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FIRMS' WAGE ADJUSTMENT DURING COVID-19: A LITERATURE SURVEY

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Abstract:

Firms' wage adjustment provides a myriad of concerns for economic contemplation where issues stemming from product and labour market resulted from the demand and supply distortion that have created new and interesting puzzles which required further attention. The Covid-19 virus has recorded a remarkable wage adjustment among firms towards their workers in order to sustain the business during the catastrophic events. This study attempts to provide insight of articles related to firms' wage adjustment during COVID-19. Papers related firms' wage adjustment during COVID-19 from the year 2020 to 2023 that published in Web of Science were reviewed and critically discussed. This paper used PRISMA methodology for reporting the article extracted in systematic review. Findings showed that wage adjustment was significant response among firm during Covid-19 crisis, though government provide wage subsidies programmes, it just lasts for the short-run. This paper serves as an information bank for readers in obtaining a better understanding of firms' wage adjustment behaviour during economic turbulence.

Keywords:

Covid-19, Crisis, Pandemic, Wage Adjustment, Wage Cuts

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Introduction

The cyclical behaviour and responds on wages and its impacts for the propagation of firms' cycle shocks are fundamental issues in macroeconomics. Since Keynes (1936) explore the consequences of wage adjustment among firms', vast literature suggests wage adjustment frictions have vital implications towards labour market system. This paper attempts to provide an insight on review of article related to wage adjustment among firms'. Various approaches undertake by firms' to adjust labour cost and demand, including reduction of employment and the wages cut. According to Bell and Machin (2018) margin on wage adjustment may differ from industries and areas that leads to firm flexibility to cut wage of higher paid workers and reduce inequality. Flexibility on wage adjustment and changes towards labour is comprehensively discussed in this paper.

Vulnerable industries (tourism, services and recreation) contribute a large share in the structure of the economy. Therefore, the downfall of these industries will lead to sluggish demand and supply and bring down the firm business performance. Limited sales volume among firms' have resorted them to pursue adjustments to labor demand in order to remain profitability and ensure the businesses can be kept afloat. Wage adjustment is seeming as prominent strategy perform by firms' during economic crisis in order to stay afloat in the market. Economic crises and sales performance are factors influence for firms' to adjust the wage in order to sustain the business performance during crisis (Bergin et al 2012; Hassan and Ali, 2011; Suherman and Putri, 2020; Ariga and Kambayashi, 2010).

The Coronavirus Disease 2019 (COVID-19) epidemic has undoubtedly had a terrible impact on both the global and sectoral economies. It is a risk to the labour market, health, and economic production. Several studies on the COVID-19 pandemic reveal that it has a detrimental impact on every sector of the global economy (Codagnone et al. 2020; Dzigbede and Pathak 2020). The COVID-19 pandemic creates negative shockwaves across the global economy, triggering the most catastrophic worldwide economic crisis in over a century. The crisis caused in an enormous rise in inequality both within and between countries. Most developed economies have restored to or exceeded pre-crisis employment levels, but many firms' in developing and developing countries confront manpower shortages (ILO, 2022). This situation has resulted in 94% of workers living in countries where workplaces have been shuttered down to prevent the spread of the COVID-19 virus.

The impact of crises towards labour market are not create negative affect to the whole labour market system, as reported low-income workers affectedly worse and vulnerable towards firm labour cost reduction strategy. It creates margin of inequality to expand towards high-paid workers and low paid workers where low paid workers are more vulnerable during crises. According to Linehan et al. (2015) brief that wage initial response towards negative economic shocks is employment reduction including wage adjustment. However, Eggers (2020) found that wage adjustment are not the premier measure used by firm at the initial phase and only impacted the employments after prolonged crises. Firms' will focus on non-labour costs at the beginning of crises to ensure business operation are still running.

Department Of Statistics Malaysia (DOSM) reported that employees' will undergo wage adjustments as an outcome of the Movement Control Order. Employees' in Malaysia are affected from a range of industries, including private, government-linked cooperation (GLC),

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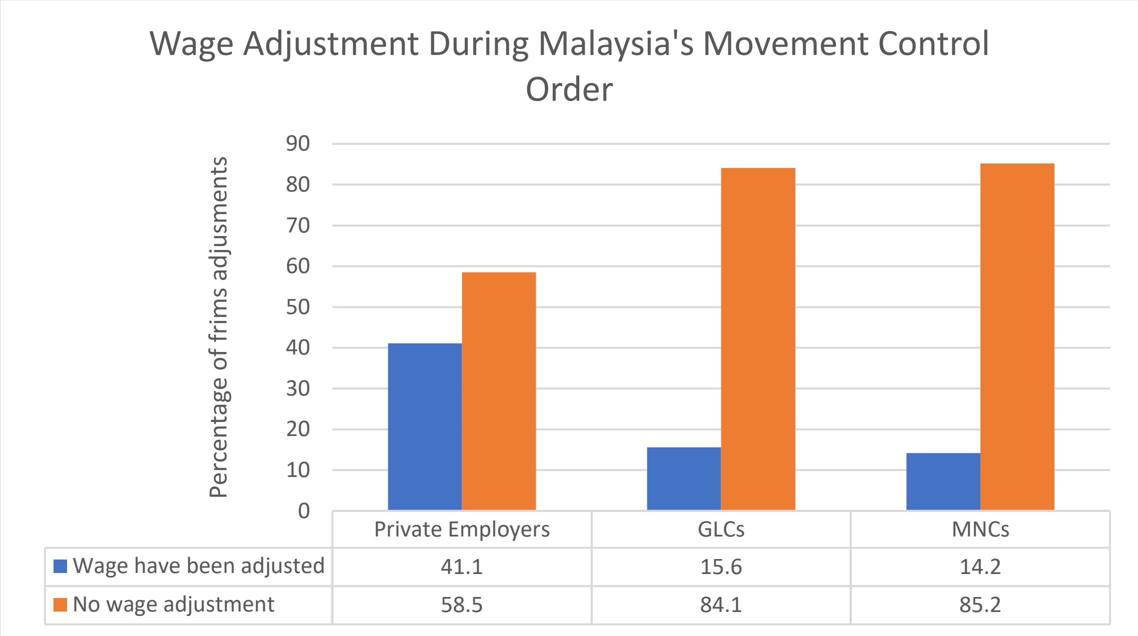
and multinational corporations (MNC). According to DOSM (2020), 2.7 million Malaysian own-account workers are at risk of job loss or wage reduction.



Graph 1: Wage Adjustment Scenario During MCO in Malaysia

Source: Department of Statistics of Malaysia

According to the Graph 1.0, Private Employers recorded a higher percentage of employees' (41.1%) had their wages adjusted compared to those who did not (58.5%). In GLCs, there seems to be a more balanced distribution with 15.6% having adjusted wages and 84.4% not having adjustments. In MNCs, there are more employees' who did not have wage adjustments (85.2%) compared to those with adjustments (14.2%).

This analysis shows that during Malaysia's Movement Control Order (MCO), Multinational Corporations (MNCs) and Government-linked Companies (GLCs) likely benefited from stronger financial reserves. This allowed them to maintain some business continuity compared to private companies with limited cash flow. The financial strain on private companies have necessitated wage adjustments for their employees. According to Cowling et al (2020) significant portion of SMEs have low cash reserve to sustain their business during COVID-19 crisis.

In this area of this studies, terminology of wage adjustment and wage settings are widely been used to describe the situation of wage changes during challenging times. As per definition, both wage adjustment and settings define changes in wage (minimum wage and incumbent workers wage) relatively same definition. Therefore, it could be sum up as wage settings are widely used to describe the situation of minimum wage change (Blau and Khan, 1999; Katz and Autor, 1999) and wage adjustment is a terminology to brief incumbent workers wage change (Suherman and Putri, 2020; Bergin et al, 2012). However, Strom and Falch (2020) used terminology wage settings to define wage change among incumbent teacher for their studies.

Wages settings discuss the increment of minimum wages set up by governments. This idea is to increase the bottom of the wage distribution among low-skill workers. On the other hand, wage adjustment explains the changes in wages made by firms to reduce the cost of the company. Numerous factors that lead to wage adjustment happened in firms' such as uncertain economic conditions and the new introduction of technology.

A clear distinction on the terminology is crucial to understand the severity of labour market impacts during crisis through industries and firm wage adjustment lens. This study is necessary as it breaks down to the firm level understanding in order to develop targeted policy to the governments. The main objective of this paper is to understand firm behaviour towards wage adjustments during COVID-19 based on article available in Web of Science. This paper could be used to policy makers and researchers as reference to identify the wage changes for workers during economic crises. Institutions may use this study for future research and recommendation on improvement towards wage adjustment study.

Wage Adjustment History

Wage adjustment study starts with John Maynard Keynes (1936) with the findings that wage reductions is associate with the changes on aggregate demand on different production thus, reducing purchasing power. Keynes Theory stance with three (3) main ideologies: 1) Aggregate demand is influenced by many economic decisions through public and private sector. It stance mixed economy should be guided by private sector and partly controlled and operated by the government. 2) Wage changes with economic performance such as high inflation and disruption in global supply chain 3) Changes in aggregate demand have impact towards output and employment as the price or significantly rigid. However, Keynes theory have been critics as it only rely on central economy and reduced the power of market forces towards decision making.

Next, John B. Taylor (1970) introduce staggered wage settings model. This model emphasizes the overlapping of individual price and wage due to staggered price and wage settings. In the meantime, this model was not been analysed using any data set until Taylor (1983) used macroeconomic wage data setting in the United States to proof the model that have been introduced.

Furthermore, Cecchetti (1986) found wage decline and higher inflation have correlation where there will interact and made changes between one another. During 1970s, the average interval between changes of wage fell with high inflation in more than one year. According to Jonung (1986) found that wage settings in Sweden do not have significant relationship between high rate of inflation and contract length decreased.

According to Calmfors et al. (1990) exposed the relationship of unemployment and wage adjustment where changes in wage will leads changes in labour demand. Wage data study from Sweden, Norway and Finland found that labour demand will decrease when wage offered is decrease. In addition, Calmfors (1990) stance for wage settings are also associate from union power from the firms to the employees. It states that union have power to bargain with firms to adjust the wage.

Wage adjustment studies starts to evaluate the wage gap between genders by Blau and Khan (1999) analysed that gender discrimination has impacted the labour market by discrimination in gender pay gap, qualifications, wage structure and rewards on skills in particular sectors. The also found that United States recorded significantly high in wage inequality among gender

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differences in domestic labour market. According to Katz and Autor (1999) used model of two sector of monopolistic to study the correlation between wage inequality and intra-industry trade found that gender pay gap exists in labour market due to the capability discrimination.

New Keynesian model is the evolution of classical Keynesian Theory that focus on changes in aggregate demand has been criticized on their stance of centrally planned economy and forgetting the power of open market towards wage settings and unemployment. Therefore, Lucas and Sargent (1979) introduced New Keynesian Model that stance on changes in the aggregate price level are sticky, it adjusts slowly to short-term economic fluctuations. Thus, it leads to involuntary unemployment and the impact on real Gross National Product (GNP).

This approach highlights the options accessible to monopolistically competitive firms' that set their individual prices and accept the number of real sales as a constraint, as opposed to new-classical economics, in which competitive price-taking firms' make output decisions. According to Suleman et al. (2013) analyzed firm that implement wage adjustment are based on three (3) main pillars, firm characteristics, institutional framework and inflation.

Furthermore, Downward Nominal Wage Rigidity explain on the situation of unacceptance nominal wage cuts among employees that will leads the labour price from falling down during economic turbulence. Downward nominal wage rigidity (DNWR) is defined on the circumstance and degree of nominal wage freeze occurred in labour market (Babecky, Caju, Kosma, Lawless, Messina and Room, 2009). According to Palley (1990) if labour market is perfectly competitive, nominal wage will be flexible to adjust on the nominal wage rate in order to achieve full employment. However, in the case of workers oppose to wage flexibility, the real wage rigidity will occur and lower marginal product of labour including reduction in real wage. Previous study has been done by Babecky et al. (2009) that perform a survey-based to study downward nominal and real wage rigidity among European firms' and found a positive correlation on downward nominal and real wage rigidity among firms' during crisis. According to Christiano et al. (2005) the degree of nominal wage rigidity is influenced by monetary policy impact implemented in the real economy. This theory has been widely used by previous researcher to understand the wage fluctuations in the labour market during event of crisis.

Past Crises and Firm Behaviour Towards Labour Market

Past crises have recorded a different impact and behaviour of firms towards labour market in tackling the issues appropriately. Crises has created different behaviour towards wage adjustment, working hours and involuntary unemployment including margin of wage rigidity that has significantly create a loss to the economic performance in that particular country. Crises in the past showed that wage adjustment not only occurred among existent workers but newly hired workers also affected when they are been offered the amount below market wage rate. According to Kwapil and Cludia (2010) performed a survey among European countries found that firm mainly have five (5) strategies to stay afloat during Covid-19 crisis, reducing working hours, cutting base pay, reducing flexible wage components, discontinuing temporary and contract staff and retrenchment or lay off workers. These labour cost strategies have been implemented by many firms' in order to reduce the cost of the firm during recent crisis. Therefore, this paper provides a comparison on each firm behaviour towards different crisis.

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Global Financial Crisis 2008-2009

The Global Financial Crisis (GFC) was a severe global economic crisis that happened in the 2008-2009. It was the worst financial crisis since the 1929 Great Depression. The global financial crisis (GFC) was a period of extreme pressure in financial markets and banking institutions globally that started from the mid of 2007 until the beginning of 2009. This crisis had recorded, a decline in the US housing market generated a financial crisis that spilled from the US throughout the world via global financial system linkages. Many banks in the world suffered massive losses and required government aid to prevent bankruptcy.

According to Fabiani, Lamo, Messina, and Room (2015), Estonian enterprises employed wage cut measurement during the Great Recession to sustain business costs. According to Betcherman and Islam (2001), Korea had a reduction in real earnings due to job losses, while the Philippines looked to have seen a negative impact on real wages due to increased food and fuel prices that coincided with the GFC. This crisis was driven by external factors, and hence it was export demand that drove the economic slump, while domestic demand contraction was rather minor. This appears to lead to a loss in job status only in impacted industries, such as international trade. Numerous methods used by firm during crisis including overtime reduction, freezing bonuses, promotion stagnation, reschedule jobs and responsibilities, changing working hours (Cascio, 2010; Gunnigle et.al 2013; Lai et. al, 2016).

According to International Labour Organization (2010) GFC 2009 has disrupted the labour market system when global wage growth excluding China recorded a slowed 0.8 percent in 2007 to 0.7 percent in two consecutive years. This recession situation has not only resulted to job loss but also impacted those in the employment and received reduction in purchasing power and post GFC showed that many employees faced wage stagnation stage where the cost of living had increased and it leads to the slowing down the recovery process in domestic economy.

Asian Financial Crisis 1998

Asian Financial Crisis (AFC) 1998 has impacted various industries among countries in Asian. It has recorded a negative impact to the economic performance in domestic and international country. ILO reported that says that the Asian Financial Crisis has severe impacts in Asian labour market that need to be response with urgent reaction by affected countries to avoid impact into unemployment, underemployment and poverty that economic growth and industrialization had recorded a slump growth. Real wage recorded a fall in Indonesia and Thailand. According to ILO (1999) real wages are falling by 8 per cent in Thailand, 30 per cent in Indonesia and 5-10 per cent in the Republic of Korea, vary upon the industry. During AFC 1998, reduction in wages was the strategy made by firms' including retrenchment and layoff to ensure the firms are stay afloat. According to Singh (1998) direct reduction in wage and self-employment order has made a labour market disruption in Indonesia during this time. Real wage trend appears to be starkly contrasted during GFC as compared to the AFC when significant wage adjustments happened in all courtiers that were facilitated by sharp currency depreciations and higher inflation. According to Betcherman and Islam (2001) reported that real wages fell dramatically in Indonesia, Korea and Thailand by 41.0 percent, 9.3 percent and 7.4 percent respectively. Asian Financial Crisis create a labour market changes in the sectoral composition of employment in all crisis-affected industry. In Malaysia, economic system has shown weak stock prices, the slump in property market and the domestic industry such as services and construction were severely hit. According to World Bank (2001) Malaysia,

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Philippines, Indonesia, Thailand and Korea Republic experienced the hardest hit in construction and manufacturing sectors where labour employment markedly fell across these countries. According to Ariff and Abu Bakar (1999) Malaysia government announced the cutting down of expenses budget to 18 percent including cancelation or postponement of several infrastructure mega projects. Uncertainties impact on crisis has significant influence to private, local and foreign investment.

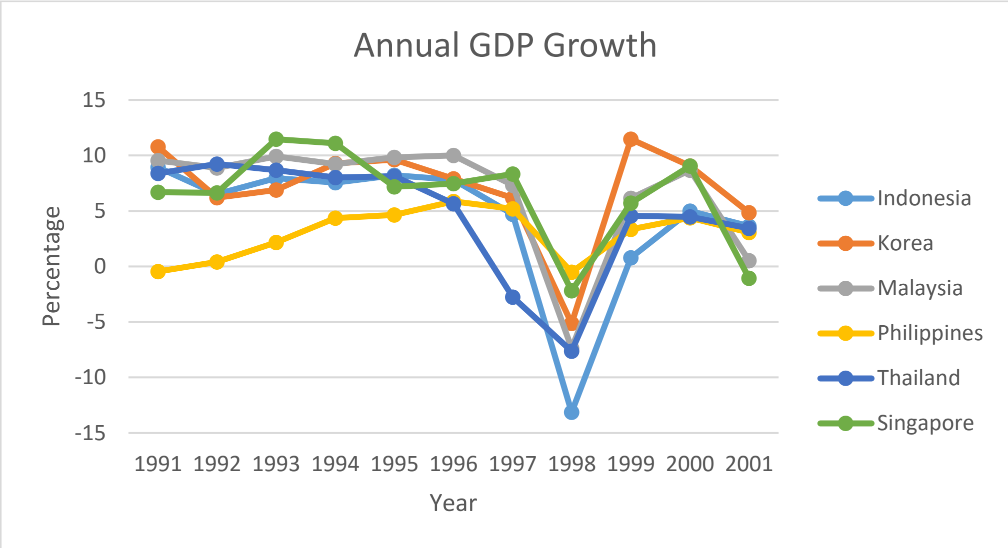

Figure 1: Annual GDP Growth in Southeast Asia Countries (1991-2001)
Source: World Bank

Middle East Respiratory Syndrome (MERS) and SARS Crisis
Middle East respiratory syndrome coronavirus (MERS-CoV) is a virus that spreads from infected camels to humans. The virus spreads between animals to humans through direct and indirect contract with infected animals. MERS-CoV cases have been reported in various countries throughout the Middle East, Africa, and South Asia. Middle East Respiratory Syndrome (MERS) outbreak has documented greater involuntary unemployment and underemployment situation as well as declined in working hours (Lee and Cho, 2016). In Korea, informed that older workers have high vulnerability in the labour market as compared to the other age's group. They also found that Korean labour market recorded that wage for non-regular workers were half from regular workers brings to the high inequalities during the phase of MERS crisis. Korean labour market shows a significant stratified structure where non-regular jobs portion with low wages and poor working conditions compared to regular jobs is high and expand the inequality gap in the labour market.

The unprecedented outbreak of the severe acute respiratory syndrome (SARS) has created an uncertainty for the world economy. SARS has created a disruption in the business performance especially tourism industry where people starts to limit their travel destination to avoid this severe disease. According to European Parliamentary Research Service (2020) estimates that China losses reached US$3.5 billion and Malaysia recorded a loss of US$1.7 billion during of SARS outbreak for the domestic tourism industry. Meanwhile, government order to close the business has create significant losses among firms' in service and tourism industries. Singapore recorded a weak labour market system during SARS and total employment fell by 40,900 in 2002 and 9400 in 2003. Firms' recorded a wage cuts on 15% reduction in variable on the new

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basic wage announced and wage freeze as firms are take the precaution methods to avoid any cost rises in the this outbreak phase. Numerous literatures explained the impact of cataphoric events towards macroeconomic and industrial economy towards SARS. The total cost from the SARS recorded in China was 1.5 percent of total Gross Domestic Product (GDP) (Hanna and Huang, 2006) and create shock to Taiwan manufacturing, retail, tourism and service industry (Chou et.al 2004) and (Zheng, 2003)

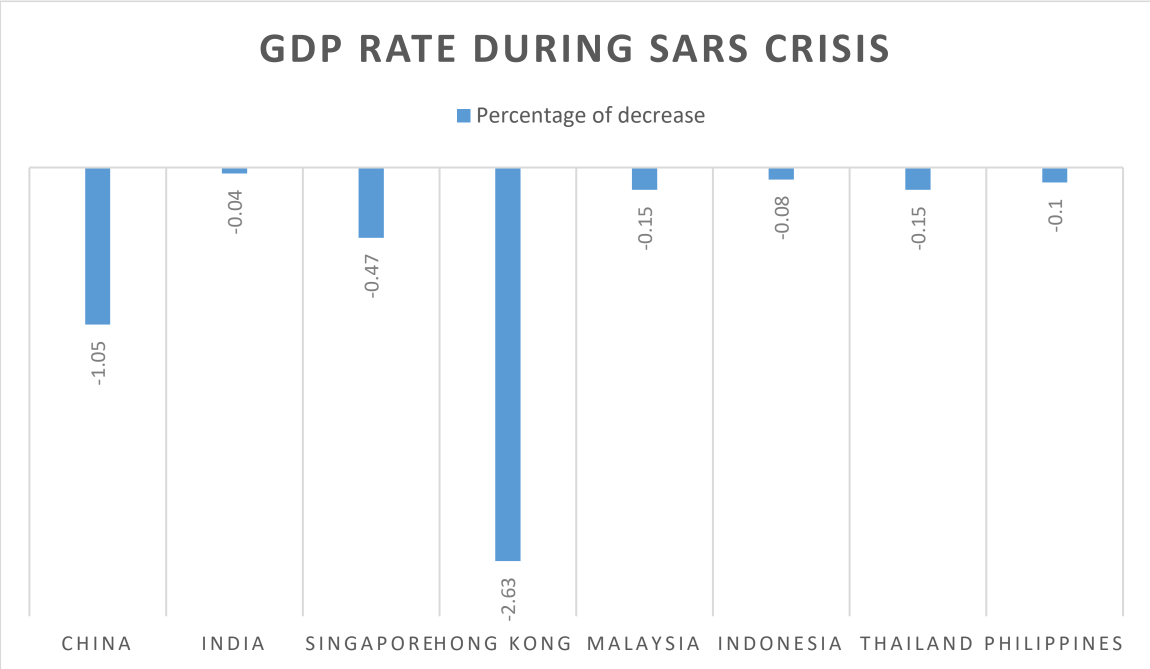

Figure 2: Percentage GDP Change in Asia Countries
Source: G–Cubed (Asia Pacific) Model version 50n.

Coronavirus Disease 2019 (Covid-19) Crisis
Covid-19 disease outbreak has been certainly had a devastating impact on both the global economy and on sectoral economies. It posing detrimental risk to labour market, health, and economic production. Various research on the COVID-19 pandemic exposed the negative impact on every sector of industries in the whole world (Codagnone et al. 2020 and Dzigbede and Pathak 2020). Most industrialised economies employment levels have returned to or above pre-crisis levels, while many enterprises in developing and developing countries face labour shortages (ILO,2021). This crisis has made 94% of workers lived in nations where workplaces were closed to stop the spread of the COVID-19 pandemic.

The immediate consequences of COVID-19 include physical and human capital losses, health problems for victims, and consumer and producer processes. COVID-19's long-run costs include economic activity distortion and diminished productivity. According to OECD (2020) reported the COVID-19 recorded 14 times higher on decline of scale fall in the employment across the affected countries as compared to Global Financial Crisis (GFC) even it has much longer time span with COVID-19 crisis. Lockdown restrictions enacted in 2020 and 2021 to halt the spread of the Covid-19 disrupt global labour markets system that resulted to wage cuts and retrenchment.

Covid-19 crisis create margin of inequality to expand towards high-paid workers and low paid workers where low paid workers are more vulnerable during crises. Researchers has explained various findings in terms of wage adjustment studies. Linehan et al. (2015) brief that wage initial response towards negative economic shocks is employment reduction including wage adjustment. However, Eggers (2020) found that wage adjustment are not the premier measure used by firm at the initial phase and only impacted the employments after prolonged crises. Firms' will focus on non-labour costs at the beginning of crises to ensure business operation are still running.

Wage adjustment is seeming as prominent strategy perform by firms' during economic crisis in order to stay afloat in the market. According to Ariga and Kambayashi (2010) they explain that Japanese firms will reduce labour cost including adjustment in wages in order to sustain the business performance during crises.

The study on the wage adjustments during COVID-19 by firms has highlighted various issues Kurowski (2021), Andersen et al. (2020) (Shen et al. 2020). The economic and social constraints caused by the COVID-19 pandemic undoubtedly had a direct strong impact on the economy (Baker et al. 2020), The first study on firm wage adjustment during COVID-19 were Cowling, Brown and Roca (2020) recognized the negative impact of COVID-19 towards SME performance and prove that wage for staff forced to furlough as response towards crisis. According to McDonald (2020) highlighted the downward wage rigidity is supported by worker loss aversion with respect to wages due to the social distancing order form government. Croatian manufacturing impacted during COVID-19 when firms' faced export trading limitations that leads to wage adjustment to firms' workers (Stojcic, 2020).

COVID-19 disease highlighted on wage adjustment implementation is the premier's strategy in response to limited access to finance. According to Choi (2020), Iyke (2020), Jorda et al. (2020) and Liu et al. (2020) observed important output and credit contraction due to COVID-19 and found most firms' tend to wage cuts and looking for business finance to ensure the retain and growth of businesses.

COVID-19 pandemic has disrupted the economic system and bring down firm performance that leads to wage cuts as the shock is unprecedented by many countries. Various research has shown the relationship of COVID-19 crisis and wage adjustment among firms' in the country (Meyer, Prescott and Sheng, 2022).

In the year 2021, literature in the study has shifted to study the impact of COVID-19 in the SMEs level. Seo, Ribin, Lee and Youngwoo (2021) study on crisis management studies and found wage reduction and working hour losses exist in Korean startup firms'. Lin, Aragao and Dominguez (2020) found that wage adjustment happened among United States firms' and firm size is no longer a strong indicator that associate the level of wage premium as COVID-19 impact the and disrupt the whole economic sectors including international trade.

Meanwhile, Djoumessi (2021) analyzed the impact of COVID-19 towards Cameroon firms' and identified that large proportion (60.93%) of workers were suffer from wage cuts during pandemic. On the other hand, Neely and Carmicheal (2021) studied on the relationship of access to finance to the firms' during crises and choose wage cuts and burden as one indicator

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in providing loan. Study on Nigerian firms' response towards COVID-19 has resulted on wage cuts including staff downsizing (Olatunde, Municio and Awodele, 2022).

No	**Crisis**	**Time**	**Location**	**Findings**
1	Global Financial Crisis	2007-2009	United States	Decline in US housing market
			Korea	Reduction in real earnings
			Philippines	Increase in food and fuel prices
2	Asian Financial Crisis	1998	Indonesia, Korea & Thailand	
			Malaysia	Labour construction and Manufacturing sectors has markedly fell
			Indonesia, Philippines Korea, Malaysia & Thailand	GDP growth recorded a fall beyond 0 in 1998
3	Middle East Respiratory Syndrome (MERS) and SARS Crisis	2002-2004	China	Losses US$ 3.5 billion in tourism industry
			Malaysia	Losses US$ 1.7 billion in tourism industry
			Singapore	Employment recorded fell in 2002 to 2003.
			Taiwan	Manufacturing, Retail, Tourism and Service Industry has recorded slump
4	Coronavirus Disease (Covid-19) 2019	2020	Croatia	Export trading limitations that leads to wage adjustment to firms' workers
			South Korea	Wage reduction and working hour losses exist in start-up firms'
			United States	Wage adjustment happened among local firms'
			Cameroon	Large proportion (60.93%) of workers were suffer from wage cuts during pandemic
			Nigeria	Wage cuts including staff downsizing

Table 1: Findings On Past Crises And Impact Towards The Country's Economic Performance

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Firm Characteristics

Numerous researches have shown the relationship of firms' characteristics and wage (Meyer, Prescott and Sheng, 2022). Impact of the economic shock were more severe and fell disproportionally on employment causing layoffs and wage cuttings. In order to explain the situation, the economic literature has swift the attention on the role of labour market institutions in firms' decisions about margins of adjustments. Firms' will adjust the wage to a change in demand or supply by increasing output price or reducing production costs. Firms' react to a demand shock by reducing employment, adjust the wage including layoff of temporary workers (Bertola et al., 2012). According to Dias (2013) firms' may adjusting flexible pay components, decrease working hours and freezing new employment including encouraging early retirement.

Therefore, wage adjustment is one of the strategies undertaken by firms' as reaction towards economic shocks. It has been recognised that the reward programmes implemented by the employer varies due to the internal working condition of the firms' (Groschen, 1991). Financial capability and employee's productivity influence firms' with the capability to pay wage accordingly (Blanchflower and Oswald, 1988). Generating greater profit allows the firms' to allocate financial resources wisely that may result in a performance increment together with wage increase or a base wage increase.

Moreover, few studies discuss on the correlation between firm size and their wage policy during economic shocks. Large firms' willing to pay higher wages and introduced new wage advertisements to new employees. (Brown and Medoff, 1989; Belfield and Wei, 2004). Larger firms' are likely to be more subtle to work changes that leads to the high bargaining power of employee in larger firms' in order to minimize the risk of crisis. (Agell and Bennmarker, 2007). Start-ups and small firms' pay lower wages to their employees as capacity of business is limited (Brixy et al., 2007). A minimum positive correlation exists between wages and firm performance may be due to the broad geographical area of the countries where their business operates (Moriones et al., 2016).

Union power is another factor that influences wage changes in the firms'. According to Bryson (2014) unions affect wage amount, create bargaining power that able to negotiate terms for their members including wages. The wage bargaining power is used to resist wage from downward pressure, such as firm's initiatives to cut wages during economic crisis. This condition has led the union wages to be more rigid than non-union wages where adjustment margin flexibility can be controlled by union.

For non-union firms', the wage is less rigid than union firms' as employers may adjust the wage without pressure or force. However, Farber (2003) found mixed result on the relationship of the union threats in organization as a factor in determining the wages of non-union workers where the adjustment is exist in non-union firm but not significantly impact the whole labour market.

Institutional Framework

The correlation between labour market and institutional framework impacts has been discussed in various literature (Lehmann and Muravyev, 2012). An institutional framework is explained as the systems of regulations, formal laws and procedures, culture and informal norms that have involved in socio economic activity and business behaviour. The institutional framework

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is frequently to be the result of government policy but workers organizations may have their own regulations and procedures on hiring employees.

In wage adjustment perspective, institutional framework plays vital role in determines the firm responses and behaviours when their businesses experience economic challenges (Ingram et al., 1999). Unions and collective agreements are one of the institutional adjustment tools to create the likelihood of wage bargaining. Strict institutional regulation is associated with the prevalence of external factors in the wage setting process, while weak institutions, in contrast, result in the predominance of internal factors (Moriones et al., 2016). Unions involve in developed a strength in wage determination in spite of the efforts taken to adjust the system and decontrol labour markets and leads to improve the performance (Lehmann and Muraviev, 2012).

Another institutional structure that businesses must adhere to is the national minimum wage. The minimum wage serves as the starting point for employees' compensation. Productivity is the key factor determining earnings for the employees' minimum wage. However, other external factors also associate to increase the amount of minimum wage (Agudelo and Sala, 2016).

Amount of wages offered from particular firms' is the result of collective bargaining of firms' between the employees and the employer. However, in countries with rigid institutions wage adjustment are been regulate by national and industry and not solely depend on the firms' decision. Firms' functioning in centralized bargaining framework have higher wages compared to firms' in decentralized wage settings (Ronchi and Mauro, 2017).

Finally, the effectiveness of policy implementation is vital in determining the future effectiveness of labour market laws. Firms' become more inflexible when strict labour regulations and a valid enforcement mechanism are implemented, which can have a negative impact on business performance. In developed and developing countries, enforced labour restrictions are connected with poorer growth rates in terms of the country's economic performance as a whole.

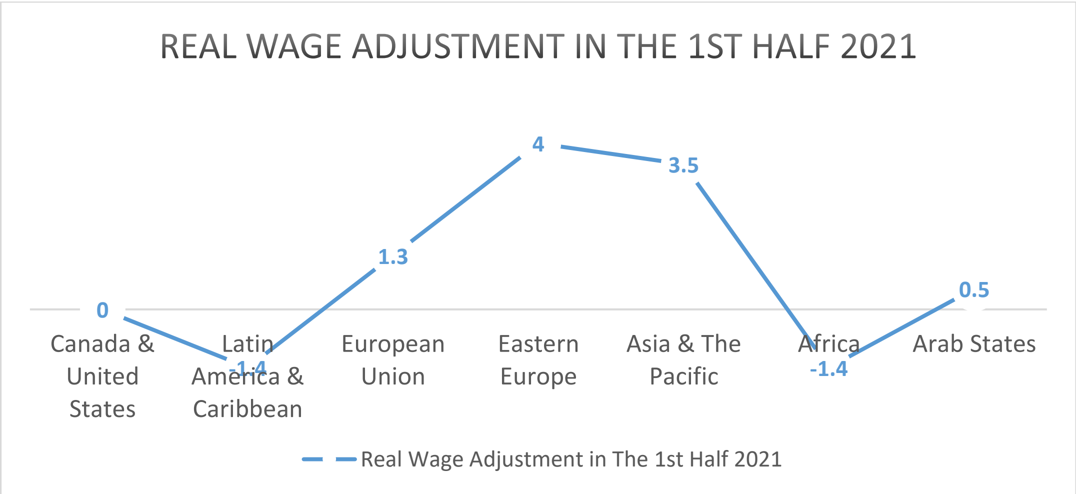

Figure 3: Real Wage Adjustment Rate in 1st Half 2021
Source: International Labour Organization (2022)

Wage Respond towards Firms' Internal and External Condition

Wage tends to be fluctuated over crises as it disrupts the whole performance of the firms' to pay and sustain the remuneration. Limited financial access and investments has made the firms' respond to the wage changes to the employees. A crisis is a condition defined by unanticipated events that have a detrimental influence on the company. Economic crisis is the result of an unforeseeable global circumstance that world need to provide fast, precise, and accurate decision in order to avoid disruption in the entire operation of firms' and minimise unintended consequences.

Internal and external challenges have deteriorates firm performance from every side of business angle during economic turbulence. Firms' have capability to adjust business profit through prices, margins, and costs. However, the demand and consumer purchasing power is not adequate to fulfil the gap of business loss.

Therefore, firms' tends to turn the costs to the workers and internal manpower such as reducing working hours and basic salary cuts in order for firms' to sustain during economic crisis. The significance of adjustment is the adjustment margin is predicted to rely on the nature and intensity of the shock together with the structural features of the labour markets and product according to the geographical operation of the firms'.

According to Bewley (2007) firms' hiring decision influences by the wage flexibility among new or marginal worker and not the aggregate wages. According to Schaefer and Singleton (2017) show that firms' were able to respond to the Great Recession by implementing significant real wage cuts and hiring more part-time workers.

According to Fabiani et al. (2015) brief that firms' might adjust the labour costs by reducing wages or number of employment. According to Campello et al. (2009) finds that firms' having difficulty in accessing financial access during crises including investments that leads to sluggish performance of the firms'. According to Thaker and Mohamed (2015) internal and external challenges among Malaysia SMEs are lack of capabilities and resources, low technology literacy, business competition from the international brands, poor business management, economics turbulence, socio-cultural and international factors. Firms' tend to adjust the wage during crises due to internal and external factors that disrupt their business performance including shorten of supply chain, low financial capability and low purchasing power among consumers.

Strategies Undertaken By Firms' During Crisis

A dramatic fall in sales performance has forced firms' to adjust numerous methods in order to survive and thrive. Firms' in economic crisis may suffer disproportionately from downturns due to limited financial resources, reliance on bank lending, and high interest rates. Business cycles are changes in production or economic activity that occur over a period of months or years. (Shumpeter 1954).

In the midst of economic crisis, firms' will implement strategies undertaken to ensure business continuation. A rising cost of raw materials and credit interest has made firms' layoff the employee (Salerno, 2012). Firms' with relative deficiencies in the manpower tend to reduce their capacity to resolve the economic turbulence (Bourletidis and Triantafyllopoulos, 2014). According to Dias, Marques, and Martins (2012), a significant majority of Portuguese firms'

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have reduced labour costs by lowering their staff sizes and wages, including the removal of bonus payments and other financial perks.

According to Shayb and Musetescu (2020) firms' will change business strategy according to the needs of current consumers. Crises gave impact to the demand and supply, hence the needs of consumer also have change that leads to the changes of business strategy. However, this efforts may seem like positive method to reduce costs in the short-term, while it can actually have negative consequences in the long-term of the economic performance in the country.

Labour cost reduction strategies have been the prominent strategy perform by firms' during economic crisis in order to stay afloat in the market. Firms' in European countries are using labour cost reduction by reducing the salary of employee. Cost labour reduction has been implemented by many European countries post Global Financial Crisis 2009 (Fabiani et al. 2015). According to Linehan et al. (2015), an enterprise survey in Ireland at the firm level revealed that firms' will adjust the labour cost during crises including employment cuts, reduction on labour input and wage adjustment. In addition, Kunovac (2015) found that firms' who refuse to adjust labour input and wage are limited to raise the wage in the economic crisis recovery phase due to challenges on balancing the cost during economic turbulence. Firms' are more likely to decrease the number of employees working hours, and bonus payments rather than wage adjustment (Bergin, Kelly and McGuiness, 2012).

Furthermore, retrenchment is an idea for firms' to reduce business cost in order to sustain the company firm during economic crisis. Firms' will tend to retrench their employees during economic crisis due to lack of resources such as financial and raw materials. Retrenchment strategies has become a popular method in order to keep the company afloat during economic turbulence. As a general rule, enterprises operating considerably below their breakeven point should undertake a dramatic retrenchment plan with asset reduction as their major aim. He added that firms' operating closer to the breaking point, on the other hand, should pursue a cost-cutting or combination strategy for retrenchment.

Paradoxically, a popular organizational response to crisis is layoffs employees in order to help organizations cope during the periods of crisis. Retrenchment is a set of proactive measures used by firms' during an economic downturn to reduce costs and assets (Pearce and Micheal, 1987). According to Hambrick and Schecter (1983) firms' seek to recover during a crisis by decreasing costs and boosting productivity. Firms' with limited financial resources will prefer retrenchment as a short run solution (Kylver and Nielsen, 2021). According to Hofer (1980) proposed three core turnaround strategies during crisis namely cost cutting, asset reduction, and income generation.

Moreover, another strategy used by firms' during crisis is layoff strategy. Layoff is a measure adopted by firms' with limited financial reserves amid economic turmoil, and this strategy will lessen the company's cost of employment (Gittell, Cameron, Lim and Rivas, 2006). However, layoffs may cause emotional and motivational disturbances for remaining employees and may have an influence on the firm's overall performance (McDevitt, Giapponi and Houston, 2013).

Firm Investments During Crisis

Firms' experienced greater funding constraints and investor unable to finance their projects during economic downturns. Firms' will adjust physical capital investment, workforce,

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innovative capability, and stakeholder relationships to maintain competitiveness when company costs rise during the crisis. According to Flammer and Iannou (2018) explains that firms' will adjust their labour workforce and investment to ensure the business continuation. They also stated that corporations have not adjusted the cost of investing in Corporate Social Responsibility (CSR) and Research and Development (RandD). This adjustment demonstrated that the company still intends to grow during economic downturns and focuses more on branding through CSR projects because they can easily connect with associated parties and government agencies. The extreme situation on the crisis may have compelled firms' to revise and reshape their strategic investments to ensure survival and sustain their competitiveness.

Wage Adjustment of Newly Hiring Workers
Wage adjustment of newly hiring workers appears to play a crucial role in the decision to open a vacancy during crisis. According to Martin, Solon and Thomas (2012) discovered using data by Portuguese census of employee that real entry wage is 1.8 percent higher during unemployment rate was one percentage point lower.

Reduction of wage among newly hiring workers are associate with external environment such as a disruption of economic supply chain. According to Stuber (2013) research to Germany employees shows that entry-level wages are not rigid, but rather respond significantly to economic cycle conditions. According to Bils (1985) identify the cyclical sensitivity of new hire wages in comparison to existing workers.

According to Snell, Stuber and Thomas (2018) they discover that the elasticity of real wages to output is close to zero in downswings but positive and significantly substantial in upswings. They also discover that the cyclicality of new hire earnings is approximately the same as that of imp pay, regardless of whether they came from unemployment.

The wage rigidity of new hires is thus an essential amplification mechanism in a wide range of models, which has sparked considerable interest in the literature. According to Schaefer and Singleton (2017) show that firms' were able to respond to the Great Recession by hiring part-time workers and cutting real wage cuts.

Increase in the unemployment with one point rate resulted in a 2.8 percent drop in real hourly wages for new recruits and a 2.6 percent drop for job keepers. New hire hours in entry-level positions were also significantly pro-cyclical, but job-stayer hours were essentially constant. New hires workers were not only paid less during crisis, but were also trapped into low-wage growth pathways.

Conefrey and Smith (2014) conducted the research to identify the margin and impact in Irish labour market towards wage adjustment among new graduate entrants. The study provides insights on the significant degree of flexibility in the wage offered by firms' found that the wage for fresh graduate were rapidly deteriorated when the economy falls into recession in 2008. However, aggregate salary data analysis has likely concealed significant variation in wage trends across different industrial sectors and population groups. They also stated that their study is lacking in justifying the significant proof on downward adjustment in nominal wage for new graduates into the labour market, despite the findings that reductions in overall earnings for the entire labour market have been marginal during the recession.

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Limited Access To Finance As Constraints To Firms' During Covid-19 Crisis

A flagging financial position and a deteriorating macroeconomic environment raised concern regarding access to finance among firms. These constraints have made it difficult for SMEs to survive the COVID-19 outbreak because disrupt the revenue streams, fixed costs must be paid, and business operations have become more restricted and limited. High numbers of SMEs are vulnerable towards crisis and no longer sustainable when revenues fall below operational costs.

SMEs typically suffer from shortage of sales volume, financial loss, workforce reduction and firm closure during and after crises (Alves, Lok, Luo and Hao, 2020). The operations of businesses are negatively affected during a crisis due to the difficulties in accessing resources and inadequate financial liquidity (Eggers, 2020). SMEs are generally having financial constraints, inadequate working capital, limited cash flow including challenges in getting financial assistance or other form of loans has been a longstanding issue prior to the pandemic (Ambad et al., 2020).

In Malaysia perspective, access to finance is considered as one of the main challenges for micro enterprise to sustain and growth the firm performance. According to Thaker and Mohammed (2013) brief that micro enterprises faced the constraints of external financing access as most financing facilities benefited the SMEs and not micro enterprise.

Hassan et al. (2010) found that micro enterprise have financial constraints particularly during the start up. According to Selamat et.al (2011) examined that low level of business knowledge and limited access to business capital are main difficulties faced by micro enterprises in Pulau Pinang. According to Aris (2007) lack of collateral, insufficient related documents and unrecorded business transaction have become a limitation for micro enterprises loan approval.

According to Bank Negara Malaysia (2023) reported that there is a significant gap between numbers of business loan application and numbers of approval.

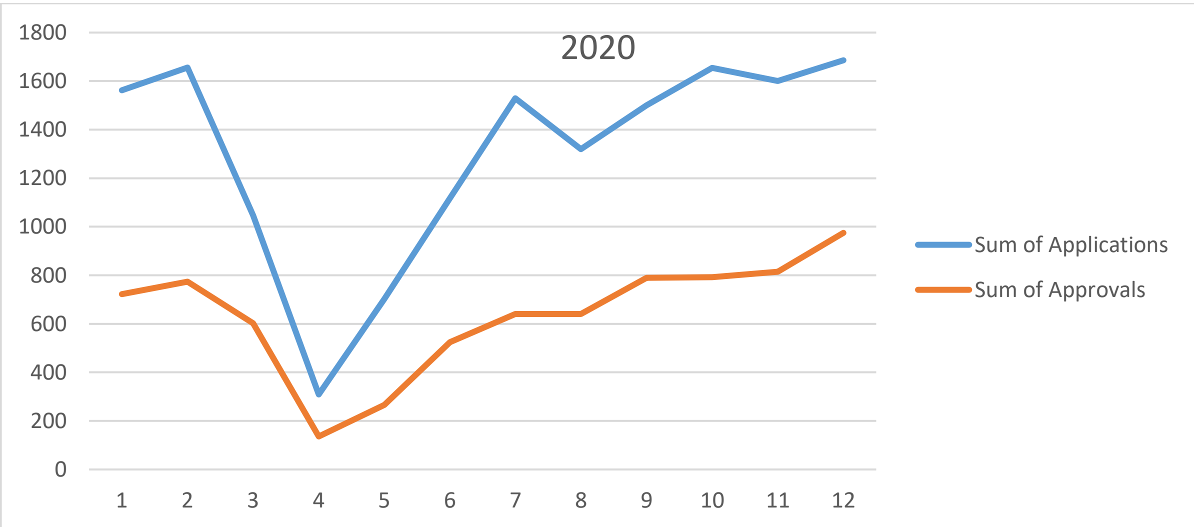

Figure 4: Business Loan Application and Approval

Source: Bank Negara Malaysia

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According to the graph above, Malaysian firms' having difficulty in business loan approval even after the announcement of endemic of crises. During October 2020, more than half applications of finance was rejected that leads to the slump growth among Malaysia SMEs. Therefore, this situation can be proved that firms' in Malaysia having constraints in accessing the financial aid that has brings them to take internal measurement such as wage adjustment and retrenchment. According to Department of Statistics Malaysia (2020) during Movement Control Order in Malaysia, revenue streams of SMEs were reported as lower as compare to non-crisis time and they are still burden to pay the rising fixed cost.

Methodology

This paper using Web of Science as main source to extracted article related with wage adjustment literature. Various process had taken place during article extraction in the literature bank. The paper chosen was from 2020 and ends in 2024 with a study that focus on firm-level. Therefore, The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) method is used to explain the process for article extraction in the Web of Science. PRISMA is a guideline for reporting systematic review that widely been used by numerous researcher.

Firstly, the articles from Web of Science was extracted with topic firm wage during Covid-19. Next, advanced search was used and option 'OR' selected to find articles with topic firm salary Covid-19. Further, filtration on only articles is selected from the year 2020 to 2024 and no articles has been published before the year 2020 in a case of Covid-19. Therefore, 69 results of article is appeared. In addition, the results from Web of Science with the filter set up has been extracted to excel file in order to analyse the findings of each paper in systematic way. The findings and results of articles is been discussed in the literature analysis section.

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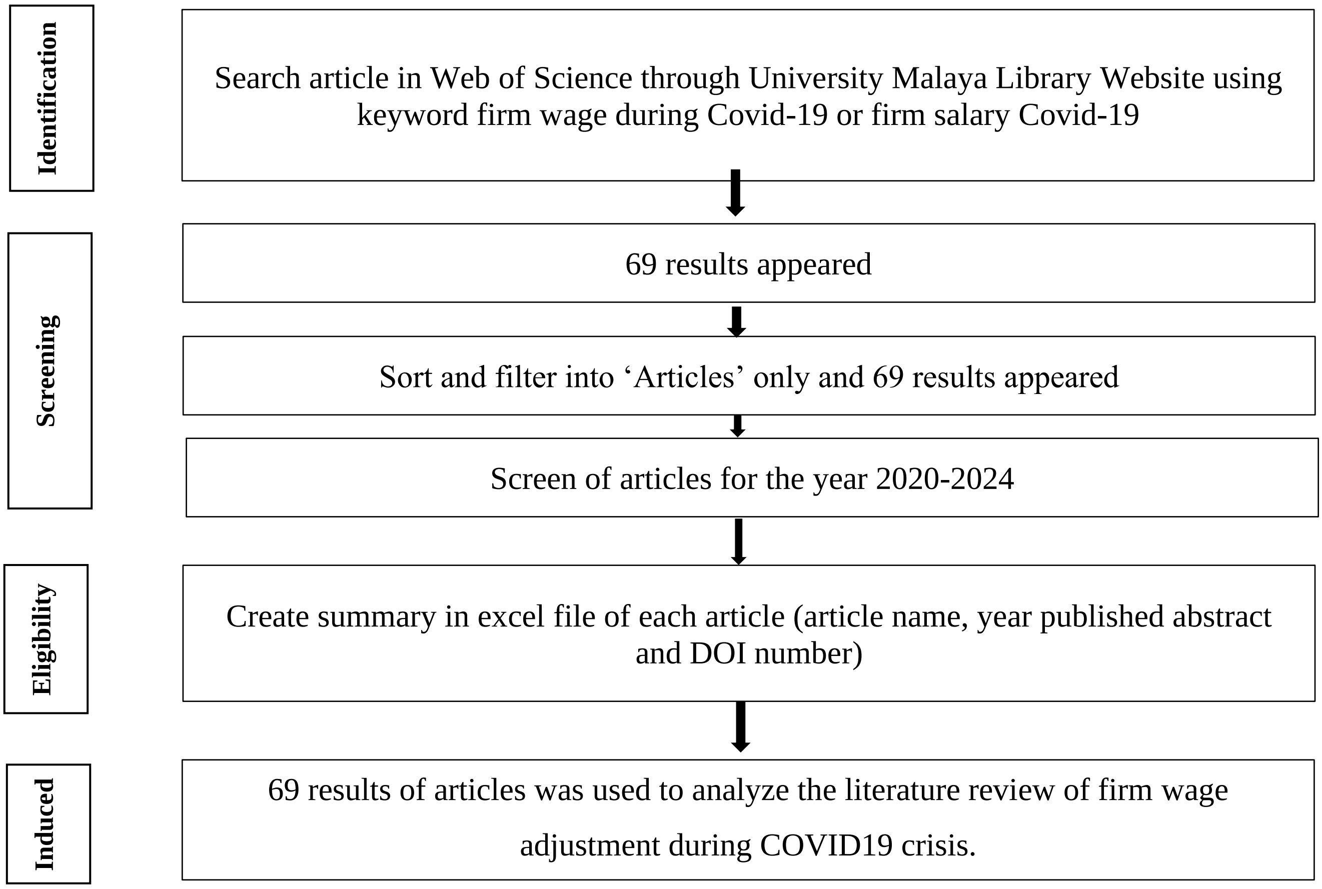

Figure 5: PRISMA Diagram Process of Articles Extraction

Source: This PRISMA Diagram is adapted from Rathnayaka, Khanam, & Rahman, 2022

Literature Analysis

The study on the wage adjustments during COVID-19 by firms’ has highlighted various issues (Meyer, Prescott and Sheng (2022); Lalinsky and Pal (2022), Kuchakov and Skougarevskiy (2021). The first study on firm wage adjustment during COVID-19 were Cowling, Brown and Roca (2020) recognized the negative impact of COVID-19 towards SME performance and prove that wage for staff forced to furlough as response towards crisis. The social and economic restriction leads by the COVID-19 pandemic significantly had a direct impact on the overall economic performance (Baker et al. 2020).

COVID-19 pandemic has disrupted the economic system and bring down firm performance that leads to wage cuts as the shock is unprecedented by many countries. Research has shown the relationship of COVID-19 crisis and wage adjustment among firms’ in the country (Meyer, Prescott and Sheng, 2022). Therefore, literature analysis in this study is segregated into three main issue that highly discussed in articles provided.

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Supply Chain Disruption Towards Firm Performance

Supply chain disruption caused by catastrophic Covid-19 virus is an issue that leads to the unstable labour market system in the country. The spill over impact on labour market is caused by low performance of business during Covid-19 disease where firms' were having limited demand on their product that leads to labour cost reduction strategy. According to Frenkel, Rahman, Stephen (2022) disruption in global supply chain has created negative impact to labour market system. The Covid-19 restriction movement continues to be the significant challenges for firms' due to disruption in supply chains globally. Movement Control Order has slowing down the movement of raw materials and negatively impacted the firm performance as a result. According to Nagurney and Anna (2022) Covid-19 has disrupted the supply chain functionality that leads to labour shortage resulting downfall of product availability and business profit performance. Manufacturing industries also affected during this event due to raw materials limitations and export process. Croatian manufacturing impacted during COVID-19 when firms' faced export trading limitations that leads to wage adjustment to firms' workers (Stojcic, 2020).

Wage Cuts: Alternative Strategy For Firms'

Various articles found that firms' implemented wage cuts strategy as methodology for firms' to sustain their business during Covid-19 crisis (Prescott, Brian and Meyer, 2022). According to Djoumessi (2021) found that 60.93% employees in the country were affected with wage cuts. Wage cuts have seemed as prominent and highly impacted strategy for firms' to cover the business loss during Covid 19. High numbers of employees wage cuts in the country will slower down the economic recovery process in the country. Low purchasing power and inflation rate spike among employees who faced wage cuts will slower down economic recovery process including recovery on labour market system in the country. According to International Labour Organization (2012) stated that wage cuts will depress the consumers consumption and leads to negative impact to the economic growth. In the United States, firms' methodology to reduce business cost is employee salary reduction rather than layoff and reduction in working hours (Fassas, Bellos, George 2021). According to Fukuda and Akira (2022) labour cost reduction is found among Japanese SMEs. Lin, Aragao and Dominguez (2020) found that wage adjustment happened among United States firms' and firm size is no longer a strong indicator that associate the level of wage premium as COVID-19 impact the and disrupt the whole economic sectors including international trade.

Meanwhile, Djoumessi (2021) analyzed the impact of COVID-19 towards Cameroon firms' and identified that large proportion (60.93%) of workers were suffer from wage cuts during pandemic. On the other hand, Neely and Carmicheal (2021) studied on the relationship of access to finance to the firms' during crises and choose wage cuts and burden as one indicator in providing loan. Study on Nigerian firms' response towards COVID-19 has resulted on wage cuts including staff downsizing (Olatunde, Municio and Awodele, 2022). Wage cuts was profound as the premier strategy from firms' during economic crisis as employees' vulnerability towards wage changes is high and flexible in every economic realm. According to Baltaji, Fakih and Sayour (2023) found that manufacturing and retail industries cut the wage in the medium term of the crisis.

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Wage Subsidies as Strategy To Reduce Wage Adjustment

Next, wage subsidies effectiveness to the firm performance is another area that widely discuss in the literature. According to Kuchakov and Skougarevskiy (2021) O'Toole, McCann, McQuinn (2021), Lalinsky and Pal (2022), Abbott and Phan (2022) and Lin, Liu and Liang (2023) study on the effectiveness of wage subsidies to the affected firm of COVID-19 and the results shows less significant impact to the small firm performance and the big corporations receive high numbers of subsidies and business aid from the government. According to Fukuda (2022) found negative correlation between wage subsidies and firm performance when firm still implement wage adjustment towards their employees. Autor, Cho and Yildirmaz (2022) study on the effectiveness of Paycheck Protection Program as one of the stimulus packages during COVID-19 pandemic and found a positive significant impact towards firm performance, boost up employment between 2 percent to 5 percent and as May 2020 recorded 3.6 million jobs are retained. According to Lalinky and Tibor (2022) Covid-19 wage subsidies have successfully save non-negligible jobs, mitigate firm losses and sustain economic recovery in European countries.

However, few research found that wage subsidies have certain limitation and ineffectiveness in few countries. According to Wong, Wong and Norman (2021) firms’ used wage subsidies money for wealth transfer. According to Kuckakov and Dmitry wage subsidies have no impacts on firms’ performance among Russian firms’. Abott, Brant, Nam Van Phan (2022) found that wage subsidies programme are less efficient towards high income workers as firms’ still need to bear huge amount of wage in order to retain these group of workers. According to Morikawa (2023) firms’ that applied support policies had recorded a lower productivity and wages since before the pandemic and firms’ that used multiple policy aid including those that repeatedly applied tended to show lower on firms’ performances.

In addition, other articles highlighted few issues in wage adjustment correlation and variables. According Petach and Tavani (2022) discovered underutilization impacts the functional income and wealth distribution where the wage and the workers wealth share during COVID-19 using a two-class model of growth and the distribution of income and wealth at the intersection of contemporary work in classical political economy and post-Keynesian economics. Robu, Dicu and Vuta (2023) analyzed the effectiveness of teleworking to the growth of economics and result shown that average wage offered is influenced with teleworking as the existence in the office is limited. According to Yan, Wag and Zhang (2023) wage offered is different across the cities in China during Covid-19 pandemic due to formation of regional supply chain that disrupt the economic system. In addition, Lee and Dong-Han (2021), Wong and Wong (2021), Makin and Laton (2021) and Janzen and Radulescu (2022) researched on the impact of COVID-19 towards industries performance and found positive correlation towards the sustainability of the firms’ during COVID-19. According to Wellalage, Reddy and Wallace (2023) found that probability to received government aid will be high if firms’ have good environmental score.

Furthermore, few articles study on the impact of technology adoption towards wage adjustment during Covid-19 crisis. According to Xu, Liu and Liu (2024) study on robot adoption as a strategy for firm continuity plan among Chinese manufacturing firms’ in China during Covid-19 crisis. The result showed that robot adoption able to reduce firms’ cost but impacted negatively to low- income workers. Robu et al. (2022) research on teleworking relationship on firm’s performance and found that teleworking were significantly influences wage for

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employees' during the crsisis. According to Luma and Ademi (2023) brief that counties with high corruption resulted positive impact in wage subsidies programme but technical assistances programmes positively impacted in low corruption countries.

Gender Gap and Firm's Wage Adjustment
Gender pay gap has also exist in the uncertain circumstance of the Covid-19 crisis that driven by labour markets across continents leads to the unparalleled dynamics of earnings by gender across location. According to Popovici, Carvajal, Peeples and Rabionet (2022) explored on the wage gap among gender in the United States found that the wage gap of 44.7% in wage and 46.8% in total earning relative to their U.S. counterparts with greater gaps for women than men. They also found that wage gap among countries outside United States is greater than in the United States. Factors influence to the gap has been proved that working experience, remote working and age has significant relationship with the wage gap between male and female in the United States and other countries in the study.

Furthermore, the study on the woman participation and firm's growth has highlighted the importance of woman contribution in labour market system thus contribute to the economic growth in the country. According to Marconatto, Peixoto, Teixeira and Fochezatto (2022) examined woman's contribution in firm's growth during Covid-19 crisis found that an increase in women workers in the total workforce boosts the firm's growth. Few variables such as wage and job tenure also resulted in positive significant showed the increment of wage and continuation of job tenure have increase the firm's performance. This study showed that woman participation in labour workforce is vital to the firm's overall performance and alleviate the predicament experienced by women workers during economic crises.

According to Bell, Bloom and Blundell (2022) study on income dynamics found that male and female wage changes reaching the lowest point of skewness across 45 years of period during Covid-19 crisis. Both genders recorded declining pattern in Kelley skewness and lowest point in the young female workers.

Country	Year	Author	Main Results	Sample	Wage response
United States	2022	Meyer, Prescott and Sheng	Shock on demand and supply on business sales and operation	Firm's survey	Wage reduction perform by firms'
Australia	2023	Bedford, Bugeja, Ghannam, Jeganathan and Ma	CEO paycuts does not reduce the expenses of firm and not have significant relationship to the business performance.	Australian Firm's Data	CEO paycuts as strategy to reduce cost during Covid-19
United States	2021	Mazur, Dang and Vega	Firms' cut wage for workers and CEO during	Standard and Poor Data from	Base wage has been cut

Country	Year	Author	Main Results	Sample	Wage response
			Covid-19 market crash	Thompson Reuters	during Covid-19
Jordan, Egypt, Tunisia and Morocco	2023	Sahli and Alsamara	Working hour and wage cutting are the initial responses rather than layoff during the beginning of crisis.	Firm level data survey	Firms' in vulnerable industry (tourism and food) reduce wage significantly
Nigeria	2022	Olatunde, Municio and Awodele	Downsizing, salary cuts, work from home are survival strategies made by firms' during pandemic	Quantity surveying firms' (QSF)	Firms' cut wage during Covid-19 pandemic
Cameroon	2021	Djoumessi and Yannick	Majority of firms' use wage cuts (60.93%), temporary job suspension (31.6%) and only (7.47) having job loss.	Rapid Survey by National Institute of Statistics	Large numbers of firms' cuts wage during pandemic
United States	2022	Autor et.al	Level of employment at eligible firms' has increased 2 to 5 percent in May and slowly declined thereafter for the impact of Paycheck Protection Program	Payroll Data	Paycheck program is an alternative to reduce paycuts among firms'
China	2021	Jin, Gao and Xiao	Tourism industry severely impacted as compare to other industry	Survey from Domestic Tourism Data	Wage incentive is less declined for state-owned firm
Ireland	2021	Kren, Lawless, Toole,	61% of SMEs received wage subsidies	Survey data from Irish SME	Wage reduction happened

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Country	Year	Author	Main Results	Sample	Wage response
		McCann, McQuinn			mong affected firms'
China	2020	Cheng,Gao, Saliba and Dorduncu	Tourism industry affect the labour market	Survey by questionnaire	54.29% firms' reduce their workers wage
China	2024	Xiu, Liu and Liu	Robot adoption significantly impact low income workers	Firm level data analysis	Wage for low income workers are declined

Table 2: Literature Analysis: Study on Relationship of Wage Adjustment During Crisis

Conclusion

This paper has attempted to offer a review of the burgeoning literature on the wage adjustment during COVID-19 crisis. A particular contribution to the literature is comprehensive literature review that can be used as reference for researchers. This paper review 68 numbers of papers from Web of Science and highlight the issues and results for related articles on issue of wage adjustment during COVID-19 crisis. The review provides clear insight on how the wage have been adjusted across countries together on measurement undertaken by government to control wage adjustment during COVID-19.

Therefore, the impact of COVID-19 towards labour market system can be debatable due to the impact are almost similar to all developed and developing countries but the margin of impact was slightly different that leads to different approaches by firms' towards their labour management. Firms' adjust the wages of a whole group of workers simultaneously and assume all workers have a similar cost of living (Brown et al., 2014). On the average, most firms' implement wage cuts to the workers as an alternative strategy to keep their business afloat. According to Pissarides (2009) new hire wages are allocative for employment decisions. A prolonged COVID-19 crisis has made newly hiring workers in risk due to their wages offered are way lower than amount of before crisis. Most spatial studies find that the firm behaviour of wage adjustment towards newly hiring workers together with the impact on inflation and economic performance. However, wage subsidies program announced by governments to certain countries shows a significant relationship to the reduction of wage adjustment among firms' in that particular country in the short-run.

Finally, future research may emphasize on margin of adjustment towards impact on labour market together on whole economic system. Reducing tax rate to certain group of income is suggested for governments to increase purchasing power and implementation of regulation on the wage adjustment should be proceed to ensure the sustainable economic growth in the country. Last but not least, data comprehensiveness was another challenge to study wage adjustment. Researchers in the past were limited to identifying a few variables that related to their studies to incomplete data records from the firms' and authority bodies. Therefore, completed data will help future researcher to study the impact of wage adjustment.

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