

Thailand's Economic History from 1991 to 2022: Exploration through Economic Modeling

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The economic background of Thailand between 1991 and 2022 presented a narrative of turbulent and ever-improving forces in the face of adversity. This period, marked by three significant financial crises -the Asian Financial Crisis of 1997, the Global Financial Crisis of 2008, and the COVID-19 pandemic in 2020- saw Thailand navigating through economic turmoil. Each of these events had profound negative impacts on Thailand's economy, demonstrated by the immediate repercussions and the nation's path to recovery. This essay will explore the impact brought by the financial crises using refined World Bank data, detail Thailand's economic model under Phillip's Curve and Okun's law, and explain how the models may differ from theoretical expectations.

The Asian Financial Crisis represented a pivotal moment in Thailand's economic history, its economy was hit by a sudden withdrawal of foreign capital, leading to a massive depreciation of the Thai baht and a financial sector meltdown. The sudden capital outflow led to a significant contraction of the economy, with GDP plummeting and unemployment rates surging. For example, Thailand's GDP growth rate plummeted to negatives by 1997 and worsened in 1998. Thailand also faced a significantly higher inflation rate of 8.06% and an unemployment rate of 3.4% in 1998. Despite these challenges, Thailand demonstrated remarkable resiliency, and fully recovered in real output and growth rate by 2001. Interestingly, the post-crisis period saw the country experiencing a lower average inflation rate than before, indicating a period of economic stabilization and adjustment.

Transitioning to the Global Financial Crisis of 2008, Thailand once again faced economic hardship, this time due to its reliance on exports in a context of diminished global demand. Despite the crisis started outside of Asia, Thailand experienced a sharp decline in exports due to reduced global demand. International investors became more sensitive to risk, leading to capital

outflows and a depreciation of the currency. However, Thailand's economy rebounded relatively quickly due to fast policy responses that helped mitigate the impact. As shown in the table, the real output and growth rate of GDP stagnated in 2008 and 2009, but quickly turned around and reached a new high in 2010. This recovery highlighted the country's capacity to adapt to global economic fluctuations and protect its economic interests.

The COVID-19 pandemic also presented an unprecedented challenge, affecting both supply and demand simultaneously. On the supply side, lockdowns disrupted manufacturing and tourism, which are key components of Thailand's economy. The demand shock was even more harsh, with domestic consumption plummeting due to reduced income and health concerns. The government's fiscal stimulus and monetary easing cushioned the economic blow, however, Real output has not yet returned to pre-pandemic level as of the latest 2022 data.

In the following analysis, this essay leverages time series graphs derived from the World Bank's dataset to explain the distinct differences in the impacts of each of the three pivotal financial crises. Although the scale of the Global Financial Crisis and the COVID-19 pandemic may be larger to the globe, their impacts on Thailand's economy were less severe compared to the devastation wrought by the Asian Financial Crisis. For instance, Graph 1, which highlights the Annual Inflation Rate, reveals a sharp decline of 10.5% in 1999, in contrast to the more moderate decreases of 4.9% and 2.3% in 2009 and 2020, respectively. Similarly, Graph 2, illustrating the Unemployment Rate, indicates that the highest surge in unemployment occurred between 1997 and 1998, surpassing the increases observed during the subsequent recessionary periods. Nevertheless, graph 3 (GDP Deflator) and Graph 4 (Real Output) clarify that despite the short-term setback of recessions, Thailand, in the very long run, increases in productivity through technological progress, capital accumulation, and improved human capital.

For the modified Phillips Curve, $\pi_t - \pi_{t-1} = a + bY_t$, Regression statistics was used to calculate the coefficients, R^2 , and significant F value. The R^2 equals 0.1955, meaning approximately 19.55% of the variance in the Inflation Rate can be explained by the model. This suggests that while there is some relationship, real GDP output alone does not account for the majority of the variance in inflation rates, and inflation is rather influenced by many other factors. Despite this, the model's F-value of 0.011284332 highlights its statistical significance of the model predicting inflation rate based on real GDP output, which is statistically significant. This shows a significant relationship between real GDP output and inflation at the population level, supporting the inclusion of real GDP output as a predictor in the model. This is also confirmed by the T-statistic for the slope (-2.7), which indicates an inverse relationship between real GDP output and the inflation rate. Next, delving into the specifics of the regression function, we observe that the b-coefficient is set at -0.000443353, and the a-coefficient at 6.241233535. b-coefficient points to a slight yet negative correlation between real output and inflation rate, emphasizing that while the influence of real GDP on inflation is subtle, it remains statistically significant. The a-coefficient, however, is likely to be insignificant because Thailand can't reach zero real output.

Based on the modified Phillips Curve, when the economy is operating above its potential where the output gap is positive, inflationary pressures increase due to higher demand for goods and services and possibly due to increased costs of production. Conversely, when there is a decrease in the economy and the output gap is negative, in theory, inflationary pressures diminish. However, Thailand's data suggests that there is a slight negative relationship between Real output and Inflation Rate as both α equals -0.00044 and b equals -0.00044. This observation can be influenced by several factors specific to Thailand's economy such as Thailand's economy

having inflation-sensitive investors and a prominent tourism industry. Due to the 1997 Asian Financial Crisis, foreign investors became sensitive to inflationary pressure. Hence, High inflation might deter foreign investment or affect the competitiveness of Thai exports, thereby negatively impacting real output. Furthermore, Thailand is known for its tourism industry, which foreign visitors would like to visit when inflation is low and generate more output during the low inflation period. Nevertheless, it is important to stress that Thailand's economy may be more susceptible to supply-side shocks that simultaneously affect inflation and output. For example, a sharp increase in oil prices can lead to higher inflation and reduce real output by increasing production costs.

To estimate Okun's Law, using $u_t - u_{t-1} = a + b g_{yt}$, Regression statistics was used to calculate the coefficients, R^2 , and significant F value. The R^2 equals 0.007180264, suggesting that only about 0.7% of the variance in GDP growth rates can be explained by changes in the unemployment rate. This indicates a weak linear relationship between Thailand's unemployment rate and GDP growth rate. Moreover, a "Significant F" of 0.6447 suggests that the relationship between unemployment and GDP growth rate is not statistically significant - it fails to reject the null hypothesis that there is no linear relationship between these two variables at the conventional level of significance. In addition, the t-statistic for the unemployment rate is -0.4658, which corresponds to a p-value much higher than 0.05, indicating that the unemployment rate is not a significant predictor of the GDP growth rate. On the other hand, the t-statistic for the intercept equals 2.984943255, which suggests that the intercept is statistically significant. Thus, when the unemployment rate is zero, the GDP growth rate is significantly different from zero. The regression function also tells us the a-coefficient (0.042789321) and

b-coefficient (-0.004427676), which shows the relationship between the two variables is slightly negative but not statistically significant.

After adjusting for the standard Okun's Law equation, α is equal to 0.004427676 and g is equal to 9.7272. This positive β coefficient signifies an inverse relationship between the unemployment rate and GDP growth rate within Thailand's economy, although not as steep as one might expect based on theoretical predictions. Usually, Okun's Law would suggest a more direct and significant correlation, where a decrease in unemployment is associated with a robust increase in GDP growth. However, the observed relationship in Thailand's model deviates from this theory, indicating more of a subtle economic relationship. The anticipated steeper negative slope, which was not observed, can be attributed to various "lurking variables" that complicate the linear application of Okun's Law model. Particularly, the supply and demand shocks instigated by the three significant financial crises of 1997, 2008, and 2020 have introduced substantial disturbances. These crises not only disrupted GDP growth rates but also affected unemployment rates in ways that are not fully captured by the linear relationship suggested by Okun's Law. These external shocks—ranging from the sudden withdrawal of foreign capital during the Asian Financial Crisis to the global demand slump in the Global Financial Crisis, and the unprecedented dual supply-demand shock from the COVID-19 pandemic—have imposed unique stresses on Thailand's economy. Each crisis demanded specific policy responses and had differing impacts on the labour market and overall economic productivity. Moreover, the calculated t-statistics, R^2 value, and "Significant F" further underscore the limitations of the model in capturing the full spectrum of Thailand's economic fluctuations. The low R^2 value suggests that changes in the unemployment rate explain only a minuscule portion of the variations in GDP growth rates, indicating other external factors not accounted for in the model.

The lack of statistical significance, as indicated by the "Significant F" value, reinforces the notion that the unemployment rate and GDP growth rate in Thailand are influenced by outside factors beyond the direct relationship supported by Okun's Law model. This divergence from theoretical expectations may also reflect structural changes in Thailand's economy over time, including shifts towards sectors with different labour intensities, the evolution of labour market policies, and changes in the global economic environment. These elements, alongside the immediate impacts of financial crises, suggest that a multifaceted approach is necessary to understand and predict the dynamics between unemployment and economic growth in Thailand accurately. In essence, while Okun's Law provides a valuable economic model for analyzing trends, the application to Thailand's economic history from 1991 to 2022 reveals the disruption of many other factors influencing the relationship between unemployment rates and GDP growth, highlighting the importance of considering broader economic and societal variables when applying macroeconomic models.

In conclusion, this essay examined the economic history of Thailand from 1991 to 2022, a period marked by significant hardships due to the impacts of three major financial crises. It detailed the consequences of the Asian Financial Crisis, the Global Financial Crisis, and the COVID-19 pandemic, showcasing how each event uniquely affected Thailand's economy. Despite these challenges, Thailand's ability to recover, highlighted by World Bank data, shows the country's strong capacity for bouncing back and adapting. In addition, the analysis also applied the Phillips Curve and Okun's Law to study Thailand's economic behaviour, revealing differences from theoretical expectations. These differences highlight the complex relationship between macroeconomic models and the effects of external lurking variables, which can often diverge from standard economic predictions.

Appendix

The calculation for modified Phillips Curve:

$$\pi_t - \pi_{t-1} = a + bY_t$$

$$\pi_t - \pi_{t-1} = 6.2412 + (-0.00044)Y_t$$

$$\pi_t - \pi_{t-1} = b(Y_t + a/b)$$

$$\pi_t - \pi_{t-1} = -0.00044(Y_t + 6.2412/-0.00044)$$

$$\pi_t - \pi_{t-1} = -0.00044(Y_t - 14184.55)$$

$$\pi_t - \pi_{t-1} = \alpha(Y_t - \bar{Y})$$

Therefore, $\alpha = -0.00044$ and $\bar{Y} = 14184.55$

The calculation for Okun's Law:

$$u_t - u_{t-1} = a + bg_{yt}$$

$$u_t - u_{t-1} = 0.042789 + (-0.0044)g_{yt}$$

$$u_t - u_{t-1} = b(g_{yt} + a/b)$$

$$u_t - u_{t-1} = -0.0044(g_{yt} + 0.0428/-0.0044)$$

$$u_t - u_{t-1} = -0.0044(g_{yt} - 9.7272)$$

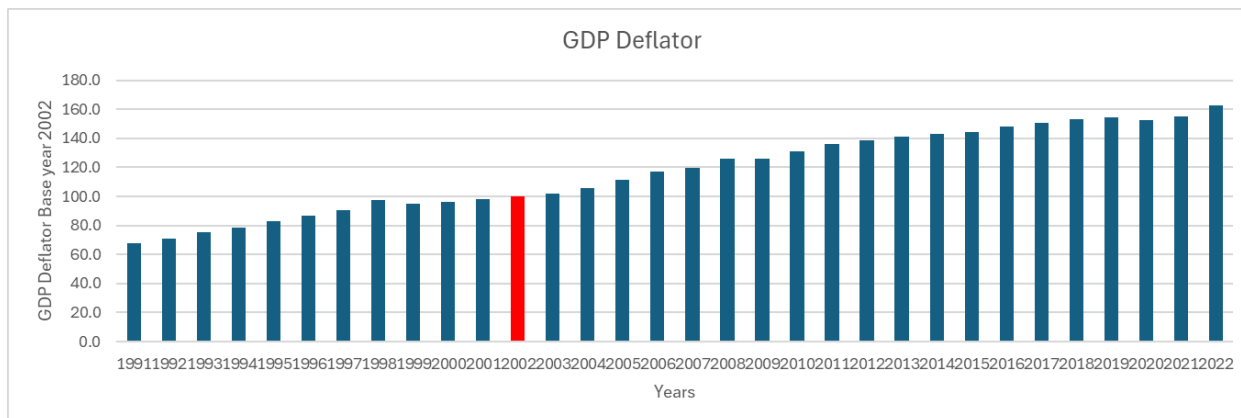
$$u_t - u_{t-1} = -\square(g_{yt} - g)$$

Therefore $\square = 0.0044$, and $g = 9.7272$

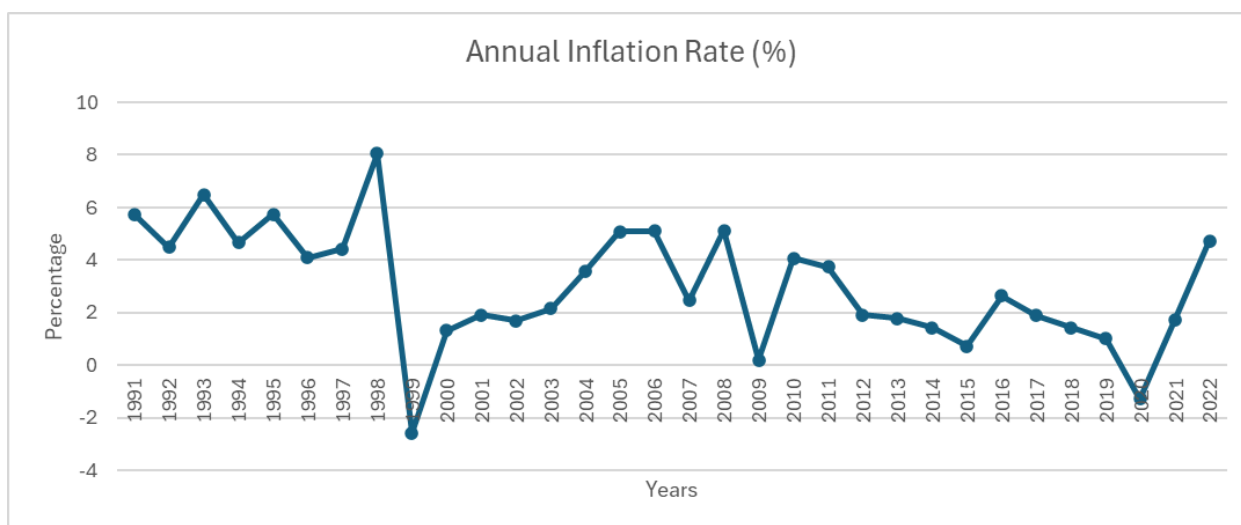
Modified Data from World Bank Data Based (see Work Cited):

- Real GDP using World Bank's Database with base year 2002. Both the original copy and the modified version (in billions of B) are provided.
- By using the Real GDP of the current period and the previous period $[(Y_t - Y_{t-1})/Y_{t-1}]$, we could calculate the real GDP growth rate.
- GDP Deflator using World Bank's database with Base Year 2002. Annual change in Inflation measured by the GDP Deflator is also provided using the World Bank's database.
- The country's unemployment rate is accessed on the World Bank's database and is provided by the International Labour Organization.

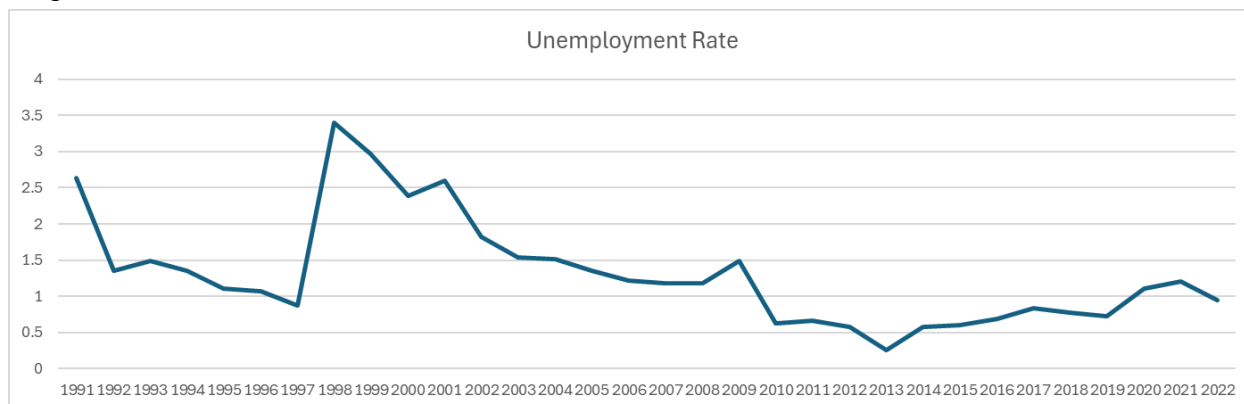
Graph 1:



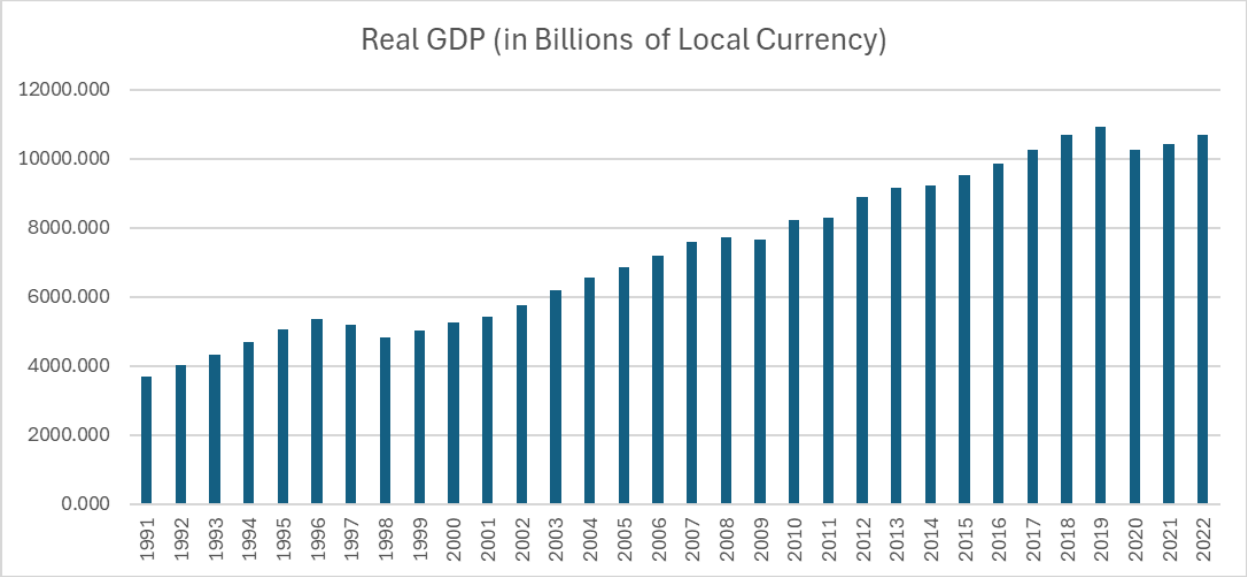
Graph 2:



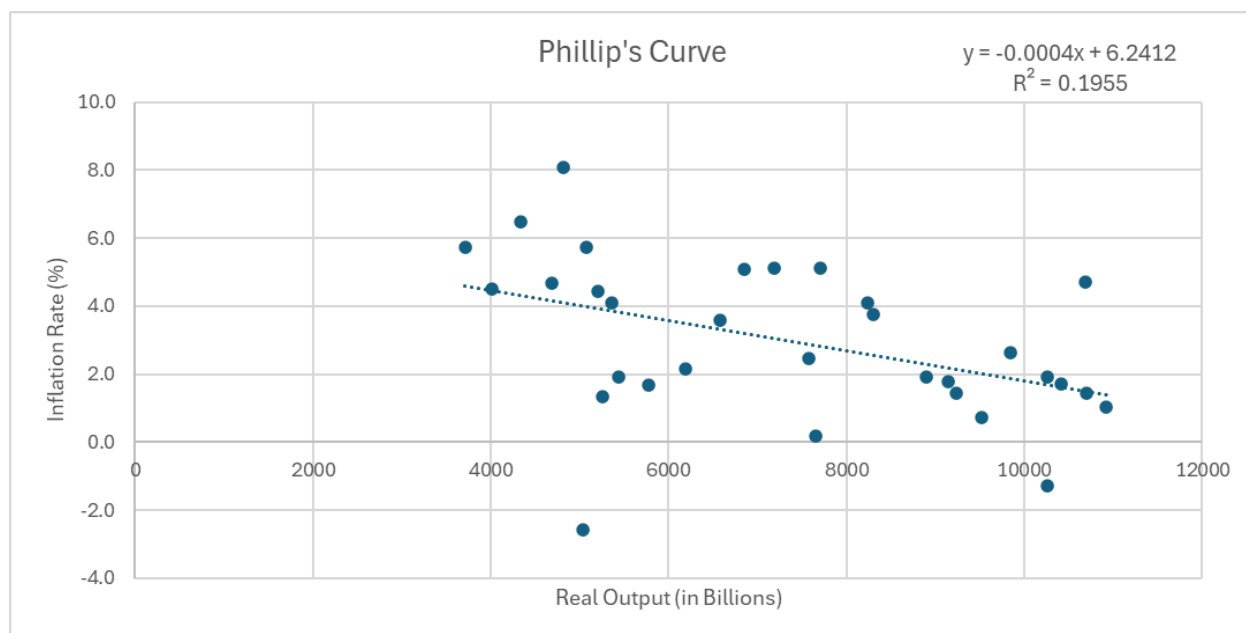
Graph 3:



Graph 4:

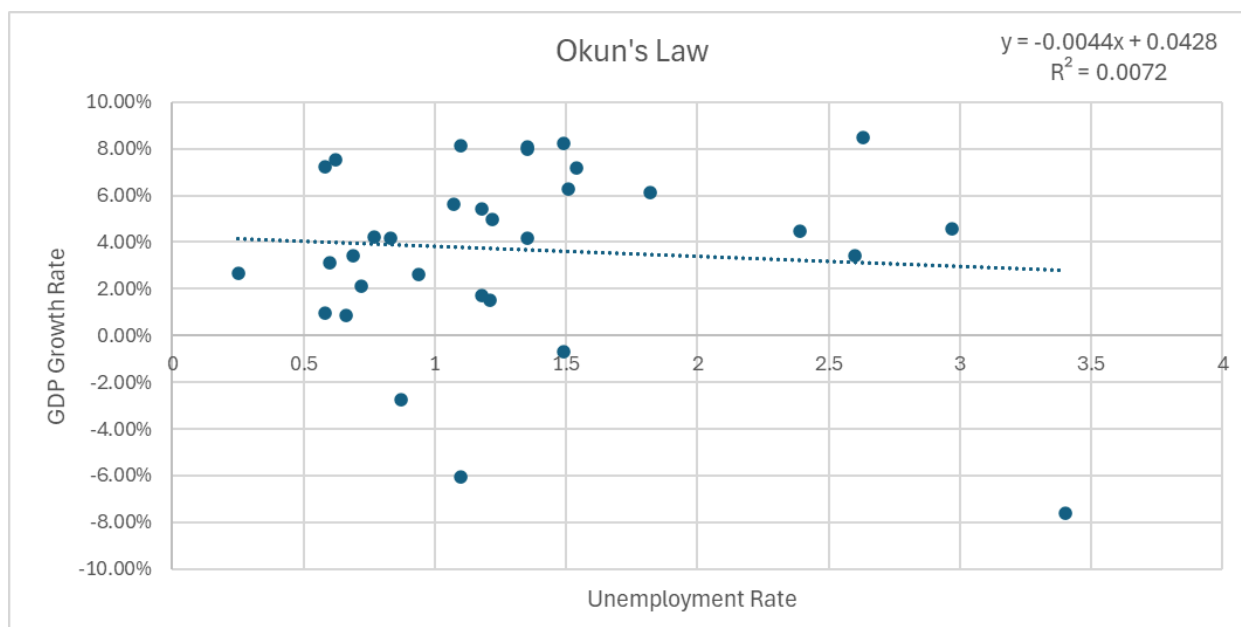


Phillips Curve:



SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.44214856							
R Square	0.19549535							
Adjusted R Square	0.16867853							
Standard Error	2.09195461							
Observations	32							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	31.90315546	31.90316	7.2900268	0.011284332			
Residual	30	131.2882225	4.376274					
Total	31	163.1913779						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	6.24123354	1.26044395	4.951615	2.671E-05	3.667063573	8.815403497	3.667063573	8.815403497
Real GDP	-0.00044335	0.000164204	-2.7	0.0112843	-0.0007787	-0.000108	-0.000778703	-0.000108003

Okun's Law:



SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.08473644							
R Square	0.00718026							
Adjusted R Square	-0.02591373							
Standard Error	0.03975733							
Observations	32							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.000342946	0.000343	0.216966	0.644725792			
Residual	30	0.047419351	0.001581					
Total	31	0.047762297						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.04278932	0.014335054	2.984943	0.005598	0.013513236	0.07206541	0.013513236	0.07206541
Unemployment	-0.00442768	0.009505615	-0.4658	0.644726	-0.023840732	0.01498538	-0.02384073	0.01498538

Table 1:

Real GDP, Inflation Rate, and Unemployment Rate of Thailand (1991-2022)					
Years	GDP deflator (2002)	Inflation Rate	Unemployment Rate	Real GDP in Billions	GDP Growth Rate
1991	67.561	5.747	2.63	3710.205	8.49%
1992	70.594	4.490	1.35	4010.11563	8.08%
1993	75.176	6.491	1.49	4341.027	8.25%
1994	78.689	4.673	1.35	4688.18	8.00%
1995	83.206	5.740	1.1	5068.875	8.12%
1996	86.616	4.098	1.07	5355.365	5.65%
1997	90.445	4.421	0.87	5207.901	-2.75%
1998	97.739	8.064	3.4	4810.328	-7.63%
1999	95.220	-2.577	2.97	5030.271	4.57%
2000	96.487	1.331	2.39	5254.382	4.46%
2001	98.338	1.918	2.6	5435.356	3.44%
2002	100.000	1.690	1.82	5769.578	6.15%
2003	102.150	2.150	1.54	6184.367	7.19%
2004	105.796	3.569	1.51	6573.323	6.29%
2005	111.182	5.092	1.35	6848.59	4.19%
2006	116.857	5.104	1.22	7188.815	4.97%
2007	119.747	2.473	1.18	7579.538	5.44%
2008	125.895	5.134	1.18	7710.338	1.73%
2009	126.140	0.195	1.49	7657.089	-0.69%
2010	131.288	4.081	0.62	8232.396	7.51%
2011	136.202	3.743	0.66	8301.559	0.84%
2012	138.802	1.909	0.58	8902.824	7.24%
2013	141.271	1.779	0.25	9142.087	2.69%
2014	143.308	1.441	0.58	9232.088	0.98%
2015	144.343	0.722	0.6	9521.426	3.13%
2016	148.148	2.636	0.69	9848.502	3.44%
2017	150.963	1.900	0.83	10259.941	4.18%
2018	153.119	1.429	0.77	10693.205	4.22%
2019	154.672	1.014	0.72	10919.319	2.11%
2020	152.690	-1.282	1.1	10256.852	-6.07%
2021	155.300	1.710	1.21	10409.894	1.49%
2022	162.638	4.725	0.94	10680.306	2.60%

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