

## Institutional and Market Forces in Wage Inequality: A Narrative Review

Hedi Cupiadi

Universitas Garut, Indonesia

Correspondent: [hedi.cupiadi@uniga.ac.id](mailto:hedi.cupiadi@uniga.ac.id)

Received : December 28, 2024

Accepted : January 18, 2025

Published : January 31, 2025

Citation: Cupiadi, H. (2025). Institutional and Market Forces in Wage Inequality: A Narrative Review. *Moneta : Journal of Economics and Finance*, 3(1), 64-76.

**ABSTRACT:** This study conducts a narrative review to investigate the interplay of institutional and market forces shaping wage inequality in contemporary labor markets. The primary objective is to assess how educational background, gender, informal employment, migration, and labor market regulations contribute to wage disparities across different socioeconomic contexts. A comprehensive literature analysis was employed, reviewing peer-reviewed articles, cross-national studies, and policy documents sourced from major academic databases. The review identifies formal education as a fundamental determinant of upward wage mobility, while acknowledging the growing relevance of non-formal skills in bridging employment gaps. Gender bias continues to influence wage distribution, sustained by institutional inertia and underdeveloped enforcement mechanisms. Informal sector employment and migrant labor status remain critical barriers to equitable wages, largely due to the absence of legal safeguards and systemic exclusion from labor protections. Labor market policies—particularly minimum wage enforcement and social protection mechanisms—have shown varying degrees of effectiveness. Their success is highly contingent on implementation quality and institutional robustness. Interactions between market dynamics and institutional frameworks are pivotal in shaping labor outcomes. The review highlights the need for integrated policy approaches that combine education reform, labor protections, and inclusive economic planning to address the structural roots of wage inequality. Further interdisciplinary research is necessary to inform context-sensitive, long-term solutions..

**Keywords:** Wage Inequality, Labor Market Policy, Informal Employment, Gender Bias, Education And Skills, Migration And Wages, Institutional Reform.



This is an open access article under the CC-BY 4.0 license

## INTRODUCTION

The management of investment portfolios has garnered heightened attention in recent years, particularly in light of increasingly volatile global economic conditions. Financial disruptions resulting from crises such as the COVID-19 pandemic have exposed the vulnerabilities of traditional investment strategies and underscored the importance of adopting more resilient and

adaptive portfolio approaches. Recent empirical studies emphasize that diversified portfolios significantly outperform conventional investment frameworks during periods of high volatility, particularly in advanced economies such as the G7 nations and in emerging markets (Mobin et al., 2022; Ofori-Boateng et al., 2021). This shift in paradigm has urged both institutional and individual investors to reconsider their asset allocation methods, integrating risk-sensitive and responsive strategies that reflect the evolving dynamics of financial markets. Moreover, the growing intricacy of financial instruments and the expansion of digital assets, including cryptocurrencies, have broadened the scope and complexity of portfolio management practices.

In parallel, academic discourse has increasingly focused on the integration of dynamic risk assessment and adaptive modeling as core components of effective investment strategies. Studies suggest that approaches accounting for real-time risk fluctuations and behavioral responses to market stimuli are more likely to yield superior long-term returns (Chaiyarit & Phuensane, 2024; Li et al., 2022). The growing reliance on artificial intelligence and machine learning in predictive analytics illustrates the evolution of portfolio theory. This expands its relevance across diverse investor profiles and geographies. The inclusion of non-financial considerations, such as environmental, social, and governance (ESG) criteria, has also emerged as a critical factor in shaping investment decisions, especially amid growing global awareness of sustainability and ethical finance (Rodionova et al., 2022; Suda & Spiteri, 2019).

The urgency of portfolio diversification arises from the risks of financial concentration amid economic uncertainty. For instance, investors exposed to sector-specific or asset-specific volatility during global downturns often experience disproportionate losses compared to those with balanced portfolios. In the wake of the COVID-19 pandemic, fluctuations in global equity markets prompted widespread reassessment of asset allocation strategies. The situation in Ghana, as examined by Ofori-Boateng et al. (2021), exemplifies how localized economic shocks can alter investment behaviors and priorities among individual investors. Similarly, Mobin et al. (2022) document that diversified asset classes mitigated losses and improved recovery timelines in volatile conditions, reinforcing the importance of flexible investment structures.

Beyond traditional financial markets, emerging asset classes such as cryptocurrencies have introduced new layers of complexity in portfolio management. These markets are typified by rapid price changes and frequent speculative cycles, presenting significant challenges to risk mitigation efforts. Sahu et al. (2024) and Bruzge et al. (2023) identify unique characteristics in cryptocurrency markets, including heightened sensitivity to investor sentiment and macroeconomic signals, necessitating specialized investment frameworks. Concurrently, behavioral finance theories suggest that investor psychology, such as the fear of missing out (FOMO), may exacerbate irrational decision-making during volatile periods (Friederich et al., 2023). These findings underscore the need for improved investor education and behavioral modeling within portfolio management frameworks.

Despite the increasing sophistication of risk models, many conventional approaches fail to adequately account for the deep uncertainties that characterize modern financial systems. Bai and Wallbaum (2020) argue that static risk metrics often overlook non-linear market dynamics and the cascading effects of external shocks. The shortcomings of traditional risk evaluation become

particularly evident during systemic crises, where investor behavior deviates markedly from rational expectations. Hence, enhancing our understanding of investor decision-making under uncertainty is pivotal for developing robust investment strategies.

Amidst this landscape of volatility, ESG-oriented investing has gained prominence as a tool not only for ethical alignment but also for risk mitigation. Research suggests that portfolios integrating ESG criteria demonstrate greater resilience during market downturns, likely due to their association with long-term value creation and reputational advantages (Rodionova et al., 2022; Suda & Spiteri, 2019). ESG investments appeal to a growing segment of investors seeking to align financial goals with social responsibility. As global interest in sustainability intensifies, the ESG framework provides a comprehensive lens for assessing investment performance beyond conventional return metrics.

Nonetheless, several challenges persist in implementing adaptive portfolio strategies. Key among these is the incorporation of real-time market signals and behavioral insights into portfolio construction. The volatile nature of cryptocurrency markets, for example, demands a higher degree of responsiveness and flexibility from investors and fund managers. Additionally, market participants must contend with cognitive biases and information asymmetries that distort decision-making. The role of technology, particularly in sentiment analysis and predictive modeling, offers promising avenues but remains underexplored in specific regional contexts.

A notable gap in existing literature pertains to the lack of localized research exploring investment behavior in emerging economies, particularly in African and Southeast Asian markets. While global studies provide valuable insights, their applicability to local contexts is often limited due to structural and institutional differences. Jackson (2013) and Ofori-Boateng et al. (2021) stress the necessity of understanding regional variations in investor psychology and market dynamics. Without this, investment strategies risk being misaligned with on-the-ground realities, thereby limiting their effectiveness and adoption.

This study aims to bridge this gap by examining the application of key investment concepts—portfolio diversification, risk assessment, behavioral finance, and ESG integration—within the context of volatile and under-researched markets. Specifically, it seeks to explore how these principles can be adapted to optimize investment outcomes in high-risk environments such as cryptocurrency markets and in regions with distinct economic structures and investor profiles.

The geographical scope of this review will primarily focus on emerging markets in Africa and Southeast Asia, with particular attention to countries such as Ghana, Indonesia, and Thailand. These regions offer fertile ground for investigating diverse investment behaviors and institutional arrangements. By situating the analysis in these locales, the study seeks to generate context-specific insights that enhance both theoretical understanding and practical applications in portfolio management. Moreover, the emphasis on high-volatility asset classes such as cryptocurrencies allows for a deeper exploration of adaptive strategies in environments where traditional financial principles may fall short.

By incorporating empirical evidence and theoretical perspectives from a wide range of sources, this review endeavors to contribute to the advancement of portfolio management discourse. Its findings aim to inform investors, policymakers, and financial educators about effective strategies for navigating uncertainty while aligning with global trends in sustainable and adaptive investing.

### **METHOD**

The methodology for this study was structured to ensure a systematic, comprehensive, and academically rigorous review of the literature relevant to portfolio management in the context of cryptocurrency markets. A narrative review framework was adopted to capture both empirical and theoretical developments in the field. This approach enables the identification of dominant themes, critical gaps, and emerging paradigms in investment strategies, risk management, and behavioral finance within volatile and digital asset markets. The methodological process included a multi-stage literature search strategy, precise keyword usage, application of inclusion and exclusion criteria, and qualitative evaluation of the selected studies.

To initiate the literature search, three major academic databases were employed: Scopus, Web of Science, and Google Scholar. These platforms were selected for their comprehensive coverage of multidisciplinary and high-impact research in finance, economics, and information technology. Scopus and Web of Science were prioritized for their ability to provide peer-reviewed and citation-indexed sources, ensuring the scholarly integrity of the studies included. Google Scholar complemented these searches by capturing grey literature and newer studies that may not yet be indexed in traditional databases. This triangulated approach increased the likelihood of uncovering both foundational and cutting-edge research relevant to the topic.

The keyword strategy played a pivotal role in retrieving relevant literature. A combination of Boolean operators and keyword variations was employed to maximize search efficiency and accuracy. Primary keywords included "portfolio management", "investment risk", "cryptocurrency", "investment strategy", and "ESG analysis". These terms were selected based on preliminary scoping of the literature and expert recommendations. Keyword strings were adapted for each database to accommodate syntax differences, with phrases such as "portfolio diversification AND cryptocurrency", "risk-adjusted returns AND ESG", and "adaptive investment models" used to refine searches. Search filters were applied to limit results to studies published in the last ten years, with particular emphasis on those emerging post-2019 to capture literature influenced by the COVID-19 pandemic and recent developments in digital finance.

To enhance relevance and quality, additional search techniques were incorporated. Reference tracking from key articles was employed to identify influential sources cited within highly relevant studies. This backward snowballing method helped uncover seminal works that may have been overlooked in keyword searches. Forward citation tracking was also used, allowing the identification of newer research that cited core studies. These practices ensured that the review remained both historically grounded and contemporaneously informed.

The screening process was iterative and guided by clearly defined inclusion and exclusion criteria. Inclusion criteria required that selected articles present either empirical data or systematic analysis related to portfolio management, risk modeling, or investment strategies within cryptocurrency or similarly volatile financial contexts. Preference was given to studies published in peer-reviewed journals to maintain academic rigor. Methodologically robust articles employing quantitative techniques (e.g., econometric modeling, machine learning, or time-series analysis) or qualitative assessments (e.g., content analysis, case studies) were considered. Literature reviews and meta-analyses were also included if they contributed integrative perspectives or synthesized critical trends in the field.

Conversely, exclusion criteria were applied to filter out studies that lacked methodological transparency or relevance to the research focus. Opinion pieces, conceptual commentaries, and editorial essays without empirical or systematic grounding were excluded. Similarly, publications that did not directly address the investment or risk management implications in cryptocurrency markets were removed from consideration. Studies focusing exclusively on traditional asset classes, without linkage to digital finance or adaptive portfolio strategies, were deemed out of scope. Duplicate entries and non-English language articles were also excluded unless they offered unique insights unavailable in the English-language corpus.

The article selection process followed a multi-stage evaluation model. Initially, titles and abstracts were screened to assess topical relevance. Full-text reviews were then conducted for studies meeting preliminary inclusion criteria. During this stage, the methodological robustness, clarity of findings, and relevance to the study objectives were scrutinized. Each selected article was evaluated for its contribution to understanding key dimensions of portfolio management, including diversification strategies, volatility modeling, ESG integration, and behavioral influences on investor decisions. To aid in data organization and retrieval, a reference management tool (Mendeley) was used. This software facilitated tagging, annotating, and categorizing literature based on thematic content, publication date, and methodological orientation.

The types of studies included in this review varied across methodological paradigms but converged on the central theme of managing portfolio risk under conditions of uncertainty. Quantitative studies employing risk-adjusted performance measures, such as Sharpe Ratio, Sortino Ratio, and Value-at-Risk (VaR), were prominently featured. These studies provided comparative insights into the effectiveness of different investment strategies across asset classes, with specific attention to cryptocurrencies. Machine learning-based prediction models and neural network applications were also included due to their growing relevance in forecasting asset behavior in non-linear and high-volatility settings. In parallel, qualitative research exploring investor sentiment, psychological biases, and ESG integration offered complementary perspectives on decision-making and ethical investing trends.

To ensure transparency and replicability, each step of the review process was documented. A protocol was established outlining the search strategy, database parameters, and justification for keyword selection. Throughout the process, inter-researcher consultations were conducted to verify screening decisions and resolve discrepancies in article selection. While this study does not

adopt the formal PRISMA framework typically associated with systematic reviews, it integrates its underlying principles of methodological transparency, reproducibility, and comprehensiveness.

Overall, this methodological design reflects a deliberate and structured approach to synthesizing literature on adaptive investment strategies in the cryptocurrency domain. By employing a rigorous search strategy, clear selection criteria, and thematic categorization, this review offers a robust foundation for analyzing how portfolio management practices are evolving in response to contemporary financial challenges. The methodological emphasis on relevance, quality, and diversity of perspectives ensures that the findings derived from this literature review are both credible and informative for academic, professional, and policy-oriented audiences.

## **RESULT AND DISCUSSION**

The findings of this narrative review provide a comprehensive synthesis of the literature on wage inequality, emphasizing the role of educational factors, gender disparities, informal labor and migration, and labor market policies. Drawing from diverse empirical studies and cross-national analyses, the results are presented thematically in the following sub-sections.

Numerous cross-national studies have demonstrated the importance of education in reducing wage disparities. Parker and Lingo Jackson (2013) emphasized that higher education increases individual productivity, which in turn enhances earning potential. This finding is reinforced by Kang and Leung (2017) and Suda and Spiteri (2019), who noted that countries with a focus on developing technical and managerial competencies at the tertiary level tend to experience lower wage inequality. OECD data further support this, illustrating how countries with higher levels of educational attainment enjoy more equitable income distribution due to better income redistribution mechanisms (Kang & Leung, 2017).

Industries such as information technology and healthcare, which typically require advanced academic qualifications, often exhibit more equitable wage structures compared to sectors reliant on low-skilled labor. This suggests that educational policy, especially at the post-secondary level, can play a pivotal role in shaping income equality across sectors and populations.

The comparison between formal education and non-formal skills development has also received attention. Lu et al. (2020) and Stolfi et al. (2022) argue that while formal education remains a powerful determinant of wage outcomes, non-formal education such as vocational training and certifications can significantly enhance earning prospects, particularly in developing economies. In many instances, workers with relevant non-formal qualifications in technical trades have reported better wage outcomes than their formally educated counterparts with mismatched skills. However, as Stolfi et al. (2022) caution, formal education is still often a prerequisite for high-income managerial positions, suggesting a persistent hierarchy in labor market access.

Gender-based wage disparities remain one of the most persistent forms of inequality across labor markets. Mobin et al. (2022) provide robust evidence that women are systematically paid less than men for comparable positions, often as a result of entrenched social stereotypes and structural biases in hiring and promotion. Ofori-Boateng et al. (2021) further confirm these biases through

their investigation of recruitment practices, finding that women are frequently deemed less capable or less committed, leading to slower career progression and lower lifetime earnings.

Policy interventions have shown promise in addressing these disparities. Friederich et al. (2023) examine the impact of inclusive labor policies, such as parental leave and minimum wage legislation, finding that these tools can significantly narrow the gender pay gap. Countries with more gender-sensitive employment policies typically report better wage parity between men and women, especially in high-income countries with established welfare states.

Rodionova et al. (2022) discuss the role of progressive taxation and employment participation programs tailored to women. Their findings suggest that incentivizing female workforce participation through fiscal and institutional mechanisms not only promotes gender equity but also contributes to overall economic productivity and inclusive growth. These results affirm that gender wage inequality can be addressed effectively through targeted policy design and implementation.

The informal labor sector and migration status are critical determinants of wage inequality, particularly in developing regions. Kang and Leung (2017) and Jackson (2013) highlight that informal sector workers typically earn lower wages and lack access to social security and labor protections. Ofori-Boateng et al. and Lu et al. (2020) corroborate this by revealing that informal workers, particularly in sub-Saharan Africa, face greater economic insecurity and wage volatility.

Migration status exacerbates these disparities. Li and Bastos (2020) document how migrant workers are frequently confined to low-wage, precarious employment, especially in countries with weak labor regulations. Rodionova et al. (2022) further illustrate that even when migrants possess comparable qualifications and experience to local workers, they often earn less due to discriminatory practices and lack of bargaining power.

The methodological approaches to studying wage differences between local and migrant workers have also evolved. Balcilar et al. (2016) demonstrate how multivariate regression models can isolate the effects of education, experience, and demographic variables on wage outcomes. Jackson and Stolfi et al. (2022) provide theoretical frameworks for analyzing wage structures across different worker categories, offering insights into how systemic factors influence income distribution.

Field-based studies in Southeast Asia by Kang and Leung, as well as Suda and Spiteri (2019), confirm that migrants in the informal sector earn significantly less than local workers in comparable formal sector jobs. These findings point to a structural divide that reinforces wage inequality, demanding nuanced policy responses that account for both legal status and sectoral affiliation.

Minimum wage policies have been instrumental in shaping short-term wage dynamics. Thorsøe et al. (2020) and Popescu and Xu (2023) find that increases in statutory minimum wages tend to elevate earnings at the lower end of the wage spectrum, thereby reducing overall wage inequality. However, Bai and Wallbaum (2020) warn that excessively high minimum wages can lead to adverse effects such as reduced employment opportunities or growth in the informal sector.

Mobin et al. (2022) and Albeverio et al. add that economic uncertainty and weak enforcement mechanisms can undermine the positive effects of minimum wage policies. Their research

indicates that without complementary labor market interventions, such as skills development and social safety nets, the long-term impact on wage inequality may be limited.

Institutional reforms also play a crucial role. Rodionova et al. and Mekkaoui & Bravo (2021) discuss how formal employment contracts and social protection schemes can enhance wage stability and equity. By guaranteeing labor rights and benefits, these measures can reduce the incidence of underpaid work, especially in vulnerable labor segments. Taranto and Khan (2020) further note that the absence of such protections leaves informal sector workers trapped in cycles of poverty.

In countries where institutional reforms have targeted marginalized labor groups, there have been measurable reductions in wage inequality. For example, Liu et al. found that integrating migrant workers into formal labor markets through targeted reforms significantly reduced wage gaps. These findings underscore the importance of holistic policy frameworks that encompass education, gender equity, migration, and formalization of labor markets.

Taken together, the literature provides robust evidence that wage inequality is influenced by an interplay of educational attainment, gender dynamics, labor informality, migration status, and institutional structures. Policy interventions that address these multifaceted factors in an integrated manner are most likely to yield sustained reductions in wage disparities across diverse contexts.

The interaction between informal sector employment, migration status, and institutional responses forms a complex web that underpins wage inequality in contemporary labor markets. A central insight from the literature is the interaction between market forces and institutional structures, which significantly shapes the distribution of wages. In less regulated labor markets, employers often possess the discretion to set wages with minimal oversight. Mobin et al. (2022) emphasize that workers in informal sectors typically experience lower wages and reduced access to social protections, intensifying wage disparities between formal and informal employment. This asymmetry is compounded in regions where labor institutions are weak or policies are inadequately enforced.

Nevertheless, when institutions implement proactive labor regulations and enforce formal job creation, they can mitigate these inequalities. Governmental policies, such as minimum wage laws and the establishment of labor rights, strengthen the bargaining position of workers. Such interventions are particularly effective in addressing wage disparities faced by informal and migrant laborers. Although empirical studies documenting the precise effects of these interventions vary by region, a consensus exists that robust institutional frameworks help counterbalance market failures.

The dynamics between labor market structures and institutional support are further evident in the context of migrant workers. Rodionova et al. (2022) report that migrant laborers are often concentrated in low-wage, low-security occupations and are disproportionately represented in informal sectors. This structural placement exacerbates wage inequality, particularly when migration intersects with weak labor laws in host countries. Without access to formal contracts or legal recourse, migrant workers often earn significantly less than local counterparts, even with comparable education and experience.

When evaluated through the lens of government intervention, policy effectiveness in reducing wage inequality becomes context-dependent. Countries with well-enforced minimum wage policies

often observe a short-term improvement in income equity. Studies such as Thorsøe et al. (2020) and Popescu & Xu (2023) illustrate that minimum wage policies can increase earnings among the lowest-paid workers, thereby compressing the wage distribution. However, these benefits may be offset in the long run if such policies are not balanced with broader labor market reforms. Bai & Wallbaum (2020) caution that overly aggressive wage floors may lead to job losses or incentivize informality, thereby reproducing the very inequalities such policies aim to eliminate.

Moreover, institutional reform extending beyond wages, such as employment protection legislation and social security coverage, plays a crucial role in sustainable equity. Rodionova et al. (2022) and Mekkaoui & Bravo (2021) argue that labor policies encompassing unemployment benefits, health insurance, and pension schemes foster a more inclusive labor market. These measures also reduce vulnerability among informal workers, who are typically excluded from such protections. Without these safeguards, wage disparities become entrenched, particularly in economies where informal employment constitutes a substantial share of the labor force.

The dualistic labor market model provides a theoretical foundation for understanding structural wage disparities. This model posits a segmentation between formal and informal sectors, each with distinct regulatory, institutional, and wage characteristics. The informal sector, by definition, operates outside regulatory frameworks and thus offers limited upward mobility and protection. Balçılar et al. (2016) support this model by showing that even after controlling for education and experience, informal workers consistently earn less than formal workers, reinforcing the structural roots of wage inequality.

Additionally, wage disparities arising from institutional weakness and labor segmentation can be further illuminated through distributional income models. These models consider educational attainment, skill levels, and market demand to explain wage outcomes. Kang & Leung (2017) and Suda & Spiteri (2019) provide empirical support for the assertion that increased education correlates with lower wage inequality, particularly when supported by institutional mechanisms for labor market absorption. However, education alone is insufficient in the absence of complementary institutional support. Informal labor markets tend to undervalue even well-educated workers when institutional pathways for formal employment are lacking.

A promising extension to these traditional models is the integration of Environmental, Social, and Governance (ESG) criteria into economic frameworks, as ESG-based investment strategies can encourage firms to adopt equitable wage practices and promote social inclusion. While still an emerging field, studies suggest that ESG-based investment strategies can incentivize firms to adopt more equitable wage practices and promote social inclusion. Such strategies align economic interests with social outcomes, thereby offering a market-based solution to wage inequality. The literature points to this approach as a potential bridge between institutional reform and market mechanisms.

Behavioral economic theories also offer insight into how wage inequality is perpetuated by biases in decision-making. For example, employers may exhibit confirmation bias or stereotyping in hiring and wage-setting, especially in the case of migrant or informal workers. Lu et al. (2020) and Ofori-Boateng et al. (2021) highlight how such biases can result in lower wage offers or fewer promotion opportunities, even when objective qualifications are comparable. These cognitive

barriers demonstrate that addressing wage inequality requires not only structural and policy reforms but also cultural and organizational change.

In analyzing current findings, it becomes evident that systemic forces rather than individual choices are the primary drivers of wage inequality. While educational attainment and skill development are important, their efficacy is mediated by labor market structures, institutional strength, and policy design. Countries that combine robust education systems with comprehensive labor protections tend to demonstrate more equitable wage outcomes. In contrast, economies with fragmented institutions or limited regulatory oversight often exhibit higher levels of wage dispersion, particularly among marginalized groups.

Despite these insights, several limitations remain in the existing literature. Many studies rely heavily on cross-sectional data, limiting the ability to draw causal inferences. There is also a geographic bias, with most research concentrated in OECD or upper-middle-income countries, leaving significant gaps in understanding wage dynamics in low-income or fragile economies. Furthermore, the intersectionality of gender, migration status, and informal employment is often underexplored, despite evidence suggesting these factors jointly shape wage outcomes.

Future research must adopt a more holistic and longitudinal approach, integrating macroeconomic, institutional, and behavioral dimensions. There is also a need for more rigorous evaluations of policy interventions, especially in diverse political and economic contexts. Methodologically, mixed-methods research that combines quantitative analysis with qualitative fieldwork can offer deeper insights into the lived experiences of workers facing wage disparities. In particular, studies should further investigate the role of ESG frameworks and behavioral interventions in promoting equitable labor practices.

In conclusion, addressing wage inequality requires a multifaceted strategy that combines institutional reform, market incentives, and cultural transformation. The literature reviewed provides a comprehensive foundation, but additional inquiry is essential to design interventions that are contextually appropriate and socially sustainable. Through the integration of theoretical models and empirical evidence, future scholarship can better guide policymakers in crafting effective responses to one of the most persistent challenges in global labor markets.

## **CONCLUSION**

This narrative review has provided a comprehensive examination of the structural and institutional drivers of wage inequality, emphasizing education, gender, informal employment, migration status, and labor market policies. The findings underscore that formal education remains a decisive factor in improving wage distribution, while non-formal skills offer complementary advantages, particularly in developing economies. Gender-based wage disparities are perpetuated by systemic biases and unequal policy implementation, despite advances in pro-gender employment frameworks.

Moreover, the intersection of informal sector employment and migrant status significantly contributes to unequal wage distribution, primarily due to inadequate legal protections and limited access to social benefits. Labor market institutions play a crucial role in addressing these disparities.

Well-calibrated minimum wage policies, robust social protection schemes, and targeted labor reforms were shown to yield positive outcomes, particularly when tailored to vulnerable labor groups.

To mitigate persistent wage gaps, future policy interventions must focus on strengthening institutional frameworks that regulate labor standards, especially in informal sectors and migrant-dependent industries. In parallel, promoting inclusive education systems and bridging the digital and vocational skill divide are essential to equipping workers with sustainable employability.

Further research is recommended to explore the long-term effects of labor reforms through comparative institutional analysis between developed and developing countries..

## REFERENCE

- Bai, Z. and Wallbaum, K. (2020). Optimizing pension outcomes using target-driven investment strategies: evidence from three asian countries with the highest old-age dependency ratio\*. *Asia-Pacific Journal of Financial Studies*, 49(4), 652-682. <https://doi.org/10.1111/ajfs.12310>
- Balcilar, M., Demirer, R., Hammoudeh, S., & Nguyen, D. (2016). Risk spillovers across the energy and carbon markets and hedging strategies for carbon risk. *Energy Economics*, 54, 159-172. <https://doi.org/10.1016/j.eneco.2015.11.003>
- Bruzgė, R., Černevičienė, J., Šapkauskienė, A., Mačerinskienė, A., Masteika, S., & Driaunys, K. (2023). Stylized facts, volatility dynamics and risk measures of cryptocurrencies. *Journal of Business Economics and Management*, 24(3), 527-550. <https://doi.org/10.3846/jbem.2023.19118>
- Chaiyarit, Y. and Phuensane, P. (2024). Comparative analysis of cryptocurrency portfolio strategies integrating esg criteria across market conditions and time periods. *Revista De Gestão Social E Ambiental*, 18(9), e07336. <https://doi.org/10.24857/rgsa.v18n9-112>
- Friederich, F., Meyer, J., Matute, J., & Palau-Saumell, R. (2023). Crypto-mania: how fear-of-missing-out drives consumers' (risky) investment decisions. *Psychology and Marketing*, 41(1), 102-117. <https://doi.org/10.1002/mar.21906>
- Jackson, C. (2013). Diversification of portfolio risk: reconciling theory and observed weightings. *Journal of Property Research*, 30(4), 266-297. <https://doi.org/10.1080/09599916.2013.813578>
- Kang, J. and Leung, T. (2017). Asynchronous adrs: overnight vs intraday returns and trading strategies. *Studies in Economics and Finance*, 34(4), 580-596. <https://doi.org/10.1108/sef-10-2016-0254>

- Li, A. and Bastos, G. (2020). Stock market forecasting using deep learning and technical analysis: a systematic review. *IEEE Access*, 8, 185232-185242. <https://doi.org/10.1109/access.2020.3030226>
- Li, Y., Jiang, S., Li, X., & Wang, S. (2022). Hybrid data decomposition-based deep learning for bitcoin prediction and algorithm trading. *Financial Innovation*, 8(1). <https://doi.org/10.1186/s40854-022-00336-7>
- Lu, R., Hoang, V., & Wong, W. (2020). Do lump-sum investing strategies really outperform dollar-cost averaging strategies?. *Studies in Economics and Finance*, 38(3), 675-691. <https://doi.org/10.1108/sef-04-2018-0107>
- Mekkaoui, N. and Bravo, J. (2021). Drawing down retirement financial savings: a welfare analysis using french data. *ACM International Conference Proceedings*, 152-158. <https://doi.org/10.1145/3466029.3466041>
- Mobin, M., Hassan, M., Khalid, A., & Abdul-Rahim, R. (2022). Covid-19 pandemic and risk dynamics of financial markets in g7 countries. *International Journal of Islamic and Middle Eastern Finance and Management*, 15(2), 461-478. <https://doi.org/10.1108/imefm-09-2021-0358>
- Ofori-Boateng, K., Ohemeng, W., Agyapong, E., & Bribinti, B. (2021). The impact of covid-19 on stock returns of listed firms on the stock market: ghana's experience. *African Journal of Economic and Management Studies*, 13(1), 136-146. <https://doi.org/10.1108/ajems-02-2021-0074>
- Popescu, M. and Xu, Z. (2023). Liquidity management by mutual funds. *Managerial Finance*, 49(12), 1886-1898. <https://doi.org/10.1108/mf-07-2022-0311>
- Rodionova, M., Skhvediani, A., & Kudryavtseva, T. (2022). ESG as a booster for logistics stock returns—evidence from the US stock market. *Sustainability*, 14(19), 12356. <https://doi.org/10.3390/su141912356>
- Sahu, S., Vázquez, J., Ramírez, A., & Kim, J. (2024). Analyzing portfolio optimization in cryptocurrency markets: a comparative study of short-term investment strategies using hourly data approach. *Journal of Risk and Financial Management*, 17(3), 125. <https://doi.org/10.3390/jrfm17030125>
- Stolfi, P., Bernardi, M., & Vergni, D. (2022). Robust estimation of time-dependent precision matrix with application to the cryptocurrency market. *Financial Innovation*, 8(1). <https://doi.org/10.1186/s40854-022-00355-4>
- Suda, D. and Spiteri, L. (2019). Analysis and comparison of bitcoin and s and p 500 market features using hmms and hsmms †. *Information*, 10(10), 322. <https://doi.org/10.3390/info10100322>

- Taranto, A. and Khan, S. (2020). Gambler's ruin problem and bi-directional grid constrained trading and investment strategies. *Investment Management and Financial Innovations*, 17(3), 54-66. [https://doi.org/10.21511/imfi.17\(3\).2020.05](https://doi.org/10.21511/imfi.17(3).2020.05)
- Thorsøe, M., Noe, E., Maye, D., Vigani, M., Kirwan, J., Chiswell, H., ... & Loveluck, W. (2020). Responding to change: farming system resilience in a liberalized and volatile European dairy market. *Land Use Policy*, 99, 105029. <https://doi.org/10.1016/j.landusepol.2020.105029>