also enables organisations to determine the most suitable approach for them to adopt AI and to implement targeted programmes to increase their AI readiness.

Ultimately, AIRI translates abstract concepts into concrete actions to help organisations accelerate their AI adoptions. Thus, AI Singapore uses AIRI to help its clients identify which of its and its collaborators' programmes can be leveraged to accelerate their AI journey. An illustration of how companies' readiness is assessed via AIRI is offered in Theme Chapter Table 3.

Theme Chapter Table B.3

AIRI SCORES

	AI UNAWARE	AI AWARE	AI READY	AI COMPETENT
Average Score	Less than 2.5	2.5 - 3.4	3.5 - 4.5	Greater than 4.5
Interpretation	Organisation might hear about AI, but is unaware of AI applications.	Organisation is aware of AI applications and could identify potential used cases.	Organisation has the capabilities to intergrate pre-trained AI models into products or business process.	Organisation has the capabilities to develop customised AI models and solutions for specific business needs.
Characteristics	Wait for vendors to convince with use cases and business value of AI. Consume ready-made AI solutions.	Actively seek AI solutions to address business needs. Able to identified potential use cases for AI applications, and consume ready-made AI solutions.	Evaluate and seek AI APIs, SDKs and pre-trained AI models for use within business.	Have strategy and roadmap of AI deployment for organisation.
Recommendations	increase AI literacy of organisation.	Consume ready-made, end-to-end, COTS AI solutions.	Prepare organisation to adopt and integrate AI solution. Broaden understanding of AI to whole of organisation.	Deepen organisational AI capabilities. Broaden understanding of AI to whole of organisation.

The pillars and dimensions of AIRI

AIRI 2.0 consists of five pillars which map to 12 dimensions. The five pillars are interdependent and synergistic. Thus, organisations with strong Organisational Readiness (Pillar 1) would be assessed as being able to identify good use cases, thereby contributing to their Business Value Readiness (Pillar 2). The decision and approach of identifying appropriate business use cases would be guided by the organisation's Ethics and Governance Readiness (Pillar 3). Being able to identify such use cases would in turn support the organisation's Data Readiness (Pillar 4) if it possessed established data policies, processes and practices to ensure the accuracy, reliability and completeness of data. Infrastructure Readiness (Pillar 5) would be established by AI Singapore helping the organisation to turn ideas into actions by providing it with the tools and technologies to train, host and deploy AI solutions.

Each of these pillars has several dimensions, each in turn assessed at four levels of AI readiness, namely AI Unaware, AI Aware, AI Ready and AI Competent. Since organisations may exhibit different levels of AI readiness across these dimensions, their score across the five pillars of the AIRI offers a holistic assessment of such readiness.

CONCLUSION AND POLICY RECOMMENDATIONS

Conclusion

- » **The rise of AI presents both opportunities and challenges for the future of work and society as a whole.** While many concerns about job displacement are valid, it is essential to recognise that AI has the potential to liberate individuals from mundane and unfulfilling tasks. Studies have shown that many people are dissatisfied with their jobs, often feeling undervalued and confined to repetitive roles for extended periods. Thus, embracing AI as a means to free humanity from such drudgeries could lead to a more rewarding existence. Achieving this positive vision, however, requires a paradigm shift from viewing AI as a mere 'job destroyer/replacer' to viewing it as an unlocking human potential. Through AI's assistance in automating alienating tasks, individuals can focus on more meaningful activities, such as spending time with loved ones, pursuing cultural interests, and engaging in personal growth and learning. In this way, AI can be a complement to human capabilities rather than a replacement for them, fostering a harmonious relationship between technology and society.
- » **The future of AI is filled with potential, yet it also presents challenges.** AI is significant in empowering personalisation, improving healthcare outcomes, enhancing safety and security measures, increasing accessibility for individuals with disabilities, contributing to sustainability exertions, aiding in decision-making processes, transforming the education system, and supporting the scientific exploration and discovery of the evolving world. Notably, however, while AI offers numerous benefits, there are also considerations and challenges related to ethics, privacy, bias, and job displacement that need to be carefully addressed and managed in its implementation.
- » **In terms of job losses, it is clear that AI will replace jobs of those performing repetitive tasks, while stronger demand for highly skilled labour can also be expected.** In simple repetitive tasks, as well as in high-level decision-making, AI is rapidly changing and improving how work is done. Digital literacy and 'techno-logical' adaptability will be essential competencies for individuals navigating the complexities of the AI era.

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Recommended policy approaches to deal with AI

REMOVING BOTTLENECKS TO ADOPTION

- » **Namibia should strengthen its international cooperation in respect of facilitating technology transfer.** Considering the already advanced rollout of AI in high-income countries, developing nations can harness the already available digital capacity to provide policymakers with the knowledge and tools required to integrate and facilitate technology transfer and bridge the AI divide. High-income countries should bridge the AI divide by such transfers and by sharing their AI expertise with developing nations. This collaboration is crucial for high-income countries as well, as it creates a win-win scenario. By helping Emerging Market and Developing Economies adopt AI, Advanced Economies can open new markets for their AI technologies, foster global economic stability, and address shared challenges such as climate change and public health more effectively. International cooperation also ensures that AI adoption aligns with ethical standards, benefiting both sides in terms of economic and social progress.
- » **There is also a need to enhance Namibia's digital infrastructure.** Developing a robust digital infrastructure, including reliable internet and electricity, is foundational for AI adoption. Such infrastructure is crucial because without it, access to AI technologies will remain limited, deepening the digital divide and preventing equitable participation in the benefits of AI. Moreover, reliable infrastructure can facilitate access to, and the use of, AI tools, thus fostering inclusive growth and development. Digital infrastructure needed for AI advancements includes broadband and mobile telecommunication infrastructure, data centers, systems, networks, Internet of Things (IoT) and cloud computing services.

ENCOURAGING ADVANCEMENT OF AI

- » **It is important for Namibia to encourage local innovation and provide incentives for start-ups.** Fostering local technology ecosystems and supporting homegrown innovations will enable sustainable, locally-relevant economic growth. Encouraging AI adoption also helps build resilience and adaptability within the local economy, ensuring that AI solutions are tailored to the specific needs of the community concerned.
- » **Incentives and supportive policies are also needed to encourage Namibian start-ups to develop AI innovations that address specific challenges faced by developing countries.** These startups can be instrumental in creating solutions that are both culturally relevant and economically viable. By combining incentives with fostering a culture of innovation, developing countries can create an environment not only where innovation thrives, but also where responsible growth is achieved.

- » **Regulations and policies related to AI also need to be pro-innovation while ensuring consumer protection, striking a balance that fosters a dynamic startup ecosystem that can innovate responsibly, benefiting both the economy and society.** The Bank of Namibia and the Namibia Financial Institutions Supervisory Authority currently play a key role in this regard in Namibia by encouraging local innovation and removing regulatory barriers through regulatory sandboxes, as well as by offering other initiatives that provide start-ups with the necessary support to develop and scale their solutions.
- » **In addition, Namibia should promote public-private partnerships to foster advancements in AI.** Close collaboration between the Namibian Government and the private sector is required to create an environment that supports AI adoption. Such partnerships can also help bridge funding gaps, provide necessary infrastructure, and ensure that AI solutions are tailored to meet local needs.

DEALING WITH THE IMPACT ON LABOUR MARKETS AND DISTRIBUTION

- » **Advancing in AI and preventing job losses require extensive focus on skills development.** Educational initiatives in Namibia should prioritise not only basic digital literacy, but also advanced training in AI, ensuring the workforce is equipped for the future. This is important because, without the necessary skills, workers may be left behind in an AI-driven economy, leading to increased inequality and missed opportunities for economic growth. By focusing on both foundational and advanced AI skills, developing countries can build a competitive workforce capable of driving innovation and benefiting from the AI revolution.

REGULATING AI: TRANSPARENCY, INTELLECTUAL PROPERTY, PRIVACY, HUMAN RIGHTS, SECURITY

- » **The final recommendation is a call for standardised data collection and governance.** Namibia should establish standards for collecting, governing and managing data to ensure that such data used in AI systems has the necessary quality, privacy protection and security. Developing and enforcing such standards are crucial for building trust in AI technologies and ensuring that data-driven AI solutions are both effective and ethical. Standardising data practices also helps in creating a consistent framework that can facilitate collaboration between public and private sectors, as well as across borders. There is also an urgent need to finalize the Cybercrime Bill as cybercrime incidents continue to increase. National policies to protect against cybercrime are crucial because they provide a coordinated framework to combat the growing threat of cyberattacks, safeguarding critical infrastructure, citizen privacy, and the economy.

