KHAZANAH
RESEARCH
INSTITUTE

WORKING PAPER 03/23 | 20 MARCH 2023

The Returns to Malaysian Labour - Part I

Wage growth and inequality from 1995 to 2019

Nithiyananthan Muthusamy, Jarud Romadan Khalidi and Mohd Amirul Rafiq Abu Rahim

Khazanah Research Institute

WORKING PAPER 03/23 | 20 MARCH 2023

The Returns to Malaysian Labour - Part I
Wage growth and inequality from 1995 to 2019

This working paper was authored by Nithiyananthan Muthusamy, Jarud Romadan Khalidi and Mohd Amirul Rafiq Abu Rahim from the Khazanah Research Institute (KRI). The authors are grateful for the insightful review and comments from Allen Ng (Securities Commission) and Adam Manaf Mohamed Firouz (KRI), and the technical advice of Dr Rosalia Vasquez-Alvarez (ILO).

The authors are also grateful to Nur Marsya Zuhairi, Beatrice Jeanette Tay Hui Wen, Zainab Ali Ahmad, Nur Thuraya Sazali, and Shazrul Ariff Suhaimi for their research support.

Authors' E-Mail Addresses: **nithiya.muthusamy@krinstitute.org**, **jarud.khalidi@krinstitute.org** and **amirul.rahim@krinstitute.org**

Cover photo by Deva Darshan on Unsplash

Information on Khazanah Research Institute publications and digital products can be found at **www.KRInstitute.org**.

WORKING PAPER 03/23 | 20 MARCH 2023

The Returns to Malaysian Labour - Part I

Nithiyananthan Muthusamy, Jarud Romadan Khalidi and Mohd Amirul Rafiq Abu Rahim

Summary

- Households and workers depend on their wages to sustain their livelihoods, and to invest in their upward mobility and well-being. An in-depth study of wage growth patterns over the past few decades has been lacking. This two-part working paper series attempts to remedy this gap.

- The objectives of Part I are to: (i) assess wage growth and wage inequality trends from 1995 to 2019, with a special emphasis on 2010 – 2019; (ii) decompose the driving factors of wage trends into those defined by worker or occupational characteristics, and structural forces. While Part I deals with wage trends for all workers differentiated only by their wage levels, Part II will assess the experiences of sub-groups.

- We use Household Income Survey (HIS) (11 survey years covering 1995 – 2019) and Salaries and Wages Survey (SWS) (annual surveys from 2010 – 2020) microdata from the Department of Statistics Malaysia (DOSM) to conduct this study. We generate relative and absolute indicators of wage growth and wage inequality, and visualise and analyse a sub-set in the body of the paper to emphasize vital trends. We also adapt decomposition methods used in the literature to understand the impact of compositional and structural factors on the wage distribution[1].

- Our key findings are as follows:
  - The Malaysian labour market, in the absence of institutional or policy interventions such as the minimum wage, exhibits a generally suppressed and broadly regressive wage growth pattern[2].
  - The minimum wage, the most important policy intervention in the labour market in the period under study, has been an effective force for boosting the wage growth of low wage workers[3], effectively reducing overall wage inequality.

[1] The paper does not provide an empirical assessment of wage or job mobility—changes in a worker's wage or job throughout their lifetime—since this would require panel data at the worker level.

[2] Regressive indicates lower growth for lower wage groups relative to those in higher wage groups. Progressive indicates higher growth for lower wage groups relative to those in higher wage groups.

[3] Low wage workers refer to those in first few deciles, middle wage workers around the median and top wage workers around the 9th decile.

- Workers in the middle of the wage distribution have experienced low wage growth relative to low and high wage earners, and are getting left behind. The minimum wage's effect is largely restricted to lower portions of the wage distribution.

- The institution of the minimum wage should be strengthened through consistent upward revision and comprehensive implementation. Broader wage growth measures should include the upgrading of our economy and jobs towards higher value-added activities, and the institutionalisation of centralised wage-setting processes to ensure fair returns to labour.

Table of Contents

1. Introduction

There is a foundational notion in our imagination of a just society; that one may venture into the marketplace of labour, and there find not just the avenue to sustenance, but also the means to the comforts and securities of a dignified life. To labour to improve one's lot is considered worthy, and the creation of a society or state that enables such labour is merited as ideal.

Embedded within this notion is the assumption that the returns to labour would be commensurate to meeting the needs and aspirations of the labouring class, and sufficiently distribute the gains of production to make viable the pursuit of a dignified life through labour. Since the distribution of capital, and the associated income from capital, is usually highly unequal[4], it falls to labour income to make the economic journey a more equitable one. There is much evidence in our world today that such an assumption is untenable.

Sluggish wage growth is a global phenomenon and constitutes a key driving force in rising levels of structural inequality. Productivity growth has slowed in many advanced and emerging economies, and wage growth has slowed to an even greater degree[5]. We are witnessing an increasing coincidence of high labour and high capital incomes for the wealthiest individuals, and a stagnation if not depression of labour incomes for the rest[6]. Globalisation's drive to scatter supply chains, and the weakened position of labour unions at a time of technological and geopolitical disruption, have contributed to the minimization of the wage bill[7].

Whence and whither Malaysia in this world?

We're used to tracking headline numbers on mean and median wage levels. We're accustomed to comparing them to our inner compasses and lived realities, and juxtaposing them against living wage indicators, to assess their adequacy. We frequently compute their growth rates in ringgit terms, often forgetting to correct for the depressing effects of inflation. But we must move beyond the headlines, and dig deeper, to comprehend the effects that differential returns to labour have on our economic life.

[4] Milanović (2016); Piketty (2013)
[5] OECD (2018)
[6] Piketty and Saez (2003); Piketty (2013); Goldin (1994); Daly and Valletta (2006); Jun et al. (1993)
[7] Mazzucato (2011); Milanović (2016); Lemiuex (2007); Autor et al. (2008); Howell and Kalleberg (2022); Katz and Autor (1999)

KRI's past publications, by digging deeper, have provided us with a richer understanding of our labour market[8]. Of note is the recently published "Fresh Graduate Adversities", which uses annual graduate earnings data from the decade leading up to the pandemic to demonstrate the poor returns to labour for our working graduates; approximately 50% of working graduates earn less than RM1,500 in their first year of employment[9]. The authors hope that this working paper builds on, and makes a significant contribution to, the KRI tradition of telling a more complete Malaysian story.

The data made available to us allows for an analysis of wage growth patterns from 1995 to 2019, with a special and greater emphasis on the decade preceding the pandemic (2010 to 2019). Our review of the literature indicates that the analyses we present here have never before been undertaken for Malaysia (at least in a publicly accessible format), and we believe that they surface important findings for understanding our labour market and for formulating future policy.

The timescale (1995 to 2019) is an interesting one. It is expansive enough to identify the structural patterns by which our economy rewards labour and is close enough to our present moment to be policy relevant. It covers crucial economic moments (the Asian Financial Crisis of 1997, the steady deindustrialization of our economy from the 2000s, the Global Financial Crisis of 2007 – 2009 etc.), and it excludes the shock of the pandemic. The latter consideration is an important one, since we do not yet have sufficient data following the pandemic to disentangle the temporary effects from the more stubborn ones.

We are dividing this analysis into two parts. The first will focus on understanding how the returns to labour have evolved as a whole, in effect treating all workers equally and differentiating them only on the basis of their wage or salary levels. The second part will incorporate the heterogenous experiences of sub-groups and strata in our labour market. You now read Part I, and we will be releasing Part II soon.

The sections of Part I are organized as follows. We begin with a review of datasets and variables. We then present our research objectives and discuss the methods that we apply to meet those objectives. This is followed by the results section which forms the core and dominant part of this paper. We conclude with a discussion on the policy implications of our results.

[8] KRI (2020)

[9] Mohd Amirul Rafiq Abu Rahim and Shazrul Ariff Suhaimi (2022)

2. Datasets and Variables

We are fortunate and grateful to the Department of Statistics Malaysia (DOSM) for providing us with rich microdata from the Household Income Surveys (HISs) and Salaries and Wages Surveys (SWSs)[10] to conduct our analyses. Table 1 below presents a summary of the data we've received.

Table 1: Summary of Household Income Surveys and Salaries and Wages Surveys data

Dataset	Granularity Level	Nationality	Survey Years	Income Variables	Other Variables
Household Income Survey (HIS)	Household	Malaysian citizens	1995, 1997, 1999, 2002, 2004, 2007	Total paid employment income, including bonuses and allowances Wages and salaries (before deductions) Total employer's contribution Total other earned income Total from property income Total current transfer received Gross total income	State Strata (urban/rural) Sex (male/female) Age Highest education Highest certificate Occupation (classified according to 1 digit MASCO 1998) Industry (classified according to 2 digits MSIC 2008)
	Individual	Malaysian citizens	2009, 2012, 2014, 2016, 2019		
Salaries and Wages Survey (SWS)	Individual	Malaysian citizens and non-citizens	2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020	Total salaries & wages received, exclude overtime payment Total salaries & wages received, include overtime payment	State Strata (urban/rural) Sex (male/female) Age Citizenship Highest education Occupation (classified according to 2 digits MASCO 1998) Industry (classified according to 2 digits MSIC 2008)

[10] The SWS provides yearly statistics on wages and salaries with a consistent approach for comparable time series statistics. It collects wages and salaries for the main job among employed respondents of a household aged 15 – 64 in the public or private sector. It is also important to note that the SWS sample excludes employers, self-employed persons, unpaid family workers, domestic personnel of household as employers, temporary workers (including apprentices who receive allowances, volunteers) and part-time workers (including casual workers on a daily basis with uncertain working hours and income). The HIS is based on the Household Income and Basic Amenities Survey (HIS & BA) and is conducted twice in five years to provide detailed information on income, poverty and basic amenities for household members who earn income from paid employment and self-employment. The survey only covers households whose head of household is a Malaysian citizen. Both SWS and HIS represent results at national, state and urban/rural levels, and do not include residential institutions such as hostels, hotels, hospitals, old folks' homes, prisons and welfare homes.

HIS microdata for the six survey years from 1995 to 2007 was received at the household level; all income data was summed up at the household level, and the "Other Variables" that were meant to represent individual characteristics were those of the head of household (HoH). Data for the five survey years from 2009 to 2019 was received at the individual level; all income and "Other Variables" data was at the individual level. HIS data is meant to be representative of households with a Malaysian head of household (HoH).

The SWS is part of the annual Labour Force Survey (LFS) which was initiated in 2010. All SWS data was received at the individual worker level. The SWS covers both Malaysian citizens and non-citizens.

Our analyses are primarily concerned with income received from rendering labour services to an employer **before** the effects of taxes and transfers. This approach is appropriate considering that the object of this study is to parse the quantum and distribution of labour income as determined by the market. Furthermore, greater equity in the distribution of market income reduces the burden on a government's tax-and-transfer machinery to fight income inequality and liberates public resources to be channelled towards public goods and public services[11].

The HIS surveys classify all income received from an employer as paid employment income, which includes; (i) wages and salaries before deductions ("basic salaries & wages"); (ii) bonuses, allowances, and in-kind payments ("bonuses & allowances"); and (iii) employer contributions for EPF, SOCSO, and other schemes ("employer contributions"). Our SWS data captures total wages and salaries including and excluding overtime payment. Our chosen income variables for analysis are basic salaries & wages and bonuses & allowances from HIS, and total salaries & wages including overtime payment from SWS. An examination of Appendix 1, where the relevant portions of the survey questionnaires are presented, will indicate that these two wage variables are highly similar between the datasets.

Another point to note is that these surveys employ different recall periods; the HIS asks the relevant respondents within a household to recall their incomes for the 12 months preceding the survey, whereas the SWS collects income data for a reference month during each survey round. Since all our analyses are predicated on monthly salaries and wages, we divide the HIS wage variable by 12 to obtain a monthly figure that is comparable to SWS.

Our data cleaning procedures included the removal of duplicates, rationality and consistency checks, and the relabelling or recoding of variables to ensure comparability across survey years. We remove all observations with zero wage or salary incomes, and we shear the bottom and top three percent of all observations from each survey year before conducting our analyses. The latter step, also known as 'trimming', removes irrational, unstable and outlier observations at the extreme ends of the survey data. Table 2 below presents the total number of observations across survey years for both datasets after cleaning.

[11] Milanović (2016)

Table 2: Sample size of HIS and SWS datasets

Households from HIS	
Year	Sample size
1995	26,583
1997	23,882
1999	24,837
2002	27,504
2004	28,039
2007	27,168
2009	30,468
2012	29,547
2014	58,717
2016	57,031
2019	56,038
Total	389,814

Individuals from SWS	
Year	Sample size
2010	49,078
2011	51,577
2012	51,067
2013	48,715
2014	49,551
2015	48,346
2016	44,716
2017	87,199
2018	87,975
2019	92,683
2020	92,412
Total	703,319

Finally, where appropriate, we adjust for inflation and conduct our analyses in 2021 ringgit, thereby using real wage numbers based on recent price levels to ease comprehension and relatability.

3. Objectives and Methodology

The research objectives for Part I of this working paper series are as follows:

1. Assessing wage growth and wage inequality trends from 1995 to 2019, with a special emphasis on 2010 – 2019
2. Decomposing the driving factors of wage trends into those defined by worker or occupational characteristics, and structural forces.

As indicated in the introduction section, the upcoming second and final part (Part II) will explore the experiences and contributions of sub-groups, such as gender and specific educational or occupational categories, towards overall wage trends.

The greater emphasis placed on 2010 – 2019 is due to the noteworthy nature in which wage trends are altered in the decade preceding the pandemic (as will be demonstrated later), and the availability of detailed and complete worker-level data on an annual basis from the SWS for this period.

We adopt the **wage-earning Malaysian household** as the unit of analysis for the period **1995 – 2019**, in order to exploit the HIS' consistent data series for this period. As we dive deeper into the **2010 – 2019** period using SWS data, we shift to the **wage-earning worker** (regardless of nationality) as our unit of analysis.

Unit of Analysis	Time Period	Dataset
Wage-earning Malaysian household	1995 – 2019	Household Income Survey (HIS)
Wage-earning worker	2010 – 2019	Salary and Wages Survey (SWS)

For the first research objective, and in addressing certain portions of the second objective, we apply a selection of wage growth and inequality indicators that are widely utilized in wage analyses[12]. The indicators provide both relative and absolute measures of wage growth and inequality, as seen in Table 3 below.

Table 3: Definition of inequality indicators

Relative Inequality Indicators	Absolute Inequality Indicators
Percentage real wage growth by decile Decile ratios • D9/D1 (headline inequality) • D9/D5 (top-end inequality) • D5/D1 (low-end inequality)	Absolute real wage growth by decile
Gini Coefficient	Absolute spread between 25th and 75th percentiles
Coefficient of Variation (CoV)	Standard deviation of wage distribution

We compute real wage growth, both in percentage (difference in natural log of wages) and absolute (2021 ringgit) terms, at the decile level. We first compute these numbers at the percentile level, and then average them for each decile as a smoothing method. Decile ratios provide a relative sense of the gap between different positions along the wage distribution, and here we choose three positions that are commonly used in the literature: the 10th percentile (1st decile), the 50th percentile (5th decile or median), and the 90th percentile (9th decile).

The Gini Coefficient simplifies variations in the shares of income held by different parts of the income distribution into a single score; 0 representing perfect equality and 1 representing perfect inequality. The Coefficient of Variation (CoV) is a ratio of the standard deviation of the wage distribution to the mean wage. These are both relative indicators as they are normalized to the shape and density of a particular distribution. On the other hand, the absolute distance between the 25th and 75th percentiles, and the standard deviation of a wage distribution, provide a measure of wage spread in real ringgit terms.

We present these indicator values in Appendix 2, and we visualize a select group of them in the body of the document to emphasize and highlight overall trends. We use visualizations commonly adopted in the literature, such as time series graphs and growth incidence curves, in our analyses and discussions of the results. We also, where appropriate, index indicator values to a base reference year to ease visual comparisons of trends between indicators.

We do not specifically present and discuss headline numbers such as median and mean wage levels, since these are already widely accessible and routinely discussed in multiple forums. That said, they are addressed tangentially in presentations of wage growth and inequality indicators.

[12] ILO (2022); Daly and Valletta (2006); Goldin (1994), Goldin and Margo (1991); Goldin (1994);Machin (1996); Jun et al. (1993)

The second objective (for which we exclusively use SWS data) requires the disaggregation of changes in the wage distribution into compositional and structural factors. The method of constructing conditional density estimates by DiNardo et al (1996), and adapted by researchers and policy institutes working on inequality[13], provides a practical and effective means of doing so. By compositional factors, we mean all factors related to specific worker and job characteristics, such as gender, age, citizenship, educational attainment, occupation, economic sector and location (urban/rural). Structural factors are those that are largely beyond the control of any individual worker or employer, and include policies, regulations, norms, technological or productivity shifts and macro trends that define the functioning of markets and economies.

A counterfactual wage distribution is constructed for 2019 by holding compositional factors constant to their 2010 levels. The difference in wage indicators between the actual and counterfactual 2019 distributions provides the compositional contribution, while the difference between the counterfactual 2019 and actual 2010 distributions provides the structural contribution. The policy value of this exercise is to understand the degree to which changing the nature of workers and their jobs (altering compositional factors) influences wage outcomes in comparison to redefining the rules and realities within which the labour market operates (modifying structural parameters). Appendix 3 provides a more detailed explanation of the method.

It is important to note here that our use of sectoral variables under the compositional category is at variance with the usual approach in Malaysia's policy discourse of classifying sectoral changes within structural parameters. We adopt this approach for two reasons; (i) to match the approach in the literature which often includes sectoral variables under "composition", and (ii) to more precisely isolate the policy, institutional and regulatory forces under "structural".

In further pursuance of the second objective, we replicate Card and Krueger's (1995)[14] method which exploits variations in the wage distributions of national sub-units (such as states), to assess the minimum wage's effect on the overall wage distribution. We first divide Malaysia's states (numbering 16 since we account for KL, Labuan and Putrajaya separately) into low, medium and high impact states based on where the first RM900 minimum wage level fell in their respective wage distributions[15]. We then assess how wage levels at the 5th, 10th, 25th, 50th, and 90th percentiles evolve for each of these state categories during the 2010 to 2019 period. The most significant structural force from a policy standpoint in the 2010 – 2019 period was the introduction and subsequent adjustments of the minimum wage, and so a deeper understanding of the minimum wage's effects is critical. Finally, all analyses utilize survey weights as provided by DOSM; household-level weights for HIS, and worker-level weights for SWS.

[13] Daly and Valletta (2004); ILO (2022); Fortin et al. (2010); Suqin Ge and Yang (2012); Azam (2009)

[14] Card and Krueger (1995)

[15] States where the percentage earning below minimum wage RM900 in 2012 is below 15% are categorised as high wage/low impact states, between 15% and 30% as medium wage/medium impact states, above 30% as low wage/high impact states. By 2018, percentages between groups were more identical likely due to compliance and small changes between old and new minimum wages, but the ranking of states based on the new minimum wage level remain the same except for Terengganu which increased in ranking.

3.1. Limitations

Survey data is a powerful tool for understanding polities, economies and societies. It is the foundation of much rigorous empirical work and informs the debates and mechanics of policy formulation and implementation. Nevertheless, as with all data sources, there are limitations to survey data that have a bearing on the results in this working paper.

First, household surveys are generally weak at capturing incomes at the extreme ends; low incomes because these surveys avoid hostels, dormitories and other facilities in which low wage labour may be concentrated, and high incomes because these households usually have the highest non-response rates and chronically underreport income levels. Second, HIS data covers only households with a Malaysian citizen as head of household. This means that the analysis on wages, salaries and bonuses that we conduct using HIS data excludes foreign workers. Third, SWS data excludes specific portions of the wage-earning labour force, such as domestic workers, part-time workers and temporary workers.

In spite of these limitations, we believe the following analyses provide a broadly representative picture of wage trends. The use of the wage-earning Malaysian household as the unit of analysis for HIS data allows us to observe wage trends stretching across nearly a quarter century (1995 to 2019). And the SWS' emphasis on full-time work provides a sense of how the labour market rewards work that is fully traded in the labour market.

As mentioned in the methodology section, we adapt methods applied by DiNardo et al (1996) to decompose the changes in wage inequality indicators into compositional and structural factors. For compositional factors, we apply all the variables in our SWS dataset that represent workers and their jobs, such as sex, age, citizenship, educational attainment, occupation, economic sector and location (urban/rural). The assumption in this approach is that these variables capture most, if not all, of the main compositional effects affecting wage trends and we must concede that this may not be the case. Nonetheless, our approach and selection of compositional variables compare well to a similar multi-country study by the ILO in their recent Global Wage Report[16], and our understanding and application of the method was discussed and reviewed by an ILO econometrician and wage specialist, Dr Rosalia Vazquez-Alvarez.

Finally, our results provide a vivid understanding of the distributional dimensions of wage growth, but they don't necessarily shed light on elements of wage or job mobility. A worker at the bottom of the wage distribution (in the first decile) may, over the course of their career, climb the wage ladder to higher deciles. We are unable to provide an empirical assessment of such mobility since this would require panel data at the worker level.

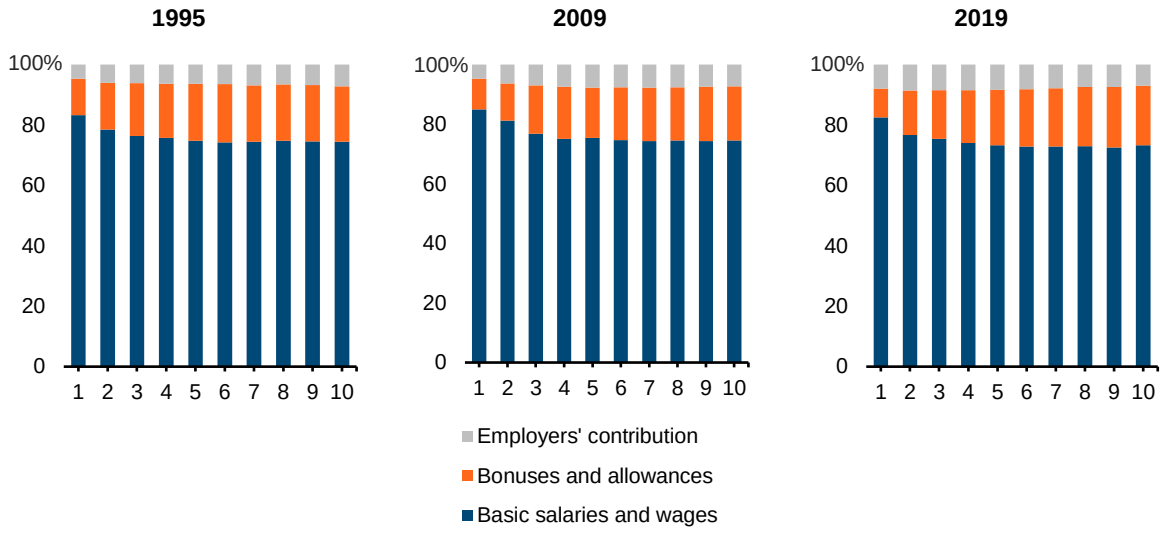
[16] ILO (2022)

4. Results

4.1. Some descriptive statistics

The rich datasets from DOSM provide the opportunity to generate an array of descriptive statistics, but we must adopt a parsimonious approach here for two reasons. First, many descriptive stats are already available via DOSM's portal (such as median and mean wage levels etc.) and those statistics don't require repetition here. Second, an overzealous review of descriptive statistics would detract precious attention from the two primary objectives of this study. Therefore, please forgive us for focusing our attention on just a few elements of the data that we think can inform and elevate understanding of our methods and results.

Figure 1: Share of total paid employment income by income category, by decile, 1995, 2009 and 2019



Source: DOS (2022), authors' calculations

Figure 1 above presents how total paid employment income, collected as part of the HIS surveys, is disaggregated between three income categories across wage deciles[17] for 1995, 2009 and 2019. Basic salaries and wages, and bonuses and allowances, comprise labour income that is directly enjoyed by a household or worker in monetary or real[18] terms. Employers' contribution captures the portion of the wage bill that flows towards EPF retirement schemes and SOCSO social protection coverage. The portion comprised of bonuses and allowances increases sharply from the first to the fourth deciles, before settling at around 20% of the total for the top 60% of the wage distribution (D4 to D10). Basic salaries and wages, though declining in significance for the first four deciles, is still sizeable across the distribution, making up between 73 to 83% of total paid employment income. Employers' contributions are a small portion of the total across deciles, and never exceed ~8%.

[17] Deciles organise wage earners from the lowest to highest earners, and then divide them into 10 equal groups, with the lowest earners in decile 1 (D1) and the highest in decile 10 (D10).
[18] In kind payments, such as housing and food.

The data above indicate that variations in employers' contributions do not significantly affect total paid employment, and that our exclusion of this category does not weaken the power of our results to represent long-term wage trends. More importantly, we are primarily concerned with how labour is rewarded in immediate and directly tangible terms, and employers' contributions do not flow directly to workers or households but instead to intermediate state or statutory entities.

Table 4: Distribution of salary and wage recipients by demographic and occupational characteristics, by quintile, 2010 and 2019

		2010						2019					
		All	Q1	Q2	Q3	Q4	Q5	All	Q1	Q2	Q3	Q4	Q5
State group	High-wage states (KL, Putrajaya, Selangor)	31.4%	14.4	23.9	37.1	42.6	39.4	31.0	14.0	22.1	34.1	42.7	41.9
	Medium-wage states (Johor, N Sembilan, P Pinang, Melaka, Labuan, Pahang, Perak)	38.7	34.4	45.5	41.4	37.9	34.1	37.1	33.8	41.9	39.7	35.6	34.2
	Low-wage states (Kedah, Kelantan, Perlis, Sabah, Sarawak, Terengganu)	29.9	51.1	30.6	21.4	19.4	26.5	32.0	52.2	35.9	26.2	21.7	23.9
Strata	Urban	74.1	59.6	67.5	78.2	83.4	82.5	82.8	67.1	79.4	85.9	89.5	91.9
	Rural	25.9	40.4	32.5	21.8	16.6	17.5	17.3	32.9	20.6	14.1	10.5	8.1
Sex	Male	65.0	62.7	68.9	66.7	65.1	61.5	62.0	58.1	63.1	67.9	61.3	59.4
	Female	35.0	37.3	31.1	33.3	34.9	38.5	38.1	41.9	36.9	32.1	38.7	40.6
Age group	15 – 24	20.3	37.9	28.5	19.8	10.4	3.0	17.5	33.2	26.0	17.5	8.0	2.5
	25 – 54	76.3	58.1	68.4	77.4	86.3	92.9	77.4	64.0	68.2	77.8	86.2	90.7
	55 – 64	3.5	4.0	3.1	2.8	3.3	4.1	5.2	2.7	5.8	4.7	5.8	6.8
Education level	No formal education	2.0	4.9	3.3	1.1	0.3	0.1	2.0	4.1	3.9	1.7	0.4	0.1
	Primary	14.0	28.2	21.1	11.7	6.4	1.4	10.2	21.5	14.9	9.2	4.0	1.2
	Secondary	57.4	61.0	67.1	67.6	58.1	30.6	55.3	64.4	66.5	66.2	52.1	27.3
	Tertiary	26.6	5.9	8.5	19.6	35.2	67.8	32.5	10.1	14.7	22.8	43.5	71.4
Citizenship	Malaysian	85.5	67.8	75.2	89.8	97.1	99.0	84.3	68.4	73.0	85.0	97.1	97.9
	Non-Malaysian	14.5	32.2	24.8	10.2	2.9	1.0	15.7	31.6	27.0	15.0	2.9	2.1
Skill level	Low	10.9	21.2	14.7	11.0	5.8	0.5	13.3	27.8	18.5	13.0	5.7	1.3
	Mid	60.5	74.2	77.5	71.1	52.2	24.1	56.1	67.4	72.9	70.0	52.0	18.1
	High	28.7	4.6	7.7	17.9	41.9	75.4	30.7	4.8	8.6	17.0	42.3	80.6
Sector	Agriculture, forestry and fisheries	6.6	14.9	11.0	4.2	1.7	0.9	5.9	11.5	9.2	5.8	2.2	0.7
	Mining and quarrying	0.6	0.3	0.6	0.4	0.4	1.3	0.7	0.1	0.1	0.4	1.6	1.2
	Manufacturing	21.9	25.5	28.2	21.6	19.3	14.1	21.1	24.4	28.8	24.9	16.7	10.8
	Construction	9.5	8.9	13.1	12.9	7.9	4.5	8.5	9.9	10.0	10.0	6.9	5.7
	Modern services	8.1	2.1	3.3	7.8	11.9	15.9	8.2	0.8	1.9	5.9	15.5	17.1
	Other services	53.4	48.3	43.9	53.1	58.9	63.3	55.5	53.2	50.0	53.0	57.1	64.5

Note:

1. Quintiles are created by ordering workers from lowest to highest earners, and then dividing them into 5 equal groups.
2. Occupations are grouped into skill level as follows: (1) managers, professionals, and technicians and associated professionals as high-skilled (2) clerical support workers, services and sales workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, and plant and machine-operators and assemblers as mid-skilled, and (3) elementary occupations as low-skilled.
3. Modern services include information and communication; financial and insurance/takaful activities; real estate activities; and professional, scientific and technical activities while other services include other industries under the services sector excluding modern services.

Source: DOS (2022), authors' calculations

The emphasis in Table 4 above shifts to SWS data, and it presents how, for 2010 and 2019, wage recipients in each wage quintile are divided between states, strata, sex, age, education, citizenship, skill level and sector. We also present how the overall wage recipient population is divided between these characteristics (the two "All" columns), since it allows for an assessment of whether particular characteristics are over or underrepresented within each quintile.

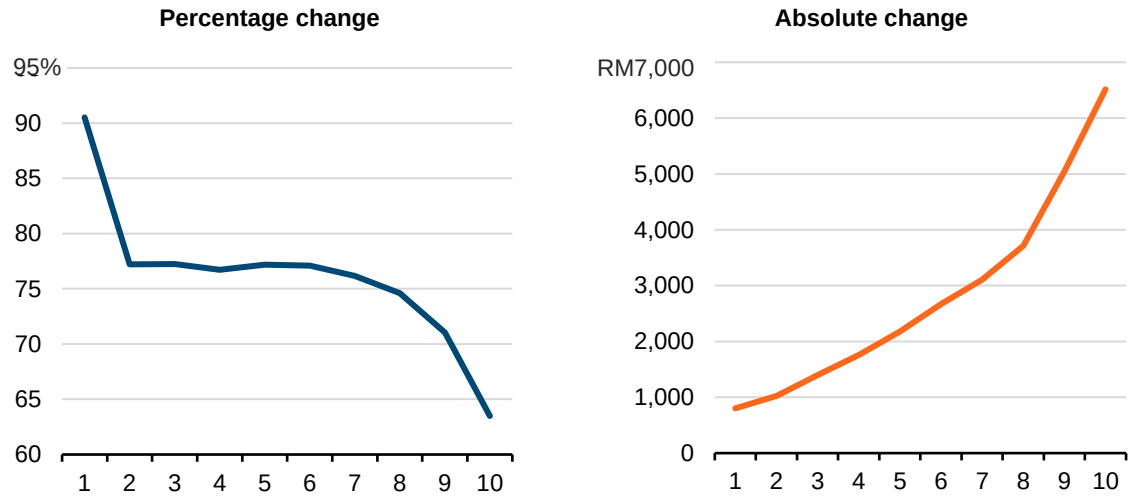
As indicated in the methodology section, we divide Malaysia's states into high, medium and low wage groups in the application of one of our analytical methods. We find that this division is effective; the majority of quintile one (Q1) are concentrated in low wage states, quintiles two (Q2) and three (Q3) are primarily concentrated in medium wage states, and the central density for the top two quintiles (Q4 and Q5) are in high wage states.

While Malaysia's labour force is concentrated in urban areas, as is reflected across all quintiles, rural areas are overrepresented in the bottom two quintiles. The gender pattern is interesting; women are overrepresented in the bottom and top quintiles, while being underrepresented in the middle. It is important to reemphasize here that our use of over (under) representation does not indicate a majority (minority) position, but rather a proportion that is greater (less) **relative** to overall workforce statistics. In 2019, for example, 38.1% of wage recipients were women, but women comprised 41.9% of the lowest wage earners (Q1) and 40.6% of the top (Q5)—thus overrepresentation in these segments.

Young wage earners (age 15 – 24) and non-Malaysians are overrepresented in the bottom two quintiles. To emphasize the productive challenges of our economy, mid-skilled employment is overrepresented in the bottom 3 quintiles and comprise the majority in all but the top-most quintile. From a sectoral perspective, manufacturing, construction and agriculture are overrepresented in the bottom 2 to 3 quintiles. The data for "Other services" indicates the heterogeneity of this sectoral grouping, and the increase in its representation for the bottom two quintiles from 2010 to 2019 is noteworthy.

4.2. Wage growth and inequality for the wage-earning Malaysian household, 1995 – 2019, HIS data

Figure 2: Percentage and absolute change in real monthly household wage, by decile, 1995 – 2019



Note: Household wages are in real 2021 terms.
Source: DOS (2022), authors' calculations

Figure 2 above presents wage growth in percentage and absolute terms for the **wage-earning household** at the decile level for the period 1995 – 2019. The x-axes are wage-earning households arranged from lowest to highest earners, and then divided into 10 equal groups (deciles). The y-axis on the left is in percent, while the one on the right is in real 2021 ringgit.

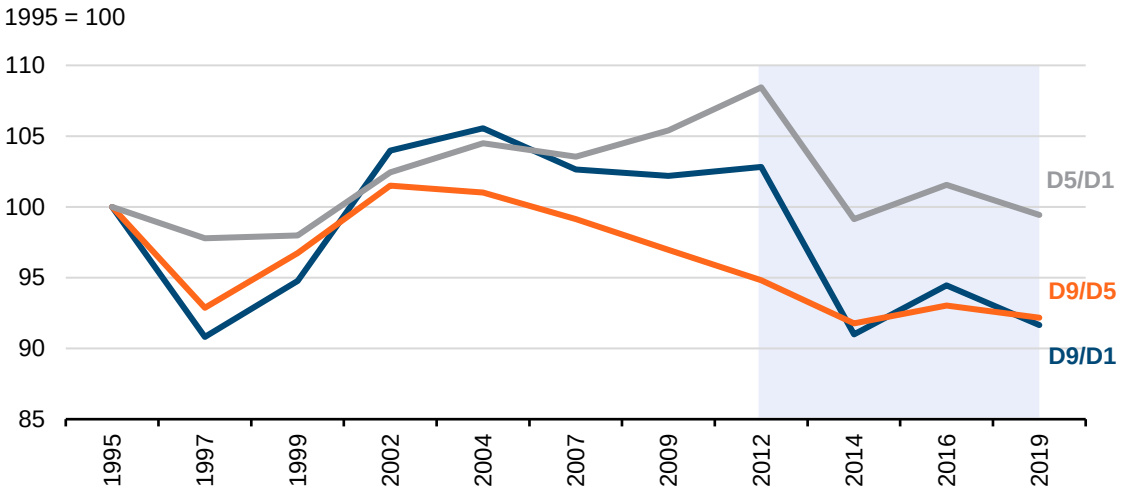
For the graph on the left (percentage) we see a shape made up of three distinct sections. The first is a sharply progressive[19] shape from the first to the second decile. The following 4 deciles are neutral in their growth pattern, and then there's a progressive trend for the top 4 deciles. The kink at the second decile, indicating a much greater growth rate for the first decile, is suggestive of a possible external intervention or shock, and motivates much of our following analyses. In fact, the growth rate for the bottom decile is 28 percentage points higher than that of the top decile, and 14 percentage points higher than the growth rate for the median household (5th decile).

The graph on the right (absolute), is a reminder that a progressive relative pattern need not translate into progressive absolute realities. The graph has an exponentially regressive pattern, with an inflection at the 8th decile indicating higher absolute growth for the top 20%. The real[20] monthly household wage for the bottom 10% grew by only RM802 over 24 years, averaging to an annual increase of about RM33. The median household experienced an increase of RM2,177, or an annual average increase of RM90. In comparison, the 9th and 10th deciles found their real monthly wages increasing by more than RM5,046 (an average annual increase of more than RM210). The increase in absolute inequality is confirmed by the increase in the standard deviation of the wage distribution from RM1,960 to RM3,643, and the increase of the interquartile range from RM2,265 to RM4,652, in the 1995 – 2019 period.

[19] Progressive = higher growth for lower wage groups. Regressive = lower growth for lower wage groups.
[20] All real values are in 2021 ringgit after adjusting for inflation.

As implied above, there is value in further investigating these patterns to assess the potential role of external shocks. Figure 3 below presents a trend of headline (wage ratio of the 9th to 1st decile – D9/D1), top-end (wage ratio of the 9th to 5th decile – D9/D5), and low-end (wage ratio of the 5th to 1st decile – D5/D1) inequality indicators from 1995 to 2019. All values are indexed to their 1995 levels.

Figure 3: HIS D9/D1, D9/D5 and D5/D1 ratios, 1995 – 2019

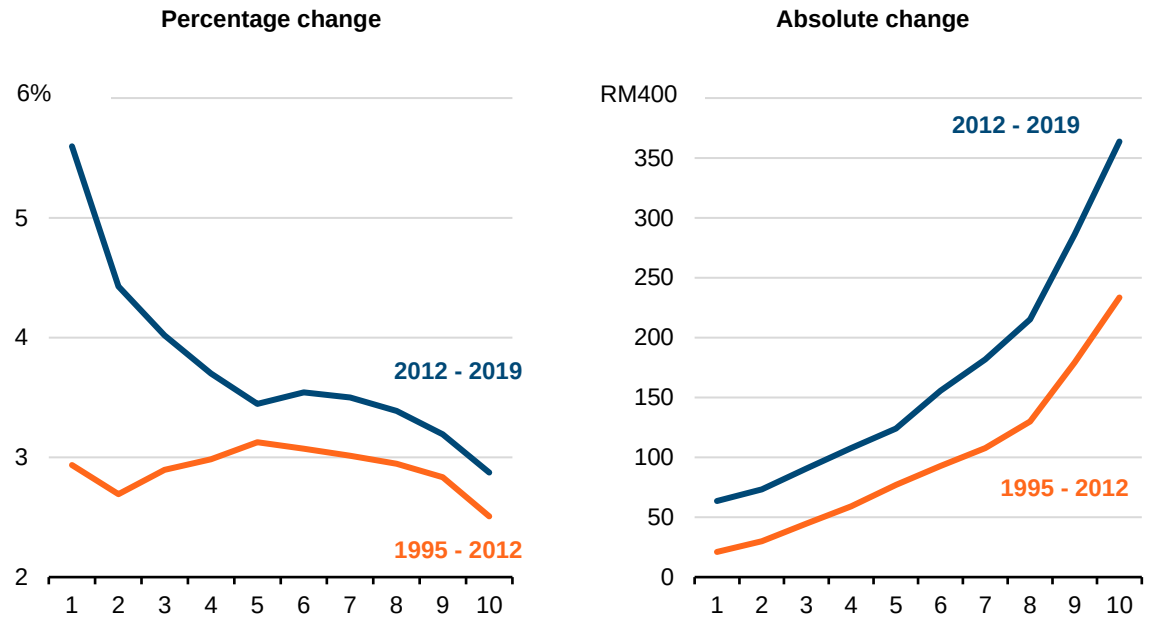


Note: Household wages are in real 2021 terms.
Source: DOS (2022), authors' calculations

All inequality indicators dip from 1995 to 1997, before experiencing a steep rise from 1997 to 2002, and there their paths diverge. Top end household wage inequality (D9/D5) steadily declines before flattening at around 8% below its 1995 level from 2014 to 2019. The Gini Coefficient's indexed trend closely tracks that of the D9/D5 ratio (see Appendix 2). Headline (D9/D1) and low-end (D5/D1) inequality remain at elevated levels until 2012; low-end inequality peaks at 8% its 1995 level in 2012. But from 2012 onwards we witness a dramatic improvement in the position of low-wage households (D1) in relation to median (D5) and high wage (D9) households; D5/D1 returns to its 1995 level, and D9/D1 is 8% below its 1995 level. The Coefficient of Variation (CoV), though already on a downward trend, also declines sharply to a lower level in 2012 (see Appendix 2).

The dramatic improvement in the relative position of low-wage households, and the concomitant reduction in headline and low-end inequality, in the "special decade" preceding the pandemic is worthy of greater exploration. Figure 4 decomposes the 24-year results in Figure 2 into two time periods (1995 to 2012, and 2012 to 2019), and presents their annualised growth rates to improve comparability since they cover time periods of varying lengths.

Figure 4: Annualized percentage and absolute change in real monthly household wage, by decile, 1995 – 2012 and 2012 – 2019



Note: Household wages are in real 2021 terms.
Source: DOS (2022), authors' calculations

We see from these graphs that, not only was wage growth at the household level greater in the 2012 – 2019 period for all parts of the distribution, but also that almost all the overall progressive relative pattern is attributable to this period. The relative (percentage) growth pattern for 1995 – 2012 is distinctly regressive for most of the bottom half of the distribution, and broadly regressive across the distribution—the growth rates for the bottom 4 deciles are below 3%, while they're above 3% from the median to the 7th decile (D5 to D7). These potentially reflect the Malaysian labour market's long-term structural inequalities in the absence of the interventions of the 2010s.

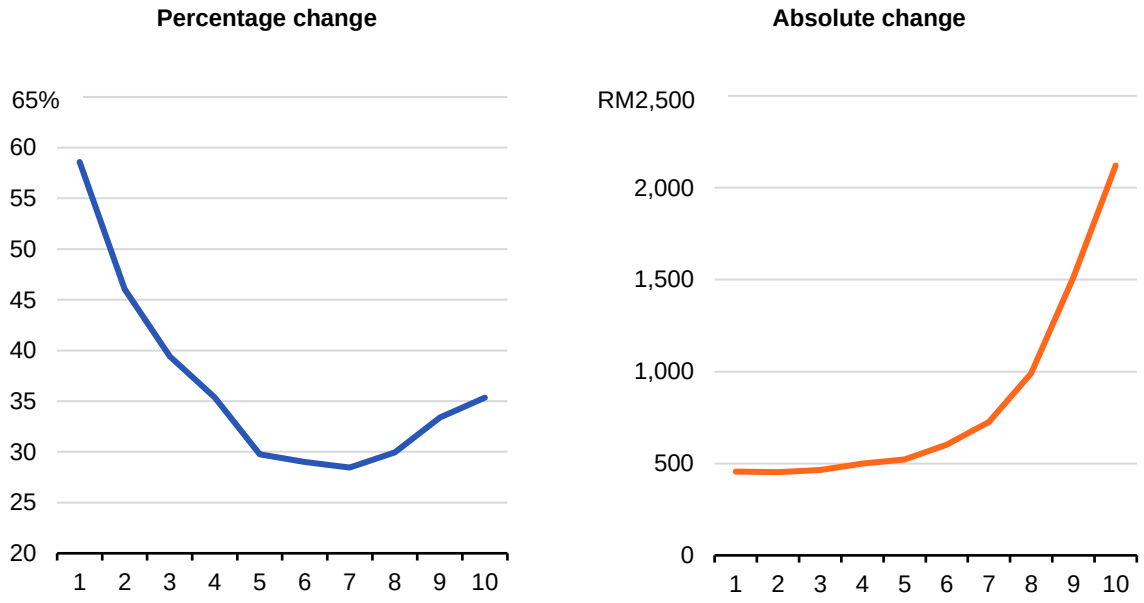
A substantial upswing in the percentage growth of the bottom half of the distribution occurs in 2012 – 2019, with the median (D5) acting as a pivot point since the relative pattern of the top half remains remarkably similar. This improvement in the wage earnings of the bottom 50% of households causes the overall relative pattern for 2012 – 2019 to assume a progressive shape.

It is important to note that the results presented thus far are at the wage-earning household level, and the ideal trend to have observed would be wages at the individual worker level. Nevertheless, as presented in Appendix 5, the correlation between total household wages and total household income is high across all HIS survey years (R-squared range from 0.506 to 0.948), and so these results provide a robust indication of how the labour market has rewarded households from 1995 to 2019.

In order to better understand the "special decade" preceding the pandemic, we now shift our attention to SWS data, which provides worker-level wage trends on an annual basis from 2010 to 2019.

4.3. Wage growth and inequality for the wage-earning worker, 2010 – 2019, SWS data

Figure 5: Percentage and absolute change in real monthly individual wage, by decile, 2010 – 2019



Note: Individual wages are in real 2021 terms.
Source: DOS (2022), authors' calculations

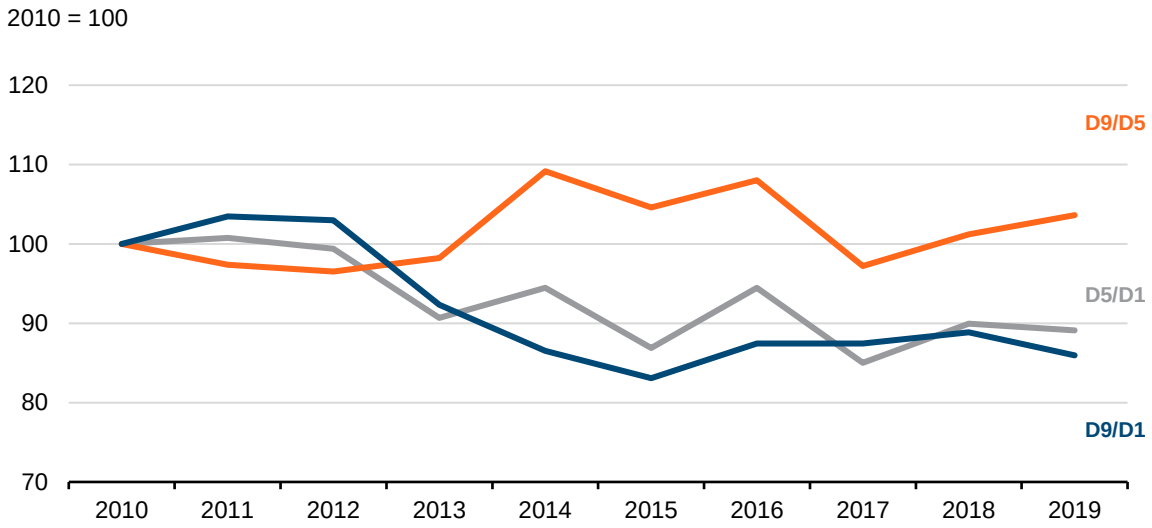
Figure 5 above reproduces the percentage and absolute growth analyses in the previous section, but for the period 2010 – 2019 and using wages at the worker level. As a result of the increased granularity of wage data, we are able to observe more precise trends across deciles.

The relative (percentage) growth pattern during this decade demonstrates a distinct U-shape, with a pronounced and raised left tail. The curve descends steeply from the first decile to the median (a progressive pattern), and then flattens at an approximate 30% growth rate between the median to the 8th decile (a neutral pattern), before rebounding for the top 2 deciles of wage earners (a regressive pattern). This seems to indicate a "squeezed middle" of 30% of the workforce (between the median and the 8th decile) that finds its relative position in decline.

The absolute pattern on the right, as usual, provides a telling counterpoint. The curve is exponentially regressive, as observed in the previous section. The most startling result is that the increase in the real monthly wage per worker across this 9-year period is only approximately RM500 for the whole of the bottom 50% of the wage distribution—the line is almost perfectly flat at the RM500 level (RM458 at D1 to RM508 at D5). This translates to an average annual increase of only RM56 per worker in real terms for the bottom 50% of workers—a clear indication of wage stagnation. This is in spite of the improved relative position of these workers and speaks volumes of suppressed wage growth in general.

The 5th to 8th deciles ("squeezed middle") fare little better, with absolute real increases from RM508 (D5) to RM887 (D8). A significant jump is observed for D9 (RM1,433) and D10 (RM2,107). Growing levels of absolute inequality are confirmed by the increase in the standard deviation of the wage distribution from RM1,292 in 2010 to RM1,784 in 2019, and the increase in the interquartile range from RM1,619 in 2010 to RM2,073 in 2019 (see Appendix 2).

Figure 6: SWS D9/D1, D9/D5 and D5/D1 ratios, 2010 – 2019



Note: Individual wages are in real 2021 terms.
Source: DOS (2022), authors' calculations

Figure 6 provides a time trend of key relative inequality indicators, with all values indexed to their 2010 levels. Headline inequality (D9/D1) and low-end inequality (D5/D1) stagnate between 2010 to 2012, and then, from 2012 to 2015, decline by 13 and 17% respectively in comparison to their 2010 levels. They fluctuate slightly at these lower levels but don't greatly alter their positions; they end the decade 11 and 14% below their 2010 levels.

Top-end inequality (D9/D5) tells a different story. After stagnating between 2010 to 2013, top-end inequality increases from 2013 to 2016 (8% above its 2010 level), dips in 2017 (3% below its 2010 level), before ending the decade 4% above its 2010 level. The changes wrought in the wage distribution during this decade seem not to have greatly affected top-end inequality. If anything, the greatest increase in top-end inequality is synchronous with the greatest decline in the other two inequality indicators (2012 – 2015). The Gini Index and the Coefficient of Variation, both summary measures of relative inequality, are stagnant during this period and end the decade 1 and 4% below their 2010 levels (see Appendix 2); these too seem relatively unaffected by factors influencing headline and low-end inequality.

The data above emphasize a few critical points for 2010 – 2019. The lowest wage earners have greatly improved their relative position against both middle and high wage earners. Middle wage earners, on the other hand, have experienced a relative decline in their position against low wage earners and have barely maintained their position against high wage earners. The changes of this "special decade" have shifted the distribution in favour of low wage workers, while failing to meaningfully reward the middle.

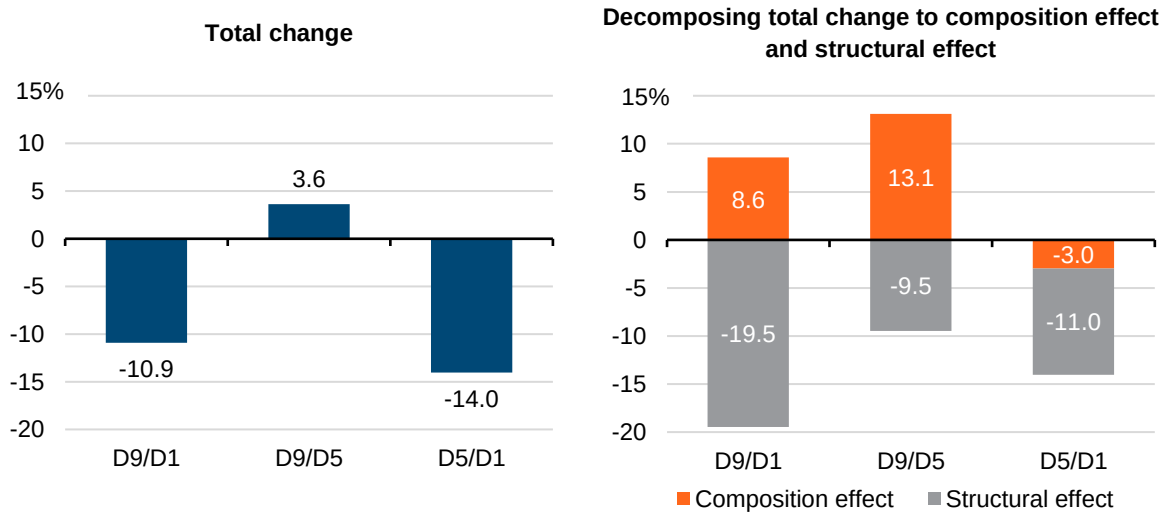
We now attempt to disentangle the driving forces of these relative trends. While we are cognizant of the importance of absolute measures of inequality, relative indicators are a more useful analytical tool since they account for a shifting wage distribution in the context of economic growth and institutional change, and so the following analyses are focused on relative measures.

4.4. Decomposing the "special decade", 2010 – 2019, SWS data

Studies on inequality have attempted to understand how and why inequality indicators evolve over time, and decomposition methods have proved particularly useful in pursuing a deeper understanding of the forces that drive dispersion or convergence. We adopt here the method used by DiNardo et al (1996)[21], and adapted to a multi-country analysis in the ILO's most recent Global Wage Report[22], to estimate the contributions of compositional and structural factors to changes in wage inequality. For more details on the method see Appendix 3.

Compositional factors include variables related to the characteristics of individual workers and their jobs, such as sex, age, citizenship, education, occupation, sector and geography (urban/rural). Structural components are all other residual factors, which primarily relate to policies, regulations, cultural norms, technological or productivity shifts, and other macro trends beyond the control of any individual worker or employer[23].

Figure 7: Decomposing the change in real monthly individual wage inequality between 2010 and 2019 to isolate the contributions due to composition and structural effects, by D9/D1, D9/D5 and D5/D1 ratios



Note: Individual wages are in real 2021 terms.
Source: DOS (2022), authors' calculations

[21] DiNardo et al. (1996)
[22] ILO (2022)
[23] Our use of sectoral variables under the compositional category is at variance with the usual approach in Malaysia's policy discourse of classifying sectoral changes within structural parameters. We adopt this approach for two reasons; (i) to match the approach in the literature which often includes sectoral variables under "composition", and (ii) to more precisely isolate the policy, institutional and regulatory forces under "structural".

The graph on the left in Figure 7 recapitulates the changes in the three key relative inequality indicators discussed in the previous section, while the right graph decomposes these changes into composition and structural effects. The significant progressive effect of structural forces is apparent from the results. In the absence of the countervailing effect of structural forces, headline inequality (D9/D1) may have actually increased in this period. The decline in low-end inequality (D5/D1) was intensified by structural effects. Top-end inequality (D9/D5) may have worsened to a much greater degree without the progressivism of structural change.

Another important point to note here is the greater progressive effect of structural forces for the relative position of the lowest earners (D9/D1 and D5/D1), compared to middle earners (D9/D5). The compositional factors of the "squeezed middle", meaning the specific nature of their labour and jobs, seem to be holding back their wage growth relative to the highest earners.

These results invite us to further explore the most salient structural force in the 2010-2019 period; the minimum wage. It is plausibly arguable that no other policy shift, or insitutional reform, affected wage setting as much as the introduction and subsequent adjustments of the minimum wage. Table 5 below presents a summary of minimum wage levels and details for the period under study.

Table 5: Summary of minimum wage levels, 2012 – 2020

Round	Level (Nominal RM)	Year of announcement	Year of enforcement
Introduction	RM900 (Peninsular) 850 (East Malaysia)	2012	Initially 2013, and then delayed to early 2014
Adjustment 1	1,000 (Peninsular) 920 (East Malaysia)	Mid-2016	Mid-2016
Adjustment 2	1,050	2018	Early 2019
Adjustment 3	1,200 (for 57 towns/cities) 1,100	2019	Early 2020

Source: Astro Awani (2013), Berita Harian (2019), Siti A'isyah Sukaimi and Noor Atiqah Sulaiman (2018), Suhaila Shahrul Annuar (2016), Adib Povera et al. (2022)

We present both years of announcement and enforcement based on past evidence that many employers reset wages in response to an announcement, or even a hint, of a new minimum wage level, without necessarily waiting for the date of enforcement[24]. This is both to rapidly incorporate the new wage level into their operations, and to avoid implementation gaps closer to the enforcement date. This is of course not true of all employers, some of whom may delay or avoid implementation altogether, but we must nevertheless account for the announcement effect in our following analyses. We present below the kernel density graphs of the annual wage distributions to further uncover the time horizons in which these minimum wage levels took effect.

[24] Card and Krueger (1995)

Figure 8: Kernel density estimates of nominal monthly wage, 2010 – 2015

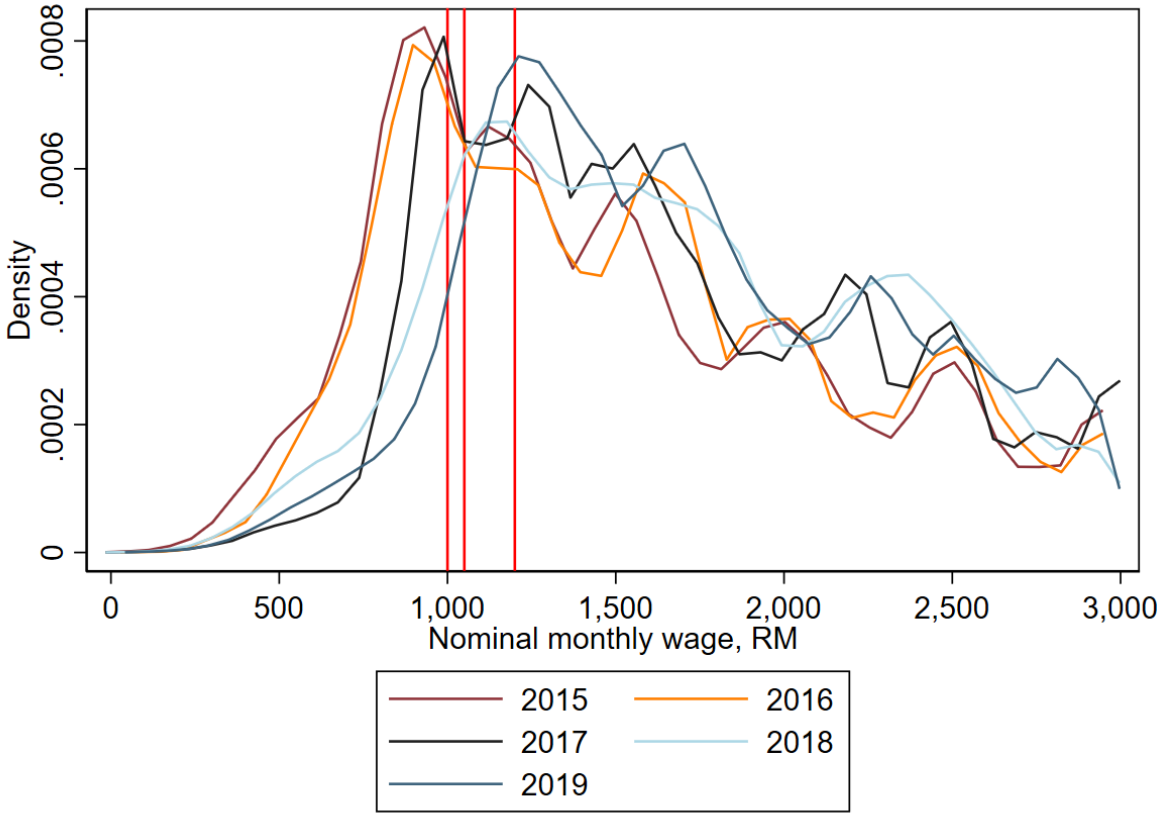
Note: In this figure, outliers included. Vertical red line indicates minimum monthly wage level RM900 (announced 2012, enforced 2014).
Source: DOS (2022), authors' calculations

Figure 8 above focuses on the first half of the decade (2010 – 2015). We limit the upper bound of the distribution to a nominal monthly wage of RM3,000 in order to better detect changes in the lower end of the wage distribution[25]. The vertical red line is the RM900 minimum wage announced in 2012 and enforced in early 2014; where there is more than one minimum wage level, we choose to visualise the higher level which usually covers the majority of the labour force.

The distributions for 2010 to 2012 exhibit some movement to the right, but there is no significant reduction in the density of wages below the RM900 level. We see a more pronounced reduction in sub-minimum wage density, and a peaking of the density at the RM900 level, from 2012 to 2015. These trends signal that employers were resetting wages in response to the first minimum wage in the 2012 to 2015 period.

[25] The overall distribution, as is common of most income distributions, is heavily skewed to the right, thereby making changes at the lower end less visually detectable when graphed as a whole.

Figure 9: Kernel density estimates of nominal monthly wage, 2015 – 2019



Note: In this figure, outliers included. Vertical red lines indicate minimum monthly wage levels RM1,000 (announced and enforced in 2016), RM1,050 (announced 2018, enforced 2019) and RM1,200 (announced 2019, enforced 2020).
Source: DOS (2022), authors' calculations

Figure 9 above visualises the distributions of the second half of the decade (2015 – 2019). The three vertical red lines represent minimum wage adjustments 1, 2 and 3. We see that the sub-minimum wage distributions of 2015 and 2016 closely trace each other, further corroborating our assessment that the distributional effects of the first minimum wage introduction largely ended by 2015.

In response to adjustment 1 (RM1,000), we see a significant reduction in the lower density in the 2016 – 2017 period. The quantum of adjustment 2's increase (a mere RM50) seems not to have greatly affected the distribution, and we in fact see a slight increase in the lower density for 2018. Adjustment 3 (RM1,200) is correlated with a marked reduction in the lower density in the 2018 – 2019 period, but we would also expect adjustment 3's effects to have lingered into the 2019 – 2020 period which is excluded from this study for reasons explained in the introduction section.

One of the most striking aspects of the visualisations above is the minimum wage's power to concentrate the lower end of the wage distribution at a new peak, which is consistent with global evidence[26]. Based on the above, we further analyse the minimum wage's distributional effects over three impact periods in 2010 – 2019 (see Table 6 below for an enumeration of impact periods).

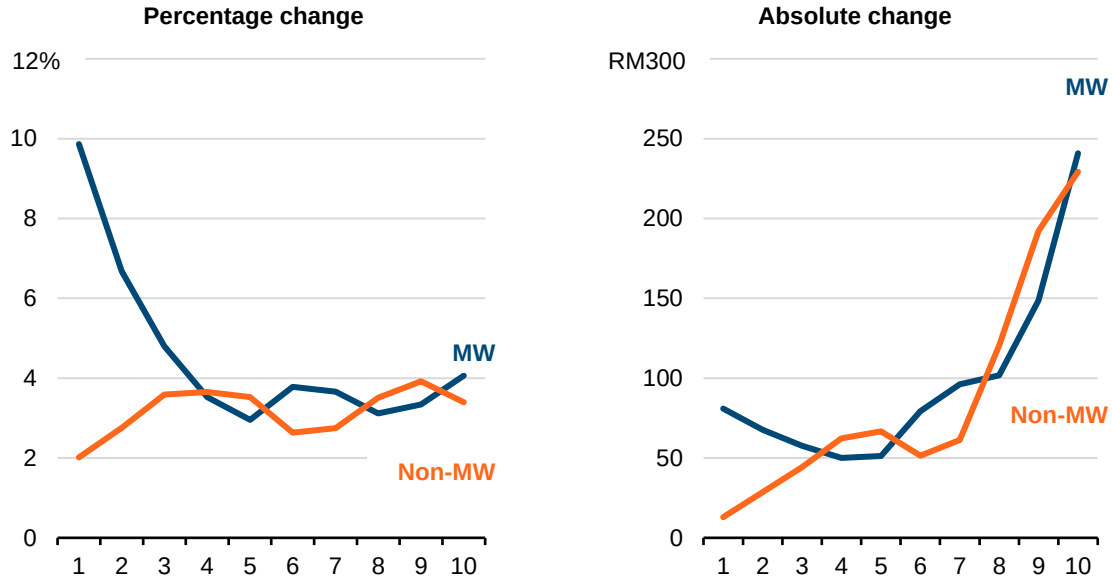
Table 6: Distribution effects of minimum wage over three impact periods in 2010 – 2019

Round	Level in nominal terms	Impact Periods
Introduction	RM 900 (Peninsular) 850 (Sabah & Sarawak)	Impact Period 1: 2012 – 2015
Adjustment 1	1,000 (Peninsular) 920 (Sabah & Sarawak)	Impact Period 2: 2016 – 2017
Adjustment 2	1,050	Weak effect on wage distribution
Adjustment 3	1,200 (for 57 towns/cities) 1,100	Impact Period 3: 2018 – 2019

4.5. Assessing the minimum wage's distributional effects, 2010 – 2019, SWS data

Figure 5 presented cumulative wage growth patterns in both percentage and absolute terms for the 2010 – 2019 period. In order to isolate the minimum wage's distributional effects, we decompose them into minimum wage impact and non-impact periods.

Figure 10: Annualized percentage and absolute change in real monthly individual wage, by decile, minimum wage impact (MW) and non-impact (non-MW) periods



Note: Individual wages are in real 2021 terms. Minimum wage impact period includes 2012 – 2015, 2016 – 2017 and 2018 – 2019, while non-impact period includes 2010 – 2012, 2015 – 2016 and 2017 – 2018.
Source: DOS (2022), authors' calculations

[26] Card and Krueger (1995)

The impact periods (labelled "MW" in Figure 10 above) present average annual wage growth in percentage and absolute terms for the 2012 – 2015, 2016 – 2017 and 2018 – 2019 periods. These were the periods that demonstrated distributional shifts in response to the minimum wage as explained in the previous section. The non-impact periods (labelled "Non-MW") present the average annual wage growth results for the remaining periods. Appendix 6 contains these visualisations for each survey interval.

What is clearly noticeable from the left graph in Figure 10 is that nearly all the progressive wage growth for the bottom half of the wage distribution in the 2010 – 2019 period is concentrated in the minimum wage impact periods. When we exclude the minimum wage years, the result is an overall upward slope, indicating a broadly regressive growth pattern; this is consistent with the 1995 – 2012 household wage growth trend observed in Figure 4 using HIS data, further corroborating the notion that the Malaysian labour market's wage growth dynamics are, in the absence of institutional and policy interventions such as the minimum wage, generally supressed and broadly regressive in nature.

The right graph (Figure 10) emphasizes the progressive importance of the minimum wage, even in absolute terms. We see that the median acts as a pivot point; when the minimum wage is in effect, absolute wage growth for the lower half of the distribution swivels upwards like a switch. This positive effect for the lower half is so significant that we see a progressive absolute pattern from the first decile to the median for the minimum wage years – the first time a progressive absolute pattern is observed during the entire timescale of this study. We also see more evidence of a squeezed middle; when the minimum wage is in effect, the 6th decile's absolute real wage growth is equivalent to the 1st decile's, and the 4th and 5th deciles experience the lowest growth quantum of the whole distribution.

These findings, combined with the time trend of relative inequality indicators in Figure 6, suggest that the minimum wage has compressed the lower half of the wage distribution, causing low wage earners to catch up to middle earners, but not greatly affecting top end inequality. We also see from Figure 10 that the minimum wage exerts the greatest effect on the lowest earners (D1) and its effect weakens significantly for the following deciles before dissipating at the median.

We attempt to further unpack the minimum wage's effects on various points in the distribution by replicating an approach used by Card & Krueger (1995) in their study of the minimum wage in the US. We divide Malaysia's states into high, low, and mid impact groups, depending on where the initial RM900 minimum wage level fell in their respective wage distributions (see methodology section for a more detailed explanation). The states and their categorizations are in Table 7 below; the total wage-earning workforce is roughly divided into thirds among the three categories.

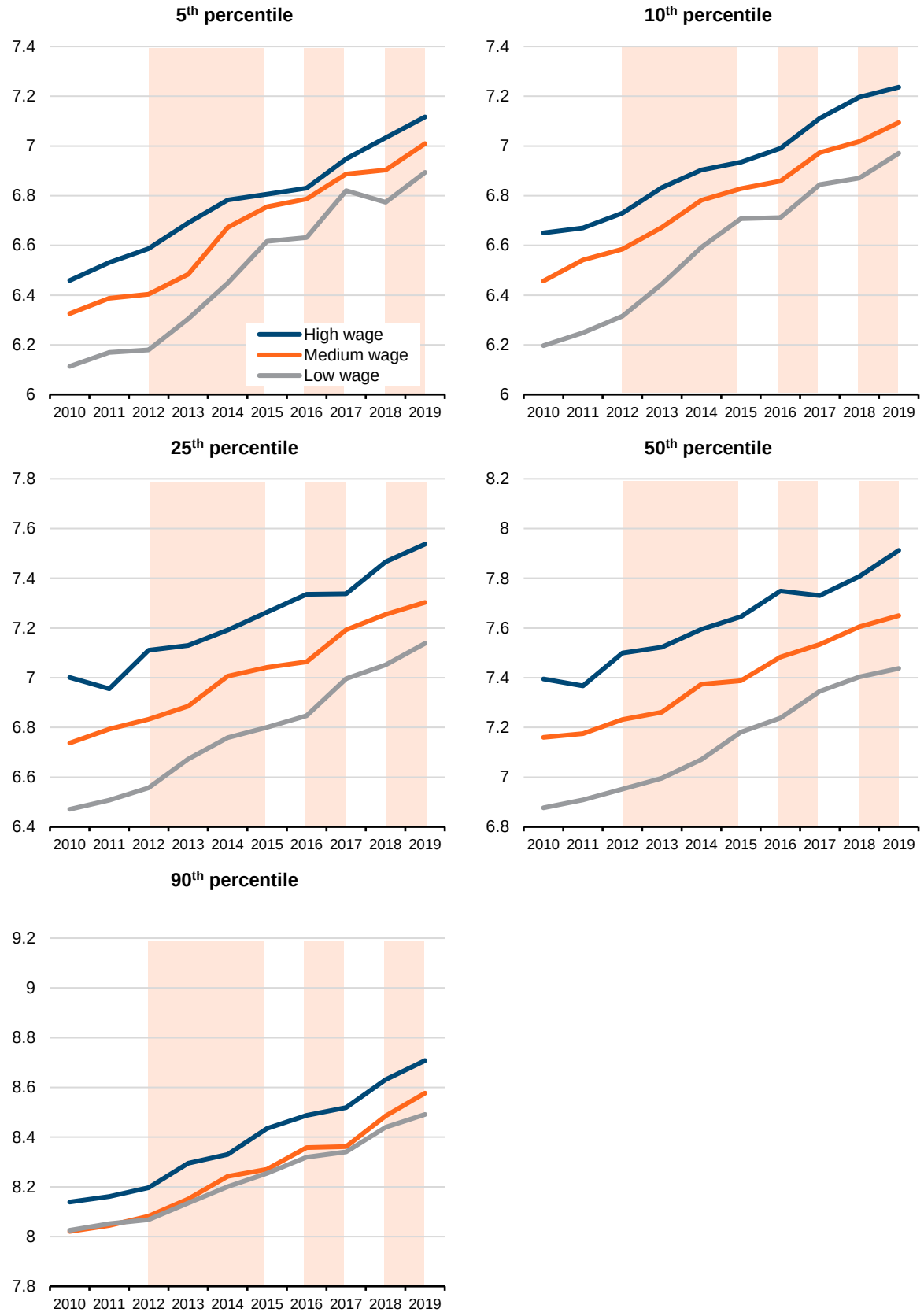
Table 7: State categories by wage level/minimum wage impact

Category	States	Percentage of total wage earners
Low Wage (High Impact)	Kedah, Sarawak, Terengganu, Perlis, Kelantan, Sabah	29%
Medium Wage (Medium Impact)	Johor, N Sembilan, P Pinang, Melaka, Labuan, Pahang, Perak	38
High Wage (Low Impact)	Putrajaya, KL, Selangor	33

Note: States where the percentage earning below minimum wage RM900 in 2012 is below 15% are categorised as high wage/low impact states, between 15% and 30% as medium wage/medium impact states, above 30% as low wage/high impact states. By 2018, percentages between groups were more identical likely due to compliance and small changes between old and new minimum wages, but the ranking of states based on the new minimum wage level remain the same except for Terengganu which improved in ranking i.e. smaller percentage affected by new minimum wage.
Source: DOS (2022), authors' calculations

The graphs below present the evolution of the natural logged values of nominal wage levels at the 5th, 10th, 25th, 50th and 90th percentiles for each of these categories during the 2010 – 2019 period. The three minimum wage impact periods are emphasized by translucent pink boxes.

Figure 11: Changes in 5th, 10th, 25th, 50th and 90th percentiles of log nominal monthly wage in high, medium and low wage states, 2010 – 2019



Note: States where the percentage earning below RM900 in 2012 is below 15% are categorised as high wage/low impact states, between 15% and 30% as medium wage/medium impact states, above 30% as low wage/high impact states.
Source: DOS (2022), authors' calculations

The first two graphs address the lowest portions of the wage distribution—the 5th and 10th percentiles—across the three state groups. We see that wage levels in low wage (high impact) states converge significantly to high wage (low impact) states during the minimum wage impact periods. The minimum wage effect weakens significantly for the 25th and 50th percentiles, but we still notice a convergence of wage levels between low wage (high impact) and medium wage (medium impact) states. Wages at the 90th percentile evolve quite independently of the minimum wage impact periods.

This analysis demonstrates how the minimum wage powerfully converged the wage levels of low wage workers across states, with the effect weakening significantly towards the median (50th percentile). It confirms the previous analyses and evidence on the minimum wage driving wage growth for low wage workers and compressing the wage structure to reduce headline (D9/D1) and low-end inequality (D5/D1) in the 2010 – 2019 period. But it is a limited tool for driving overall wage growth, and there is significant evidence of a squeezed middle group of wage earners whose relative position is in decline.

5. Discussion

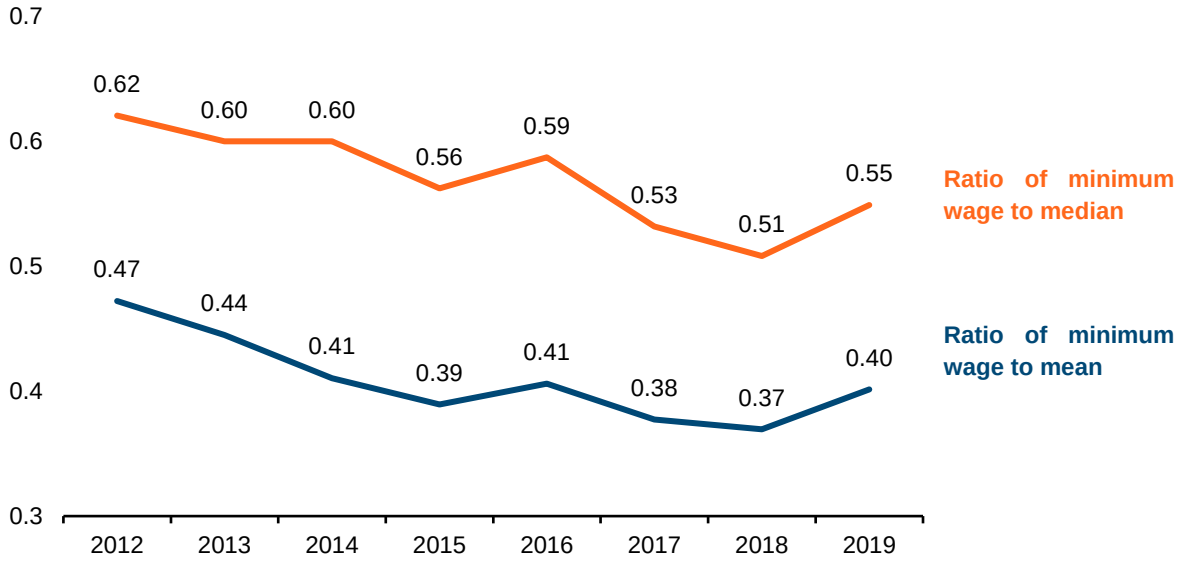
There are a few essential points from the evidence above that bear repeating and elaboration here. First, the Malaysian labour market, in the absence of robust policy and institutional measures, demonstrates a structural pattern of suppressed and broadly regressive wage growth. While the overall relative pattern for 1995 – 2019 has been progressive, this progressivity is almost exclusively a result of time periods in which the minimum wage was introduced. In other words, the labour market, "left to its own devices", and functioning with prevalent market imperfections and power imbalances, provides a poor pathway for the larger part of the workforce to secure the foundations of a dignified life. The paltry levels of real wage growth in absolute ringgit terms for the bottom half of the wage distribution, even after including the effect of the minimum wage, is testament to this reality.

Attendant to the point above is the importance of the minimum wage as a force of wage growth for low wage workers, particularly in an economic environment characterised by very low unionisation and collective bargaining coverage rates[27]. A statutory wage floor has proved useful even in contexts with a long tradition of institutionalised wage bargaining, particularly to mitigate the effects of declining unionization and increasing non-compliance with centralised wage agreements—Germany is an example in this regard[28]. The minimum wage level also signals the remuneration "floor" beneath which a society finds labour to be fundamentally undignified and exploitative in nature—it is, to some extent, a reflection of societal values.

[27] Muthusamy and Wilkstrom (2022)
[28] Dustmann et al. (2021); Garloff (2017)

With this in mind, it is useful to consider how "generous" the minimum wage has been in the period of our study in relation to the overall wage distribution. A useful, if blunt, indicator of the minimum wage's "bite" is the Kaitz Index, which is the ratio of the minimum wage to a chosen average wage indicator (median or mean). In Figure 12 below, we present the trend for the Kaitz Index in Malaysia with both the median and mean wages as reference.

Figure 12: Kaitz index, 2012 – 2019



Source: DOS (2022), authors' calculations

We use the date of announcement as the initiation point for a particular minimum wage level. While there are small upward bumps for new minimum wage levels (2016 & 2019), the overall trend is consistently downward. The minimum wage adjustments are never sufficient to attain the original level of generosity in 2012/2013, and the ratio to the median (the most commonly used indicator) declines from 0.62 to 0.55. Therefore, while the nominal ringgit value of the minimum wage may be revised upwards, its generosity should be assessed in relation to the wage distribution prevalent at the time.

The evidence for the minimum wage's progressive effect on Malaysia's wage distribution is compelling and considering that Malaysia enjoyed relatively healthy macroeconomic indicators during this period (unemployment rate between 2.9 and 3.4%[29], and real GDP growth between 4.4 and 7.5%[30]), the minimum wage should be strengthened as a core and essential labour market institution.

[29] DOS (2023)
[30] IMF (2022)

Our analyses also find that the effect of the minimum wage weakens rapidly and significantly as the wage scale increases towards the median. There is compelling evidence of a "squeezed middle" of the wage scale, whose relative position has declined during the 2010 – 2019 period. Median wage earners experienced the lowest increase in real wages in absolute terms during the years in which the minimum wage was being implemented.

The weak wage performance for middle earners is consistent with local and global evidence on job polarisation, whereby the employment share and wage growth rates of occupations comprising the middle of the wage-skills spectrum have declined in the past few decades[31]. The root causes of these structural trends are the source of much argumentation and deliberation between schools of thought[32], but what is clear is that an approach that balances the creation of high quality and productive jobs on the one hand, and the establishment of labour market institutions that ensure fair and equitable returns to labour on the other, is critical for the prospects of middle earners.

On quality jobs, Malaysia's economic centre of gravity has drifted towards low value-added services, and we haven't sufficiently capitalised on the potential within our manufacturing, services, and agricultural sectors to move towards more knowledge, skills, and tech-intensive activities[33]. In Table 4 of the descriptive statistics section, we see "modern services" declining in importance for middle wage earners (3rd quintile) between 2010 and 2019, and sectors such as manufacturing and agriculture increasing in significance. If the manufacturing sector is stuck in a mid-to-low tech trap[34], then its increased significance for middle earners may be a contributing factor to the "squeezed middle". Another signal of the manufacturing sector's challenges is its decline in importance for high earners (quintiles 4 and 5) between 2010 and 2019, despite retaining a similar share of the total wage-earning workforce.

Many of the underwhelming labour market outcomes observed here and elsewhere is partly attributable to this economic drift. The creation and pursuit of a cohesive industrial strategy for the 21st century, and the propagation of a dynamic and innovative landscape of Malaysian firms, must form part of our approach towards productivity growth. We've placed significant focus on supplying the labour market with credentialled and skilled labour, and while there is room for improvement in this area, we also aren't creating the types of quality jobs that meet decent work standards[35] – an emphasis on firms is vital to solving this problem[36].

[31] KRI (2020); Autor (2015)
[32] Howell and Kalleberg (2022); KRI (2020)
[33] EPU (2021); KRI (2020)
[34] Ng et al. (2018)
[35] Nur Thuraya Sazali and Siti Aiysyah Tumin (2020)
[36] Mohd Amirul Rafiq Abu Rahim and Shazrul Ariff Suhaimi (2022); KRI (2020); Loecker et al. (2022); Card et al. (2018)

But our empirical results also caution against an approach that focuses purely on compositional factors (workers and their jobs), while ignoring the institutions and policies that structurally define the "rules of the game" for the labour market. Firpo et al (2009) use unconditional quantile regressions[37] to estimate the effects of unionization on wage rates across the US male wage distribution in 1983 – 1985 after controlling for factors such as education and experience. The importance of union membership to the middle of the wage distribution is apparent from their results. While Malaysia's context and experiences are certainly distinct from the US', there is sufficient global evidence that ignoring labour market institutions such as unions, and collectivised or centralised wage setting, would provide an incomplete narrative of wage trends and hamper our ability to devise policy solutions for the labour market[38].

Malaysia's institutional set-up has historically disincentivised unionisation and incentivised a low-wage model of growth[39]. It is a model that is now revealing its fundamentally unsustainable nature in the form of a cost-of-living crisis, rising household debt, and a highly financialised and mid-to-low productivity economy. Hawati Abdul Hamid et al (2019) used 2014 HIES data to find that households in the middle of Malaysia's income distribution (2nd to 7th deciles) exhibited largely homogenous consumption patterns that failed to reflect an aspirational "middle class"[40].

We must reset the rules of the game to disincentivise activities that rely on low wages, and proactively pursue approaches that enable wage-setting at more centralised levels. In this regard, Muthusamy and Wikstrom (2022) conduct a review of institutionalised wage bargaining systems in seven countries and present preliminary medium-to-long term proposals for centralised wage-setting in 21st century Malaysia[41].

6. Conclusion

In summary, the institution of the minimum wage needs to be strengthened through consistent upward revision and robust implementation. Additional structural measures should include concerted efforts to lift our economy onto higher planes of value addition, and to introduce centralised wage-setting institutions that ensure improved returns to labour while disincentivising low wage activities.

Part II will assess wage growth and inequality trends across and within specific sub-groups.

[37] Firpo et al. (2009)

[38] Howell and Kalleberg (2022); Dustmann et al. (2021); Manning (2021); Blanchflower et al. (1990); Howell (2021); DiNardo et al. (1996)

[39] Sundaram (1986); Muthusamy and Wilkstrom (2022)

[40] Hawati Abdul Hamid et al. (2019)

[41] Muthusamy and Wilkstrom (2022)

Appendices

Appendix 1: Salaries and wages portions of HIS and SWS questionnaires

Table A1.1: Subcategories of paid employment income in Household Income Survey and salaries and wages in Salaries and Wages Survey included in study

HIS		SWS	
Basic salaries & wages	Wages and salaries (before deductions for income tax, EPF contributions, etc.)	**Basic salaries/wages**	Basic salaries/wages (Before deduction of income tax, EPF contributions, etc.)
Bonuses & allowances	Allowances (e.g: cost of living allowances, specialist allowances, housing allowances, expatriate allowances, etc.)	**Allowance**	Housing/Region Housing Allowance Public Service (EKA)/Entertainment Cost of Living (COLA)/Incentive Region Payment Specialist Food Transport/Petrol Other allowances
	Bonuses Other cash (e.g: commissions, tips, earnings from overtime work, etc.)	**Other cash** **Overtime payment**	Commissions/Tips Others Overtime payment
	Free/concessional food Free/concessional lodging Free/concessional consumer goods and services Other payments in kind received (e.g: paddy, rubber, coconut, etc.)	**Payment in kind**	Food Lodging Others
Basic salaries & wages and bonuses & allowances		Total salaries & wages received, include overtime payment	

Appendix 2: Growth and inequality indicator values

Table A2.1: Relative growth in monthly household wage, by survey interval, 1995 – 2019, HIS

Decile	1995 – 1997	1997 – 1999	1999 – 2002	2002 – 2004	2004 – 2007	2007 – 2009	2009 – 2012	2012 – 2014	2014 – 2016	2016 – 2019
1	20.4%	-10.2	6.7	4.3	8.6	4.9	15.2	19.7	6.0	13.5
2	24.9	-16.4	7.6	1.4	8.6	3.8	16.0	17.2	6.4	7.4
3	24.5	-14.9	7.0	1.0	10.5	4.6	16.6	15.1	6.3	6.8
4	22.7	-14.5	8.5	2.7	9.4	5.3	16.7	12.8	6.6	6.5
5	21.8	-14.3	10.8	3.1	8.9	5.0	17.9	9.2	7.5	7.5
6	19.9	-13.2	11.9	2.8	8.8	5.3	16.8	8.2	8.4	8.2
7	19.6	-12.7	11.9	3.0	9.0	4.7	15.7	7.5	8.5	8.5
8	17.6	-10.8	13.1	2.8	7.6	4.4	15.4	6.3	8.5	8.9
9	14.5	-8.9	15.0	2.9	6.6	3.5	14.6	6.0	9.1	7.3
10	9.9	-6.5	14.3	2.8	6.6	1.4	14.1	6.7	6.9	6.5

Source: DOS (2022), authors' calculations

Table A2.2: Absolute growth in monthly household wage, by survey interval, 1995 – 2019, HIS

Decile	1995 – 1997	1997 – 1999	1999 – 2002	2002 – 2004	2004 – 2007	2007 – 2009	2009 – 2012	2012 – 2014	2014 – 2016	2016 – 2019
1	RM133	-72	44	28	63	40	131	204	71	172
2	259	-177	78	15	97	46	216	269	113	139
3	340	-217	99	15	162	77	307	326	152	174
4	396	-264	150	52	185	114	398	350	202	210
5	464	-316	234	73	221	131	531	311	277	298
6	516	-354	317	79	268	171	610	338	376	399
7	629	-421	395	108	338	190	704	378	461	506
8	712	-451	558	129	369	223	873	400	580	659
9	785	-498	870	180	438	245	1,115	507	828	715
10	783	-525	1,205	265	634	133	1,536	816	873	900

Source: DOS (2022), authors' calculations

Table A2.3: Relative and absolute inequality in monthly household wage, 1995 – 2019, HIS

Year	Relative inequality					Absolute inequality	
	D9/D1	D9/D5	D5/D1	Gini coefficient	Coefficient of variation	Interquartile range	Standard deviation
1995	6.73	2.61	2.57	0.38	0.73	RM2,265	RM1,960
1997	6.11	2.43	2.52	0.36	0.67	2,594	2,140
1999	6.38	2.53	2.52	0.37	0.71	2,379	2,021
2002	6.99	2.65	2.64	0.38	0.73	2,812	2,361
2004	7.10	2.64	2.69	0.39	0.74	2,884	2,442
2007	6.91	2.59	2.66	0.38	0.72	3,094	2,585
2009	6.88	2.53	2.71	0.37	0.70	3,245	2,626
2012	6.92	2.48	2.79	0.37	0.69	3,766	3,016
2014	6.12	2.40	2.55	0.35	0.67	3,786	3,153
2016	6.36	2.43	2.61	0.36	0.67	4,184	3,406
2019	6.17	2.41	2.56	0.35	0.66	4,652	3,643

Source: DOS (2022), authors' calculations

Table A2.4: Relative growth in monthly individual wage, by survey interval, 2010 – 2019, SWS

Decile	2010 – 2011	2011 – 2012	2012 – 2013	2013 – 2014	2014 – 2015	2015 – 2016	2016 – 2017	2017 – 2018	2018 – 2019
1	3.6%	1.7	9.8	10.4	5.1	6.1	12.7	-3.3	11.3
2	1.8	4.0	8.3	5.4	1.7	2.3	10.6	3.9	7.3
3	1.0	3.4	5.7	3.2	3.3	4.4	7.2	5.8	4.6
4	-0.3	4.5	3.9	4.1	1.2	6.4	4.7	6.6	3.8
5	-1.7	3.6	4.1	1.6	2.5	5.6	1.9	7.7	4.7
6	-2.2	2.8	2.4	3.6	3.5	2.7	4.5	6.3	4.9
7	-1.9	2.8	2.0	3.7	4.1	3.3	-0.1	5.5	8.7
8	-1.3	3.7	4.0	3.1	2.7	3.2	-1.5	9.3	7.3
9	-1.8	2.4	4.0	5.5	2.4	5.1	-2.6	11.5	7.4
10	-2.5	1.9	4.4	6.4	2.5	2.2	0.8	12.9	6.2

Source: DOS (2022), authors' calculations

Table A2.5: Absolute growth in monthly individual wage, by survey interval, 2010 – 2019, SWS

Decile	2010 – 2011	2011 – 2012	2012 – 2013	2013 – 2014	2014 – 2015	2015 – 2016	2016 – 2017	2017 – 2018	2018 – 2019
1	RM21	11	64	76	40	49	114	-30	111
2	15	34	72	49	16	22	113	43	88
3	9	36	60	36	38	53	90	79	64
4	-4	56	50	52	17	92	68	105	63
5	-25	55	64	24	39	95	34	143	94
6	-39	52	46	69	69	53	94	141	118
7	-44	61	46	90	100	81	-3	147	248
8	-38	101	119	93	82	103	-50	316	267
9	-66	87	158	220	101	223	-113	524	377
10	-130	91	232	354	135	136	58	820	426

Source: DOS (2022), authors' calculations

Table A2.6: Relative and absolute inequality in monthly individual wage, 2010 – 2019, SWS

Year	Relative inequality					Absolute inequality	
	D9/D1	D9/D5	D5/D1	Gini coefficient	Coefficient of variation	Interquartile range	Standard deviation
2010	5.29	2.44	2.17	0.34	0.64	RM1,619	RM1,292
2011	5.33	2.38	2.24	0.34	0.63	1,611	1,254
2012	5.26	2.36	2.23	0.34	0.63	1,665	1,287
2013	4.80	2.40	2.00	0.34	0.63	1,747	1,356
2014	5.00	2.67	1.88	0.33	0.63	1,720	1,410
2015	4.60	2.56	1.80	0.33	0.63	1,856	1,475
2016	5.00	2.64	1.89	0.33	0.63	1,886	1,498
2017	4.50	2.37	1.90	0.31	0.60	1,751	1,449
2018	4.76	2.47	1.93	0.33	0.64	1,898	1,677
2019	4.72	2.53	1.86	0.33	0.64	2,073	1,784
2020	4.74	2.69	1.76	0.34	0.66	2,063	1,712

Source: DOS (2022), authors' calculations

Appendix 3: Description of conditional density estimation for decomposition analysis

Change in wage inequality between two periods is the sum of the following:

1. **Composition effect** or change in the composition of wage recipients e.g. change in the share of male and female wage recipients with the wage structure held constant.
2. **Structural effect** or change in the wage structure i.e. compression or widening of the wage scale with the composition of wage recipients held constant.

$$Change\ in\ wage\ inequality = Composition\ effect + Structural\ effect$$

To decompose changes in wage inequality between 2010 and 2019 into composition and structural effects, Section 4.4 applies the method proposed by DiNardo et al (1996) and expanded by Daly and Valletta (2006).

We adjust the wage distribution in 2019 to mirror the composition of wage recipients in 2010 while keeping the 2019 wage structure intact. The adjusted distribution is referred to as the counterfactual distribution i.e. the 2019 distribution that would have been observed in the absence of changes in the composition of wage recipients relative to 2010. Using the 2010 and 2019 distributions and the counterfactual distribution, the following can be calculated:

1. **Composition effect**: Comparing the 2019 distribution with its counterfactual distribution reveals the contribution of the composition effect to change in wage inequality between 2010 and 2019 as both distributions reflect the same structure.
2. **Structural effect**: Comparing the 2019 counterfactual distribution with the 2010 distribution reveals the contribution of the structural effect to changes in wage inequality between 2010 and 2019 as both distributions reflect the same composition.

Constructing the counterfactual wage distribution

Let $F(w, m_{2019}|t = 2019)$ and $F(w, m_{2010}|t = 2010)$ represent the 2019 and 2010 wage distributions respectively, conditional on composition m_t, where the suffix t denotes the year. Following DiNardo et al (1996), we use re-weighting functions so that the 2010 composition of wage recipients (m_{2010}) is imposed on the 2019 wage distribution while keeping its wage structure ($F(w|t = 2019)$) intact.

The SWS data collects the following characteristics of wage recipients: age, citizenship, education, industry, occupation, sex, state and strata. Taking into account all these characteristics, we estimate the conditional probability of being a wage recipient in 2019 ($\hat{p}(t = 2019|m)$) and 2010 ($1 - \hat{p}(t = 2019|m)$) using a logit specification. The re-weighting function to adjust the wage distribution in 2019 so that it emulates the composition in 2010 is calculated using the function below:

$$\widehat{\Psi}(m) = \frac{\hat{p}(t = 2010|m)}{\hat{p}(t = 2019 \mid m)} \cdot \frac{\hat{p}(t = 2019)}{\hat{p}(t = 2010)}$$

$$= \frac{1 - \hat{p}(t = 2019|m)}{\hat{p}(t = 2019 \mid m)} \cdot \frac{\hat{p}(t = 2019)}{1 - \hat{p}(t = 2019)}$$

This re-weighting function represents the relative probability of observing a wage recipient with characteristics m in 2010 relative to 2019, normalized by the unconditional probabilities of being in either year.

The function $\widehat{\Psi}(m)$ is estimated by pooling the 2010 and 2019 samples, and then estimating a binary dependent variable logit model for a dummy variable indicating the sample from which the observation is obtained. The conditional probability $\hat{p}(t = 2019 \mid m)$ is obtained by forming fitted probabilities for wage recipients in the 2019 sample, based on their m characteristics. The unconditional probability $\hat{p}(t = 2019)$ is the weighted share of the 2019 sample in the pooled sample.

Multiplying the SWS weights by the re-weighting function produces newly adjusted weights so that wage employees in 2019 emulate the composition of wage employees in 2010. For detailed explanation on the derivation of re-weighting function, refer to Daly and Valetta (2006).

Estimating composition and structural affects

Wage inequality can be estimated from the density functions for 2010 and 2019 as well as the counterfactual conditional density function for 2019.

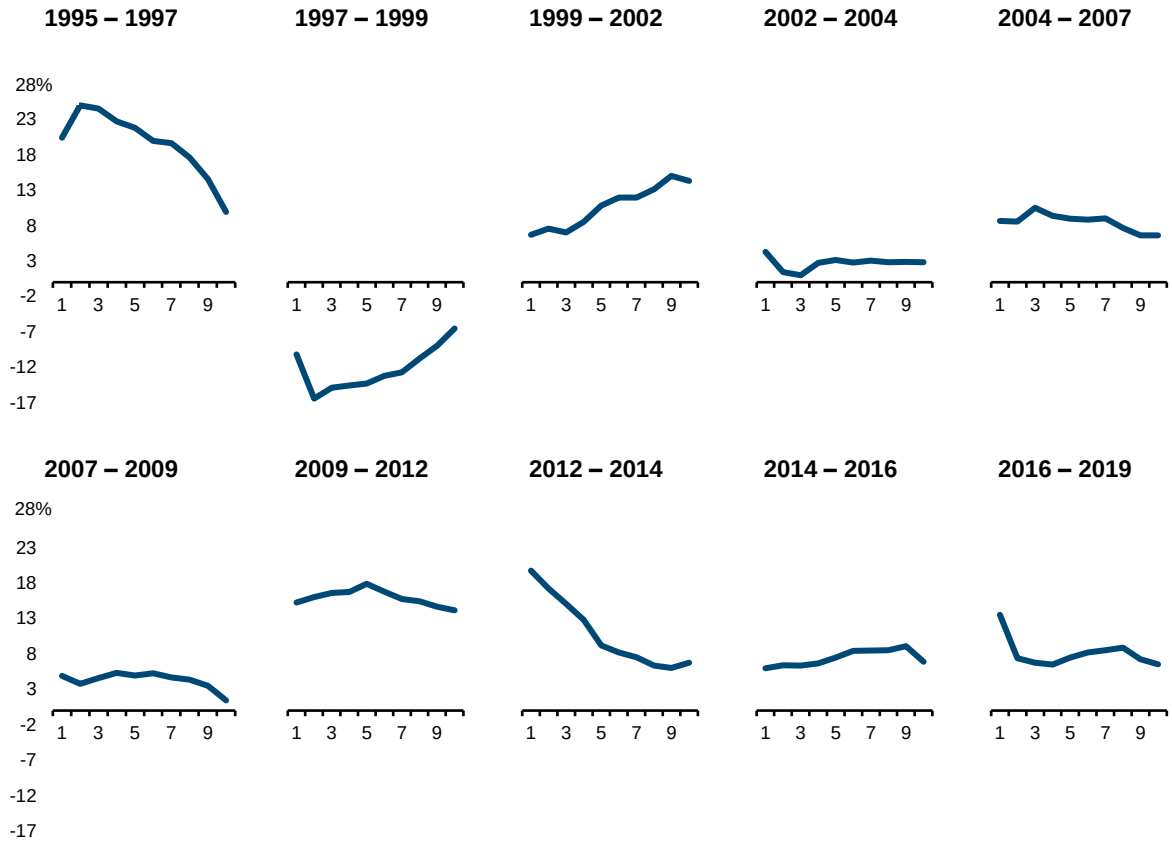
To illustrate calculating the composition and structural effects, we measure wage inequality using the ratio between the top and bottom deciles (D9/D1). From the three density functions, three measures of the ratio can be produced, namely $9,1_{2010} = \frac{D9_{2010}}{D1_{2010}}$, $9,1_{2019} = \frac{D9_{2019}}{D1_{2019}}$ and $9,1^{c}_{2019} = \frac{D9^{c}_{2019}}{D1^{c}_{2019}}$ with the suffix 2010 and 2019 referring to the year and c indicating if it is adjusted. The change in wage inequality can be expressed as follows:

$$\triangle 9,1_{2019,2010} = \left(\frac{D9_{2019}}{D1_{2019}}\right) - \left(\frac{D9_{2010}}{D1_{2010}}\right)$$

$$\triangle 9,1_{2019,2010} = \underbrace{\left(\frac{D9_{2019}}{D1_{2019}}\right) - \left[\frac{D9^{c}_{2019}}{D1^{c}_{2019}}\right]}_{\textit{Composition effect}} + \underbrace{\left[\frac{D9^{c}_{2019}}{D1^{c}_{2019}}\right] - \left(\frac{D9_{2010}}{D1_{2010}}\right)}_{\textit{Structural effect}}$$

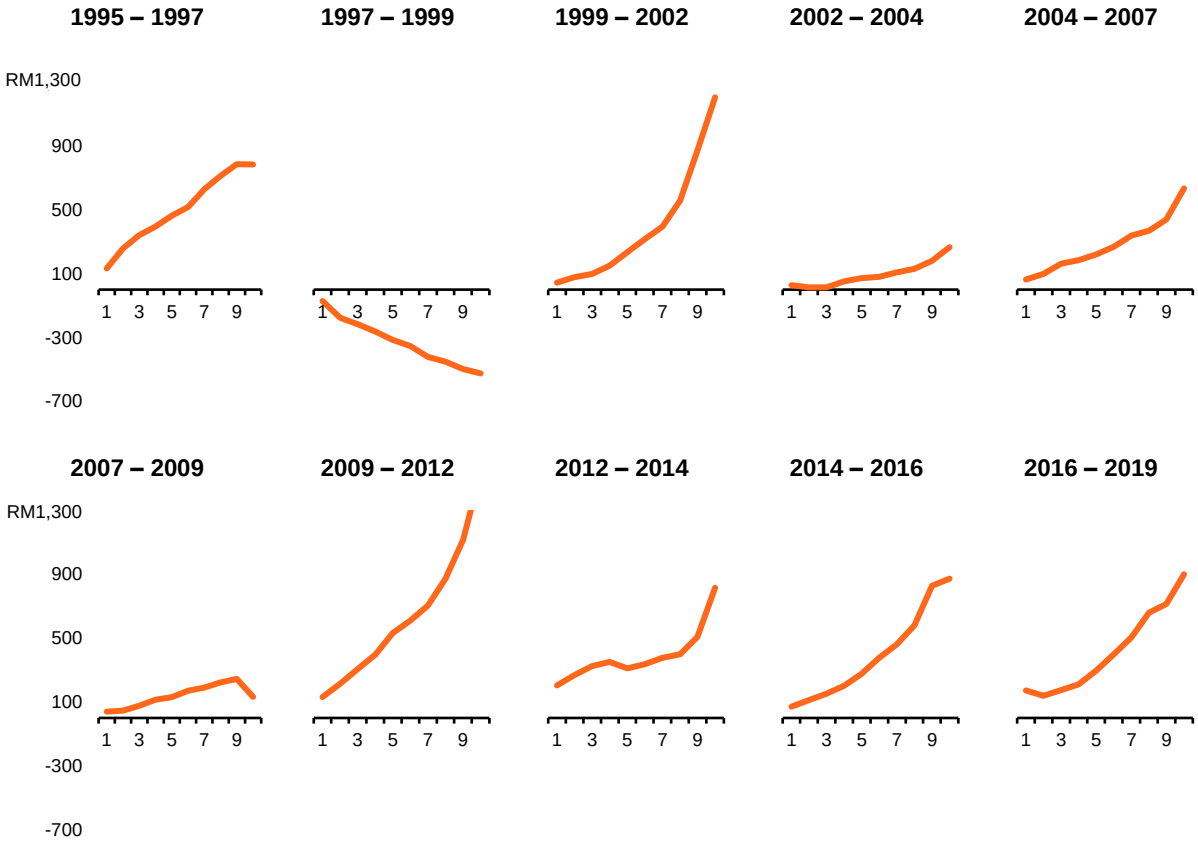
Appendix 4: Relative and absolute real household wage growth by decile, by survey interval, 1995 – 2019, HIS data

Figure A4.1: Percentage growth in monthly household wage by decile, by survey interval, 1995 – 2019



Source: DOS (2022), authors' calculations

Figure A4.2: Absolute growth in monthly household wage by decile, by survey interval, 1995 – 2019



Source: DOS (2022), authors' calculations

Appendix 5: Correlation between total gross household income and household wage income (basic + bonus), by survey year, 1995 – 2019, HIS data

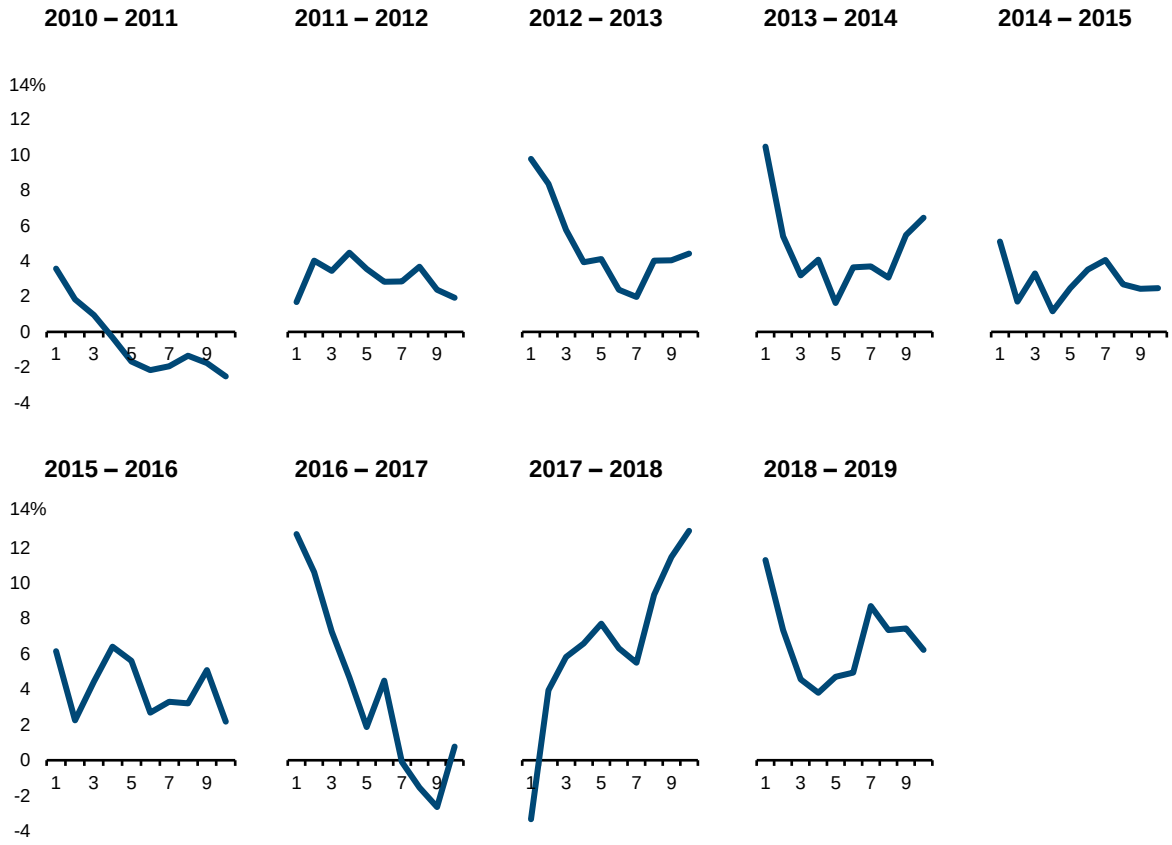
	1995	1997	1999	2002	2004	2007	2009	2012	2014	2016	2019
Household wage income (basic plus bonus)	1.153* (0.00427)	1.119* (0.00133)	1.197* (0.00441)	1.208* (0.00711)	1.202* (0.00713)	1.141* (0.00377)	1.161* (0.00317)	1.175* (0.00463)	1.181* (0.00330)	1.170* (0.00363)	1.188* (0.00369)
Constant	4,275* (128.0)	741.0* (44.81)	4,620* (151.6)	5,327* (279.1)	4,439* (296.4)	7,138* (177.5)	6,890* (163.5)	10,157* (296.5)	13,754* (238.5)	16,916* (287.7)	17,991* (319.1)
Observations	26,169	23,594	24,393	26,927	27,544	27,151	34,660	31,641	62,076	60,400	61,781
R-squared	**0.735**	**0.968**	**0.751**	**0.518**	**0.508**	**0.772**	**0.795**	**0.670**	**0.673**	**0.632**	**0.626**

Standard errors in parentheses. The dependent variable is total gross household income.
* p<0.01

Source: DOS (2022), authors' calculations

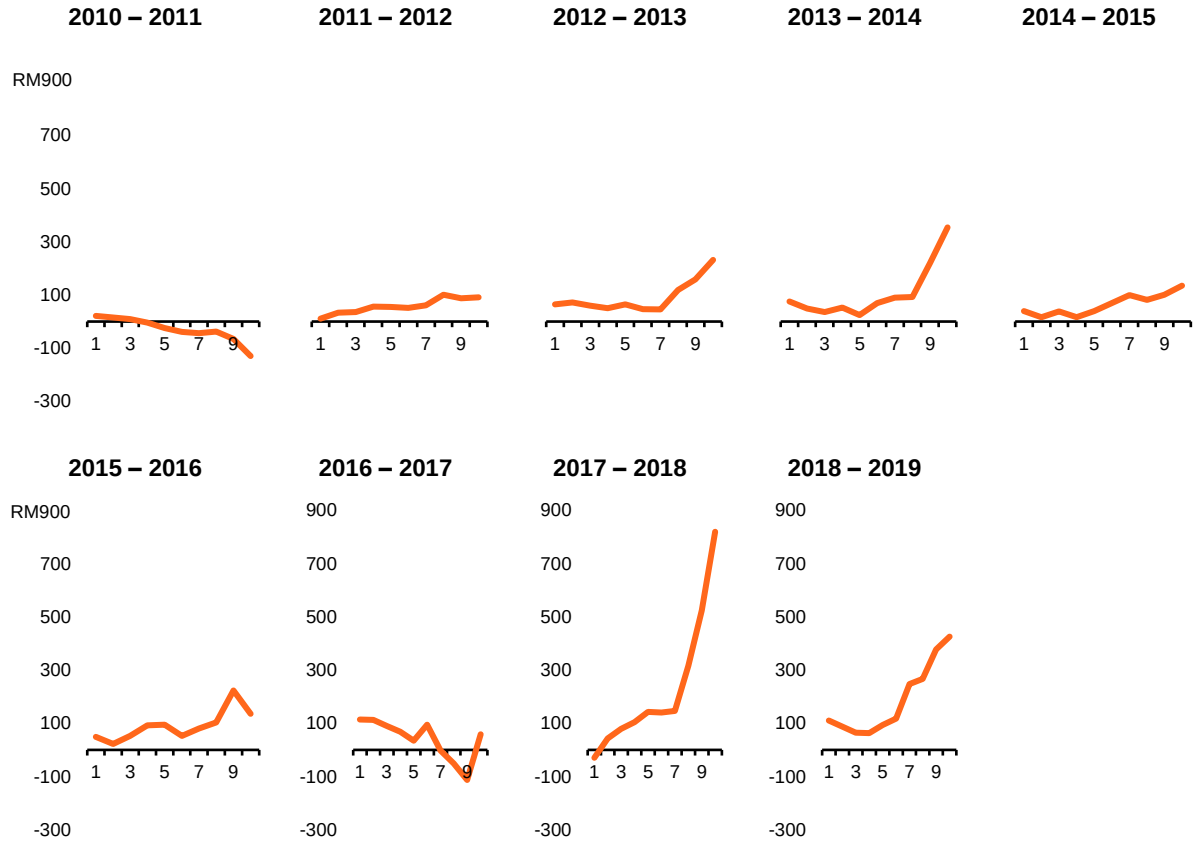
Appendix 6: Relative and absolute real wage growth by decile, by survey interval, 2010 – 2019, SWS data

Figure A6.1: Percentage growth in monthly individual wage by decile, by survey interval, 2010 – 2019



Source: DOS (2022), authors' calculations

Figure A6.2: Absolute growth in monthly individual wage by decile, by survey interval, 2010 – 2019



Source: DOS (2022), authors' calculations

References

Adib Povera, Nor Ain Mohamed Radhi, and Teoh Pei Ying. 2022. *Minimum Wage Officially Rm1,500 from May 1.* New Straits Times. https://www.nst.com.my/news/nation/2022/03/781405/minimum-wage-officially-rm1500-may-1.

Astro Awani. 2013. *Gaji Minimum Dilaksanakan Sepenuhnya Mulai Jan 2014.* Astro Awani. https://www.astroawani.com/berita-malaysia/gaji-minimum-dilaksanakan-sepenuhnya-mulai-jan-2014-24975.

Autor, David H. 2015. *Why Are There Still So Many Jobs? The History and Future of Workplace Automation.* Journal of Economic Perspectives 29 (3):3-30.

Autor, David H., Lawrence F. Katz, and Melissa S. Kearney. 2008. *Trends in U.S. Wage Inequality: Revising the Revisionists.* The Review of Economics and Statistics 90 (2):300-323.

Azam, Mehtabul. 2009. *Changes in Wage Structure in Urban India 1983-2004: A Quantile Regression Decomposition*. Bonn, Germany: The Institute for the Study of Labor (IZA).

Berita Harian. 2019. *Gaji Minimum Rm1,200 Sebulan Di 57 Bandar Utama.* Berita Harian. https://www.bharian.com.my/berita/nasional/2019/12/639835/gaji-minimum-rm1200-sebulan-di-57-bandar-utama.

Blanchflower, David G., Andrew J. Oswald, and Mario D. Garrett. 1990. *Insider Power in Wage Determination.* Economica 57 (226):143-170. https://www.jstor.org/stable/2554158.

Card, David, Ana Rute Cardoso, Joerg Heining, and Patrick Kline. 2018. *Firms and Labor Market Inequality: Evidence and Some Theory.* Journal of Labor Economics 36 (1):13-70.

Card, David, and Alan B. Krueger. 1995. *Myth and Measurement: The New Economics of the Minimum Wage*. Twentieth-Anniversary ed. Princeton, New Jersey: Princeton University Press.

Daly, Mary C., and Robert G. Valletta. 2004. *Inequality and Poverty in the United States: The Effects of Rising Male Wage Dispersion and Changing Family Behavior*. Federal Reserve Bank of San Francisco.

Daly, Mary C., and Robert G. Valletta. 2006. *Inequality and Poverty in United States: The Effects of Rising Dispersion of Men's Earnings and Changing Family Behaviour.* Economica 73 (289):75-98. https://www.jstor.org/stable/3549189.

DiNardo, John, Nicole M. Fortin, and Thomas Lemieux. 1996. *Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach.* Econometrica 64 (5):1001-1044. https://www.jstor.org/stable/2171954.

DOS. 2022. *Household Income Survey (His) and Salaries and Wages Survey (Sws) Microdata*. Putrajaya: Department of Statistics Malaysia.

DOS. 2023. *Annual: Unemployment Rate*. Putrajaya: Department of Statistics Malaysia. https://open.dosm.gov.my/data-catalogue/dosm-public-economy_labour-principalstats-annual_5.

Dustmann, Christian, Johannes Ludsteck, and Uta Schonberg. 2021. *Revisiting the German Wage Structure.* The Quarterly Journal of Economics.

EPU. 2021. *Rancangan Malaysia Ke-12 (Rmk-12)*. Putrajaya: Economic Planning Unit, Prime Minister's Department. https://www.epu.gov.my/sites/default/files/flipping_book/RMKe-12/mobile/index.html.

Firpo, Sergio, Nicole M. Fortin, and Thomas Lemieux. 2009. *Unconditional Quantile Regressions.* Econometrica 77 (3):953-973. https://www.jstor.org/stable/40263848.

Fortin, Nicole, Thomas Lemieux, and Sergio Firpo. 2010. *Decomposition Methods in Economics*. In NBER Working Paper. Cambridge, Massachusetts: National Bureau of Economic Research. http://www.nber.org/papers/w16045.

Garloff, Alfred. 2017. *Side Effects of the Introduction of the German Minimum Wage on Employment and Unemployment: Evidence from Regional Data – Update*. Germany: German Federal Ministry for Economic Affairs and Energy.

Goldin, Claudia. 1994. *Labor Markets in the Twentieth Century*. In NBER Working Papers Series. Cambridge, Massachusetts: National Bureau of Economic Research.

Goldin, Claudia, and Robert A. Margo. 1991. *The Great Compression: The Wage Structure in the United States at Mid-Century*. In NBER Working Papers Series. Cambridge, Massachusetts: National Bureau of Economic Research.

Hawati Abdul Hamid, Gregory Ho Wai Son, and Suraya Ismail. 2019. *Demarcating Households: An Integrated Income and Consumption Analysis*. Kuala Lumpur: Khazanah Research Institute.

Howell, David. 2021. *Low Pay in Rich Countries: Institutions, Bargaining Power, and Earnings Inequality in the U.S., U.K., Canada, Australia and France*. In Working Paper: Washington Center for Equitable Growth. https://equitablegrowth.org/working-papers/low-pay-in-rich-countries-institutions-bargaining-power-andearnings-inequality-in-the-u-s-u-k-canada-australia-and-france.

Howell, David, and Arne Kalleberg. 2022. *Labour Market Inequality: A Comparative Political Economy Perspective.* IFS Deaton Review of Inequalities. https://ifs.org.uk/inequality/labour-market-inequality-a-comparative-political-economy-perspective/.

ILO. 2022. *Global Wage Report 2022-2023: The Impact of Inflation and Covid-19 on Wages and Purchasing Power*. Geneva: ILO.

IMF. 2022. *World Economic Outlook Database*. In October 2022: International Monetary Fund. https://www.imf.org/en/Publications/WEO/weo-database/2022/October.

Jun, Chinhui, Kevin M. Murphy, and Brooks Pierce. 1993. *Wage Inequality and the Rise in Returns to Skill.* Journal of Political Economy 101 (3):410-442.

Katz, Lawrence F., and David H. Autor. 1999. *Changes in the Wage Structure and Earnings Inequality.* Handbook of Labor Economics 3.

KRI. 2020. *Work in an Evolving Malaysia. The State of Households 2020 Part Ii*. Kuala Lumpur: Khazanah Research Institute. https://www.krinstitute.org/assets/contentMS/img/template/editor/KRI%20-%20Full%20report-%20Work%20in%20an%20Evolving%20Malaysia%20-%2020201103.pdf.

Lemiuex, Thomas. 2007. *The Changing Nature of Wage Inequality*. In NBER Working Papers Series. Cambridge, Massachusetts: National Bureau of Economic Research. http://www.nber.org/papers/w13523.

Loecker, Jan De, Tim Obermeier, and John Van Reenen. 2022. *Firms and Inequality*. In The IFS Deaton Review: Institute of Fiscal Studies.

Machin, Stephen. 1996. *Wage Inequality in the Uk.* Oxford Review of Economic Policy 12 (1):47-64. http://www.jstor.org/stable/23606410.

Manning, Alan. 2021. *Monopsony in Labor Markets: A Review.* ILR Review 74 (1):3–26. doi: 10.1177/0019793920922499.

Mazzucato, Mariana. 2011. *The Entrepreneurial State*. London, United Kingdom: Demos. https://www.demos.co.uk/files/Entrepreneurial_State_-_web.pdf.

Milanović, Branko. 2016. *Global Inequality: A New Approach for the Age of Globalization*: Harvard University Press, Belknap Press.

Mohd Amirul Rafiq Abu Rahim, and Shazrul Ariff Suhaimi. 2022. *Fresh Graduate Adversities: A Decade's Insight on the Graduate Tracer Study*. Kuala Lumpur: Khazanah Research Institute.

Muthusamy, Nithiyananthan, and Eleanor Wilkstrom. 2022. *Wages as Power: Models of Institutionalised Wage Bargaining and Implications for Malaysia*. Kuala Lumpur: Khazanah Research Institute.

Ng, Allen, Tan Theng Theng, and Tan Zhai Gen. 2018. *What Explains the Increase in the Labor Income Share in Malaysia?* In ADBI Working Paper Series. Tokyo: Asian Development Bank Institute. https://www.adb.org/publications/what-explains-increase-labor-income-share-malaysia.

Nur Thuraya Sazali, and Siti Aiysyah Tumin. 2020. *Leaving No Worker Behind: Deficit in Decent Work*. Kuala Lumpur: Khazanah Research Institute. https://www.krinstitute.org/assets/contentMS/img/template/editor/Deficit%20in%20decent%20work_20200304%20(1).pdf.

OECD. 2018. *Decoupling of Wages from Productivity: What Implications for Public Policies?* OECD Economic Outlook 2018 (2).

Piketty, Thomas. 2013. *Capital in the Twenty-First Century*. Translated by Arthur Goldhammer: Harvard University Press.

Piketty, Thomas, and Emmanuel Saez. 2003. *Income Inequality in the United States, 1913–1998*.* The Quarterly Journal of Economics CXVIII (1).

Siti A'isyah Sukaimi, and Noor Atiqah Sulaiman. 2018. *Gaji Minimum Rm1,050 Berkuat Kuasa Januari 2019.* Harian Metro. https://www.hmetro.com.my/mutakhir/2018/09/374591/gaji-minimum-rm1050-berkuat-kuasa-januari-2019.

Suhaila Shahrul Annuar. 2016. *Perintah Gaji Minimum 2016 Kuat Kuasa 1 Julai.* Berita Harian. https://www.bharian.com.my/berita/nasional/2016/05/149474/perintah-gaji-minimum-2016-kuat-kuasa-1-julai.

Sundaram, Jomo K. 1986. *A Question of Class: Capital, the State, and Uneven Development in Malaya*. Virginia: Monthly Review Press.

Suqin Ge, and Dennis Tao Yang. 2012. *Changes in China's Wage Structure*. In Discussion Paper Series. Bonn, Germany: The Institute for the Study of Labor (IZA).