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L’impatto dell'intelligenza artificiale sui tassi di crescita occupazionale nel settore finanziario

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AI impact on the financial sector employment growth rates

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Riassunto

I rapidi progressi dell'intelligenza artificiale (AI) stanno trasformando il mercato del lavoro globale, in particolare nel settore finanziario. Questa tesi indaga l'interazione tra l'adozione dell'AI, le tendenze occupazionali nel settore finanziario e l'evoluzione delle competenze richieste nelle diverse economie. Analizzando il duplice impatto della creazione e della perdita di posti di lavoro, la ricerca identifica le competenze sempre più richieste e mette in evidenza le sfide che la forza lavoro deve affrontare. Utilizzando dati storici del 2020, 2021 e 2023, lo studio esplora i fattori che potrebbero influenzare i livelli occupazionali e le dinamiche settoriali nelle diverse economie e in che misura.

L'analisi è arricchita da un confronto tra economie sviluppate, in via di sviluppo ed emergenti, offrendo una comprensione approfondita di come i diversi contesti economici influenzino l'integrazione dell'AI e gli effetti sull'occupazione. I risultati evidenziano le variabili chiave che guidano i cambiamenti occupazionali, tra cui la preparazione all'AI, i tassi di crescita del PIL, i tassi di inflazione, la stabilità politica e altri fattori, sottolineando l'importanza di allineare le iniziative di riqualificazione e aggiornamento professionale alle esigenze del mercato.

Le raccomandazioni politiche sono rivolte a stakeholder quali governi, istituzioni finanziarie ed enti educativi, e propongono strategie per favorire una concorrenza equa, migliorare la preparazione all'AI e colmare il divario di competenze. Inoltre, lo studio evidenzia la necessità di quadri collaborativi per ridurre il disallineamento tra offerta e domanda di formazione e promuovere una crescita occupazionale sostenibile nel settore finanziario.

Pur riconoscendo limitazioni come la disponibilità e la coerenza dei dati, nonché variabili esterne impreviste, questa ricerca pone le basi per futuri approfondimenti. Si propone di ampliare l'analisi ad altre economie, estendere l'orizzonte temporale e considerare variabili finora inesplorate. In definitiva, questa tesi fornisce una roadmap per sostenere la crescita dell'occupazione nel settore finanziario affrontando l'impatto trasformativo dell'AI.

Abstract

The rapid advancements in artificial intelligence (AI) are reshaping the global workforce, particularly within the financial sector. This thesis investigates the interplay between AI adoption, financial sector employment trends, and the evolving skill demands across economies. By examining the dual impact of job creation and displacement, this research identifies the skills that are increasingly in demand and highlights areas where the workforce faces challenges. Using historical data from 2020, 2021, and 2023, the study explores what factors could influence employment figures and sectorial dynamics for different economies and to what degree.

The analysis is enriched by comparative insights across developed, developing, and emerging economies, offering a nuanced understanding of how varying economic contexts influence AI's integration and employment outcomes. The findings reveal key variables driving employment shifts, including AI readiness, GDP growth rates, Inflation rates, political stability and others. And emphasize the importance of aligning reskilling and upskilling initiatives with market demands.

Policy recommendations are tailored for stakeholders, including governments, financial institutions, and educational entities, addressing strategies to foster fair competition, enhance AI readiness, and bridge the skill gap. Furthermore, the study underscores the necessity of collaborative frameworks to mitigate the training supply-demand mismatch and promote sustainable employment growth in the financial sector.

While limitations such as data availability, consistency, and external unforeseen variables are acknowledged, this research lays the foundation for future exploration. It advocates for expanding the scope of analysis across additional economies, incorporating broader time frames, and exploring previously unexamined variables. This thesis ultimately provides a roadmap for fostering employment growth in the financial sector while navigating the transformative impact of AI.

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1. Introduction

1.1 Context and Importance

The financial system, often referred to as the "brain of the economy," plays a pivotal role in processing vast amounts of information to enable efficient resource allocation, maintain stability, and manage risk. It serves as the backbone of economic activity, ensuring the flow of capital while fostering innovation and societal progress. However, like any complex system, it is not without vulnerabilities—imbalances or inefficiencies in its function can lead to significant economic disruptions. Financial policy and regulation thus act as mechanisms to correct these imbalances and harness the system's capabilities for the betterment of society.

At the heart of the financial system's evolution lies its ability to process information. From the invention of double-entry bookkeeping to the advent of modern computing, technological advancements have continuously enhanced the system's capacity to analyze data and coordinate actions among participants. Today, artificial intelligence (AI) represents the next frontier of innovation, offering unprecedented tools for efficiency, decision-making, and risk management. Technologies such as machine learning (ML), generative AI (GenAI), and AI agents are transforming financial markets and intermediaries, enabling faster and more accurate insights while also presenting unique challenges.

(Source: Aldasoro, I, Gambacorta, L, Korinek, A, Shreeti, V & Stein, M 2024b, Intelligent financial system: how AI is transforming finance.)

The rapid integration of AI in finance has unlocked new possibilities across investment management, fraud detection, credit scoring, and customer support. For instance, AI-powered models have revolutionized asset pricing and risk analysis by identifying patterns in large datasets, often inaccessible to traditional methods. Additionally, generative AI is streamlining back-office operations, enhancing regulatory compliance, and reshaping customer experiences. However, the same technologies that drive efficiency also introduce concerns around transparency, data privacy, algorithmic bias, and systemic risk.

(Source: Belelieu, A, Propson, D & Parker, D 2025, Artificial Intelligence in Financial Services, World Economic Forum.)

A particularly pressing issue is the "black box" nature of many AI systems, which complicates accountability and trust. Moreover, AI's increasing adoption raises fears of labor market disruption and exacerbates risks to financial stability. From early rule-based systems to today's complex algorithms, the potential for cascade effects, herding, and market concentration has only grown. As the financial system becomes more dependent on these technologies, policymakers face the urgent task of designing frameworks that balance innovation with safeguards against unintended consequences.

(Source: Chinu & Bansal, U 2023, 'Explainable AI: To Reveal the Logic of Black-Box Models', New Generation Computing.)

1.2 Research Questions

This thesis explores implications for employment growth in the financial sector across different economies and regions around the world amid the ongoing progress of AI. The central research questions include:

- **How does AI adoption influence employment in finance across different economic regions, and what other factors could impact the employment growth in the industry?**
- **What is the balance between job creation and job displacement in the financial sector due to technological advancements, and which skills are becoming increasingly essential for the workforce?**
- **What tailored recommendations can be made for economies at different development stages to foster growth in the financial sector and, consequently, employment opportunities?**

By addressing these questions, this research seeks to contribute to the broader discourse on the role of AI in shaping the future of work and economic dynamics in finance.

1.3 Methodology Overview

This study employs a mixed-methods approach to analyze AI's impact on the finance sector. The methodology includes:

- **Quantitative Analysis**: This thesis employs a range of statistical models and data analysis techniques to examine the factors influencing employment growth in the financial sector amidst the adoption of AI technologies. The analysis draws on data collected from various reputable sources, including but not limited to the **World Bank**, the **U.S. Bureau of Labor Statistics (BLS)**, datasets from the **International Monetary Fund (IMF)**, and reports published by the **United Nations Development Program (UNDP)**.
- **Qualitative Analysis**: Reviewing industry reports, case studies, and academic literature to contextualize the quantitative findings.
- **Comparative Analysis**: To enhance the depth of the study, a comparative analysis was conducted across different economies and regions worldwide. This approach aimed to identify and evaluate the varying factors that influence employment growth in the financial sector in the context of AI adoption. By comparing economies at different stages of development—such as advanced, emerging, and frontier market.

2. Literature Review

2.1 Evolution of AI in Finance

Artificial Intelligence (AI) has emerged as a transformative force in the financial sector, reshaping traditional practices and enabling unprecedented advancements. Over the past few decades, AI has evolved from being a futuristic concept to a practical tool, driving innovation across various domains of finance.

Automation in the financial sector is not a novel concept, as the industry has long utilized technology to optimize operations and improve service quality. A notable milestone was the introduction of automated teller machines (ATMs) in the 1960s, which revolutionized banking by providing customers with 24/7 access to cash and essential banking services. In the 1980s and 1990s, the adoption of electronic trading platforms transformed securities markets, allowing for faster and more efficient trade execution. The early 2000s witnessed the rise of online banking, empowering customers to manage their accounts and conduct transactions conveniently from their homes. These foundational technologies paved the way for the development of more sophisticated systems.

A significant advancement occurred with the emergence of high-frequency trading algorithms in the 2000s, which demonstrated the potential of automation to improve market efficiency and liquidity. However, these systems were typically designed to address specific functions in financial services, with human oversight continuing to play a vital role.

(Source: Adeyeri, TB 2024a, 'Economic Impacts of AI-Driven Automation in Financial Services', Valley International Journal Digital Library, vol. 12, no. 7, pp. 6779–6791.)

The Advent and Growth of Machine Learning in Finance

The next wave of innovation was driven by machine learning (ML), a subset of artificial intelligence (AI). ML algorithms are capable of autonomously learning and performing tasks such as classification and prediction without requiring explicit rule-based programming. Although early ML applications in finance were constrained by limited computing power, the technology quickly gained traction, with financial institutions leveraging structured and labeled data to implement early use cases.

The most advanced ML models are now based on deep neural networks, a type of algorithm inspired by the structure and functioning of the human brain. These networks are universal function approximates capable of learning systematic relationships in various datasets, including complex and unstructured data such as news feeds and social media sentiment

(Source: Aldasoro, I, Gambacorta, L, Korinek, A, Shreeti, V & Stein, M 2024b, Intelligent financial system: how AI is transforming finance.)

The application of deep learning has enabled financial institutions to analyze terabytes of data, leading to dynamic and fast-paced markets with optimized pricing and valuation. Despite these advancements, such models are often opaque, adapting dynamically to new data with minimal human intervention, which raises concerns about their transparency and interpretability

(Source: Gensler, G & Bailey, L 2020, Deep Learning and Financial Stability, papers.ssrn.com, Rochester, NY.)

Generative AI and Its Advancements

For the past 15 years, i.e., since the beginning of the deep-learning era, the computing power used for training the most cutting-edge AI models has doubled every six months – much faster than Moore's law would suggest ((BIS, How AI is Transforming Finance, 2024)). This exponential growth in computational capacity has driven remarkable advancements in artificial intelligence, culminating in the emergence of Generative AI (GenAI) systems. GenAI models, particularly Large Language Models (LLMs), represent a pivotal innovation in AI by focusing on data generation capabilities.

LLMs, exemplified by systems such as ChatGPT, specialize in processing and generating human-like text. These models are trained on vast datasets to predict text continuations, such as determining the next word in a sentence based on its preceding context. Through this process, LLMs learn intricate relationships between words and concepts, enabling them to statistically associate ideas and develop what many consider a rudimentary form of understanding. Leveraging this foundational principle, LLM-based chatbots can generate coherent and contextually relevant text based on a given input, or "prompt".

One of the key explanations for the impressive performance of modern LLMs lies in their ability to develop an internal "world model" during training. This representation allows them to respond accurately to a wide range of prompts by drawing from their learned associations. As a result, LLMs have found applications across numerous sectors. They excel in text generation, analysis, categorization, editing, summarization, coding, translation, customer service, and even synthetic data generation.

(Source: Li, K, Hopkins, AK, Bau, D, Viégas, FB, Pfister, H & Wattenberg, MP 2022, 'Emergent World Representations: Exploring a Sequence Model Trained on a Synthetic Task', arXiv (Cornell University), Cornell University.)

Applications in the Financial Sector

In finance, LLMs are increasingly being utilized to transform operations and improve efficiency. Key applications include:

- Robo-Advising: Providing automated, data-driven investment advice.
- Fraud Detection: Identifying suspicious transactions with greater precision.
- Back-End Processing: Streamlining administrative workflows.
- Enhanced Customer Experience: Improving client interactions with natural language capabilities.
- Software Development: Assisting in internal code creation and harmonization.

Regulators have also started exploring the potential of GenAI and LLMs for regulatory and supervisory technologies, such as compliance monitoring and risk assessment (Cao, 2022).

2.2 Impact of AI on Employment in Different Sectors

Automation's impact on workers and industries will differ significantly depending on the nature of tasks, occupations, and skill levels involved. While machines are poised to take over various activities, many jobs will evolve, requiring humans to collaborate closely with automated systems.

Early Targets for Automation

Activities with high predictability, such as physical tasks in manufacturing and retail or data collection and processing, are likely to be automated first. These tasks span diverse sectors, skill levels, and wage brackets. Automation often favors high-skill workers, boosting their productivity while reducing demand for lower-skill, routine-based roles like filing clerks or assembly-line workers.

However, the effects of automation are not uniform. While some forms disproportionately impact middle-skill workers, technological advancements are increasingly exposing the activities of both low- and high-skill workers to automation, potentially reducing the polarization in job displacement across skill levels.

(Source: McKinsey 2017, A FUTURE THAT WORKS: AUTOMATION, EMPLOYMENT, AND PRODUCTIVITY, January.)

Global and Sectorial Effects

Automation's reach is global, but its adoption varies by geography and industry. Notably, China, India, Japan, and the United States together account for over half of the wages and nearly two-thirds of jobs that could be automated using existing technologies as revealed by Mckinsey Global Institute report “A Future that works”. Within countries, automation's potential is shaped by their sectorial composition and the nature of tasks within industries. For example:

Manufacturing and Agriculture: These sectors involve repetitive physical activities that are highly automatable.

Developing Economies: Lower wage rates may delay automation adoption despite technical feasibility.

Key Drivers of Automation Adoption

The pace and scale of automation depend on five critical factors:

1. Technical Feasibility: Innovations must be developed, integrated, and adapted to automate specific tasks.
2. Cost Considerations: The economic viability of automation hinges on the cost of deploying solutions relative to alternatives.
3. Labor Market Dynamics: The availability, demand, and cost of human labor significantly influence automation adoption.
4. Economic Benefits: Automation offers advantages like higher output, improved quality, and labor cost savings.
5. Regulatory and Social Acceptance: Policies and societal attitudes can accelerate or hinder automation, regardless of its economic benefits.

Given these factors, the full impact of automation on work will unfold over decades. While macro-level changes across industries may be gradual, micro-level effects can be swift—affecting individual workers or companies disrupted by competitors leveraging automation.

(Source: McKinsey 2017, A FUTURE THAT WORKS: AUTOMATION, EMPLOYMENT, AND PRODUCTIVITY, January.)

Automation and the Future Workforce

Contrary to fears of mass unemployment, the global economy will likely face a labor shortage rather than a surplus due to aging populations in both developed and developing countries. Automation will be essential to offset demographic trends, but human labor will remain indispensable.

The nature of work will evolve as machines take over certain tasks, prompting humans to focus on activities that complement automation. This shift will reshape organizational structures, competitive dynamics, and business models. Workers will need to engage more deeply with technology and acquire new, in-demand skills. *(McKinsey 2017, A FUTURE THAT WORKS: AUTOMATION, EMPLOYMENT, AND PRODUCTIVITY, January.)*

Automation is technically feasible for any types of activities in industry sectors, but some activities can be more affected than others. The below chart extracted from *McKinsey Global Institute* is reflecting the time spent in US different occupations under different Sectors with the technical potential of automation. With bigger bubbles indicating bigger percentage of time spent on the occupation and automation potential for 0-100:

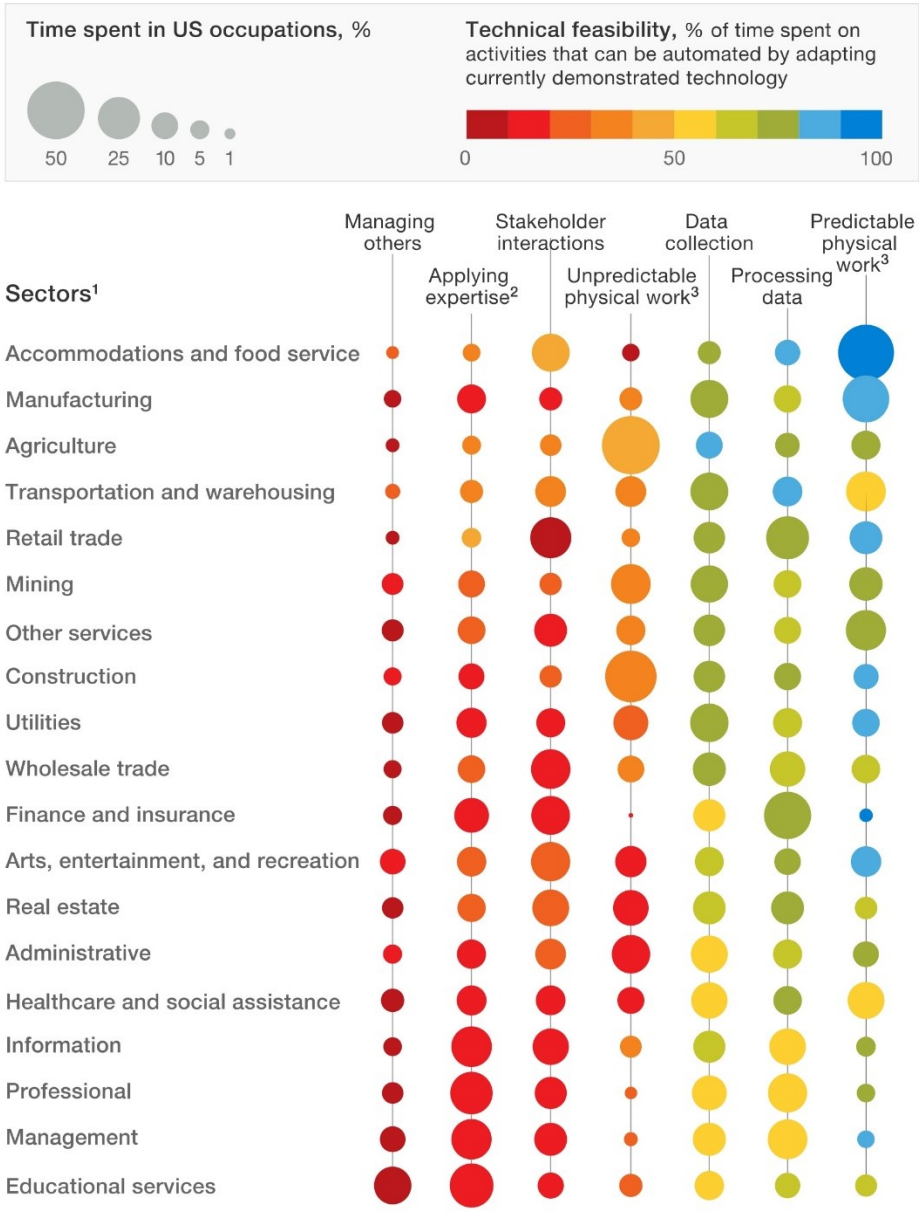


Figure (1): Technical potential for automation across sectors. Source: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Firstly, automatable activities

On top of the industries comes the **Accommodation and food services** with an automation percentage of **73%** of all the accommodation activities, where almost half of all labor time involves predictable physical activities and the operation of machinery—including preparing, cooking, or serving food; cleaning food-preparation areas; preparing hot and cold beverages; and collecting dirty dishes.

Then comes the **manufacturing** industry where performing activities or operating machineries in a predictable environment and data processing are representing one-third of the overall spent time of workers, those activities include packaging, loading materials on production lines, and all other physical works like welding, cutting, shaping…etc. the chart is showing that **60%** of all manufacturing activities could be automated representing second highest percentage among all other industries.

Retailing has significant automation potential, with an estimated **53%** of activities being automatable. However, the feasibility of automation varies by role within the sector. Tasks like stock management, logistics, packaging items for shipping, and stocking merchandise are highly suited for automation, as are activities involving data collection and maintaining sales records. Despite this, retail work often requires cognitive and social skills that are less easily automated. Providing personalized customer advice, such as recommending specific cuts of meat or selecting shoe colors, relies on judgment and emotional intelligence, making these tasks more challenging to automate.

Activities and industries in the middle range for automation

The financial services and insurance sectors illustrate the varying potential for automation. While finance heavily depends on professional expertise, with stock traders and investment bankers relying on their analytical skills, approximately 50% of the workforce's time is spent on data collection and processing—tasks with a high potential for automation. Insurance sales agents gather customer or product information, underwriters verify records, securities and financial sales agents prepare contracts, and bank tellers confirm the accuracy of financial data.

Overall, **43%** of activities in the financial sector are technically automatable, though this potential varies significantly across roles. For Instance, mortgage brokers dedicate up to 90% of their time to processing applications. By implementing more advanced verification systems for documents and credit applications, this percentage could drop to just over 60%, enabling mortgage advisers to focus more on providing personalized advice. This shift would enhance value for both customers and financial institutions.

Similarly, activities involving physical tasks or operating machinery in unpredictable environments, such as those in farming, forestry, and construction, exhibit moderate

potential for automation. These tasks are also prevalent across other sectors, demonstrating a diverse range of automation possibilities.

Finally activities with low technical potential for automation
The activities most difficult to automate with current technologies are those requiring **people management and development** (with only 9% automation potential) or the application of **expertise in decision-making, planning, or creative work** (18% automation potential).

(Source: McKinsey 2017, A FUTURE THAT WORKS: AUTOMATION, EMPLOYMENT, AND PRODUCTIVITY, January.)

This reliance on human interaction is particularly evident in sectors like **healthcare and education**, which have relatively low technical potential for automation. Among all sectors examined, education has the lowest feasibility for automation. While digital technology has brought transformative changes—such as the proliferation of online classes—the core of teaching relies on deep expertise and complex interpersonal interactions. These activities, which are the least automatable of all categories, constitute about half of the tasks within the education sector.

Worth mentioning that certain activities exemplify tasks requiring flexibility due to unpredictable environments, making them challenging to automate with current technologies. Examples include **operating a crane** on a construction site, **delivering medical care** as a first responder, **collecting trash in public spaces**, **setting up classroom materials**, and **making beds in hotel rooms**. The unpredictability arises because the surroundings are constantly changing. In schools, for instance, children leave bags, books, and coats scattered randomly. Similarly, in hotel rooms, guests might place pillows and clothing in various locations, creating clutter that varies from room to room.
These tasks, demanding adaptability, currently have an automation potential of **25%**. However, advancements in technology that enable machines to manage unpredictable environments as effectively as predictable ones could raise this potential to 67%. Already, some activities in less predictable settings, such as farming and construction, are becoming more automatable. For example, evaluating crop quality, measuring materials, and translating blueprints into work instructions demonstrate a higher susceptibility to automation as technology progresses.

(Source: Chui, M, Manyika, J & Miremadi, M 2016, Where machines could replace humans-and where they can't (yet) the technical potential for automation differs dramatically across sectors and activities.)

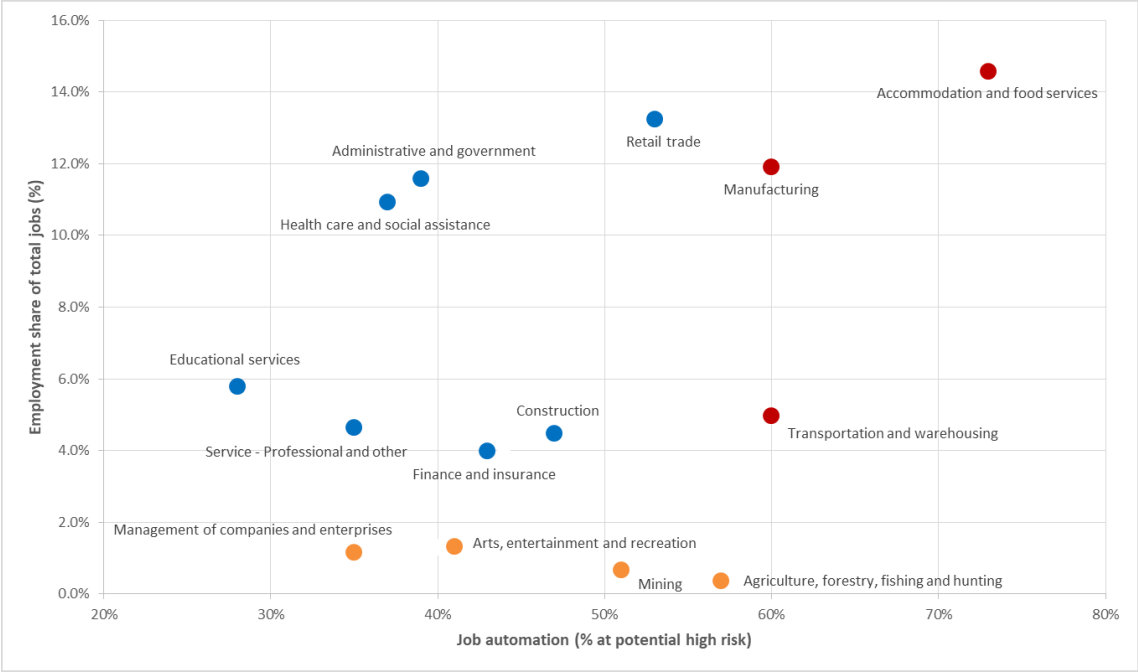


Figure (2): Job automation versus Employment share of total jobs in the US. Source: McKinsey Global Institute, 2017
Note: Authors' elaboration based on Mckinsey data and for selected sectors.

So based on the automation potential for each industry versus the employment share of total jobs in the US, Accommodation and food services, Transportation and warehousing, Manufacturing are the 3 most sectors at a potential high risk of automation representing around 31% of employment share in the US.

Finance and insurance comes in an intermediate level with a 4% share of employment and potential risk of automation 41%.

Deeper look into the financial sector within the US

We gathered a breakdown of occupations within Business and financial sector with number of employment for each occupation as well as 10-year-outlook extracted from the U.S. BUREAU OF LABOR STATISTICS.
We added a column for each occupation indicating the automation potential as (High, low and moderate).

Business and financial sector occupations breakdown along with a 10-year-employment change outlook and the automation potential for each occupation:

Occupation	Number of Jobs, 2023	Job Outlook, 2023-33	Employment change, 2023-33	Automation potential
Accountants and Auditors	1,562,000	6%	91,400	High
Budget Analysts	50,800	4%	2,000	Moderate
Compensation, Benefits, and Job Analysis Specialists	103,700	7%	7,200	Moderate
Compliance Officers	403,900	5%	21,900	Moderate
Cost Estimators	227,900	-4%	-8,300	High
Credit Counselors	31,800	5%	1,500	High
Financial Analysts	404,800	9%	37,900	Low
Financial Examiners	65,500	21%	13,800	Low
Fundraisers	125,900	6%	7,400	Moderate
Human Resources Specialists	933,700	8%	74,200	Moderate
Insurance Underwriters	118,400	-4%	-4,700	High
Labor Relations Specialists	65,800	0%	-200	High
Loan Officers	334,100	1%	4,500	High
Logisticians	237,100	19%	45,800	Moderate
Management Analysts	1,018,300	11%	107,900	Low
Market Research Analysts	903,400	8%	74,900	High
Meeting, Convention, and Event Planners	149,000	7%	9,900	Moderate
Personal Financial Advisors	321,000	17%	55,000	Low
Project Management Specialists	973,600	7%	69,900	Moderate
Property Appraisers and Assessors	83,900	4%	3,200	High
Purchasing Managers, Buyers, and Purchasing Agents	605,400	7%	41,400	Moderate
Tax Examiners and Collectors, and Revenue Agents	54,000	2%	1,000	High
Training and Development Specialists	420,100	12%	48,500	Low
Claims Adjusters, Appraisers, Examiners, and Investigators	355,600	-5%	-16,200	High

Figure (3); Source: U.S. BUREAU OF LABOR STATISTICS.
Note: number of jobs and outlook are extracted from the U.S Bureau of labor statistics as of 2023; we added the automation potential for each job based on the nature of the job (repetitive and structured jobs are classified as “High”, Analytical, Semi-structured and Interactive as “Moderate”, and Creative, Strategic, Human-centric as “”Low”

With performing a simple linear regression relationship between the automation potential, it’s clear that occupations with higher automation potential are associated with lower 10-year-job outlook, for some occupations like Insurance underwriters, cost estimators and claims adjusters, the outlook is negative indicating lower number of employment in the next 10 years. Those activities are characterized by repetitive and Rule-Based Nature of Tasks, they’re highly automatable because they rely on structured data, making them ideal candidates for AI and machine learning tools that can process large datasets and apply complex rules efficiently.

Insurance Underwriters: Their work involves evaluating applications, assessing risk profiles, and deciding on coverage terms based on predefined guidelines and actuarial tables. This process follows standardized procedures and rarely requires deviation from established rules.

Cost Estimators: These professionals analyze materials, labor, and project timelines using historical data and industry benchmarks to generate cost estimates. Their tasks are structured and formulaic, often relying on software tools to produce results based on input variables.

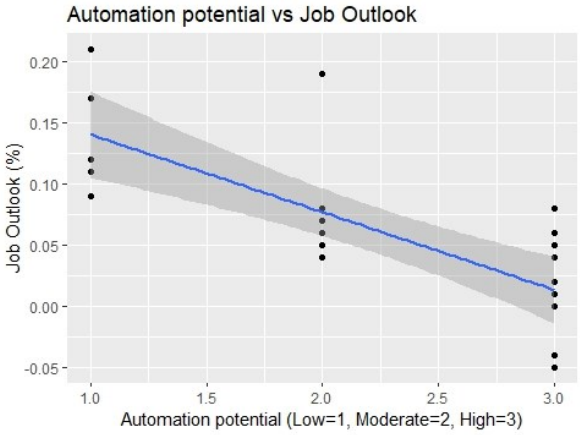


Figure (4): Regression result as extracted from R

Claims Adjusters: Their role entails reviewing insurance claims, verifying policy details, and determining payout amounts by following predefined rules and guidelines. Much of this work involves data processing and adherence to standardized workflows.

3. Methodology

3.1 Scope and Focus of the Study case

The financial sector is undergoing a significant transformation driven by the rapid adoption of artificial intelligence (AI) worldwide. This technological revolution is reshaping job requirements and the skills demanded within the industry, presenting both opportunities and challenges for employment growth.

This project aims to analyze the key factors influencing employment growth rates in the financial sector, particularly in light of AI's expanding role. To achieve this, we have compiled a comprehensive database encompassing data from 35 countries across various global regions, covering the years 2021 to 2023.

The analysis focuses on the **financial sector's employment** as the dependent variable, with seven independent variables identified as potential influencers, including AI adoption. These variables were carefully selected based on their relevance to the evolving landscape of financial employment, ensuring a holistic exploration of the factors shaping workforce dynamics.

The highlighted regions in red (as depicted in our visual representation) denote the geographic scope of our dataset. Through this study, we aim to provide actionable insights into the

interplay between technological advancements and employment trends in the financial sector, thereby contributing to a deeper understanding of the sector's future trajectory.

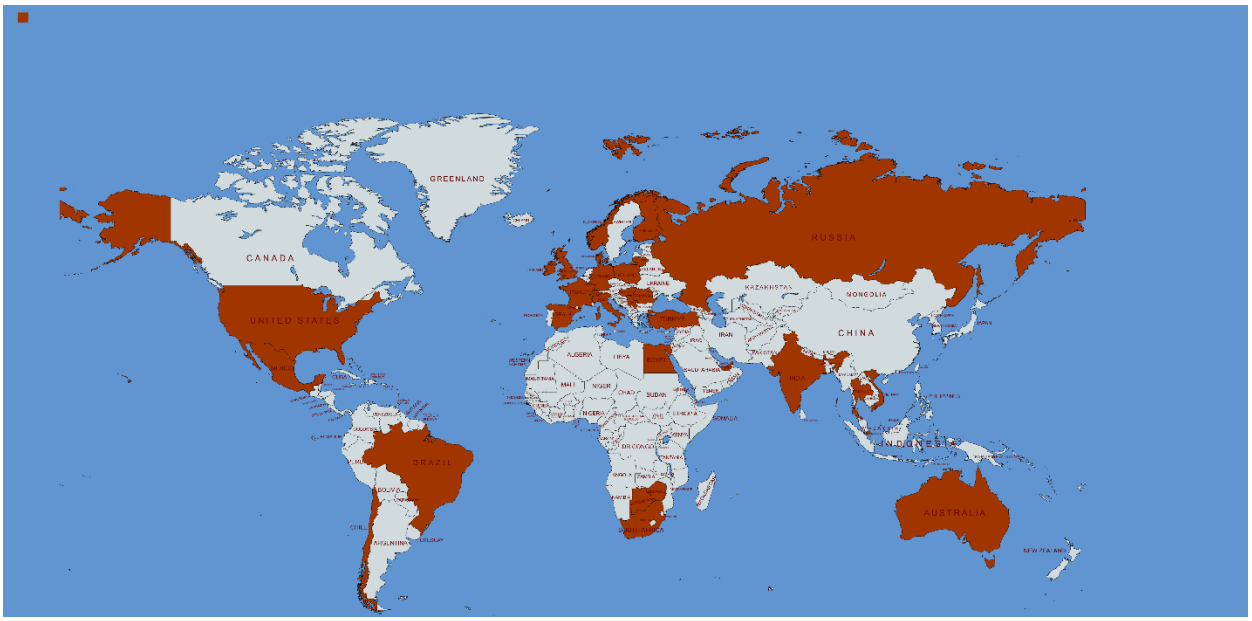


Figure (5); World Map, generated by MapChart.net

3.2 Variables explanation and the rationale behind selecting each one

1- AI Readiness

The AI Index is a numeric index ranges from (0 to 100) providing a comprehensive framework for evaluating the readiness of governments to implement AI in public service delivery. It examines the multi-dimensional aspects of AI governance through 39 indicators grouped into three core pillars:

Government: This pillar assesses a government's strategic vision and regulatory framework for AI, emphasizing governance and ethical considerations. It also evaluates the internal digital capacity of governments, including the skills, practices, and adaptability required to navigate technological advancements effectively.

Technology Sector: A robust technology sector is essential for supplying governments with innovative AI tools. This pillar highlights the sector's innovation capacity, the strength of its business environment for entrepreneurship, the flow of R&D investments, and the quality of human capital driving the sector.

Data & Infrastructure: AI tools rely heavily on the availability of high-quality, representative data to ensure fairness and accuracy. Additionally, the infrastructure required to store, process, and deliver this data effectively to power AI solutions is crucial for successful implementation.

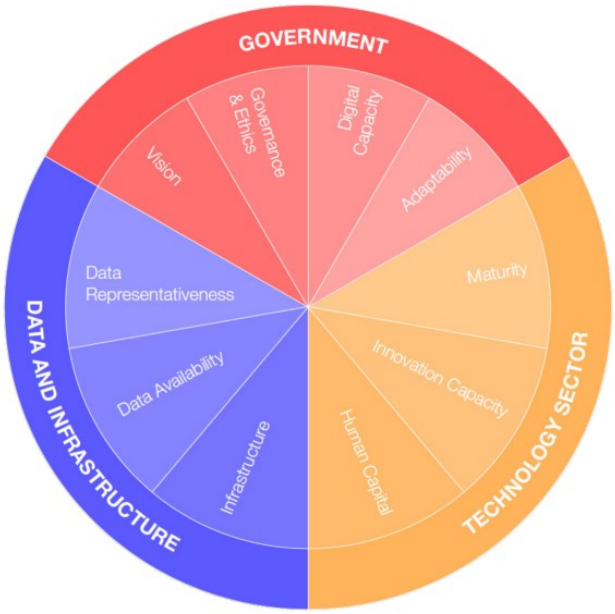
This index serves not only as a measure of governmental and technological readiness but also as a lens for understanding the broader context of AI adoption and policy. It incorporates both numerical scores and qualitative insights, providing a nuanced view of regional and national AI strategies.

For better interpretation, the index has been normalized using the Z-score given that values are bigger than other variables.

$$Z = \frac{x - \mu}{\sigma}$$

(Source: Abdi, H 2010, Encyclopedia of Research Design.)

Figure (6); Factors considered in the AI readiness index. Source: Oxford insights



Rationale for Incorporating the AI Index into the Database

The inclusion of the AI Index in the database for this thesis is essential for examining how governmental readiness, technological maturity, and data infrastructure influence the adoption of AI and its subsequent impact on employment in the financial sector. The thesis investigates how AI-driven innovation and regulatory frameworks shape the financial industry's labor market dynamics, including job displacement, creation and transformation.

(Source: Oxford Insights 2023, Government AI readiness index, Oxford Insights)

2- Real GDP Annual Growth Rates

Real GDP annual growth rates, sourced from the International Monetary Fund (IMF), serve as a key measure of a country's overall economic activity. GDP represents the total value of final goods and services produced within a country at constant prices during a specific period, reflecting the economy's health and productivity. As a widely recognized economic indicator, GDP provides insight into national economic trends and performance over time.

(Source: IMF 2024, Real GDP Growth, Imf.org, International Monetary Fund.)

Rationale for Incorporating Real GDP Growth Rates

Economic growth significantly influences employment levels across various sectors, including finance. In periods of robust economic growth, increased demand for goods and services typically extends to financial services, driving job creation within the industry. Conversely, economic contraction can dampen demand, leading to reduced employment opportunities.

By incorporating real GDP growth rates into the analysis, this thesis establishes a critical link between macroeconomic performance and employment trends in the financial sector. Understanding the interplay between economic cycles and workforce dynamics provides valuable context for assessing how external economic conditions, in conjunction with AI and other factors, shape the employment landscape in finance.

3- Unemployment Rate

The unemployment rate, extracted from the International Monetary Fund (IMF) database, measures the percentage of unemployed individuals within the total labor force, providing a critical indicator of labor market health. This metric reflects the balance between labor supply and demand and is a key measure of economic and social stability.

(Source: Unemployment rate 2023, Imf.org.)

Rationale for Incorporating the Unemployment Rate

The unemployment rate offers essential insights into the broader labor market context in which AI adoption occurs. High unemployment rates may suggest a labor market more susceptible to job displacement caused by AI and automation, as fewer alternative opportunities exist for displaced workers. On the other hand, low unemployment rates could indicate a robust labor market, where AI adoption is more likely to complement human labor and create new employment opportunities.

By including the unemployment rate as a variable in this thesis, the analysis captures the nuanced relationship between labor market conditions and the impact of AI on employment in

the financial sector. This variable helps contextualize whether AI adoption exacerbates job losses or facilitates job creation, depending on existing labor market dynamics.

4- Political Stability and Absence of Violence/Terrorism

Political Stability and Absence of Violence/Terrorism is a key component of the Worldwide Governance Indicators (WGI) provided by the World Bank. This metric measures perceptions of the likelihood of political instability, politically motivated violence, and terrorism within a country. It serves as a proxy for governance quality, highlighting patterns in political stability and its impact on economic and social development.

The WGI aggregates data from over 30 think tanks, international organizations, NGOs, and private firms, drawing on tens of thousands of survey respondents and expert opinions worldwide. Scores range from -2.5 (weak governance performance) to 2.5 (strong governance performance), offering a standardized view of governance across countries and over time.

(Source: Kaufmann, D & Kraay, A 2024, Worldwide Governance Indicators, World Bank.)

Rationale for Incorporating Political Stability

Political stability is a critical determinant of a country's economic environment, particularly its ability to attract and sustain investments. A stable political climate encourages higher investment volumes, fostering job creation and economic growth. Conversely, political instability and violence deter investment, disrupt economic activity, and lead to stagnation or declines in employment rates.

For example, regions such as parts of the Middle East or Eastern Europe experiencing political unrest often face reduced financial sector activity, limiting opportunities for employment growth. By including this indicator, the thesis evaluates the extent to which political stability mediates the relationship between AI adoption, economic conditions, and employment trends in the financial sector. This variable underscores the broader contextual factors shaping labor market outcomes and the diffusion of AI technologies.

5- Inflation Rate

The inflation rate, derived from the International Monetary Fund (IMF), measures the percentage change in the average consumer prices over a specified period. It is based on the cost of a typical basket of consumer goods and services, reflecting the average price level in an economy. This indicator serves as a key gauge of price stability and economic conditions, with rising inflation signifying an increase in overall price levels and decreasing purchasing power.

Rationale for Incorporating the Inflation Rate

The inflation rate has been included in this thesis for two key reasons.

a- Impact on Employment: High inflation tends to erode the purchasing power of wages, which may lead to decreased real income and reduced consumer spending. This can create downward pressure on overall economic growth, including within the finance sector, potentially resulting in job losses or stagnant employment levels.
b- Impact on Investment in AI and Innovation: High inflation can also constrain companies' ability to invest in innovation, including AI technologies. As inflation drives up costs, businesses may face tighter profit margins and reduced financial flexibility, making them less likely to allocate resources toward the development and adoption of new technologies, including AI-driven solutions in finance.

By incorporating inflation rates into the analysis, this thesis assesses how macroeconomic factors like price stability influence both the financial sector's labor market dynamics and its capacity to invest in technological advancements, including AI.

(Source: Inflation rate, average consumer prices 2023, www.imf.org, International Monetary Fund.)

6- Human Development Index (HDI)

The Human Development Index (HDI), compiled by the United Nations Development Program (UNDP), is a composite measure designed to assess a country's average achievements in three key dimensions of human development: *health (life expectancy)*, *education (knowledge)*, and *standard of living (income)*. The HDI aggregates various indicators, such as life expectancy, literacy rate, and access to electricity in rural areas, GDP per capita, income inequality, internet access, and many others. These indicators are combined into a single value ranging from 0 to 1.0, with 1.0 representing the highest level of human development. For this thesis, the HDI data for the years 2020-2022 is used, as 2023 data has not yet been released.

(Source: United Nations 2022, Human Development Data, hdr.undp.org, UNDP.)

Rationale for Incorporating the Human Development Index (HDI)

The Human Development Index (HDI) is essential for assessing the broader socio-economic context in which the financial sector operates. HDI reflects a country's overall human development, including factors like education, health, and standard of living. These elements contribute to the skill level and health of the labor force, which directly influence employment opportunities in various sectors, including finance.

Countries with higher HDI values typically have better-educated and healthier workforces, which could lead to higher employment levels in the financial sector. In contrast, countries with

lower HDI values may face challenges in maintaining a skilled workforce, which could impact job creation or lead to higher unemployment rates in finance.

By including HDI in this analysis, the thesis aims to explore how human development factors, such as education and health, influence employment dynamics in the financial sector. The focus is to understand how these socio-economic variables may interact with other factors, such as economic growth, inflation, and political stability, to shape employment trends within the industry.

7- Population Growth Rate

The population growth rate, as extracted from the World Bank database, measures the annual percentage change in a country's population. It reflects the dynamics of population size over time, accounting for births, deaths, and migration. This indicator is crucial for understanding the overall trends in a country’s population and the potential changes in the workforce.

(Source: The World Bank 2023, Population growth (annual %) | Data, Worldbank.org.)

Rationale for Incorporating the Population Growth Rate

The population growth rate is an important variable for analyzing the expansion or contraction of the labor force. A high population growth rate generally indicates a growing labor supply, which can influence employment levels in various sectors, including finance. An expanding workforce may lead to more job opportunities, but it could also increase competition for available positions. Conversely, a declining population growth rate could signal a shrinking labor force, which may result in fewer job opportunities or even reduced employment in certain sectors.

By including population growth as a factor in this thesis, the aim is to evaluate how demographic changes interact with other economic and political variables to influence employment trends within the financial sector. Understanding these demographic shifts helps contextualize the broader labor market dynamics that affect job creation and employment levels in finance.

8- Employment in financial sector:

As mentioned earlier, Employment in finance sector is our response variable. Data are extracted from the International Labour Organization (ILO), an official U.N. agency that brings together governments, employers and workers of 187 Member States.

For better interpretation Employment data are normalized to the number of population for each country to reflect the percentage of workforce employed in finance out of the total population. This would make it more reflective when comparing between countries of different scale.

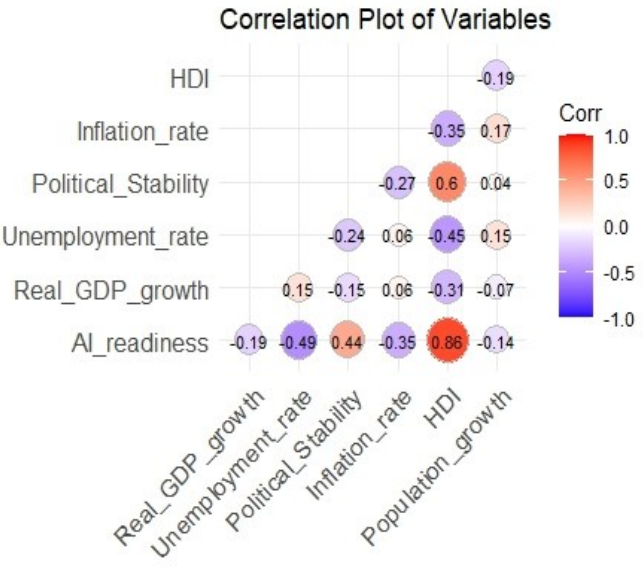
(Source: International Labour Organisation 2023, labour statistics, ILOSTAT.)

3.3 Introduction to correlation analysis

Before proceeding with the regression and decision tree analysis, it is important to first explore the relationships between the independent variables in order to understand their interactions and potential impact on the dependent variable (employment in the finance sector). A correlation matrix provides a simple yet powerful way to assess how strongly different variables are related to one another. By calculating correlation coefficients, we can identify patterns and potential collinearity between the variables that might affect the reliability and interpretability of the regression models and decision tree results.

Correlation main insights:

a) **AI Readiness and HDI (0.86):** A strong positive correlation exists between AI readiness and the Human Development Index (HDI). This suggests that countries with higher human development levels (in terms of education, health, and standard of living) are more likely to be ready for AI adoption. It reflects the potential for developed nations to invest in technological advancements, which are often tied to better infrastructure, education, and healthcare systems.



b) **AI Readiness and Political Stability (0.44):** AI readiness is moderately positively correlated with political stability. This indicates that countries with more stable political environments may be better positioned to adopt and implement AI technologies, as political stability provides the necessary confidence for businesses to invest in technological innovation and digital transformation.

c) **HDI and Political Stability (0.6):** HDI is strongly positively correlated with political stability. Countries with higher human development indices tend to enjoy greater political stability, which in turn supports long-term development strategies, including investments in education, health, and technological infrastructure.

d) **AI Readiness and Unemployment rate (-0.49):**
AI readiness shows a moderate negative correlation with unemployment rate, indicating that countries better prepared for AI adoption tend to experience lower unemployment. This can be attributed to strategic investments in education and skill development, enabling the workforce to adapt to AI-driven industries. Additionally, AI-ready nations often implement policies such as reskilling programs and innovation incentives, which offset job losses caused by automation. By fostering economic diversification and leveraging AI for growth, these countries create new employment opportunities while maintaining a stable labor market.

3.4 Introduction to Descriptive Analysis

It is essential to understand the key characteristics of the dataset through descriptive statistics. This step provides a comprehensive overview of the central tendencies, variability, and distribution of the variables under study. By analyzing measures such as the mean, standard deviation, median, skewness, and kurtosis, we can identify patterns, detect extreme values, and assess the overall distributional properties of the data.

	n	mean	sd	median	trimmed	mad	min	max	range	skew	kurtosis	se
AI_readiness	105	-0.02	1	0	0.03	1.13	-2.61	1.95	4.56	-0.43	-0.21	0.1
Real_GDP_growth	105	0.04	0.03	0.04	0.04	0.03	-0.06	0.16	0.22	0.39	0.61	0
Unemployment_rate	105	0.07	0.06	0.05	0.06	0.03	0.01	0.34	0.33	2.64	7.72	0.01
Political_Stability	105	0.29	0.72	0.49	0.33	0.71	-1.14	1.46	2.6	-0.46	-0.99	0.07
Inflation_rate	105	0.17	0.68	0.06	0.06	0.04	0	6.67	6.68	8.61	78.32	0.07
HDI	105	0.84	0.11	0.86	0.85	0.11	0.54	0.97	0.43	-1.02	0.37	0.01
Population_growth	105	0.01	0.01	0.01	0.01	0.01	-0.04	0.05	0.09	-0.35	4.37	0

As highlighted, Inflation rate data are showing extreme values in the skew and kurtosis.

Skewness measures the **asymmetry** of the distribution of the data. A positive skew means the data has a long tail on the right (more values are on the lower end, and few extreme high values). A negative skew indicates a long tail on the left. While **Kurtosis** measures the "tailedness" of the distribution. It indicates how outliers or extreme values are distributed in comparison to a normal distribution.

This is reflecting the very high inflation rate recorded in both **Zimbabwe** and **Turkey** during the years 2023, 2022 and 2021 with 667%, 193%, 98.5% respectively for Zimbabwe and 53.9%, 72.3% and 19.6% respectively for Turkey, which are way higher than any of the other countries included in our database.

3.5 Statistical models applied

1- Random forest analysis

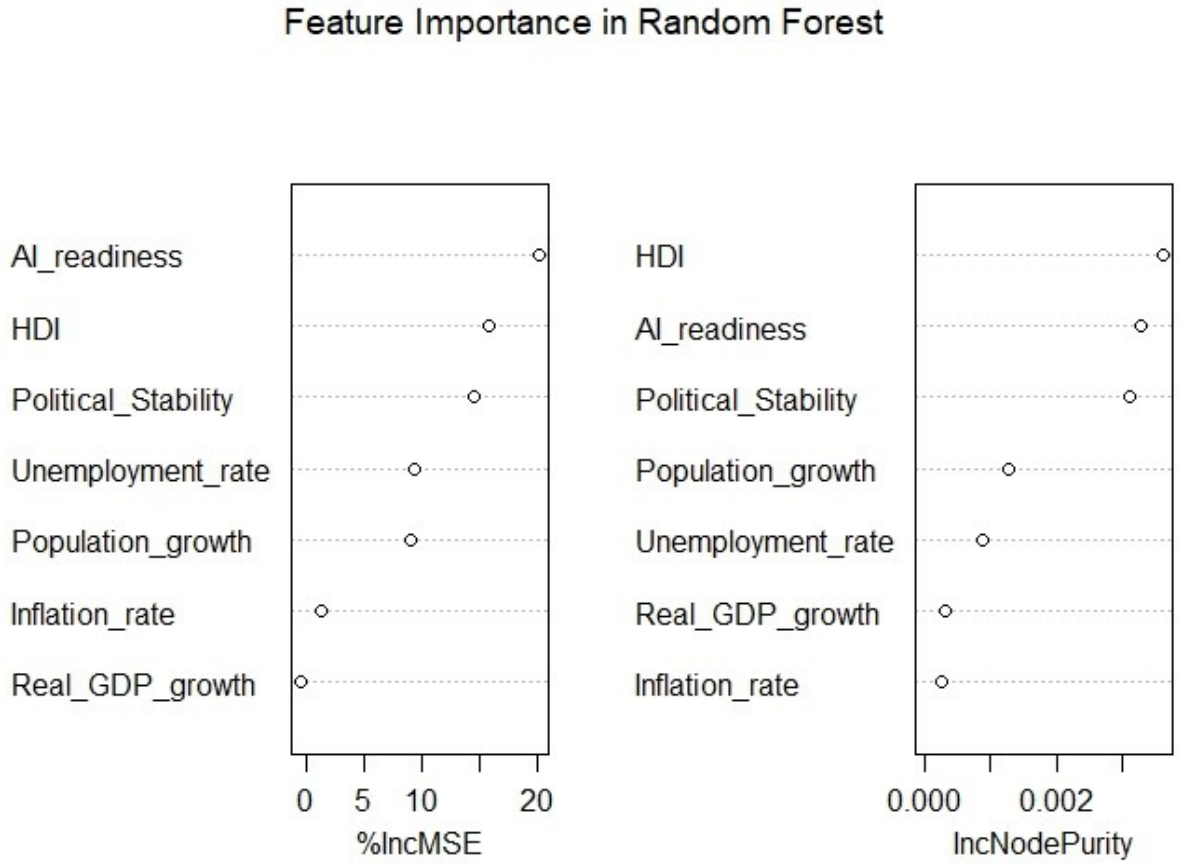
Random Forest is an ensemble learning technique widely used for regression and classification tasks due to its robustness and ability to handle complex interactions among variables. In this analysis, a Random Forest regression model was constructed to evaluate the relative importance and impact of various socio-economic and technological factors on the dependent variable **Finance Sector Employment**, while the independent variables include key economic and societal indicators such as **AI Readiness**, **Real GDP Growth**, **Unemployment Rate**, **Political Stability**, **Inflation Rate**, **Human Development Index (HDI)**, and **Population Growth**.

The model parameters were set to use 500 trees, with 3 variables randomly selected at each split. Variable importance metrics were computed to evaluate the contribution of each predictor to the model's performance.

Interpretation of Results

A. **Model Performance:**
   - The model explains 74.44% of the variance in finance sector employment, indicating a strong predictive ability.
   - The Mean Squared Residuals (MSE) is 3.187×10^{-5}, the average squared difference between predicted and actual values, indicating a very low error in the model's predictions.

B. **Variable Importance:** The importance of each predictor was assessed using two metrics:
   - %IncMSE (Percentage Increase in MSE): Measures how much the model's error increases when a variable is excluded.
   - IncNodePurity: Indicates the total decrease in node impurity (variance) contributed by a variable across all trees.



As we can see in the above figure; Top contributors are:

- **AI Readiness**: The most important predictor, with a %IncMSE of 20.18% and an IncNodePurity of 0.0032, highlighting its critical role in determining employment levels.
- **HDI:** The second most important factor, contributing significantly to the model's accuracy (%IncMSE of 15. 8% and IncNodePurity of 0.0036).
- **Political Stability**: a key determinant is also political stability with (%IncMSE of 14.56% and IncNodePurity of 0.0031)

2- Regression analysis

Regression analysis is a powerful statistical tool widely used in the field of finance and economics to model relationships between a dependent variable and one or more independent variables. The process began with a **multiple linear regression model** with same variables, the initial model provided insights into the relationships between our variables and finance sector employment. However, not all predictors contributed significantly to the model, as indicated by their p-values.

Interpretation of Results

- **Political Stability and Population growth** exhibited significant positive relationships with employment in the finance sector ($p < 0.01$).
- Followed by **AI readiness** which had a significant positive impact on finance sector employment.
- Other variables, such as Real GDP Growth, Unemployment Rate, Inflation Rate, and HDI, were found to have non-significant impacts.

The initial model's adjusted R-squared value (0.5013) suggested that improvements could be made in the model's fit.

3- Stepwise regression

Stepwise regression was employed to optimize the model further. Starting with the full model, variables were added or removed based on their contribution to the AIC. This process yielded a final model comprising the following predictors:
AI Readiness, Political Stability, Population growth

```
Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)        0.0098664  0.0009374  10.525  < 2e-16 ***
AI_readiness       0.0055705  0.0008692   6.408 4.74e-09 ***
Political_Stability 0.0050681  0.0012020   4.216 5.42e-05 ***
Population_growth   0.2239451  0.0698758   3.205  0.00181 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.007877 on 101 degrees of freedom
Multiple R-squared:  0.5213,    Adjusted R-squared:  0.5071
F-statistic: 36.66 on 3 and 101 DF,  p-value: 4.106e-16
```

The adjusted R-squared value (approximately 0.507) remains relatively low, indicating that the model explains just half of the variation in the dependent variable. We generated diagnostic plots which allow for an assessment of the model's adequacy and the potential presence of

outliers, leverage points, and non-linearity. Below are the interpretations of the residual diagnostic plots:

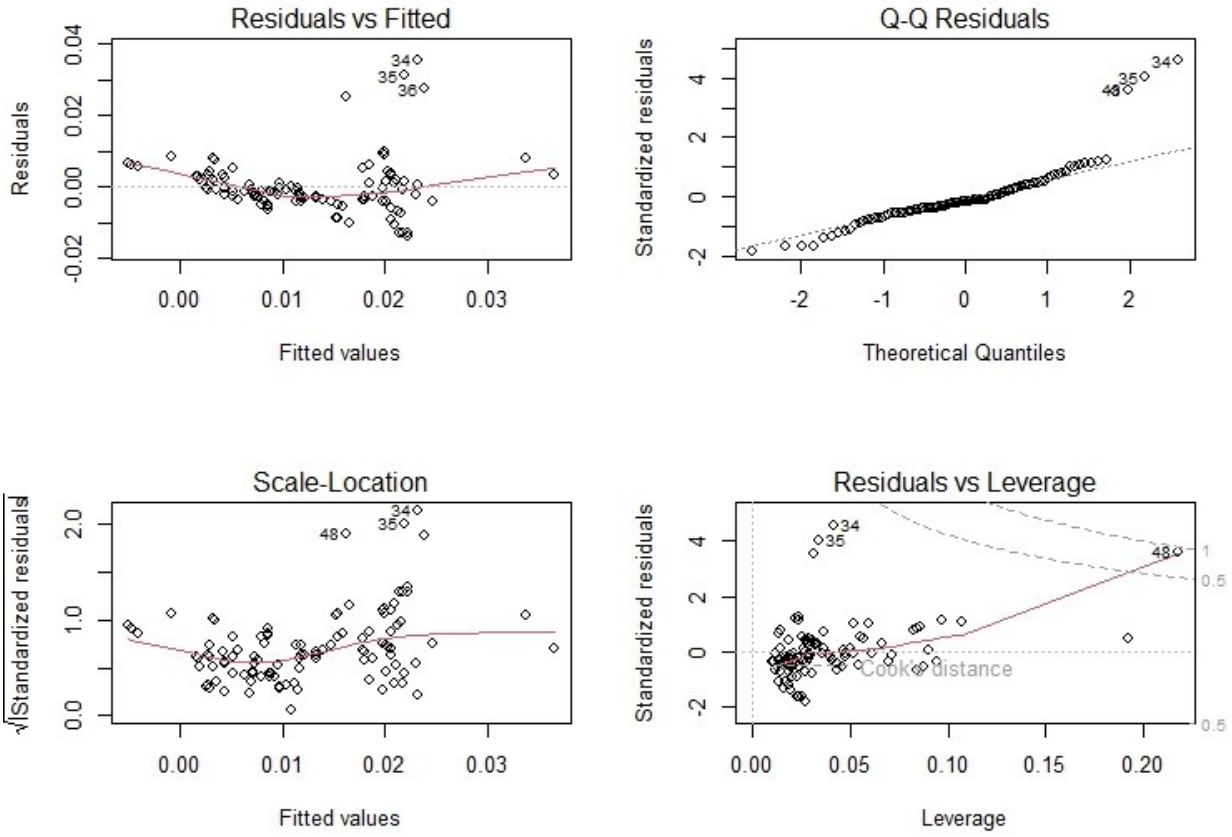


Figure 1; Residuals vs. Fitted

The Residuals vs. Fitted plot demonstrates a clear deviation from randomness. A noticeable curvature indicates non-linearity, suggesting that the relationship between the predictors and the dependent variable may not be adequately captured by the linear model.
Additionally, the residual spread is not uniform across the fitted values, which may point to heteroscedasticity (non-constant variance of residuals).

Figure 2; Q-Q Plot of Residuals

The Q-Q plot reveals that the residuals deviate from the theoretical normal distribution, especially in the tails. This indicates potential violations of the normality assumption, which can affect the validity of hypothesis tests and confidence intervals.

Figure 3; Scale-Location Plot

The Scale-Location plot somehow shows a pattern in the spread of the standardized residuals, further suggesting heteroscedasticity. Ideally, the points should be randomly scattered without any discernible pattern.

Figure 4; Residuals vs. Leverage

The Residuals vs. Leverage plot identifies a few observations with high leverage, which could be influential points in the model. Cook's distance highlights observations that may disproportionately impact the regression results.

In response to the above mentioned issues, we proceeded with some enhancements,

A- **GAM (Generalized Additive Model):** We used GAM to allow for non-linear relationships between the predictors and the dependent variable. This is important as many real-world relationships are non-linear and may provide better insights.

Model evaluation:

AIC Comparison: The Akaike Information Criterion (AIC) was used to compare the models. The linear model had an **AIC of -708**, while the GAM model had a much lower **AIC of -801**. A lower AIC indicates a better-fitting model, suggesting that the GAM model is more appropriate for the data.

Root Mean Squared Error (RMSE): Linear Model RMSE: 0.007 versus GAM Model RMSE: 0.003

The GAM model's lower RMSE indicates that it provides better predictive accuracy compared to the linear model, which is further evidence of the GAM model's superiority.

```
Approximate significance of smooth terms:
                       edf Ref.df     F  p-value
s(AI_readiness)      6.317  7.340 2.197 0.038611 *
s(Real_GDP_growth)   1.000  1.000 2.294 0.134217
s(Unemployment_rate) 2.254  2.656 2.963 0.035988 *
s(Political_Stability) 8.072  8.687 7.179  < 2e-16 ***
s(Inflation_rate)    1.000  1.000 0.132 0.717169
s(HDI)               7.259  8.035 4.890 0.000139 ***
s(Population_growth) 4.683  5.645 4.396 0.001063 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

R-sq.(adj) =  0.826   Deviance explained = 87.7%
GCV = 3.129e-05  Scale est. = 2.1877e-05  n = 105
```

In terms of P-values, now political stability and HDI are the most significant followed by population growth, AI readiness and unemployment rate.

B- Outlier Detection

Outliers were identified using Cook's Distance.
Threshold = 4/n (common rule of thumb).
Eleven outlier points were detected, primarily from countries with unusual data points (e.g., Zimbabwe, Luxembourg, Brunei Darussalam, Norway…). These outliers could be disproportionately influencing the model. The affected observations were removed, and the cleaned dataset was used to improve the model's robustness.

3.6 Regional Classifications and Rationale

Now as a part of our analysis and after taking in consideration the previous adjustments, we divided our dataset "after removing the outliers" into **three distinct groups** to account for variations in the impact of key variables across countries. The rationale for this classification stems from the recognition that economic, political, and social factors influencing employment in the finance sector can differ significantly based on regional contexts. Below, we outline the three regional groups, their compositions, and the rationale for their categorization.

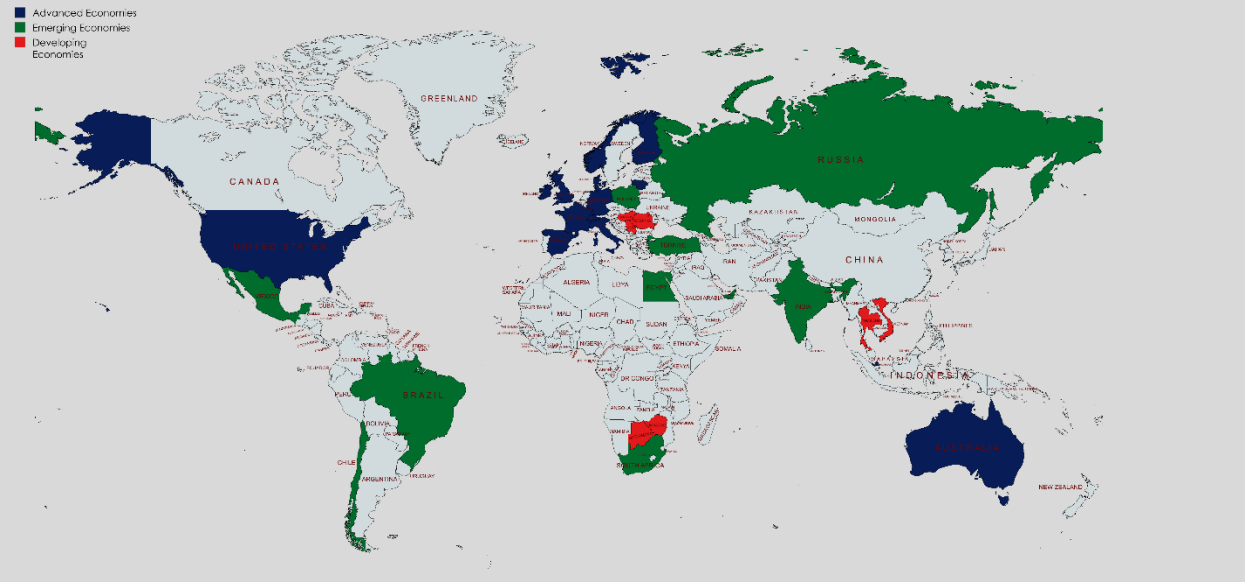


Figure (13); World Map, generated by MapChart.net

	Group 1 Advanced economies	Group 2 Emerging economies	Group 3 Developing economies
Regions	North America + Western Europe + Oceania + Singapore	Eastern Europe + Middle east+ South America + South Africa + Turkey	Asia + Africa + Latin America + Eastern Europe
Countries	• United states of America • Germany • Denmark • Finland • France • United Kingdom • Italy • Luxembourg • Norway • Switzerland • Australia • Singapore • Spain • Ireland • Lithuania	• United Arab Emirates • Egypt • Poland • Brazil • Chile • South Africa • Turkey • Russia • India • Mexico	• Thailand • Viet Nam • Brunei Darussalam • Botswana • Rwanda • Serbia • Hungary • Mauritius • Romania • Zimbabwe

N.B countries classification into Advanced, Emerging and Developing is backed by World economic outlook database provided by the IMF as of 2023.

Rationale behind each group

Group 1, Advanced Economies:

i. This group consists of developed economies characterized by high levels of political and economic stability, well-established financial systems, and robust regulatory frameworks.
ii. Australia is included due to its strong economic ties with Western economies and shared values with other developed nations.
iii. These countries typically exhibit advanced technological adoption, a high Human Development Index (HDI), and relatively low unemployment rates compared to global averages.

This classification aims to group nations with similar macroeconomic dynamics, creating a cohesive framework for understanding variable impacts within highly stable and economically developed regions.

Group 2, Emerging Economies:

iv. These countries represent transitional and emerging markets with varying levels of economic development and political stability, significant room for financial sector growth and moderate GDP per capita, reflecting a growing but uneven distribution of wealth.
v. Mexico is included in this group due to its emerging market status and economic characteristics that align more closely with Eastern European and Eurasian economies.
vi. This region captures countries facing similar economic challenges, such as fluctuating political stability, moderate to high unemployment rates, and significant reliance on commodity-driven economies.

By grouping these nations together, the analysis can better explore the influence of variables like unemployment, population growth, and political stability within transitional and emerging economies.

Group3, Developing Economies:

vii. These countries are in the early stages of integrating AI and modernizing their financial sectors. The adoption of AI could yield significant benefits by enabling financial inclusion and streamlining operations. However, these efforts face obstacles such as inadequate infrastructure, limited expertise, and resource constraints.
viii. They are characterized by relatively low levels of AI readiness due to weak technological infrastructure, insufficient investment, and a lack of skilled workers.

Now we dive deep in each group separately…

Group 1 (Advanced economies)

A- Summary of Linear Regression Results:

The linear regression model was applied to analyze the relationship between our variables and **finance sector employment** in developed economies (Group 1). The regression results reveal the following key insights:

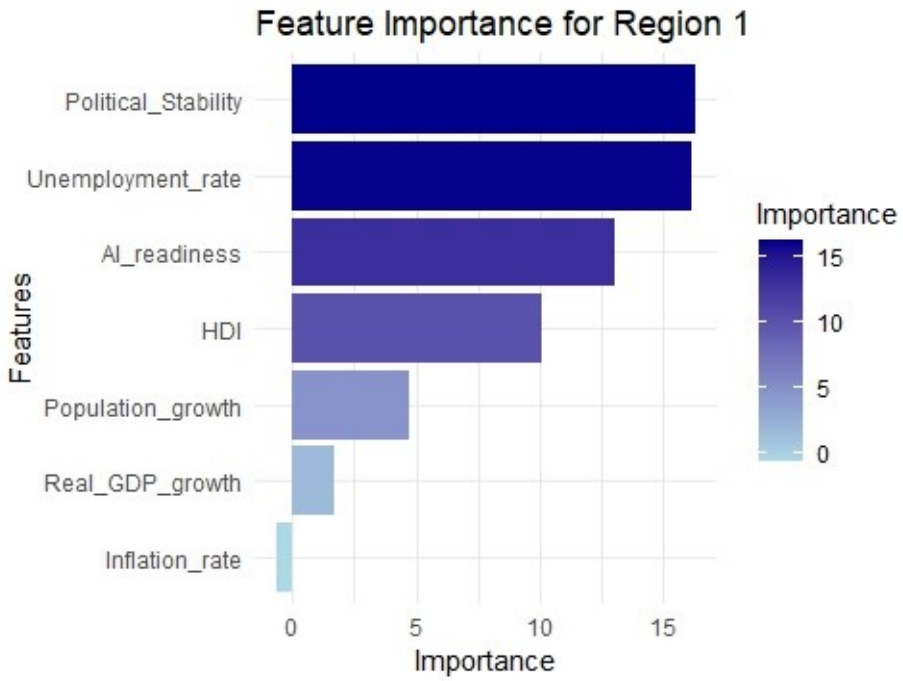
```
Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)         0.033062   0.050433   0.656 0.517272
AI_readiness        0.002742   0.002415   1.135 0.265530
Real_GDP_growth     0.050842   0.024247   2.097 0.044841 *
Unemployment_rate  -0.132596   0.046656  -2.842 0.008123 **
Political_Stability -0.003351   0.004290  -0.781 0.441085
Inflation_rate      -0.085343   0.031743  -2.689 0.011767 *
HDI                 -0.010163   0.053374  -0.190 0.850319
Population_growth    0.522500   0.122863   4.253 0.000201 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.004846 on 29 degrees of freedom
Multiple R-squared:  0.7514,    Adjusted R-squared:  0.6913
F-statistic: 12.52 on 7 and 29 DF,  p-value: 2.839e-07
```

- **AI readiness** doesn’t seem to be impactful in the developed economies. This could be justified as AI readiness is already at a mature stage, with many of these countries having started adopting AI technologies earlier than other regions, therefore we’re expecting here to have already high level of technological adoption. Therefore, while continued advancements in AI can create new job opportunities, these countries are already well-positioned with AI-driven financial systems, reducing the need for drastic growth in employment solely driven by AI adoption.
- **Real GDP Growth**: The coefficient for Real GDP growth is positive (0.050842), and statistically significant (p-value = 0.044841). This indicates that increased GDP growth is positively associated with the growth of finance sector employment. In developed economies, a strong economy usually leads to more jobs in the finance sector due to higher demand for financial services, investments, and corporate activities.
- **Unemployment Rate:** The coefficient for Unemployment rate is negative (-0.132596), and statistically significant (p-value = 0.008123). This suggests that higher unemployment rates negatively impact finance sector employment. In developed economies, this likely reflects a competitive job market where financial jobs may be harder to come by during economic downturns or recessions.
- **Inflation Rate:** The coefficient for Inflation rate is negative (-0.085343) and significant (p-value = 0.011767), indicating negative correlation between inflation rate and finance sector employment. These economies generally have high levels of investment across various sectors, and a higher inflation rate can limit the flow of investments due to

increased uncertainty and higher costs. As inflation rises, businesses and investors may become more cautious, leading to a reduction in the demand for **financial services and a slowdown in the creation of new jobs within the finance sector.**

- **Population Growth:** The coefficient for Population growth is positive (0.522500) and highly significant (p-value = 0.000201). This shows that higher population growth correlates with increased finance sector employment. In developed economies, a growing population often leads to greater demand for financial services, such as banking, insurance, and real estate.

B- Summary of Random Forest Results:



The random forest model was used to explore the relative importance of each variable in predicting finance sector employment growth. The results highlight the following:

Key Feature Importance Rankings:

- **Political Stability:** Political Stability has an importance score of 16.32 (for %IncMSE), which is the highest of all variables, indicating that political stability plays a crucial role in determining the pace of finance sector employment growth. In developed economies, stability in governance and policy consistency ensure a conducive environment for businesses, thereby promoting job creation in the financial sector.
- **Unemployment Rate:** The importance of Unemployment rate is 16.18 (for %IncMSE). This reinforces the finding from the linear regression that higher unemployment rates significantly reduce the growth of finance sector employment. In developed economies, a highly competitive job market and the cyclical nature of employment can have a major impact on employment opportunities in the financial sector.
- **AI Readiness:** AI readiness shows a moderate importance of 13.09. This suggests that advancements in AI and technology adoption are indeed factors influencing finance sector employment, but their impact is less pronounced compared to macroeconomic factors like GDP growth or unemployment rates.

Group 2 (Emerging economies)

A- Summary of Linear Regression Results

```
Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)         -0.026877   0.007757  -3.465 0.002316 **
AI_readiness         0.006366   0.001661   3.832 0.000970 ***
Real_GDP_growth     -0.024544   0.017817  -1.378 0.182842
Unemployment_rate    0.007913   0.007009   1.129 0.271623
Political_Stability -0.001435   0.001513  -0.949 0.353629
Inflation_rate      -0.016185   0.004217  -3.838 0.000956 ***
HDI                  0.046259   0.009120   5.072 5.05e-05 ***
Population_growth    0.253697   0.111630   2.273 0.033671 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.002632 on 21 degrees of freedom
Multiple R-squared:  0.8476,    Adjusted R-squared:  0.7967
F-statistic: 16.68 on 7 and 21 DF,  p-value: 2.866e-07
```

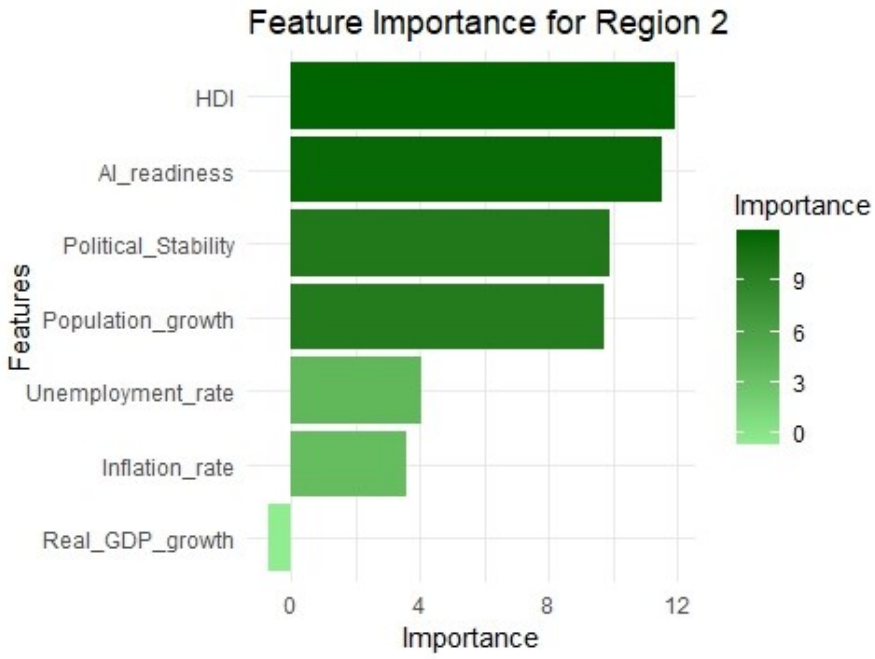
- **AI Readiness:** Positive and significant effect (Estimate: 0.0064, p-value: 0.00097):
  In emerging economies, AI readiness plays a critical role in finance sector employment growth. These countries are in the early stages of adopting AI technologies, which can create new opportunities in automation, analytics, and digital financial services. This indicates that investments in AI infrastructure are pivotal for job creation in the finance sector.
- **HDI (Human Development Index):** Positive and significant effect (Estimate: 0.0463, p-value: 0.00005):

The significant positive effect of HDI on finance sector employment highlights the crucial role of human development in driving employment growth in emerging economies. This is distinct from advanced economies, where HDI was not as much significant predictor. The higher significance in emerging markets can be attributed to threshold effects, meaning that many advanced economies have already achieved high and stable levels of HDI, making marginal improvements are less likely to produce noticeable changes in employment growth.

- **Inflation Rate:** Negative and significant effect (Estimate: -0.0162, p-value: 0.00096): High inflation undermines financial stability and discourages investments, leading to reduced job creation in the finance sector. Emerging economies are often more vulnerable to inflationary pressures, which can erode financial sector growth.
- **Population Growth:** Positive and significant effect (Estimate: 0.2537, p-value: 0.0337): Population growth shows a significant positive effect reflecting its role in expanding the workforce and increasing demand for financial services. However, its significance is less pronounced compared to advanced economies. This can be explained by demographics and Birth Control Behavior, where advanced economies tend to have better access to education and healthcare, leading to more effective birth control practices and slower population growth. As a result, the growth that does occur in these economies is more targeted and often aligned with economic development, leading to higher significance in finance sector employment growth.
- **Real GDP Growth:** Non-significant negative effect (Estimate: -0.0245, p-value: 0.1828): Unlike group 1, the non-significant effect suggests that in emerging economies, higher GDP growth does not necessarily translate into proportional job creation in the finance sector. This could be attributed to Structural Challenges meaning economic growth in these regions may be concentrated in sectors like agriculture, manufacturing, or extractive industries rather than finance, limiting its direct impact on financial sector jobs. In addition to Informal Economy Influence as emerging economies often have a significant informal sector that absorbs much of the labor force, reducing the measurable impact of GDP growth on formal employment in finance.
- **Unemployment Rate:** Non-significant positive effect (Estimate: 0.0079, p-value: 0.2716): Unlike the advance d economies where unemployment rate was one of the most significant factors, in emerging economies it's not having a significance on the employment growth rate and this could be stemming from workforce Skill Gaps, suggesting that labor force in emerging economies may be less skilled or less efficient compared to that in advanced economies. This limits the potential for employment growth in highly specialized sectors like finance. Another justification could be the dependence on Foreign Expertise as financial institutions in emerging economies may rely on foreign labor or expertise from advanced economies to meet their needs, further

dampening the impact of local unemployment rates on job creation in the finance sector.

B- Summary of Random Forest Results:



Key Feature Importance Rankings:

- **HDI** (11.90) and **AI Readiness** (11.50) (for %IncMSE),:
  These are the top contributors, reinforcing the linear model's findings that advancements in human development and AI integration are key drivers of employment growth in the finance sector.
- **Political Stability** (9.91) and **Population Growth** (9.70) (for %IncMSE):
  Both factors are also important, as political stability fosters investor confidence, while population growth expands the labor market and demand for financial products.

Group 3 (Developing economies)

A- Summary of Linear Regression Results

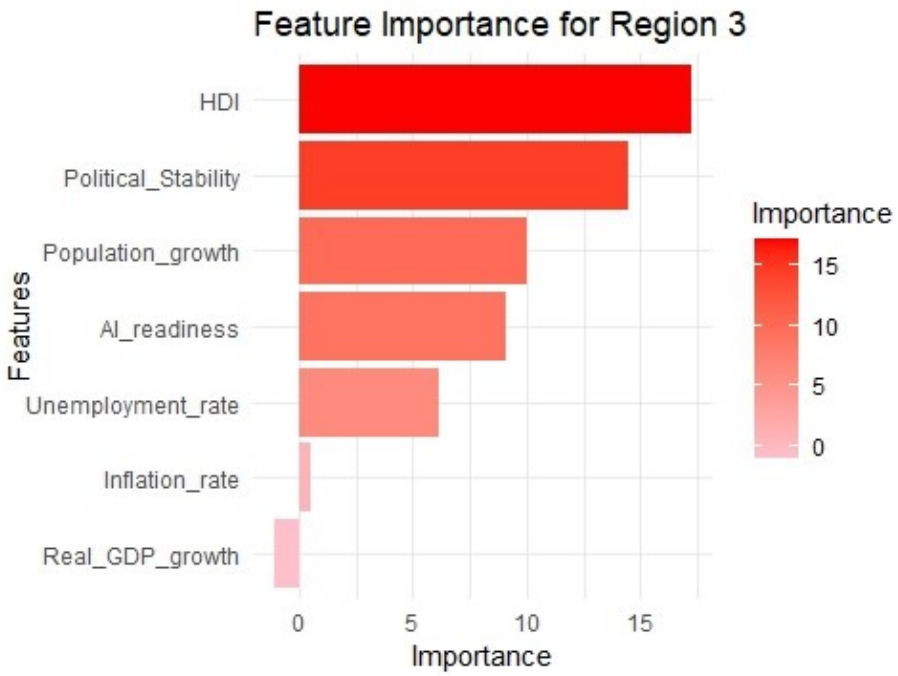
```
Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)         0.0063080  0.0073300   0.861  0.39967
AI_readiness        0.0008591  0.0009810   0.876  0.39157
Real_GDP_growth    -0.0088461  0.0105570  -0.838  0.41197
Unemployment_rate  -0.0125605  0.0077103  -1.629  0.11895
Political_Stability 0.0023360  0.0007607   3.071  0.00603 **
Inflation_rate      0.0008510  0.0011048   0.770  0.45012
HDI                 0.0024502  0.0088881   0.276  0.78563
Population_growth  -0.0670820  0.0551556  -1.216  0.23806
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.001403 on 20 degrees of freedom
Multiple R-squared:  0.8273,    Adjusted R-squared:  0.7669
F-statistic: 13.69 on 7 and 20 DF,  p-value: 2.18e-06
```

- **Political Stability:** Political stability is the only significant predictor (Estimate: 0.0023, p-value: <0.01) for finance sector employment in developing economies. This could be justified by:
  - In many developing countries, the financial sector heavily depends on government policies, international aid, and political will to implement reforms. A stable political environment ensures the continuity of these supports and initiatives, driving employment growth.
  - Unlike advanced and emerging economies, where institutions and markets may be more resilient to political fluctuations, developing economies often face structural challenges that make political stability a critical factor for economic and sectoral growth.
  - Political stability fosters investor confidence, ensuring capital inflows into the financial sector. It reduces uncertainty, which is particularly impactful in economies where financial markets are less mature and highly sensitive to political risks.
- **AI Readiness:** AI readiness has an insignificant impact on employment growth in the finance sector. Developing economies often lack the infrastructure, funding, and technological penetration needed for widespread AI adoption. Limited internet access, low digital literacy, and inadequate AI training programs contribute to the weak impact on employment. The integration of AI technologies in the financial sector is at an early stage, and their benefits, such as process automation and new job creation, are not yet realized on a large scale.
- **Real GDP Growth:** GDP growth does not significantly predict employment in the finance sector. In developing economies, GDP growth is often driven by agriculture, resource

extraction, or informal sectors, which have limited links to the formal financial sector. Another justification could be that financial sector might not scale proportionately with GDP growth, as underdeveloped financial systems are not fully integrated into broader economic activities.

- **Unemployment Rate:** The unemployment rate also lacks significance given that high unemployment in developing economies is often tied to systemic issues, such as inadequate education and skills mismatches. Even when jobs are created, the labor force may not be equipped to take advantage of them, limiting the impact on employment growth in specialized sectors like finance.
- **Inflation Rate:** Inflation does not significantly affect financial sector employment demonstrating that in these economies, inflation is typically volatile and can vary significantly based on factors like government policies or external economic crises (e.g., oil price fluctuations or foreign debt pressures). Since inflation is unstable and can be influenced by factors that aren't directly related to financial sector dynamics, its effect on employment in the finance sector may not be clear or significant. In addition, financial sector in developing economies might be underdeveloped, with relatively few institutions and limited market sophistication. Therefore, even if inflation increases, its direct impact on the number of employees in the finance sector could be less pronounced.
- **Population growth:** The population growth variable also shows no significance, which could be driven by the fact that in developing economies, population growth tends to be rapid but is often accompanied by significant challenges in providing quality education, healthcare, and infrastructure. As a result, even though the population is growing, a large portion of the population may not be entering the formal labor market, or they may not be entering some sectors like finance.

B- Summary of Random Forest Results:



Key Feature Importance Rankings:

- **HDI (Human Development Index):** %IncMSE: 17.21 (Highest significant)
  HDI, which combines health, education, and income indicators, plays a critical role in shaping finance sector employment in developing economies. A higher HDI indicates better overall human capital, which can lead to a more skilled workforce and higher demand for financial services. The high importance here suggests that a more developed population (in terms of education and health) contributes to the growth of the financial sector.

- **Political Stability:** %IncMSE: 14.46 (second- highest)
  Confirming the linear regression findings, Political stability is also a significant predictor in the random forest model. A high %IncMSE value indicates that if political stability were removed from the model, the model's prediction accuracy would decrease substantially. This suggests that political stability is crucial for finance sector employment in developing economies. Political stability impacts the overall business environment, investor confidence, and long-term growth, all of which are vital for a growing financial sector.

3.7 Conclusion

1- Advanced Economies

Figure (20); Chart is generated given the results extracted from the both RF and regression models for advanced economies

- In advanced economies, AI readiness has a significant impact on the financial sector employment growth but is not as significant as in emerging economies. This is likely because these regions are already in a mature phase of AI adoption, with well-developed infrastructure and technology integration in the financial sector. Consequently, the marginal benefits of AI readiness on employment growth are smaller compared to regions still in earlier adoption stages. This contrasts with emerging economies, where the scope for further enhancements and adoption makes AI readiness a more critical driver of employment growth.
- Inflation rate, and population growth emerged as the most significant variables influencing employment growth in the financial sector. Inflation, with its negative significance, shows how higher rates limit investments and put pressure on employment rates, aligning with their high levels of investment across sectors. Population growth has a particularly strong positive impact due to the well-managed economic dynamics, ensuring that population growth contributes productively to the workforce.

2- Emerging Economies

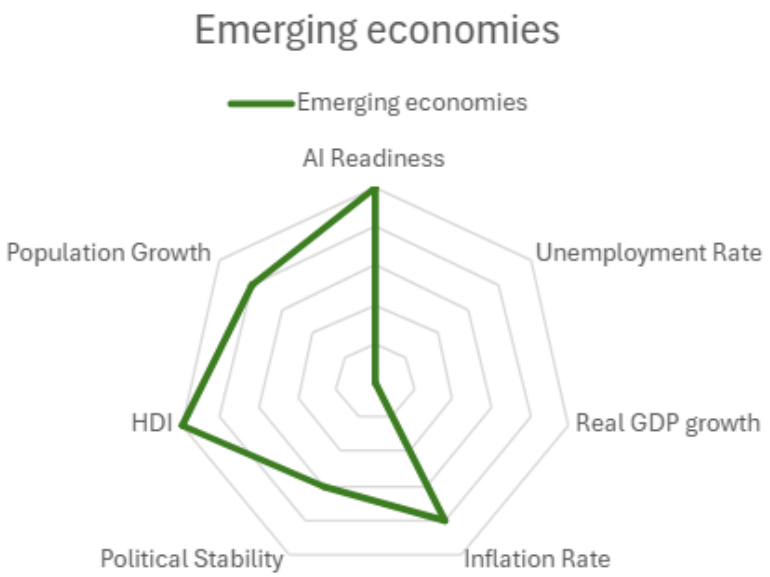


Figure (21); Chart is generated given the results extracted from the both RF and regression models for Emerging economies

- AI Readiness and Human development index (HDI) stand out as the most significant variables. The high significance of HDI suggests that human capital development plays a pivotal role in employment growth in these regions, as investments in education and health are critical for workforce quality. Inflation rate, like in advanced economies, has a negative impact, underlining its role as a barrier to investments and employment.
- AI readiness comes with a high significance in this group, both in linear regression and random forest results. This highlights the transformative potential of AI adoption in these regions, where infrastructure is still developing, and significant opportunities exist for technological advancements. The increasing reliance on AI reflects its critical role in driving efficiency and creating employment in the financial sector. Compared to advanced economies, where AI has already reached a mature phase, emerging economies are in the process of reaping the initial and more substantial benefits of AI readiness.

3- Emerging Economies

Figure (22); Chart is generated given the results extracted from the both RF and regression models for Developing economies

- In developing economies, political stability and HDI (from random forest results) emerge as the most significant variables. Political stability is highly significant, emphasizing its foundational role in creating an environment conducive to financial sector development. While HDI is important in the random forest model, its lack of significance in linear regression suggests that its impact may be more indirect. Variables like AI readiness and inflation rate are less significant here, reflecting underdeveloped technological infrastructure and less sensitivity to inflation's impact on investments compared to the other regions.

4. Impact of AI on Employment in the Financial Sector

As we have seen, AI might have a positive correlation with the employment growth within the financial sector this is referring to the fact that while some jobs are being displaced, many others are being created. In the following chapter we discover more about:

4.1 Job displacement vs. Job creation in the finance sector

(How AI displaces traditional jobs in areas while creating new roles in other areas?)

2024 world economic reform shows that among other occupations, finance sector is placed with a percentage of 42% higher potential of automation, 28% as higher potential for augmentation and only 31% with low exposure and no language tasks which are the areas involving more technical activities.

(Source: O'Reilly, K & Zahidi, S 2023, Jobs of Tomorrow: Large Language Models and Jobs, World Economic Forum.)

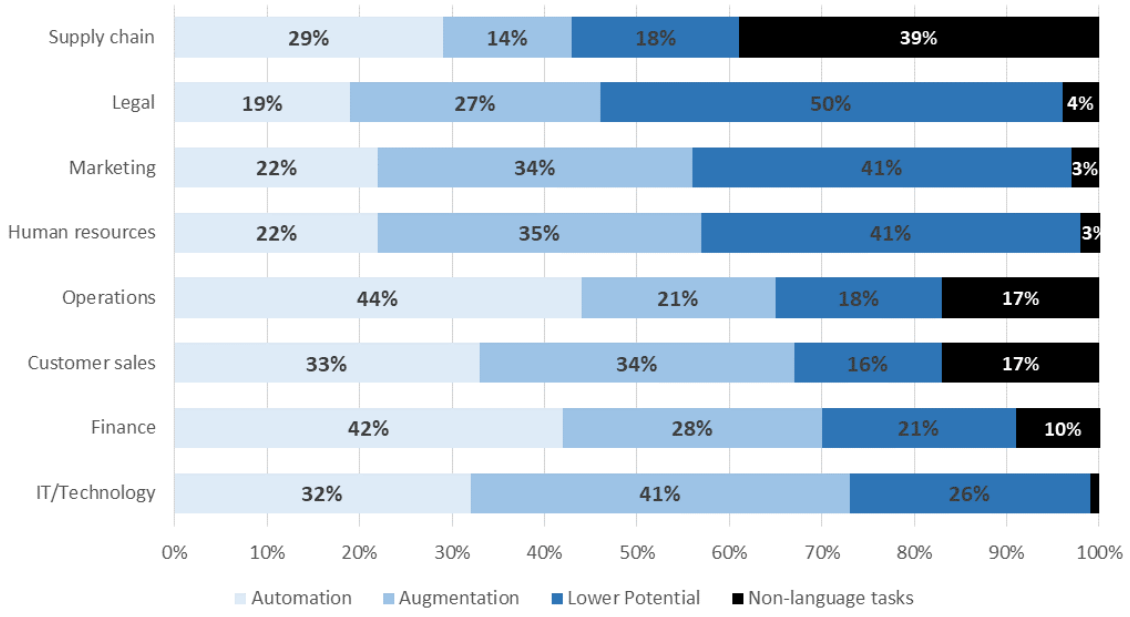


Figure (23); Job function groups with the highest exposure. Source: World Economic Forum, Sep 2023.

High potential for automation (Higher risk of replacement)

Around 42% of the occupations in the finance sector are classified as highly automatable. Those are jobs that involve repetitive, rule-based tasks that can be performed efficiently by algorithms, software, or robotics

Examples for some highly automatable jobs and how AI is interfering in each job:

1- **Data Entry clerk**: ensuring that the organization's database is accurate, up-to-date and organized by transferring data from paper formats into computer files or database systems.

   AI role: Those are ideal tasks for **Robotic Process Automation (RPA)** which is a technology that uses software robots or "bots" to automate repetitive, rule-based tasks in business processes. These bots interact with applications, systems, and data just as a human would but do so more efficiently, accurately, and consistently.

2- **Bookkeepers**: recording and maintaining a business' financial transactions, such as purchases, expenses, sales revenue, invoices, and payments. They will record financial data into general ledgers, which are used to produce the balance sheet and income statement.

   AI role: Software like **QuickBooks** and **AI-powered tools** revolutionize bookkeeping by automating tasks, reducing errors, and providing actionable insights. With features like Expenses tracking, tax preparation and user-friendly interfaces they ensure accuracy and higher efficiency than traditional Bookkeeping systems.

3- **Loan Officers**: Analyzing loan applicants' credit history and assisting in servicing loans by processing such items as payoff, refinances, problem loan workout arrangements…etc.

   AI role: This shift towards algorithm-based credit assessment leverages predefined criteria and machine learning models to make the process of **creditworthiness assessment** faster, more efficient and more data-driven.

By applying **Automated Data analysis** where Algorithms use **Machine learning** models to predict the probability of default and **Artificial Neural Networks** for more complex and unstructured data. In addition, algorithms often use predictive models, such as logistic regression, support vector machines, or neural networks, to calculate a **credit score** that represents the likelihood of a borrower repaying a loan. Finally, algorithms are being employed for **Fraud Detection** by identifying any inconsistent data for example sudden change in spending patterns or atypical loan behavior.

4- **Insurance claims processors:** review insurance claims, verifying insurance policy coverage and making sure client information is accurate.

AI role: **Insurance claims processors** are also leveraging **AI-powered claims management systems** to automate and streamline the claims process, making it faster, more accurate, and efficient. AI and machine learning technologies can analyze documents, assess claims, and determine their validity based on predefined criteria, drastically reducing manual intervention.

High potential for augmentation (Moderate risk of replacement)

With 28% of the financial sector occupations, comes the jobs with high potential augmentation, where technology will augment these roles, enhancing efficiency and capabilities, but human workers remain essential. While some tasks may be automated, there is potential for the **creation of new jobs** as workers adapt and utilize new technologies.

Examples for some jobs with high potential for augmentation and how AI is interfering in each job leading to a potential creation of new job:

1- **Financial Analyst**: A financial analyst gathers and reviews financial data from various sources, analyzes trends, and creates financial models to evaluate company performance. They prepare reports and presentations to summarize their findings and provide recommendations to help stakeholders make informed investment or business decisions

AI role: AI can automate data collection, clean datasets, and generate financial models more efficiently than manual processes. It can also use predictive analytics to forecast trends and provide deeper insights,

enabling analysts to focus on **strategic tasks like interpreting results and advising stakeholders.**

Job Creation:
AI Financial Model Specialist: This role, already existing in some advanced organizations, focuses on developing, managing, and optimizing AI-driven tools used for financial modeling and analysis

2- **Credit Risk Analyst**: A credit risk analyst assesses the creditworthiness of individuals, companies, or other entities. They analyze financial data, monitor risk factors, and provide recommendations on credit limits or lending decisions to minimize potential losses for the organization.

AI role: AI can automate the evaluation of credit applications by analyzing financial records, payment histories, and other relevant data in real time. Machine learning models can predict the probability of default or risk levels more accurately, flagging high-risk entities and helping analysts make better-informed decisions.

Job Creation:
AI Credit Risk Specialist: An existing role in which the analyst will more focus on developing, training, and maintaining machine learning models to assess credit risk efficiently and accurately than processing data and manually monitoring the creditor's behavior.

Bias and Fairness Auditor for Credit Models: This could also be role dedicated to ensuring AI credit risk models remain unbiased and ethical, especially in areas like consumer lending, where fairness is crucial.

3- **Wealth managers**: A wealth manager provides personalized financial advice to high-net-worth clients, helping them manage their investments, plan for long-term goals, and optimize their financial portfolios. They assess client needs, recommend investment strategies, and monitor portfolio performance.

AI role: **Robo-advisors** are automated platforms that provide financial advice or investment management services with minimal human intervention. They use algorithms and technology to assess a client's financial situation, risk tolerance, and investment goals, and then generate data-driven investment strategies or portfolios.

Job Creation:
AI Investment Advisor: This role involves managing robo-advisors and AI-driven tools to support wealth managers in offering data-backed, customized investment solutions.

4- **Compliance officers:** ensuring adherence to regulatory requirements and internal policies. Their responsibilities include conducting risk assessments, monitoring business activities, reviewing financial transactions, and ensuring that the company complies with relevant laws and regulations

AI role: AI-powered regulatory technology (RegTech) can automate many of the compliance tasks, such as monitoring transactions, screening for suspicious activities, and ensuring that reports are up-to-date with the latest regulations. These systems can flag potential violations or risks, streamline the compliance process, and reduce manual efforts. However, interpreting complex regulations and addressing edge cases still require human expertise, as AI may not fully grasp nuanced legal interpretations or the context behind certain decisions.

Job Creation:
RegTech Specialist: This role involves managing and optimizing AI-driven compliance tools, ensuring they run efficiently and help automate regulatory checks.

Lower potential for exposure (automation or augmentation) (Low risk of replacement)

Jobs in this category involve high levels of creativity, interpersonal skills, or judgment, making them difficult to automate or augment. Some non-language tasks fall here as well. They represent 31% of total occupations in the financial sector.

Examples for some jobs with low automation potential

1- **Relationship managers**: this job relies heavily on personal interactions, emotional intelligence, and the ability to understand nuanced client needs. While AI can assist with data analysis or scheduling, the core tasks—building trust, negotiating, handling complex situations, and offering personalized advice—require human empathy, communication skills, and judgment. These elements are difficult to replicate through automation or AI, making the role resistant to full automation.

2- **Strategic financial planners**: A strategic financial planner works closely with clients to develop long-term financial strategies, including retirement planning, investment management, tax strategies, and estate planning. Financial planners often adjust strategies over time as clients' circumstances evolve.

   This role involves complex decision-making, long-term forecasting, and personalized advice that requires deep understanding of a client's goals, preferences, and changing circumstances. While AI can assist with data analysis and model financial projections, the personalized, holistic approach needed to develop a comprehensive financial strategy, considering both financial and emotional factors, is a distinctly human function. This nuanced, interpersonal aspect of the job makes it resistant to automation.

3- **Mergers & Acquisitions Advisors**: M&A advisors guide companies through the process of mergers, acquisitions, and business sales.

   M&A advisory is highly complex and requires deep industry knowledge, negotiation skills, and the ability to navigate human dynamics, such as differing business cultures, stakeholder interests, and confidential negotiations. While AI can assist with data analysis and financial modeling, the strategic decision-making, relationship-building, and judgment involved in structuring and executing a deal require human expertise and experience. The highly personalized and strategic nature of the role makes it resistant to automation.

4- **Cyber security analysts:** with the evolution of AI and digitalization, cyber security is becoming one of the biggest concerns for each firm. This role addresses the protection of organization's computer systems and networks from cyber threats. They monitor network traffic for suspicious activity, implement security measures like firewalls and encryption, conduct vulnerability assessments, and respond to security incidents.

While automation can help with tasks like scanning for vulnerabilities or flagging suspicious activity, the role of a cybersecurity analyst requires human expertise to interpret complex security data, respond to novel or evolving threats, and make critical decisions in high-pressure situations. Cybersecurity is a dynamic field, where the ability to understand the context, adapt to new threat vectors, and create tailored security strategies is essential. These elements require human judgment, creativity, and decision-making, making the role resistant to full automation.

4.2 Skill Demand Shift

(*How AI increases the demand for highly skilled professionals in data analysis, machine learning, and algorithm development, while reducing demand for routine jobs?)*

Core skills as of 2023

Based on a comprehensive survey involving 803 companies worldwide, collectively employing over 11.3 million workers spanning 27 industries across all global regions, below figure extracted from the *world economic forum, 2023*, represents the share of organizations identifying specific skills as essential for their workforce. Skills are ranked and listed based on the proportion of organizations that regard each as fundamental to their workforce.

Source: World Economic Forum 2023, Future of Jobs Report 2023, World Economic Forum.

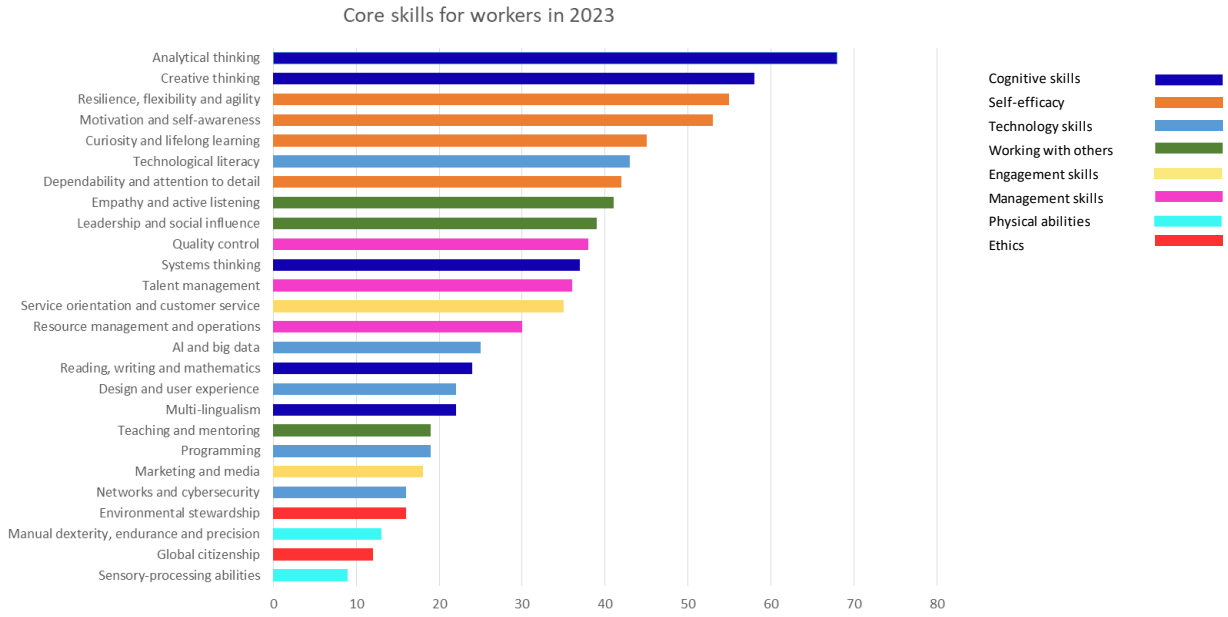


Figure (24); Core skills as of 2023. Source: World Economic Forum, Future of Jobs, May, 2023

Cognitive skills are recognized as the most critical for workers, reflecting the growing demands of a rapidly evolving, digital-first workplace. At the forefront is **analytical thinking**, identified as a core skill by more organizations than any other. This underscores the increasing need for workers to process complex data, solve problems effectively, and make data-driven decisions.

Following closely is **creative thinking**, which complements analytical abilities by fostering innovation and problem-solving in unpredictable and dynamic environments. These are joined by three key **self-efficacy skills**: **resilience, flexibility and agility**, **motivation and self-awareness**, and **curiosity and lifelong learning**. These skills are essential as they enable workers to adapt to workplace disruptions, embrace change, and continuously upskill in a world where technological advancements are reshaping industries.

“There's more of a focus and an interest in having people with analytical thinking, people with creativity,” remarked Saadia Zahidi, Managing Director of the World Economic Forum, during an interview on the Future of Jobs Report 2023. “But it's also become very important to have leadership skills, social influence, and the ability to work with other people. The traits that make us human—our capacity to relate to one another and collaborate—are crucial for driving innovation and achieving creative outcomes in the workplace.”

In light of digitalization, these skills are indispensable for navigating the intersection of human and machine collaboration. Analytical and creative thinking drive the effective use of advanced tools like artificial intelligence, while **adaptability** and **emotional intelligence** ensure that workers can lead, collaborate, and thrive amidst continuous technological disruptions. As automation takes over routine tasks, these uniquely human capabilities become the foundation of workforce resilience and organizational success.

Future Skills: Growing in Importance

The future of work is shaped by a combination of **skills, knowledge, abilities**, and **attitudes**, with cognitive and emotional competencies taking center stage. Among these, **analytical thinking** is projected to remain a cornerstone skill, with businesses predicting its importance to grow by **72%** over the next five years. This is largely because reasoning and decision-making—integral components of analytical thinking—are among the least automated tasks in the workplace, accounting for just 26% of total task automation. As organizations increasingly rely on human judgment and critical thinking, these skills become ever more vital.

Interestingly, the demand for **creative thinking** is anticipated to grow even faster, with a projected increase of **73%** in importance over the same period. This reflects the growing need for innovative solutions to address complex challenges in a rapidly changing, technology-driven world.

Technology literacy ranks as the third-fastest-growing core skill, underscoring the necessity for workers to understand, adapt to, and leverage digital tools effectively. Complementing these cognitive skills are **curiosity and lifelong learning**, **resilience, flexibility, and agility**, and **motivation and self-awareness**, which round out the top five. These abilities enable workers to stay adaptable, motivated, and continuously prepared for new challenges in a dynamic workplace.

While no skills are predicted to decline on a net basis, certain abilities such as reading, writing, and mathematics; global citizenship; sensory-processing skills; and manual dexterity, endurance, and precision are considered less critical by some organizations. This reflects a shift in focus toward skills that enable workers to thrive in environments increasingly characterized by automation, digitalization, and rapid innovation.

This evolving skills landscape emphasizes the growing interplay between technological advancements and human capabilities, highlighting the enduring value of uniquely human traits in an era of transformation.

Skills on the rise:

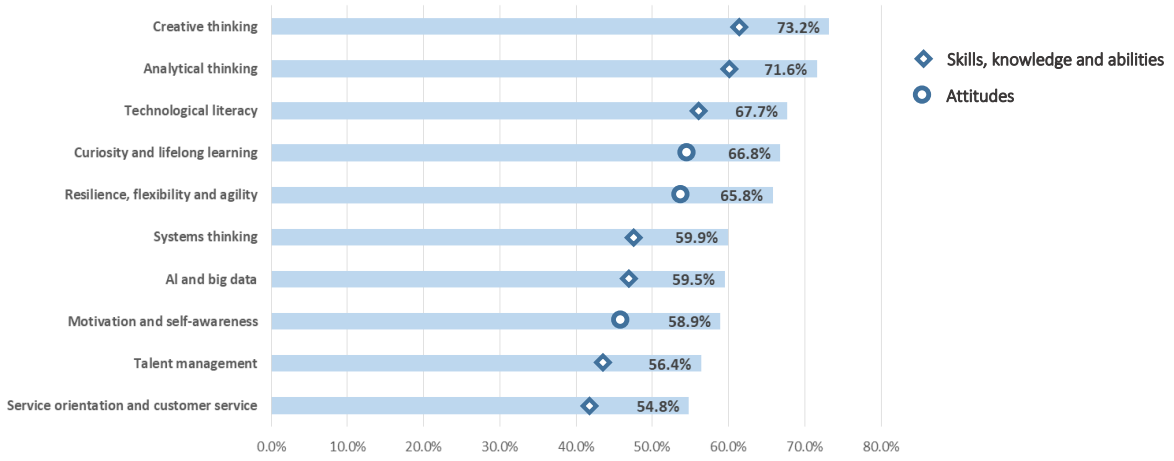


Figure (25); Skills on the rise as of 2023. Source: World Economic Forum, Future of Jobs, May, 2023

Comparing the top 10 current skills with those predicted to be most important in the future highlights how workplace priorities are evolving in response to technological and organizational changes:

Top 10 skills of 2023			Top 10 skills on the rise (5-year-outlook)		
#1		Analytical thinking (Cognitive skills)		Creative thinking (Cognitive skills)	↑
#2		Creative thinking (Cognitive skills)		Analytical thinking (Cognitive skills)	↓
#3		Resilience, flexibility and agility (Self-efficacy)		Technological literacy (Technology skills)	↑
#4		Motivation and self-awareness (Self-efficacy)		Curiosity and lifelong learning (Self-efficacy)	↑
#5		Curiosity and lifelong learning (Self-efficacy)		Resilience, flexibility and agility (Self-efficacy)	↓
#6		Technological literacy (Technology skills)		Systems thinking (Cognitive skills)	↑
#7		Dependability and attention to detail (Self-efficacy)		AI and big data (Technology skills)	↑
#8		Empathy and active listening (Working with others)		Motivation and self-awareness (Self-efficacy)	↓
#9		Leadership and social influence (Working with others)		Talent management (Management skills)	↑
#10		Quality control (Management skills)		Service orientation and customer service (Engagement skills)	↑

Figure (26); a comparison between top skills needed as of 2023 versus skills that will be demanded in the 5 coming years. Source: World Economic Forum, Future of Jobs, May, 2023

4.3 Reskilling and Up-skilling Priorities for the Next Five Years

As skill requirements evolve, businesses are scaling up their training programs to address these changes. In 2023 companies undertaken the survey reported that only 41% of workers had completed training to bridge skills gaps, this means in upcoming 5 years, six in ten workers will require trainings to cope with the skills evolution and digitalization. Investing in on-the-job learning and training remains the most promising strategy for achieving business goals, making effective reskilling and up skilling plans crucial for the next five years.

Interestingly, there are some differences between current skills importance as reported by companies and future training priorities, for example companies place greater emphasis on skills like **AI and big data** and **leadership and social influence** than their current workforce importance suggests. For instance, **AI and big data** ranks 12 places higher in reskilling strategies than in core skill evaluations. As it was ranked 15th among the core skills of workers in 2023, while ranked 3rd in the 5-year reskilling focus.

Other strategically emphasized skills include **design and user experience**, **environmental stewardship**, **marketing and media**, and **networks and cyber security**, which companies rank significantly higher in training priorities compared to current importance.

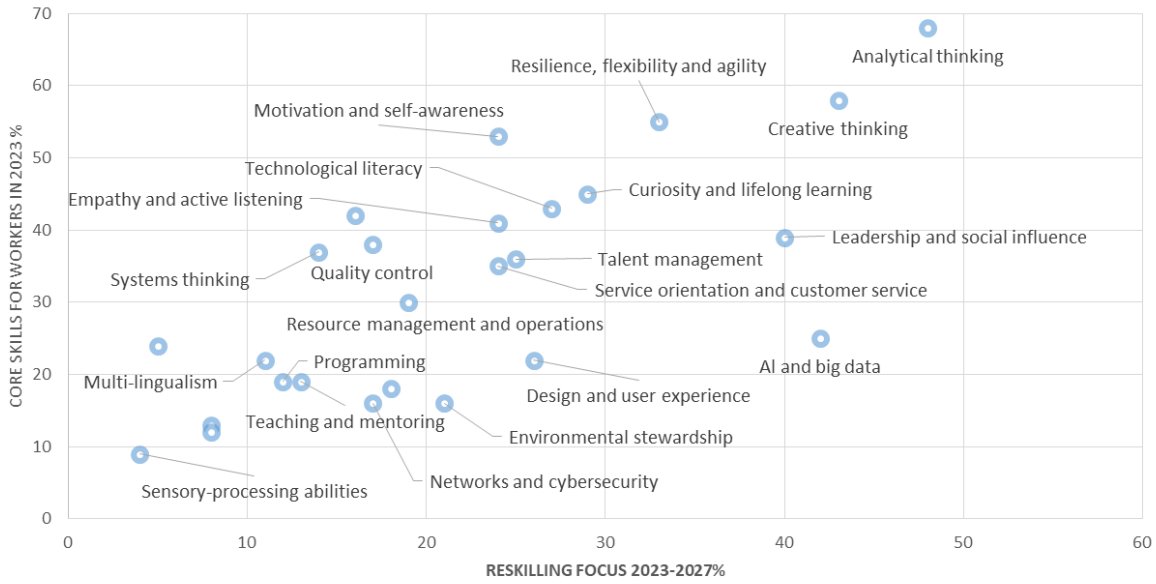


Figure (27); Source: World Economic Forum, Future of Jobs, May, 2023

4.4 Training Supply-Demand Mismatch

A critical aspect of the reskilling and up skilling landscape, beyond identifying the skills needed for work and employer training strategies, is the choices made by individual learners. Research conducted by Coursera for this report reveals that these choices often differ from business priorities.

Individual learners on Coursera primarily focus on building technical skills such as programming, resource management and operations, networks and cybersecurity, and design and user experience (as shown in the below chart). While some of these align with skills businesses seek, they are often foundational to advanced skills like AI and big data and leadership and social influence, which are more explicitly prioritized by employers. Additionally, learners frequently emphasize reading, writing, and mathematics—skills that, while not a primary corporate focus, are critical foundational skills for any career.

However, gaps remain between the skills individuals prioritize and those demanded by employers. To bridge these gaps, job seekers can more effectively leverage online learning platforms to align their skill development with market needs, especially as traditional qualifications lose their dominance in hiring decisions.

Historically, Coursera learners have focused on technical, or "hard," skills linked to lucrative careers in programming and data analytics. However, the rise of emerging technologies like generative AI is reshaping workforce demands. Employers are increasingly emphasizing "soft"

skills, such as adaptability and socio-emotional competencies, which are vital for navigating change and remain resistant to automation.

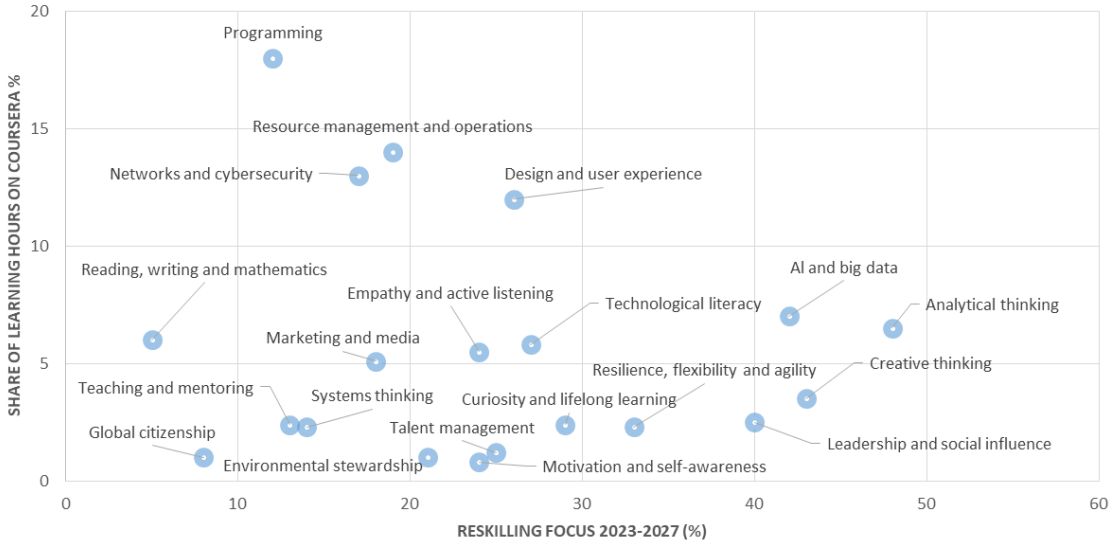


Figure (28); Source: World Economic Forum, Future of Jobs, May, 2023

Programming courses come with the highest share of hours spent on Coursera while ranked 20th among the 5-year reskilling focus as reported by companies.

5. Policy implications

5.1 Scope

After analyzing the impact of AI on financial sector employment and identifying the evolving demand for skills, it is evident that the workforce landscape is undergoing a significant transformation. Key findings highlight a demand shift towards analytical, creative, and socio-emotional skills, alongside the critical need for reskilling and upskilling initiatives to address skill mismatches.

The financial sector, a cornerstone of global economies, faces unique challenges and opportunities shaped by automation, digitalization, and AI-driven innovations. These factors have varying implications across economies, depending on their technological infrastructure, labor market composition, and educational systems.

To foster sustainable growth and minimize job displacement, it is imperative to provide targeted recommendations for each economy. These recommendations must consider the current and future skill demands, the capacity for reskilling and upskilling, and the alignment between employer needs and individual training priorities. By doing so, economies can position their financial sectors to thrive in a rapidly changing technological environment while ensuring workforce resilience and inclusion.

5.2 Structured Recommendations by Economy

Advanced economies

Artificial Intelligence investments

In advanced economies, while AI readiness remains an impactful factor, its role is relatively less critical compared to emerging economies where AI is still in the growth phase. Advanced economies have already established robust AI infrastructure and widespread technological adoption, positioning them as leaders in the global AI landscape. Consequently, their focus should shift towards sustaining their competitive edge rather than achieving baseline readiness. This entails continued investment in cutting-edge AI applications, albeit at a scale lower than that required by emerging economies working on foundational infrastructure and growth.

Given their advanced stage of AI integration, these economies face heightened exposure to the risks associated with mature AI systems. Cyberattacks, data breaches, and security violations pose significant threats, making it imperative for advanced economies to prioritize risk mitigation strategies. Investments should be directed toward developing and implementing advanced encryption technologies, secure data-sharing frameworks, and AI governance mechanisms to counteract these vulnerabilities. Establishing international collaborations to create unified cybersecurity standards could further enhance resilience against global threats.

Additionally, advanced economies should focus on the ethical use of AI, ensuring that it aligns with societal values and minimizes unintended consequences such as algorithmic bias or job displacement. Policymakers can promote innovation by incentivizing research in explainable AI and transparent decision-making systems, which are critical for maintaining public trust and fostering sustainable AI-driven growth. By addressing these nuanced challenges, advanced economies can continue to lead in AI adoption while safeguarding their economic and societal stability.

(Source: Bughin, J, Seong, J, Manyika, J, Chui, M & Joshi, R 2018, NOTES FROM THE AI FRONTIER MODELING THE IMPACT OF AI ON THE WORLD ECONOMY.)

Population Growth

Secondly moving to the most significant factor on the financial sector employment in the advanced economies, Population growth, when managed effectively, can drive demand for financial services and support labor market sustainability, even in economies with highly skilled workforces. Below are some key recommendations and points to consider:

(Source: Guga, K, Alikaj, L & Zeneli, F 2015, 'POPULATION, ECONOMIC GROWTH AND DEVELOPMENT IN THE EMERGING ECONOMIES')

a. Enhancing Labor Force Inclusion:

Advanced economies already benefit from a highly skilled labor force, but there is still potential for further inclusion. Governments and businesses can promote workforce participation by:

Encouraging policies that support work-life balance, such as affordable childcare and parental leave, to increase labor force participation among women.

Providing retraining and upskilling programs to ensure older workers remain employable in evolving job markets, especially as AI and automation transform industries.

b. Harnessing Immigration:

Given that natural population growth rates are often stagnant or declining in advanced economies, targeted immigration policies can address labor shortages and sustain economic growth. Policies should prioritize attracting highly skilled workers who can contribute to industries like finance and technology while also integrating them into the workforce through language training and cultural adaptation programs.

c. Technological Integration in Demographic Strategies:

Advanced economies can use AI and data analytics to forecast labor market needs and plan for population dynamics. For example, predictive models can help identify future skill shortages, enabling policymakers to tailor immigration and education strategies accordingly.

d. Promoting Economic Mobility:

Policies aimed at reducing income inequality and ensuring equitable access to education and training can enable more individuals to participate in and contribute to the economy, further amplifying the benefits of population growth.

By adopting these measures, advanced economies can maximize the positive effects of population growth, ensuring that it translates into sustainable economic development and robust employment in the financial sector. These strategies would complement their existing advantages of a highly skilled workforce and mature economic systems.

(Source: Cayssials, G, Antonio, F & London, S 2024, 'Population and Economic Growth: a Panel Causality Analysis', Population and Economics, vol. 8, Faculty of Economics, Lomonosov Moscow State University, no. 3, pp. 220–240.)

GDP Growth

Unlike emerging economies, which focus on infrastructure and foundational investments, advanced economies can tap into their leadership in R&D, financial systems, and global influence to spearhead transformative growth initiatives. By focusing on areas requiring significant expertise, capital, and global collaboration, they can sustain GDP growth while retaining their competitive edge, below are some recommendations by which advanced economies can keep their competitive edge and maintain their high GDP growth rates compared to other economies:

a. Pioneering High-Tech Sectors and Green Innovation:

Advanced economies can focus on leading global innovation in cutting-edge fields such as artificial intelligence (AI), biotechnology, quantum computing, and green technologies. By investing heavily in research and development (R&D), they can foster industries with high value-added potential, driving GDP growth beyond the capabilities of economies still in infrastructure-building phases.

Example: Establishing global hubs for clean energy production, where advanced economies provide the technology and expertise to transition the world to sustainable energy.

b. Global Leadership in Financial Services:

Advanced economies with robust financial systems can further their role as global financial hubs by developing sophisticated financial instruments and services tailored to emerging market needs. For instance, advanced economies could pioneer green bonds, climate risk insurance, or global digital currencies.

c. Fostering Talent Migration and Retention:

These economies can attract and retain top global talent through visa programs, competitive compensation packages, and advanced career opportunities in specialized fields. By positioning themselves as hubs for international expertise, they can amplify workforce productivity and innovation, fueling economic growth.

d. Promoting Agility in Governance and Regulation:

Advanced economies can streamline governance processes to respond swiftly to new economic opportunities. For example, adapting regulatory frameworks to encourage the development of emerging industries (e.g., the metaverse economy, space exploration, or personalized medicine) and enabling rapid commercialization of innovations.

e. Driving Public-Private Sector Synergies in Mega Projects:

With access to vast capital resources and advanced expertise, these economies can initiate large-scale projects that no other region can match, such as transcontinental infrastructure, space exploration missions, or large-scale decarbonization initiatives.

(Source: McKinsey Global Institute 2019, Outperformers: High-growth emerging economies and the companies that propel them, McKinsey & Company.)

Inflation rates

In advanced economies, where inflation negatively correlates with financial sector employment, managing inflation requires strategies that balance price stability with sustainable growth. Unlike emerging economies, which often face structural inflationary pressures, advanced economies have the tools and sophistication to address inflation through targeted interventions that minimize its impact on financial sector employment.

a. Enhance Central Bank Agility

Advanced economies benefit from highly developed monetary systems. Central banks should:

- Adopt real-time data analytics and AI to predict inflationary trends and implement timely monetary policies.
- Use nuanced tools such as targeted interest rate adjustments or quantitative tightening, focusing on sectors prone to inflationary pressures without stifling overall growth.

b. Promote Wage-Price Stability

Advanced economies often face inflation driven by wage increases in high-skill sectors. Policies to mitigate this include:

- Encouraging wage growth tied to productivity gains rather than general inflation adjustments.
- Incentivizing skills development and workforce training to expand labor supply in high-demand sectors, thereby reducing wage-driven inflation.

c. Strategic Energy and Commodity Policies

Inflation in advanced economies is frequently influenced by volatile energy and commodity prices. Actions to address this include:

- Investing in renewable energy to reduce dependency on global energy markets.
- Establishing strategic reserves and hedging mechanisms for critical commodities to cushion against price shocks.

d. Strengthen Global Supply Chains

Supply chain disruptions are a significant driver of inflation in advanced economies. They can:

- Lead global efforts to build resilient, diversified supply chains by investing in smart logistics, AI-powered demand forecasting, and partnerships with key trade partners.
- Encourage regional supply chain networks to reduce dependency on distant sources prone to disruptions.

e. Promote Competition in Key Markets

Advanced economies often face inflationary pressures due to monopolistic practices or lack of competition in critical industries (e.g., healthcare, housing, or energy). Policies to address this include:

- Strengthening anti-trust regulations and fostering competition to lower costs for consumers.
- Supporting innovation in cost-intensive sectors to introduce alternative, more affordable solutions.

Emerging economies

Artificial intelligence investments

Emerging economies are at a pivotal stage where investments in AI infrastructure and adoption are critical to unlocking their transformative potential. The findings indicate that AI readiness is a highly significant driver of finance sector employment growth, highlighting the need for targeted policies and investments to maximize the benefits of AI adoption.

(Source: Bughin, J, Seong, J, Manyika, J, Chui, M & Joshi, R 2018, NOTES FROM THE AI FRONTIER MODELING THE IMPACT OF AI ON THE WORLD ECONOMY.)

a. Prioritize Infrastructure Development

Emerging economies often lack robust digital infrastructure, which is essential for deploying and scaling AI applications, making the prioritization of infrastructure a main focus for those economies in the meantime

Infrastructure development is the cornerstone of AI readiness in emerging economies. Without a robust foundation of digital infrastructure, the adoption and scalability of AI technologies are significantly hindered. Key components include **cloud computing**, **high-speed internet**, and **data centers**. For example, countries like India and Brazil have prioritized expanding affordable internet access to rural areas, enabling more inclusive participation in AI-driven services. Additionally, investments in **5G networks** can dramatically improve connectivity and allow real-time AI applications, such as mobile banking and automated financial transactions, to reach underserved communities. Developing **smart data centers** with sufficient storage and processing capacity ensures that AI models can handle large datasets, which are crucial for tasks such as credit scoring and fraud detection. Furthermore, the infrastructure must be tailored to local needs. For instance, in regions with frequent power outages, integrating renewable energy solutions into AI infrastructure can ensure reliability while supporting

sustainability goals. By addressing these infrastructural gaps, emerging economies can unlock the potential of AI to drive financial inclusion, boost employment, and support economic growth.

b. Intensifying private and foreign AI investments

Emerging economies often face resource constraints that hinder their ability to allocate sufficient funding toward AI research, development, and implementation. These constraints include limited fiscal budgets, competing priorities like healthcare and education, and underdeveloped private investment ecosystems. For example, many African countries, such as Nigeria and Kenya, struggle to balance public spending between essential infrastructure and fostering technological advancements. Similarly, countries in South Asia, like Bangladesh, face budgetary limitations due to large-scale poverty alleviation programs.

Private sector participation in AI is also less robust in emerging economies compared to advanced economies. For instance, venture capital investments in AI startups in regions like Southeast Asia remain significantly lower than those in North America or Europe. Without adequate incentives, such as tax breaks, grants, and public-private partnerships, private firms and international investors may hesitate to commit resources to these markets.

By implementing policies that incentivize AI investments, emerging economies can attract both domestic and foreign funding. Countries like India have demonstrated success by offering tax incentives and establishing innovation hubs, such as the Bengaluru Tech Hub in India, which have spurred private sector interest in AI development. These measures can address funding gaps, encourage research and development, and promote the adoption of AI technologies across industries, including finance, where the potential for automation and analytics remains largely untapped.

(Source: Adeoye, OB, Addy, WA, Ajayi-Nifise, AO, Odeyemi, O, Okoye, CC & Ofodile, OC 2024, 'LEVERAGING AI AND DATA ANALYTICS FOR ENHANCING FINANCIAL INCLUSION IN DEVELOPING ECONOMIES', Finance & Accounting Research Journal, vol. 6, no. 3, pp. 288–303.)

Human resources development

Emerging markets face challenges in attracting skilled labor from advanced economies due to limited incentives or motivating factors. For professionals in advanced economies, relocating to emerging markets often requires compelling financial or career benefits, which can make this talent attraction effort costly for local governments or firms. Without robust opportunities or infrastructure, these regions may struggle to compete with advanced economies that already offer higher wages, better living standards, and established professional networks. To bridge this gap, emerging economies countries would prioritize Investing in the quality of education and skill development within emerging economies is essential. Enhancing local human capital ensures a steady pipeline of skilled labor that can meet the demands of growing industries, including the finance sector. For example, countries like Vietnam and Malaysia have made substantial progress by introducing vocational training programs and fostering

partnerships between educational institutions and the private sector. These initiatives equip the local workforce with the expertise needed to leverage technologies like AI in finance.

In addition to building local capacity, selectively attracting expertise from advanced economies can accelerate knowledge transfer. Professionals with extensive experience in developed markets can share best practices, technological insights, and operational strategies that can be adapted to local contexts. For instance, Singapore's government has actively recruited global talent in areas such as fintech and artificial intelligence while simultaneously investing in local talent development programs like SkillsFuture, a national initiative launched in 2015 that encourages Singaporeans to continually upskill and reskill to stay competitive in a rapidly changing global landscape

By balancing investments in education and training with targeted efforts to attract global expertise, emerging economies can cultivate a highly skilled labor force capable of driving sustainable growth in the financial sector. This approach not only reduces reliance on costly foreign expertise over time but also fosters a workforce that can adapt to future technological advancements.

(Source: Zidan, SS 2001, 'The role of HRD in economic development', Human Resource Development Quarterly, vol. 12, no. 4, p. 437.)

Inflation rates control

a. Diversify Sources of Economic Growth

Many emerging markets rely heavily on the export of commodities like oil, metals, or agricultural products, which are often subject to price fluctuations. These fluctuations can create inflationary spikes due to the volatility of global commodity prices. By diversifying their economic base, countries like India and Indonesia have reduced their vulnerability to such shocks. Investments in high-value industries also promote long-term economic stability and job creation.

This can be done by diversify their economies to reduce reliance on sectors that are vulnerable to inflationary pressures, such as commodities. Encouraging innovation and developing high-value sectors like technology, services, and manufacturing will provide more stable revenue streams and help mitigate the impact of external price shocks.

b. Foster exchange rate stability

Currency depreciation can drive up the cost of imports, contributing to inflation. By ensuring exchange rate stability, emerging economies can reduce the cost of imported goods, which is especially important for economies that depend on foreign goods and services. This could be managed by applying the policies as an example:

- Maintain Sufficient Foreign Currency Reserves: Countries should accumulate enough foreign currency reserves to manage fluctuations in the exchange rate. These reserves act as a buffer for the central bank to intervene when needed to prevent excessive currency depreciation.
- Build Investor Confidence: A stable political and economic environment, coupled with transparent and credible policies, builds trust in the country's currency. Investor confidence encourages foreign investments, which supports currency stability.
- Interest Rate and Inflation Management: By adjusting interest rates, central banks can attract foreign capital and prevent inflation from eroding the value of the currency. Higher interest rates make the currency more attractive to investors, stabilizing its value.

(Source: Aguilar, A, Guerra, R & Martinez, B 2024, Global inflation, inflation expectations and central banks in emerging markets, Bis.org, viewed 2 February 2025)

Developing economies

For developing economies, establishing and maintaining **political stability** is of utmost importance. It is crucial for these countries to foster environments that are perceived as transparent, with fair competition, equality, and long-term stability. When political stability is in place, it sends a clear message to both domestic and international investors that the country offers a reliable and secure market. This creates a conducive environment for investment in key sectors such as education, infrastructure, and finance. Over time, these investments will catalyze improvements across various sectors, leading to sustainable economic growth and an enhanced capacity to develop a skilled workforce, ultimately driving employment and prosperity.

(Source: Aluko, A & Bagheri, M 2012, 'The impact of money laundering on economic and financial stability and on political development in developing countries', Journal of Money Laundering Control, vol. 15, no. 4, pp. 442–457.)

Our recommendation for those economies will all be stemming from this approach, and this can be done in different directions…

a. **Strengthening Institutions and Governance**

- Institutional Reforms: Reform key governmental institutions, including the judiciary, legislative bodies, and financial regulatory authorities, to improve transparency and reduce corruption. This may involve establishing independent anti-corruption commissions, implementing - - performance audits, and promoting e-governance.

- Training Public Officials: Provide ongoing training programs for government officials to enhance their knowledge and skills in managing public resources and promoting transparency.

We can take Rwanda as a recent example as the government has implemented a range of anti-corruption policies and established institutions such as the **Rwanda Governance Board** to oversee governance issues. Additionally, Rwanda created a strong legal framework that includes strict laws and penalties for corrupt activities. These measures have helped build public trust in government institutions by showing that corruption is not tolerated at any level of government.

(Source: Kigali 2012, REPUBLIC OF RWANDA OFFICE OF THE OMBUDSMAN RWANDA ANTI--CORRUPTION POLICY.)

The government also encourages **citizen participation** in governance, ensuring that people have a role in monitoring public officials and public resources. By promoting accountability, Rwanda has seen a significant reduction in corruption, making it one of the least corrupt countries in Africa.

Another historical example of how institutions reforms can lead to a sustained economic growth and development is **South Korea**. In the decades following the war (1950-1953), which left the country in ruins, took radical steps to curb corruption and create a more centralized system for economic planning and state control.

One of the key steps was the establishment of strong, state-led development institutions like the Korea Development Institute (KDI) and the Economic Planning Board (EPB), which focused on guiding economic growth through long-term, strategic planning. These institutions helped reduce corruption in public projects and government contracts by centralizing power and promoting transparency in decision-making.

South Korea also began emphasizing public sector reforms and creating independent agencies to monitor corruption. The Anti-Corruption and Civil Rights Commission was established later in the 2000s to fight corruption in the public and private sectors, ensuring accountability across all levels of government.

(Source: Won Lee, J 2001, The Impact of the Korean War on the Korean Economy, Sungkyunkwan University, Seoul, Korea.)

b. **Fostering Investor Confidence through Political Risk Insurance**

Governments can collaborate with international organizations such as the Multilateral Investment Guarantee Agency (MIGA) to offer political risk insurance to foreign investors. This protects investors against political risks such as expropriation, currency inconvertibility, or political violence.
Example is Vietnam's adoption of political risk insurance schemes in the late 1990s played a significant role in attracting foreign direct investment, particularly in the manufacturing and financial sectors.

- **Promoting fair competition and market access** is essential for fostering an environment where businesses can thrive without undue advantage or barriers. This involves implementing and enforcing regulations that create a level playing field, ensuring that no single company or group of companies dominates a market to the detriment of others. Key components include:
- **Antitrust Laws:** Governments should establish and enforce laws to prevent monopolies, cartels, and anti-competitive practices. Such regulations deter companies from exploiting their market position to set unfair prices or limit choices for consumers.
- **Ease of Entry for New Businesses:** Simplifying the processes for starting and running a business—such as reducing bureaucratic hurdles, lowering costs for registration, and streamlining licensing procedures—encourages entrepreneurship and innovation.
- **Equal Resource Distribution:** Ensuring fair access to resources like credit, land, and infrastructure allows small and medium-sized enterprises (SMEs) to compete effectively with larger corporations.
- **Transparent Public Procurement:** Governments should adopt transparent and open bidding processes for public contracts to avoid favoritism or corruption. This provides equal opportunities for businesses of all sizes to participate in economic activities.
- **Reduction of Trade Barriers:** By minimizing tariffs, quotas, and import/export restrictions, governments can increase market access for domestic and foreign firms, fostering competitiveness and efficiency.
- **Regulating Dominant Players:** In industries where certain companies hold significant market power, regulations must ensure these entities do not abuse their dominance to stifle competition or innovation.

(Source: Akın, T 2017, The Effects of Political Stability on Foreign Direct Investment in Fragile Five Countries, Central European Journal of Economic Modelling and Econometrics.)

6. Limitation of the study

While this study provides valuable insights into the factors influencing financial sector employment globally, several limitations must be acknowledged:

a. Data Availability and Scope

Despite our efforts to focus on major economies and gather data pertaining to 35 countries across diverse regions, the absence of information from key economies such as China, Saudi Arabia, and Canada is a notable limitation. The inclusion of such countries could have enriched the analysis and provided a more comprehensive understanding of global trends. However, due to data constraints and unavailability of certain critical indicators for these nations, their impact on our findings remains unexplored.

b. Data Consistency and Timeframe

Our analysis is based on data spanning three specific historical years—2020, 2021, and 2023. While these years provide a snapshot of the financial sector's employment trends, they might not fully represent longer-term patterns. Moreover, extraordinary events during this period, such as the COVID-19 pandemic, could have significantly influenced the presented figures. Expanding the analysis to cover additional timeframes would likely enhance the robustness of our findings, mitigating the influence of singular, extraordinary events and offering a clearer picture of sectorial dynamics.

c. Methodological Constraints

This study encompassed data from 35 countries with distinct economic structures, financial systems, educational frameworks, political climates, and cultural norms. Interpreting non-linear relationships across such diverse contexts posed significant challenges. The complexity of cross-country comparisons might have resulted in an incomplete understanding of localized or nuanced factors influencing financial sector employment.

d. External Factors and Unforeseen Variables

While we attempted to include a broad range of factors that could impact financial sector employment and maintained a balance between model complexity and interpretability, there are undoubtedly additional variables that were not captured. Examples of such unforeseen factors include:

- Global crises such as recessions or pandemics.
- Rapid technological advancements and disruptive innovations.
- Regional wars and geopolitical tensions.
- Supply chain disruptions affecting financial market stability.
  Incorporating these elements could further refine our understanding of the dynamics influencing financial sector employment.

Recognizing these limitations is crucial for contextualizing the findings and guiding future research. While we aimed to address the most impactful variables, we deliberately avoided introducing excessive complexity into the model to maintain the accuracy and reliability of our findings. Expanding the scope of data, increasing temporal coverage, and incorporating additional variables in a controlled manner can provide a more nuanced and comprehensive analysis, enhancing the reliability and applicability of our conclusions.

7. Future Research Directions

Building on the findings and limitations of this study, several avenues for future research can be explored to deepen the understanding of factors influencing financial sector employment globally. These include:

a. Expanding Geographical Coverage

Future research could incorporate data from additional key economies such as China, Saudi Arabia, Canada and South Korea to provide a more comprehensive global perspective. Including these countries may help to capture unique dynamics and trends that were not accounted for in this study.

b. Incorporating Longer or different Timeframes

To mitigate the influence of short-term anomalies and extraordinary events like the COVID-19 pandemic, supply chain restrictions or political tense occurring in some regions, future studies could analyze financial sector employment trends over an extended period or different timeframe. This would allow researchers to better

identify long-term patterns and relationships while accounting for cyclical or structural changes in the global economy.

c. Investigating Additional Variables

Future studies could integrate a broader range of factors, such as global crises, Environmental and ESG Trends, technological disruptions, demographic shifts, and geopolitical developments. Including these variables would provide a more holistic view of the determinants of financial sector employment and account for unforeseen influences on the sector.

d. Advancing Methodologies

Leveraging advanced machine learning models and simulation techniques could improve the predictive power of future analyses. These tools can help address non-linear relationships more effectively, providing deeper insights while maintaining model accuracy.

e. Exploring Non-Linear Relationships in Depth

Given the challenges of interpreting non-linear relationships across diverse economies, future research could focus on country-specific or region-specific analyses. This approach would enable a more granular understanding of localized factors and reduce the complexity introduced by global variations in economic, cultural, and political contexts.

By pursuing these research directions, future studies can build upon the foundation laid by this analysis, providing actionable insights for policymakers, financial institutions, and educational systems to foster sustainable employment growth in the financial sector worldwide.

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