

An analysis of the effectiveness of the Hong Kong Dollar (HKD) peg to the US Dollar (USD) during crisis periods

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Abstract

Background/Objective

This paper examines whether Hong Kong's currency peg to the US dollar amplifies economic contractions during crisis periods. This topic is important as there is an ongoing debate between economists, policymakers, and hedge funds due to the potential trade-offs and vulnerabilities the peg system presents. After the 2019 protests and the 2020 Global Pandemic, Hong Kong has had many periods of deep contractions and recessions. This has been further exacerbated by the recent geopolitical tensions between China and the US, who are both major trading partners of Hong Kong.

Methods

Eight countries with varying exchange rate regimes were compared using panel data. A Fixed Effects panel regression model with a $PEG \times Crisis$ interaction term was used to test whether pegged economies experience larger GDP declines than non-pegged economies specifically during crisis years.

Results

The findings from the Fixed Effects model suggest that pegged economies may suffer more during crisis periods, with an additional 3.3 percentage point decline in GDP growth ($p = 0.093$). Given the small sample, this result is suggestive rather than conclusive. This result was found to be more prevalent for the COVID-19 crisis, rather than the Global Financial Crisis (GFC).

Conclusions

Hong Kong faces a trade-off between the stability of the peg and a lack of independent monetary policy actions that may have implications on its economy. The Special Administrative Region (SAR) could evaluate other alternatives, although this dataset alone does not justify changing the peg.

Keywords: Hong Kong dollar, currency peg, exchange rate regime, crisis amplification, fixed effects, panel data

Introduction

Background and Context

The Linked Exchange Rate System (LERS) was established on October 17, 1983. This link ties the Hong Kong Dollar (HKD) to the US Dollar (USD). During this period, Hong Kong's currency had already been experiencing months of depreciation. The lack of consumer and business confidence led to the currency reaching the 'all-time' lowest value of 9.6 HKD per USD. Many shops in Hong Kong began to start quoting in USD and refused to accept HKD dollar notes. Because of this financial unrest, John Bremridge, the

financial secretary of Hong Kong, announced the introduction of the LERS, which pegged the HKD to the USD at \$7.8 HKD per USD.

Under the Currency Board System, the Monetary Base is fully backed with US dollar assets, with over US\$420 billion in foreign reserves (1.7 times the value of Hong Kong's monetary base). The HKMA maintains the exchange rate within a narrow band of HK\$7.75 to HK\$7.85 per USD through automatic interest rate adjustments.

Figure 1: USDHKD Spot Rate from 2000 to 2024 (source: Bloomberg)

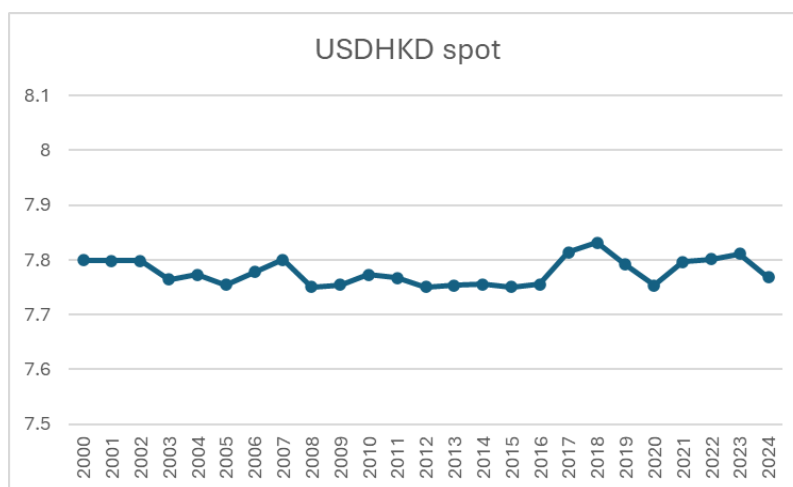


Figure 1 shows the USD vs HKD exchange rate. The graph shows that the spot rate always remained between the values of 7.7500 and 7.8500, displaying the pegged nature of the HKD to the USD.

The LERS has become 'a core component of Hong Kong's economic and financial system.' (Yue, 2024) The system is especially crucial for the small open economy and major financial hub that Hong Kong is, as it ensures exchange rate stability. During extreme volatility in global foreign exchange markets in 2024, the HKMA reported that many currencies, such as the Korean won, Australian Dollar, Mexican Peso, and Japanese Yen, experienced 'significant declines against the US dollar' (Yue, 2024). Contrastingly, the HKD remained at a stable rate. This helps to create more certainty for global investors to invest in Hong Kong and allows Hong Kong to be a suitable intermediary for financial transactions, which is important to reinforce its status as 'an international financial center' (Chen & Yung, 2022). The International Monetary Fund (IMF) has 'consistently viewed [the LERS] as the most suitable monetary system for Hong Kong.' The Hong Kong Monetary Authority (HKMA) has also made clear that there is 'no intention... to change the LERS' (Yue, 2025).

Apart from instilling confidence in individuals, investors & corporations, this currency system also enabled Hong Kong to send 'an implicit message that the city's financial system was maintaining some distance from mainland China.' If Hong Kong were to lose its peg, it may 'lose its semi-autonomous status and be integrated into the mainland' (Chen & Yung, 2022).

Due to the LERS, "Hong Kong's inflation rate is quite responsive to US price shocks" (Cheung & Yuen, 2002). Hong Kong is "a clear example of a nation with the 'Impossible Trinity dilemma'" (Ozdagli & Yu, 2013), in which a country can only achieve two out of three macroeconomic objectives: a fixed exchange

rate, free capital movement and an independent monetary policy. Hong Kong is unable to have its own independent monetary policy.

Hong Kong is not able to have its own exchange rate flexibility or maintain its own monetary and inflation policies in the midst of external inflation shocks. Instead, the HKMA imports interest rates to tightly align and adopt a subservient policy as the US Federal Reserve. Hong Kong is an economy with a fairly free market along with minimal government intervention. In the short run, "US inflation has a delayed positive impact on Hong Kong inflation" (Cheung & Yuen, 2002), as Hong Kong is affected both by domestic inflation, as well as US inflation due to the peg, and Mainland Chinese inflation, due to both nations being strong trading partners, and HK importing a large amount of goods and services from Chinese markets. This leaves Hong Kong more vulnerable to external shocks especially linked to the US and China, both of which are major powers in the global economy with immense influence over global manufacturing supply chains and economic scale.

Figure 2: HK vs US Inflation from 2000 to 2024 (source: Bloomberg)

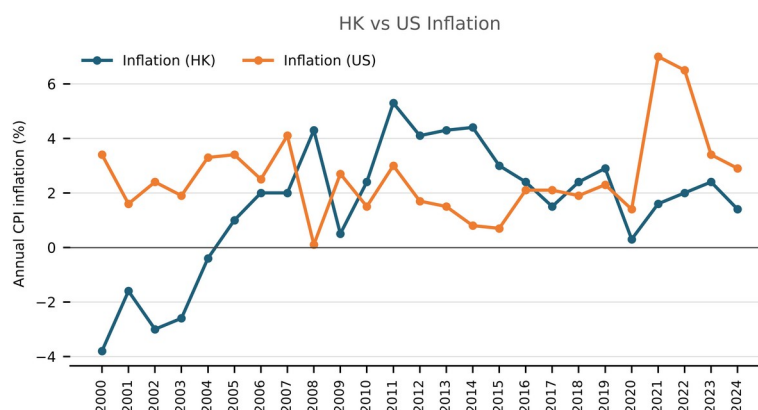


Figure 2 represents the relation between Hong Kong's inflation and the US's inflation. As can be seen, both curves seem to be moving in tandem, indicating that Hong Kong's inflation rate is reliant on the current rate of inflation in the US.

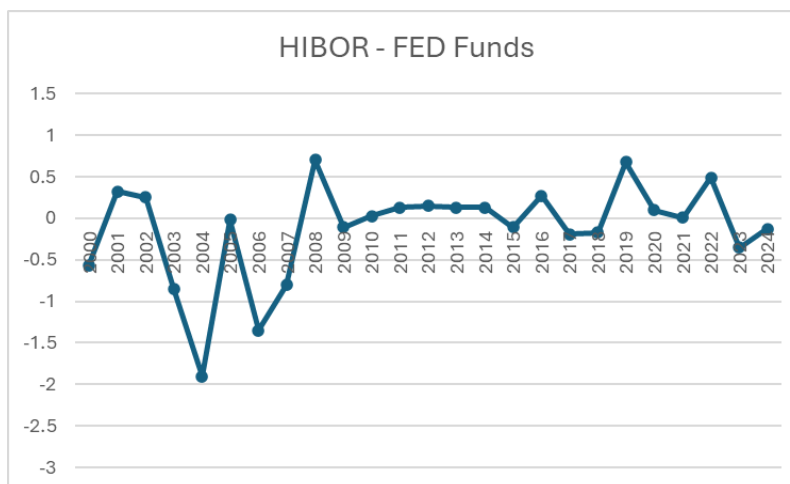
Monetary policy can also affect changes in stock prices. Due to close shadowing to the US interest rates that do not necessarily align with Hong Kong stock price movements or objectives, there may be sharp fluctuations in HK stock prices. The overnight Hong Kong Interbank Offered Rate (HIBOR) acts as the "closest interest rate to the Federal Funds Effective Rate for Hong Kong" (South China Morning Post, 2020).

Figure 3 represents the difference between HIBOR (Hong Kong benchmark rate) and Fed Funds (US benchmark rate). In this graph, there are wide fluctuations between the two rates despite the currencies being pegged. This indicates different economic fundamentals between Hong Kong and the US.

'After China took over the sovereignty of Hong Kong in 1997' (South China Morning Post, 2020), after British rule, Hong Kong became a Special Administrative Region (SAR) which had autonomy under the 'one country, two systems' regime. This allows Hong Kong to be able to maintain the use of the HKD and be able to have its own central bank (the HKMA); which were both established during the period of British rule. In 1949, the Chinese Yuan was established, and a double exchange rate was put in place. In 1994, the

Chinese Yuan was pegged to the USD, however this peg was removed in 2005, and basket of currencies was used instead. After the 2008 Financial Crisis, the Yuan was pegged to the USD again in 'an effort to stabilize the economy'. On August 11th, 2015, the basket of currencies was once again reintroduced.

Figure 3: HIBOR - FED Funds (source: Bloomberg)



Because of the Yuan's highly volatile nature, the HKD is significantly impacted by it. If the HKD were to link to the Chinese Yuan, it would lead to an increasing market-dependent status, especially on Mainland China. This would cause further problems for Hong Kong, as China has recently been experiencing a slowdown in its economy, which would create an even larger impact if a peg were to be present, and may lead to a downward pressure on costs and prices. This slowdown has already been harming Hong Kong's economy, causing a decline in Hong Kong's retail and real estate sectors.

There are also many reasons why the RMB would not be suitable for the HKD to be pegged to. The yuan is a currency that is not fully convertible and cannot be traded freely in significant amounts in foreign exchange markets. As of now, 'pegging the local dollar to the yuan "could be a long-term possibility"' (DailyFX, 2016) the yuan is able to increase international status and usage.

Prior Research: Urban J. Jermann

This research paper by Jermann et al. (2025) utilizes an asset-pricing model to derive analytical formulas, so that an estimation of how the peg will respond to certain market prices can be measured. A continuous-time formula is also used to show that equilibrium exchange rate to be expressed as a function (like the "honeymoon effect" in the target-zone literature). Since Hong Kong is recently facing a slowing economy, the peg is under increasing pressure, and the Hong Kong Monetary Authority (HKMA) had to intervene by buying a large amount of Hong Kong dollars due to the increased US Interest Rates (IRs). Because of this, the aggregate liquidity in the HK banking system declined more than 90% from its peak in 2021. Many Hedge Funds have also taken large positions against the HKD, such as Pershing Square Capital Management. Due to this current issue, Jermann et al. (2025) decided to create a research paper to understand the credibility and benefits of the HK Currency Peg. This paper was able to find that the HKD Peg Linked Exchange System (LERS) remains very credible and stable, primarily due to the HKMA operations in FX and rates of markets which have kept the peg steady. With these results, it can be concluded that there is no risk to the peg system in the short run despite short positions by various Hedge Funds. However, as Hong Kong integrates more with China in the coming 20-25 years, the peg to the USD

may come under question. Further research that could be carried out could be alternative scenarios to the peg, such as implementing a system like Singapore's currency basket mechanism to Hong Kong's economy. Another option is to check the feasibility of pegging HKD to Chinese Renminbi (CNY). Lastly, work should be done to check if there are any circumstances under which HKMA will have to depeg HKD (like Swiss Franc's depeg from Euro in 2015). This paper extends this by using panel regression across 8 countries to directly test whether pegged economies suffer more during crises.

Prior Research: Dihua Fang

Fang (2021) investigates the question of whether Hong Kong's currency should remain pegged to the USD and absorb the great costs that come with that decision. The paper utilized a comparison & contrast analysis to determine the benefits and drawbacks of certain monetary policies in Hong Kong. This research was motivated by Hong Kong's complications after the 2019 protests and 2020 global pandemic. Furthermore, there has been increasing tensions between the US and China, which is especially relevant for the HKD which is pegged to the USD (the rival currency of China). Because of this, there have been many uncertainties in trading and investment within Hong Kong. Their study found that having a free-floating exchange rate would discourage foreign investment and lead to high uncertainty, even though it could help boost employment, economic growth and stabilize the Balance of Payments (BOP) in Hong Kong. It was also found that other currencies, such as the Euro, GBP and Japanese Yen would not act as a good alternative for the HKD peg. Pegging to a basket of currencies (such as the IMF's SDR) would also be less stable and difficult to implement due to many barriers preventing its use. However, the repegging to the Chinese Yuan would serve as a viable alternative. In conclusion, the costs of changing currencies can lead to many impacts and instability, especially in the short term. Because of this reason, despite the costs Hong Kong may face, Hong Kong should keep the peg to USD, due to its historical success story, and those other alternatives are too expensive or risky to apply. While Fang uses qualitative comparison, this paper provides econometric results to further back results.

Prior Research: Betty Huang and Le Xia

This article by Huang and Xia (2025) examines whether Hong Kong should abandon the HKD-USD peg. As the US Federal Reserve has recently had to increase interest rates, Hong Kong had to follow suit. Due to the peg, Hong Kong would also be pressured to act accordingly to rising inflation in the US as well. Moreover, Hong Kong is starting to have a growing reliance on China and the RMB, which can lead to the political tensions of China and the US further exacerbating due to the peg. This study revealed that the peg provides predictability for international trade and transactions, while minimizing exchange rate volatility and attracting international investors. It also assists China's gradual financial liberalization. Because of this, the advantages outweigh the drawbacks of keeping the USD peg, and the currency peg should remain intact, especially in the short run while Hong Kong is still in a time of economic distress due to its fiscal deficit, declining property prices and high debt to GDP ratio; removing the peg would be very risky as of now. It is also feasible to remain intact as the HKMA has enough foreign reserves to defend the currency peg. Additional research that could be carried out to answer any further questions include analysis of the effects on the HKD to be pegged to a basket of currencies, like Singapore's approach for more diversification, or to be pegged to the RMB, for more alignment with Mainland China. Other alternatives that can be analyzed are the effects of a floating HKD system, or other dual currency systems. This paper extends this study by also analyzing other exchange rate systems such as a managed and free float exchange rate, to understand how effective it would be if Hong Kong were to change to one of these other exchange rate regimes.

Prior Research: Kun Li

Li (2017) inspects the effects of de-pegging the HKD and the collapse of the Chinese housing bubble on Hong Kong's currency and general economic stability. This topic was chosen to be researched due to the sluggishness of HKD's price, and the growing inequality of wealth between the population, which has led to a social and political pressure; if not addressed, may lead to a collapse in the midst of another crisis after the global pandemic and Hong Kong 2019 protests. Li (2017) was able to find that the US monetary policy mainly affects rate-sensitive sectors, and that although Hong Kong's currency may be able to handle a shock, it would be due to political & social pressures that lead to the exit from the Currency Board System. If Hong Kong unpegs at the time of a crisis, the exit costs will be small or even negative and will remain relatively stable. However, a collapse in the Chinese housing bubble may destroy confidence from investors for the Hong Kong Dollar (HKD). These findings showcase that Hong Kong is likely to maintain the currency board system even at high social and economic costs. Additionally, factors such as timing, the Chinese housing bubble, and risks of de-pegging the currency must be considered before any decisions can be made. Additional study that can be done to answer this may be to check residency-based BOP data, currency-based BOP data, or to assess the credibility of currency peg by comparing interest rates difference between HKD and USD. While Li's paper focuses mainly on the Chinese economy and how it affects HK, this paper provides additional insights on how the Hong Kong economy acts during crisis periods rather than focusing primarily on external factors.

Problem Statement and Rationale

The topic of this paper is The HKD Peg to the USD. The objective is the economic impacts, current challenges, and prospects of the Hong Kong Dollar Peg to the USD. The question that will be investigated is "Does the HKD-USD peg amplify GDP losses during crisis periods?".

Significance and Purpose

While the existing literature focuses on single-country or single-factor analysis of the HKD peg, no study has empirically tested the crisis amplification effect of the peg using panel data across different geographical contexts and exchange rate regimes. This paper helps to bridge this gap by directly comparing pegged, managed-float, and free-float economies within a single econometric framework, allowing the cost of the peg specifically during crisis years to be isolated and quantified rather than inferred from single-country narratives.

Objectives

This research addresses the following specific objectives:

1. To test whether pegged economies experience a larger decline in GDP growth than non-pegged economies specifically during crisis years.
2. To compare the performance of pegged, managed-float, and free-float exchange rate regimes using a common panel-data framework.
3. To determine whether the crisis-amplification effect, if present, is driven more by a globally-synchronized crisis (the Global Financial Crisis) or a shock whose economic impact varied more across economies (the COVID-19 pandemic).

4. To assess the robustness of any crisis-amplification finding using inflation as an alternative dependent variable and multiple panel-data estimation methods.

Scope and Limitations

The scope of this study is limited to eight countries (Hong Kong, the United Arab Emirates, China, Singapore, the United States, the United Kingdom, Australia, and New Zealand) observed annually between 2000 and 2024, grouped into pegged, managed-float, and free-float exchange rate regimes. The analysis relies on annual, country-level macroeconomic data rather than higher-frequency or firm-level data, and treats only 2008, 2009, and 2020 as crisis years. As only two of the eight countries are pegged economies, the study's ability to statistically generalize the crisis-amplification effect beyond these specific cases is limited; this constraint is revisited in the Limitations subsection of the Discussion.

Theoretical Framework

This study is grounded in the Impossible Trinity (or 'trilemma') framework, under which a country can achieve at most two of three macroeconomic objectives: a fixed exchange rate, free capital movement, and an independent monetary policy. Because Hong Kong maintains both a fixed exchange rate and free capital mobility under the LERS, it necessarily forfeits independent monetary policy, importing US interest-rate decisions regardless of whether they suit its own domestic economic conditions. This framework motivates the study's central expectation: that pegged economies, unable to use independent monetary policy to cushion domestic shocks, should experience larger output declines than non-pegged economies specifically during crisis periods, when the value of an independent policy response is highest.

Methodology Overview

To answer this question, this paper uses panel data from eight countries between 2000 and 2024, grouped by exchange rate regime: pegged (Hong Kong, United Arab Emirates), managed float (China, Singapore), and free float (United States, United Kingdom, Australia, New Zealand). A crisis interaction term ($PEG \times Crisis$) is utilized to test whether pegged economies suffer more during crises years (2008, 2009, and 2020). The primary model being used for observation and analysis is a Fixed Effects panel regression. The results found in the interpretation indicate that pegged economies experience an additional 3.3 percentage point decline in GDP growth during crisis periods, on top of the 3.9 percentage point decline experienced by all economies. This result is significant only at the 10% level and is treated as suggestive. The effect is larger for the COVID-19 crisis. Full procedural and analytic detail is provided in the Methods section below.

Methods

Research Design

This study employs a quantitative, cross-country panel-data research design to test whether a fixed exchange rate regime amplifies GDP losses during crisis periods. Four regression approaches (Pooled OLS, Random Effects, Fixed Effects, and System GMM) are estimated and compared, with the Fixed Effects specification selected as the primary model based on a formal Hausman test, described in the Data Analysis subsection below.

Participants or Sample

This investigation aims to look at 8 countries having varied exchange rate regimes to be able to compare and analyze the impact of exchange rate regimes on the variables of study. The countries were split into 3 groups based on their exchange rate regime as shown below:

Group 1: Pegged Countries

1. Hong Kong (HK) 2. United Arab Emirates (UAE)

Group 2: Countries with a managed float

1. China 2. Singapore (SG)

Group 3: Countries with a free float

1. United States of America (US) 2. United Kingdom (UK) 3. Australia 4. New Zealand (NZ)

Regimes were checked year by year against the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (International Monetary Fund, 2000–2024) and the classification of Ilzetzki, Reinhart and Rogoff (2019). All economies keep the same regime throughout 2000–2024 except China, whose currency was held fixed against the US dollar until July 2005 and again from mid-2008 to June 2010. China is kept in the managed group in the main analysis, and coded as pegged in 2000–2005 and 2009 as a robustness check (Table 12).

The full dataset contains 200 observations (8 countries $\times$ 25 years). Because the first year (2000) is lost when lagged GDP growth is used, all regressions use 192 observations (8 countries $\times$ 24 years).

Data Collection

All the data for these variables is secondary data that has been collected from Bloomberg, utilizing the Bloomberg Terminal which offers historical data, and from various websites, such as the Hong Kong Monetary Authority. The data collected spans from the years 2000 to 2024. The data collected is an annual data period frequency. Annual data was used for every variable to help maintain consistency. GDP growth, inflation and policy rates were obtained from Bloomberg, and the real rate is the policy rate minus inflation.

Variables and Measurements

(all definitions are found and modified from Investopedia's Financial Terms Dictionary)

The variables that are to be observed include:

Dependent Variables: GDP Growth (main dependent variable), Inflation (for robustness check)

Independent Variables:

Variable	Description
PEG	Dummy Variable (1 for PEG = TRUE, 0 for PEG = FALSE)
MANAGED	Dummy Variable (1 for MANAGED float = TRUE, 0 for MANAGED float = FALSE)
CRISIS	Dummy Variable (1 for CRISIS year = 2008, 2009, 2020; 0 otherwise)
PEG × CRISIS	Interaction of PEG and CRISIS variables
MANAGED × CRISIS	Interaction of MANAGED and CRISIS variables

Control Variables:

Variable	Description
Policy Rate	Annual policy rate by central banks
Inflation	CPI - a measure of the general increase in prices and the gradual loss in the purchasing power of money in a specific economy during a particular period.
Lag GDP	GDP Growth for the previous year (at $t - 1$)
Real Rate	Policy rate adjusted for inflation to show the effective real rate (robustness check only).

The variable of interest remains PEG × CRISIS given that this interaction term will show whether the crisis in financial terms gets amplified for pegged economies or not. As the economies have been categorized in three groups, this interaction term will help to determine the difference in impact of exchange rate regimes on GDP growth, especially during crisis periods.

Gross Domestic Product (GDP): A common measure to calculate the total value of goods and services produced by a specific economy during a particular period. It includes consumer spending, government expenditure, net exports, and total business investments.

Inflation: A measure of the general increase in prices and the gradual loss in the purchasing power of money in a specific economy during a particular period. It is calculated as the average price increase of a basket of selected goods and services over one year.

Table 1: Descriptive Statistics (Full Sample)

Variable	gdp_rate	inflation	policy_rate	real_rate
Mean	3.67	2.38	2.53	0.15
Standard Deviation	3.64	2.14	2.04	2.73
Minimum Value	-10.30	-3.80	0.05	-12.00
Maximum Value	14.53	12.25	8.25	11.80
Number of Observations	200	200	200	200

Based on Table 1, some trends can be noted. While the mean GDP growth rate is 3.67%, a significant amount of variation can be observed, as indicated by the standard deviation of 3.64% and minimum and maximum values of -10.30% and 14.53%, respectively. It can be noted that average inflation is at 2.38%, with a standard deviation at 2.14% with a wide range across different countries and years as depicted by the minimum and maximum values of -3.8% and 12.25% respectively.

Table 2: Descriptive Statistics (by exchange rate regime)

Variable	Pegged	Non-Pegged
GDP Growth % – Mean	3.57	3.71
GDP Growth % – Standard Deviation	4.17	3.46
Inflation % – Mean	2.29	2.41
Inflation % – Standard Deviation	3.07	1.74
Number of Observations	50	150

Looking at Table 2, it can be seen that the mean of the GDP growth and inflation is higher in non-pegged countries compared to pegged ones, with the values of GDP growth being 3.71% for non-pegged and 3.57% for pegged, and the mean of inflation as 2.41% and 2.29% for non-pegged and pegged respectively. However, the standard deviation of GDP growth and inflation seems to be higher for the pegged currencies with the GDP growth standard deviation being 4.17% for pegged, and 3.46% for non-pegged. The standard deviation of inflation is 3.07% for pegged and 1.74% for non-pegged.

Procedure

Analysis proceeded in the following steps. First, annual macroeconomic data for all eight countries (2000–2024) were compiled from Bloomberg and central-bank sources and merged into a single country-year panel. Second, the PEG, MANAGED, CRISIS, and interaction variables were constructed as described above, and descriptive statistics were computed for the full sample and by exchange rate regime (Tables 1 and 2). Third, a Pooled OLS model was estimated as a baseline, followed by Random Effects and Fixed Effects panel models; a Hausman test was used to select between the Random and Fixed Effects specifications. Fourth, a System GMM model was estimated to check for endogeneity and unobserved heterogeneity, though it was ultimately judged unsuitable for this sample size. Fifth, the primary Fixed Effects model was re-estimated with the crisis years split into the Global Financial Crisis (2008–2009) and the COVID-19 pandemic (2020) separately, and with inflation substituted as the dependent variable, as robustness checks.

Data Analysis

This research paper uses Stata (a statistical tool often used for economic modelling) to see the effect on countries during normal periods and crisis periods. Four different regression lenses were considered. In all models, standard errors are clustered by country. Because there are only eight countries, the p-value of the key $PEG \times Crisis$ term is also checked with a wild cluster bootstrap (Roodman et al., 2019).

Pooled OLS

This takes all usable data points and puts them in a single scatter graph and regression equation. It ignores differences in an economy, and assumes each economy is in a perfect vacuum with no regard to changes over time. It provides a baseline empirical model that relates GDP Growth to the exchange rate regime and crisis periods.

Model Specification: $GDP_{it} = \beta_1 PEG_i + \beta_2 MANAGED_i + \beta_3 Crisis_t + \beta_4 (PEG_i \times Crisis_t) + \beta_5 (MANAGED_i \times Crisis_t) + \beta_6 PolicyRate_{it} + \beta_7 Inflation_{it} + \beta_8 GDP_{i,t-1} + \epsilon_{it}$

GDP_{it} is the GDP rate of a country i in a particular year t , PEG_i and $MANAGED_i$ are the dummy variables for the pegged exchange rate and managed exchange rate regime respectively. $Crisis_t$ is the dummy variable for the crisis period. $PolicyRate_{it}$ is the policy interest rate of the country in a specific year, $Inflation_{it}$ is the inflation rate of the country in a specific year, $GDP_{i,t-1}$ is the lagged GDP growth, and ε_{it} is the error term.

Random Effects and Fixed Effects Panel Data Models

These models are being utilized to be able to observe unique characteristics that countries encompass (i.e., country-specific effects) not observed by the Pooled OLS regression model.

The Hausman Test is conducted to determine whether the Fixed Effects Model or Random Effects Model is more suited for the specific panel data. The Hausman Test rejects Random Effects ($\chi^2(6) = 134.28$, $p < 0.001$), and a cluster-robust Mundlak test (Mundlak, 1978) gives the same result ($F(3, 7) = 59.90$, $p < 0.001$), so the Fixed Effects Model is more appropriate, but both models are being covered for a comprehensive study. The Hausman Test checks whether the country-specific effects are correlated with the independent variables. Since they are correlated in this case, Fixed Effects is preferred because it controls for this.

Fixed Effects Model

This accounts for the different country-specific characteristics and their economies, and strips away values that do not change over time, to isolate the specific effect being observed.

Model Specification: $GDP_{it} = \alpha_i + \beta_1 Crisis_t + \beta_2(PEG_i \times Crisis_t) + \beta_3(MANAGED_i \times Crisis_t) + \beta_4 PolicyRate_{it} + \beta_5 Inflation_{it} + \beta_6 GDP_{i,t-1} + \varepsilon_{it}$

In this model, α_i is being used to represent the country-specific effects, including the PEG and MANAGED variables, that do not change over time (time-invariant country-specific characteristics), therefore the PEG and MANAGED variables are not declared separately in this equation.

The fixed effects model effectively removes the country-specific fixed effects by differencing them out over a constant, similar to taking first differences or demeaning the data. As a result, the model isolates the impact of variables, such as PEG-Crisis interaction and MANAGED-Crisis interaction, that actually do change over time.

Random Effects Model

This model considers that every country has unique characteristics; however, it assumes these features as random, uncorrelated values.

System Generalized Methods of Moments (System GMM)

This model is used to solve endogeneity and unobserved heterogeneity (limitations often found in other models), such as omitted variable bias and reverse causality, and looks at changes over time and economies on an individual level. This allows it to handle the endogeneity problem by using the lagged dependent variable as an independent variable and other related lagged variables as proxies (instruments). However, this model is suitable for large datasets only, considering that too many instrument terms can dilute the credibility of the model for a smaller dataset.

Model specification: $GDP_{it} = \alpha + \rho GDP_{i,t-1} + \beta_1 PEG_i + \beta_2 MANAGED_i + \beta_3 Crisis_t + \beta_4(PEG_i \times Crisis_t) + \beta_5(MANAGED_i \times Crisis_t) + \beta_6 PolicyRate_{it} + \beta_7 Inflation_{it} + \mu_i + \varepsilon_{it}$

Ethical Considerations

This study relies exclusively on secondary, publicly available, country-level macroeconomic and financial data obtained from Bloomberg and central bank sources; no human participants were recruited, no individually identifying information was accessed, and no informed consent process was required. Because the data are aggregate, public, and non-personal, the study posed no more than minimal risk and required no additional ethical review.

Results

Table 3: Pooled OLS (Dependent Variable as GDP Growth)

Variable	Coefficient	Robust Standard Error
PEG	1.518**	0.480
MANAGED	4.266***	0.827
Crisis	-3.723**	1.173
PEG × Crisis	-3.163*	1.666
MANAGED × Crisis	0.297	2.261
Policy Rate	0.113	0.068
Inflation	0.326**	0.097
Lag GDP	0.027	0.111
Constant	1.508***	0.341

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The Pooled OLS results seen in Table 3 show that the PEG × Crisis term is -3.163 and is significant at the 10% level. This indicates that pegged economies experience approximately 3.16 percentage points lower GDP than non-pegged economies. Along with this decrease, these economies also experience an additional decrease of approximately 3.723 percentage points during crisis periods. Floating economies only incur a 3.723% decrease in GDP growth, as they do not have a peg. Managed economies face 3.723 percentage points lower GDP partly offset by 0.297 percentage points during crisis periods. The MANAGED × Crisis term, however, is not statistically significant. Overall, this shows that while all countries experience a decrease in GDP during crisis periods, pegged economies experience a larger decline in GDP compared to floating and managed economies. The PEG coefficient is positive and is 1.518; however, this does not account for the pure effect of the exchange rate regime, but rather the permanent differences between pegged and non-pegged countries.

Table 4 shows that the crisis variable is statistically significant, with a coefficient of -3.878 . This means that countries see a GDP growth rate declining by approximately 3.88% during the crisis years. The PEG × Crisis interaction variable has a coefficient of -3.281 and is significant at the 10% level ($p = 0.093$; 95% confidence interval -7.27 to 0.71 ; wild cluster bootstrap $p = 0.12$). This is a main finding of the paper, indicating that during crisis periods, pegged economies face a GDP growth decline of 3.28 percentage points in addition to the 3.88 percentage point decline all economies face, captured by the Crisis variable above. This suggests that the peg may amplify the crisis effect, although the result is not conclusive. The Inflation variable with a coefficient of 0.35 is also statistically significant. Other variables, such as MANAGED × Crisis interaction and Lag GDP, are not statistically significant.

Table 4: Fixed Effects Model (Dependent Variable as GDP Growth)

Variable	Coefficient	Robust Standard Error
Crisis	-3.878**	1.175
PEG × Crisis	-3.281*	1.688
MANAGED × Crisis	0.442	2.346
Policy Rate	0.030	0.078
Inflation	0.347**	0.101
Lag GDP	-0.051	0.088
Constant	3.411***	0.421

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: Random Effects Model (Dependent Variable as GDP Growth)

Variable	Coefficient	Robust Standard Error
PEG	1.518***	0.480
MANAGED	4.266***	0.827
Crisis	-3.723***	1.173
PEG × Crisis	-3.163*	1.666
MANAGED × Crisis	0.297	2.261
Policy Rate	0.113*	0.068
Inflation	0.326***	0.097
Lag GDP	0.027	0.111
Constant	1.508***	0.341

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The Random Effects Model also shows similar results with respect to the significance of Crisis and PEG × Crisis interaction variables in Table 5. However, the Hausman Test indicates that this model is not appropriate for the dataset. Random Effects gives the same coefficients as Pooled OLS because the estimated country-effect variance is zero.

Table 6: System GMM Model (Dependent Variable as GDP Growth)

Variable	Coefficient	Corrected Standard Error
PEG	6.495659	30.44849
MANAGED	0	(omitted)
Crisis	130.233	201.6619
PEG × Crisis	-121.4282	168.7189
MANAGED × Crisis	-226.1347	338.0309
Policy Rate	-1.791129	1.932637
Inflation	-1.50316	2.041567
Lag GDP	0.5403716	0.8715366
Constant	13.10113	5.870971*

Note: $N = 192$ (8 countries). Diagnostic only. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Due to a high number of instruments (73) as compared to the sample size (192 observations), the model is not effective, and the results are not credible. Given the nature of the dataset, the Fixed Effects Model is the most suitable model for this investigation. It is therefore shown only as a diagnostic and is not used for inference.

Table 7: Comparative Table (GDP Growth as the dependent variable)

Variable	Pooled OLS	Fixed Effects	Random Effects	System GMM
PEG	1.52**	-	1.52***	6.50
MANAGED	4.27***	-	4.27***	0.00
Crisis	-3.72**	-3.88**	-3.72***	130.23
PEG × Crisis	-3.16*	-3.28*	-3.16*	-121.43
MANAGED × Crisis	0.30	0.44	0.30	-226.13
Policy Rate	0.11	0.03	0.11*	-1.79
Inflation	0.33**	0.35**	0.33***	-1.50
Lag GDP	0.03	-0.05	0.03	0.54
Constant	1.51***	3.41***	1.51***	13.10*

Note: $N = 192$ (8 countries). Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Observing Table 7, it can be noted that Pooled OLS, Random Effects Model, and Fixed Effects Model show similar trends of GDP decline during crisis periods, especially for pegged economies. However, given the differentiated regimes and country-specific characteristics, the Fixed Effects Model is the most robust model for the study. The System GMM Model is not a reliable model for analysis of this dataset for reasons enumerated above.

Robustness Check: Separating Global Financial Crisis from the COVID-19 Crisis

The assumed crisis years in this investigation are 2008 and 2009 during the Global Financial Crisis (GFC), and 2020, during the COVID-19 Pandemic. The GFC was a global financial crisis, whereas the COVID Pandemic was a health-related crisis whose economic impact varied more across countries. Due to this difference, it is possible that the policy rate decisions being utilized in the economy would be varied as seen fit by the government and Central Bank.

Table 8: GFC

Variable	Coefficient	Robust Standard Error
Crisis_GFC	-2.748***	0.745
PEG × Crisis_GFC	-1.917	1.740
MANAGED × Crisis_GFC	1.518	2.471
Policy Rate	0.183*	0.093
Inflation	0.398***	0.109
Lag GDP	-0.053	0.082
Constant	2.594***	0.382

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

As can be seen in Table 8, during the Global Financial Crisis (GFC), the coefficient of the PEG $\times$ Crisis_GFC was -1.917, and was not statistically significant. The Crisis_GFC has a coefficient of around -2.7, and is highly statistically significant. Inflation is also highly significant with a coefficient of 0.398.

Table 9: COVID

Variable	Coefficient	Robust Standard Error
Crisis_COVID	-5.073*	2.156
PEG x Crisis_COVID	-5.582**	2.310
MANAGED x Crisis_COVID	-2.130	2.425
Policy Rate	0.149	0.084
Inflation	0.218**	0.065
Lag GDP	-0.081	0.077
Constant	3.266***	0.365

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

During the COVID-19 global pandemic, the Crisis_COVID variable had a significant coefficient of -5.073. The PEG $\times$ Crisis_COVID is significant at the 5% level at -5.582, although it is based on only two observations (Hong Kong and the UAE in 2020). Inflation also significant at the 5% level, with a coefficient of 0.218.

Table 10: GFC vs COVID Comparison Table

Variable	GFC only (2008, 2009)	COVID only (2020)
Crisis	-2.75***	-5.07*
Peg $\times$ Crisis	-1.92	-5.58**

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The result shows that the peg amplification is larger for COVID than for the GFC, although the difference between the two is not statistically significant ($p = 0.227$). During the GFC Crisis, the Peg $\times$ Crisis coefficient is -1.92 but is not statistically significant (p -value = 0.307). During COVID, the coefficient is -5.58 and is significant at 5% level. The original pooled result of -3.28 shown in the Fixed Effects Model was essentially an average of a strong COVID effect and a weak GFC effect.

Robustness Check: Inflation as a Dependent Variable

Inflation was taken as a dependent variable to show how stable the price level of the different economies was during periods of crisis, especially for the pegged economies.

Table 11 shows that the Crisis variable is strongly significant with a coefficient of -0.55 in the Fixed Effects Model. This shows that crisis years are associated with significant deflationary pressures across all economies. The PEG $\times$ Crisis interaction variable is sizeable at -1.09 but not statistically significant, suggesting that while the (negative) direction is consistent with GDP growth findings, inflation by itself lacks the statistical power to confirm the amplification effect of the peg during crisis years.

Table 11: Inflation as the Dependent Variable

Variable	Pooled OLS	Fixed Effects Model
PEG	0.18	-
MANAGED	-0.13	-
Crisis	-0.57***	-0.55***
PEG × Crisis	-1.15	-1.09
MANAGED x Crisis	-0.73	-0.72
Policy Rate	0.03	0.05
Lag Inflation	0.56***	0.55***
Constant	1.10***	1.10***

Note: $N = 192$ (8 countries); standard errors clustered by country. Significance level displayed as *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Robustness Check: Year Effects, Regime Coding and Individual Economies

Table 12 re-estimates the Fixed Effects model with year fixed effects, with China's regime coded year by year, and with each pegged economy removed in turn. The estimate stays negative in all cases, but it is not robust: it is smaller when China is coded year by year, and it is driven mainly by the UAE, while the estimate for Hong Kong alone is -1.710 and not significant.

Table 12: Robustness of the PEG × Crisis Estimate (Fixed Effects)

Specification	PEG × Crisis	p-value	Bootstrap p-value	N (countries)
Main model (Table 4)	-3.281	0.093	0.122	192 (8)
Adding year fixed effects	-3.260	0.107	0.115	192 (8)
China coded year by year	-2.383	0.248	0.331	192 (8)
Excluding Hong Kong (UAE only)	-4.852	0.005		168 (7)
Excluding the UAE (Hong Kong only)	-1.710	0.194		168 (7)

Note: Standard errors clustered by country. Bootstrap p-values from a wild cluster bootstrap (Webb weights, 9,999 replications).

Discussion

Restatement of Key Findings

These economic models show that during a crisis, countries with a floating exchange rate have a GDP which suffers by 3.9 percentage points. However, for the countries with a peg (like Hong Kong), the GDP falls by $3.9\% +$ the interaction term coefficient (3.3 additional percentage points), which totals to 7.2 percentage points. This additional decline is significant only at the 10% level and should be read as suggestive. Simple averages show little difference in GDP growth between pegged and non-pegged economies over the full period (Table 2), although the Fixed Effects model itself does not test differences in normal years.

Because the regression estimates an average effect for Hong Kong and the UAE, the points below about Hong Kong also draw on the institutional background. Hong Kong's Linked Exchange Rate System (LERS) and currency peg to the USD may make it difficult for the Special Administrative Region (SAR) to manage its own shocks and be more resilient to global shocks due to the constraint to follow the US Federal

Reserve's Interest Rates. Due to a lack of its own independent monetary policy, inflation from the US is imported to Hong Kong. These findings are consistent with the concerns raised by Li (2017) and Fang (2021) about the costs of maintaining the peg during economic distress, while also agreeing with Jermann et al. (2025) that the peg remains credible in the short run.

Implications and Significance

A likely reason for this amplification, which this study does not test directly, is the loss of independent monetary policy. During a crisis, floating economies can cut their own interest rates or let their currency weaken to cushion the shock. Pegged economies like Hong Kong cannot do this, as they must keep their interest rates aligned with the US Federal Reserve to defend the peg. As a result, when a crisis hits, Hong Kong is forced to follow US policy even when its own economy needs a different response.

During the GFC, both pegged and managed float economies face similar problems with similar coefficients during global crises when both domestic and global economies are affected.

Hong Kong particularly suffered during the COVID-19 Crisis period. This may reflect the fact that the economic impact of COVID-19 differed widely across economies, with Hong Kong hit hard by border closures and the collapse in tourism; the regression cannot separate this from the effect of the peg. The peg's cost may be highest during crises where countries need independent monetary policy response personalized for the individual economy, rather than during global crises where all countries face similar situations and conditions. This helps explain why the amplification effect was strong during COVID-19 but weak during the GFC: a global financial crisis pushes almost every country to loosen policy at the same time, so being tied to the US costs Hong Kong very little, whereas a shock that differs across countries does not.

The effect of a peg is strongest during crises like the COVID-19 pandemic, where all countries focused on their own individual economies and made specialized economic decisions based on the economic state of their nation. This was a privilege Hong Kong was unable to have, and will continue to lack in the future due to the peg. During global crisis periods, such as the Global Financial Crisis, the peg does not make a significant difference compared to other exchange rate regimes, such as managed, fixed, or floating rates. In other words, the peg does not appear to be a significant burden during global crises, but it becomes costly precisely when Hong Kong most needs the flexibility to respond on its own.

Connection to Objectives

The study's four objectives were each addressed directly by the results. Objective 1 was addressed by the Fixed Effects model, which found suggestive evidence (significant at the 10% level) that pegged economies experience an additional 3.3 percentage point GDP decline during crisis years (Table 4). Objective 2 was addressed by the comparison of Pooled OLS, Random Effects, Fixed Effects, and System GMM specifications (Table 7), which converged on a consistent pattern across the three viable models. Objective 3 was addressed by separating the GFC and COVID-19 crisis periods (Tables 8–10), which showed the amplification effect was concentrated in the COVID-19 period. Objective 4 was addressed by re-estimating the model with inflation as the dependent variable (Table 11), which showed a consistent negative direction for the $PEG \times Crisis$ interaction, though without reaching statistical significance on its own.

Recommendations

It is important to note that the PEG $\times$ Crisis interaction term relies on only 6 treated observations (2 pegged countries $\times$ 3 crisis years), which limits the statistical power of the results. The significance at the 10% level ($p = 0.093$) means the findings are suggestive rather than definitive. Future research could expand the sample to include more pegged economies and a longer time period. With a small-sample (wild cluster bootstrap) correction, the p-value rises to 0.12, and the estimate is driven mainly by the UAE (Table 12).

Hong Kong could consider other alternatives in the future, although this dataset alone does not justify changing the peg, particularly mechanisms that allow for independent monetary policy during crises. Hong Kong could consider attaching the peg to another currency or a less volatile basket of currencies, such as Singapore's currency model. However, these new exchange rate systems come with their own economic costs and limitations, and may not suit Hong Kong's highly specialized and free economy, as they may not provide as much of certainty for global investors, which is an absolute priority for the financial hub. Instead, Hong Kong could explore other options for safety during crisis periods, such as strengthening financial and monetary buffers, as well as other stabilization methods in the most vulnerable industrial sectors in its economy.

Limitations

The findings of this paper have some limitations that should be considered, such as the small sample of only two pegged economies and the marginal statistical significance of some results. As noted above, the PEG $\times$ Crisis interaction term relies on only 6 treated observations (2 pegged countries $\times$ 3 crisis years), which limits statistical power; the finding is significant only at the 10% level ($p = 0.093$), so it should be read as suggestive rather than definitive. The study is also limited to annual, country-level data over 2000–2024 and to the three designated crisis years, and does not incorporate higher-frequency data that might better capture within-year dynamics. With only eight country clusters, even clustered standard errors may understate uncertainty, and the result is sensitive to the coding of China's regime and to the inclusion of the UAE (Table 12).

Closing Thought

Ultimately, any decision must weigh the peg's proven stability and investor confidence against its possible cost during crises, and this trade-off should guide Hong Kong's monetary policy going forward.

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