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The relationship between human development, financial development, rule of law, technology, and labour income in BRICS countries

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Abstract

Objective: This article examines the impact of the Human Development Index (HDI), the Rule of Law Index, Financial Institutions and Market Depth Index, and internet access on labour incomes in BRICS countries.

Methodology: Utilising annual panel data from 2004 to 2022, this study relied on secondary data sourced from the International Monetary Fund, ILO, UNDP, and the World Bank. The analysis used panel data regression to evaluate the relationship between these variables.

Results: The findings revealed that HDI, Rule of Law Index, Financial Development, and Internet access significantly and positively affect labour incomes in the BRICS countries. These results highlight the important role of universal access to quality education, which includes formal education and vocational training, in improving labour market outcomes.

Implications and recommendations: Strengthening the Rule of Law Index requires consistent law enforcement, worker protection, and institutional transparency, as demonstrated in South Africa. In addition, driving the growth of the Financial Institution Depth Index requires broader financial inclusion through fintech solutions, microcredit expansion, and regulatory reform. Digital transformation also plays a key role in improving accessibility and financial efficiency.

Originality/value: This research supports several Sustainable Development Goals (SDGs) achievements. The latest outcome empirically links SDGs indicators with certain institutional and technological variables in influencing labour income. While many previous studies focused on other groups of developed or developing countries, this study analysed ten BRICS member countries.

Keywords: labour income, human development, rule of law, financial development

1. Introduction

BRICS is a group of cooperating countries including Brazil, Russia, India, China, and South Africa, formed against the background of certain trends in the post-Cold War period detrimental to their interests. The organization's most important goal is to create a global order that is multipolar, just, non-hegemonic, and non-discriminatory (Patnaik, 2022). BRICS was formed in response to changes in the global economic and geopolitical landscape. These countries are considered to have a thriving economy, large populations, and abundant natural resources, making them a major force in the economy of the future. The main objective of BRICS was to balance the influence of global institutions dominated by Western countries, such as the IMF and the World Bank, as well as to provide an alternative in shaping global economic policies that are more inclusive and represent the interests of developing countries (Kenny, 2025). The first member states of BRICS were Brazil, Russia, India, and China, whilst South Africa officially joined in 2010 and attended the BRICS Summit for the first time. The organization expanded again in 2024, with Egypt, Ethiopia, Iran, and the United Arab Emirates becoming official members after attending the 16th BRICS Summit. In January 2025, Indonesia also joined the BRICS membership (Curtis, 2024).

Today the BRICS countries are home to about 3.3 billion people, i.e. more than 40% of the global population, and are also estimated to account for 37.3% of global gross domestic product based on purchasing power parity (World Economic Forum, 2024). By 2024, the bloc's labour force participation rate was calculated to be 60.6%, which translates to a total of 1.5 billion people, according to the International Labour Organization. The BRICS countries play a key role in influencing economic policy and globalisation, as well as supporting the development of a more equitable sustainable economy in the world (Suhel et al., 2025). In addition, they continue to strive to increase cooperation in the fields of trade, investment, and social development to strengthen competitiveness and improve socio--economic welfare in their respective regions. Figure 1 shows the share of labour income in the BRICS countries varies, reflecting the differences in economic structure, labour market policies, and the quality of education and training in each country. For example, Brazil with a larger industrial base and fast-growing service sector tends to have a higher contribution of labour income to GDP, while Iran and the UAE, which are more dependent on the energy sector and less diverse in their economic industries, show lower labour income contributions. In addition, the cultural diversity and institutional systems that exist in the BRICS countries affect access to education, skills training, and protection of workers' rights, all of which play a role in determining labour incomes.

The huge economic potential of the BRICS countries shows their significant role in the global economy. However, the labour income gap between member countries remains a major challenge (Beletskaya, 2022). Various institutional and structural factors, such as human development levels, legal certainty, depth of financial markets, depth of capital markets, and access to digital technologies, play a key role in determining the quality and distribution of labour income in these countries. This study measured labour income as the total compensation received by the labour force as a percentage of a country's Gross Domestic Product (GDP), which includes both formal employees and informal workers.

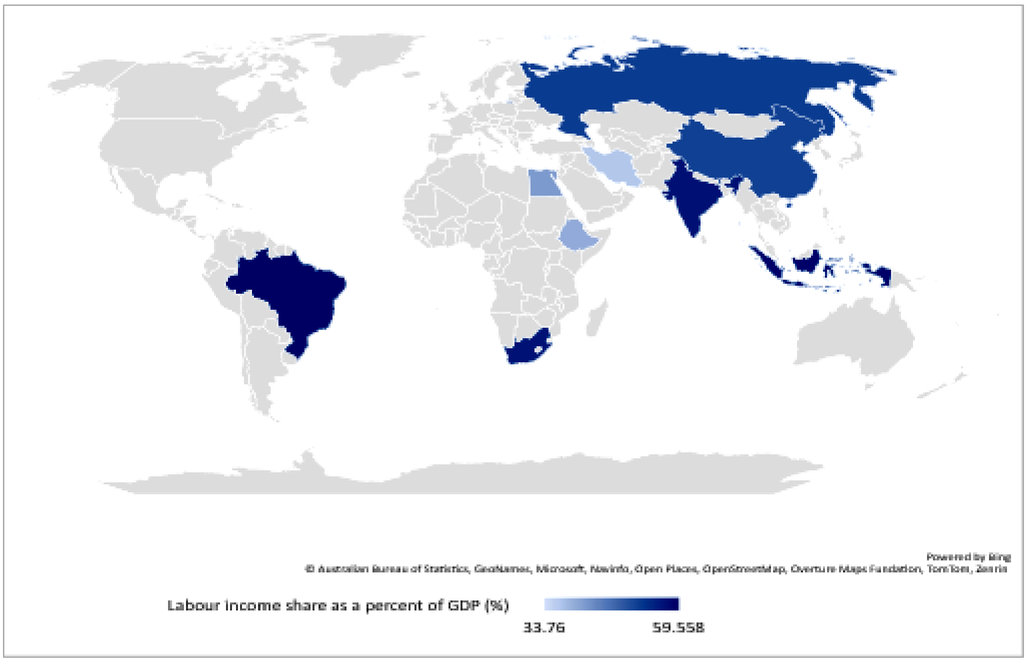

Fig. 1. Labour Income as a percentage of GDP (%) in BRICS

Source: UNDP, data processed (2024).

The Human Development Index (HDI) measures the level of human development achievement through three main dimensions, namely Education, Health, and a decent standard of living (UNDP, 2024). Countries with high levels of HDI tend to have more skilled and productive workforces, which ultimately leads to increased labour income, and those with high HDI tend to have a more skilled, innovative, and productive workforce, hence they are able to contribute more to the growth of knowledge and technology-based economies. A number of earlier studies confirmed a significant link between human resources and increased labour income (Boustanifar et al., 2018; Lee et al., 2015).

Meanwhile, the Rule of Law Index is an important indicator in assessing the quality of a country's legal governance. Through strong regulations, it is the foundation to ensure legal certainty and fair law enforcement, including protecting workers' rights (Versteeg & Ginsburg, 2017). Countries with strong legal systems are able to create a stable working environment and attract investment, thus opening up more quality opportunities. Legal stability also encourages employers to improve workers' welfare, both through competitive wages and social protection. In contrast, in countries with weak legal systems, legal uncertainty and lack of enforcement of labour rights often lead to exploitative practices, such as low wages, lack of social protection, and discrimination in the workplace.

The role of the financial sector cannot be ignored in analysing factors that are able to affect labour income. Financial Development is a composite index that occurs from four components, i.e. financial access, depth, efficiency, and financial stability (Suhel et al., 2025). The depth of financial institutions, which reflects the ability of financial institutions to provide services and access to capital, contributes greatly especially to the increase of Small and Medium Enterprises (SMEs) as the backbone of many economies in BRICS (Song et al., 2018). In terms of financial markets, the Financial Market Depth Index component shows an important level of financial market maturity in supporting long-term investment and job creation (Ahmed, 2016). The relationship between the financial market and labour ensures an efficient allocation of resources, so that the workforce can improve its skills and productivity.

Another increasingly crucial factor that can have an impact on labour income is infrastructure in the form of access to the Internet. In the era of digitalisation, the Internet opens up opportunities for workers to get online-based education and training, seek new job opportunities, and participate in the digital economy. In this study, 'Internet access' refers to the percentage of the population that has the ability to use the Internet, measured by the number of individuals who accessed it in the last three months (see Table 1). The BRICS countries with high Internet penetration rates show developments in the technology-based economy sector, which creates new jobs in various sectors. According to Zafar et al., (2023), each member country is improving the ICT sector to be competitive and relevant in the modern digital era. In addition, greater Internet access allows workers in remote areas to connect to global markets, thereby narrowing the economic gap.

This study aimed to investigate the impact of human development, financial development, institutional and technological on labour income in the BRICS countries, examining several achievements of the Sustainable Development Goals (SDGs), especially Goal 8, namely Decent Work and Economic Growth, Goal 10, Reducing Gaps, and Goal 16, Peace, Justice, and Strong Institutions. The article empirically links SDGs indicators with certain institutional and technological variables in influencing labour income. While many previous studies focused on other groups of developed or developing countries (Jauch & Watzka, 2016); Vivarelli, 2014; Haseeb et al., 2020), this study analysed ten BRICS member states, aiming to contribute to the economic literature, especially in the field of monetary economics and employment.

2. Literature review

Financial, legal, and infrastructure factors play an important role in shaping the income of the workforce in different countries. One of the main factors that affect the income of the workforce is human development, and the quality of education reflected in HDI directly affects labour productivity and wages (Grisolia et al., 2022). Countries with higher HDI tend to have a more skilled workforce, which ultimately increases their incomes. Research by Bilan et al. (2020) showed that countries with high HDI categories tend to have better education systems, more inclusive health services and more equitable access to economic opportunities. This contributes to a more equitable distribution of income, where more individuals in society are able to upskill and obtain more productive jobs with higher incomes. A more equitable distribution of income is important because it reduces socio-economic inequality that can limit social mobility and active participation in the economy. When incomes are more evenly distributed, more individuals are in a position to contribute productively to the economy, which in turn drives more inclusive and sustainable economic growth.

In terms of legal governance, the Rule of Law Index (RLI) also plays an important role in its influence on labour income. It measures the level of law enforcement and justice in a country, including government openness and human rights protection. Bilgin et al. (2021) stated that countries with strong legal systems tend to have higher economic stability, which in turn enables to create more job opportunities. Wang et al. (2023) stressed that countries with a fair rule of law have lower economic risks, which impacts sustainable economic growth and a fairer distribution of labour income, therefore strengthening the rule of law is expected to have a a positive impact.

Institutional factors such as the legal, employment, and financial systems, have a significant impact on labour incomes in the BRICS countries that have very different levels of development. China, with large manufacturing sectors and industry-centric economic structures, shows a higher contribution to labour income thanks to formal employment that provides more stable and productive wages (Simachev et al., 2020). In contrast, India, which relies more on the service sector and the informal economy, faces challenges in ensuring a higher quality of employment and labour income, given the high proportion of workers in the informal sector with low wages and limited protections. In addition, cultural factors also affect the ability of the workforce to participate in the formal and productive sectors, which has a direct impact on the income of the workforce. For example, in India and South Africa gender roles and work culture play an important role in limiting women's participation in the formal sector.

In the financial variable, the depth of financial institutions and financial markets is suspected to have a positive and significant impact on labour income. The depth of a financial institution, which refers to the size and effectiveness of the banking system and financial institutions, allows for greater access to credit and financing. Surmanidze et al. (2023) showed that good and deep financial markets are able to facilitate access to cheaper capital, thereby encouraging investment and creating new jobs.

Moreover, the depth of financial markets contributes to the reduction of financial risks through the broader diversification of financial products, such as bonds, stocks, and other derivative instruments. The existence of a deep and liquid market allows the national economy to be more resilient to external pressures, such as global crises or international market volatility. Policies in Brazil and South Africa that focus on strengthening capital market regulation and financial inclusion have succeeded in increasing the resilience of their labour sectors during periods of global economic uncertainty, thereby driving increased productivity and labour income, while China has launched an intensive openness policy since November 2014. Among these policies, the Shanghai-Hong Kong Stock Connect offers international investors an approach to investing directly in the Mainland Chinese stock market. At the same time, the capital of Mainland China can gain access to overseas markets through Hong Kong (Wang et al., 2016). The Brazilian stock market is creating a domino effect with increased investment in the infrastructure and manufacturing sectors. This triggers the creation of new jobs, increased productivity, and higher wages in these sectors. Iran has shown an increase in its stock market depth since 2018, and since the US withdrew from the nuclear deal (JCPOA) in 2018 and reimposed economic sanctions, it has faced more intensive economic isolation (Juneau, 2019).

Developing countries have embarked on significant reforms in financial institutions and financial markets that are essential for the expansion of the financial sector and thus for their economic growth (Guptha & Rao, 2018). The existence of effective financial institutions offering many benefits, especially for workers in the formal and informal economic sectors, by providing access to savings, insurance, and credit that can be used to plan for a better future.

From the infrastructure aspect, access to technology is also an increasingly important factor in increasing labour productivity. Technology plays a significant role in influencing wage structures, where companies that invest in technology tend to pay higher wages (Majumdar et al., 2014). On the one hand, technological advances such as digitalisation and automation are able to increase efficiency and productivity, which ideally has an impact on improving worker welfare, yet on the other hand, the benefits of this technological transformation are often uneven. Only high-skilled workers tend to enjoy higher wages and better job opportunities, while low-skilled workers are often left behind and face income stagnation. Garrote Sanchez et al. (2021) found that countries with high Internet penetration have a more efficient workforce and can access a wider range of job opportunities, both locally and globally. This helps the workforce to upskill and adapt to technological changes, which has an impact on increasing income. 0 Hjort & Poulsen, (2019) showed that digital technology improves the skills of the workforce as well as creates new job opportunities.

Based on previous theories, concepts, and research, the hypothesis of this study is that HDI, the Legal Rule Index, the Financial Institutional Depth Index, the Financial Market Depth Index, and Internet access are expected to be positive and significant for labour income.

3. Methodology

The population of the study included ten BRICS member countries, i.e. Brazil, China, Egypt, Ethiopia, India, Indonesia, Iran, Russia, South Africa, and the United Arab Emirates. Secondary data were obtained from various sources, namely the UNDP, the IMF, the World Bank, the ILO, and the World Justice Project. The authors used data from the period 2004 to 2022. The definitions for each variable are presented in Table 1.Panel data regression analysis techniques using three approaches, including general, fixed, and random effect models were deployed. In choosing the best method, the authors used three tests, namely Chow, Hausman, and Lagrange multipliers.

Table 1. Variable operational definition

Variable	Definition	Measurement	Source
Labour Income	The total compensation of employees and the income of the self-employed workforce is given as a percentage of GDP, which is a measure of total output.	The share of labour income as a percentage of GDP (%)	ILO
IPM	HDI is a combined measure of a country's average achievement in three basic aspects of human development: health, knowledge, and living standards.	Index	UNDP
Rule of Law Index	The WJP Rule of Law Index is a measurement tool developed by the World Justice Project to evaluate the extent to which a country or jurisdiction adheres to the principles of the rule of law.	Index	World Justice Project
Financial Market Depth Index	The Financial Market Depth Index, which collects data on stock market capitalisation to GDP, stocks traded to GDP, government international bonds to GDP, and total debt securities of financial and non-financial companies to GDP.	Index	IMF
Financial Institution Depth Index	FID collects data on banking loans to the private sector as a percentage of GDP, pension fund assets to GDP, mutual fund assets to GDP, and life and non-life insurance premiums to GDP.	Index	IMF
Internet Access	An Internet user is an individual who has used the Internet (from any location) in the last 3 months.	Individuals who use the Internet (% of the population)	World Bank

Source: authors' compilation (2025).

$$Labour_{it} = \beta_0 + \beta_1 HDI_{it} + \beta_2 Law_{it} + \beta_3 FID_{it} + \beta_4 FMDI_{it} + \beta_5 Internet_{it} + e_{it}, \quad (1)$$

where β is a constant, LABOUR is a part of labour income as a percentage of GDP, HDI is a human development index, Law is the index of the rule of law, FID is a financial institution's depth index, FMDI is a financial market depth index, *i* is cross-section, *t* is a time series, and *e* is an error term.

4. Result

4.1. Labour income development in BRICS

The ILO found upward pressure on inequality as the share of labour income was stagnant and most young people were still unemployed, without education or training (ILO, 2024). Based on Figure 2, Indonesia and India showed a slight downward trend in labour income; China and Ethiopia demonstrated a stagnant trend, while an increasing trend of labour income was seen in other countries. Indonesia is a rich country with relatively low wages, hence its contribution to GDP is quite high compared to other countries. The number of jobs in Indonesia has increased, but mostly in low-skilled sectors with employment arrangements dominated by the informal sector. According to Duraisamy & Duraisamy, (2016), India has a labour market segmented by gender, type of occupation, sector and location of residence.

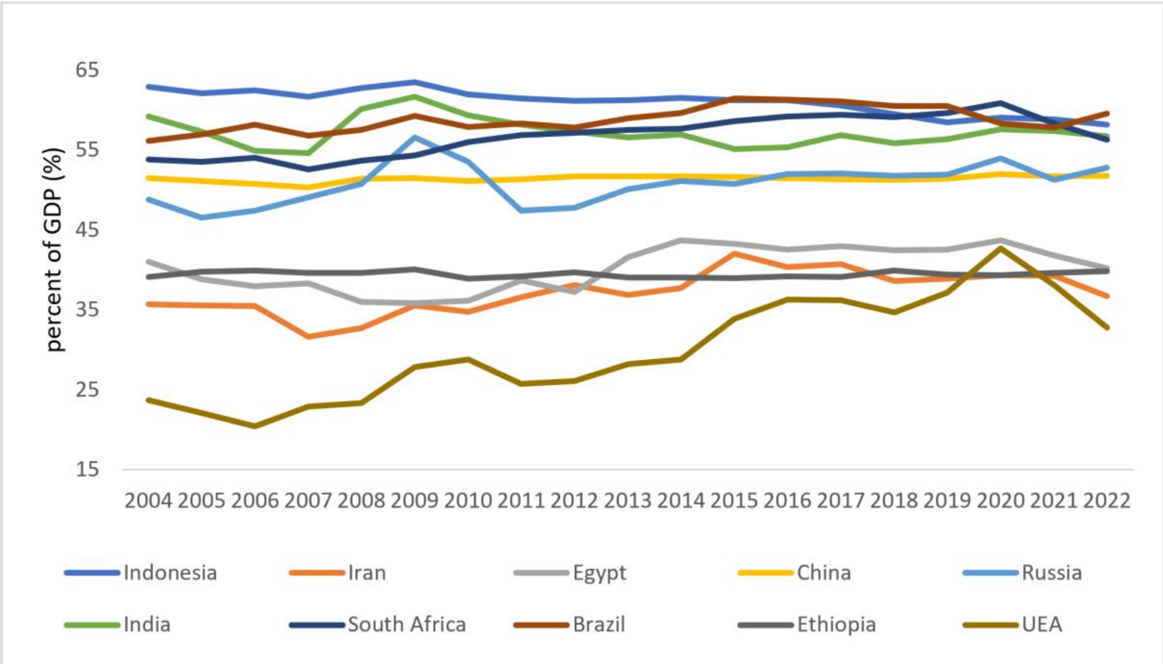

Fig. 2. Labour income in BRICS

Source: ILO (2024).

China showed a stagnant trend in the percentage of labour income to GDP. Wage growth in China has been polarised since the mid-2010s, with significant wage increases occurring only in skill-intensive sectors such as high tech, finance, health, and education. Globalisation and automation in China are accelerating the shift of the workforce from the manufacturing sector to the informal service sector, unable to absorb a workforce with high productivity and adequate wages. As a result, the wages are relatively low compared to the added value generated by the economy. Ethiopia recorded a stagnant trend in total labour income. Most Ethiopian non-agricultural workers operate in low-skilled sectors, especially in informal trade areas such as street vending and local markets, whose contribution to economic added value is relatively small.

Brazil, South Africa, and Russia have experienced diversification of economic sectors from dependence on primary to secondary sectors, especially on services and manufacturing. The UAE and Iran are undergoing major economic transformations, with a focus on non-oil industries, thereby providing job opportunities and income. Iran and Egypt implemented policies aimed at improving the education and training of the workforce's skills. Russia and Brazil, large countries with abundant natural resources, and rising global commodity prices were able to increase labour income.

4.2. HDI development in BRICS

HDI plays an important role as a measure of human development progress amid complex global economic dynamics (Hidayat et al., 2025). Based on Figure 3, the BRICS countries showed an increasing HDI trend, with the UAE having the highest HDI, while Ethiopia the lowest. This success was achieved thanks to huge investment policies in the energy sector, especially oil and gas, as well as progressive economic diversification with an increase in the tourism and technology sectors. In addition, the education and health sectors in the UAE received serious attention, which contributed to the high HDI index. Ethiopia recorded the lowest HDI among the most recent BRICS countries.

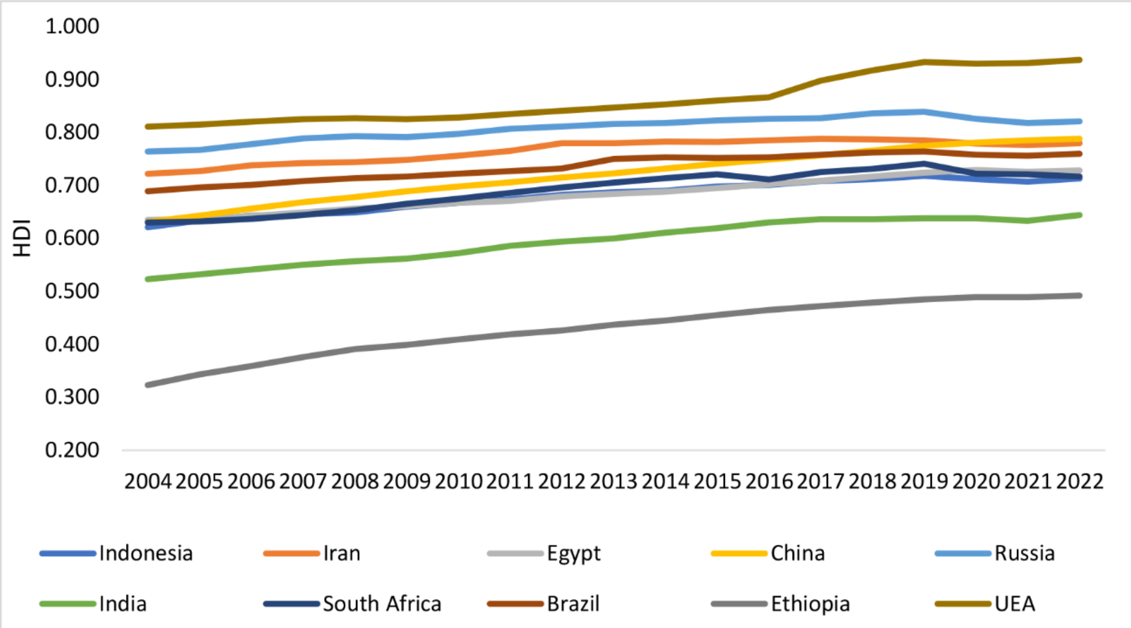

Fig. 3. IPM in BRICS

Source: UNDP (2025).

Indonesia has made many reforms and investments in the education sector, both at primary and secondary levels (Hidayat & Shodrokova, 2025). Government programmes to increase the level of educational participation, such as compulsory nine-year education and more affordable education, have contributed to increasing literacy and educational participation. Indonesia is working to increase public access to basic health services, including through the National Health Insurance (JKN) programme. Russia, despite the challenges related to its dependence on the energy sector, showed a significant upward trend in HDI. Brazil is a successful example of expanding access to social services through programmes such as Bolsa Família, which provides direct cash assistance to poor families with certain conditions, e.g. children's education. China's economic and social development has made great progress in recent decades, yet also resulting in a deterioration in environmental quality, which threatens sustainable development (Li & Xu, 2021; Hidayat, 2024). India is quite low in HDI, despite showing an uptrend. In most rural areas and some states, the education system still faces problems such as low-quality teaching, inadequate facilities, and high dropout rates.

4.3. Development of the Rule of Law Index in BRICS

In recent years the rule of law has declined in many countries (Graber et al., 2018). Based on Figure 4, most of the BRICS countries, such as Brazil, Indonesia, Iran, India, China, South Africa, and Russia, showed a decrease in the Rule of Law Index during the period 2004-2022, which could be influenced by factors such as corruption, political instability, and the decline in judicial independence that occur in these countries. In Brazil this is linked to systemic corruption and weak law enforcement efforts to eradicate organised crime. Major cases such as the Lava Jato scandal revealed widespread levels of corruption, whereas in Indonesia challenges in judicial independence and legal policy were the main reasons. In Iran human rights are often ignored, while the legal system functions more as a political instrument to control the opposition, whilst in India cases of pending judicial process, corruption at the bureaucratic level, and discrimination against minorities contribute to the fall in the RLI. South Africa has experienced rampant corruption, especially during the Jacob Zuma era, while in Russia this is due to the government's tight control of the deteriorating legal system.

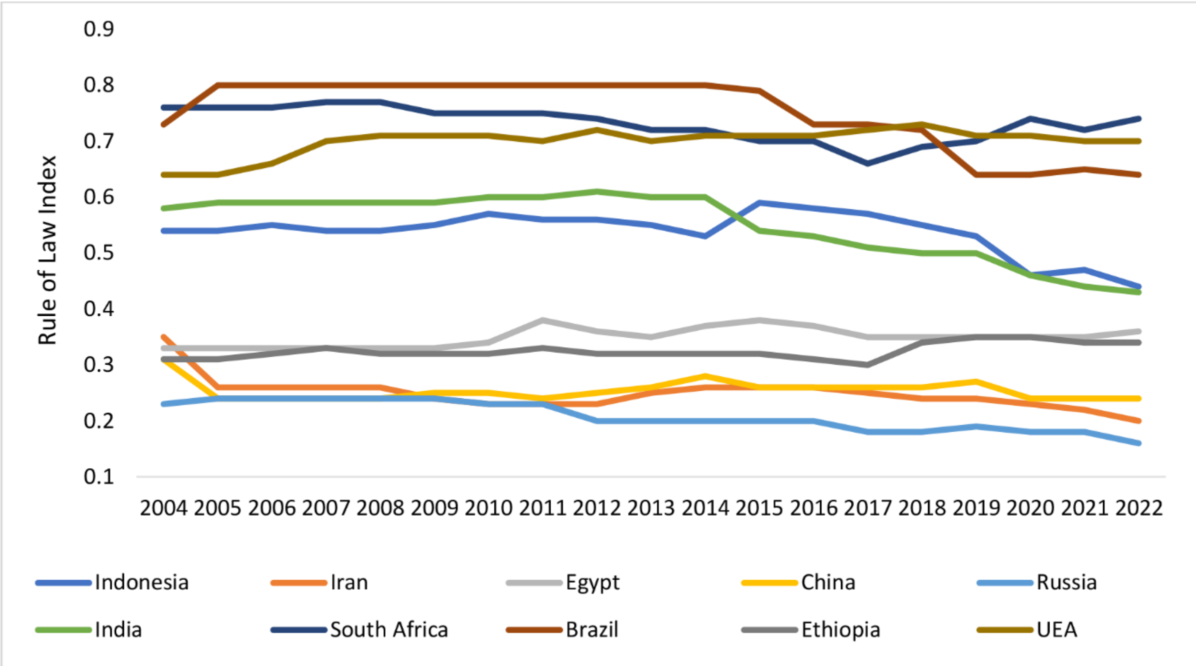

Fig. 4. Rule of Law Index in BRICS

Source: World Justice Project (2022).

Egypt, the UAE, and Ethiopia experienced a slight uptrend. After the Arab Spring and the overthrow of President Hosni Mubarak, there took place significant political fluctuations, including the brief rule of the Muslim Brotherhood under Muhammad Morsi and then the takeover of power by the military led by Abdel Fattah el-Sisi in 2013. In 2019, Egypt's constitution was amended and authorised the President to appoint prosecutors and judges without transparency in his election (cf. Hofmann, 2021). The UAE has modernised its legal system to increase its attractiveness as an international business hub, including changes in investment regulations, golden visas, and deregulation of some social restrictions. The trend of the Rule of Law Index in Ethiopia showed a slight improvement, although overall it tended to be stagnant. Government reforms under Prime Minister Abiy Ahmed since 2018, such as the release of political prisoners, revisions of repressive laws, and strengthening the role of civil society organizations, have had a positive impact albeit limited. Ethiopia has also established the Ethiopian Human Rights Commission (EHRC) to monitor violations of the law and strengthen human rights enforcement.

4.4. Development of the Financial Institution Depth Index in BRICS

China, Brazil, India, and South Africa have managed to deepen their financial institution sectors in recent decades. China has a large and rapidly growing banking sector, with many large banks and increasingly open financial markets. Blockchain technology is the underlying core technology with promising application prospects in the banking industry in China (Guo & Liang, 2016). Brazil and India also noted significant developments in the depth of the banking sector, allowing people and businesses to access a more diverse range of financial products, although financial inclusion challenges remain.

India is a bank-based economy, where banking institutions dominate the financial system. South Africa has stabilised and expanded the structure of their financial institutions, making it one of the most advanced on the African continent.

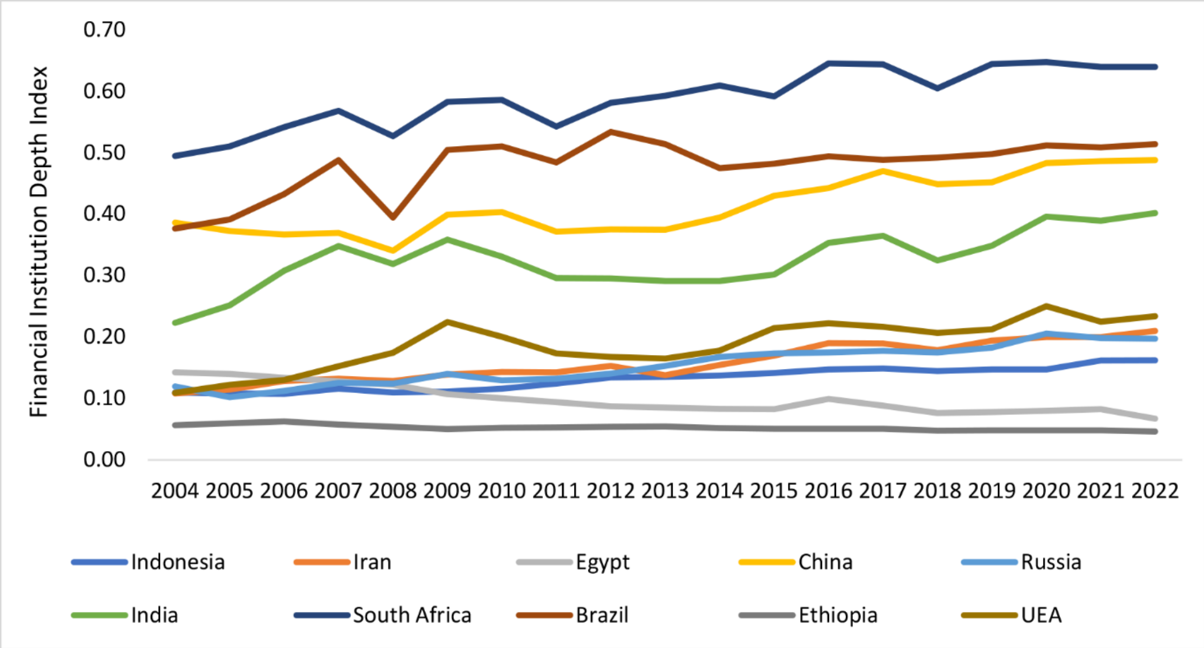

Fig. 5. Financial Institution Depth Index in BRICS

Source: International Monetary Fund (2026).

The UAE, Iran, Indonesia, Egypt, and Ethiopia are still lagging behind in terms of the depth of their financial institutions. The UAE, despite having a well-organised banking sector, is still heavily dependent on the energy sector for its economic growth, which limits the deep development of the non-energy financial sector. Iran faces international challenges related to economic sanctions that affect the development of its domestic financial institutions. Indonesia and Egypt, despite their development, still face limitations in the diversification of financial products, which limits the depth of their financial sectors. The increase in the index of Indonesian financial institutions was supported by an increase in the number of bank branches. Ethiopia, as a smaller economy, is still in the early stages of deepening its financial sector, despite efforts to improve the development of financial institutions.

4.5. Development of Financial Market Depth Index variables in BRICS

Based on Figure 6, China, India, Brazil, the UAE, and South Africa have shown significant improvements in developing their financial markets through policies that support liquidity, access to capital markets, and better infrastructure and regulation. The UAE, regarded as one of the most important investment centres in the Gulf Cooperation Countries (GCC) and in the Middle East, has opened its financial markets to foreign investors with the aim of attracting foreign investment and direct capital to boost economic growth (Kapar et al., 2020). Meanwhile, Indonesia is increasingly supporting economic policies and regulations as well as the advancement of fintech.

FMDI is lowest in Ethiopia and highest in South Africa. In Sub-Saharan Africa in general, particularly in Ethiopia, the level of financial development is very low and dominated by a bank-based financial system. Although financial markets do exist in some African countries, financial markets are relatively new compared to markets in developed countries (Beyene, 2023). Many countries including Ethiopia have no capital markets at all in their history. The South African stock market has played an important role in Africa as the largest stock market on the continent (Ho, 2019). The Johannesburg Stock

Exchange (JSE) is the largest and fastest growing stock exchange, with more than 400 listed companies and a market capitalisation of over $1 trillion.

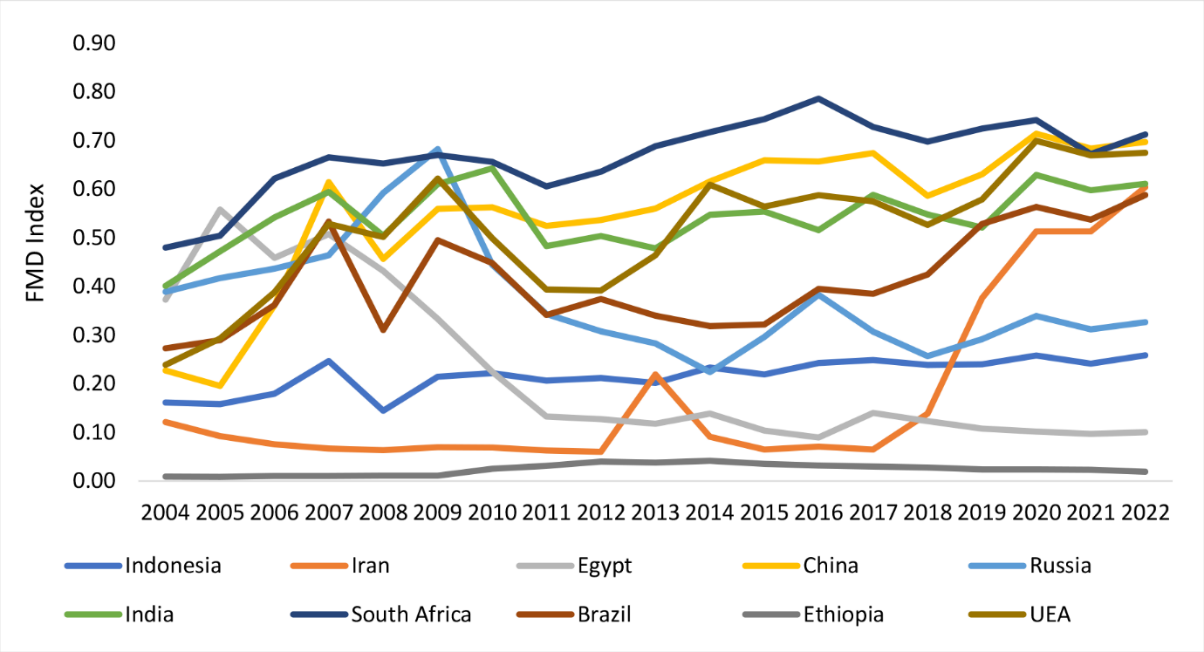

Fig. 6. Financial Depth Market Index in BRICS

Source: International Monetary Fund (2026).

In Russia, factors such as political tensions, international sanctions, and economic instability have led to a slowdown in the growth of financial markets, resulting in a decline in market depth. Egypt faces challenges in the financial sector due to limited market structure and domestic economic uncertainty, which reduces the market's ability to develop optimally, and the country faced several obstacles that led to a decline in the capital market, especially in 2011. Meanwhile, Iran showed an increase in the FMD index after 2018, mainly due to government policies and the impact of social sanctions. When the United States withdrew from the Iran Nuclear Deal (JCPOA) in 2018 and reimposed tougher economic sanctions, Iran lost access to the global financial system, one of which was transactions through SWIFT, which caused governments and investors to become increasingly dependent on domestic financial markets, thereby increasing activity on stock and bond exchanges.

4.6. Internet development in BRICS

Based on Figure 7, BRICS member countries showed an increase in Internet users. The UAE and Russia recorded the highest figures, while Ethiopia the lowest. The number of people using the Internet (% of the population) in the UAE was expected to reach 100% in 2022. The increasing level of mobile phone use in the region strongly reflects the growth of wider development, especially the sophistication of information and telecommunications networks (Vally & El Hichami, 2019). On the other hand, various indicators of the development of the digital economy, as noted by the International Telecommunication Union and other international institutions, show that Russia continues to invest in the development of the digital sector, which contributes to the high number of Internet users. As a developing country, Ethiopia faces a major challenge in building adequate internet networks, especially in rural areas and underserved areas.

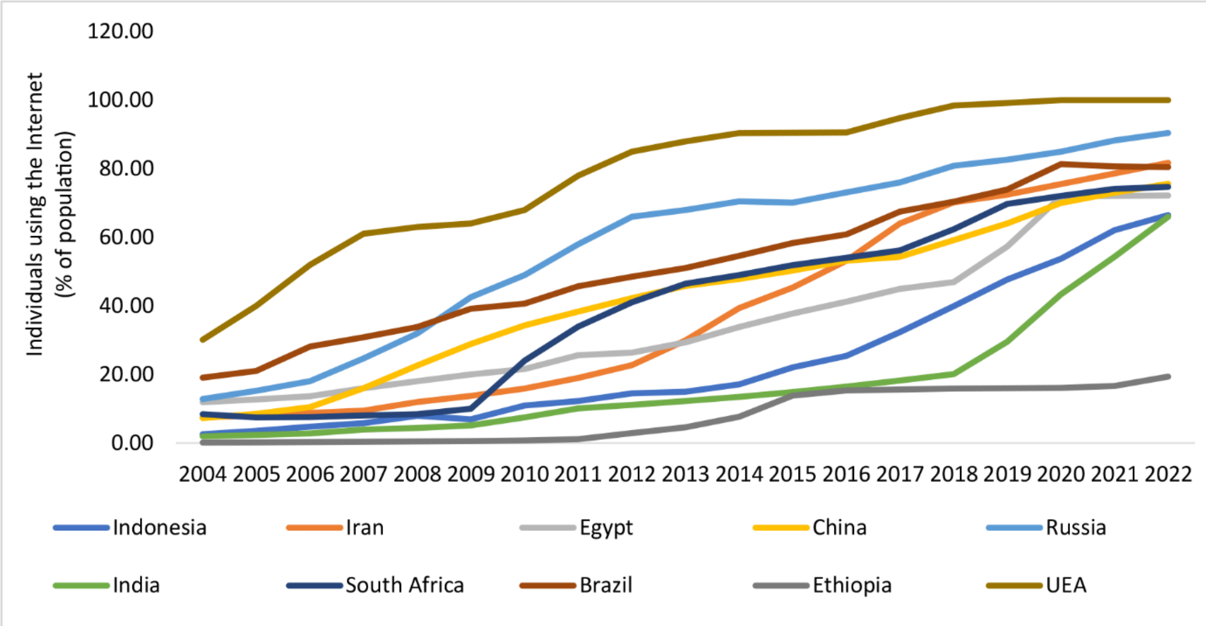

Fig. 7. Individuals who use the Internet in BRICS

Source: World Bank (2024).

Brazil, Iran, China, India, and Indonesia experienced significant increases in Internet usage, with Iran recording the highest growth rate compared to other countries. The increase in Internet access in these countries was influenced by a variety of factors, including advances in telecommunications infrastructure and digital policies that increasingly focus on digital inclusion. In Brazil, Internet adoption was driven by the expansion of broadband networks to cover remote areas as well as a push by the private sector to introduce information technology services. Iran, with its unique political and economic background, showed the highest growth rate, although challenges such as regulation and access restrictions have shaped its growth dynamics. In China, one of the global leaders in terms of digital infrastructure, Internet adoption continued to increase rapidly as the digital economy and e-commerce sector strengthen (Woetzel et al., 2017). India recorded significant progress thanks to government initiatives in expanding Internet coverage to remote areas and improving technological accessibility.

4.7. Descriptive statistics

Based on the descriptive statistics presented in Table 2, Labour Income had an average of 48.29 with a median value of 51.42, indicating a significant variation in the contribution of labour income to GDP among the countries in the sample. The range of values for Labour Income was between 20.40 and 63.49, with a sizable standard deviation of 10.59, indicating high variability. A slope value of –0.52 indicated a slightly negative skewed distribution, with most of the data being above average. Kurtosis at 2.26 was close to the normal distribution.

The Rule of Law Index showed an average of 0.46 with a wide range from 0.16 to 0.80. This variation reflected the large differences in the quality of legal governance between countries. A standard deviation of 0.21 indicated significant variability in the application of the rule of law, which has the potential to affect institutional stability and labour distribution indirectly.

Table 2. Descriptive statistics

	Labour Income	Law	IPM	Internet	FID	FMDI
Mean	48.29251	0.465947	0.697095	39.38343	0.259026	0.371362
Median	51.42100	0.405000	0.714500	34.13500	0.186128	0.384194
Maximum	63.49100	0.800000	0.937000	100.0000	0.647287	0.786161
Minimum	20.40200	0.160000	0.323000	0.155335	0.046094	0.008646
Std. Dev.	10.59345	0.205858	0.119693	28.81069	0.176147	0.225325
Slope	–0.521241	0.215538	–0.903787	0.368969	0.670374	–0.085998
Kurtosis	2.259356	1.504210	3.930048	1.877640	2.133456	1.716329
Jarque-Bera	12.94631	19.18378	32.71414	14.28360	20.17568	13.27938

Source: authors' calculations (2025).

HDI with an average of 0.70 and a median of 0.71 showed a fairly good rate of human development in most of the sample countries, although the range from 0.32 to 0.94 reflected significant inequality.

The Financial Institution Depth Index (FID) and Financial Market Depth Index (FMDI) had an average of 0.26 and 0.37, respectively. The range of values for FID varied from 0.05 to 0.64, while for FMDI from 0.008 to 0.78. The large variation in these two indices reflects the differences in the depth of financial institutions and financial markets in the BRICS countries. Better financial depth can encourage wider access to capital and improve labour opportunities to contribute to economic growth.

4.8. Research results

Based on several stages of testing, the Chow and Hausman tests showed that the fixed-effect model was the best method. Based on Table 3, a significant coefficient with a probability of 0.0000, indicated the presence of an important baseline value in the model.

Table 3. Test Results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	27.40920	1.063551	25.77139	0.0000
LAW	24.81026	1.795253	13.81993	0.0000
IPM	6.135311	1.840545	3.333420	0.0010
FID	9.339043	1.814927	5.145684	0.0000
FMDI	1.125421	0.628546	1.790516	0.0751
INTERNET	0.056093	0.005622	9.976970	0.0000
R-squared	0.994563	Number of residue boxes		185.9790
Regresi S.E.	1.030891	Normality Test		0.225854
F-Statistics	2286.645			
Prob(F-statistic)	0.000000			
Cross-sectional Effect				
Indonesia_	13.30173			
Iran_	–4.919793			
Egypt_	–3.192884			
China	6.327080			
Russia_	8.161634			
India_	7.864696			
South Africa_	–1.529739			
Brazil_	0.441190			
Ethiopia_	0.379655			
UAE_	–26.83357			
Best Model Testing	Prob	Selected Results		
Chow Tests	0.0000	Fixed Effects		
Hausman Test	0.0000	Fixed Effects		
Lagrange Multiplier Test	0.0000	Random Effects		

Source: authors' calculations (2025).

4.8.1. Coefficient

The results of the estimate showed that the rule of law had a significant effect on labour income. The coefficient of 24.8102 indicated that every 1unit increase in the Rule of Law Index was associated with an increase in labour income of 24.81 percentage points to GDP, with a very strong degree of significance. This confirms that a strong and stable legal system supports economic growth and workforce welfare.

In addition, HDI also had a significant positive impact. The coefficient of 6.1353 meant that a 1-unit increase in HDI resulted in a 6.14-point increase in labour income, with a very significant probability. Human development, through improved education and health, contributed to the productivity and quality of the workforce, leading to their improved well-being.

From a financial perspective, the depth of financial institutions played a big role in increasing labour income. The coefficient of 9.339 shows that a 1-unit increase in FID corresponded to a 9.34 point increase in labour income, highlighting the importance of better access to capital and financing for workers and the economic sector. The depth of financial markets was also influential, albeit with significance at the level of 10%, suggesting that more developed financial markets help create more job opportunities.

Lastly, Internet penetration also played an important role. The coefficient of 0.0561 indicated that a 1%-increase in Internet penetration resulted in a 0.056-point increase in labour income. Wider Internet access increased opportunities for workers to access information, education, and employment opportunities in the digital economy, contributing to their improved well-being.

4.9. The effect of the Human Development Index on labour income

The results of the study showed that HDI is positively and significantly correlated with Worker Income in the BRICS countries. HDI as an indicator of quality of life reflects increased access to education, health services and a decent standard of living, hence it is directly able to increase the ability of the workforce to contribute productively to the economy. These results are also in line with the literature that emphasises the importance of investing in social aspects such as education and health (Goijaerts et al., 2023). The increase in HDI also affects the formal sector which tends to offer higher and more stable wages, which ultimately increases the contribution of labour income to GDP.

Countries such as the UAE and India, have recorded significant increases in HDI in recent decades (Figure 3). Based on the index score, Russia and the UAE are in the high category, Iran, Brazil, Egypt, South Africa, Indonesia, India are in the medium category, while Ethiopia is in the low category. Ethiopia's HDI score has always been lower than the world average and the Sub-Saharan African average (Gebrselassie et al., 2024). Despite improvements in recent decades, life expectancy in Ethiopia is still lower than in other countries with higher HDI. Ethnic tensions and internal conflicts in some parts of Ethiopia are hampering social and economic development. However, even though HDI is still in the low category, according to the World Bank, (2024), Ethiopia's strong growth record is reflected in an average real growth of nearly 10 percent per year.

Human development has a close relationship in increasing workers' wages (Faggian et al., 2019). China has shown that improving the quality of education as well as public health can drive the growth of a skilled workforce that ultimately increases incomes. In contrast, the countries of India and South Africa with low HDI in certain regions leave most of the workforce lacking the skills needed in the modern job market, leaving them trapped only in informal jobs with relatively low wages (Ogujiuba et al., 2024). Archipelago Indonesia faces challenges, especially in the eastern part, where limited access to education and health services has a direct impact on the low productivity and income of its workers (Agustina et al., 2019).

4.10. The effect of the Rule of Law Index on labour income

The results of the study showed that the Rule of Law Index has a positive and significant impact on the income of workers in BRICS, demonstrating that the effectiveness of law enforcement and justice play an important role in creating an environment that supports inclusive economic development. Countries with high RLI tend to have better protection of labour rights, transparent regulations, and reliable legal mechanisms for resolving disputes. These results are consistent with the literature stating that legal stability increases investor confidence and encourages the creation of high-quality jobs (Zhang & Wang, 2022).

Countries that fail to enforce fair labour regulations are more likely to experience exploitative practices, wages below the minimum wage, and discrimination based on sex or race (Arslan, 2020). In South Africa, racial inequality is still a problem in the labour income structure, while India and Russia, which are quite weak in labour law reviews, this results in many informal sector workers not receiving decent wages (Gorman, 2010). In Indonesia, labour reform through the Cipta Karya Law has drawn criticism because it is considered to allow for a decrease in protection for workers' income. Moreover, in Indonesia, weak enforcement of labour laws has led to workers being paid below the minimum wage, even though provincial and sectoral minimum wages have been established (Nugroho et al., 2024).

Countries with relatively high RLI scores, such as South Africa and the UAE, tend to have more stable and fair legal systems. This is reflected in clearer regulations regarding labour protection, better wages, and more efficient social welfare programmes. South Africa has undergone significant institutional reforms since the change of its political regime in 1994. This was largely influenced by the dramatic political transition after the end of the apartheid era, accompanied by the establishment of a more inclusive legal system. The UAE has an economy that relies heavily on non-oil sectors, including the property, financial services, and trade sectors, in which workers benefit from rules that support market integrity, protection of their wages, and greater career development opportunities (Antwi-Boateng & Jaberi, 2022) .

Indonesia and India, despite having better RLI scores than other countries with low scores, still face challenges in effective law enforcement, which can affect the improvement of the overall quality of life and welfare of the workforce. According to the latest data, Indonesia still faces several challenges in terms of law enforcement, government transparency, and protection of individual rights, which affect Indonesia's position in this index. In 2020, India launched the New Employment Code, which brings together four major employment laws into a single more efficient and easy-to-understand unit. Ethiopia and Egypt are still positioned low compared to Indonesia and India. The lowest point in Ethiopia, according to the World Justice Project, (2022), in particular related to Law and Security factors which measure the government's ability to maintain public order and security, essential to protect citizens' rights and create stability.

4.11. The influence of financial institution depth on labour income

The findings show that the depth index of financial institutions is positively and significantly correlated with the income of workers in BRICS. Deeper financial institutions, as reflected in greater access to financial products and services, have a significant impact on an individual's ability to manage financial risk, access credit, and participate in investment and savings markets. In the BRICS countries, with ever-expanding financial systems, the existence of strong financial institutions contributes to increased economic liquidity and labour stability, leading to increased labour income.

In developing countries, e.g. India, China, and Brazil, this provides greater opportunities for workers to increase their incomes and reduce their vulnerability to economic turmoil. For example, widely available credit facilities can encourage workers' courage to innovate and invest in businesses or side hustles that improve their well-being. South Africa, China, and Brazil are experiencing increased depth of financial institutions thanks to financial inclusion policies that expand access to finance in rural areas and support the digitalisation of financial services. In South Africa, policies encourage micro and commercial banks to serve the wider community, while in China, economic reforms and support for fintech are strengthening the financial sector (Rizky et al., 2025). Brazil has introduced policies to improve access to finance for underserved groups and support capital market development. These three countries also focus on market transparency, product innovation, and opening up the financial sector to accelerate growth and access to financial services.

Indonesia, Egypt, and Ethiopia are the lowest in the depth of financial institutions. In Indonesia, despite developments in the financial sector, access to financial services is still limited in remote areas, and many communities are not yet fully served by the formal banking sector. Egypt has a state-owned banking sector dominated by the state, which leads to limited access as well as a lack of inclusion and financial services for the large informal sector. Ethiopia is low rated due to a lack of competition in the financial sector, where most of the institutions are state-owned. State-owned banks dominate the banking system, hindering innovation and more diverse services. Limited financial infrastructure, with very few bank branches outside the capital, as well as the dominance of the agricultural sector that mostly works in the informal sector, worsens access to financial services (Regasa et al., 2021).

Countries with inclusive financial systems tend to be able to support the growth of the informal sector and MSMEs, thus being able to expand productive employment opportunities (Lakuma et al., 2019). However, in its implementation, not all community groups get the same benefits. In Brazil and Indonesia, limited access to financial services in rural areas is a serious obstacle to the development of small businesses that have great potential to absorb labour and increase income (Rojas-Suarez, 2016). This shows that uneven financial inclusion policies can deepen disparities, even marginalising already vulnerable groups. China has successfully expanded its reach of financial services digitally, which has contributed to the increase in the income of microworkers through access to capital and markets (Zhang & Chen, 2019).

4.12. The effect of the Financial Market Depth Index on labour income

The results show that the higher the financial market depth index, the higher the income of workers in the BRICS countries. The increase in the FMD Index reflects the increasingly efficient and developing financial market in providing access to capital and investment for business actors. With deeper and more efficient financial markets, companies, including MSMEs and large corporations, can obtain funding through instruments such as stocks, bonds, and loans at lower costs. Wider access to capital allows businesses to increase their business capacity through production expansion, adoption of new technologies, and increased productivity. In the long run, this increase in business capacity contributes to the creation of more jobs, as companies need additional labour to support their growth. As the demand for labour increases, competition in the labour market increases, leading to higher wages for workers (Autor et al., 2023).

The BRICS countries have enjoyed capital inflows in their financial markets by international investors seeking optimal portfolio allocation and international diversification (Bhuyan et al., 2016). China and India have shown how the transformation of financial structures through capital market modernisation, financial digitalisation, and tightening regulations, has driven growth in various productive sectors. Increased access to credit and investment has created conditions conducive to employers increasing production capacity, creating new jobs, and increasing workers' wages.

4.13. The influence of the Internet on labour income

This study showed that Internet use has a positive and significant effect on increasing labour income in the BRICS countries. This is in line with Song & Gao, (2020),who found that with the spread of high--speed Internet over the past few decades, more and more people are working from home.

In China, despite the macro increase in national wages, this phenomenon is mainly driven by the growth of the information technology sector creating an elite class of workers with high incomes (Chen et al., 2019), however this group is only a small fraction of the total workforce. Many workers in traditional sectors continue to receive low wages, reflecting the unequal distribution of benefits from technological advancements. A similar condition is beginning to be seen in Indonesia, where digitalisation is growing rapidly, but it is not yet fully able to create quality and inclusive jobs (Allen et al., 2018). This shows that without a strategy that targets the upskilling of students broadly, digital transformation risks widening social and economic disparities.

In Egypt and Ethiopia, although the development of the Internet is not as fast as in the other BRICS countries, governments have already begun to take steps to harness the digital potential. In Egypt, although the political revolution that occurred in 2011 hampered economic growth, since 2018 the country has begun to show improvements in digital infrastructure, which opens up more job opportunities, especially in the technology and communications sectors. In Ethiopia, despite limited Internet access, government policies to increase Internet penetration in rural areas are slowly starting to increase income opportunities for workers in the agricultural sector who are turning to e-commerce to sell their products. Ethio-Telecom, a major telecommunications service provider in Ethiopia, faces major challenges, such as an access gap between urban and rural, low levels of digital literacy, and digital poverty that is more prominent than many other countries (Wassie et al., 2023).

The Internet infrastructure in Indonesia presents a striking imbalance between the western and eastern regions of the country. Most users are located on islands in the west, such as Java and Bali, with a more sophisticated infrastructure and wider access to Internet connection services (Kharisma, 2022). The internet plays there an important role in strengthening social capital, especially among male heads of households. India has realised the importance of investing in ICT infrastructure as a foundation for social and economic development, alongside basic needs including literacy, clean water, and sanitation.

5. Conclusion

This article shows that the Human Development, the Rule of Law Index, and the Financial Institution Depth Index are positively and significantly related to labour income in the BRICS countries. Increases in HDI, which reflect advances in education, health, and well-being, directly contribute to labour productivity and income. These results are in line with previous studies that affirm the importance of social investment in supporting inclusive economic growth. In addition, the Rule of Law Index demonstrates that legal stability and labour rights enforcement create an environment that supports quality work and community welfare, whilst deeper financial institutions facilitate access to credit, investment, and financial protection, which improves the well-being of workers, especially in the formal sector. South Africa, China, and Brazil have recorded success in leveraging financial inclusion policies and legal reforms, while challenges remain present in Ethiopia, Egypt, and Indonesia. From the financial market viewpoint, wider access to capital allows businesses to increase their business capacity through production expansion, adoption of new technologies, and increased productivity.

Based on these findings, several policy recommendations can be provided for the BRICS countries, directly related to the results of the carried-out analysis. HDI was proved to have a positive effect on labour income, therefore the governments need to continue to expand access to quality education, improve health services, and strengthen social security to reduce social inequality. Increased HDI, as reflected in Brazil and China, can boost workforce productivity through vocational training and sustainable universal health programs.

Moreover, strengthening the Rule of Law Index through consistent law enforcement and increased transparency in the judicial system is indispensable to create an environment conducive to increasing labour income. Some countries, e.g. South Africa, have successfully implemented more inclusive employment policies can be an example for others. It is also important to involve civil society and strengthen anti-corruption institutions to create a more credible and reliable legal system for workers.

In terms of the depth of financial institutions, the results reveal that countries with deeper access to finance have higher labour incomes, hence financial inclusion efforts should be expanded, focusing on creating access to financial services in rural areas and for marginalised groups. Reforms including Digital India, which expand banking access through digital platforms, provide a relevant example for countries such as Ethiopia and Egypt, which can learn from the financial inclusion policies that have been successfully implemented in other BRICS countries, e.g. China, Brazil, and South Africa.

To address inequality in access to technology and finance, inclusive and affirmative policies must be implemented. The BRICS authorities should develop digital literacy and financial programmes, especially for vulnerable groups including women, rural communities, and MSME actors, to improve their ability to use digital and financial services independently. Technology subsidies relevant to local needs, such as digital tools for agriculture or online marketing platforms, can be provided along with entrepreneurship training.

Strengthening digital infrastructure and formal financial services in disadvantaged, frontier, and outermost areas must be a priority. Without Internet access and digital payment systems, these area will continue to lag behind in terms of economic and social development. Governments can work with the private sector through the public-private partnership scheme to accelerate equal development of digital infrastructure. In addition, upskilling and reskilling programmes for skills needed by the industry of the future, e.g. basic digital skills and green technology, should be intensified to ensure workers who were previously in the informal sector or had low education can transition to more productive and high-paying jobs.

Finally, affirmative policies that support vulnerable groups, including people with disabilities, women as heads of households, or indigenous populations, must be strengthened. These policies can include training access quotas, unsecured microloans, and community-based social protection. With a more inclusive and equitable approach, the benefits of digital and financial transformation can be felt by all levels of society, not just those who already have more benefits.

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