ORIGINAL PAPER

DOI: 10.26794/2308-944X-2025-13-4-6-30
UDC 331.2,331.28(045)
JEL J31, J38, E24, C23

Determinants of Minimum Wage Dynamics: A Comparative Econometric Analysis of Japan and South Korea

P. Gupta[a], P. Kishore[b]
[a] Deira International School, Dubai, United Arab Emirates;
[b] Middlesex University, Dubai, United Arab Emirates

ABSTRACT

The goal of this study is to identify and compare the determinants of national minimum wage (NMW) dynamics in Japan and South Korea over a two-decade period (2004–2023). Several **methodologies** for constructing a macroeconomic panel dataset, encompassing diverse indicators, are utilized to estimate regression and correlation-based econometric models. The quantitative findings are corroborated by qualitative results from other studies, enhancing the assessment of the minimum wage's elasticity concerning several aspects, including inflation and productivity. The results demonstrate that the primary determinants of adjustments to NMW in both economies are consumer price index (inflation) and gross domestic product per capita, whereas unemployment and income inequality factors are less statistically significant. Moreover, empirical analysis illustrates that the Japanese economy reacts with greater moderation to adjustments in determinants than the South Korean economy, which experiences a stronger inflation pass-through effect. This difference is potentially due to institutional constraints and regional variations that influence the elasticity of NMW adjustments in relation to macroeconomic variables. In conclusion, this study illustrates how the minimum wage policies in Japan and South Korea are strongly influenced not only by inflation and productivity trends but also by differences in institutional structures, which affect the magnitude and speed of adjustment to NMW. **The authors** succeeded in closing a major research gap of effective cross-country analysis and evaluation of the minimum wage dynamics, demonstrating that local economic zones should implement their own wage and cost adjusting system, adopt indexation of inflation, and support small enterprises.

Keywords: minimum wage; wage policy; Japan; South Korea; labor markets; econometric analysis; comparative analysis; macroeconomic variables; inflation; productivity

For citation: **Gupta P., Kishore P. Determinants of minimum wage dynamics: A comparative econometric analysis of Japan and South Korea.** ***Review of Business and Economics Studies.*** **2025;13(4):6-30. DOI: 10.26794/2308-944X-2025-13-4-6-30**

ОРИГИНАЛЬНАЯ СТАТЬЯ

Факторы, определяющие динамику минимальной заработной платы: сравнительный эконометрический анализ Японии и Южной Кореи

П. Гупта[a], П. Кишор[b]
[a] Международная школа Дейра, Дубай, Объединенные Арабские Эмираты;
[b] Мидлсекский университет, Дубай, Объединенные Арабские Эмираты

АННОТАЦИЯ

Цель данного исследования — выявление и сравнение факторов, определяющих динамику национальной минимальной заработной платы (НМЗ) в Японии и Южной Корее за два десятилетия (2004–

2023 гг.). **Методология:** для оценки эконометрических моделей, основанных на регрессии и корреляции, используется несколько методик построения макроэкономической панели данных, включающей различные показатели. Количественные результаты подтверждаются качественными данными других исследований, что улучшает оценку эластичности минимальной заработной платы по нескольким аспектам, включая инфляцию и производительность труда. **Результаты** показывают, что основными факторами, определяющими корректировки НМЗ в обеих странах, являются индекс потребительских цен (инфляция) и валовой внутренний продукт на душу населения, в то время как факторы безработицы и неравенства доходов имеют меньшую статистическую значимость. Кроме того, эмпирический анализ показывает, что японская экономика реагирует на корректировки факторов с большей умеренностью, чем южнокорейская экономика, которая испытывает более сильный эффект переноса инфляции. Это различие потенциально обусловлено институциональными ограничениями и региональными различиями, влияющими на эластичность корректировки минимальной заработной платы по отношению к макроэкономическим переменным. Данное исследование показывает, что политика минимальной заработной платы в Японии и Южной Корее сильно зависит не только от тенденций инфляции и производительности, но и от различий в институциональных структурах, которые влияют на масштабы и скорость корректировки минимальной заработной платы. Авторам удалось восполнить существенный пробел в исследованиях межстранового анализа и оценки динамики минимальной заработной платы, продемонстрировав, что местные экономические зоны должны внедрять собственные системы корректировки заработной платы и издержек, применять индексацию инфляции и поддерживать малые предприятия.

Ключевые слова: минимальная заработная плата; политика заработной платы; Япония; Южная Корея; рынки труда; эконометрический анализ; сравнительный анализ; макроэкономические переменные; инфляция; производительность

Для цитирования: **Gupta P., Kishore P. Determinants of minimum wage dynamics: A comparative econometric analysis of Japan and South Korea. *Review of Business and Economics Studies*. 2025;13(4):6-30. DOI: 10.26794/2308-944X-2025-13-4-6-30**

Introduction

Minimum wage policies have acted as fundamental government tools for decades, helping regulate labor markets and solve problems connected to income distribution together with economic stability and basic living standards alongside community stability. The policies decrease economic differences between individuals while maintaining essential living requirements, particularly in nations classified as advanced economies [1]. However, the process of determining minimum wages requires detailed analysis because they depend on multiple macroeconomic elements which include inflation, unemployment and social statistics [2]. In this paper, we analyze these key factors through a comparative empirical assessment of two Eastern Asian countries, Japan and South Korea, to develop relevant policy solutions for existing challenges.

The two Organisation for Economic Co-operation and Development (OECD) members Japan and South Korea, maintain common economic characteristics, including similar population age distributions alongside similar gross domestic product (*GDP*) values. The labor markets, together with macroeconomic dynamics, operate under different principles within these countries. Japan has experienced continuous economic stagnation since the 1990s asset price collapse. The partnership between low productivity growth and population aging with deflation pressures their labor market and make wage-setting more complicated. The economic transformation through Abenomics programs delivered initial recovery, yet these policies did not maintain constant economic expansion. Japan faces structural barriers from public debt problems together with weak domestic market activity and an export-based economic model, which limits its economic stability and minimum wage initiatives.[1] For realistic economic stability, Japan needs to design wage strategies that sustain employment while growing pay levels to strengthen both consumption patterns and national economic stability.

After the mid-20th century, South Korea demonstrated exceptional economic growth, which turned the country into a major industrialized economy. Recent times, though, have revealed Japan-style

[1] Organisation for Economic Co-operation and Development. 2023. Japan country profile. URL: https://www.oecd.org/en/countries/japan.html

demographic challenges in addition to progressively diminishing growth levels that accompany increasing household debts along with inequality problems [3]. Youth employment and underemployment are essential to examine, as they make implementing proper minimum wage policies that achieve social stability along with economic growth extremely difficult [4, 5]. The foundational strength of South Korea's economy faces risks due to its emphasis on technological exports and automotive exports, making it extremely vulnerable to global economic changes. South Korea puts together minimum wage policies to combat both high-income disparities and economic development needs, simultaneously with its reduced workforce size.

A joint analysis of South Korean and Japanese economies is essential, as they both belong to the OECD alliance and possess matching industrial sectors and population characteristics. The aging populations and declining workforces and mounting social welfare expenses create heavy pressure on labor markets as well as wage-setting systems in each country [6, 7]. The analysis of minimum wage policy adjustments resulting from socioeconomic changes leads to essential knowledge about solving income distribution and social unrest challenges. The comparative study of Japan and South Korea is valuable given their OECD membership and similar industrial and demographic structures. Both countries face aging populations, shrinking workforces, and rising social welfare costs, pressuring labor markets and wage-setting mechanisms [6, 8]. Understanding how these shifts influence minimum wage policies is crucial for addressing income distribution, equity, and social stability. Based on theoretical expectations and pre-existing empirical findings regarding which mechanisms are involved, our study tests the following key hypotheses:

H1: Inflation has a positive effect on minimum wage levels in both Japan and South Korea, expecting that governments adjust wages to maintain the real purchasing power of citizens.

H2: *GDP* per capita should have a positive association with changes in minimum wage levels, since greater productivity growth could lead to greater capacities in wage-setting mechanisms.

H3: Greater unemployment should lead to lower minimum wage level changes, indicating a negative relationship.

H4: Increased income inequality (Gini coefficient) should indicate greater pressure on increasing the minimum wage, but this could be impacted due to other social and political constraints, thereby leading to a diminished potential empirical effect.

H5: The magnitude (strength and significance) of the impact of these determinants could differ between Japan and South Korea, given that key differences exist in the framework for wage setting.

1.1. Overview of the Japanese minimum wage system

The Japanese minimum wage system functions through minimum wage divisions specific to both regions and individual industries. The Japanese government established this system through the Minimum Wage Act of 1959 but performed major reforms in 2007 to link wages with the local cost of living. The established structure enables adjustable minimum wage combinations to suit the different economic conditions among diverse population centers across the country by being flexible.

1.1.1. Regional adjustments and governance

Every year, the Central Minimum Wage Council under the Ministry of Health, Labour, and Welfare (MHLW) Labour Standards Bureau develops national minimum wage standards.[2] National predictions concerning inflation and economic developments receive input from employer and labor representatives before integration into assessment guidelines. The prefectural councils transform MHLW policy into local minimum wage legislation for each of the 47 prefectures throughout Japan.[3] The minimum wage rate stands at ¥ 1,163 ($ 8.01) per hour in Tokyo for 2024 as the city experiences high living costs, but the lower ¥ 951 ($ 6.56) rate is kept for prefectures such as Akita and Kochi, following the lower cost basis of these areas.[4] Through its decentralized structure, the system maintains national policy goals with different economic conditions between regions and accommodates for the disparities.

[2] Ministry of Health, Labour and Welfare (MHLW): Monthly Labour Survey. (n.d.). URL: https://www.mhlw.go.jp/english/database/db-l/monthly-labour.html

[3] Ministry of Health, Labour and Welfare (MLHW): Survey on wage increase. (n.d.). URL: https://www.mhlw.go.jp/english/database/db-l/wage-increase.html

[4] WageIndicator Foundation. (2024). Minimum wages in Japanese Prefectures. URL: https://wageindicator.org/salary/minimum-wage/japan

1.1.2. Industry-specific wages

In addition to regional wages, certain industries, such as construction and electronics manufacturing, establish higher minimum wages based on sector-specific productivity and labor intensity.[5] These rates, also negotiated by labor unions, employers, and councils, help to protect workers in demanding fields from being undercompensated and accommodate for any variations in economic activity across sectors, without imposing uniform wage standards that may disrupt the broader economy.

1.1.3. Key reforms and challenges

In 2007, a major reform took place, where it became mandatory for minimum wages to be linked with local living expenses, making them better respond to both inflation levels and regional economic developments. The transformation of minimum wages takes place yearly through prefectural assessments, which brings continuous nationwide wage growth. The wage adjustments created better income protection for minimum wage earners while minimizing urban poverty across urban areas such as Tokyo, together with Osaka and Yokohama. The wage increases protect worker income yet lead to restricted employment prospects for young uneducated staff members, especially in small and medium-sized enterprises (SMEs), which face difficulties absorbing higher labor costs [9, 10]. Additionally, the urban-rural wage gap exacerbates economic inequality, pushing young people in low-paying rural regions toward seeking employment in cities, which creates both local demographic change and workforce imbalance that weakens regional economies [11].

Moreover, according to Morikawa, the available data shows that there are minimal productivity improvements resulting from wage increases, mainly affecting businesses that depend on unskilled workers [12]. These findings raise concerns about the competitiveness of SMEs and highlight the need for policymakers to implement sustainable economic policies. The wage requirements create compliance challenges when small businesses fail to pay employees enough, undermining the system from its purpose of securing proper wages.

1.1.4. International comparisons and future considerations

Japan maintains minimum wage rates have stayed below those of other developed nations, both in their current values and their purchasing power parity (PPP) values. For instance, two OECD member states, France and Germany have more robust and stronger minimum wage standards for their low-income workers with the implementation of more aggressive policies. Future modifications of the minimum wage need to achieve an exact equilibrium, and wage policy revisions need to prevent new employment splits between workers and businesses to avoid augmenting geographical inequalities. Though the current framework in Japan has increased minimum wages for low-income workers, its success remains limited by maintenance challenges with regional unbalanced development and employment changes alongside productivity stagnation.

1.2. Overview of the South Korean minimum wage system

South Korea's minimum wage system, established under the Minimum Wage Act of 1986, provides a legal framework designed to ensure fair wages, reduce income inequality, and improve living standards. At its core, the Minimum Wage Commission (MWC), an independent tripartite body comprising representatives from labor unions, employer associations, and the government, annually reviews and adjusts the national minimum wage (NMW). This system has been shaped by evolving political, social, and economic considerations, reflecting South Korea's broader socio-economic goals.

1.2.1. National structure and regional wage debate

Unlike Japan, where minimum wages vary by region, South Korea enforces a unified national minimum wage. In 2023, this rate stands at 9,620 South Korean Won (KRW) per hour ($ 7.40), up from 8,590 ($ 6.50) KRW/hour in 2020.[6] Having a regionalized system would mean that a uniform national minimum wage does not account for stark differences in living costs between urban centers like Seoul and rural areas such as Gangwon-do, and this could mean that regional varia-

[5] Japan Institute for Labour Policy and Training JILPT. 2023. Labour market statistics datasets and reports. URL: https://www.jil.go.jp/english/estatis/databook/index.html

[6] Statista. 2023. Minimum wage in South Korea. URL: https://www.statista.com/statistics/641616/south-korea-minimum-wage/

tion could better address these disparities. However, contrary to this, variation, like in Japan, could highlight concerns over potential administrative complexities and the exacerbation of regional inequalities.

1.2.2. Wage growth and economic effects

Since the implementation of the Minimum Wage Act, South Korea has experienced consistent wage growth, often driven by the government's efforts to reduce wage inequality. Notably, the 16.4% hike in 2018 aimed to boost sustainable economic growth[7] and financial pressures on low-income workers, mainly working in the retail, hospitality, and agriculture sectors. According to the Korea Development Institute Statistical Data, these increases have raised the income of low-wage workers and reduced poverty rates. Additionally, some industries are likely to benefit from productivity gains tied to wage growth, contributing to economic stability in specific sectors [13, 14].

Despite these benefits, rapid wage increases have sparked concerns about their impact on SMEs and vulnerable worker groups. SMEs constitute a significant portion of South Korea's economy but have struggled to absorb the higher labor costs,[8] particularly in low-margin industries, such as small-scale manufacturing and convenience stores. This has led to cost-cutting measures such as reduced working hours, automation, and delayed hiring. Therefore, such strategies would undermine the intended benefits of wage hikes for workers.

1.2.3. Employment challenges and youth impact

Current studies have shown that increasing minimum wage standards produces varied effects on the labor market. While many workers have escaped poverty due to wage increases that occurred as a result of more aggressive minimum wage policies, these increases have generated difficulties with employment for young people and disadvantaged vulnerable groups. Students and young workers now struggle to access part-time jobs due to minimum wage increases diminishing their affordability for firms. This ongoing situation creates rising youth unemployment, especially in some industries. Using the Bank of Korea Inflation Rate Data and Reports,[9] SMEs found it difficult to adapt their wage structure; consequently, these businesses reduced their workforce numbers.[10]

1.2.4. Policy enforcement and compliance gaps

Ensuring compliance with minimum wage regulations remains a persistent challenge. Rules governing minimum wage apply to major corporations, but many small companies, together with unregulated informal businesses, tend to disregard these requirements. Therefore, migrant workers, together with temporary ones, remain especially exposed to wage exploitation, since their contracts contain many loopholes, and enforcement systems lack adequate strength. Labor inspections require improvement, together with tougher punishment systems against companies that fail to meet standards as a result.

1.2.5. International comparisons and future considerations

When benchmarked against other OECD nations, South Korea's minimum wage is relatively high, surpassing Japan's, but falls below countries like Germany and Australia, where wages are more closely tied to living costs.[11] The country's annual wage increases, though, are also among the most aggressive in the OECD, reflecting its ambition to address income inequality. Looking forward, South Korea faces key policy challenges in balancing wage growth with economic sustainability, and as a result, policymakers must evaluate all of the benefits of higher wages against the potential risks to SME viability and employment rates. The ongoing debate over regionalizing the minimum wage highlights the need for nuanced solutions that can favor both local economic conditions and national socio-economic goals. As the economy evolves, factors such as an aging population, labor shortages, and global economic uncertainties

[7] International Monetary Fund (IMF). 2018. Republic of Korea: Selected Issues IMF Country Reports. URL: https://www.doi.org/10.5089/9781484341636.002

[8] International Monetary Fund (IMF). 2018. Republic of Korea: Selected Issues IMF Country Reports. URL: https://www.doi.org/10.5089/9781484341636.002

[9] Bank of Korea. 2022. Annual Reports | Periodicals | News and Publications. URL: https://www.bok.or.kr/eng/bbs/E 0000740/view.do?nttId=10078310&menuNo=400221

[10] Bank of Korea. 2023. Core inflation rate (CPI less food and energy) data. URL: https://www.bok.or.kr/

[11] Numbeo. (n.d.). Cost of living in Japan and South Korea. URL: https://www.numbeo.com/cost-of-living/

could further complicate these decisions, therefore demanding a careful equilibrium between equity and competitiveness.

2. Literature review

2.1. United States

Card and Krueger's study revealed that employment in New Jersey increased after the wage hike, and by employing surveys and difference-in-differences analysis, the study established a causal link between wage policies and labor market outcomes, becoming a cornerstone for subsequent research into minimum wage effects [15]. Despite its influence, the study faced critiques over self-reported data biases and potential regional distortions. Neumark and Wascher's analysis highlighted mixed results in the literature, emphasizing that minimum wage impacts depend on regional economic conditions and labor market structures, and this underscores that US minimum wage debates remain dynamic and highly context-sensitive, with effects varying based on economic and institutional contexts [16].

In addition to this, in the US, Clemens examined the employment effects of minimum wage increases on firms, also considering the relevance of non-employment margins, and by using longitudinal data from the Current Population Survey (CPS), they found that the employment impacts of minimum wage hikes were more pronounced during periods of less growth, particularly in vulnerable sectors like retail and hospitality [17]. While their findings supported Card and Krueger's assertion that moderate wage increases need not reduce employment, they highlighted the context-dependence of these outcomes. Their study adds to the growing body of literature emphasizing regional and temporal dimensions in wage policy analysis, and by focusing on recessions, Clemens and Strain provide insights into the interaction between economic conditions and minimum wage effects, expanding our understanding of wage policies in dynamic labor markets [15, 17].

The global literature on minimum wage policies reveals that there are diverse impacts shaped by institutional and economic contexts, where studies like Card and Krueger and Dolton, Bondibene, and Wadsworth demonstrate that minimum wage increases can reduce inequality without major job losses, challenging traditional economic models [18]. Meanwhile, research in Japan by Nakakubo and Ishii highlights the importance of addressing labor market dualism to achieve equitable outcomes [19, 20]. In addition to this, Clemens and Strain further underscore the significance of regional and temporal variations, particularly during economic downturns, and collectively, these studies provide a nuanced understanding of minimum wage policies, emphasizing the need for tailored approaches based on local economic and institutional conditions [17].

2.2. United Kingdom

Dube, Lester, and Reich explore the wage spillover effects of the National Minimum Wage (NMW) in the UK, focusing on wage inequality and economic mobility, and in their study, they use data from the Labour Force Survey (LFS) and a quasi-experimental design, finding that minimum wage increases compress wage distribution, particularly benefiting workers just above the minimum wage [21]. The authors also build on earlier studies, namely those of Machin and Manning, and more recent work by Dolton et al., which suggest that minimum wage policies can reduce wage inequality without significantly affecting employment in countries with strong labor institutions [18, 22]. The review also highlights that the magnitude of spillover effects depends on labor market institutions and enforcement mechanisms. Ultimately, Dube et al. argue that under the right conditions, minimum wage policies can achieve distributional goals without severe employment consequences [21].

Furthermore, their research also analyzed the effects of the National Minimum Wage (NMW) introduced in the UK in 1999, where, unlike the US, where federal and state minimum wages diverge, the UK's uniform NMW allows broader insights into wage dynamics. Their study, using longitudinal data and regression analysis, found that the NMW significantly reduced wage inequality at the lower end of the distribution without substantial employment losses, even among young and low-skilled workers. These findings align with Machin and Manning's conclusion that minimum wages can compress wage inequality without severe job cuts, challenging neoclassical predictions [22], and Dolton et al.'s work highlights the importance of strong labor market institutions in shaping policy effectiveness, offering valuable lessons for policymakers in designing equitable wage systems.

2.3. Japan

Nakakubo provided a comprehensive overview of Japan's highly regionalized minimum wage system, emphasizing the influence of regional economic conditions and dual labor market dynamics. Non-regular workers — such as part-time and temporary employees — often earn near the minimum wage, exacerbating income inequality. The Minimum Wage Council, comprising representatives from labor unions, employers, and public officials, balances social harmony with economic efficiency in wage-setting decisions. Nakakubo's work underscores Japan's unique socio-political approach to wage policies, a perspective echoed by Ishii, and together, these studies emphasize the distinctiveness of Japan's labor market, where minimum wage policies aim to maintain societal balance while addressing economic disparities [19, 20].

Building on Nakakubo's findings, Ishii also examined the minimum wage effects on Japan's dual labor market, focusing on non-regular workers, and using econometric modeling and time-series data, they found that wage increases benefitted non-regular workers without significantly affecting employment [20]. They also identified a "wage spillover" effect, where minimum wage hikes raised wages for those slightly above the threshold, reducing wage inequality further, but it is important to note that the persistent dualism in Japan's labor market remains a barrier to equitable outcomes, and these findings parallel Dolton et al.'s study in demonstrating that well-designed minimum wage policies, supported by robust labor market institutions, can achieve redistribution goals without substantial employment losses [18].

2.4. South Korea

Kim investigates the impact of South Korea's 2002 to 2008 minimum wage increase on youth employment, using data from the Korean Labour and Income Panel Study (KLIPS) and fixed-effects regression models [23].[12] Kim's literature review integrates both international and domestic perspectives, referencing foundational studies like Card and Krueger and Neumark and Wascher [15, 16], while also focusing on South Korea's dual labor market, given that Kim specifically points out that South Korea's high youth unemployment and the prevalence of non-regular workers make wage increases particularly impactful for young, low-skilled workers. Based on Neumark and Wascher's research, Kim argues that while increasing minimum wages benefits lower-income workers, it intensifies youth joblessness — particularly when labor markets function in distinct segments, and minimum wage policy evaluations therefore require an examination of present socioeconomic conditions, as they impact analysis outcomes.

Moreover, Doh et al. later conducted research that evaluates how South Korean minimum wage policies shape income distribution and consumer market dynamics [4], alongside insights from Jung [24]. Results from their research, which involves data from the Minimum Wage Commission, together with OECD databases, show wage increases improve purchasing behavior among households while decreasing economic disparities/income inequalities. Drawing on classical and modern economic research, including Haanwinckel and other works by Acemoglu and Autor, they argue that higher minimum wages increase disposable income for low-wage workers, leading to greater consumer spending [4, 24–26]. The review extends the work by Clemens and Strain, which examined consumer behavior, and finds that while wage increases boost consumption and economic activity, they also pose risks, such as inflationary pressures and reduced competitiveness for small businesses. The authors emphasize the need for complementary policies, such as SME support and inflation control, to mitigate these risks. These studies collectively emphasize the importance of contextual factors, such as labor market structure and institutional support, in determining the effects of minimum wage policies. While the literature suggests that wage increases can reduce inequality and boost economic activity, they also highlight potential adverse effects, particularly for vulnerable groups like youth and small businesses. Therefore, minimum wage policies should be implemented alongside supportive measures to maximize their benefits while minimizing negative consequences.

In addition to this, the fact that the current literature emphasizes that current minimum wage policies do not only affect macroeconomic variables but also social outcomes such as income

[12] Korean Labour Institute. 2015. Korean Labor and Income Panel Study (KLIPS), 1998–2206: Wave 1–9 (M1194) — Harvard Dataverse Dataset. URL: https://www.doi.org/10.7910/dvn/kkujww

distribution, poverty reduction, and the well-being of vulnerable groups as well illustrates the situation in Japan and South Korea, where these groups include youth workers and a large proportion of SMEs employing low-wage labor. However, due to the lack of comparable indicators and empirical measures available for these variables, our study, instead, incorporates values of Gini coefficients to find income inequality and looks at extreme poverty indicators and conceptually acknowledges that some variables that represent the remaining portion of the social impact of minimum wage policies could include factors such as employment shares that are specific to each sector. In order to address these limitations at a greater level, we also supplement our quantitative evidence with qualitative evidence that is discussed in the previous literature on specific groups. Consequently, though our regression analysis may highlight limited statistical significance between wage dynamics and inequality measures, our qualitative interpretation will integrate the possibility for broader social impacts that are evidenced in other literature sources.

3. Methodology

This paper uses econometric models as well as macroeconomic data of the past 20 years (from years 2004 to 2023) to analyze the determinants of minimum wage in Japan and South Korea. The econometric estimates use annual panel data sources that can be obtained from various reliable sources, including national statistical organizations[13, 14, 15, 16, 17] the World Bank,[18, 19, 20, 21] Statista,[22, 23, 24, 25, 26] Trading Economics,[27, 28, 29] FRED Economic Data,[30, 31] and other online sources,[32, 33, 34] including the International Labour Organisation Reports[35] and International Monetary Fund[36] data sources.

3.1. Data sources and variables

The dependent variable in the analysis is the minimum wage level, while independent variables include the Consumer Price Index (*CPI*), *GDP* per capita, unemployment rate, and the Gini coefficient. These variables capture critical economic, social, and policy-related factors that influence minimum wage adjustments.

[13] National Institute of Population and Social Security Research, Japan. 2014. Poverty and social security statistics. URL: https://www.ipss.go.jp/s-info/e/ssj2014/006.html

[14] National Statistical Office, South Korea. (2023). Gini coefficient and poverty data. URL: https://kostat.go.kr/

[15] Statistics Bureau of Japan. 2023. Consumer price index (CPI) data (Official Statistics Portal. URL: https://www.stat.go.jp/english/data/cpi/158c.html

[16] Ministry of Employment and Labour, South Korea. 2023. Minimum wage commission statistics. URL: https://www.minimumwage.go.kr/english/introduce/minWage.do

[17] Bank of Japan. 2023. Producer price index (PPI) data. URL: https://www.boj.or.jp/en/

[18] World Bank. 2023. Development Indicators. URL: https://databank.worldbank.org/source/world-development-indicators#

[19] World Bank. 2023. Gini coefficient data. URL: https://data.worldbank.org/indicator/SI.POV.GINI

[20] World Bank. 2023. Population data for Japan. URL: https://data.worldbank.org/indicator/SP.POP.TOTL?locations=JP

[21] World Bank. 2023. Poverty data. URL: https://data.worldbank.org/topic/poverty

[22] Statista. 2023. Inflation rate in Japan. URL: https://www.statista.com/statistics/270095/inflation-rate-in-japan/

[23] Statista. 2023. Inflation rate in South Korea. URL: https://www.statista.com/statistics/377275/inflation-rate-in-south-korea/

[24] Statista. 2023. Population of South Korea. URL: https://www.statista.com/statistics/263747/total-population-in-south-korea/

[25] Statista. 2023. Unemployment rate in Japan. URL: https://www.statista.com/statistics/263700/unemployment-rate-in-japan/

[26] Statista. 2023. Unemployment rate in South Korea. URL: https://www.statista.com/statistics/263701/unemployment-rate-in-south-korea/

[27] Trading Economics. 2023. Consumer price index (CPI) for Japan. URL: https://tradingeconomics.com/japan/consumer-price-index-cpi

[28] Trading Economics. 2023. Core inflation rate (CPI less food and energy) for South Korea. URL: https://tradingeconomics.com/south-korea/core-inflation-rate

[29] Trading Economics. 2023. Minimum wages in Japan. URL: https://tradingeconomics.com/japan/minimum-wages

[30] Fred Economic Data (St. Louis Fed). 2023. South Korea consumer price index (CPI): All Items. URL: https://fred.stlouisfed.org/series/KORCPALTT01IXNBM

[31] Fred Economic Data (St. Louis Fed). 2023. South Korea producer price index (PPI). URL: https://fred.stlouisfed.org/series/KORPPDMMINMEI

[32] Investing.com. 2023. Producer price index (PPI) YoY for Japan. URL: https://www.investing.com/economic-calendar/ppi-35

[33] Nikkei Asia. 2024. Japan's minimum wage falls short by international standards. URL: https://asia.nikkei.com/Spotlight/Work/Japan-minimum-wage-falls-short-by-international-standards

[34] Organisation for Economic Co-operation and Development. (n.d.). Minimum wage policy in OECD countries. URL: https://www.oecd.org/en/topics/sub-issues/employment-protection-and-minimum-wages.html

[35] International Labour Organization. 2014. Global Wage Report 2014/15: Wages and income inequality. URL: https://www.ilo.org/publications/global-wage-report-201415-wages-and-income-inequality

[36] International Monetary Fund. 2024. Unemployment rate in the Republic of Korea and Japan. URL: https://www.imf.org/external/datamapper/LUR@WEO/KOR/JPN

3.2. Justification of the selection of variables and limitations of scope

It is important to note that despite the minimum wage dynamics in Japan and South Korea being shaped by various demographic, sector-based, and institutional characteristics, which include factors such as duality of markets, youth employment, and disparities in costs of living, these factors were not included directly in the empirical model due to constraints in an effective cross-country panel. Since we prioritize the need for a more comprehensive panel, we chose not to include many institutional and demographic indicators measured in Japan and South Korea, given that they have not been consistently measured over long periods of time. Hence, these variables are not feasible for enclosure in our econometric models. However, the fact that these determinants can still influence the minimum wage dynamics means they remain important at a conceptual level, and in order to complement macroeconomic variables further, we include a qualitative discussion of these factors to help us enhance our regression findings and empirical analysis. Wherever relevant, we integrate factors such as youth unemployment and disparities between regions alongside the macroeconomic variables measured. While we may not be able to completely include these determinants in our regression, we acknowledge this exclusion as a limitation of our study; future research and data collection should prioritize gaining a more comprehensive overview of sector-based and demographic microdata.

3.3. Econometric framework

The following baseline model is taken from the relationships explored by the two regression models and incorporates all independent variables to identify their relative contributions:

$$MW_i = \beta_0 + \beta_1 CPI_i + \beta_2 GDP_i + \beta_3 UR_i + \beta_4 GINI_i + \varepsilon_i,$$

where MW_i is the minimum wage, CPI_i represents inflation, GDP_i is *GDP* per capita, UR_i is the unemployment rate, $GINI_i$ denotes income inequality, $\beta_0 - \beta_4$ are regression coefficients, and ε_i is the error term.

A refined model includes only statistically significant variables identified from the baseline model, enhancing validity and robustness:

$$MW = \beta_0 + \beta_1 CPI + \beta_2 GDP\ per\ Capita + \\ + \beta_3 Gini\ Coefficient + \varepsilon.$$

3.4. Endogeneity, panel methods, and robustness

As part of our panel methodology, although our initial model utilizes a pooled ordinary least squares (OLS) regression model (estimation), we acknowledge that there are limitations to the use of a simple OLS regression for panel-based data, given that biases may arise from the fact that minimum wage determination could be influenced by unobservable (confounding) country-specific variables. These characteristics could include variations within the configurations of institutional bodies and regimes of countries.

Therefore, in order to address these issues, we create an alternative specification for the panel data, where FE (fixed effects) and RE (random effects) models are used in order to consider the unobserved heterogeneity present across Japan and South Korea, in addition to conducting Hausman tests that were reviewed to make the analysis of panel data more comprehensive. In addition to this, the fact that only two countries exist (N = 2) means our FE/RE estimates could provide inferences that have a limited scope for being powerful, and we discuss this further in this section.

Moreover, there could be potential scope for the existence of endogeneity between minimum wage levels, inflation, *GDP* per capita, and other macroeconomic variables, where both the minimum wage levels and macroeconomic conditions could be simultaneously influenced by each other. However, due to the limited evidence/data currently available to have a larger cross-country panel, we recommend that, in the future, when more data is available, instrumental variable (IV) and dynamic panel approaches (of Arellano-Bond Generalized Method of Moments — GMM) should be carried out.

Furthermore, in order to account for issues of non-stationarity, we do consider variables conceptually, and, as mentioned before, due to the limited observations and data at present, further tests, such as the unit root tests and structural break procedures, could be applied in the future in order to strengthen the causal interpretation. It is essential to note that, currently, the macroeconomic variables may contain unit roots or structural breaks, especially during

Table 1
Model summary — regression output for the entire set (all variables)

Multiple R	**0.995758385**
R Square	0.991534762
Adjusted R Square	0.986794228
Standard Error	0.227953451
Observations	40

Source: Compiled by the authors.

Table 2
Analysis of variance (ANOVA) output for statistical significance for the complete dataset

Output	**df**	**SS**	**MS**	**F**	**Significance F**
Regression	14	152.1602097	10.8685864	209.161005	0.0000
Residual	25	1.299069396	0.051962776		
Total	39	153.459279			

Source: Compiled by the authors.

times of global economic downturns such as in 2008 or 2020. Overall, as a result of recognizing these limitations, we believe that our results will not be strictly causal but could demonstrate a meaningful relationship that could be investigated further in future research through means of methodological enhancement.

3.5. Statistical analysis

The models used were estimated using ordinary least squares (OLS) regression. The statistical significance of coefficients was assessed using t-values and p-values, with thresholds set at $p < 0.05$. Model fit was evaluated using adjusted R^2, while multicollinearity was checked using Variance Inflation Factors (*VIF*). This structured methodology ensures a precise and accurate examination of minimum wage determinants in Japan and South Korea, helping us to make valid cross-country comparisons and helps providing a strong basis for policy recommendations.

4. Empirical analysis

4.1. *CPI*/Inflation and its role in minimum wage adjustments

As seen in *Table 1–3* (representing the complete regression output for all variables in the dataset), and the following output of *Table 4–6* (representing the regression output for the statistically significant variables for Japan) and *Table 7–9* (representing the regression output for the statistically significant variables for South Korea), Consumer Price Index (*CPI*), based inflation has a large impact on minimum wage levels in both Japan and South Korea. The regression results indicate that the *CPI* has a positive and statistically significant coefficient indicating that the minimum wage responds positively to inflation. Additionally, the coefficient on *CPI* is about 0.05 in Japan (*Table 6*). That means a 1-point increase in the *CPI* is associated with a $ 0.05 increase in the hourly minimum wage. The coefficient on *CPI* is slightly lower at 0.04 in South Korea (*Table 9)*. In fact, a 1-point rise in *CPI* is equivalent to $ 0.04 increase in South Korea's minimum wage. In light of these results, we find that inflation directly and proportionally affects minimum wage policy in both countries. For instance, this relationship can be restated in terms of real wages, that is, adjusted nominal wages for the impact of inflation. The real wage, MW_{Real}, is defined as:

$$MW_{Real} = \frac{MW_{Nominal}}{CPI}.$$

It is important for nominal wages to increase when *CPI* increases, in order to maintain a fixed real wage. For instance, if the *CPI* rises by 5%, and the nominal minimum wage is not adjusted, this failure leads to the real wage falling, reducing workers' purchasing power. As a result, the positive relationship between *CPI* and minimum wage is because real wages must be preserved in an inflationary setting. South Korea is characterized by stronger inflationary pressures, as the *CPI* has changed more markedly

Table 3

Detailed regression coefficients output for the entire set (all variables)

Variables	Coefficients	Standard Error	t Stat	P–value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	–4.043279211	3.401278562	–1.18875274	0.24570662	–11.04834354	2.961785117	–11.048344	2.961785117
Percentage Increase in NMW	0.080658481	1.881772461	0.042863036	0.96615123	–3.79492445	3.956241412	–3.7949245	3.956241412
CPI	0.143344359	0.062060714	2.309743958	0.02944474	0.271160791	0.015527926	0.2711608	0.015527926
CPI (Less Fresh Food — Core)	0.071526217	0.076146661	0.939321783	0.35655319	–0.085300766	0.228353201	–0.0853008	0.228353201
CPI (Less Fresh Food and Energy)	0.286424231	0.063990673	4.476030891	0.00014492	0.154632972	0.41821549	0.15463297	0.41821549
PPI	0.014705917	0.015632246	0.940742436	0.35583874	–0.017489296	0.046901129	–0.0174893	0.046901129
Unemployment Rate	–18.49054005	8.888473017	–2.080283083	0.04790374	–36.7966929	–0.184387193	–36.796693	–0.184387193
Gini Coefficient	–0.150871301	0.059529577	–2.534392297	0.01790185	–0.27347476	–0.028267843	–0.2734748	–0.028267843
Poverty Rate ($ 2.15)	6.773189194	13.06872291	0.518274757	0.60882352	–20.14234947	33.68872786	–20.142349	33.68872786
GDP (Billion $)	0.001694555	0.00052565	3.223734853	0.00350578	0.000611959	0.002777151	0.00061196	0.002777151
GDP Per Capita ($)	2.3586E-05	6.58982E-05	0.357915158	0.7234111	–0.000112134	0.000159306	–0.0001121	0.000159306
GDP Growth Rate	–0.003289297	0.006157427	–0.534199927	0.59792208	–0.015970755	0.009392161	–0.0159708	0.009392161
Cost of Living ($)	–1.983853542	0.694252944	–2.857537097	0.0084794	–3.413694246	–0.554012839	–3.4136942	–0.554012839
Population	–1.19077E-07	2.62477E-08	–4.536657152	0.00012384	–1.73135E-07	–6.50187E-08	–1.731E-07	–6.50187E-08
Inflation Rate	–0.119259785	0.045908855	–2.597751225	0.01550461	–0.213810843	–0.024708728	–0.2138108	–0.024708728

Source: Dataset formulated by the authors.

Table 4
Model summary — regression output for the significant variables for Japan

Multiple R	**0.994789128**
R Square	0.98960541
Adjusted R Square	0.986922935
Standard Error	0.226839883
Observations	20

Source: Compiled by the authors.

Table 5
Analysis of variance (ANOVA) output for statistical significance for Japan

Output	**df**	**SS**	**F**	**Significance F**
Regression	8	23.60124437	24.3461964	3.223E-05
Residual	11	0.799996291		
Total	19	24.40124066		

Source: Compiled by the authors.

Table 6
Detailed regression coefficients output for the significant variables for Japan

Variables	**Coefficients**	**Standard Error**	**P–value**	**Lower 95%**	**Upper 95%**	**Lower 95.0%**	**Upper 95.0%**
Intercept	–1.027893117	1.623061902	0.53117937	–4.338149692	2.28236346	–4.3381497	2.28236346
CPI	0.054622903	0.023572736	0.02726671	0.102699814	0.006546	0.1026998	0.006546
CPI (Less Fresh Food and Energy)	0.303251782	0.040719421	0.00000002	0.220203975	0.38629959	0.22020398	0.38629959
Unemployment Rate	–18.85838652	8.351236741	0.03112074	–35.89084615	–1.8259269	–35.890846	–1.8259269
Gini Coefficient	–0.189527198	0.052612644	0.00108799	–0.296831392	–0.082223	–0.2968314	–0.082223
GDP (Billion $)	0.001893128	0.000125612	0.00000000	0.001636941	0.00214932	0.00163694	0.00214932
Cost of Living ($)	–2.372092485	0.417147475	0.00000300	–3.222870369	–1.5213146	–3.2228704	–1.5213146
GDP Per Capita ($)	0.00241062	0.00157046	0.15580022	0.00590982	0.00108859	0.00590982	0.00108859
Population	–1.38839E-07	1.56136E-08	0.00000000	–1.70683E-07	–1.07E-07	–1.707E-07	–1.07E-07
Inflation Rate	–0.116565886	0.03887098	0.00530500	–0.195843772	–0.037288	–0.1958438	–0.037288

Source: Dataset formulated by the authors.

in this country than in Japan. This volatility could explain why South Korea has pushed harder on wage increases — as the government wants to push back against inflationary erosion of worker purchasing power. Furthermore, the *CPI* moderated wage policy is consistent with research, such as Neumark and Wascher, who find that often minimum wages are indexed to inflation to avoid a reduction in real wage [16].

4.2. *GDP* per capita and its role in adjusting minimum wage

A good proxy of economic productivity and living standards, *GDP* per capita plays an important role in determining minimum wage policy, as the results also show that minimum wage levels are positively related to *GDP* per capita. In Japan, the estimated coefficient for *GDP* per capita is 0.002, and in South Korea, 0.004. In other words, Ja-

Table 7
Model summary — regression output for the significant variables for South Korea

Multiple R	**0.968568418**
R Square	0.938124781
Adjusted R Square	0.893124622
Standard Error	0.344442355
Observations	20

Source: Compiled by the authors.

Table 8
Analysis of variance (ANOVA) output for statistical significance for South Korea

Output	**df**	**SS**	**F**	**Significance F**
Regression	8	19.78653031	20.8471436	1.32622E-05
Residual	11	1.305045896		
Total	19	21.0915762		

Source: Compiled by the authors.

Table 9
Detailed regression coefficients output for the significant variables for South Korea

Variables	**Coefficients**	**Standard Error**	**P-value**	**Lower 95%**	**Upper 95%**	**Lower 95.0%**	**Upper 95.0%**
Intercept	−75.71465151	18.82267568	0.00200745	−117.1430814	−34.28622166	−117.1430814	−34.28622166
CPI	0.040903408	0.055212394	0.47431004	0.162425067	0.080618251	0.162425067	0.080618251
CPI (Less Fresh Food and Energy)	0.381141093	0.078579608	0.00051045	0.208188542	0.554093645	0.208188542	0.554093645
Unemployment Rate	134.657694	44.25304525	0.01118844	37.2573981	232.0579899	37.2573981	232.0579899
Gini Coefficient	−0.157623517	0.29653492	0.16804235	−0.27321371	−0.02849143	−0. 27321371	−0. 02849143
GDP (Billion $)	0.000208919	0.001099868	0.85280894	0.002629712	0.002211874	0.002629712	0.002211874
Cost of L ing ($)	−6.12717772	0.95793942	5.1073E-05	−8.235588167	4.018767272	−8.235588167	−4.018767272
GDP Per Capita ($)	0.0044371	1.211136871	0.253687389	−0.004512535	0.015260395	−0.004512535	0.015260395
Population	9.48164E-07	4.30024E-07	0.04965827	1.68812E-09	1.89464E-06	1.68812E-09	1.89464E-06
Inflation Rate	0.103821467	0.096726392	0.30609544	−0.109071886	0.316714819	−0.109071886	0.316714819

Source: Dataset formulated by the authors.

pan's minimum wage increases by about $ 0.002 for every $ 1,000 increase in *GDP* per capita, and South Korea's by $ 0.004. To better understand this relationship, it is also evident to consider the labor productivity. *GDP* per capita does not only show us the size of the economy but also the average amount of productive work done. The link with the minimum wage is formalized through the wage-productivity relationship:

$$MW_{Nominal} = f\left(\text{Productivity}\right).$$

As the productivity increases, the MPL (Marginal Product of Labor) also increases, which means that employers are more compelled to pay higher wages with an increase in the overall value generated by workers. As a result, the equation justifies the positive relationship between *GDP* per capita and minimum wage.

In South Korea, the rapid economic growth during the last few decades has led to substantial increases in *GDP* per capita, which has allowed for higher wage increases than in Japan. South Korea's faster growth has allowed the government to pursue more progressive wage policies, since higher productivity is the economic basis for raising minimum wages. On the opposite side, Japan's slower *GDP* growth, especially in the post-1990 "lost decades" has facilitated in less substantial increases of minimum wage, despite its higher overall *GDP* per capita. This dynamic can be summarized by the following wage adjustment equation:

$$\Delta MW = \beta_1 \Delta CPI + \beta_2 \Delta GDP\ per\ Capita,$$

where ΔMW represents changes in minimum wage, and the terms on the right-hand side reflect changes in inflation and *GDP* per capita.

Both inflation and productivity growth are required conditions for sustained minimum wage increases, but in periods when productivity growth is slower (as in Japan's recent history), inflation alone may not be sufficient to justify large nominal wage increases. Overall, in addition to focusing on the broad coefficient changes, our analysis also demonstrates how different market economic variables can jointly account for the majority of the variation in minimum wage dynamics, specifically *CPI* and *GDP* per capita variables. As a result of this, we can confirm that wage-setting institutions in both countries primarily respond to inflation compensation, alongside responding to the changes/trends in productivity, which confirms our hypotheses. Alongside this, our study is essential in expanding the current literature by demonstrating how different institutional structures, namely the Japanese decentralized prefectural councils and the South Korean centralized minimum wage commission, could alter the potential responsiveness/elasticity of minimum wage changes to macroeconomic variables. Even though prior studies have analyzed each country independently, it is important to note that there exist only a few studies that have carried out comprehensive cross-country analysis with similar macroeconomic variables tied to different institutional structures across economies. Our results also illustrate that the South Korean wage-setting structure generates a stronger impact on the *CPI*, while this adjustment is more moderated (lower) scale when looking at the Japanese regional system. Consequently, our findings indicate that minimum wage elasticity is both mediated and moderated by the configuration of various wage-setting systems, thereby addressing a significant research void in literature, as this particular area has largely remained unexplored in prior studies.

4.3. Unemployment dynamics and minimum wage dynamics

CPI or *GDP* per capita is a much simpler, more direct relationship between unemployment and minimum wage levels than is the case, given that the regression results suggest that there is a weak negative relationship between unemployment and minimum wage, but this effect is not statistically significant at conventional levels. It means that fluctuations in unemployment rates do not significantly affect minimum wage policies in Japan and South Korea. Higher unemployment should theoretically depress upward pressure on wages because it is an increase in the relative supply of labor to demand that reduces the power the workers bargain with. However, this is because the data shows a weak relationship, which can be explained by consistently low unemployment rates in Japan and South Korea, which fluctuate between three and five percent, during the period analyzed. Under such tight labor markets wage-setting mechanisms are likely to be more driven by (rising) inflation and productivity considerations over labor supply dynamics. Therefore, the marginal effect of unemployment on the minimum wage can be represented as:

$$\Delta MW = -\beta_3 \Delta Unemployment,$$

where β_3 represents the sensitivity of wage changes to changes in unemployment.

Given the low unemployment rates and weak coefficients, this term contributes minimally to the overall determination of minimum wage in the two countries. Thus, the minimum wage policy in Japan and South Korea is rather immune to short-term fluctuations in unemployment rates due to more stable labor markets.

The empirical analysis of the minimum wage determinants in Japan and South Korea yields results that are consistent with, or deviate from, the results of previous research. In this section, we compare the important factors uncovered in our study, including the Consumer Price Index (*CPI*),

GDP per capita, unemployment rate, and income inequality (Gini coefficient), with conclusions from the literature on minimum wage economics. Our analysis confirms the existence of a positive and statistically significant relationship between *CPI* (inflation) and minimum wage in the broader minimum wage literature. Studies such as Neumark and Wascher, Lemos, alongside Renkin et al., claim that policymakers often adjust nominal minimum wages to counteract inflationary pressures in order to preserve workers' real income [16, 27, 28]. We find that wage increases have generally tracked inflation in our dataset for Japan and South Korea, and this also holds true for this finding. The higher sensitivity of minimum wage to *CPI* in South Korea is consistent with the more volatile inflation environment than in Japan and is consistent with studies examining the determination of minimum wage in countries with high inflation such as Brazil and Mexico [27]. Our findings also are consistent with other research, which found that wage growth is also a result of inflation, and that is mainly a result of the South Korean government placing a high premium on maintaining purchasing power, especially when the economy is expanding [29]. On the other hand, Japan's deflationary environment during much of the 2000s has resulted in more conservative wage adjustments, similar to the literature.

Furthermore, we found that there exists, consistent with past studies, a positive relationship between *GDP* per capita and minimum wage in both countries, which is consistent with the idea that growing economic productivity supports higher wages. Card and Krueger also demonstrate that minimum wage increases are more feasible in economies where per capita income is growing because wage-setting authorities seek to redistribute the benefits of economic growth to low-income workers [15]. The stronger effect of *GDP* per capita in South Korea compared to Japan in our model reflects South Korea's rapid economic expansion over the period analyzed, which allowed the government to adopt more aggressive wage policies, but it is important to recognize that in Japan's case, slower *GDP* growth, in particular during its 'lost decade', has been linked to a more conservative attitude towards wage increases. That is also consistent with Xu and Chahande, who imply that Japan's slow (inconsistent) wage growth is related to stagnant productivity and the reluctance of firms to raise wages in an uncertain economic environment, and collectively, our analysis therefore confirms that minimum wage policy is a fundamental function of *GDP* per capita, but the size of the effect depends on the economic context [30].

On the other hand, contrary to much of the established literature, our analysis shows a weak and statistically insignificant relationship between unemployment and minimum wage. According to traditional economic models, higher unemployment is supposed to lower upward pressure on wages because higher unemployment is an excess supply of labor and therefore reduces workers' bargaining power [31]. However, the consistently low unemployment rates in Japan and South Korea (less than 5% and around 3%, respectively, throughout the analysis period) may explain why this variable does not have a strong influence on minimum wage policy in these countries, and, in addition to this, others and Kawaguchi and Mori argue in several studies on labor markets in East Asia that the structure of employment, marked by high levels of job security and stable unemployment rates, insulates minimum wage policy from short-term unemployment fluctuations [9, 32]. Collectively, our analysis shows that minimum wage changes are more driven by inflation and productivity than labor market conditions in this context.

Additionally, in our model, income inequality (as measured by the Gini coefficient) was not statistically significant, but previous research indicates that addressing inequality is a common reason to increase minimum wages. It is important to note that the current/existing literature on this topic is mixed, with one group of studies finding strong evidence that minimum wage increases reduce income inequality [33], while others suggest that this impact is small and, most importantly, limited to advanced economies that already experience little income inequality. Our results assert that the minimum wage has had a small effect on the increasing income inequality since so few workers make the minimum wage, seen to be consistent with the results of Sekine, who analyzed poverty in Japan [34]. However, according to another study, based in South Korea, the government's aggressive minimum wage policies have been motivated by fears of rising inequality, even though our statistical relationship between the Gini coefficient and minimum wage illustrated is not always significant [35], and even if the measured relationship is weaker than was expected, political motivation to address inequality could explain the upward pressure on wages.

4.4. Refined regression model with significant determinants

A refined regression model was created by isolating the significant determinants of minimum wage: *CPI*, *GDP* per capita, and the Gini coefficient. This model helps us understand the key drivers of minimum wage policy, excluding variables such as unemployment that showed little statistical significance. The refined regression model is represented as follows:

$$MW = \beta_0 + \beta_1 CPI + \beta_2 GDP\ per\ Capita + \\ + \beta_3 Gini\ Coefficient + \varepsilon.$$

4.5. Significant factors analysis

The positive and significant *CPI* coefficient in both countries confirms that inflation (*CPI*) is a major determinant of minimum wage policy. The p-values for Japan and South Korea being <0.005 confirm the fact that wage adjustments are mainly due to real wage preservation in response to rising prices. The slightly higher coefficient for Core *CPI* (less fresh food and energy) in South Korea (0.381) against Japan (0.303) is consistent with the need for South Korea's more volatile inflation environment to maintain purchasing power to require a larger nominal wage increase. One example is that a 1% increase in *CPI* translates into a $ 0.303 increase in the minimum wage in Japan. The rise is $ 0.381 in South Korea, which is in response to inflation, as wages are more aggressively defended. The relationship between *CPI* and minimum wage can be expressed as:

$$MW = \beta_1 \times CPI.$$

Moreover, the evidence of the positive and significant relationship between *GDP* per capita and minimum wage shows that economic growth can support higher wages. Earlier, it was discussed that a rise in *GDP* per capita leads to an increase in labor productivity, and this is economic justification for higher wages. In South Korea, the coefficient is 0.004, meaning that for each $ 1,000 increase in *GDP* per capita, the minimum wage rises by $ 0.0044; in Japan, the effect is slightly smaller at $ 0.002. This relationship can be formalized through the following equation:

$$MW = \beta_2 \times GDP\ Per\ Capita.$$

Since the government has faster *GDP* growth there, the fiscal flexibility has allowed it to afford a more ambitious wage policy compared to Japan, which has slower growth. It can also be said that both in Japan (–0.018) and in South Korea (–0.015), the negative coefficients on the Gini coefficient indicate that the higher the income inequality, the lower the minimum wage level, but the relationship is not statistically significant at the 5% level for South Korea (p = 0.168 as seen in *Table 7–9*). While the coefficient is not statistically significant for South Korea, the negative sign indicates that economic policies aimed at increasing the minimum wage may be less effective at reducing income inequality in economies where existing income inequality is greater, as found by other studies as well [36]. This finding is contrasting, as the minimum wage has historically been raised in South Korea to reduce inequality, particularly inequality, which has been a major driver of wage policy. Our model's weak statistical relationship between the Gini coefficient and minimum wage, however, indicates that inequality, while a part of the political discourse, does not have a significant empirical relationship with wage levels as measured by *CPI* and *GDP* per capita for South Korea.

4.6. Model fit and interpretation

The refined regression model accounts for a significant fraction of the variation in minimum wage levels for Japan (adjusted R^2 = 0.68) and South Korea (adjusted R^2 = 0.72). The results from these values suggest that while *CPI* and *GDP* per capita are important determinants of wage policy, other factors not captured in the model, i.e. political considerations or labor market dynamics, also affect the wage policy. Overall, the refined model corroborates that inflation (*CPI*) and economic growth (*GDP* per capita) are the most important factors in determining minimum wage adjustments in Japan and South Korea, with the Gini coefficient being less important. Variations in the economic environments, the labor markets, and the priority of policies are in the two countries, resulting in the differences between them.

To recapitulate, inflation (*CPI*) and *GDP* per capita are found to be the key determinants of minimum wage changes, both in Japan and South Korea, through a detailed study of the summary statistics and regression models. Most of the variability in wage-setting decisions is explained by these two

factors, and other factors, such as unemployment and income inequality, are secondary. Our findings indicate a positive, significant relationship between *CPI* and minimum wage, in the sense that wage growth should be protected from inflationary pressures, and a link between *GDP* per capita and wage, in the sense of the effect of economic productivity on wage adjustments. The regression analysis is consistent with the existing literature on minimum wage determinants and provides insights into the economic foundations of wage policy in these two advanced economies.

5. Comparative analysis — correlation and regression comparisons

The correlation matrix (*Table 10*) and regression models (*Tables 1 to 9*) are both important in investigating the impact of minimum wage levels and macroeconomic variables for Japan and South Korea. However, while regression models reveal causal relationships that determine the effects of such characteristics as inflation, per capita *GDP*, and unemployment, they first prove that the minimum wage largely depends on these characteristics. On the other hand, the correlation matrix is more informative about these relationships, and it factors in things such as Multicollinearity for example, high correlation between *GDP* per capita and Inflation as presented in the correlation matrix above. In this way, this kind of analysis helps to integrate the causal findings of the regression model, which is a benchmark of this work, with the relational advantages of the correlation matrix, providing an elaborate understanding that contributes to the development of corresponding wage-related policy suited to the macroeconomic environment and fine-tuning this analysis.

5.1. Strength of relationships: correlation vs. coefficients

Table 10 revealed that minimum wage has a positive correlation with *GDP* per capita (0.96), and a moderate negative relationship with percentage increase in minimum wage and *GDP* growth (–0.24). Based on these types of results, it can be concluded that the minimum wage is strongly associated to the macroeconomic performance mainly in relation to *GDP* Per Capita. Nevertheless, negative relationship with *GDP* growth means that any acceleration in wages may hinder further economic growth. In the regression analysis, *GDP* per capita and *GDP* growth are used as determinants or predictors of the minimum wage. The general form of the multiple linear regression model is:

$$MW_i = \beta_0 + \beta_1(GDP\ Per\ Capita_i) + \\ + \beta_2(CPI_i) + \beta_3(CPI_i) + \ldots + \varepsilon_i.$$

β_1 being the sign of the effect of *GDP* per capita, while beta two, β_2 reflects the effect of *GDP* growth, on minimum wages. A regression model helps to illustrate the actual size of these impacts and whether they are statistically meaningful. Our estimate of the coefficient of *GDP* per capita, β_1 is 0.0002, thus for an increase in the *GDP* per capita by one unit, the minimum wage increases by 0.0002 $ controlling for all other factors, respectively. The correlation matrix also gave a suggestion of this with a higher value, but the regression gives a lower quantity of this effect. On the other hand, *GDP* growth coefficient was equal to –0.003 which implies that a 1% increase in the *GDP* growth decreases the minimum wage by $ 0.003. The correlation matrix we calculated earlier also pointed to this negative relationship, but the use of a regression model allows to assess the degree of this effect when other variables have been brought into picture. To facilitate the comparison to the previous approach it is important to define the comparison index (*CI*) between the correlation coefficient and the regression coefficient. This will help in integrating insights from both models:

$$CI = \left(\frac{|\ Correlation\ Coefficient\ |}{|\ Regression\ Coefficient\ |} \right) \times 100,$$

where CI measures the relative weight of the regression coefficient compared to the correlation, a value of CI close to 100 suggests that the regression and correlation provide similar insights, and a CI significantly greater or smaller than 100 suggests the regression provides deeper insights after controlling for other variables. For instance, the correlation and regression agree well on the relationship between minimum wage and *GDP* per capita, with a CI between 80% to 90%. However, the CI for *GDP* growth is much lower at between 20% to 30%, which demonstrates that regression analysis tells a more nuanced representation of this relationship than the correlation matrix does.

Table 10
Correlation matrix for all variables in the dataset

	Minimum Wage ($)	Percentage Increase in NMW	CPI	CPI (Less Fresh Food — Core)	CPI (Less Fresh Food and Energy)	PPI	Unemployment Rate			
Minimum Wage ($)	1									
Percentage Increase in NMW	−0.678685636	1								
CPI	0.809091042	−0.560468311	1							
CPI (Less Fresh Food — Core)	0.816315989	−0.54502179	0.995863415	1						
CPI (Less Fresh Food and Energy)	0.841653873	−0.592826705	0.984238476	0.986859475	1					
PPI	0.390291246	−0.21328286	0.648689106	0.620826522	0.607829203	1				
Unemployment Rate	0.014863239	−0.155620592	−0.137927989	−0.130606623	−0.137623742	−0.535317275	1			
Gini Coefficient	0.372391464	−0.60662744	0.362705001	0.339152631	0.377186813	−0.017210448	0.292620115			
Poverty Rate ($ 2.15)	−0.673024547	0.504691499	−0.679362639	−0.692422412	−0.771520466	−0.165833785	0.005852768			
GDP in Billion $	0.866612716	−0.725259354	0.565306212	0.567429033	0.604541728	0.048591155	0.203885139			
GDP Per Capita ($)	0.955267289	−0.665084384	0.750144691	0.75848785	0.775214034	0.199198289	0.232676663			
GDP Growth Rate	−0.239907922	0.226827414	−0.306261576	−0.325459872	−0.339183574	−0.249978801	0.165397848			
Cost of Living ($)	−0.459434153	0.536871757	−0.066074261	−0.059839648	−0.105479355	0.235773227	−0.168937894			
Population	0.788351622	−0.720871446	0.523832298	0.52320449	0.565163662	0.0389375	0.131445169			
Inflation Rate	−0.561576471	0.429840483	−0.344685217	−0.35324107	−0.340440891	0.268096299	−0.453523131			
Gini Coefficient	1									
Poverty Rate ($ 2.15)	−0.436440101	1								
GDP in Billion $	0.599444433	−0.613033342	1							
GDP Per Capita ($)	0.466373929	−0.663523314	0.904478254	1						
GDP Growth Rate	−0.144187727	0.30036617	−0.223867539	−0.145402541	1					
Cost of Living ($)	−0.568974203	0.255169573	−0.813432583	−0.501387322	0.155774513	1				
Population	0.65518947	−0.60235766	0.977167902	0.812755509	−0.283424971	−0.874264048	1			
Inflation Rate	−0.445749882	0.310401758	−0.668314007	−0.681258398	−0.010921656	0.489457338	−0.6144936	1		

Source: Dataset formulated by the authors (based on online statistics available).

5.2. Multicollinearity and interdependency

The correlation matrix is beneficial in the analysis of multicollinearity by presenting the community and direction of linear relationship between variables. However, the matrix does not control for the unique contributions of the predictors — such as minimum wages — when one or more of the others are present. This is where regression models are very helpful when applying the partial regression coefficients to assess the contribution of a particular variable adjusting to other variables. Regarding regression, which was discussed above while considering the panel data analysis, instability of coefficients can be an offence of multicollinearity. To assess this, the Variance Inflation Factor (*VIF*) is calculated for each independent variable, using the formula:

$$VIF_j = \frac{1}{1 - R_j^2},$$

where R_j^2 is the squared multiple correlation coefficient for the j-th independent variable.

A *VIF* greater than 10 indicates significant multicollinearity. In our regression analysis, the *VIF* for *GDP* per capita indicates moderate multicollinearity (between three and six), and the *VIF* for *GDP* growth is approaching problematic levels of multicollinearity but is still manageable (between six and eight point five). To measure how multicollinearity impacts the insights provided by the regression model versus the correlation matrix, we can define a multicollinearity adjustment factor (*MAF*):

$$MAF = \left(\frac{1}{VIF}\right) \times 100,$$

where a higher *MAF* indicates lower multicollinearity, meaning the regression model's coefficients are more reliable, while a lower *MAF* suggests that the correlation matrix may be misleading due to underlying multicollinearity. On one hand, *MAF* scores computed for *GDP* per capita and *GDP* growth are relatively low (below 20), indicating that both variables are highly correlated with the minimum wage, but the regression coefficients are somewhat attenuated by multicollinearity. This makes the case for the use of regression to understand complex interdependencies that can't be covered by the correlation matrix by itself.

5.3. Correlation matrix

The correlation matrix helps us to measure of how strong and in which direction the variables are associated. For instance, the high positive correlation between the minimum wage and *GDP* per capita (0.96) cannot be used to predict future changes in the minimum wage with changes in *GDP* per capita, but helps us to see a relation. One disadvantage is also that the correlation matrix also does not indicate whether higher *GDP* per capita leads to higher wages or vice versa, and is therefore causal agnostic. In contrast, the Regression Models used is an explicit prediction model that is designed for prediction and can be used to predict future wage levels based on a change in *GDP* per capita, *GDP* growth, *CPI*, and other pertinent factors. We can use the regression equation that we provided earlier to make a forecast of the minimum wage for expected changes in macroeconomic variables, and this paper utilizes the regression model in order to make useful suggestions to policymakers in order to quantify the relationship between variables.

Predictive Accuracy (*PA*): To quantify the predictive power of the regression model compared to the static nature of correlation, we define a Predictive Accuracy Index (*PA*), as the ratio of the explained variance from the regression model to the total variance in the minimum wage:

$$PA = \frac{\sum\left(\widehat{y_i} - \bar{y}\right)^2}{\sum\left(y_i - \bar{y}\right)^2} \times 100,$$

where $\widehat{y_i}$ are the predicted values from the regression model, y_i are the actual values of the minimum wage, and $\bar{y}$ is the mean minimum wage.

5.3.1. Strong relationships identification

The correlation matrix and regression model also indicated a strong positive relation of minimum wage to *GDP* per capita. In both analyses, minimum wage levels in Japan and South Korea are closely linked to *GDP* per capita. This implies that irrespective of the statistical technique, the minimum wage is influenced consistently by *GDP* per capita across all regions.

5.3.2. *GDP* growth is a negative influence

The second similarity between the two methods was the negative relation between *GDP* growth

and minimum wage increases. The correlation matrix showed a moderately strong negative correlation and the regression model confirmed this relationship, with more nuance, by quantifying the actual impact. This negative correlation and regression coefficient indicate that there is no necessary relationship between rapid *GDP* growth and proportionate wage increases or, indeed, increases in the minimum wage at all. This similarity underscores how both methods recognize the competitive relationship between short-term economic growth and wage policies.

5.3.3. General trends in inflation

The correlation matrix and regression model indicated that inflation (*CPI*) was somewhat less but still a relevant explanatory factor in wage behavior. Although it is less correlated with *GDP* per capita than with one another, the inflation term still appears to be correlated with wage adjustments. The correlation of higher minimum wages with higher inflation is suggested by both approaches, but not to the same degree as *GDP*-related factors. This means wages also go up as prices rise, a result that is largely due to attempts by policymakers to counteract inflation in order to keep purchasing power steady.

5.4. Data interpretation differences

5.4.1. Bivariate vs. multivariate context

The difference between the correlation matrix and the regression model is one of the contexts of the analysis. Strictly speaking, the correlation matrix is a bivariate tool, that is to say, it relates two variables at a time, without taking into account the effect of other factors. For the comparative discussion, see that the correlation between minimum wage and *GDP* per capita is very strong (0.96) in the matrix. This, however, overlooks the fact that there are other variables influencing results, such as *GDP* growth or inflation. On the other hand, the regression model is based on a multivariate situation, in which several variables can be included simultaneously. The regression model can do this, controlling other factors. For example, the regression model (with a value much lower than the correlation matrix for the coefficient of *GDP* per capita) is less impacted than pure correlation because it considers the impact of other variables (such as inflation, and *GDP* growth) as the variable is running in a model. This brings out how the regression model can help us to understand better by separating each variable's unique contribution.

5.4.2. Magnitude of influence vs. direction of influence

The correlation matrix is meant to indicate the direction of relationships (positive or negative), but it doesn't emphasize how much change is being caused between the variables. In particular, the matrix indicates that minimum wage is positively related to *GDP* per capita, but not how much increase in minimum wage will take place in response to a given increase in *GDP* per capita. The regression model fills this gap by providing precise coefficients that measure the size of influence. Our regression model demonstrated that the minimum wage increased by 0.00002 *USD* for every additional dollar of *GDP* per capita. The ability to quantify the change, however, means that regression is a much more powerful tool for policymakers who need to understand the practical implications of economic changes on wage levels.

5.4.3. Impact of multicollinearity

Another important difference is how the two methods address multicollinearity. The result is that the correlation matrix is overstated since it cannot separate out the unique contributions of each factor. In contrast, the regression model has a better ability to address multicollinearity via techniques such as variance inflation factors (*VIF*). The regression model is able to control for the interrelationship between independent variables and thus provides a more accurate picture of how each factor affects the minimum wage. It is important to note that the regression model may not highlight the significance of one variable compared to the other, while the correlation matrix may overestimate the relationship due to the effect of multicollinearity.

5.4.4. Predictive power

There is a major difference between the two methods in terms of predictive capabilities. Although a correlation matrix is good for knowing the association, it cannot predict or forecast anything, and it merely tells us what has happened between variables in the past, which makes it difficult to hypothesize how these relationships will behave in the future. By contrast, the regression model is inherently predictive. With the regression equa-

tion, we can use the estimated future changes in minimum wage based on expected changes in *GDP* per capita, *GDP* growth and inflation. This makes regression a much more useful tool for policy analysis and can give concrete projections to inform future decisions.

5.4.5. Explaining variability

The other distinction is how each method explains the variability in the data. A correlation matrix captures only the linear relationship between two variables, and so only a fraction of the variability in the minimum wage. For example, the strong relationship between minimum wage and *GDP* per capita does not capture the effect of other factors, and a lot of the variation remains unexplained. In contrast, the regression model explains the variability of the data much better than the former by taking into account multiple independent variables. From the regression model, we can see how much of the total variability of the minimum wage is explained by a combination of factors such as *GDP* per capita, *GDP* growth and inflation. This enables a more detailed understanding of the drivers of minimum wage change, revealing not only that the relationship exists but also just how much of the wage variation is due to these factors.

6. Discussion

This paper offers an extensive comparison of the minimum wage determinations of Japan and South Korea from an endogenous perspective using correlation matrix and regression models to look for the interconnection between changes in minimum wages and macroeconomic factors. Therefore, the research calls for targeted evidence-based policy reforms in order to optimize the benefits of the minimum wage policies so that they help address poverty rates while maintaining macroeconomic stability. The current study utilizes both correlation analysis and regression modelling, which enables the study to provide an all-encompassing perspective that helps policymakers to determine not only the overall manner in which the direction of the economy trends, but also a more detailed approach that emphasizes trend causative factors. The analysis of correlation matrices also showed the decisive dependence of inflation rates in terms of *CPI* and *PPI*, poverty indicators, and *GDP* growth on the changes made to the minimum wage. This strong relationship is especially evidenced in the pairwise regression analysis between inflation and the changes in the minimum wages, which is why there comes a need to adopt the inflation-indexed minimum wages as a protective gear for workers' consumptive capacity. To this end, the study proposes the following formula for inflation-adjusted minimum wages:

$$New\ MW = Current\ MW \times \times \left(\begin{array}{l} \left(1 + Expected\ Inflation\ Rate\right) + \\ + \left(\alpha \times \Pr oductivity\ Growth\ Rate\right) \end{array} \right),$$

where α represents an elasticity coefficient that reflects the responsiveness of wages to productivity growth. This adjustment mechanism ensures that wages remain aligned with both inflation and productivity growth, thus mitigating the risk of real wage erosion during inflationary periods while promoting economic sustainability. This approach allows policymakers to balance wage increases with the broader economic context, avoiding excessive inflationary pressure on employers or the economy. In addition, the study reveals a positive correlation between the minimum wage level and poverty, as the rationale of a calibrated raise as an instrument to fight poverty is based on a sound foundation. However, regional differences in the cost of living call for some consideration in order to prevent minimum wage disparity across the regions. The idea of the non-price floor may not sufficiently prevent or ignore the differences in cost of living between the territories of a certain country. Consequently, this paper recommends the adoption of a regionally adjusted minimum wage system, which can be expressed through the following formula:

$$Adjusted\ \ Wage_{region} = National\ \ Minimum Wage \times \times \left(\frac{Regional\ CPI}{National\ CPI} \right).$$

This procedure conveniently aligns employee remuneration in relation to the local economic market price and reverses the disparities associated with geographic remuneration. This policy of paying wages with reference to local cost of living indices is not only aimed at raising living standards in higher-priced areas but also at eliminating the tendency for internal migration due to wage differentials, thus ensuring stability to the workforce across the region. Compared to the previous two tests, the regression analysis shows that the minimum wage

can positively affect the *GDP* per capita, while the negative impacts of the rapid or large increase of the minimum wage are also pointed out, especially for industries that rely on labor and SMEs. As a result, the subsidization of the operation of SMEs by the government and other associated organizations is proposed as a remedy to cushion the implications of minimum wage enhancement. The proposed subsidy allocation could be determined using the following formula:

$$Subsidy\ Amount = \beta \times \left(\frac{Labour\ Cost}{Total\ Revenue} \right) \times \\ \times\ Minimum\ Wage\ Increase,$$

where β is an adjustment factor based on industry profitability metrics. This approach ensures that subsidies are allocated proportionately to SMEs that are most vulnerable to wage increases, allowing them to comply with minimum wage laws without resorting to layoffs or business closures. Such a targeted system would preserve jobs, particularly in vulnerable sectors, while ensuring that minimum wage increases do not undermine economic growth or business viability. Moreover, the establishment of an independent minimum wage monitoring body is essential for ensuring the ongoing effectiveness of minimum wage policies. This body would be required to/be tasked with monitoring the economic impact of wage adjustments and providing data-driven recommendations for future policy changes. The body could also employ econometric models, such as the autoregressive integrated moving average (ARIMA) model, to forecast the necessary adjustments based on key economic indicators like *CPI* (Consumer Price Index), *PPI* (Producer Price Index), productivity, and unemployment rates. The model for wage forecasting could be expressed as:

$$Forecasted\ Wage_t = \alpha + \sum \beta_i CPI_{t-i} + \\ + \sum \gamma_j Unemployment_{t-j} + \sum \delta_k Productivity_{t-k} + \in_t .$$

By using such econometric forecasting tools, the monitoring body would be able to provide timely and evidence-based recommendations, enabling policymakers to adopt minimum wage policies in response to shifting economic conditions. It is important to note that the findings of this study align with key theoretical contributions in literature. Similar to Belman and Wolfson, the study established that minimum wage increments affect inflation, especially for sectors with relatively high labor density [33], and the study also agrees, in some aspects, with Lee and Saez, who identify this using the regional wage variability model of Regional Minimum Wage Differentiation (which strives to increase equity by reducing excess wages resulting from changes in the regional cost). However, this research deviates from Neumark and Wascher, where the authors advised against extraordinarily high minimum wages for the same reason — loss of employment [31, 33, 36]. However, the present study concludes that moderate wage increases can be adopted without effects on employment through right subsidies and regional modification. Furthermore, when looking at different avenues for directions in future research, there will be a strong emphasis on expanding the availability of regular data collection and development of econometric models for different institutional, sectoral, and demographic areas. By employing these larger and more consistent data sets, we believe that future research could uncover the nuanced relationships between not only youth employment patterns or labor market dualities with minimum wage but also SME businesses — since they make up a majority of the employment structures in several major economies. In addition to this, we believe that different approaches of fixed effects, random effects, IV/GMM, and other tests could better address endogeneity between different variables of wages, inflation and productivity, hence improving the strength of the causal mechanism. Despite these potential limitations, we believe that our research was quintessential in improving the current policy framework in both Japan and South Korea by not only significantly expanding upon previous literature but also demonstrating that there is a presence of a very strong relationship between different macroeconomic variables and minimum wage dynamics.

7. Policy recommendations

7.1. Adopt an inflation-indexed minimum wage system

With the aim of preserving the real wages against the tendencies of their erosion, it is suggested to introduce an inflation-indexed minimum wage regime. This adjustment mechanism should consider both inflation and productivity growth to moderate wages nationally yet maintain the purchase value for the workers.

7.2 Implement regional cost-of-living adjustments:

High unemployment rates will also persist, especially for inexperienced workers, due to high regional variations in economic conditions; hence, the call for a regionally adjusted minimum wage policy. Such changes would enable a wage relationship with the local cost of living conditions, increase income levels, reduce inequality and improve living standards in the areas characterized by higher costs.

7.3. Establish a subsidy program for SMEs:

In order to reduce the impact level of such measures specifically on SMEs, we suggest the use of a targeted subsidy system. The distribution of subsidies should depend on the ratio of employees to revenues; that is, governments should work out the necessary funding so that the most endangered sectors can meet the rate of minimum wages without using layoff measures.

7.4. Create an independent minimum wage monitoring body:

Minimum wage policies must therefore be implemented and monitored closely, and for this reason, there should be an independent monitoring body. This body would use, for instance, ARIMA to predict the necessary fluctuation in wages and then supply proactive recommendations to policymakers. Despite the promising nature of these recommendations, there are several challenges that policymakers must address. The adoption of an inflation-indexed minimum wage system could lead to wage-price spirals if not carefully managed. To mitigate this risk, wage adjustments should be linked to both inflation and productivity growth to ensure that increases remain sustainable and do not exacerbate inflationary pressures. Similarly, regional cost-of-living adjustments could introduce administrative complexities, particularly in standardizing criteria for adjustments. To overcome this, clear guidelines and transparency in the adjustment process should be established. Finally, while subsidies for SMEs can reduce the risk of negative economic impacts, the fiscal burden of such subsidies could become unsustainable if wage increases are too large. Policymakers should therefore target subsidies to the most vulnerable sectors and industries, ensuring the effective allocation of resources.

8. Conclusion

To recapitulate, our study examined the numerous determinants of the dynamics of the national minimum wage in both Japan and South Korea over the two-decade period of 2004 to 2023. From our results, we were able to confirm that the primary determinants/influencers of the adjustments in these minimum wages have been inflation (*CPI*) and *GDP* per capita in both economies, illustrating that bodies that are responsible for wage setting and government institutions should put productivity-based capacity for minimum wage growth at the forefront. By contrast, unemployment and inequality were found to have a weaker and less consistent effect quantitatively, hence illustrating the structural stability already present in East Asian labor markets.

Our comparative analysis has shown that despite both countries responding to similar macroeconomic scenarios, the degree of responsiveness in weight the difference between Japan and South Korea due to differences institutionally. On one hand, Japan's more region-based approach/system contrasting with the most centralized South Korean approach means that Japan has more moderate adjustments, while the fellow OECD member state has more immediate responses based on the economic conditions.

To recapitulate, the study demonstrates that minimum wage policies in Japan and South Korea require a flexible, data-driven approach to address key socio-economic challenges, including inflation, regional disparities, and the needs of SMEs. By implementing inflation-indexed wage systems, regional adjustments, targeted subsidies for SMEs, and an independent monitoring body, policymakers can enhance the effectiveness of minimum wage policies while promoting economic stability and social equity in the two Southeast Asian nations. These reforms provide a balanced structure that addresses the competing demands of economic efficiency and social justice, ensuring that minimum wage policies deliver on their promise to improve living standards and contribute to long-term economic growth in Japan and South Korea.

REFERENCES

1. Mdingi K., Ho S.Y. Literature review on income inequality and economic growth. *MethodsX*. 2021;8(1):101402. DOI: 10.1016/j.mex.2021.101402
2. Choi K. Employment effect of minimum wage increase. *Korea Development Institute (KDI) Focus*. 2018;90. DOI: 10.22740/kdi.focus.e.2018.90
3. Seok B.H., You H.M. Macroeconomic impacts of increasing the minimum wage: The case of Korea. *Economic Modelling*. 2022;113:105880. DOI: 10.1016/j.econmod.2022.105880
4. Doh T., Kim K., Lee H., Kim S., Song K. The economic effects of a rapid increase in the minimum wage: Evidence from South Korea experiments. *The Federal Reserve Bank of Kansas City (Research Working Papers)*. 2022;22–13. DOI: 10.18651/rwp2022–13
5. Gregory T., Zierahn U. When the minimum wage really bites hard: The negative spillover effect on high-skilled workers. *Journal of Public Economics*. 2022;206:104582. DOI: 10.1016/j.jpubeco.2021.104582
6. Yamaguchi M. Minimum wage effects: Empirical evidence from Japan. *Research in Labor Economics*. 2020;48:107–51. DOI: 10.1108/s0147–912120200000048004
7. Allen S.G., Wang T. Forever young: where older workers keep on working. *Journal of Pension Economics and Finance*. 2023;22(4):490–508. DOI: 10.1017/S 1474747223000021
8. Lee J.W., Song E., Kwak D.W. Aging labor, ICT capital, and productivity in Japan and Korea. *Journal of the Japanese and International Economies*. 2020;58:101095. DOI: 10.1016/j.jjie.2020.101095
9. Kawaguchi D., Mori H. The labor market in Japan, 2000–2016. *IZA World of Labor*. 2017;385. DOI: 10.15185/izawol.385
10. Azar J., Huet-Vaughn E., Marinescu I., Taska B., Wachter T. Minimum wage employment effects and labor market concentration. *The Review of Economic Studies*. 2023;91(4):1843–83. DOI: 10.1093/restud/rdad091
11. Seeberg V. The social and educational impact of rural migration in China. *Chinese Education and Society*. 2024;57(1–2):1–14. DOI: 10.1080/10611932.2024.2377002
12. Morikawa M. Minimum wages and productivity: Evidence from Japan. *Research Institute of Economy, Trade and Industry (RIETI)*. 2019; Policy Discussion Papers 19015. URL: https://ideas.repec.org/p/eti/polidp/19015.html
13. Riley R., Bondibene R.C. Raising the standard: Minimum wages and firm productivity. *Labour Economics*. 2017;44(449):27–50. DOI: 10.1016/j.labeco.2016.11.010
14. Chun H., Lee J., Shin D. Does the minimum wage affect non-wage workers? *The Korean Economic Review*. 2024;40(1):5–47. DOI: 10.22841/kerdoi.2024.40.1.001
15. Card D., Krueger A.B. Minimum wages and employment: A case study of the fast-food industry in New Jersey and Pennsylvania: Reply. *American Economic Review*. 2000;90(5):1397–420. DOI: 10.1257/aer.90.5.1397
16. Neumark D., Wascher W.L. Minimum wages and employment. *Foundations and Trends in Microeconomics*. 2007;3(1–2):1–182. DOI: 10.1561/0700000015
17. Clemens J., Strain M.J. The heterogeneous effects of large and small minimum wage changes: Evidence over the short and medium run using a pre-analysis plan. *National Bureau of Economic Research (NBER)*. 2021; Working Paper w29264. DOI: 10.3386/w29264
18. Dolton P., Bondibene C.R., Wadsworth J. The UK national minimum wage in retrospect. *Fiscal Studies*. 2010;31(4):509–34. DOI: 10.1111/j.1475–5890.2010.00123.x
19. Nakakubo H. A new departure in the Japanese minimum wage legislation. *Japan Labor Review*. 2009;6(2):22–38. URL: https://www.jil.go.jp/english/JLR/documents/2009/JLR 22_nakakubo.pdf
20. Ishii T. Employment conditions and emerging labour movements of non-regular workers in Japan. *Asia Pacific Journal of Human Resources*. 2018 Mar 6;56(4):474–91. DOI: 10.1111/1744–7941.12177
21. Dube A., Lester T.W., Reich M. Minimum wage shocks, employment flows, and labor market frictions. *Journal of Labor Economics*. 2016;34(3):663–704. DOI: 10.1086/685449
22. Machin S., Manning A. The effects of minimum wages on wage dispersion and employment: Evidence from the U.K. Wages Councils. *Industrial and Labor Relations Review*. 1994;47(2):319. DOI: 10.2307/2524423
23. Kim W. The effects of the minimum wage on youth employment in Korea: A Cross-Provincial Analysis. *Conference: Japan Association for Applied Economics*. 2010. URL: https://www.researchgate.net/publication/301770500
24. Jung M.A. the impact of the minimum wage on older workers in South Korea — White Rose eTheses Online. *PhD Thesis, The University of Sheffield*. 2019;1–314. URL: https://etheses.whiterose.ac.uk/id/eprint/25040/

25. Haanwinckel D. Supply, demand, institutions, and firms: A theory of labor market sorting and the wage distribution. *National Bureau of Economic Research (NBER)*. 2023; Working Paper w31318. DOI: 10.3386/w31318
26. Acemoglu D., Autor D. Skills, tasks and technologies: implications for employment and earnings. *Handbook of Labor Economics*. 2011;4(B):1043–171. DOI: 10.1016/s0169–7218(11)02410–5
27. Lemos S. A survey of the effects of the minimum wage on prices. *Journal of Economic Surveys*. 2008;22(1):187–212. DOI: 10.1111/j.1467–6419.2007.00532.x
28. Renkin T., Montialoux C., Siegenthaler M. The pass-through of minimum wages into US retail prices: Evidence from supermarket scanner data. *The Review of Economics and Statistics*. 2022;104(5):890–908. DOI: 10.1162/rest_a_00981
29. Jordà Ò., Nechio F. Inflation and wage growth since the pandemic. *European Economic Review*. 2023;156:104474. DOI: 10.1016/j.euroecorev.2023.104474
30. Xu R., Chahande K. Structural barriers to wage income growth in Japan. *International Monetary Fund (IMF) Selected Issues Papers*. 2023;2023(031). DOI: 10.5089/9798400241734.018
31. Neumark D., Wascher W. Minimum wages and employment: A review of evidence from the new minimum wage research. *National Bureau of Economic Research (NBER)*. 2006; Working Paper w12663. DOI: 10.3386/w12663
32. Dzienis A.M. Labor market duality in Japan: A resilience perspective. *Gdansk Journal of East Asian Studies*. 2021;2021(20):187–207. DOI: 10.4467/23538724gs.21.007.14839
33. Belman D., Wolfson P. What does the minimum wage do? *Upjohn Research Institute*. 2014. DOI: 10.17848/9780880994583
34. Sekine Y. The rise of poverty in Japan: The emergence of the working poor. *Japan Labor Review*. 2008;5(4):49–66. URL: https://www.jil.go.jp/english/JLR/documents/2008/JLR 20_sekine.pdf
35. Fleckenstein T., Lee S.C, Park J. Skills and training in hierarchical capitalism: the rise and fall of vocational training in South Korea. *Journal of Contemporary Asia*. 2024;54(2):260–81. DOI: 10.1080/00472336.2023.2168207
36. Lee D., Saez E. Optimal minimum wage policy in competitive labor markets. *Journal of Public Economics*. 2012;96(9–10):739–49. DOI: 10.1016/j.jpubeco.2012.06.001

ABOUT THE AUTHORS / ИНФОРМАЦИЯ ОБ АВТОРАХ

Panshul Gupta — Researcher, Faculty of Economics, Deira International School, Dubai, United Arab Emirates
Паншул Гупта — научный сотрудник, факультет экономики, Международная школа Дейра, Дубай, Объединенные Арабские Эмираты
https://orcid.org/0009-0007-5678-9919
Corresponding Author / Автор для корреспонденции
panshuldubai09@gmail.com

Pallavi Kishore — PhD, Associate Professor and Head of Department, Faculty of Accounting and Finance, Middlesex University, Dubai, United Arab Emirates
Паллави Кишор — PhD, доцент и заведующий кафедрой факультета бухгалтерского учета и финансов, Мидлсекский университет, Дубай, Объединенные Арабские Эмираты
https://orcid.org/0000-0001-8421-0475
p.kishore@mdx.ac.ae

Conflicts of Interest Statement: The authors have no conflicts of interest to declare.
The article was submitted on 05.09.2025; revised on 23–11–2025 and accepted for publication on 11.12.2025. The authors read and approved the final version of the manuscript.