The Impact of Involuntary Job Loss on Unemployment Rate During Asian Financial Crisis and Subprime Crisis in Thailand

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ผลของการเลิกจ้างต่ออัตราการว่างงานในประเทศไทยในช่วงวิกฤตการณ์ทางการเงินในเอเชียและวิกฤตสินเชื่อไร้คุณภาพ

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เบญญา คงธนาสมบูรณ์ : ผลของการเลิกจ้างต่ออัตราการว่างงานในประเทศไทยในช่วงวิกฤตการณ์ทางการเงินในเอเชียและวิกฤตสินเชื่อไร้คุณภาพ. (The Impact of Involuntary Job Loss on Unemployment Rate During Asian Financial Crisis and Subprime Crisis in Thailand) อ.ที่ปรึกษาหลัก : รองศาสตราจารย์ ดร.เจสสิกา เวชบรรยงรัตน์

ในแต่ละปีคนงานหลายพันคนตกงานด้วยเหตุผลที่อยู่นอกเหนือการควบคุม เช่น การปรับโครงสร้างองค์กร การเคลื่อนย้ายทางเทคโนโลยี และวิกฤตเศรษฐกิจ และอื่นๆ การสูญเสียงานที่ไม่คาดคิดเป็นเหตุการณ์พลิกผันที่เปลี่ยนเส้นทางอาชีพของคนงาน และส่งผลเสียต่อสังคมและเศรษฐกิจ ซึ่งในประเทศไทยสามารถสังเกตได้ในช่วงเศรษฐกิจตกต่ำ รวมถึงวิกฤตการณ์ทางการเงินในเอเชีย (พ.ศ. 2540) และวิกฤติสินเชื่อด้อยคุณภาพ (พ.ศ.2551) การศึกษานี้มีวัตถุประสงค์เพื่อให้เกิดความเข้าใจอย่างครอบคลุมถึงผลกระทบของวิกฤตการณ์ทางการเงินในเอเชียและวิกฤติสินเชื่อด้อยคุณภาพต่ออัตราการว่างงานในประเทศไทยทั้งก่อน ระหว่าง และหลังวิกฤตการณ์ ข้อมูลจากการสำรวจภาวะการทำงานของแรงงานทั่วราชอาณาจักรในปี พ.ศ. 2536, 2541, 2546, 2551 และ 2556 รวบรวมโดยสำนักงานสถิติแห่งชาติ ประเทศไทย นำไปใช้ในการวิเคราะห์ตามกลุ่มอายุเพื่อตรวจสอบผลกระทบดังกล่าวต่อกลุ่มอายุต่างๆ ระดับความสำเร็จทางการศึกษา และอุตสาหกรรม ผลการวิจัยพบว่าวิกฤตการณ์ทางเศรษฐกิจมีผลกระทบเพียงเล็กน้อยต่อการว่างงาน กล่าวคือ แนวโน้มการเพิ่มขึ้นของอัตราการว่างงานตั้งแต่ก่อนเกิดวิกฤติจนถึงระหว่างเกิดวิกฤติ และโดยทั่วไปแนวโน้มลดลงตั้งแต่ก่อนเกิดวิกฤติจนถึงหลังวิกฤต สิ่งนี้แสดงให้เห็นถึงความยืดหยุ่นของเศรษฐกิจไทยและยังแสดงถึงการพึ่งพาภาคนอกระบบในช่วงวิกฤตอีกด้วย

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Each year, thousands of workers lose their jobs for reasons beyond their control, such as reorganization, technological displacement, and economic crisis, among others. Unexpected job loss is a disruptive occurrence that alters workers' career trajectory and has a negative impact on society and the economy which in Thailand can be observed during economic downturns including the Asian Financial Crisis (1997) and the Subprime Crisis (2008). This study aims to gain a comprehensive understanding of the impact of the Asian Financial Crisis and the Subprime Crisis on the unemployment rate in Thailand before, during, and after the crises. The data from Labor Force Survey Whole Kingdom from the years 1993, 1998, 2003, 2008, and 2013 collected by the National Statistical Office Thailand is used to conduct analysis by age cohort to examine such impact across different age groups, educational attainment levels, and industries. The findings reveal that the economic crises had little effect on unemployment: an increase trend of the unemployment rate from pre-crisis to during crisis, and a generally decrease trend from pre-crisis to post crisis. This shows the resiliency of Thailand's economy as well as implies its reliance on the informal sector during the crises.

Field of Study:	Labour Economics and Human Resource Management	Student's Signature .....
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Chapter 1: Introduction

1.1 Research Background

Each year thousands of employees experience job loss due to reasons beyond their control. Involuntary job loss disrupts worker's career trajectories resulting in negative social and economic affairs (Dixon and Maré 2013). The conspicuous socio-economic impact of involuntary displacement in Thailand can be seen during global economic recessions including Asian Financial Crisis (1997) and Subprime Crisis (2008).

Due to Thailand's excessive off-shore borrowing, the external debt skyrocketed from almost 40 billion US$ in 1992 to 80 billion US$ in March 1997 (Lauridsen 1998). By August 1997, the foreign debt was announced to be about 90 billion US. Due to such massive inflow of money, there was not enough space to accommodate productive investment. As a result, the investment bubble was created. A huge part of the money was invested into the inflated real estate sector leading to an increase in loans from financial institutions. Eventually, industrial investment crashed, with up to 400 billion baht in approved investment cancelled or delayed by the end of 1997 (Hewison 1999). All industries are affected by this crisis especially in banking, real estate, and manufacturing sectors. The World Bank reported that more than 1,000 businesses a month were de-registering during the last quarter of 1997 and through 1998. One of Thailand's biggest textiles manufacturers, Thai Melon, closed, laying off 8,000 workers with round 5,000 companies closed by June 1998 and those who survived are at risk of bankruptcies.

Not long after the Asian Financial Crisis, the Subprime Crisis in the US began to take place in the beginning of 2007 when over 100 mortgage lending companies went bankrupt (Cheewatrakoolpong and Manprasert 2010). The main cause came from the bubble burst in the US housing market and the mortgage issue led to world-wide financial catastrophe. The crisis has been considered the worst financial catastrophe since the Great Depression. Its effect has led to a sharp contraction in global trade since World War II and caused the worldwide recession (Cheewatrakoolpong and Manprasert 2010). Due to the US's massive size of economy and its strong financial and economic linkages between the rest of the world, the crisis transmitted worldwide, Thailand was no exception. Due to Thailand's dependence on foreign exposure, many industries including but not limited to automotive, gem and jewelry, and processed food are highly affected by the subprime crisis to the extent of bankruptcy which led to a massive layoffs (Cheewatrakoolpong and Manprasert 2010).

This research aims to understand the impact of involuntary job loss on the unemployment rate before, during, and after the Asian Financial Crisis (1997) and the Subprime Crisis (2008) in Thailand across different age groups, levels of educational attainment, and industries. The age cohort analysis will be conducted using the Labor Force Survey collected by National Statistical Office Thailand (NSO). These two crises are chosen due to their different in nature and origin as well as the degree of

severity – to explore how different types of crises impact different types of workers. It is expected that the impact of the Asian Financial Crisis on the unemployment rate in Thailand would be more prominent than the Subprime Crisis as the Asian Financial Crisis is originated from the Thai economy, hence the impact is expected to be direct and seen all dimensions of the labor market. On the other hand, the Subprime crises is expected to impact mostly workers related to import/export sector. It is also expected that the impact of the two crises on the unemployment rate won't be too severe as Thai labor market is heavily reliant on the informal sector with rooms for workforce reallocation including but not limited to freelance workers, drivers, food sellers, street vendors, and farmers — when undergoing economic crises and experiencing involuntary job loss, many would make a living in the informal sector (Hewison 1999). The career stage of workers when being displaced is also expected to be one of the key factors indicating displacement. Therefore, another expected outcome is that the older age groups would have a hard time re-entering the labor market after being displaced. There is considerable evidence that those who are displaced in later stages of their careers face especially difficult challenges. The negative impact of job loss in the late career stage is more severe in comparison to early and mid-career stages due to stigma of skills and knowledge obsolescence; age-related productivity decline in relation to deterioration of skills. This makes older workers appear less employable, thus being forced to take pay cut or be displaced (Heisig and Radl 2017). Older workers are also seen by employers as less likely to retrain, more expensive, more injury-prone, and less likely to remain for a long period in the labor force (Mazerolle and Singh 2004). Therefore, older workers are expected to be more at risk of displacement during economic crisis based on the given stereotype.

1.2 Research Objectives

The main objective of this research is to examine the impact of involuntary job loss on the unemployment rate before, during, and after Asian Financial Crisis (1997) and Subprime Crisis (2008) in Thailand stratified by age, level of education and industry using the Labor Force Survey from National Statistical Office Thailand (NSO). The detailed research questions are listed as follows:

1. How does each crisis affect the unemployment rate of workers from each age group?
2. How does each crisis affect the unemployment rate of workers with each level of educational attainment?
3. How does each crisis affect the unemployment rate of workers from each age group with each level of educational attainment?
4. How does each crisis affect the unemployment rate of workers from each level of educational attainment across each industry?
5. How does each crisis affect the earnings of workers from each age group?
6. How does each crisis affect the earnings of workers with each level of educational attainment?

7. How does each crisis affect the earnings of workers from each age group with each level of educational attainment?
8. How does each crisis affect the earnings of workers from each level of educational attainment across each industry?

1.3 Hypothesis

Regarding the hypothesis of how these two crises affected unemployment rates and earnings in each industry in the Thai economy. Involuntary job loss from mass layoffs of both crises are expected to lead to an increase in unemployment rate, thus causing disruption in loss in earnings. The decline in employment rate and earning often goes hand in hand as jobs are the major source of income for workers (Carrington and Fallick 2017). The major cause of Asian Financial Crisis was excessive off-shore borrowing leading to the creation of an investment bubble in all industries, especially in real estate; all industries were greatly affected by this crisis especially in banking, real estate, and manufacturing sectors. Therefore, the effect is expected to be severe across all industries leading to a sharp decline in employment rate and earnings. On the other hand, the Subprime Crisis originated from the bubble burst in the US housing market which led to a worldwide great recession. The impact of the Subprime Crisis is expected to be less severe to Thailand in comparison to other countries such as the US, Russia, and many European countries. Therefore, the industries that were most affected, including in terms of decrease in employment rate and earnings would be those that are highly dependent on foreign exposure including transportation and warehousing, manufacturing/oil and gas, and agriculture.

Through the examination of workers from each age group for, for both crises but varying in degree, it is expected that the age group of 20 - 24, 25 - 29, and 30 - 34, will have a better chance at getting back into the labor market due to their ability of adjustment and potential of skills acquisition in the eyes of the firms. On the other hand the older worker in late career in the age group of 25 - 44 and 45 - 60 would have a harder time in getting back into the labor market and with lower paying and lower paying than the previous one, might turn to being self-employed with multiple sources of income or retired from the workforce permanently. According to Heisig & Radl (2017), the negative impact of job loss in the late career stage is more severe in comparison to early and mid-career stage due to stigma of skills and knowledge obsolescence which makes them appear less employable for potential employers, hence forced to accept significantly lower wages for long term employment (Heisig and Radl 2017).

Regarding the expected result when exploring the workforce by the level of educational attainment, it is expected that workers with Bachler's Degree and above would be more at risk of being laid off than others as most of those workers are white-label corporate workers making them the most vulnerable to being laid off and receiving pay-cut due to their higher pay rate as compared to other groups (Kletzer and Fairlie 2003). Higher Vocational and Upper Secondary education level groups are expected to be the second most vulnerable to being displaced as the majority of the

workforce are blue collar workers within the formal employment sector. The groups with the least negative impact are expected to be those with Lower Secondary education attainment and below as most of these workers are residing in the informal sector. The informal sector plays a significant role within an economy, particularly in developing countries including Thailand as this sector encompasses a huge part of unstructured economic undertakings, spanning commerce, agriculture, construction, manufacturing, transportation, and services. As a result, this sector has a substantial impact on the economy. The statistical data shows that the estimated share of labor force in the informal sector, especially in the urban area, in Africa, Asia, and Latin America are 44.0, 49.8, 54 percent, consecutively (Warunsiri 2011). This also aligns with the labor market dynamic within Thailand as when workers experience hardship in their working environment regardless of the reasons, they always have the informal sector to turn to accommodate them.

Chapter 2: Literature Review

2.1 The Impact of Economic Crises on Unemployment Rates

Thailand's unemployment rate has climbed by 50% to 1.5 million people (as of February 1998) since the start of the Asian Financial Crisis, and it is expected to top 6% by year's end. Unemployment in Korea increased from 0.5 million to 7% by June 1998, affecting up to 2 million individuals. Between April 1997 and April 1998, the Philippines lost one million more jobs, raising the unemployment rate to 13.3%. Indonesia's unemployment is expected to reach 10 million in early 1999, up from 4.5 million (4.9%) in 1996. Many displaced workers would migrate to the informal sector, while the global component will have an impact on Malaysia, where migrant workers from Indonesia may face job losses or wage reductions (Atinc and Walton 1998).

Verick's 2009 article examines the influence of the economic crisis and recession on unemployment rates in Europe, the United States, Norway, Finland, Sweden, and Japan. In Finland, the prime-age male unemployment rate rose from 2.5% in 1990 to roughly 16% in 1993, and youth unemployment remained consistently high years after the economy recovered. Young men and women had substantially higher unemployment rates in 1997 than before the crisis, at 12.6 and 16.7 percentage points higher, respectively, with adult rates 7.9 percentage points higher. Youth unemployment took a long time to fall, and it still hadn't returned to pre-crisis levels in 2008 (Verick 2009). Sweden's economy, like Finland's, entered a long recession in the early 1990s, with GDP per capita falling by 6%. In 1993, young male unemployment reached over 26%, while young female unemployment reached nearly 20% in 1994. Youth unemployment in Norway lasted even after the economy began to recover and fell only after a protracted period of strong economic growth, like in Finland and Sweden (Verick 2009). Japan's "lost decade" in the 1990s was defined by economic stagnation brought on by the collapse of the 1980s asset and housing bubble. Non-performing loans and unsustainable debt levels caused bank failures, which harmed the economy. Throughout the episode, unemployment rates rose, particularly among young people. The young male unemployment rate peaked in

2003 at 11.6%, seven percentage points higher than in 1992, while the young female jobless rate rose by 4.6 percentage points (Verick 2009).

Workers often face difficulty in finding full-time employment after being displaced especially when it comes to the major recession many remain unemployed upto 2 - 4 years afterwards despite the increased employment rates (Farber 2017). One of the major factors deals with the decreasing employability resulting in long spells of unemployment. The longer the workers remain unemployed, the less likely they are to find a job as being perceived by employers as incompetent (Farber 2017). Heisig and Radl (2017) also suggest that involuntary displacement has substantial and persistent negative impact on future employment, especially for older workers as it appears that many leave work permanently after being displaced (Heisig and Radl 2017).

The career stage of workers when being displaced is also one of the key factors indicating choice of employment. There is considerable evidence that those who are displaced in later stages of their careers face especially difficult challenges. The negative impact of job loss in the late career stage is more severe in comparison to early and mid-career stages due to stigma of skills and knowledge obsolescence; age-related productivity decline in relation to trends such as globalization and skill-biased technological change which inevitably adds to deterioration of skills. This makes them appear less employable for potential employers, thus being forced to accept significantly lower wages for long term employment (Heisig and Radl 2017). Mazerolle and Singh (2004) also highlighted 4 negative stereotypes about older workers: less productive, less likely to retrain, more injury-prone, and less likely to remain for a long period in the labor force (Mazerolle and Singh 2004). Therefore, if an employer were to choose between an older and a younger worker, the younger one is more likely to be chosen based on the given stereotype.

Fogg and Harrington's research on value of a college degree in a recessionary the economy found that the number of employment rate of workers with high-school education and below declined by double digits whereas there was only a 4 percent decline in employment rate of university graduate workers, however, the skill mismatch was evident (Fogg and Harrington 2011). It is also found that workers with university degrees have a large earnings advantage on average, however it is heavily dependent on the ability of university graduates to find employment in CLM Occupations (Fogg and Harrington 2011).

2.2 The Impact of Economic Crises on Earning Rates

Many empirical analyses have found that involuntary displacement leads to long term wage loss. In Barnette and Michaud's research, it is found that the impact of wage loss caused by lay off could last over 20 years (Barnette and Michaud 2012). In the research of Couch and Placzek (2010), job separation from a mass layoff in Connecticut, loss in earnings range from initially 32 percent to 33 percent and remain at 12 percent to 15 percent six years later (Couch and Placzek 2010). According to (Raposo, Portugal and Carneiro 2021), loss in earnings can be related to the firm, job title, and match quality that existed before and after displacement. Regarding job title, it may be due to depreciation of specific human capital or to the difficulty of finding a new job which requires the similar skills acquired from job prior to displacement.

From his research losses related to the firm/match quality fixed effects may mean that a worker is moving from a high paying firm to a lower paying one in exchange for stability (Raposo, Portugal and Carneiro 2021).

According to Oreopulos and Heisz's research, it is found that the average worker who graduated from university during recession faces a significant loss in earnings, however, not permanently. Loss in earnings can be attributed to the unemployment rate variation in the first year after graduating from university. It is also found that the effect of the economic recession strikes the strongest at new entry workers, whereas workers with a few years of labor market experience are less affected (Oreopoulos, Von Wachter and Heisz 2012).

According to Regana's (2020) research on the impact of the Great Recession in Europe, young employees in both crisis and non-crisis nations incur income penalties when faced with rising unemployment on labor market entry (Regana 2020). Wage scarring is only applicable in the European labor market to highly skilled labor, such as college graduates. Wage scars are initially severe, with a 2% rise in wage scars for every percentage point increase in unemployment at graduation. These losses fade to zero over a ten-year period. It has been discovered that wages in the recession-affected countries drop by more than 20% a year after graduation (Regana 2020). These losses compound over time, and a 20% pay penalty remains ten years after graduation. These findings are significant because they demonstrate the masked financial fate of unlucky groups in the years after an unemployment shock. These findings indicate that the earnings of more skilled new workers are highly susceptible to macroeconomic conditions. Unlucky cohorts who begin their careers during a recession suffer significant and long-term wage losses (Regana 2020).

Chapter 3: Methodology

This study uses the Labor Force Survey Whole Kingdom from the years 1993, 1998, 2003, 2008, and 2013 collected by the National Statistical Office Thailand (NSO). The data is used to conduct analysis to examine the impact of the Asian Financial Crisis and the Subprime crisis on unemployment rates and earning rates by age cohort, education level, and industry. The groups are divided as follows:

Age Groups: 20-24, 25-29, 30-34, 35-44, 45-60

Education Levels: Lower Primary, Upper Primary, Lower Secondary, Upper Secondary, Higher Vocational, and Bachelor's Degree and above

Industries: Agriculture, Manufacturing/Oil and Gas, Construction, Transportation and Warehousing, Hospitality and Services, Professional Services, and Real Estate

The Asian Financial Crisis and Subprime Crisis were chosen due to their profound and long-term impacts on the dynamics of the Thai labor market from involuntary displacement. The analysis is presented through summary tables similar

to the methodology followed by Fogg and Herrington (2011) (Fogg and Harrington 2011).

Individuals in the Labor Force Survey are coded as unemployed if they are: 1) available for work and 2) seeking work for more than two weeks. The unemployment rate is calculated as follows:

$$unemployment\ rate_{ct} = \frac{unemployed_{ct}}{employed_{ct} + unemployed_{ct}}$$

The subscript c denotes the age cohort and the subscript t denotes the time period. The cohort of unemployment rates are calculated for the period before, during, and after both economic crises. Changes in unemployment by cohort are then analyzed. This exercise is also repeated by education level for both crises.

The earning rate is calculated and adjusted based on CPI 2015 as follows:

$$\frac{Nominal\ wage\ in\ a\ year}{\text{CPI}} \times 100 = Real\ wage\ in\ a\ year$$

The cohort of earning rates are calculated for the period before, during, and after both economic crises. Changes in earning rates by cohort are then analyzed. This exercise is also repeated by education level for both crises.

Regarding the limitation of the research, it is also crucial to address other major reasons contributing to the decline in unemployment rate and sharp increase in earning rate during the chosen time of both crises with One of the major one being minimum wage adjustment during the ex-prime minister's era Thaksin Shinnawatra from 2001-2005. During that period there were 6 minimum wage adjustments across all sectors resulting in a jump in earning rate. Also, during the period of 1998 - 2013 Industrial estate in eastern seaboard started to boom and rapidly thrive attracting foreign investment and pulling up the wage as a result of globalization. The rise of service and hospitality sector industry booming tourism sector as well as the emergence of condominium in real-estate industry. The limitation of this research is that these factors are not distinctively separated from the data set hence can be seen within the result of the research. Another limitation of this research revolves around the definition of unemployment. Thailand's definition of unemployment is those who work less than 1 hour per week, are available for work and seeking for work. This study covers only those who are reported to be unemployed for over 2 weeks,

available for work and seeking for work, however, does not cover deep down to hourly work in a week.

Chapter 4: Empirical Results and Discussion

4.1 Research Findings: The impact of Asian Financial Crisis on the unemployment rate in Thailand

4.1.1 The relationship between the Asian Financial Crisis and unemployment rates by age cohort

Table 1 The Asian Financial Crisis and unemployment rates by age cohort

Age Group	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
20 - 24	3.80%	4.80%	2.90%	1.00%	-1.90%	-0.90%
25 - 29	2.60%	3.00%	1.80%	0.40%	-1.20%	-0.80%
30 - 34	2.00%	2.30%	0.90%	0.30%	-1.40%	-1.10%
35 - 44	1.40%	1.60%	0.50%	0.20%	-1.10%	-0.90%
45 - 60	0.90%	1.00%	0.50%	0.10%	-0.50%	-0.40%

Table 1 reports unemployment rates by cohort before, during, and after the Asian Financial Crisis. As expected, the unemployment rate during the crisis is higher than before the crisis. However, the unemployment rate decreases to a rate even lower than before the financial crisis by 2003. This pattern suggests that despite being hit by a severe economic crisis in 1997, Thailand's recovery from the Asian Financial Crisis was robust.

The 20-24 age group is evidently the most affected during the crisis with the unemployment rate before the crisis (1993) at 3.80% and during 4.80%. This aligns with the fact that workers in this age group have the least experience and require employer investment in time, effort, and finance in getting them training to get them up to speed and deliver what is needed to more than other age groups. Hence, the workers in this age group are more prone to be displaced than others. However, when looking at the unemployment rate from during the crisis to after the crisis, the 20-24 age groups has an easier time than others regarding their return to the labor market. This is because their employment cost is less than other age groups and in the eyes of the employer, the freshly graduated and entry level groups are perceived as progressive, enthusiastic to work, and open to be trained.

On the contrary, the least affected age group which, however, has the hardest time to bounce back was 45 - 60: with the unemployment rate before the crisis (1993)

at 0.90.% and after (2003) at 0.50% resulting in an overall decrease of unemployment rate -40% which is the lowest among all groups. On the flip side, the 30 - 34 age group is clearly on the better note with the unemployment rate at 2.00% before the crisis (1993) and 0.90% after the crisis resulting in an overall decrease of unemployment rate at -1.10%. This suggests that the career stage of the workers serves as a significant factor to the recovery rate after displacement. The career stage of the 45-60 age group has been in the labor market the longest, hence at its highest in terms of salary, however that does not always match the level of their productivity and skills in the eyes of the employers. Employees in the late career stage are often stigmatized as obsolete in skills and knowledge, less productive, less enthusiastic, and less adaptive to changes. This is especially evident when compared with the prior age group — 35-44 — which is the prime age where the employees have gathered enough industry experience, skills, expertise, and specialty. Thus, are on the leadership and management level. These two age groups exhibit similar levels of maturity, but the younger counterpart is more agile, more adaptive to changes, and costs less. Therefore the 45-60 age group is at highest risk when it comes to getting back into the labor market after displacement.

4.1.2 The relationship between the Asian Financial Crisis and unemployment rates by education level

Table 2 The Asian Financial Crisis and unemployment rates by education level

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	1.40%	1.40%	1.10%	0.00%	-0.30%	-0.30%
Upper Primary	3.30%	2.20%	1.20%	-1.10%	-1.00%	-2.10%
Lower Secondary	1.80%	2.20%	1.10%	0.40%	-1.10%	-0.70%
Upper Secondary	1.40%	2.80%	1.20%	1.40%	-1.60%	-0.20%
Higher Vocational	1.70%	2.30%	0.40%	0.60%	-1.90%	-1.30%
Bachelor's +	1.60%	2.30%	2.10%	0.70%	-0.20%	0.50%

When scrutinizing the groups in different educational attainment, the most significantly affected group is Bachelor's Degree and above with an increase in unemployment rate from before the crisis (1993) to after (2003) at 0.50% which stood out from the rest: Lower Primary, Upper Primary, Lower Secondary, Upper

Secondary, Higher Vocational with the change of unemployment rate of – 0.30%, -2.10%, -0.70%, -0.20%, - 1.30% consecutively (see table 2). The Higher Vocational group and below are not affected as much as the majority of the workforce are in the manufacturing industry, agricultural industry, and informal sector which although not all, many were still operating despite the overall economic downfall. It is important to note that though the Asian Financial Crisis had such a severe impact on the overall economy, it was mostly the corporate sector — financial and banking that were highly affected. The industrial side, despite being affected to a noticeable degree, many companies were still operating, hence, not affecting industrial workers as much. This aligns with the result that the least affected groups are the Upper Primary and the Higher Vocational group— with the Upper Primary group being the dominant group in the informal sector and the Higher Vocational group being the leading group in the manufacturing and agricultural sector.

4.1.3 The relationship between the Asian Financial Crisis and unemployment rates by age group and education level

Table 3 Age 20-24

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	1.93%	3.13%	1.40%	1.21%	-1.74%	-0.53%
Upper Primary	4.53%	4.08%	2.51%	-0.46%	-1.57%	-2.03%
Lower Secondary	4.11%	5.13%	1.38%	1.02%	-3.75%	-2.73%
Upper Secondary	1.99%	3.62%	2.65%	1.63%	-0.97%	0.66%
Higher Vocational	3.84%	4.30%	3.82%	0.46%	-0.48%	-0.02%
Bachelor's +	4.71%	8.83%	7.11%	4.11%	-1.72%	2.40%

Table 4 Age 25-29

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	3.02%	3.47%	1.30%	0.45%	-2.17%	-1.71%
Upper Primary	2.99%	2.61%	1.35%	-0.38%	-1.26%	-1.64%
Lower	2.02%	3.24%	1.20%	1.22%	-2.03%	-0.81%

Secondary						
Upper Secondary	1.58%	3.07%	1.94%	1.49%	-1.13%	0.36%
Higher Vocational	2.74%	3.23%	3.31%	0.48%	0.08%	0.57%
Bachelor's +	1.08%	4.79%	2.50%	3.71%	-2.29%	1.42%

The findings of unemployment rate during the Asian Financial Crisis among early - mid career groups are very similar. The most affected education level for the 20-24 age group are those with bachelor's degree and above with the change of unemployment rate from before the crisis (1993) to after (2003) at 2.40%. The less affected education levels of the 20-24 age group are the Lower Primary, Upper Primary, and Lower Secondary with the change in unemployment rate from before the crisis (1993) to after (2003) at -0.53%, -2.03%, and -2.73% consecutively (see Table 3).

The similar finding applies to the 25-29 age group (see Table 4): those within the Bachelor's Degree and Above group were affected the most with the change in unemployment rate from before the crisis (1993) to after (2003) at 1.42% whereas the less affected education levels of the same age group are the Lower Primary, Upper Primary, and Lower Secondary with the change in unemployment rate from before the crisis (1993) to after (2003) at -1.71%, -1.64%, and -0.81% consecutively (see Table 4).

The finding of the 20-24 and 25-29 age groups aligns with the fact that those in the corporate sector especially those with finance, banking, and real estate involvement were the most affected — most of the workers are those with Bachelor's Degree and above education level. On the other hand the workers in the Lower Primary, Upper Primary, and Lower Secondary groups are mostly within the informal sector, therefore, are not affected by the crisis as much.

Table 5 Age 30-34

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	1.28%	2.33%	0.65%	1.05%	-1.68%	-0.64%
Upper Primary	2.28%	2.28%	1.33%	-0.01%	-0.95%	-0.95%
Lower Secondary	2.05%	2.53%	1.00%	0.48%	-1.53%	-1.06%

Upper Secondary	1.06%	1.12%	0.41%	0.06%	-0.71%	-0.65%
Higher Vocational	3.64%	3.29%	2.55%	-0.35%	-0.74%	-1.09%
Bachelor's +	1.15%	1.98%	1.04%	0.83%	-0.94%	-0.11%

Table 6 Age 35-44

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	1.74%	1.87%	0.41%	0.13%	-1.47%	-1.33%
Upper Primary	0.50%	0.83%	0.83%	0.33%	0.00%	0.33%
Lower Secondary	0.42%	1.73%	0.64%	1.32%	-1.10%	0.22%
Upper Secondary	0.60%	1.03%	0.68%	0.43%	-0.35%	0.08%
Higher Vocational	1.80%	1.88%	0.64%	0.08%	-1.24%	-1.16%
Bachelor's +	0.31%	0.89%	0.41%	0.58%	-0.48%	0.10%

One of the most affected level of education attainment among age group 30-34 and 35 – 40 were those with bachelor's degree and above with the change in unemployment rate from before the crisis (1993) to after (2003) at -0.11% and 0.10% consecutively. However it is important to note that even so, those with bachelor's degree and above education level of these two groups are noticeably less as compared to their younger counterparts – the 20-24 and 25-29 age group. This is because the two youngest groups consist of new entry and junior workers who still lack experiences, require a lot of investment of time and effort in training them to get up to speed as well as close supervision. On the other hand the workers in the 30-34 and 35-40 age group are in the mid-career stage where they've acquired sufficient experience to work effectively, independently, and able to deliver what are needed to – not to mention they are less expensive as compared to the older age groups. Therefore, they are the most worthy of keeping in the eyes of employers when going through economic downturns (see Table 5 and 6).

The least affected education level of both 20-24 and 25-29 groups was Higher Vocational as the majority of the workforce are in the manufacturing industry, agricultural industry, which although not all, many were still operating despite going

through the economic crisis with the change in unemployment rate from before the crisis (1993) to after (2003) at -1.09% and -1.16% consecutively.

Table 7 Age 45-60

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	0.89%	1.13%	0.58%	0.24%	-0.55%	-0.31%
Upper Primary	0.28%	1.58%	0.51%	1.30%	-1.07%	0.24%
Lower Secondary	0.45%	1.15%	0.74%	0.71%	-0.41%	0.29%
Upper Secondary	0.32%	0.57%	0.87%	0.25%	0.30%	0.55%
Higher Vocational	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bachelor's +	0.13%	0.43%	0.51%	0.30%	0.08%	0.38%

The age group 45-60 are the most affected group among all age groups with the hardest time getting back into the labor market after job loss. The 45-60 age group has been in the labor market the longest, hence at its highest in terms of salary, however that does not always match the level of their productivity and skills in the eyes of the employers. Employees in the late career stage are often stigmatized as obsolete in skills and knowledge, less productive, less enthusiastic, and less adaptive to changes.

4.1.4 The relationship between the Asian Financial Crisis and unemployment rates by Industry and education level

Table 8 Agriculture

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2.79%	0.25%	0.66%	-2.54%	0.41%	-2.12%
Upper Primary	8.64%	0.74%	0.72%	-7.90%	-0.02%	-7.91%
Lower Secondary	4.82%	1.04%	0.62%	-3.78%	-0.42%	-4.20%
Upper Secondary	2.37%	2.32%	0.91%	-0.05%	-1.41%	-1.46%

Higher Vocational	4.60%	1.61%	0.00%	-2.99%	-1.61%	-4.60%
Bachelor's +	2.02%	9.83%	1.26%	7.81%	-8.57%	-0.76%

Table 9 Construction

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	1.27%	2.14%	0.57%	0.87%	-1.57%	-0.70%
Upper Primary	1.96%	5.47%	0.56%	3.51%	-4.91%	-1.40%
Lower Secondary	2.23%	4.12%	1.30%	1.89%	-2.83%	-0.93%
Upper Secondary	0.90%	1.85%	0.12%	0.95%	-1.73%	-0.78%
Higher Vocational	2.65%	1.76%	2.32%	-0.89%	0.56%	-0.33%
Bachelor's +	0.35%	1.38%	0.45%	1.03%	-0.93%	0.10%

When taking a look at the impact of Asian Financial Crisis and unemployment rates by Industry and education level, the most affected group of education level within the Agriculture and Construction industry was Bachelor's Degree and above with the change in unemployment rate from before the crisis (1993) to after (2003) at -0.76% and 0.10% consecutively. Most of the workers within Bachelor's Degree and above education level are with white collar jobs in corporate, hence are most prone to being displaced during the economic crisis. Most of the workers of other education level in the agriculture and construction industries are mostly contractors or working in the informal sector – hence are not as affected as compared to those with bachelor's degree and above education level (see Table 8 and 9).

Table 10 Manufacturing/Oi & Gas

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	0.86%	1.23%	0.83%	0.38%	-0.40%	-0.02%
Upper Primary	1.77%	1.93%	1.37%	0.16%	-0.56%	-0.40%
Lower	3.14%	1.31%	1.02%	-1.83%	-0.29%	-2.12%

Secondary						
Upper Secondary	2.03%	2.36%	1.59%	0.33%	-0.77%	-0.44%
Higher Vocational	0.00%	2.60%	3.67%	2.60%	1.07%	3.67%
Bachelor's +	1.56%	3.90%	2.79%	2.34%	-1.11%	1.23%

Table 11 Transportation & Warehousing

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2.90%	3.04%	2.68%	0.14%	-0.36%	-0.22%
Upper Primary	5.92%	6.35%	3.51%	0.43%	-2.84%	-2.41%
Lower Secondary	3.40%	5.53%	3.55%	2.13%	-1.99%	0.15%
Upper Secondary	3.14%	4.24%	0.78%	1.09%	-3.45%	-2.36%
Higher Vocational	1.15%	5.47%	3.85%	4.32%	-1.62%	2.71%
Bachelor's +	2.38%	4.78%	4.33%	2.40%	-0.46%	1.95%

Table 12 Hospitality & Services

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	2.28%	4.35%	1.67%	2.08%	-2.68%	-0.60%
Upper Secondary	1.91%	4.83%	2.35%	2.92%	-2.48%	0.43%
Higher Vocational	2.54%	4.25%	4.35%	1.72%	0.10%	1.82%
Bachelor's +	1.36%	2.74%	2.85%	1.38%	0.11%	1.49%

It is immediately apparent that the most affected education level within Manufacturing/Oil and Gas, Transportation and Warehousing, and Hospitality and Services industry are higher vocational and bachelor's degree and above with the change in unemployment rate from before the crisis (1993) to after (2003) for Manufacturing/Oil and Gas at 3.67% and 1.23%, Transportation and Warehousing at 2.71% and 1.95%, and Hospitality and Services at 1.82% and 1.49% consecutively. This is because most of the workers with Higher Vocational education and Bachelor's degree and above are those within the formal sector and are prone to being laid off (see Table 10, 11, and 12). The Lower Primary and Upper Primary group with most if not all of the workers residing in the informal sector of the industry were not as affected.

Table 13 Professional Services

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	1.21%	2.17%	0.66%	0.96%	-1.52%	-0.56%
Higher Vocational	1.17%	3.84%	3.47%	2.67%	-0.38%	2.30%
Bachelor's +	1.18%	4.77%	3.85%	3.59%	-0.91%	2.67%

Table 14 Real Estate

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	0.70%	3.23%	2.34%	2.53%	-0.89%	1.64%
Higher Vocational	0.82%	4.83%	3.57%	4.01%	-1.26%	2.75%

Bachelor's +	0.59%	4.19%	3.11%	3.61%	-1.08%	2.52%

The Professional Services and Real Estate industry are the most affected among all industries with the vast majority of the workforce being white collar workers with Higher Vocational and Bachler's Degree and above education level – hence, are at high risk of being laid off with the change in unemployment rate from before the crisis (1993) to after (2003) for Professional Services at 2.30% and 2.67%, and for Real Estate at 2.75% and 2.52%.

4.2 Research Findings: The impact of the Subprime Crisis on the unemployment rates in Thailand

4.2.1 The relationship between the Subprime Crisis and unemployment rates by age cohort

Table 15 The Subprime Crisis and unemployment rates by age cohort

Age Group	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
20 - 24	2.90%	2.60%	1.40%	-0.30%	-1.20%	-1.50%
25 - 29	1.80%	1.60%	0.90%	-0.20%	-0.70%	-0.90%
30 - 34	0.90%	0.80%	0.40%	-0.10%	-0.40%	-0.50%
35 - 44	0.50%	0.40%	0.20%	-0.10%	-0.20%	-0.30%
45 - 60	0.50%	0.30%	0.10%	-0.20%	-0.20%	-0.40%

Regarding the impact of the Subprime Crisis in Thailand on the unemployment rates in each age group, it is immediately apparent that the overall trend of the unemployment rate of the crisis period decreases in all age groups not only from before to after the crisis, but also during the crisis where the crisis reached its peak (see table 15). This aligns with the fact that the crisis does not affect Thailand as severely as the Asian financial Crisis as the Subprime Crisis was generated in the US and only affected Thailand predominantly in the import/export reliant sector.

The least affected age group is 20-24 with the unemployment rate before the crisis (2003) at 2.90%, during (2008) at 2.60%, and after (2013) at 1.40%. This is because the 20-24 age group are newly graduates and entry level workers, though they may lack experiences as compared to other age groups, they are the group with the lowest pay rate, hence are not prone to be displaced during the Subprime Crisis. It is also important to note that the Subprime Crisis did not affect Thailand as immensely as the Asian Financial Crisis did. Some companies may experience loss in revenue but

not to the point where many companies close down or on the verge of bankruptcy. Therefore, newly graduate and entry level workers with lower pay rate are not as at risk as other older age groups with higher career levels. The more affected age groups are 45 - 60, 35 - 44, and 30 - 34, with the change in unemployment rate from before the crisis (2003) to after (2013) at -0.40%, -0.30% and -0.50% consecutively. This is because these groups consist of mature workers with higher pay rate, hence are at a higher risk of being displeased as compared to their younger counterparts.

4.2.2 The relationship between the Subprime Crisis and unemployment rates by education level

Table 16 The Subprime Crisis and unemployment rates by education level

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	1.10%	0.70%	0.20%	-0.40%	-0.50%	-0.90%
Upper Primary	1.20%	1.00%	0.50%	-0.20%	-0.50%	-0.70%
Lower Secondary	1.10%	1.00%	0.40%	-0.10%	-0.60%	-0.70%
Upper Secondary	1.20%	1.10%	0.80%	-0.10%	-0.30%	-0.40%
Higher Vocational	0.40%	1.00%	1.20%	0.60%	0.20%	0.80%
Bachelor's +	2.10%	1.40%	1.00%	-0.70%	-0.40%	-1.10%

Regarding the unemployment rate of people from different educational levels, the least affected group is Bachelor's Degree and above with an overall change in unemployment rate from before the crisis (2003) to after (2013) at -1.10% — followed by Lower Primary, Upper Primary, Lower Secondary, Higher Vocational with the change of unemployment rate of -90%, -0.70%, -0.70%, -0.80% consecutively (see table 16). The Bachelor's Degree and above group is the least affected as most of the workers are in the corporate sector with white collar jobs — although the businesses were affected, it was not to the point where displacement was needed for company survival. The Higher Vocational group has a noticeably harder time as many workers from the group reside in the import/export reliant sector — manufacturing, agriculture, and logistics. The Upper Secondary follow short after with an overall change in unemployment rate from before the crisis (2003) to after (2013) at -0.40% as many of them are in the import/export reliant sector. The Lower Secondary, Upper Primary and Lower Primary groups were in the middle range of unemployment rate among other educational levels as most of them were in an

informal sector and could always find other sources of jobs and income if the current one were troubled.

4.2.3 The relationship between the Subprime Crisis and unemployment rates by age group and education level

Table 17 Age 20-24

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	1.40%	2.41%	0.48%	1.02%	-1.93%	-0.91%
Upper Primary	2.51%	2.46%	0.85%	-0.05%	-1.61%	-1.65%
Lower Secondary	1.38%	1.41%	0.35%	0.03%	-1.06%	-1.03%
Upper Secondary	2.65%	2.92%	2.38%	0.27%	-0.54%	-0.27%
Higher Vocational	3.82%	7.14%	5.88%	3.32%	-1.27%	2.06%
Bachelor's +	7.11%	5.51%	5.21%	-1.60%	-0.30%	-1.90%

Table 18 Age Group 25-30

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	1.30%	0.91%	0.33%	-0.39%	-0.58%	-0.97%
Upper Primary	1.35%	1.44%	0.46%	0.08%	-0.98%	-0.89%
Lower Secondary	1.20%	1.93%	0.67%	0.73%	-1.26%	-0.53%
Upper Secondary	1.94%	1.90%	1.68%	-0.05%	-0.22%	-0.26%
Higher Vocational	3.31%	5.90%	5.27%	2.58%	-0.63%	1.96%
Bachelor's +	2.50%	2.01%	1.61%	-0.49%	-0.40%	-0.89%

Table 19 Age Group 30-34

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	0.65%	0.68%	0.43%	0.03%	-0.26%	-0.22%
Upper Primary	1.33%	1.03%	0.48%	-0.30%	-0.55%	-0.85%
Lower Secondary	1.00%	0.86%	0.50%	-0.13%	-0.36%	-0.50%
Upper Secondary	0.41%	0.72%	0.18%	0.30%	-0.54%	-0.24%
Higher Vocational	2.55%	6.89%	5.41%	4.34%	-1.48%	2.86%
Bachelor's +	1.04%	1.12%	0.53%	0.09%	-0.60%	-0.51%

Table 20 Age Group 35-44

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	0.41%	0.34%	0.12%	-0.07%	-0.22%	-0.28%
Upper Primary	0.83%	0.63%	0.32%	-0.20%	-0.31%	-0.51%
Lower Secondary	0.64%	0.31%	0.17%	-0.33%	-0.14%	-0.47%
Upper Secondary	0.68%	0.72%	0.13%	0.03%	-0.59%	-0.56%
Higher Vocational	0.64%	0.90%	0.87%	0.26%	-0.03%	0.23%
Bachelor's +	0.41%	0.45%	0.24%	0.04%	-0.21%	-0.17%

Table 21 Age Group 45-60

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	0.58%	0.26%	0.09%	-0.32%	-0.17%	-0.49%
Upper Primary	0.51%	0.27%	0.06%	-0.24%	-0.21%	-0.45%
Lower	0.74%	0.30%	0.20%	-0.44%	-0.10%	-0.54%

Secondary						
Upper Secondary	0.87%	0.29%	0.06%	-0.58%	-0.23%	-0.81%
Higher Vocational	0.00%	0.47%	0.43%	0.47%	-0.04%	0.43%
Bachelor's +	0.51%	0.37%	0.07%	-0.14%	-0.29%	-0.44%

Table 17-21 reports the relationship between the Subprime Crisis and unemployment rates by age group and education level, the Bachelor's Degree and above group are the least affected as most are working in corporate or are workers with white collar jobs with the change in unemployment rate from before the crisis (2003) to after (2013) at -1.90%, -0.89%, -0.51%, -0.17%, and -0.44% consecutively from the youngest to the oldest age group. During the Subprime Crisis, the business owner, shareholders and financial part were affected, however most of the cases are not to the point where displacement was significant for corporate employees.

The Upper Vocational and Upper Secondary/Vocational group, on the other hand, were the most affected as most of the workforce are in the import/export reliant industries with the change in unemployment rate from before the crisis (2003) to after (2013) at 2.06%, 1.96%, 2.86%, 0.23%, and 0.43% consecutively from the youngest to the oldest age group. The consistent pattern occurs throughout all age groups that those with Higher Vocational education were affected the most. This aligns with the fact that the majority of the workforce of the group reside in the import/export reliant sector — manufacturing, agriculture, and logistics (see Table 17-21).

4.2.4 The relationship between the Subprime Crisis and unemployment rates by Industry and education level

Table 22 Transportation & Warehousing

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	2.68%	1.00%	0.53%	-1.68%	-0.47%	-2.15%
Upper Primary	3.51%	2.39%	2.05%	-1.12%	-0.34%	-1.46%
Lower Secondary	3.55%	3.12%	3.16%	-0.43%	0.04%	-0.39%
Upper Secondary	0.78%	3.68%	2.76%	2.89%	-0.92%	1.98%

Higher Vocational	3.85%	5.67%	4.94%	1.82%	-0.73%	1.09%
Bachelor's +	4.33%	3.80%	3.52%	-0.52%	-0.28%	-0.81%

Regarding the relationship between the Subprime Crisis and unemployment rates by industry and education level, most of the industries have decline trends for overall unemployment rate of all education level. However, the unemployment rate of Transportation and Warehousing industry is noticeably worse than other industries for the Upper Secondary and the Higher Vocational group with the change in unemployment rate from before the crisis (2003) to after (2013) at 1.98% and 1.09%. This aligns with the fact that the Transportation and Warehousing industry are directly involved with import/export sector which got hit the heaviest during the Subprime crisis. The majority of the operational workers from this industry are with Upper Secondary and Higher Vocational education level – hence are the most at risk of being laid off (see table 22).

Table 23 Agriculture

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	0.66%	0.83%	0.26%	0.17%	-0.57%	-0.40%
Upper Primary	0.72%	0.71%	0.43%	-0.02%	-0.27%	-0.29%
Lower Secondary	0.62%	1.19%	0.61%	0.57%	-0.58%	-0.01%
Upper Secondary	0.91%	2.96%	1.93%	2.05%	-1.03%	1.02%
Higher Vocational	1.16%	2.44%	1.95%	1.29%	-0.49%	0.79%
Bachelor's +	1.26%	1.54%	1.23%	0.27%	-0.30%	-0.03%

Table 24 Manufacturing/Oil & Gas

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	0.83%	0.43%	0.53%	-0.40%	0.10%	-0.30%
Upper Primary	1.37%	0.81%	0.40%	-0.56%	-0.41%	-0.97%

Lower Secondary	1.02%	0.75%	0.19%	-0.27%	-0.56%	-0.83%
Upper Secondary	1.59%	2.76%	2.19%	1.18%	-0.57%	0.61%
Higher Vocational	3.67%	4.84%	4.49%	1.18%	-0.35%	0.82%
Bachelor's +	2.79%	1.98%	1.84%	-0.82%	-0.14%	-0.95%

The similar trend with slightly smaller degree occurred with workers from Upper Secondary and the Higher Vocational group within Agriculture and Manufacturing/Oil and Gas industry with the change in unemployment rate from before the crisis (2003) to after (2013) for Agriculture industry at 1.02% and 0.79%, and for and Manufacturing/Oil and Gas industry at 0.61% and 0.82% consecutively. This aligns with the fact that the Agriculture and Manufacturing/Oil and Gas industry are to a certain degree involved with import/export sector which got hit the heaviest during the Subprime crisis with the majority of the operational workers from this industry are with Upper Secondary and Higher Vocational education level (see Table 23 and 24).

Table 25 Hospitality & Services

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	1.67%	1.40%	0.71%	-0.28%	-0.69%	-0.97%
Upper Secondary	2.35%	1.66%	0.31%	-0.69%	-1.34%	-2.04%
Higher Vocational	4.35%	1.25%	1.89%	-3.11%	0.64%	-2.46%
Bachelor's +	2.85%	0.85%	0.70%	-2.00%	-0.15%	-2.15%

Hospitality and Services appear to be the least affected among all industry with the least unemployment rate for all education level as compared to other industries with the change in unemployment rate from before the crisis (2003) to after (2013) for Lower Secondary, Upper Secondary, Higher Vocational, and Bachelor's

Degree and above at -0.97%, -0.24%, -2.46%, and – 2.15%. This aligns with the fact that the tourism sector in Thailand is on the rise and the Subprime Crisis doesn't seem to have any noticeable impact on workers within this industry (see table 25).

Table 26 Professional Services

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	0.66%	0.98%	0.21%	0.33%	-0.78%	-0.45%
Higher Vocational	3.47%	2.48%	1.93%	-0.99%	-0.54%	-1.53%
Bachelor's +	3.85%	2.90%	2.63%	-0.95%	-0.28%	-1.23%

Table 27 Real Estate

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	2.34%	0.64%	1.90%	-1.70%	1.26%	-0.44%
Higher Vocational	3.57%	2.23%	2.05%	-1.33%	-0.19%	-1.52%
Bachelor's +	3.11%	1.03%	0.54%	-2.08%	-0.48%	-2.56%

Table 28 Construction

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013

Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	2.34%	0.64%	1.90%	-1.70%	1.26%	-0.44%
Higher Vocational	3.57%	2.23%	2.05%	-1.33%	-0.19%	-1.52%
Bachelor's +	3.11%	1.03%	0.54%	-2.08%	-0.48%	-2.56%

When taking a look at Professional Services, Real Estate, and Construction industry, the Subprime Crisis doesn't seem to have any noticeable impact on workers within these industry with generally decline unemployment rate trend throughout all education le before (2003), during (2008), and after (2013) the crisis.

4.3 Research Findings: The impact of Asian Financial Crisis on wage rate

4.3.1 The relationship between the Asian Financial Crisis and earning rates by age cohort

Table 29 The Asian Financial Crisis and earning rates by age cohort

Age Group	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
20 - 24	2,605.65	2,388.18	4,349.21	-8.35%	82.11%	66.91%
25 - 29	4,832.11	3,547.06	7,875.97	-26.59%	122.04%	62.99%
30 - 34	7,491.99	6,750.15	9,095.70	-9.90%	34.75%	21.41%
35 - 44	8,239.19	7,876.49	11,095.18	-4.40%	40.86%	34.66%
45 - 60	9,382.03	8,212.33	12,387.41	-12.47%	50.84%	32.03%

Table 29 reports the relationship between the Asian Financial Crisis and earning rates by age cohort. The most affected age groups are 30-34, 35-44, 45-60 with the change in earning rates from before the crisis (1993) to after (2003) at 21.41%, 34.66%, and 32.03% consecutively. It is immediately apparent that the older groups of workers with generally higher earning rates are more prone to pay cut as compared to their younger counter parts, the 20-24 and 25-29 age group with generally lower earning rates with the change in earning rates from before the crisis

(1993) to after (2003) at 66.91%, and 62.99%. The 20-24 and 25-29 age group consist of new entry and junior level workers with lower pay, hence they are more prone to being laid off due to lack of experiences and inability to work independently – however, not pay cut.

4.3.2 The relationship between the Asian Financial Crisis and earning rates by education level

The impact of the Asian Financial crisis can be seen through age cohort. However, when looking at the relationship between the Asian Financial Crisis and earning rates by education level. The direct result of the crisis doesn't seem to be apparent, however the changes of earning rate from other factors can be seen throughout the chosen years, 1993, 1998, and 2003. It is immediately apparent that the trend of earning rates generally drop from before the crisis (1993) to during the crisis (2003) and increase from during the crisis to after the crisis (2003) to even higher than before. It is crucial to discuss that there are multiple reasons contributing to a sharp increase in earning rate during this period. One of the major reasons being increase in minimum wage across all industries: during the ex-prime minister, Thaksin Shinnawatra's era from 2001-2005 – there were 6 minimum wage adjustments across all sectors resulting in a jump from 1998 – 2003. During this period the industrial estates in eastern seaboard of Thailand also started to boom attracting foreign investment and pulling up the wage rate. Another reason would be the recovery and resurgence period from the Asian Financial Crisis.

Table 30 The Asian Financial Crisis and earning rates by education level

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	3,139.79	2,901.83	4,850.18	-7.58%	67.14%	54.47%
Upper Primary	4,083.56	3,781.06	6,106.33	-7.41%	61.50%	49.53%
Lower Secondary	5,692.86	4,300.90	7,202.98	-24.45%	67.48%	26.53%
Upper Secondary	6,004.62	5,443.62	7,414.88	-9.34%	36.21%	23.49%
Higher Vocational	7,041.61	6,378.98	8,726.81	-9.41%	36.81%	23.93%
Bachelor's +	7,655.98	6,859.57	11,701.24	-10.40%	70.58%	52.84%

Table 30 reports the change in earning rates by education level. The most affected groups with the lowest earning increase are the Lower Secondary, Upper

Secondary and Higher Vocational education level with the change in earning rates from before the crisis (1993) to after (2003) at 26.53, 23.49% and 23.93% consecutively. This is because during that time there is a shift in hiring trend. Prior to this period up until late 90s, Lower Secondary, Upper Secondary and Higher Vocational groups are commonly hired for white collar jobs within corporates. However due to shift in labor market dynamics and globalization, corporate start to adjust their workforce requirement and only hire those with Bachelor's Degree and above for white collar jobs. As a result, there is a distinct difference between the wage of those with Bachelor's Degree and above and those with Higher Vocational degree and below than ever before. Therefore, these groups of workers have a noticeably more difficult time recovering from the crisis as compared to the group with Bachelor's Degree with high demand in the corporate sector and above education level and those with most workforce residing in the informal sector – Lower Primary, Lower Secondary, and Upper Secondary.

4.3.3 The relationship between the Asian Financial Crisis and earning rates by age group and education level

Table 31 Age 20-24

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2,962.23	2,052.72	4,327.54	-30.70%	110.82%	46.09%
Upper Primary	2,183.39	2,339.59	4,581.62	7.15%	95.83%	109.84%
Lower Secondary	4,153.88	3,694.74	5,160.69	-11.05%	39.68%	24.24%
Upper Secondary	5,754.77	5,293.56	6,951.81	-8.01%	31.33%	20.80%
Higher Vocational	6,259.44	5,991.80	7,727.38	-4.28%	28.97%	23.45%
Bachelor's +	6,308.90	6,236.18	8,742.18	-1.15%	40.18%	38.57%

Table 32 Age 25-29

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2,115.31	1,858.93	4,598.52	-12.12%	147.37%	117.39%
Upper Primary	2,657.31	2,564.73	5,540.52	-3.48%	116.03%	108.50%

Lower Secondary	4,551.43	3,737.66	5,146.10	-17.88%	37.68%	13.07%
Upper Secondary	6,144.94	5,460.84	6,514.28	-11.13%	19.29%	6.01%
Higher Vocational	6,202.63	5,666.48	7,235.52	-8.64%	27.69%	16.65%
Bachelor's +	7,474.98	6,336.33	9,654.95	-15.23%	52.37%	29.16%

Table 33 Age 30-34

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2,616.94	2,405.64	4,704.65	-8.07%	95.57%	79.78%
Upper Primary	3,858.80	2,564.80	6,083.45	-33.53%	137.19%	57.65%
Lower Secondary	5,845.28	4,590.83	6,407.13	-21.46%	39.56%	9.61%
Upper Secondary	6,446.72	6,184.12	7,640.18	-4.07%	23.55%	18.51%
Higher Vocational	6,778.42	6,666.92	8,529.64	-1.65%	27.94%	25.84%
Bachelor's +	7,554.50	6,832.27	11,048.35	-9.56%	61.71%	46.25%

Table 34 Age 35-44

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	3,145.32	2,908.85	5,165.42	-7.52%	77.58%	64.23%
Upper Primary	5,114.87	3,269.14	6,782.93	-36.09%	107.48%	32.61%
Lower Secondary	6,849.18	6,467.11	7,551.52	-5.58%	16.77%	10.25%
Upper Secondary	7,051.06	6,239.05	8,155.26	-11.52%	30.71%	15.66%
Higher Vocational	7,535.66	6,886.03	8,553.30	-8.62%	24.21%	13.50%
Bachelor's +	7,892.10	6,929.26	12,421.67	-12.20%	79.26%	57.39%

Table 35 Age 45-60

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	3,837.03	4,437.59	5,556.07	15.65%	25.20%	44.80%
Upper Primary	4,573.10	5,331.77	6,379.54	16.59%	19.65%	39.50%
Lower Secondary	6,686.13	5,905.29	7,278.49	-11.68%	23.25%	8.86%
Upper Secondary	7,614.58	6,955.16	7,353.34	-8.66%	5.72%	-3.43%
Higher Vocational	8,326.81	7,804.22	9,050.38	-6.28%	15.97%	8.69%
Bachelor's +	9,406.86	7,478.59	13,172.61	-20.50%	76.14%	40.03%

Table 31-35 reports the change in earning rates during the Asian Financial crisis by age and education level. The result aligns with the previous section (by education level only) that the most affected groups with the lowest earning increase are the Lower Secondary, Upper Secondary and Higher Vocational education level due to the shift in corporate hiring requirement trend. Corporates start to adjust their workforce requirement and only hire those with Bachelor's Degree and above for white collar jobs. As a result, there is a distinct difference between the wage of those with Bachelor's Degree and above and those with Higher Vocational degree and below than ever before. Therefore, these groups of workers have a noticeably more difficult time recovering from the crisis as compared to the group with Bachelor's Degree with high demand in the corporate sector and above education level and those with most workforce residing in the informal sector – Lower Primary, Lower Secondary, and Upper Secondary.

4.3.4 The relationship between the Asian Financial Crisis and unemployment rates by Industry and education level

Table 36 Hospitality & Services

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-

Lower Secondary	5,621.45	5,405.89	7,383.72	-3.83%	36.59%	31.35%
Upper Secondary	5,978.15	5,649.92	6,752.27	-5.49%	19.51%	12.95%
Higher Vocational	6,308.49	6,381.55	9,600.76	1.16%	50.45%	52.19%
Bachelor's +	7,500.49	6,632.75	12,468.48	-11.57%	87.98%	66.24%

Table 37 Professional Services

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	3,404.18	2,952.91	4,406.20	-13.26%	49.22%	29.43%
Upper Secondary	5,101.97	4,737.91	6,207.99	-7.14%	31.03%	21.68%
Higher Vocational	7,013.59	6,539.82	10,097.85	-6.76%	54.41%	43.98%
Bachelor's +	7,529.81	6,769.20	12,138.00	-10.10%	79.31%	61.20%

Table 38 Real Estate

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	3,416.29	2,860.28	4,504.72	-16.28%	57.49%	31.86%
Upper Secondary	5,452.40	3,896.06	6,443.03	-28.54%	65.37%	18.17%
Higher Vocational	6,318.63	5,651.08	9,647.68	-10.56%	70.72%	52.69%
Bachelor's +	7,677.21	6,017.88	12,656.09	-21.61%	110.31%	64.85%

Regarding the relationship between the Asian Financial Crisis and earning rates by Industry and education level, the most affected groups among Hospitality and Services, Professional Services, and Real Estate with the lowest earning increase are the Lower Secondary and Upper Secondary education level with the increase in earning rates from before the crisis (1993) to after (2003) ranging from 12.95% to 31.86% which is considered significantly lower as compared to other education level. This can also be explained by the shift in hiring trends that within these industries, the minimum requirement for white collar jobs is mostly placed at Higher Vocational and above. Therefore, resulting hindrance in wage increase for Lower Secondary and Upper Secondary (see Table 36-38).

Table 39 Agriculture

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	2,574.61	2,078.56	4,553.68	-19.27%	119.08%	76.87%
Upper Secondary	4,574.00	4,687.84	6,537.13	2.49%	39.45%	42.92%
Higher Vocational	4,690.00	4,046.54	7,676.51	-13.72%	89.71%	63.68%
Bachelor's +	5,175.71	6,333.28	9,227.72	22.37%	45.70%	78.29%

Table 40 Manufacturing/Oil & Gas

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2,819.78	2,984.71	4,666.98	5.85%	56.36%	65.51%
Upper Primary	2,051.61	2,115.83	4,489.80	3.13%	112.20%	118.84%
Lower Secondary	4,213.57	3,953.82	5,971.10	-6.16%	51.02%	41.71%
Upper Secondary	5,057.26	5,118.15	7,481.90	1.20%	46.18%	47.94%
Higher Vocational	5,208.09	6,128.97	8,244.37	17.68%	34.51%	58.30%

Bachelor's +	7,413.99	6,335.36	11,205.28	-14.55%	76.87%	51.14%

Table 41 Transportation & Warehousing

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	1,056.66	1,253.44	3,889.38	18.62%	210.30%	268.08%
Upper Primary	1,950.86	1,269.96	4,608.06	-34.90%	262.85%	136.21%
Lower Secondary	2,715.73	1,843.34	5,225.32	-32.12%	183.47%	92.41%
Upper Secondary	4,787.00	2,481.19	6,702.77	-48.17%	170.14%	40.02%
Higher Vocational	6,055.74	5,132.43	8,641.63	-15.25%	68.37%	42.70%
Bachelor's +	6,856.49	5,779.97	10,708.40	-15.70%	85.27%	56.18%

Table 42 Construction

Education Level	1993 (Before)	1998 (During)	2003 (After)	Change from 1993 to 1998	Change from 1998 to 2003	Change from 1993 to 2003
Lower Primary	2,531.32	1,729.96	5,534.95	-31.66%	219.95%	118.66%
Upper Primary	3,872.32	1,615.29	6,279.21	-58.29%	288.74%	62.16%
Lower Secondary	4,953.31	3,655.35	6,941.49	-26.20%	89.90%	40.14%
Upper Secondary	4,306.02	4,936.84	7,120.30	14.65%	44.23%	65.36%
Higher Vocational	5,800.91	5,955.98	8,945.15	2.67%	50.19%	54.20%
Bachelor's +	7,160.95	6,359.55	11,878.03	-11.19%	86.77%	65.87%

Regarding the relationship between the Asian Financial Crisis and earning rates by Industry and education level, for Agriculture, Manufacturing Oil/Gas, Transportation and Warehousing, and Construction – there is a consistent earnings increase from before the crisis (1993) to after (1998) throughout all education levels. Therefore, there isn't any noticeable impact of the Asian Financial Crisis on earning rates of different education level when looking at these industries (see Table 29-42).

4.4 Research Findings: The impact of Subprime Crisis on wage rate

4.4.1 The relationship between the Subprime Crisis and earning rates by age cohort

Table 43 The Subprime Crisis and earning rates by age cohort

Age Group	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
20 - 24	4,349.21	6,931.66	9,281.12	59.38%	33.89%	113.40%
25 - 29	7,875.97	8,674.20	11,759.33	10.14%	35.57%	49.31%
30 - 34	9,095.70	9,695.94	13,237.78	6.60%	36.53%	45.54%
35 - 44	11,095.18	11,324.16	14,067.16	2.06%	24.22%	26.79%
45 - 60	12,387.41	14,415.16	15,045.15	16.37%	4.37%	21.46%

Regarding the impact of the Subprime Crisis in Thailand on the earning rates in each age group, it is immediately apparent that the overall trend of the earning rates of the crisis period increases in all age groups from before the crisis (2003) to during the crisis (2008) as well as after (2013). This is because the Subprime crisis occurred in the US, unlike Asian Financial Crisis that started from within the country, hence only affected Thailand predominantly in the import/export reliant sector (see Table 43). It is also crucial to mention that during the chosen time period, there are many factors contributing to rapid growth of Thai economy resulting in sharp increase in earning rate. This includes the rise of industrial estate and influx of foreign investment in Thailand as a result of globalization pulling up the wage alongside the rapid growth of service and hospitality industry due to the booming tourism sector as well as the rise of condominium in the real estate industry.

The least affected age group was 20-24 with the increase in earning rates from before the crisis (2003) at 59.38%, during (2008) at 33.89%, and after (2013) at 113.40%. This is because the 20-24 age group are newly graduates and entry level workers, though they may lack experiences as compared to other age groups, they are the group with the lowest pay rate, hence are not prone to being displaced or targeted to pay cut during the Subprime Crisis. There is also an apparent trend that the older the age group, the lower in earning increase rate. This is both because generally the younger the age group, the lower they pay rate – therefore, there are more rooms for earning increase. Also it is natural in the eyes of the employer that the lower the pay, the less at risk of pay cut they are likely to experience.

4.4.2 The relationship between the Subprime Crisis and earning rates by education level

Table 44 The Subprime Crisis and earning rates by education level

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	4,850.18	6,032.28	8,102.98	24.37%	34.33%	67.07%
Upper Primary	6,106.33	7,672.90	9,231.17	25.65%	20.31%	51.17%
Lower Secondary	7,202.98	8,532.69	10,900.21	18.46%	27.75%	51.33%
Upper Secondary	7,414.88	9,524.02	11,934.56	28.44%	25.31%	60.95%
Higher Vocational	8,726.81	10,795.52	12,382.34	23.71%	14.70%	41.89%
Bachelor's +	11,701.24	17,702.50	20,739.70	51.29%	17.16%	77.24%

Regarding the relationship between the Subprime Crisis and earning rates by education level, the group with the highest increase in earnings is Bachelor's Degree and above with an overall increase in earning rates from before the crisis (2003) to after (2013) at 77.24% — followed by Lower Primary, Upper Primary, Lower Secondary, and Upper Secondary with the change of unemployment rate of 67.07%, 51.17%, 51.33%, 60.95%, 41.89%, and 77.24% consecutively (see table 44). The Bachelor's Degree and above group is the least affected as most of the workers are in the corporate sector with white collar jobs — although the businesses were affected, it was not to the point where displacement was needed for company survival. The Higher Vocational group had the lowest earning increase as most workers from the group reside in the import/export reliant sector — manufacturing, agriculture, and logistics, which are the most affected industries during the Subprime Crisis (see table 44).

4.4.3 The relationship between the Subprime Crisis and earning rates by age group and education level

Table 45 20-24

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013

Lower Primary	4,327.54	5,372.87	7,032.14	24.16%	30.88%	62.50%
Upper Primary	4,581.62	6,063.15	8,046.80	32.34%	32.72%	75.63%
Lower Secondary	5,160.69	6,294.70	8,154.22	21.97%	29.54%	58.01%
Upper Secondary	6,951.81	7,586.46	8,386.57	9.13%	10.55%	20.64%
Higher Vocational	7,727.38	7,803.85	8,002.33	0.99%	2.54%	3.56%
Bachelor's +	8,742.18	9,783.31	12,912.04	11.91%	31.98%	47.70%

Table 46 25-29

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	4,598.52	5,914.37	7,802.89	28.61%	31.93%	69.68%
Upper Primary	5,540.52	6,516.99	8,903.41	17.62%	36.62%	60.70%
Lower Secondary	5,146.10	7,102.43	7,838.43	38.02%	10.36%	52.32%
Upper Secondary	6,514.28	7,778.96	8,119.18	19.41%	4.37%	24.64%
Higher Vocational	7,235.52	8,601.90	9,594.58	18.88%	11.54%	32.60%
Bachelor's +	9,654.95	11,492.56	13,581.23	19.03%	18.17%	40.67%

Table 47 30-34

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	4,704.65	6,021.93	7,818.79	28.00%	29.84%	66.19%
Upper Primary	6,083.45	7,128.08	9,123.95	17.17%	28.00%	49.98%
Lower Secondary	6,407.13	7,926.77	10,395.12	23.72%	31.14%	62.24%
Upper Secondary	7,640.18	9,062.82	10,098.18	18.62%	11.42%	32.17%
Higher Vocational	8,529.64	10,610.21	10,662.38	24.39%	0.49%	25.00%

Bachelor's +	11,048.35	14,001.41	18,305.78	26.73%	30.74%	65.69%

Table 48 35-44

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	5,165.42	6,101.19	8,142.04	18.12%	33.45%	57.63%
Upper Primary	6,782.93	7,731.07	9,753.92	13.98%	26.17%	43.80%
Lower Secondary	7,551.52	9,358.05	11,101.90	23.92%	18.63%	47.02%
Upper Secondary	8,155.26	9,081.80	10,737.28	11.36%	18.23%	31.66%
Higher Vocational	8,553.30	9,967.61	11,022.62	16.54%	10.58%	28.87%
Bachelor's +	12,421.67	12,967.61	21,883.59	4.40%	68.76%	76.17%

Table 49 45-60

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	5,556.07	7,660.28	8,968.65	37.87%	17.08%	61.42%
Upper Primary	6,379.54	8,562.53	9,169.05	34.22%	7.08%	43.73%
Lower Secondary	7,278.49	11,015.89	11,179.22	51.35%	1.48%	53.59%
Upper Secondary	7,353.34	8,092.09	9,877.25	10.05%	22.06%	34.32%
Higher Vocational	9,050.38	10,052.05	11,466.95	11.07%	14.08%	26.70%
Bachelor's +	13,172.61	21,088.32	23,111.99	60.09%	9.60%	75.45%

Table 45-49 reports the relationship between the Subprime Crisis and earning rates by age group and education level. The Bachelor's Degree and above group and the Lower Secondary and below groups experience high earning rates increase percentage throughout all age cohorts from before the crisis (2003) to after the crisis (2013) ranging from 43.73% to 76.17%. This is because most workers from Bachelor's Degree and above group are working as employees in corporate with white collar jobs. The business owner, shareholders and financial part were directly affected,

however not to the point where displacement of employees was significant. Also, workers with Lower Secondary education level and below mostly are working within the informal sector, hence are not likely to be affected by economic crises as other groups.

The Upper Secondary and Higher Vocational education level group, on the other hand were noticeably affected the most as many of the workers from these groups work in import/export reliant industry within the formal employment sector making them more vulnerable to wage increase hindrance during the Subprime Crisis with the earning rates increase percentage from before the crisis (2003) to after the crisis (2013) ranging from only 3.56% to 34.32% which is noticeably lower as compared to other groups.

4.4.4 The relationship between the Subprime Crisis and unemployment rates by Industry and education level

Table 50 Transportation & Warehousing

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	3,889.38	4,130.55	5,335.22	6.20%	29.16%	37.17%
Upper Primary	4,608.06	6,089.75	7,048.16	32.15%	15.74%	52.95%
Lower Secondary	5,225.32	7,765.26	8,074.59	48.61%	3.98%	54.53%
Upper Secondary	6,702.77	11,798.82	8,179.12	76.03%	-30.68%	22.03%
Higher Vocational	8,641.63	8,682.48	10,287.55	0.47%	18.49%	19.05%
Bachelor's +	10,708.40	14,060.48	16,204.08	31.30%	15.25%	51.32%

Table 51 Agriculture

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	4,553.68	6,514.18	8,499.13	43.05%	30.47%	86.64%
Upper Secondary	6,537.13	7,246.02	7,876.54	10.84%	8.70%	20.49%

Higher Vocational	7,676.51	5,591.32	9,489.14	-27.16%	69.71%	23.61%
Bachelor's +	9,227.72	14,168.87	17,810.63	53.55%	25.70%	93.01%

Table 52 Manufacturing/Oil & Gas

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	4,666.98	6,769.76	7,576.91	45.06%	11.92%	62.35%
Upper Primary	4,489.80	7,630.46	7,923.66	69.95%	3.84%	76.48%
Lower Secondary	5,971.10	8,823.34	9,114.83	47.77%	3.30%	52.65%
Upper Secondary	7,481.90	7,518.00	8,627.30	0.48%	14.76%	15.31%
Higher Vocational	8,244.37	10,490.02	11,042.05	27.24%	5.26%	33.93%
Bachelor's +	11,205.28	17,979.78	19,978.99	60.46%	11.12%	78.30%

Regarding the relationship between the Subprime Crisis and unemployment rates by Industry and education level. The Transportation and Warehousing industry inevitably has the lowest increase in earning percentage as compared to other industries as they are directly involved with the import/export sector which is the area that got hit the hardest during the Subprime Crisis due to foreign exposure. This is especially evident for workers with Upper Secondary and Higher Vocational education level – as the majority of these workers are operation workers within the formal employment of the industry putting them at the most risk of earning rates hindrance with the earning rates increase percentage from before the crisis (2003) to after the crisis (2013) at 22.03% and 29.05% consecutively (see Table 50).

The similar trend with less degree also applies to Agriculture and Oil and Gas industry (see Table 51 and 52) with the least earning percentage increase group from before the crisis (2003) to after (2013) being the Upper Secondary and Higher Vocational group. The earning rates increase percentage from before the crisis (2003) to after the crisis (2013) of the Upper Secondary and Higher Vocational group are at 20.49% and 23.61% for Transportation and Warehousing industry and at 15.31% for 33.93% consecutively. This aligns with the fact that most of the workers from these groups are working within the operation side of the formal employment sector and due to the industry nature, are related to import/export and foreign exposure.

Table 53 Hospitality and Services

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	6,752.27	10,256.03	14,941.07	51.89%	45.68%	121.27%
Higher Vocational	-	-	-	-	-	-
Bachelor's +	12,468.48	15,252.40	23,052.85	22.33%	51.14%	84.89%

Table 54 Real Estate

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	-	-	-	-	-	-
Upper Secondary	-	-	-	-	-	-
Higher Vocational	9,647.68	14,638.05	18,790.85	51.73%	28.37%	94.77%
Bachelor's +	12,656.09	17,626.54	22,676.08	39.27%	28.65%	79.17%

Table 55 Professional Service

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	-	-	-	-	-	-
Upper Primary	-	-	-	-	-	-
Lower Secondary	4,406.20	6,485.28	7,351.40	47.19%	13.36%	66.84%

Upper Secondary	6,207.99	8,522.34	9,514.87	37.28%	11.65%	53.27%
Higher Vocational	10,097.85	13,311.68	16,815.05	31.83%	26.32%	66.52%
Bachelor's +	12,138.00	16,999.57	20,798.59	40.05%	22.35%	71.35%

Table 56 Construction

Education Level	2003 (Before)	2008 (During)	2013 (After)	Change from 2003 to 2008	Change from 2008 to 2013	Change from 2003 to 2013
Lower Primary	5,534.95	7,368.14	8,241.66	33.12%	11.86%	48.90%
Upper Primary	6,279.21	7,757.65	8,493.60	23.55%	9.49%	35.27%
Lower Secondary	6,941.49	8,994.81	9,431.15	29.58%	4.85%	35.87%
Upper Secondary	7,120.30	9,342.52	10,368.48	31.21%	10.98%	45.62%
Higher Vocational	8,945.15	12,152.52	14,665.61	35.86%	20.68%	63.95%
Bachelor's +	11,878.03	17,185.16	19,502.19	44.68%	13.48%	64.19%

The increase in earning rates for Hospitality and Services and Real Estate industries are especially high (see Table 54 and 54) – evidently with the increase in earning rate from before the crisis (2003) to after the crisis (2013) ranging from 79.17% to 121.27%. This may not be related to the impact of the Subprime Crisis, however the Hospitality and Services are on the rise due to rapid growth of tourism industry in Thailand as well as Real Estate industry with rapid emergence of condominiums resulting in sharp increase in earning rates for workers within those industries. The increase in earnings trends can also be seen within Professional Services and Construction Industry (see Table 55-56). Therefore, the impact of Subprime Crisis in earning rates cannot be seen when taking a look at these industries by education level.

Chapter 5: Conclusion and Implication

Regarding the impact of the Asian Financial Crisis on the unemployment rate, it is clear that there was a minor rise in the trend of unemployment rates from before the crisis to during the crisis. However, after the crisis, the unemployment rate gradually decreased and eventually even dropped below the pre-crisis level. Similarly, regarding the effect of the Subprime Crisis on the unemployment rate, it is evident that there was a slight upward trend in unemployment rates from before the crisis, during the crisis, and even after the crisis. The result aligns with the fact that the

severity of the Asian Financial Crisis is much more as compared to the Subprime Crisis in Thailand.

Regarding the impact of the Asian Financial Crisis on the earning rate, it is clear that there was a consistent rise in earning rates from before (1993) the crisis to during (1998) the crisis as well as after (2003) with a slight drop in earning rate in some small groups from before to during. However, after the crisis, the earning rate sharply increases far surpassing the pre-crisis period. Similarly, regarding the impact of the Subprime Crisis on the unemployment rate and earning rate, the overall trend of unemployment rate has consistently decreased from before the crisis (2003) to during the crisis (2008) as well as from during the crisis to after (2013), the same trend also applies with earning rate as the earnings for workers in all age and education level has increased. The education level group that are the most affected regarding both the unemployment rate and the earning rate are Upper Secondary and Higher Vocational. This is because most of the workers with these education levels are operation workers in the formal employment sector – many of which are working in the industry that are involved with foreign exposure such as Transportation & Warehousing, Agriculture, and Manufacturing/Oil and Gas. Despite these groups being affected the most, the earning rate still continue to grow despite the impact of the economic crisis.

Age and career stage of the workers serve as a significant factor in determining who will be the first group to be displaced as well as the recovery rate or return to labor market after displacement. The age groups of the entry level are more prone to be displaced first during severe economic situation as they have the least experience and require employer investment in getting them training to get them up to speed and deliver what is needed to more than the experienced ones. However, the new entry workers have an easier time than others regarding their return to the labor market. This is because their employment cost is less than other age groups and in the eyes of the employer and are perceived as progressive, enthusiastic to work, and open to be trained.

On the contrary, the oldest age group, 45-60, are less prone to be laid off first but has the hardest time to recover after displacement. This is because in the eyes of the employers they mostly have the highest pay, however that does not always match the level of their productivity. They are often stigmatized as obsolete in skills and knowledge, less productive, less enthusiastic, and less adaptive to changes.

All in all, the analysis reveals that the impact of the Asian Financial Crisis and Subprime Crisis on the economy of Thailand has resulted in an overall decrease in the trend of unemployment rate. This trend indicates the resilience and strength of Thailand's economy and its continued growth, as observed despite the economic downturn during the Asian Financial Crisis and the Subprime Crisis. This is attributed to Thailand's significant dependence on the informal sector, which serves as the primary source of income for workers with educational attainment below Bachelor’s Degree as well as a source of income for when workers of all age groups and education levels are displaced during economic downturn. It is also crucial to address

other major reasons contributing to the decline in unemployment rate and sharp increase in earning rate during the chosen time of both crises with one of the major one being minimum wage adjustment during the ex-prime minister's era Thaksin Shinnawatra from 2001-2005. During that period there were 6 minimum wage adjustments across all sectors resulting in a jump in earning rate. Also, during the period of 1998 - 2013 Industrial estate in eastern seaboard started to boom and rapidly thrive attracting foreign investment and pulling up the wage as a result of globalization alongside the rise of service and hospitality sector industry booming tourism sector as well as the emergence of condominium in real-estate industry.

The findings are a testament to the strength and stability of Thailand's economy. This study sheds important light on how economic disruption affects the labor market in Thailand and provides important ramifications for decision-makers, employers, and workers, and they can guide the creation of policies and programs that support the labor market's adaptability and resilience.

Regarding suggestions for utilization, policy makers can utilize these findings to better understand the dynamics of the labor market during times of economic disruption as well as developing economic and labor-related policies particularly to encourage the re-employment of displaced individuals and exploring the potential reallocation areas and plans for the displaced workers as well as methods in providing support for displaced workers during times of economic disruption. The origin of the crisis can assist with early response to the right group of workers in the economy. The results imply that employees who lose their jobs involuntarily may need help locating new employment prospects or acquiring new skills that are in demand in the labor market.

For Subprime Crisis, the most affected groups are those within the import/export reliant sector, however other areas such as service and tourism sector are on the rise. This suggests that the workers who experience disruption within the import/export reliant occupation could be reallocated into the service and tourism sector with high demand in workforce. The government could accommodate those workers by locating new employment prospects or arranging training program service to let workers acquiring new skills that are in demand in the labor market. The similar principle can also be applied to the more severe crises such as Asian Financial Crisis and the most recent COVID19 crisis. The government could predict which groups of workers in each industry, age and education level are the most at risk of displacement and build a cross-sector workforce and skills allocation as well as creating programs to help train the workers for the needed skills. For example, during the COVID 19 crisis, the most affected groups are those related to tourism, human transportation, hospitality, and services. However, some of the areas that require more manpower than before would be logistics and food delivery services. Therefore, those workers can utilize the existing knowledge and skills as well as acquiring new ones to be ready to be reallocated into the area with higher demand in workforce.

Regarding the suggestions for further studies, another inevitable impact from economic downturn besides the rise in unemployment rate and loss in earnings is the area of well-being and psychological impact from involuntary job loss is also a crucial area to be explored as job is not just a source of income, but also holds a big role regarding sense of identity and sense of meaning (Gowan 2012). Thus, the negative impact from involuntary displacement goes beyond financial loss (Heyes, Tomlinson and Whitworth 2017). Another area worthy of investigating further would be conducting further research on the hourly work in relation to unemployment rate. Thailand's definition of unemployment is those who work less than 1 hour per week, are available for work and seeking for work. This study covers only those who are reported to be unemployed for over 2 weeks, available for work and seeking for work, however, does not cover deep down to hourly work in a week which still has room for valuable exploration.

Chapter 6: Appendix

Sample Size of Unemployment Rates by Age Group

Age Group	1993	1998	2003	2008	2013
20 - 24	588	761	625	707	69,817
25 - 29	507	602	773	836	43,319
30 - 34	454	634	644	837	22,513
35 - 44	585	757	692	760	27,483
45 - 60	310	487	583	551	15,312

Sample Size of Unemployment Rates by Education Level

Education Level	1993	1998	2003	2008	2013
Lower Primary	445	695	683	705	24,640
Upper Primary	459	548	696	681	45,700

Lower Secondary	417	599	536	752	22,576
Upper Secondary	340	586	485	509	16,406
Higher Vocational	252	466	423	413	12,850
Bachelor's +	386	512	598	757	70,516

Sample Size of Unemployment Rates by Age Group

Age Group	1993	1998	2003	2008	2013
20 - 24	2,984	3,985	5,607	4,812	711,208
25 - 29	3,463	5,510	8,020	8,067	783,948
30 - 34	2,984	5,193	7,716	8,149	696,798
35 - 44	4,421	9,433	13,940	15,379	6743,350
45 - 60	2,518	6,108	10,843	14,689	436,1935

Sample Size of Unemployment Rates by Education Level

Education Level	1993	1998	2003	2008	2013
Lower Primary	5,778	8,000	8,948	9,906	457,722
Upper Primary	3,742	4,874	6,962	7,774	734,455
Lower Secondary	2,122	4,860	4,248	5,433	662,956
Upper Secondary	1,088	3,324	3,446	3,843	551,423
Higher Vocational	1,237	1,913	2,125	1,143	328,464
Bachelor's +	3,833	9,322	8,557	10,167	567,401

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