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A SHIFTING GLOBAL ANCHOR: AN EMPIRICAL STUDY OF U.S. SPILLOVER EFFECTS AND CHINA'S RISING ROLE IN THE WORLD ECONOMY

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Table of Contents

ABSTRACT

This study investigates the spillover effects of the United States economy on global growth and inflation, with a particular focus on the evolving role of China as a potential alternative anchor in the international system. Using a balanced panel dataset covering 20 advanced and emerging economies involving United State from 1975 to 2024, the study applies a Panel Vector Autoregression (PVAR) framework to analyze how U.S. and Chinese macroeconomic shocks influence domestic GDP growth and inflation across different countries. By incorporating variables such as U.S. GDP growth, U.S. inflation, the federal funds rate, China's GDP growth, trade volume, commodity prices, exchange rates, and measures of trade and financial openness, the research provides a comprehensive assessment of transmission mechanisms over time.

The results suggest that U.S. spillovers remain highly significant, despite the relative decline in the U.S. share of global GDP. Shocks originating in the U.S. continue to have a strong and immediate impact on growth and inflation in both advanced and emerging economies, with the magnitude of this impact depending on trade linkages, financial openness, and exchange rate regimes. At the same time, China's rising global role is evident, particularly in stimulating growth in commodity-exporting countries and influencing inflation through demand for raw materials. The findings highlight that while China has become an important source of global spillovers, the U.S. retains a dominant position, particularly through financial channels and investor sentiment.

This study contributes to the literature by providing long-term evidence on the persistence of U.S. economic influence while contextualizing the growing presence of China. The results have implications for policymakers seeking to balance domestic macroeconomic stability with external vulnerabilities, as well as for debates on the future structure of global economic leadership.

CHAPTER 1: INTRODUCTION

1.0 Introduction

Chapter One begins by outlining the research context, explaining how the United States has consistently shaped the global economy through its spillover effects and the importance of external shocks to economic growth and inflation. Specifically, this study examines the evolution of U.S. spillover effects over the past 50 years across 20 developed and developing economies. Furthermore, despite a declining share of the U.S. in global GDP, its influence remains substantial, as evidenced by the fact that global markets primarily responded to U.S. actions during the trade war and financial crisis. This raises a core paradox: why do countries remain heavily dependent on the U.S., even as the European Union and China expand their economic power?

1.1 Research Background

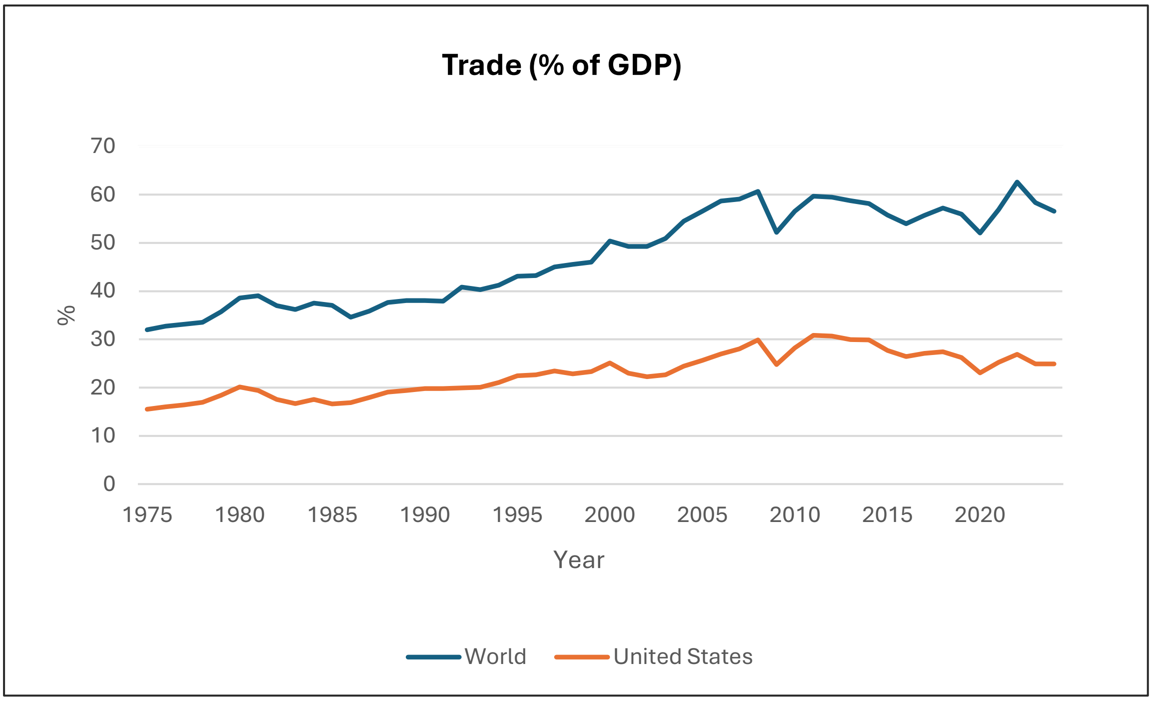

Figure 1.1: Total trade as a percentage of GDP for the World and United States over the years from 1975 to 2024. Source: World Bank, World Development Indicators.

Over recent decades, the world economy has become deeply integrated through trade, investment, and financial linkages. As shown in Figure 1.1, total trade as a share of global GDP rose from 39% in 1990 to 56% in 2016, reflecting greater economic openness and cross border production chains (Heakal, 2025).

Greater openness has also altered inflation dynamics. Globalization reduces the role of purely domestic slack and increases the importance of global demand, commodity markets, exchange rates, and supply chains in determining inflation (Forbes, 2019). These forces generate "inflation synchronization", whereby inflation becomes increasingly shaped by common global factors (Ha et al., 2019).

1.1.1 Growth Spillovers

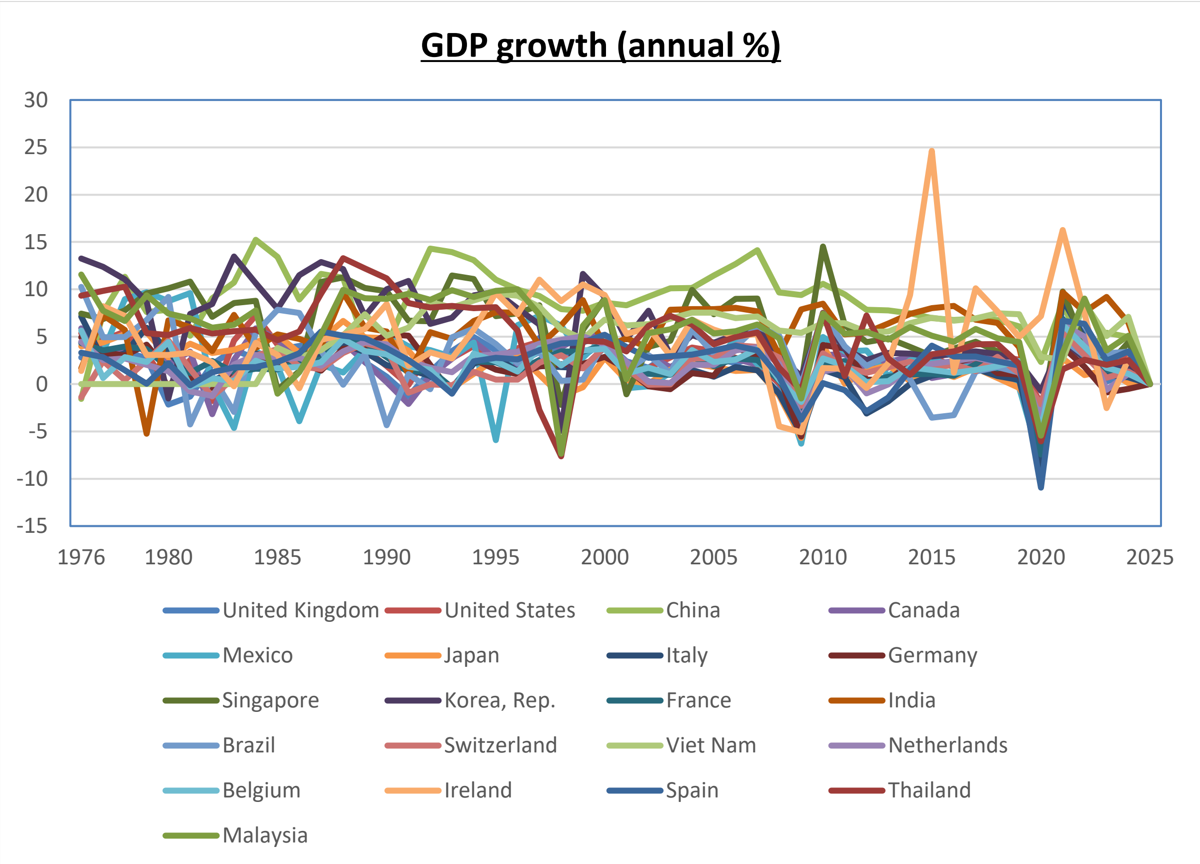

Figure 1.2: Percentage of GDP growth of 20 countries and United State over the years from 1975 to 2024. Source: World Bank, World Development Indicators.

In parallel, globalization also generates growth spillovers, where GDP growth in one economy affects others through trade, investment, and financial linkages. Figure 1.2 shows the co movement of GDP growth among the 20 sample countries from 1975 to 2024, driven largely by major economies such as the U.S. and China, whose output growth exerts measurable effects abroad (Kose et al., 2003).

Several studies document considerable growth spillovers. IMF research finds that a 1% shock to U.S. GDP raises partner country GDP by about 0.3–0.5% within one to two years, especially in trade linked economies (Georgiadis, 2016). Figure 1.2 also illustrates the 2008 Global Financial Crisis, when growth in the U.S., Europe, and emerging Asia declined simultaneously, and global GDP growth fell to –0.1% in 2009, highlighting how trade and financial channels amplify U.S. shocks.

1.1.2 Inflation synchronization

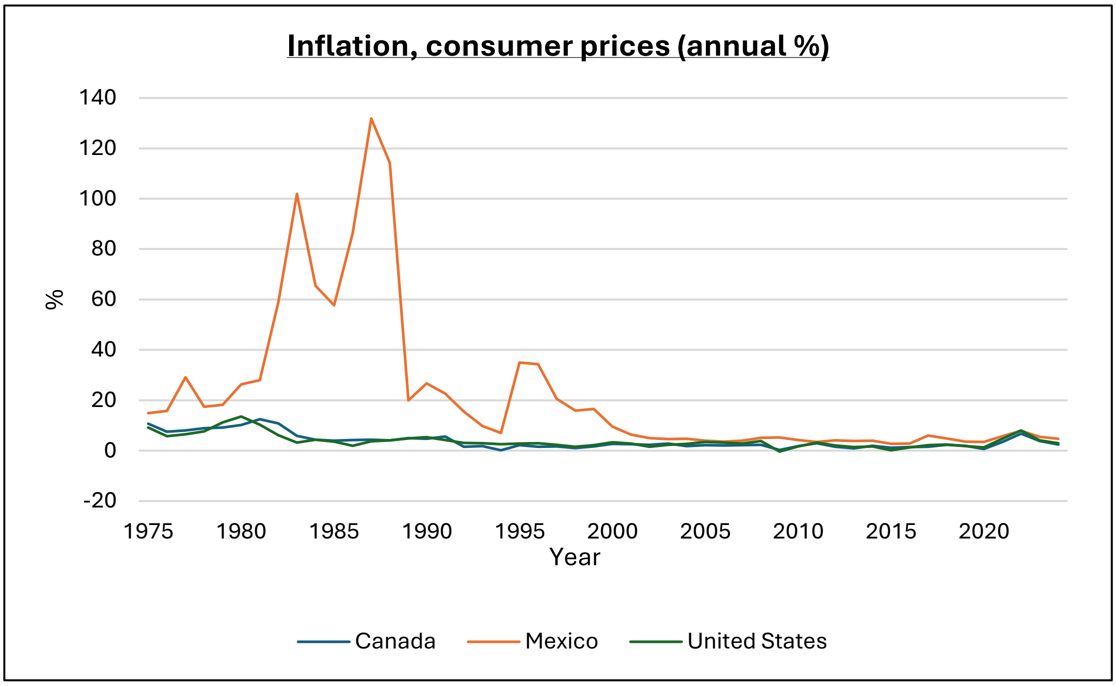

Figure 1.3: Inflation rate of selected North America countries and United State over the years from 1975 to 2024. Source: World Bank, World Development Indicators.

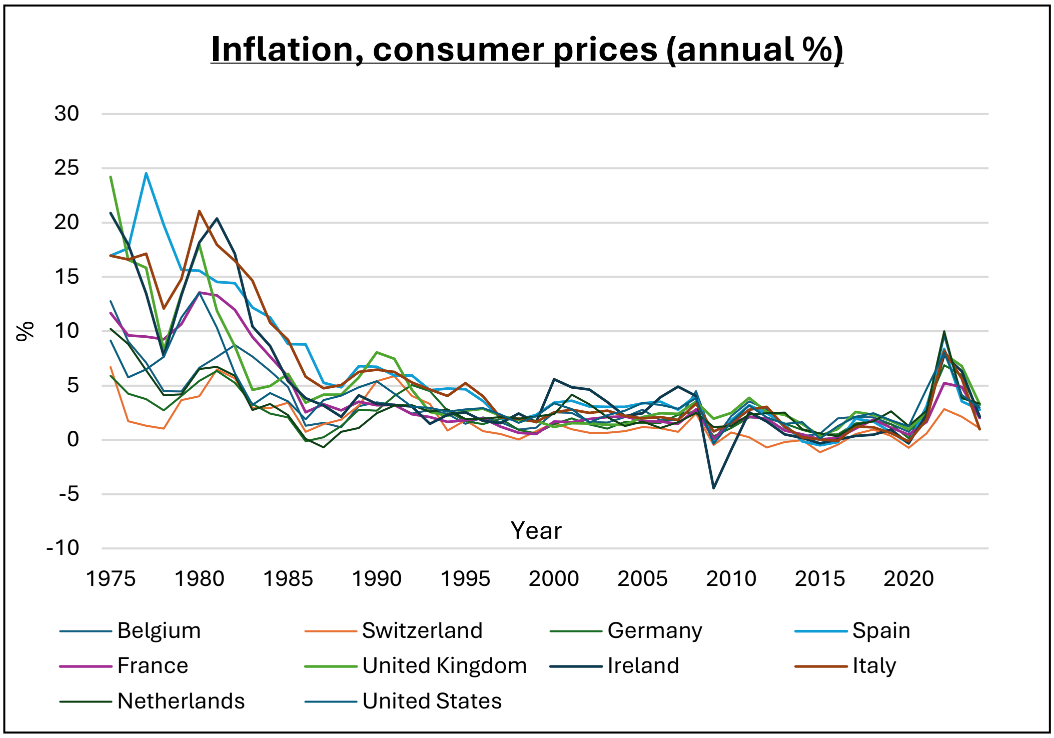

Figure 1.4: Inflation rate of selected European countries and United State over the years from 1975 to 2024. Source: World Bank, World Development Indicators.

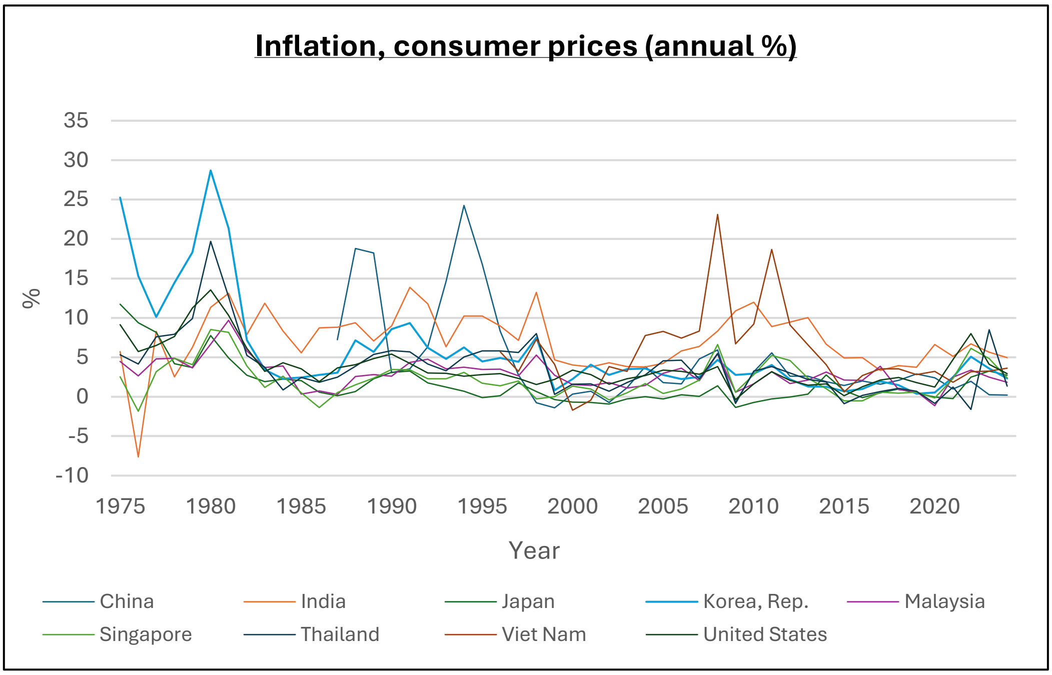

Figure 1.5: Inflation rate of selected Asian countries and United State over the years from 1975 to 2024. Source: World Bank, World Development Indicators.

Figures 1.3–1.5 show inflation rates for selected Asian, North American, and European countries alongside U.S. inflation from 1975 to 2024. Although levels differ, inflation in these regions tends to move in tandem with U.S. inflation, especially during major global shocks such as the oil crises, the 2008 Global Financial Crisis, and the COVID 19 pandemic.

Global inflation synchronization occurs when inflation rates across many countries follow similar patterns because they share common global shocks such as commodity price spikes and supply-chain disruptions. Spillovers refer to the transmission of inflation from one economy to another, whereas synchronization is the observed co-movement of inflation across economies. Principal component analysis in Forbes (2019) shows that the global component of CPI inflation more than doubled from 27% in the early 1990s to 57% in recent years.

Many studies identify the U.S. as the largest net transmitter of inflation shocks, reflecting its dominant role in global finance and trade (Bouri et al., 2023). Although the U.S. share of world GDP has fallen from around 40% in the mid-20th century to about one quarter in recent years, it remains a key engine of global growth (Bhutada, 2021).

Over the past decade, global GDP growth and inflation have shown considerable co-movement, especially during the COVID-19 period, when many economies experienced simultaneous recessions and disinflation (Auer et al., 2024). These patterns are consistent with the regional evidence in the figures, where inflation cycles across continents clearly move together.

Trade linkages, monetary policy, and financial markets are the main mechanisms behind inflation spillovers. Changes in U.S. monetary policy, particularly Federal Reserve interest rate decisions, transmit worldwide via capital flows, exchange rates, and borrowing costs, influencing both growth and inflation in other economies (Caldara et al., 2022).

Whether China will surpass the US as the principal source of global economic spillover remains a contested debate. China's rapid growth, especially in manufacturing and infrastructure, has allowed it to become the leading trading nation. Nevertheless, the US retains a considerable edge in innovation, financial market power, and strategic geopolitical alliances (Bureau, 2025).

Accordingly, this study examines how U.S. and Chinese spillovers to the rest of the world have evolved over time, identifies the transmission channels involved, and asks whether China's rise is eroding U.S. dominance in global spillovers. It develops clear research objectives, questions, and hypotheses to guide the analysis and to shed light on the changing structure of global economic linkages.

1.2 Problem Statement

Over the past five decades, Economic integration through increased trade, financial flow, and the development of global value chains has transformed inflation from a domestic event into one driven by cross-border shocks. The change was exemplified by two characteristics: inflation synchronization and the spillover effects. Both points together suggest the growing vulnerability of developed and emerging economies to external shocks.

Spillovers hold particular importance in the context of the United States. The United States, as the issuer of the world's leading reserve currency and host to the largest financial markets, possesses an unprecedented influence over world inflationary trends. Shifts in its monetary policy, such as changes in Federal Reserve interest rates, will diffuse instantly worldwide through channels such as capital movements, exchange rate fluctuations, and cause changes in borrowing costs. There is research showing that inflation shocks in the U.S. explain over half of the forecast variance in G7 countries (Istiak et al., 2021). As a result, some nations' economic outcomes may be shaped more by external forces linked to U.S. economic conditions rather than by their own internal factors.

In parallel, greater integration has encouraged inflation synchronization among countries. Studies show that a global factor is responsible for causing over one-fifth of headline inflation variations across a wide range of economies (Andriantomanga, 2025). This synchronization is representative of the effect of collective shocks, such as commodity price spikes, supply disruptions to energy supply, and supply chain bottlenecks, which spread across borders at the same time. The monetary policy of the United States plays a crucial role in this respect as well. Federal Reserve actions to further monetary policy tightness lift global interest rates, reduce demand, and solidify simultaneous disinflation across various economies. While domestic policy can mitigate these transmissions to some degree, it is incapable of eliminating the core global synchronization itself, especially for sectors working with tradable items closely embedded with global value chains.

Notably, there is evidence to show that the effect of factors is not strictly one-dimensional. The United States' inflation is now shaped significantly by international circumstances, with studies estimating that 0.5 to 1 percentage points of U.S. inflation is responsive to external impulses (Bell et al., 2024). As a result, the United States is a source and recipient of international inflationary shocks, which makes it challenging to undertake spillover analysis.

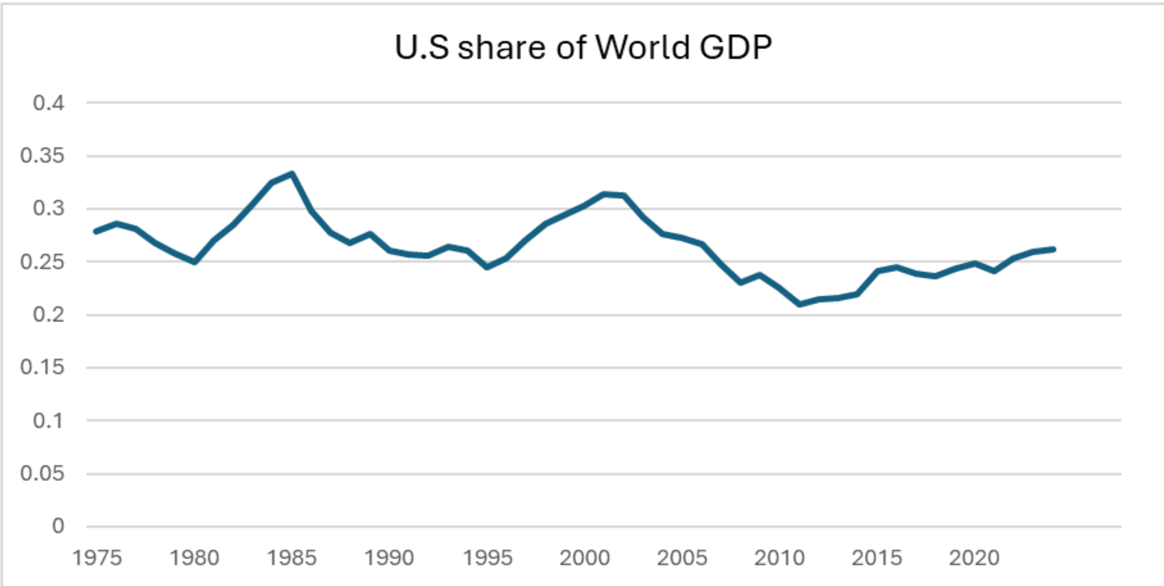

Figure 1.6: The U.S.'s GDP share of world GDP over the years from 1975 to 2024. Source: World Bank, World Development Indicators.

The ascendance of China further complicates the overall scenario. Previously regarded as a primary recipient of economic shocks, China is now emerging as a feasible alternative source for global spillovers. As the largest exporter in the world and a significant consumer of commodities, China has started to influence both the dynamics of global growth and pricing. The International Monetary Fund (2023) posits that a 1% variation in China's output growth results in a 0.2–0.8% variation in global growth. In contrast to the United States, China's historical influence has focused on commodity and trade channels rather than on financial markets, due to its comparatively insulated capital account. This situation presents a significant research inquiry: notwithstanding the decreasing proportion of the United States in worldwide

GDP, from approximately 40% in the mid-20th century to about 25% presently, which accounts for the continued dominance of the U.S. as a primary source of spillovers, and to what degree could China potentially contest this status?

Therefore, this study seeks to address a clear gap in the literature: the persistence of U.S. dominance in global spillovers despite structural shifts in the world economy, and the emerging role of China as a challenger. By systematically analysing both spillovers and synchronization across the nineteen advanced and emerging economies from 1975 to 2024, this research aims to clarify whether global inflation is still primarily “Made in the U.S.” or whether a multipolar system of spillovers is taking shape.

1.3 Research Objectives

1.3.1 General Objectives

The general objective of this study is to investigate the evolution and magnitude of U.S. spillover effects on GDP growth and inflation across 20 advanced and emerging economies over the past five decades. By analysing the magnitude, direction, and transmission mechanisms of these spillovers, the study aims to assess whether the United States continues to dominate global economic linkages despite its declining share of world GDP.

1.3.2 Specific Objectives

i. To quantify the extent of U.S. spillovers on GDP growth and inflation in the selected 20 economies from 1975 to 2024.

ii. To examine how different channels or transmission mechanisms of spillover have shifted in dominance over time.

iii. To evaluate the likelihood of China overtaking the U.S. as the primary driver of international spillovers.

1.4 Research Questions

i. To what extent do U.S. macroeconomic shocks spillover into GDP growth and inflation in the 20 selected advanced and emerging economies?

ii. Through which channels are U.S. spillovers most strongly transmitted?

iii. How has the strength of U.S. spillovers changed over time, and is there evidence that China is increasingly overtaking the U.S. as a dominant source of global economic influence?

1.5 Hypotheses of the Study

H_1: U.S. GDP growth shocks have a positive and significant spillover effect on GDP growth in the 20 selected economies.

H_2: U.S. inflation shocks have a positive spillover effect on inflation in the 20 selected economies, with stronger impacts in more open and financially integrated countries.

H_3: The strength of U.S. spillover effects on both growth and inflation has changed over time which reflecting structural shifts in global trade and finance.

H_4: China has emerged as a significant source of spillovers, particularly in influencing global GDP growth, but its effects are still not entirely greater than those of the U. S.

1.6 Significance of Study

The significance of this study lies in addressing the knowledge gap on the persistence and evolution of U.S. spillover effects in the global economy. By focusing on GDP growth and inflation across both developed and developing economies, this study seeks to provide insights into how U.S. shocks continue to shape global outcomes and whether China is emerging as a credible alternative source of spillover.

The findings are expected to contribute to academic debates on international macroeconomic interdependence by clarifying how U.S. spillovers are transmitted and how their strength has changed over the past 50 years. From a policy perspective, the results can help governments and central banks design strategies to mitigate vulnerabilities to external shocks and prepare for a possible shift in global economic leadership.

This research also benefits fellow scholars by offering a comparative framework that captures variations between advanced and emerging economies. By identifying the channels and relative magnitudes of spillovers, it provides a basis for future studies on multipolarity in global economics.

1.7 Conclusion

In short, this chapter has introduced the study by highlighting why understanding U.S. spillover effects and inflation dynamics in advanced and emerging markets remains important. Even though the U.S. share of world GDP has declined, its influence through monetary policy, trade, and financial markets remains considerable, while China's rise suggests that global spillovers are becoming more multipolar. By outlining the research background, problem statement, objectives, questions, hypotheses, and significance, this chapter provides the foundation for the subsequent review of theory and evidence on U.S. and Chinese spillovers.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter reviews relevant literature to establish the conceptual and empirical foundation of the study. It begins by introducing the key theoretical perspectives on economic spillovers, including international trade theory, financial market interdependence, and globalization dynamics. It then examines the mechanisms through which the United States transmits economic shocks to other economies, particularly in terms of GDP growth and inflation. Besides, special attention is given to empirical evidence of U.S. spillovers across both developed and developing countries, while also highlighting China's growing role as a source of global influence. Finally, the chapter identifies research gaps that motivate the present study.

2.1 Theoretical Framework of Spillover Effects

This study is based on several key economic theories that explain how spillovers occur across countries. First, the Mundell–Fleming framework provides a foundation for understanding how macroeconomic shocks affect a large economy. They are transmitted internationally through capital flows and exchange rate movements such as United States. When the U.S. adjusts its monetary policy like interest rates, it affects global capital allocation. Thus, it will lead to currency depreciation or appreciation in other economies and affect their inflation and output levels.

Second, the Global Value Chain (GVC) theory explains how production fragmentation across countries increases the transmission of shocks. In a highly interconnected production system, changes in demand or costs in one major economy can quickly spread through supply chains. It would affect intermediate goods, production costs, and ultimately inflation and growth in other countries. This is important for understanding China's role as its economy is deeply embedded in global manufacturing networks.

Third, the concept of global inflation and international price transmission highlights that inflation is increasingly determined by global rather than purely domestic factors. Commodity prices, exchange rates, and global demand conditions play a crucial role in shaping inflation dynamics across countries. This leads to the phenomenon of inflation synchronization.

Moreover, the Global Financial Cycle theory emphasizes the dominant role of major economies in driving global financial conditions. Especially in United States, changes in U.S. monetary policy influence global liquidity, asset prices, and capital flows thereby transmitting financial shocks internationally.

Finally, the broader spillover and economic interdependence framework underlines that economies are interconnected through trade, finance, and commodity markets. This interdependence justifies the use of a Panel Vector Autoregression (PVAR) model which captures the dynamic and simultaneous interactions among variables across countries. In short, these theories provide a comprehensive foundation for analysing how external shocks are transmitted globally.

2.2 Empirical Review of U.S. Spillover Effects

The empirical evidence indicates that both demand and monetary policy shocks in the U.S., as well as financial market shocks, are usually not isolated phenomena but also spill over the U.S. border. Instead, they spill across to other economies, affecting dynamics in advanced and emerging markets alike. The paradox of retreating relative growth and persistent hegemony underscores the need to fully understand the channels through which US spillovers extend beyond the rest of the world (Engler et al., 2023).

According to scholars, there are three main routes of U.S. spillover transmission. The first is **trade linkages**, in which U.S. demand shocks or price changes for imports and exports have a direct impact on inflation in the country's trading partners. One explanation for co-movements in inflation is strong bilateral trade integration, such as between the U.S. and Canada (Bank of Canada, 2022). Similarly, Mexican inflation is heavily influenced by U.S. demand fluctuations, given that its imports are sourced from the United States and its exports are primarily destined for the United States (IMF, 2022).

The second channel is **monetary policy and financial markets**, since the policy decisions of the Federal Reserve and the global dominance of the U.S. dollar influence capital flows, liquidity, and exchange rate dynamics around the world. Empirical studies reveal that conventional interest rate policy actions, as well as unconventional ones like quantitative easing, determine substantial global spillovers through financial markets (London & Silvestrini, 2025). Such spillovers manifest themselves particularly clearly in the context of emerging markets, usually leading to the pressures of devaluation of the currency and to a flow of capital, which, in turn, enhances the internal inflation (Lastauskas & Nguyen, 2024).

The third channel works through both **commodity and global value chains (GVCs)**, an expression of how US shocks are transmitted through raw materials' pricing and interconnected production networks. Because most commodities, from oil to metals to crops, are priced in dollars, changes in U.S. inflation and monetary policy translate into global input costs. When US dollar-denominated commodities prices are seen to rise, countries that are heavy energy importers such as India, Japan, and much of Europe usually face acute inflationary pressures (Baldwin & CME Group, 2024). By contrast, for other developing countries, including Brazil and Canada, having more net income initially will provide a respite, but domestically inflationary pressures are likely to increase as higher input costs spread across the economy (IMF, 2022).

Meanwhile, contemporary global value chains amplify these effects through the integration of US cost shocks in multi-country production systems. According to Chau (2024), it is estimated that 20–30 per cent of inflation in integrated economies post-COVID-19 can be attributed to spillovers through global supply networks, rather than internal determinants. Germany, Belgium, and the Netherlands, for example, are all deeply enmeshed in transatlantic supply chains for machinery and industrial goods and are highly vulnerable to changes in U.S. demand and costs. Similarly, Asian exporters, including Taiwan, South Korea, Vietnam, and Singapore, are primarily facing intense inflationary pressures through electronics and semiconductor supply chains as U.S. consumer demand increases. In fact, and in effect, it is that US shocks rip their way through commodity markets and value chains and reinforce one another, so that inflationary pressures spread simultaneously upwards, which is between production stages, and outwards, which are between countries (Bario et al., 2017).

The extent of exposure varies across these platforms. Rich countries like the Japan remain most responsive to GVC spillovers and financial markets, while emerging markets like Vietnam are still most responsive to trade shocks, exchange rate shocks, and commodity price shocks. Even within regions, variation in openness, dependence on energy, and composition of industry render some of them vulnerable to U.S. induced inflation spillovers (Rohit & Dash, 2018).

2.2.1 Trade Linkages

In the realm of international economics, trade linkages have consistently emerged as the primary conduits through which inflationary pressures in the United States propagate to the global stage. For instance, Mexican and Canadian inflation patterns are commonly characterized by close correlation to the American business cycle. There is empirical confirmation that "about 50% of the variability in Canadian inflation can be attributed to U.S. shocks" (Istiak et al., 2021), citing the intimate nature of the economies between the countries, most notably in the energy market, as well as the auto sector. Mexico is most exposed, as more than 80% of Mexican exports are absorbed by the American market, thus placing immediate pressure on inflation when American demand increases. This is compounded by the depreciation of the Peso, pushing import bills up and driving pass-through acceleration in domestic inflation (IMF, 2022).

The linkages between European economies are significant, and Europe reacts to changes in the U.S. economy in both positive and potentially volatile ways. Germany, through its role as the industrial heart of Europe, is most exposed to changes in U.S. industrial demand. IMF simulations show that a negative U.S. growth shock reduces German output by up to 1.4 percentage points over two years (IMF, 2019). A rise in American demand means a larger demand for German equipment, cars, and industrial supplies, thus boosting domestic producer prices. Exposure among producers in the U.K., France, and Italy is also significant, though less direct, as their production is conducted in supply chains that reach into the wider EU, though mainly focused on servicing U.S. demand (Chassany & Storbeck, 2025). Smaller economies like Belgium and the Netherlands are particularly exposed given their position in distributing large volumes of U.S. trade headed for the continent. Switzerland, though focused on luxury items and chemicals, is less directly affected, though still influenced by currency movements relating to U.S. trade terms (Irving Fisher Committee, 2024).

The trade impacts from the U.S. economy are most substantial in Japan and South Korea in Asia, all of which are most dependent on U.S. consumption of electrical appliances, cars, and other high-value manufactured items. Such dependence implies that their producer prices are responsive to U.S. consumption levels (Kihara & Sugiyama, 2025). Other emerging manufacturing nations in Asia, such as Vietnam and Thailand, are also struggling with increased production costs in their export supply chains due to the surge in U.S. demand. According to Nguyen (2025), which discusses Vietnam's situation, its exchange rate volatility against the U.S. dollar directly amplifies imported inflation, with a 4.4% depreciation in 2024 raising consumer price concerns. Though less exposed to U.S. trade, India and China are still most exposed to indirect spillovers, mostly with India's IT service exports, and China is the American market's most significant exporter (Fan & Chen, 2024).

Briefly, the econometric evidence indicates that trade channels have provided the most important and statistically significant avenues for U.S. inflation spillovers. Larger and diversified economies, such as Germany and the United Kingdom, experience more moderate influences. In contrast, small open economies heavily dependent on the United States' market, including Mexico, Vietnam, and Brazil, tend to suffer from immediate, magnified inflationary pressures.

2.2.2 Monetary Policy and Financial Markets

Monetary policy and financial market transmission mechanisms are one of the strongest pipelines of inflationary pressure and U.S. policy moves to global markets. The supremacy of the U.S. dollar as a dominant reserve and transaction currency, as well as the role of the Federal Reserve in global liquidity, imply that changes in U.S. interest rates and unconventional monetary policies (UMP) have significant effects on the international financial environment.

There is a wealth of studies that show US monetary policy decisions have external effects via movements of capital, asset prices, and exchange rates. They show that UMP shocks, which are proxied by the changes in the Fed's balance sheet, lead emerging markets to have higher equity returns, currency, and lending rates. This reflects how responses from the rest of the world to Fed policies are dependent on the degrees of financial openness and institutional stability (Anaya et al., 2017).

Other results confirm the complexity of these extra-transmission effects, which Engler et al. (2023) indicate. In contrast, developing countries are responsive not just to direct actions by U.S. officials but also to U.S. macroeconomic news features, including surprises such as employment data, that no explicit policy change occurred, suggesting that changes in investor mood may be important distribution channels for such effects. Similarly, Lastauskas and Nguyen (2024) show that tightening policies, orchestrated by U.S. politicians, led to significant downturns in production even in emerging economies, while adverse effects further escalate through elevated bilateral interdependence in trade and prevailing uncertainty over fiscal policies globally.

There are also profound differences in terms of countries. They are widely reported in the literature of Chen et al. (2015). The emerging markets in the world today are becoming increasingly sensitive over time to both the stereotypical practices used in combination with new techniques and are increasingly shielded from direct or indirect U.S.-sponsored sovereign action, thus enforcing global interdependence within multiple sovereign finance networks. Furthermore, they show how direct exposure to trading impacts change fee flexibility and labor flexibility, with effects occasionally exceeding those observed domestically, reflecting the prevailing economic conditions.

In practice, these dynamics play out differently across regions. In North America, spillovers to Canada are strong and predictable due to deep financial integration, with Canadian monetary policy often forced to align closely with Fed actions. By contrast, Mexico experiences more volatile effects, as peso depreciation and capital outflows amplify U.S. shocks, raising inflationary pressures and complicating monetary management (IMF, 2022). In Europe, advanced economies such as Germany and the United Kingdom face significant spillovers through bond yields, equity markets, and exchange rates. In contrast, smaller eurozone economies like Belgium, Ireland, and Spain are indirectly affected via broader ECB policy adjustments (OECD, 2025). In Asia, Japan is partly shielded by its yield-curve control policy, but dollar appreciation raises import costs and fuels inflation (Kihara, 2025). Less financially mature markets such as Vietnam and Thailand exhibit the “short rate disconnect,” responding weakly to Fed moves until global risk surges force more substantial pass-through (Kalemli-Özcan, 2020). In Latin America, Brazil is particularly exposed, with Fed tightening triggering sharp exchange rate swings and contractions in output and investment, especially during periods of fiscal fragility (Lastauskas & Nguyen, 2024).

2.2.3 Commodity Markets and Global Value Chains (GVCs)

Commodity markets and GVCs represent two of the vital avenues through which U.S. economic dislocations affect the global economy. Since there are a lot of necessary raw materials, such as oil, natural gas, metals, and agricultural products, that are denominated in U.S. dollars, U.S. monetary policy and inflation changes have a direct impact on the import costs of several countries (Kabundi et al., 2021). The strengthening of the dollar increases the value of the commodities in the local currency, thereby kindling imported inflation, especially in energy-based economies (World Bank Group, 2021). Meanwhile, the GATT-fostered globalization of production led to the creation of highly integrated supply chains, where goods and intermediates were sold between various countries. This type of integration transmits cost shocks originating from the U.S. internationally through GVCs, thereby expanding and widening the ambit of inflationary pressure (Chau, 202).

Empirical evidence validates the magnitude of such effects. The Chau (2024) estimates that 20 to 30 percent of advanced economies' post-COVID inflation does not result from domestic production but is instead imported through external supply chain dislocations internationally. Similarly, Ascari (2024) estimate that more integrated economies within the global value chains respond more to external shocks, with internal inflation drivers being proportionally smaller contributors. All of this reflects the greater significance of cross-border production linkages to the determination of the national price settings.

Experiences from various countries provide substantial evidence regarding these mechanisms. Within Asia, Japan, South Korea, and India, which are significant energy importers, are notably vulnerable to commodity inflation driven by the United States. For example, the world's largest net importer of energy, Japan, is the quintessential example of susceptibility to U.S.-generated cost pressures. Japan's main gauge of consumer prices, excluding fresh food but including the cost of oil, surged 3.5% in April 2025, the most significant gain in more than two years, and suggests underlying inflationary pressures that could force the Bank of Japan to abandon monetary policy easing (Kihara, 2025). In Europe, Germany encountered considerable cost pressures attributed to its position as a pivotal hub in international manufacturing supply chains. Data sourced from the German Economic Institute indicate that intermediate input prices increased by over 27 percent year-on-year in the early months of 2021, with import expenses rising by more than 32 percent, which reflects both heightened energy costs and supply chain disruptions associated with global shocks (Fritsch & Schröder, 2022).

For countries that depend on the export of commodities like Canada and Brazil, spikes in the United States' purchasing demands can translate into prompt gains via increased export revenues due to oil, soybeans, and metals. However, these profits often cause inflationary tensions locally since resources get funneled into global markets, and local currencies might not always appreciate by a corresponding rate to offset rising expenditures (Redman, 2024). At the same time, the combination of commodity dependence and involvement in regional supply chains increases Vietnam's susceptibility to the United States' shocks. In 2024, a 4.4 percent depreciation of the Vietnamese dong increased the cost of imported intermediaries, which then spurred raised producer prices and further concerns over ongoing inflationary pressure (Nguyen, 2024). Together, the evidence indicates that GVCs and commodity markets constitute complementary channels that magnify U.S. spillovers.

Briefly, U.S. spillover effects operate essentially through familiar transmission channels which includes trade, financial markets, commodities, and GVCs. These channels explain how U.S. shocks transmit offshore, but not yet to what extent inflation rates between countries move together.

2.3 Empirical Review of Inflation Synchronization

2.3.1 Evidence from Advanced Economies

Inflation synchronization in developed economies was one of the major themes of empirical work in the recent three decades. Spillovers from the United States are certainly relevant, but what makes synchronization so important is the degree to which inflation cycles co-move across economies as a joint outcome of international shock exposure and policy interdependence, and not unilateral spillovers. There is increasing evidence that developed economies are subject to a "global inflation factor" that has acquired larger relevance since the 1990s, with the United States providing the centre of co-movement (Ha et al., 2019).

Classically, synchronization was weaker in the 1970s and 1980s, as domestic monetary policies were less outward-oriented and the inflation dynamics were frequently caused by country-specific wage-price spirals or fiscal imbalances (Forbes, 2019). Nonetheless, after the breakdown of the Bretton Woods regime and the oil price rises of the 1970s, international synchronization started gaining ground, as oil-importing economies needed to contend simultaneously with surging oil prices (Elsayed et al., 2021). Forbes (2019) documents that the share of the global component in CPI inflation for advanced economies increased from 27% in the early 1990s to 57% in recent years. This indicates that there are global factors or shocks increasingly shaping inflationary outcomes across the developed economies.

The United States plays a crucial role in shaping this synchronization across economies, due to its dominant role in integrating into the global trade and financial system in the global economy (Bouri et al., 2023). The synchronization effect is not merely anecdotal but observable in econometric models. Evidence from a Reserve Bank of Australia study using a panel VAR model found that a one standard deviation shock to U.S. inflation produces a synchronized increase in inflation in other G7 countries by 0.3–0.9 percentage points on impact, with persistent effects up to two years, demonstrating robust cross-country co-movement (Gerard, 2012).

The GFC created a structural break in the synchronization of inflation. Synchronized monetary easing through non-traditional monetary policy instruments, such as quantitative easing, resulted in extraordinarily strong co-movements between asset prices, credit, and import prices, with corresponding translation into dynamics of inflation. Auer, Pedemonte, and Schoenle (2024) report that the patterns of synchronized inflation across advanced economies become much more pronounced after the Global Financial Crisis. During this period, coordinated monetary easing by the U.S. Federal Reserve and other central banks, along with large swings in global commodity prices, led to strong co-movement of inflation rates internationally.

Japan provides another interesting case, whose inflation dynamics display a high degree of co-movement with global cycles despite domestic deflationary tendencies, illustrating synchronization beyond national policy constraints (Auer et al., 2019). Japan's integration into global value chains creates synchronized inflationary outcomes, with Japanese consumer prices moving in tandem with global cycles. The persistence of these co-movements illustrates that synchronization is not simply a matter of domestic monetary conditions but a systemic outcome of global interconnectedness. Evidence shows that international input and output linkages explain up to half of the global component of PPI inflation in countries like Japan (Auer et al., 2019). Even during periods of Japanese deflation, U.S. market shocks were observable in relative price changes in Japan across sectors, as it is intricately linked to export demand by the U.S. These sectoral price changes reveal underlying international inflation synchronization masked by overall national deflation trends.

In short, advanced economies exhibit a structural pattern of synchronization due to prominent levels of trade intensity, financial openness, policy coordination, and financial market integration, which tie their outcomes into the shared cycles.

2.3.2 Evidence from Emerging Economies

Emerging economies, in contrast to advanced economies, exhibit an even higher sensitivity to U.S. inflation spillovers, but the nature of the spillovers tends to be asymmetric and more volatile (Nguyen et al., 2024). Most emerging markets tend to be more vulnerable to shocks because they import goods that are priced in dollars and have weaker monetary credibility, making them prone to shifts in capital flows. Their average inflation rates also have a high degree of co-movement with the global average, but they are more volatile and less insulated from foreign shocks via domestic monetary policy (Campa & Goldberg, 2005; Ha et al., 2019).

This is consistent with Thac, Pham, Li, and Do (2014), who provide evidence that U.S inflation shocks lead to a significant rise in inflation volatility for emerging Asian countries such as India, Indonesia, and Vietnam due to high imports of dollar-denominated goods and inputs, while we compare the impacts of the U.S. housing-adjusted policy rate. They find that when U.S. inflation goes up or the dollar appreciates, costs of imported goods and intermediates in India, Indonesia, and Vietnam soar relative to those in developed economies, which means greater volatility of inflation than in advanced countries. External shocks reinforce the variability of inflation, since raw materials, energy, and capital goods quoted in dollars are used as inputs. For example, when U.S. inflation accelerates and the Federal Reserve tightens policy, local currencies soften and raise the cost of imported goods that feed domestic inflation. Most importantly, the effect is not homogeneous: while inflation in AE may increase mildly by some 0.3–0.5 percentage points after a U.S. inflation shock, movements as large as 1–2 percentage points are measured for EME due to their higher pass-through from open market prices (Thac et al., 2024).

Comparisons across regions highlight why synchronization in emerging economies is distinctive based on several factors. First, the emerging economies' exchange rate pass-through is higher than that of advanced economies, as evidenced by Campa and Goldberg (2005), who estimate a 10% depreciation of local currencies resulting in an average 6% increase in import prices in emerging economies, compared to 3% in advanced economies. Also, the monetary policy credibility of emerging economies is weaker compared to that of advanced economies, as noted by Edwards (2015), who states that central banks in emerging economies struggle to anchor inflation targets in the face of global shocks, therefore undermining policy credibility and making the co-movements stronger. Lastly, commodity dependence by emerging economies is greater since many emerging economies are net importers of commodities and energy, and Arora and Vamvakidis (2001) demonstrate that oil and food price shocks explain a larger share of inflation variance in emerging economies than in advanced ones, which reinforces the synchronization during global supply disruptions.

One important implication of these conclusions is that synchronization of emerging economies is not essentially a product of coordinated policies or voluntary participation in inter-cyclical global movements. It is more the consequence of structural vulnerabilities, of exchange rate risk, of demand for commodity imports, and reduced institutional credibility. Moreover, this leads only to increased volatility and possible destabilization, since inflation tends to rise fast to exogenous shocks, but stabilization at home is difficult.

Generally, the synchronisation of inflation with the business cycle in the world is more marked, in terms of being more volatile, in emerging markets compared to developed ones. It is primarily due to shared structural vulnerabilities and not due to coordinated policy actions. Although this leads to their inflation aligning with global patterns, it also underscores the restricted independence of central banks in emerging markets when striving for domestic inflation stability amid global disturbances.

2.4 Empirical Review of China's Emerging Role

In recent decades, China has emerged as a significant source of global economic spillovers, complementing and, to a certain extent, challenging the long-standing leadership of the United States. While primarily facilitating economic shocks through financial market and monetary policy transmission channels (Georgiadis, 2016), China's impact primarily takes place through trade linkages, commodity consumption, and global value chains (Abdel-Latif, 2025). The contrast highlights structural differences in both economies, one of extensive, liquid financial markets and global reserve currency, and the other as a manufacturing base and commodity consumer with a closed financial sector (Chen et al., 2023).

Asian economies as well as commodity-exporting countries in many economies' cycles of Chinese economic growth, industrial goods demand, and supply chain interruptions more affect inflation and output dynamics (Diaz et al., 2024). The COVID-19 pandemic, followed by related supply chain issues, underscored China's key role, as interruptions in its production networks spilled over to affect international economies at large (Auer et al., 2024). At the same time, China's rise facilitates that of a dynamic multipolar world in the international economy, whereby U.S.-Chinese economic forces interact to determine macroeconomic outcomes (Amiti et al., 2019).

2.4.1 China's Growth Spillovers

The fact that China is the world's biggest commodities importer means its influence on global price cycles cannot be overstated. China also accounts for over half of global demand for steel, copper, and aluminum, and is the world's largest consumer of oil and agricultural products. 3 Consequently, it sets a global "floor" on commodity prices (World Bank, 2022). However, this also passes on inflation pressure at home, as the reallocation of resources to exports curtails domestic production, leading to rising local food and energy prices.

An article demonstrates that supply chain disruptions have emerged as dominant drivers of inflation in advanced economies, especially since the outbreak of the COVID-19 crisis (Diaz et al, 2024). Their results serve as further evidence that external demand shocks, such as those created by China's industrial cycles, travel across commodity markets and global supply chains, adding to the inflationary pressure in countries all over the world. The price of commodities, for instance, surged during China's infrastructure-led boom following the 2008 global financial crisis, which helped other commodity exporters while also lifting inflation worldwide. Instead, the 2015 slowdown in China led to a generalized collapse of commodity prices that affected the global economy but functioned as a tremendous headwind for commodity-exporting countries.

Trade spillovers operate in parallel. China's export-driven economy is intricately connected with both developed and developing countries. Kee and Tang (2016) show that a 1% decline in Chinese imports reduces exports of other Asian partners by 0.5 to 1%, underscoring the high reliance on Chinese demand for growth among regional country partners. Vietnam, Malaysia, and South Korea are particularly susceptible because they are closely tied to electronics and machinery supply chains where demand gyrations in China quickly ripple through to upstream producers.

The spillover from China is no longer about commodities and manufacturing. Its economy has undergone structural changes, notably the green transition which have led to new channels of influence. Yang and Li (2024) note that China's investments in renewable energy in Belt and Road initiative (BRI) nations not only contribute to a reduction in emissions but also reduce the cost of clean-energy adoption for partner economies, promoting sustainable growth outside

Chinese borders. These results corroborate the argument that China's green transition is transforming global development trajectories, inducing environmental and economic spillovers.

Global crises have compounded these dynamics. Supply chains broke up, both because of the explosion in demand for medical equipment and PPE across the world, as well as transportation constraints, skyrocketing all production costs between raw material suppliers on one side and manufacturers of goods on the other (Auer et al., 2024). Latest evidence has broadened the traditional spillover channels, the trade and commodity demand, to include geopolitical risk and supply chain disruptions. For example, Asadollah (2024) show that supply chain pressures account for about one-third of the long-run variance in global headline inflation, and oil price shocks and policy rate shocks also matter. More important in the near-term is geopolitical risk, which exhibits weaker long-run inflation effects.

Although China is a global one, its spillovers are less like America's. Where American monetary shocks propagate rapidly through the mechanism of capital flows and exchange rates, introducing a significant bias into the effect on output of US monetary policy, China's closed capital account and managed regime blocks global financial spillovers from China. Nevertheless, Chen (2023) finds that monetary tightening in China continues to spill over heavily into BRI economies by raising interest rate spreads and is hardest for countries with stronger trade ties and greater financial openness.

2.4.2 China vs U.S. Spillovers

The empirical literature highlights a pronounced distinction between the spillover effects emanating from China and the United States, which stem from their differing economic structures and global roles. Understanding these contrasts is central to this study, as the analysis of inflation spillovers across twenty economies requires separating the transmission of shocks originating from financial dominance (U.S.) versus trade-commodity interdependence (China).

The United States continues to dominate global financial spillovers, largely through the monetary policy actions of the Federal Reserve. By contrast, China's spillover primarily take place in international trade and commodity markets (Beirne et al., 2023). An important empirical distinction lies in the temporal profile of spillovers. U.S. shocks typically produce immediate, high-frequency effects via financial markets, while Chinese spillovers are more gradual, diffusing through trade flows and commodity demand. Blanchard and Milesi-Ferretti (2009) showed how U.S. financial stress during the 2008 Global Financial Crisis propagated instantly, whereas China's fiscal stimulus later sustained global recovery by fueling commodity demand. Similarly, Xu and the others (2023) note that external shocks transmitted through global value chains significantly explain export fluctuations in China, highlighting the sensitivity of China's trade exposure to disruptions in supply chains.

In addition, newer research shows that China's global influence has become more visible through financial market linkages and macroeconomic surprises. For example, unexpected changes in China's economic conditions can now affect global financial markets, although the magnitude remains smaller than U.S. financial spillovers (Gutierrez et al., 2025). Recent work highlights the growing interdependence of these spillovers. The U.S.–China trade war disrupted global supply chains, creating inflationary effects not only in both economies but also in highly integrated third countries (Amiti et al., 2019). More recently, Auer, Pedemonte, and Schoenle (2024) demonstrate that global inflation dynamics have been shaped simultaneously by U.S. monetary tightening and Chinese supply-chain disruptions, illustrating the multipolar nature of spillovers in the post-pandemic world.

In short, the global economy appears to be moving gradually toward a more multipolar structure in which both the United States and China play major but distinct roles in transmitting international economic shocks.

2.5 Research Gap

Although extensive literature documents the role of the United States in transmitting economic shocks globally, several gaps remain.

First, much of the prior research has concentrated on short-term financial linkages, particularly monetary policy spillovers. It means giving less attention to long-term patterns of GDP growth and inflation interdependence across both developed and developing countries.

Second, empirical studies have often focused on advanced economies such as the G7. It's leaving limited evidence on how U.S. spillovers affect emerging economies in Asia, Latin America, and Africa. This creates an incomplete picture of global dependence.

Third, while existing studies acknowledge China's growing influence. There is still insufficient comparative analysis of U.S. versus Chinese spillover effects. Most research treats China as a secondary actor rather than assessing whether it could overtake the U.S. in shaping global macroeconomic outcomes.

This study addresses these gaps by examining U.S. spillover effects on GDP growth and inflation over the past 50 years across 20 economies, which combine both advanced and emerging markets. It further explores how the relative strength of transmission mechanisms has evolved and evaluates whether China is positioned to challenge U.S. dominance in the near future.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter describes the methodology used to analyse the spillover effects of the U.S. on GDP growth and inflation in 20 selected economies during the last 40 to 50 years. The methods used are designed to ensure that the research objectives are satisfied systematically and empirically. The chapter begins with a description of the data sources and processing techniques, followed by the steps involved in data collection and transformation. It then describes the variables, their expected signs, and descriptive statistics. Together, these sections establish the foundation for applying econometric techniques like Panel Vector Autoregression (PVAR) to quantify U.S. and Chinese spillover effects.

The PVAR methodology is particularly well-suited for this research because it captures the dynamic interdependencies between multiple macroeconomic variables, adapts heterogeneity across countries, and allows for feedback effects among variables. Also, PVAR treats all variables in the system as endogenous, thereby reflecting the reality that global and domestic macroeconomic variables influence each other simultaneously (Yang et al., 2023).

The PVAR framework also includes two powerful tools for policy-relevant analysis: Impulse Response Functions (IRFs) and Forecast Error Variance Decomposition (FEVD). IRFs plot the time path of domestic GDP growth and inflation in response to shocks from the U.S. or China, while FEVD quantifies the proportion of forecast variance in domestic outcomes that attributable to these shocks. In brief, these tools enable a more advanced comparison of the relative importance of U.S. versus Chinese spillovers across different economies.

3.1 Data Processing

The study uses annual data covering the period 1975–2024 for a balanced panel of 20 economies, excluding the United States. The countries were selected to ensure representation of both advanced economies (e.g., United States, Germany, Japan, South Korea) and emerging markets (e.g., China, India, Brazil, Malaysia). This balanced approach allows for spillover effect's comparison between economies with different levels of financial development, openness, and integration into global value chains.

3.1.1 Sources of Data

The study relies on secondary macroeconomic data obtained from internationally recognized databases to ensure accuracy and comparability across countries. The primary sources include the International Monetary Fund (IMF), World Bank World Development Indicators (WDI), and Federal Reserve Economic Data (FRED). Data for commodities price for the selected 20 countries and U.S. are retrieved from the IMF's International Financial Statistics, while the monetary policy indicators for U.S. are retrieved from FRED. The remaining data such as GDP level, consumer price index (CPI), exchange rate, and export of goods and services data are extracted from the World Bank databases. These sources are widely employed in international economics research due to their credibility and standardized reporting formats (Forbes, 2019; Georgiadis, 2016).

3.1.2 Data Transformation

To ensure consistency and stationarity, all variables are converted into first differences such as annual percentage changes or growth rates to achieve stationarity. GDP growth is expressed as the annual percentage change in real GDP (current US$), while inflation is measured by the annual percentage change in the consumer price index (CPI). Exchange rate changes are computed as the annual percentage change in the official exchange rate (LCU per USD). Commodity price inflation is the annual percentage change in the country-specific commodity export price index. US variables (GDP growth, inflation, change in federal funds rate, export growth) and China's export growth are similarly transformed. The dataset spans from 1975 to 2024, this long horizon enables the study to evaluate how spillover channels may have shifted over time. To address stationarity concerns common in macroeconomic panels, the data undergo logarithmic transformation and differencing before estimation (Im et al., 2003).

3.1.3 Handling Missing Data

Data gaps were minimised by cross-checking across sources, missing observations were coded as NA (missing values) and left untreated. This approach avoids introducing artificial data points and preserves the original information. Countries with missing data over the sample period were retained, and the resulting panel is unbalanced. EViews handles missing values by excluding them from calculations, so the effective sample size varies by variable.

3.1.4 Panel Construction

The raw dataset consists of 20 countries over the period 1975–2024, giving a potential total of 1,000 observations (20 × 50). However, due to missing data notably for Vietnam and early years for China, the final panel is unbalanced. After cleaning and transforming variables into first differences, the number of usable observations per variable ranges from approximately 964 to 990. The panel structure is defined by the country and year identifiers, and all estimations are performed using the available observations without interpolation.

3.2 Data Description

This section introduces the dataset employed in the study, including the definitions of variables, their expected relationships, and descriptive statistics. The dataset is constructed as a balanced panel of 20 countries from 1975 to 2024, covering both advanced economies and emerging markets by combining U.S. and Chinese macroeconomic indicators with country-level variables such as GDP growth and inflation. This study provides a comprehensive framework for analysing international spillovers.

3.2.1 Variable Definitions

Table 3.1 summarises the variables, their measurement, and data sources. These expectations are guided by theoretical insights and prior empirical research (Georgiadis, 2016).

Table 3.1: Variable Definitions

Variable	**Proxy / Measurement**	**Source**
GDP Growth (Y)	Annual % change in GDP (current US$)	WDI
Inflation (π)	Annual % change in Consumer Price Index (CPI)	WDI
U.S. GDP Growth	Annual % change in U.S. GDP (current US$)	WDI
U.S. Export	% change in total exports	WDI
U.S. Inflation	Annual % change in U.S. CPI	WDI
U.S. Monetary Policy	Federal funds effective rate (%)	FRED
China GDP Growth	Annual % change in China's GDP (current US$)	WDI
China Inflation	Annual % change in China's CPI	WDI
China Export	% change in total exports	WDI
Commodity Prices	Commodity Export Price Index	IMF
Exchange Rate	% change (Local Currency/USD)	WDI

3.3 Empirical Model

The empirical framework of this study utilizes a Panel Vector Autoregression (PVAR) model, which combine both the dynamic properties of a typical VAR and the efficiencies of panel data. The PVAR framework is especially appropriate for our study because it treats **all variables as endogenous**, thereby allowing for feedback effects and lagged interactions across countries and over time. This captures the reality that global shocks and domestic variables influence each other dynamically. (Holtz-Eakin et al., 1988; Love & Zicchino, 2006).

3.3.1 General PVAR Specification

To capture the dynamic interdependencies between domestic economic outcomes and external shocks from the United States and China, this study employs a **Panel Vector Autoregression (PVAR)** model. The general form of the PVAR system is:

$$Y_{i,t} = A_0 + \sum_{k=1}^{p} A_k \, Y_{i,t-k} + \mu_i + \lambda_t + \varepsilon_{i,t}$$

Where:

- $Y_{i,t}$ = is the vector of all endogenous variables for country i at time t. In our specification, $Y_{i,t}$ contains nine variables:
    1. Domestic GDP growth (%)
    2. Domestic inflation (%)
    3. Exchange rate change (%, LCU per USD)
    4. Commodity export price inflation (%, country-specific index)
    5. US GDP growth (%)
    6. US inflation (%)
    7. Change in US federal funds rate (percentage points)
    8. US export growth (%)
    9. China export growth (%)
- A_0 is a vector of constants.
- A_k are autoregressive coefficient matrices for lag length k.
- μ_i and λ_t denote country-specific and time effects.
- $\varepsilon_{i,t}$ is the idiosyncratic error term.

All variables are expressed in first differences (annual growth rates or changes) to ensure stationarity, as confirmed by unit root tests. The lag order k is set to 1 after careful selection.

3.3.2 Expanded Equations for Estimation (for Lag 1)

(a) GDP growth equation:

With a lag length of 1, the PVAR system consists of nine equations. For a typical domestic country, the equation for GDP growth is:

$$\triangle GDP_{i,t} = a_1 + \beta_{11} \triangle GDP_{i,t-1} + \beta_{12} \triangle US\_GDP_{t-1} + \beta_{13} \triangle CHN\_GDP_{t-1} + \varepsilon_{i,t}^{(GDP)}$$

Where:

- $\triangle GDP_{i,t}$ is domestic GDP growth (annual % change in GDP).
- $\triangle US_GDP_{t-1} and \ \triangle CHN_GDP_{t-1}$are US and China GDP growth rates.
- $\varepsilon_{i,t}^{(GDP)}$ is the error term for the GDP growth equation.

(b) Inflation equation:

$$\triangle CPI_{i,t} = a_2 + \beta_{21} \triangle CPI_{i,t-1} + \beta_{22} \triangle US\_CPI_{t-1} + \beta_{23} \triangle CHN\_CPI_{t-1} + \varepsilon_{i,t}^{(CPI)}$$

Where:

- $\triangle CPI_{i,t}$ is domestic inflation (annual % change in CPI).
- $\triangle US\_CPI_{t-1}$ and $\triangle CHN\_CPI_{t-1}$ are US and China inflation rates.
- $\varepsilon_{i,t}^{(CPI)}$ is the error term for the inflation equation.

Equations (a) and (b) present the PVAR specifications for domestic GDP growth and inflation, respectively. The subscripts i and t denote country and year. All variables are expressed in first differences (Δ) and are stationary. The right-hand side of each equation includes the first lags of the domestic variable and the corresponding U.S. and Chinese variables. The error terms $\varepsilon_{i,t}^{(GDP)}$ and $\varepsilon_{i,t}^{(CPI)}$ are assumed to be uncorrelated with the lagged instruments used in the system GMM estimation. The full PVAR system also includes equations for other spillover transmission channel including commodity price, trade linkage and financial linkage. But the two equations above are the primary focus for analysing spillover effects on GDP growth and inflation. The full system is estimated jointly using system GMM with a lag length of 1 and without country or time fixed effects.

3.4 Model Estimation

In this study, the Panel Vector Autoregression (PVAR) model is estimated using the system Generalized Method of Moments (GMM) estimator (Arellano & Bover, 1995; Blundell & Bond, 1998). This estimator is specifically designed for dynamic panel models where lagged dependent variables may be correlated with the error term. It addresses endogeneity by using internal instruments and does not rely on exogenous variables. There are no country or time fixed effects are included in the estimators, the model assumes common slope coefficients across countries, focusing on average spillover effects.

3.4.1 Panel Unit Root Tests

Before estimating the PVAR, it is necessary to test the stationarity properties of the variables, as time-series variables in macroeconomic panels are often non-stationary, which may produce spurious results. For the 20 panel countries, the **Levin–Lin–Chu (LLC)** test is applied, assuming a common unit root process. For the US and China time series (single country), **Augmented Dickey-Fuller (ADF)** tests are used. A fixed lag length of 1 is employed for all tests, which is appropriate for annual data and preserves degrees of freedom (Ng and Perron, 2001). The null hypothesis (unit root) is rejected at the 5% level for all variables in first differences, confirming that they are integrated of order one, I(1). Therefore, all variables are used in first differences. Two panel unit-root tests are applied:

1. **The Levin, Lin, and Chu (LLC) test** assumes a standard unit root process across all panels. The null hypothesis is that each time series has a unit root, while the alternative is stationarity (Levin et al., 2002).
2. **Augmented Dickey-Fuller (ADF) test** is a standard unit root test for a single time series. The null hypothesis is that the series contains a unit root (non-stationary), while the alternative is stationarity (Dickey & Fuller, 1979). The test regression includes lagged differences of the dependent variable to account for serial correlation.

3.4.2 Lag Length Selection

The selection of lag length (p) is a significant factor determining the estimation of PVAR. A lack of lags could potentially omit relevant dynamics, while having too many lags could reduce degrees of freedom and efficiency. Optimal lag length is determined using information criteria, such as the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), and the Hannan–Quinn Criterion (HQIC). Each of these criteria minimises the trade-off between model fit and model parsimony. Thereafter, the same lag order is maintained across all equations in the system (Lütkepohl, 2005).

3.4.3 PVAR Estimation by System GMM

The Panel VAR model is estimated using **system Generalized Method of Moments (GMM)**, which addresses potential endogeneity and dynamic panel bias. Following Arellano and Bover (1995) and Blundell and Bond (1998), system GMM combines equations in first differences with those in levels, using appropriate lagged instruments. This ensures consistent and efficient estimation even in panels with relatively short time dimensions.

In this study, we estimate a homogeneous coefficient model without country fixed effects, focusing on average spillover effects across countries. The system GMM framework provides consistent and efficient estimates under the assumption that the error term is uncorrelated with the lagged instruments (Arellano & Bover, 1995; Blundell & Bond, 1998).

Moment Conditions

For a PVAR(1) model with endogenous variables $Y_{i,t}$, the moment conditions can be expressed as:

$$E\left[\, Y_{i,t-s} \cdot \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0, \qquad s \geq 2$$

These conditions state that lagged values dated $t-2$ and earlier are uncorrelated with the differenced error term. For the level equations, system GMM adds additional moment conditions using lagged differences as instruments:

$$E\left[\left(Y_{i,t-s}-Y_{i,t-s-1}\right)\cdot \varepsilon_{i,t}\right]=0, \qquad s \geq 1$$

In our implementation, we use a **parsimonious instrument set**: only the **first lags** of all endogenous variables ($Y_{i,t-1}$) are employed as instruments for both the differenced and level equations. This avoids instrument proliferation, which can lead to overfitting and weak test power (Roodman, 2009). Given the limited time dimension (49 years), using longer lags would quickly exhaust degrees of freedom and could cause numerical instability.

3.5 Diagnostic Tests

The credibility of a Panel Vector Autoregression (PVAR) method hinges on the proper modelling of dynamic interactions with respect to statistical assumptions that permit meaningful inference. To this end, diagnostic tests are conducted. These tests examine whether the system is dynamically stable, whether the residuals are correctly specified, whether there are cross-sectional dependencies across economies, and whether the proper lag length has been selected.

3.5.1 Stability Test (Eigenvalue Condition)

Dynamic stability is a fundamental requirement for the PVAR model as it ensures that shocks decay over time rather than generate explosive behaviour. With this condition, the PVAR model produces meaningful impulse response functions (IRFs) and forecast error variance decompositions (FEVD). If the system is unstable, shocks introduced into the model would accumulate indefinitely and yield explosion responses, which render the analysis invalid (Lütkepohl, 2005).

- **Null hypothesis ($\boldsymbol{H_0}$):** The system is dynamically stable (all eigenvalues lie inside the unit circle).
- **Decision rule**: If all eigenvalues are strictly within the unit circle, the null hypothesis cannot be rejected and the PVAR is considered stable. If one or more eigenvalues lays on the unit circle or outside, the model would be considered unstable, and impulse response functions (IRFs) and variance decompositions (FEVD) would be meaningless.

Confirming stability is important in our study as the interpretation of U.S. and Chinese spillovers hinges on the model's ability to show finite and converging responses over time. If stability holds, IRFs can be confidently interpreted as the dynamic adjustment process of growth and inflation following external shocks.

3.5.2 Hansen J-Test

The Hansen J-test is employed to assess the overall validity of the instruments in the system GMM framework (Hansen, 1982). The null hypothesis is that all instruments are valid which is uncorrelated with the error term. The test statistic follows a χ^2 distribution with degrees of freedom equal to the number of overidentifying restrictions. A **p-value** that greater than 0.10 indicates that the null hypothesis cannot be rejected, supporting the validity of the instrument set. Conversely, a p-value lower than 0.01 would suggest that some instruments are invalid, indicating potential model misspecification.

3.6 Impulse Response Functions (IRFs)

The Impulse Response Function (IRF) captures the dynamic response of a domestic variable to a one-standard-deviation shock in an external variable. When the PVAR is estimated, the system can be expressed in its Vector Moving Average (VMA) representation (Hamilton, 1994; Lütkepohl, 2005):

$$Y_t = \sum_{k=0}^{\infty} \Psi_k \, \varepsilon_{t-k}$$

The IRF of variable i to a shock in variable j at horizon h is given by:

$$IRF_{ij}(h) = e_i' \Psi_h e_j$$

Where e_j and e_i are selection vectors that isolate the variables of interest, and Ψ_h are the moving average coefficient matrices obtained from the PVAR.

To guarantee the interpretability of shocks, orthogonalization is performed by Cholesky decomposition of the variance-covariance matrix (Sims, 1980; Enders, 2015). The ordering of variables follows a recursive causal chain based on economic theory: global commodity prices, US variables (GDP growth, inflation, change in federal funds rate, export growth), China export growth, exchange rate changes, domestic inflation, and domestic GDP growth. This ordering implies that shocks to variables placed earlier in the sequence affect later variables contemporaneously, while shocks to later variables affect earlier ones only with a lag.

Impulse responses are computed over a horizon of 10 years, with confidence intervals obtained via Monte Carlo simulation with 1,000 repetitions (Sims & Zha, 1999; Kilian, 1998).

3.7 Forecast Error Variance Decomposition (FEVD)

While IRFs demonstrate the dynamic response of a variable to a shock, the forecast error variance decomposition (FEVD) measures how important different shocks are in explaining forecast error variance (Hamilton, 1994; Lütkepohl, 2005; Enders, 2015). Formally, the FEVD for a variable i due to a shock in the variable j at the horizon h is (Lütkepohl, 2005):

$$\theta_{ij\ (h)} = \frac{\sum_{k=0}^{h-1} \left(e_i' \Psi_k \sum e_j \right)^2}{\sum_{k=o}^{h-1} \left(e_i' \Psi_k \sum \Psi_k' e_i \right)}$$

Where:

- Σ is the variance-covariance matrix of residuals,
- Ψ_k are the moving average coefficient matrices,
- e_i and e_j select the relevant variables.

The FEVD is computed for horizons 1 to 10 years, and the results are reported as percentages. By construction, the contributions of all shocks sum to 100% for each variable at each horizon.

3.8 Conclusion

This chapter outlined the methodological foundation of the study, including data sources, processing, and descriptive analysis. By constructing a balanced panel dataset of 20 countries over five decades, the study ensures robustness in capturing the evolution of U.S. spillover effects on GDP growth and inflation. The definitions and expected signs of variables provide a theoretical anchor, while descriptive statistics reveal key contrasts between advanced and emerging economies. In short, these elements prepare the ground for the econometric analysis presented in the following chapter, where the PVAR framework will be used to quantify both U.S. and Chinese spillover effects, evaluate transmission channels, and assess shifts in global economic leadership.

CHAPTER 4: RESULTS AND DISCUSSIONS

4.1 Preliminary analysis

Before performing the panel vector autoregressive (VAR) model estimation, it is essential to conduct a series of preliminary analyses for better understand the characteristics of each of the data and ensure the applicability of the chosen econometric framework. This section will first present the descriptive statistic of the variables, followed by the two-unit root tests which is LLV and ADF to test the stationarity of the data, performs cointegration tests to explore long-term relationship, lag length selection to determine the optimal dynamic structure, and diagnostic tests to validate the estimated model.

4.1.1 Descriptive Statistics

Descriptive statistic serves as a crucial first step in data analysis which summarize the central tendency, dispersion, and distribution of each variable in the dataset. Moreover, these descriptive data justify the use of methodological choice and establishes a solid foundation for the following econometric tests.

Our dataset contains data from 20 countries, including emerging and developed counties from 1975 to 2024, yielding an unbalanced panel due to omitted observations for some countries. Table 4.1 reports the mean, standard deviation, minimum, maximum, and number of valid observations for each variable in levels before any transformation.

Table 4.1: Descriptive Statistics of Main Variables (Levels)

Variables	Mean	Max.	Min.	Std. Dev	Obs.
United states					
GDP (Current US$, Billion)	11,200	28,800	1,680	7,240	50
CPI (index, 2010=100)	78.90405	143.8573	24.68026	31.38564	50
Federal Funds Rate (%)	4.6928	16.39	0.08	3.822911	50
Exports (Current US$, Billion)	1,240	3,190	139	909	50
China					

Exports (Billion)	988	3,750	744	1,210	50
All Other Countries					
GDP (current US$, Billion)	1,200	18,700	5.63	1,930	990
CPI (index, 2010=100)	79.8	228	3.57×10^{-10}	37.9	964
Official Exchange Rate (LCU per USD)	706	24,200	3.52×10^{-12}	3,290	990
Commodity Export Price Index (2010=100)	72.4	175	21.5	24.5	976

The descriptive statistics reveal considerable heterogeneity across countries and over time. The mean real GDP of the 20 panel countries is $1.20 trillion, but the standard deviation ($1.93 trillion) is larger than the mean, reflecting the wide disparity between advanced economies and emerging economies. While the exchange rate variable exhibits a wide range between the minimum and maximum rate, this extreme variation underscores the importance of using growth rates rather than levels in the following econometric framework.

The summary statistics highlight the need for a dynamic panel framework that can accommodate cross-country heterogeneity, time-series non-stationarity, and unbalanced data. The subsequent sections formally test these properties.

4.1.2 Unit Root Tests

To determine the order of integration of the variables, panel unit root tests are applied to the panel variables and standard Augmented Dickey–Fuller (ADF) tests to the US and China time series (Dickey & Fuller, 1979). The null hypothesis is that the series contains a unit root. Table 4.2 reports the results for levels and first differences using two different unit root tests.

Table 4.2: Unit Root Test Results

Variables	**Level**		**First Difference**		
	Statistic	P-value	Statistic	P-value	Conclusion
US variables (ADF)					
GDP (Current US$)	-2.914021	0.0511*	-3.305365	0.0202**	I(0) / I(1)*

CPI (index, 2010=100)	-2.319949	0.1700	-2.917116	0.0509*	I(1)
Federal Funds Rate (%)	-2.223803	0.2008	-5.322523	0.0001***	I(1)
Exports (Current US$)	-1.833509	0.3603	-5.249270	0.0001***	I(1)
China variables (ADF)					
Exports	-1.634285	0.4576	-4.572253	0.0006***	I(1)
Panel variables (LLC)					
GDP (current US$)	-5.12826	0***	-17.5414	0***	I(0) / I(1)*
CPI (index, 2010=100)	-8.80205	0***	-7.31428	0***	I(0) / I(1)*
Official Exchange Rate (LCU per USD)	-4.39098	0***	-14.9800	0***	I(0) / I(1)*
Commodity Export Price Index (2010=100)	-1.62781	0.0518*	-21.9652	0***	I(0) / I(1)*

Note: For panel variables, the ADF test shows that US CPI, Federal Funds Rate, and Export (Current US$) are stationary in first differences. The remaining variables appear stationary in levels (p<0.1). For US CPI, the first-difference p-value of 0.0509 is significant at 10%; given the small sample (50 years) and the low power of unit root tests, it is treated as I(1). *, **, * denote significance at 1%, 5%, and 10% levels, respectively.*

All panel variables become stationary after first differencing. For consistency, all variables are transformed into first differences (growth rates or changes) for the PVAR analysis.

4.1.3 Cointegration Test

Because the panel variables are I(1), it is necessary to examine whether they share a long-run equilibrium relationship. The Kao residual cointegration test is employed, which is a panel extension of the Engle–Granger two-step procedure (Kao, 1999). The null hypothesis is no cointegration (Engle & Granger, 1987). Table 4.3 reports the results.

Table 4.3: Kao Panel Cointegration Test

Test	t-Statistic	P-value
ADF	-0.760353	0.2235

The p-value of 0.2235 exceeds conventional significance levels, so we cannot reject the null hypothesis of no cointegration. This implies that the I(1) variables do not share a long-run equilibrium relationship, further justifying the use of first-differenced variables in the PVAR. This conclusion aligns with the unit root test results and justifies the use of differenced data throughout the remainder of the analysis.

4.1.4 Lag Length Selection

The dynamic structure of the panel VAR depends critically on the choice of the lag order. To determine the appropriate lag length, we estimated a standard VAR on the **stacked panel data** (treating all countries as one long time series) with lags 1 through 8. Table 4.4 reports the log-likelihood, sequential modified LR test statistic (LR), final prediction error (FPE), Akaike information criterion (AIC), Schwarz criterion (SC), and Hannan-Quinn criterion (HQ).

Table 4.4: Lag Order Selection Criteria (Stacked VAR, Lags 1–8)

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-22065.36	NA	1.37e+14	58.09042	58.14528	58.11154
1	-20581.78	2928.108	3.41e+12	54.39943	54.94811	54.61072
2	-20058.22	1020.950	1.06e+12	53.23479	54.27728	53.63624
3	-19470.89	1131.389	2.81e+11	51.90233	53.43864	52.49394
4	-18838.80	1202.635	6.59e+10	50.45209	52.48222	51.23386
5	-18037.53	1505.535	9.91e+09	48.55666	51.08060	49.52859
6	-16930.80	2053.282	6.67e+08	45.85736	48.87511	47.01945
7	-13802.28	5730.117	219761.2	37.83759	41.34916	39.18984
8	87688.83	183485.3*	2.8e-111*	-229.0311*	-225.0258*	-227.4887*

Note: Asterisks indicate the minimum value for each criterion.

All criteria (LR, FPE, AIC, SC, HQ) select **lag 8** when the maximum lag is set to 8. Despite this statistical indication, we choose a **lag length of 1** for the following reasons.

First, after first differencing, the actual time span is only 49 years, therefore a lag of 8 would consume 8 of those 49 periods, leaving only 41 observations per equation for estimating 72 coefficients per equation. Such over-parameterisation leads to unstable estimates and loss of degrees of freedom.

Second, economic theory indicates annual macroeconomic data typically require only one or two lags as shocks to growth rates, inflation, and exchange rates dissipate within one to three years (Canova & Ciccarelli, 2013). A lag of 8 would imply that a 8-year direct effect for the variables is implausible.

Third, a robustness check using a lag-4 model produced economically implausible impulse responses with a response of domestic GDP growth to a positive US GDP shock was large and negative, followed by a positive spike later. Such oscillations are not supported by economic theory and indicate severe overfitting.

Moreover, the GMM estimation with lag 1 converged successfully and produced a Hansen J-statistic of 0.2556 ($p \approx 1$), confirming valid instruments.

Therefore, on the basis of economic plausibility, sample size constraints, overfitting concerns, and empirical robustness, we select a lag length of 1 for the PVAR model. This choice ensures that the subsequent impulse response analysis and variance decomposition are reliable and interpretable.

4.2 Diagnostic Test

To ensure the reliability of the estimated PVAR model, a series of diagnostic tests are conducted on the estimated system.

4.2.1 Stability Test (AR Roots)

The stability of the VAR system is a prerequisite for valid impulse response analysis. All roots of the characteristic polynomial lie inside the unit circle (maximum modulus = 0.87), confirming that the system is dynamically stable (Lütkepohl, 2005; Hamilton, 1994). This ensures that shocks will dissipate over time and that the impulse response functions are meaningful.

Table 4.5: AR Roots (Log-1 Model)

Root	Modulus
0.869891	0.869891
0.843874	0.843874
0.250026 - 0.285453i	0.379469
0.250026 + 0.285453i	0.379469
0.281584 - 0.170008i	0.328926
0.281584 + 0.170008i	0.328926
0.278519	0.278519
0.012954	0.012954
-0.011436	0.011436

Note: No root lies outside the unit circle. The PVAR satisfies the stability condition.

All eigenvalues have moduli less than 1. Hence, the system is stable: shocks will dissipate over time and the IRFs will converge to zero, making them reliable for economic interpretation.

4.2.2 GMM Specification Test (Hansen J-Statistic)

The validity of the instruments used in the system GMM estimation is assessed by the Hansen J-test of overidentifying restrictions (Hansen, 1982). The null hypothesis is that all instruments are valid which is uncorrelated with the error term. Table 4.6 reports the test results.

Table 4.6: GMM Diagnostics

Statistic	Value
Determinant residual covariance	1.50E+13
J-statistic	0.255648

The J-statistic of 0.2556 has a p-value near 1 (not shown, but computable from the χ^2 distribution). Therefore, we cannot reject the null hypothesis of valid instruments. This confirms that the instrument set which the first lags of all endogenous variables is appropriate and the GMM estimates are consistent (Holtz-Eakin, Newey & Rosen,1988; Arellano & Bond 1991).

4.3 Impulse Response Functions (IRFs)

In this study, IRFs are used to examine how shocks originating from the United States and China affect the GDP growth and inflation of U.S. 19 trading partners, exclude China. This directly addresses **Objectives 1 and 2** which quantifying the magnitude of US spillovers and identifying the transmission channels.

All IRFs are derived from the VAR models estimated for each channel including GDP growth, inflation, commodity price, trade linkages, and financial linkages using the Cholesky decomposition to orthogonalize the reduced-form residuals. The ordering of variables follows a recursive causal chain based on economic theory, with more exogenous variables placed first to the more endogenous variables (Sims, 1980; Keating, 1996).

The IRFs are computed over a 10-year horizon, which is sufficient for annual data as most shocks dissipate within this period. Confidence intervals of 95% are obtained via Monte Carlo simulation with 1,000 repetitions.

4.3.1 Impulse Response Functions – GDP Growth Model

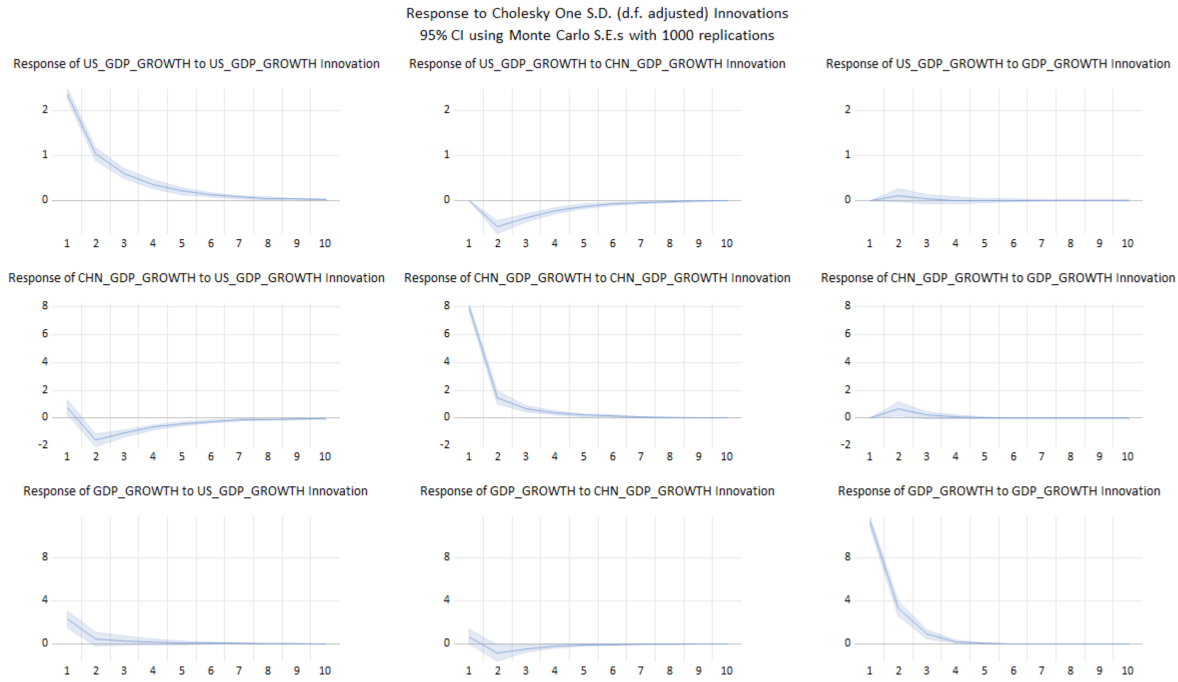

Figure 4.1: Impulse responses from the GDP growth spillover model. The figure shows the response of each variable including US_GDP_GROWTH, CHN_GDP_GROWTH, GDP_GROWTH (19 trading partners).

The bottom left panel of Figure 4.2 shows the spillover effect of a positive shock to U.S. GDP growth generates a positive and statistically significant peak of 2.3 percentage points response to its 19 trading partners GDP growth, but gradually declining. This confirms that US GDP growth stocks are a powerful and persistent driver of economic growth in other countries that supporting **Hypothesis H_1** in our study.

In contrast, a comparable shock to China's GDP growth shows a different pattern with a much smaller positive effect of 0.7 percentage points in the first year, then turns negative of 0.8 percentage points in the second year and remains negative for several years. This mixed response suggests that China's growth may initially boost trading partners' GDP growth, but not in long-term.

The middle-left panel shows that China's GDP growth responds negatively to US shocks after the first year. In contrast, US GDP growth is only marginally affected by Chinese shocks, as the responses are small and not significantly different from zero. This asymmetry underscores United States continues functions as dominant global anchor.

These results directly address **Objective 1 and 3** with the conclusion of US remains the primary source in influence both China and other economies GDP growth.

4.3.2 Impulse Response Functions –Inflation Model

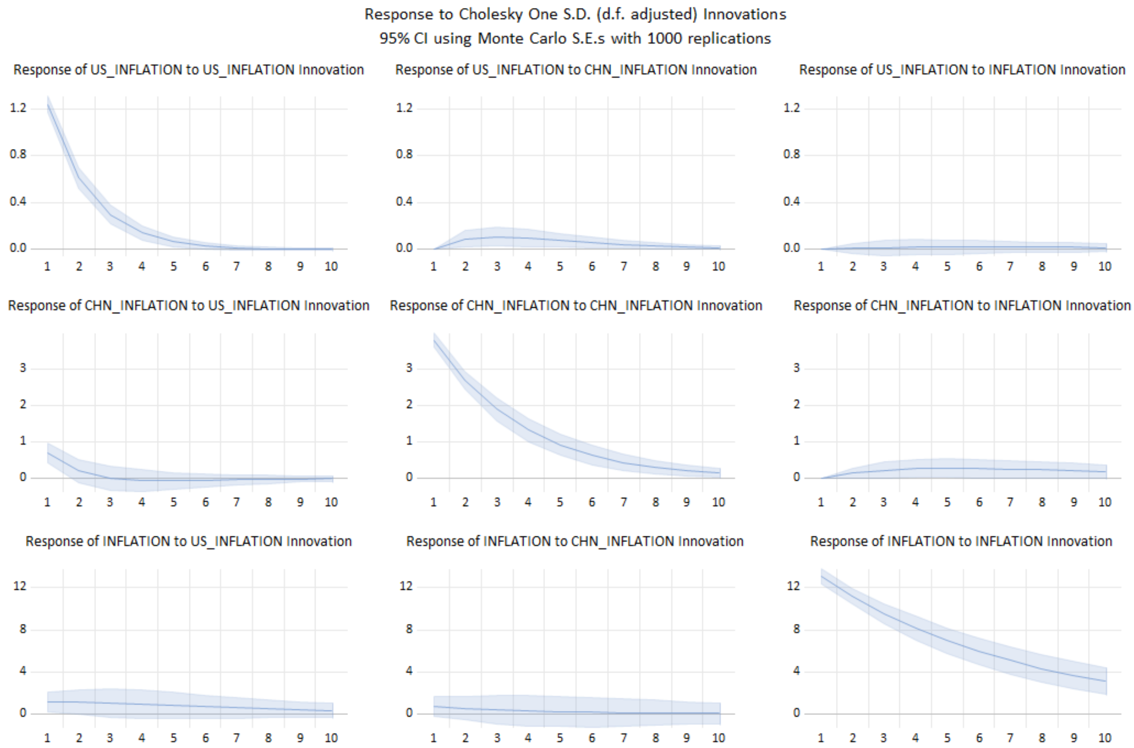

Figure 4.2: Impulse responses from the Inflation spillover model. The figure shows the response of each variable including US_INFLATION, CHN_ INFLATION, INFLATION (19 trading partners).

Figure 4.2 shows the response of trading partners' inflation to a US inflation shock is positive and statistically significant only in the first year at 1.20 percentage points. In subsequent periods, the point estimates remain positive but are not significantly different from zero, indicating an immediate but short-lived impact on global inflation.

In contrast, a shock to China's inflation does not produce a statistically significant response in trading partners' inflation at any horizon, as the largest point estimate is only 0.77 percentage points in period 1. However, China's inflation does have a small but statistically significant positive effect on US inflation, with responses of about 0.09 to 0.11 percentage points in periods 2 to 4, suggesting a modest transmission channel from China to the United States.

The results suggest that the United States remains the primary source of immediate inflationary spillovers, but its influence is short lived. China's direct spillovers to trading partners are not statistically significant, although China does exert a measurable, albeit small, impact on US inflation. These findings partially address **Objective 1 and 3** with indicating that the US still dominates inflation transmission, while China's role is limited to a specific bilateral channel with the US.

4.3.3 Impulse Response Functions – Commodity Price with GDP Growth Model

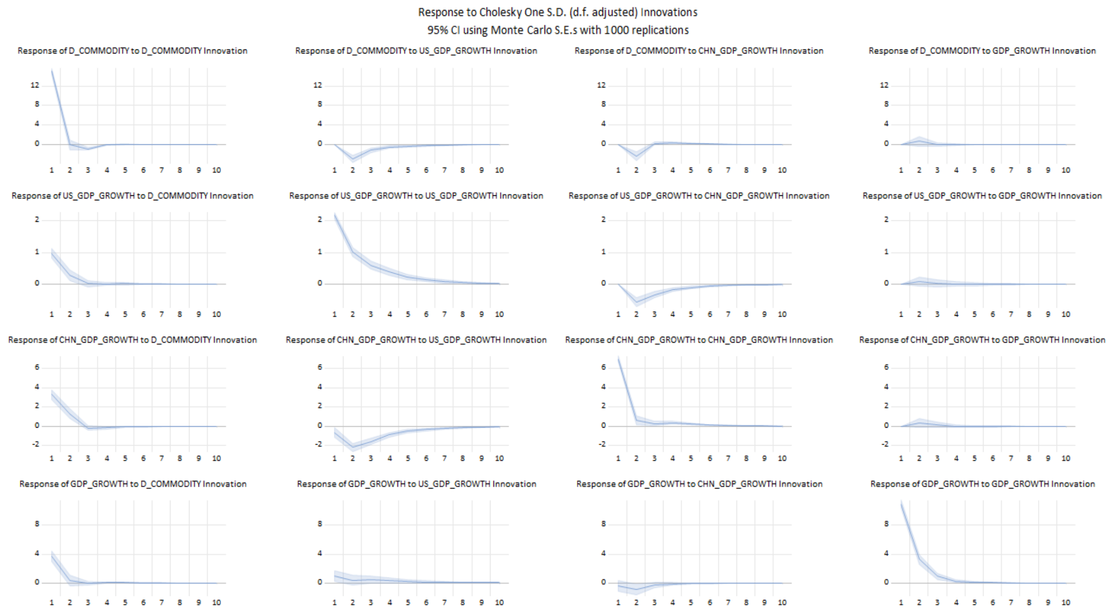

Figure 4.3: Impulse responses from the commodity price with GDP growth spillover model. The figure shows the response of each variable including D_COMMODITY, US_GDP_GROWTH, CHN_GDP_GROWTH, GDP_GROWTH (19 trading partners).

The results show shock to commodity price inflation generates a strong immediate impact in trading partners' GDP growth by 3.69 percentage points in the first year. However, this effect is short-lived as the response declines sharply to around 0.37 percentage points in the second year and becomes statistically insignificant thereafter.

In contrast, a shock to US GDP growth produces a positive but relatively modest response in trading partners' GDP growth, with an increase of about 0.99 percentage points in period 1. The quickly diminishes effect indicating that the spillover from US growth through the commodity price channel is limited and not persistent. On the other hand, a shock to China's

GDP growth results in a negative and statistically significant response of 0.96 percentage points at the second year to trading partners' GDP growth.

Overall, the findings suggest that the commodity price channel plays an important role in amplifying short-term output fluctuations. These findings partially address **Objective 2** and **3.** Commodity price shocks have a strong but temporary positive effect, US growth shocks generate weak spillovers, while China's growth shocks exert a negative influence.

4.3.4 Impulse Response Functions – Commodity Price with Inflation Model

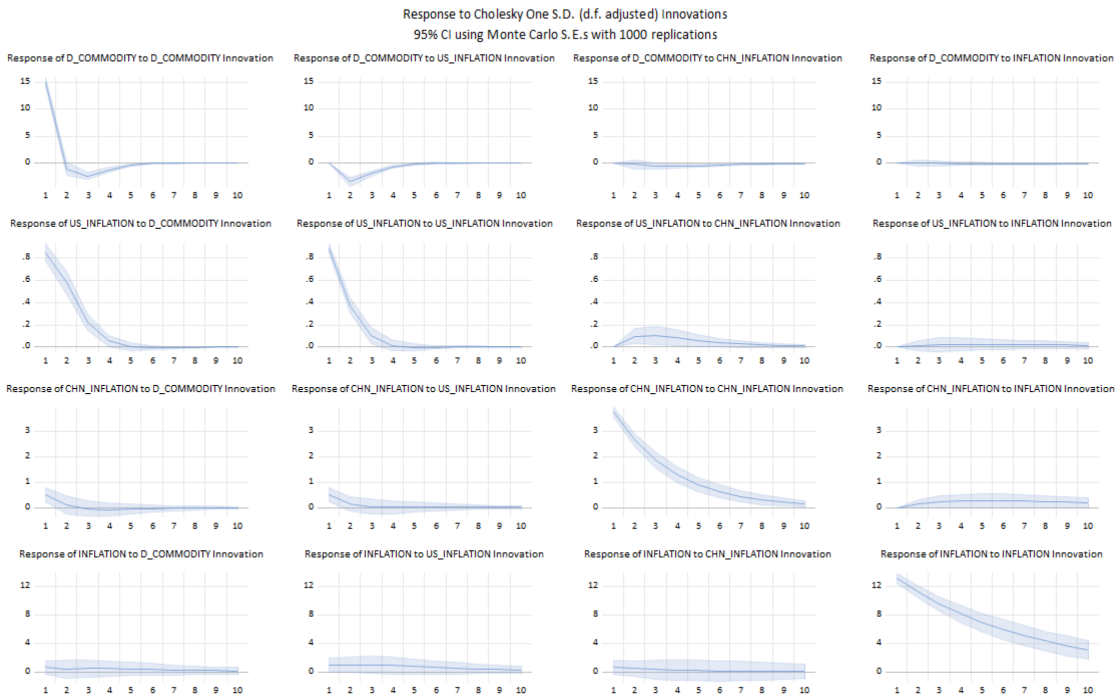

Figure 4.4: Impulse responses from the commodity price with Inflation spillover model. The figure shows the response of each variable including D_COMMODITY, US_INFLATION, CHN_INFLATION, INFLATION (19 trading partners).

A shock to commodity price inflation generates a positive and persistent response in trading partners' inflation, peaking around 0.5–0.6 percentage points in periods 2–5 before gradually declining. However, the relatively large standard errors indicate that these effects are not statistically significant. This suggests that although commodity price increases may contribute to higher inflation, the magnitude of the effect is uncertain.

A shock to US inflation generates a stronger and more immediate positive response in trading partners' inflation at approximately 1.0 percentage point, before slowly declining over time. Despite this economically meaningful pattern, the lack of statistical significance implies that the transmission is not robust across all countries. In contrast, China's inflation shock produces only a small positive response in trading partners' inflation with about 0.58 to 0.78 at period 1 to 2. The magnitude is consistently lower than the US statistically insignificant throughout the period. This indicates that China's inflation plays a limited role in influencing global inflation dynamics through the commodity price channel.

These findings partially support the O**bjective 1**, **2**, and **3**, suggesting that while commodity prices and US inflation have some influence on global inflation, the evidence is not strong enough to confirm statistically significant spillovers. China's role remains minimal.

4.3.5 Impulse Response Functions – Trade Linkage with GDP Growth Model

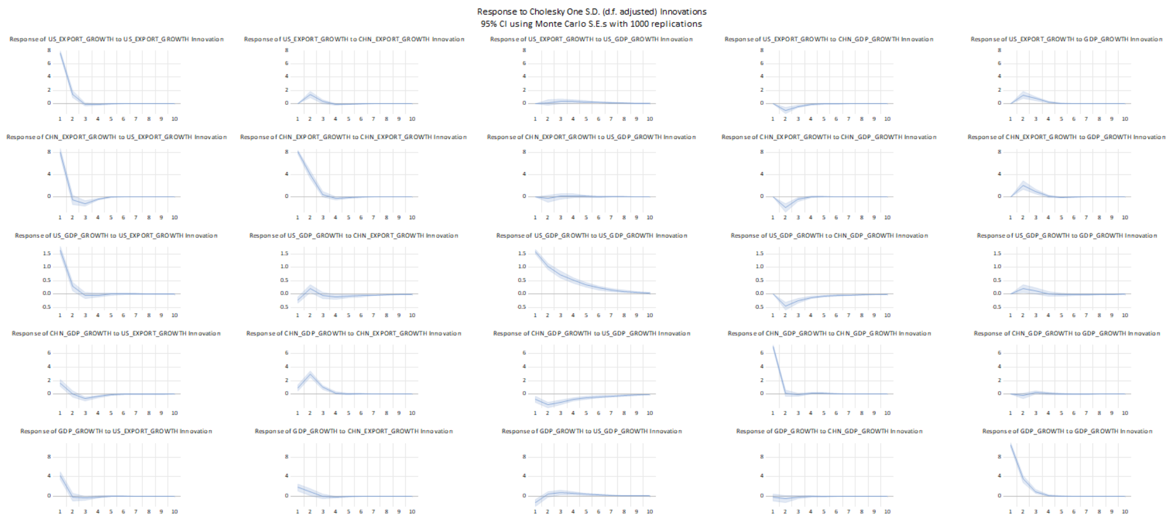

Figure 4.5: Impulse responses from the trade linkage with GDP growth spillover model. The figure shows the response of each variable including US_EXPORT_GROWTH, CHN_EXPORT_GROWTH, US_GDP_GROWTH, CHN_GDP_GROWTH, GDP_GROWTH (19 trading partners).

The response of trading partners' GDP growth to a US export shock is large, positive, and statistically significant of 4.24 percentage points in the first year. However, this effect is short-lived, as it quickly turns negative and becomes insignificant in subsequent periods. Similarly, a shock to China's export growth also generates a positive and significant response of 1.80

percentage points in the first year. The effect remains positive but declining and becoming insignificant at the second year suggests that China's export expansion contributes to short-term growth through trade and supply chain linkages but lacks persistence.

Interestingly, a shock to US GDP growth initially produces a negative and significant effect on trading partners' growth, a negative 1.33 percentage point in period 1and followed by a positive 0.39 percentage point in period 2. This reversal highlights the complexity of trade dynamics, where initial adjustments may be disruptive before longer-term benefits emerge. On the other hand, China's GDP growth shock has a small and not statistically significant negative impact throughout with a negative 0.26 percentage point at period 1. Overall, the trade linkage channel demonstrates that export shocks are more influential than direct GDP shocks, but their effects are temporary.

These findings support the **Objective 2** by showing that trade is an important but short-term transmission channel for global growth spillovers.

4.3.6 Impulse Response Functions – Trade Linkage with Inflation Model

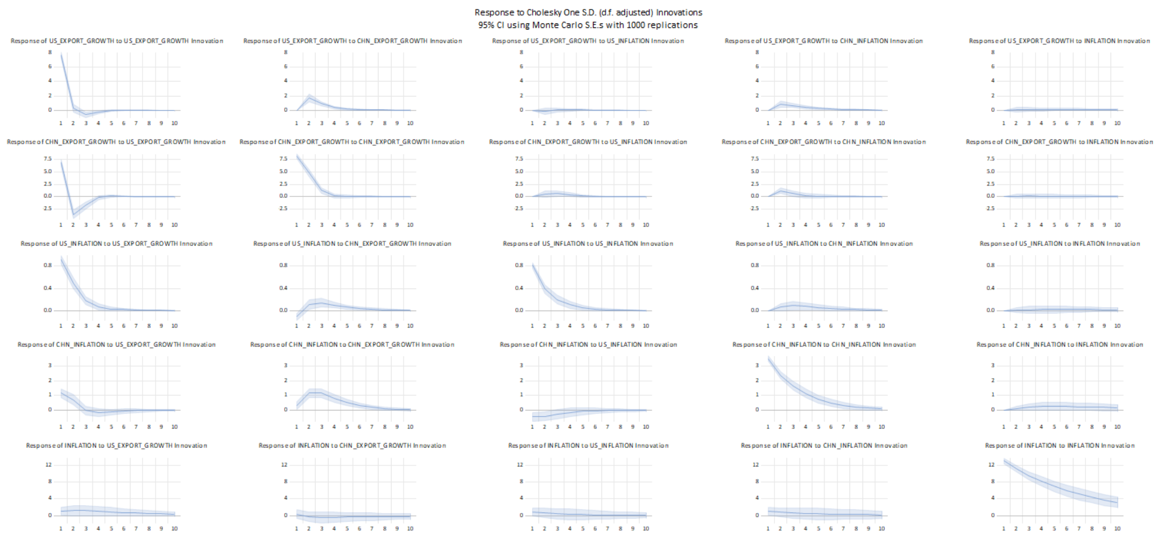

Figure 4.6: Impulse responses from the trade linkage with Inflation spillover model. The figure shows the response of each variable including US_EXPORT_GROWTH, CHN_EXPORT_GROWTH, US_INFLATION, CHN_INFLATION, INFLATION (19 trading partners).

The results show that a shock to US export growth leads to a positive response of 1.02 percentage points in trading partners' inflation. The effect becomes slightly larger in the following years but remains statistically insignificant due to large standard errors. This suggests that increased US export activity may raise inflationary pressures, but the effect is not consistent across countries. In contrast, a shock to China's export growth produces a negative response in trading partners' inflation after the first year which turn negative of negative 0.27 at period 2. However, this effect is also statistically insignificant, indicating weak transmission through this channel.

A shock to US inflation generates a positive but declining response in trading partners' inflation throughout the period. Although the pattern suggests some degree of spillover, the lack of statistical significance implies that the effect is not robust. Similarly, China's inflation shock leads to a positive but insignificant response.

Importantly, the own-shock response of trading partners' inflation is large and statistically significant, especially in the first period. This highlights that domestic factors are the primary drivers of inflation, rather than external trade-related shocks.

Overall, the results partially address **Objective 2** and **3** by indicate that trade linkages do not serve as a strong channel for transmitting inflation from the US or China.

4.3.7 Impulse Response Functions – Financial Linkage with GDP Growth Model

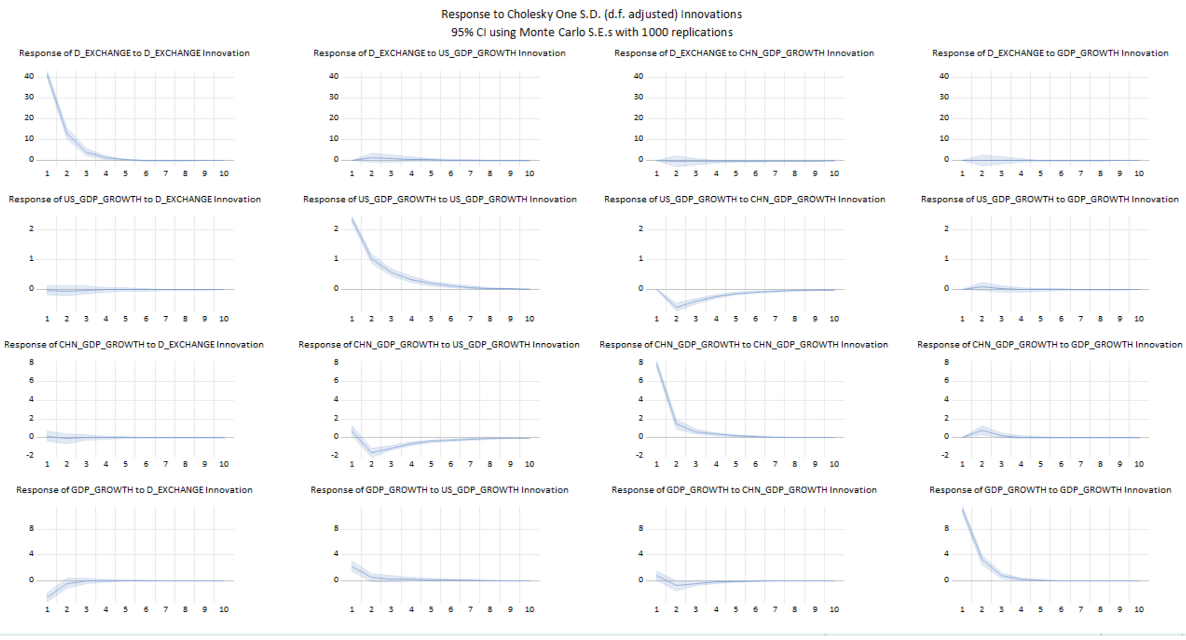

Figure 4.7: Impulse responses from the financial linkage with GDP growth spillover model. The figure shows the response of each variable including D_EXCHANGE, US_GDP_GROWTH, CHN_GDP_GROWTH, GDP_GROWTH (19 trading partners).

A positive shock to exchange rate changes has a negative and statistically significant effect on trading partners' GDP growth in the first year, with a decline of about 2.57 percentage points. This suggests that depreciation increases import costs or reduces investor confidence, leading to lower economic activity. However, the effect diminishes quickly and becomes insignificant after the second year.

A shock to US GDP growth produces a strong and statistically significant positive response in trading partners' GDP growth, increasing by approximately 2.29 percentage points in the first year with a standard error of 0.37. The effect declines rapidly and becomes insignificant after a few periods, indicating that US growth influences other economies mainly in the short term.

Moreover, China's GDP growth shock generates a small positive 0.78 percentage point with a standard error of 37 that response initially, followed by negative effects in later periods which negative 0.79 at period 2. However, these responses are not statistically significant, suggesting limited influence through the financial channel.

Overall, the financial linkage channel highlights the importance of exchange rates and US economic performance in driving short-term fluctuations in global growth, while China's impact remains weak in this channel. These findings support the **Objective 2** by identifying financial linkages as a key, but short-lived, transmission mechanism for global economic spillovers.

4.3.8 Impulse Response Functions – Financial Linkage with Inflation Model

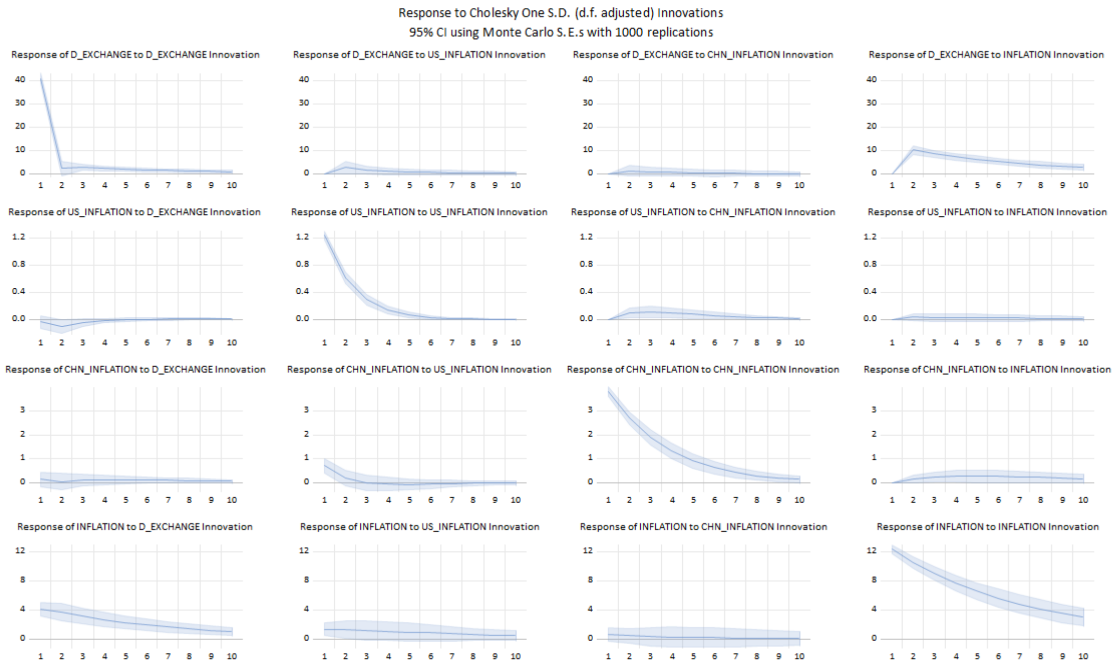

Figure 4.8: Impulse responses from the financial linkage with Inflation spillover model. The figure shows the response of each variable including D_EXCHANGE, US_INFLATION, CHN_INFLATION, INFLATION (19 trading partners).

A positive shock to exchange rate changes has a large, positive, and statistically significant effect on trading partners' inflation and remains elevated over the entire 10-year horizon, Although the magnitude gradually declines, it still indicates strong and persistent exchange rate pass-through effects on domestic prices.

A shock to US inflation generates a positive response in trading partners' inflation with 1.35 percentage point in period 1, but the effect is smaller and less persistent compared to exchange rate shocks. Furthermore, China's inflation shock produces only a modest positive effect 0.60 percentage point at period 1, which is generally not statistically significant. This implies that China's role in transmitting inflation through financial channels is limited.

Overall, the financial linkage channel is the most important mechanism for inflation transmission among all channels considered, specifically exchange rate movements play a dominant role in driving inflation dynamics across countries. These findings strongly support **Objective 1**, **2**, and **3** by demonstrating that financial factors are key drivers of global inflation spillovers, while the influence of China remains relatively small compared to the United States.

4.4 Forecast Error Variance Decomposition (FEVD)

In this study, the FEVD is derived from the same VAR models, but focuses only on GDP growth and inflation model by using the Cholesky ordering to measure the percentage contribution of US and Chinese shocks to the variability of trading partners' GDP growth and inflation. This directly addresses **Objective 3**: evaluating whether China is overtaking the United States as the primary source of global spillovers.

4.4.1 Forecast Error Variance Decomposition – GDP Growth Model

Table 4.7: Forecast Error Variance Decomposition (10-Year Horizon) – GDP Growth Model

Variable	Shock from	Contribution (%)
Trading partners' GDP growth	US GDP growth	3.85
	China GDP growth	0.96
	Own shock	95.19
US GDP growth	China GDP growth	7.46
	Own shock	92.38
China GDP growth	US GDP growth	6.89
	Own shock	92.34

Note: Contributions may not sum to 100 due to rounding. Standard errors are available in Appendix 15.

Table 4.7 presents the percentage contribution of US and Chinese GDP growth shocks to the forecast error variance of trading partners' GDP growth.

The results show that shocks to US GDP growth explain approximately 3.85% of the variance in trading partners' GDP growth, while shocks to China's GDP growth explain only about 0.96%. The remaining 95.19% is attributable to own domestic shocks. The result shows a relative contribution of the United States is roughly four times larger than that of China. This asymmetry directly addresses our study's **Objective 3**, the United States remains the dominant external driver of growth spillovers, while China's influence, though present, is substantially smaller.

The table also shows that 6.89% of China's GDP growth variance is explained by US shocks, while 7.46% of US GDP growth variance is explained by the Chinese shocks. These bidirectional spillovers are consistent with the asymmetric pattern observed in the impulse responses.

In summary, the FEVD confirms **Hypothesis H_4**: China has emerged as a non-negligible source of growth spillovers, but its effects are still not greater than those of the United States. The US continues to be the primary external anchor for global GDP growth.

4.4.2 Forecast Error Variance Decomposition –Inflation Model

Table 4.8: Forecast Error Variance Decomposition (10-Year Horizon) – Inflation Model

Variable	**Shock from**	**Contribution (%)**
Trading partners' inflation	US inflation	1.19
	China inflation	0.25
	Own shock	98.56
US inflation	China inflation	2.10
	Own shock	97.77
China inflation	US inflation	1.89
	Own shock	96.38

Note: Contributions may not sum to 100 due to rounding. Standard errors are available in Appendix 16.

Table 4.8 presents the percentage contribution of US and Chinese inflation shocks to the forecast error variance of trading partners' inflation.

At the 10-year horizon, shocks to US inflation explain approximately 1.19% of the variance in trading partners' inflation, while shocks to China's inflation explain only about 0.25%. Result also shows the relative contribution of the United States is nearly five times larger than that of China. This asymmetry directly addresses the **Objective 3**, the United States remains the dominant external source of inflationary spillovers, whereas China's influence is minimal.

The table also shows that 1.89% of China's inflation variance is explained by US shocks, while 2.10% of US inflation variance is explained by Chinese shocks. These bidirectional spillovers are consistent with the asymmetric pattern observed in the impulse responses.

In summary, the FEVD confirms **Hypothesis H4**: China has emerged as a non-negligible source of spillovers, but its effects are still not greater than those of the United States. The US continues to be the primary external anchor for global inflation dynamics.

4.4.3 Combined Comparison: GDP Growth vs. Inflation

Taken together, the FEVD results for the GDP growth and inflation models provide a consistent picture of US dominance and China's secondary role. The table below summarises the key spillover contributions from the US and China to trading partners.

Table 4.9: Summary of Spillover Contributions (10-Year Horizon)

Trading partners' variable	**Shock from US (%)**	**Shock from China (%)**
GDP growth	3.85	0.96
Inflation	1.19	0.25

In both cases, the US contributes roughly four to five times more to the forecast error variance of trading partners' outcomes than China does. This relative comparison reflecting the United States remains the dominant external source of both growth and inflationary spillovers and directly support Hypothesis H4 showing China's influence is non-negligible, but it has not overtaken the US.

The results also show that the US is more influenced by China than China is by the US, indicating a degree of bidirectional interdependence. However, the absolute magnitudes are small, and the US retains a clear leadership role in shaping global economic outcomes.

4.5 Conclusion

This chapter has presented a comprehensive empirical analysis of spillover effects from the United States and China to 20 trading partners using a panel VAR framework with smaller, channel-specific models that estimated by system GMM with a lag length of 1. The preliminary analysis established that all variables are stationary in first differences and not cointegrated, justifying the use of growth rates. Diagnostic tests confirmed the stability of the VAR system (all eigenvalues inside the unit circle) and the validity of the instruments (Hansen J-test, $p \approx 1$). Impulse response functions were derived to to examine how shocks originating from the United States and China affect the GDP growth and inflation of trading partners over a ten-year horizon, following a recursive Cholesky ordering grounded in economic theory. Last, forecast error variance decompositions were then computed to measure the percentage contribution of US and Chinese shocks to the variability of trading partners' GDP growth and inflation. The FEVD confirms that US shocks explain roughly four to five times more of the variance in trading partners' GDP growth and inflation than Chinese shocks. These findings demonstrate that the United States remains the dominant global anchor, while China's influence, though growing, is still secondary. The detailed interpretation of these results, along with a summary of key findings, policy implications, limitations, and recommendations for future research, is provided in Chapter 5.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

This chapter discusses the main empirical findings in relation to the research objectives, questions, and hypotheses. It then draws out the theoretical, policy, and practical implications, acknowledges key limitations, and proposes directions for future research.

5.1 Discussions of Major Findings

5.1.1 U.S. Spillovers remain significant but modest in variance explained

The findings indicate that domestic shocks continue to account for the largest share of the variation in GDP growth across the 20 sampled economies. Nevertheless, this does not reduce the importance of external spillovers, especially those originating from the United States. Although the forecast error variance decomposition shows that most of the variance in domestic GDP growth is still explained by own shocks, the estimated coefficients demonstrate that U.S. growth shocks remain economically and statistically significant. Recent evidence also confirms that U.S. shocks generate sizable co-movements in GDP and inflation across countries through dense trade and financial linkages (Anderson et al., 2025).

In particular, a 1 percentage-point increase in U.S. GDP growth is associated with an increase of approximately 0.96 percentage points in domestic GDP growth in the following period. This indicates a robust, statistically significant spillover effect, offering unequivocal support for Hypothesis H1, which posited a positive and considerable influence of U.S. growth shocks on the 20 economies (Engler et al., 2023).

This result corroborates the paradox in Chapter 1: despite the decline in the U.S. share of world GDP, the United States continues to act as a key anchor of global growth through trade and financial linkages (Bhutada, 2021). This shows that relative economic size alone cannot explain international influence; structural centrality also matters for cross-border spillovers.

5.1.2 U.S. Monetary Policy Spillovers on Inflation Are Detectable

For inflation, the forecast error variance decomposition shows that domestic factors still explain most inflation variability at the 10-year horizon, while U.S. inflation and monetary policy shocks account for only a small share (Andriantomanga, 2025). However, these modest variance shares do not mean that U.S. spillovers are unimportant; they indicate that inflation transmission is more complex than a simple one-to-one pass-through from U.S. to foreign prices (Ha et al., 2019). The coefficient estimates nevertheless reveal meaningful spillovers. The lagged U.S. federal funds rate enters the GDP growth equation with a positive and significant coefficient, suggesting that policy tightening is initially associated with higher partner-country growth, possibly because it tends to occur during global expansions or triggers anticipatory responses in exchange rates and financial flows (Engler et al., 2023). Over longer horizons, negative coefficients and the impulse responses point to the expected contractionary effects of sustained tightening (Caldara et al., 2022).

The findings therefore suggest that U.S. monetary conditions influence partner-country inflation mainly through exchange rates, commodity prices, and global production networks, rather than only through direct CPI co-movement, with recent evidence showing that U.S. tightening raises import prices and transmits via financial conditions (Giraldo et al., 2025). Overall, the evidence only partially supports H2: U.S. inflation does exert spillovers, but they are smaller and operate through several indirect channels.

5.1.3 China's Spillover Effects are growing but remain secondary

The results illuminate China's emerging role as a source of global spillovers. While Chinese export growth has a positive and significant effect on domestic GDP growth, the magnitude of this spillover remains smaller than that of the United States, and FEVD results confirm that Chinese shocks explain a smaller share of GDP and inflation variance than U.S. shocks, especially once financial channels are considered (Bureau, 2025). Recent work on global supply chains similarly shows that cross border production networks account for a sizeable share of the variance in consumer prices and industrial output, underscoring why China's trade and commodity shocks propagate so widely (Morales, 2025).

5.1.4 Channels: commodities, trade, financial

Taken together, the findings suggest that global spillovers are transmitted through several interconnected channels rather than through a single mechanism. U.S. spillovers remain broader in scope, operating through GDP growth, trade, and financial channels, while China's influence is concentrated more strongly in trade linkages, commodity demand, and production networks. This means that the international economy is becoming more multipolar in structure, but not yet equal in the distribution of influence (Bini, 2025).

In relation to the research objectives, three main conclusions can be drawn. First, U.S. spillovers on GDP growth remain significant and economically meaningful across the sampled economies. Second, inflation spillovers exist, but they are more indirect and channel-dependent than growth spillovers. Third, China's role in global spillover transmission is clearly increasing, but the United States remains the more dominant source of international economic influence.

5.2 Implications of the Study

5.2.1 Theoretical Implications

This study's findings enhance the literature on open economy macroeconomics, global financial cycles, and inflation synchronization in multiple ways (Auer et al., 2024). Initially, they present extensive empirical evidence indicating that U.S. spillover effects continue to be significant, notwithstanding the gradual decrease in the U.S. proportion of global GDP (Bhutada, 2021). This substantiates the assertion that the conventional "trilemma" may have transitioned into a "dilemma," wherein global financial conditions, predominantly influenced by U.S. monetary policy and the preeminent status of the U.S. dollar, constrain monetary autonomy even amidst flexible exchange rates (Aizenman, 2018).

Quantitatively, U.S. shocks still explain several times more of global GDP and inflation variance than Chinese shocks, while the United States operates mainly through trade and financial channels and China through trade, production networks, and commodity demand (Xu et al., 2023). The United States serves as the principal "financial anchor" of the global economy, while China is emerging as a significant "demand and commodity anchor." This supports the need for models that differentiate between a financial anchor and a demand-and-commodity anchor, rather than treating the “rest of the world” as a single block (IMF, 2025).

5.2.2 Policy Implications

For emerging market economies, the results underscore the importance of external vulnerability management. Despite the implementation of more flexible exchange rate regimes and enhanced domestic policy frameworks, the U.S. monetary and growth shocks persist in affecting domestic GDP and inflation results (Chen et al., 2016). Policymakers should monitor U.S. interest-rate decisions and global financial conditions closely and integrate these into their reaction functions, using reserves, macroprudential tools, and capital-flow management to mitigate volatility (IMF, 2022).

For advanced economies, including major U.S. trading partners, the large, estimated elasticity of domestic GDP growth with respect to U.S. growth implies that U.S. recessions or sharp slowdowns can translate into sizeable output losses (Degasperi & Venditti, 2025). This reinforces the argument for improved international policy coordination, especially within frameworks like the G7 and G20, to foresee and address cross-border spillovers (IMF, 2019; OECD, 2025). Transparent articulation of policy objectives by the Federal Reserve can alleviate uncertainty and avert abrupt market volatility (Caldara et al., 2022).

The findings indicate that an abrupt transition in global economic leadership from the United States to China is unlikely. The United States possesses a structural advantage through its financial markets and the worldwide dominance of the dollar, whereas China's growing influence mostly centers on trade and commodities markets (OECD, 2025). For the United States, preserving institutional credibility and financial market depth is crucial to maintaining its position as a global anchor; the policies that undermine these strengths could accelerate a move towards a more fully multipolar system (Reinhart et al., 2016; Redman, 2024).

For international organizations such as the IMF, World Bank, and BIS, the results underline the importance of systematic spillover assessments that incorporate both U.S. and Chinese shocks. Regular spillover reports that compare their relative magnitudes and channels would provide member countries with more comprehensive information to guide macroeconomic stabilization and financial surveillance (World Bank, 2025).

5.2.3 Practical Implications for Investors and Firms

From a private sector perspective, the findings suggest that multinational firms and international investors should manage their exposures with an awareness of both U.S. and Chinese spillovers. While U.S. shocks still dominate, Chinese shocks are increasingly relevant for economies tied to Asian value chains and commodity markets. (Kyriazis et al., 2024). Diversifying trade links, production locations, and financial portfolios across regions, as well as hedging against both U.S. interest rate risk and Chinese demand risk, can enhance resilience to external shocks (Diaz et al., 2024). Recent evidence shows that tariff shocks and supply chain disruptions can trigger large contractions in global trade and force firms to reconfigure production networks, reinforcing the case for diversification of both trade and financial exposures (Anderson et al., 2025).

5.3 Limitations of the Study

5.3.1 Data Limitations

Several data-related limitations must be acknowledged. First, the use of annual data over 1975–2024 allows the study to capture long-run patterns and major global shocks but inevitably abstracts from high-frequency dynamics (Hamilton, 1994; Lütkepohl, 2005). Many financial spillovers and policy reactions occur at quarterly or higher frequencies, which cannot be fully captured with annual observations (Engler et al., 2023; Fan & Chen, 2024). Second, although the panel covers 20 advanced and emerging economies, it excludes some important economies due to data availability, especially in Africa and the Middle East. Hence, the findings may not be entirely generalized to all regions (IMF, 2022; World Bank, 2025).

Thirdly, measurement constraints impact several essential factors. The trade and financial openness metrics employed in this study might not fully capture the nature, structure, or actual strength of international linkages (Irving Fisher Committee, 2024). Specifically, the reliance on aggregate commodity indexes obscures distinctions between oil, metals, and food, each of which could exhibit distinct transmission mechanisms (Ekanayake, 2024). Furthermore, historical data concerning China, especially from earlier decades, present heightened uncertainty, potentially compromising the precision of the projected Chinese spillovers (NBS, 2025).

5.3.2 Methodological Limitations

The PVAR framework assumes homogeneous coefficients across countries, implying that spillovers are the same for all economies in the sample. However, the magnitude of these spillovers likely varies, influenced by country-specific attributes including trade volume, financial sector advancement, and exchange rate policies (Claessens et al., 2011). While this assumption simplifies estimation and interpretation, it also masks potential heterogeneity that warrants future investigation (Yang et al., 2023).

Furthermore, the identification of shocks relies on a recursive (Cholesky) ordering in which U.S. and Chinese variables are treated as contemporaneously exogenous to the domestic variables. Although this is a standard approach, alternative identification schemes, such as sign restrictions or external instruments, might yield somewhat different impulse responses. The model is also linear and time invariant and therefore does not capture possible nonlinearities or regime changes, for example, larger spillovers during crises. In addition, Chinese trade variables are treated as weakly exogenous, even though global demand conditions also influence China's exports, implying potential residual endogeneity that the current framework may not fully address.

5.3.3 Conceptual Limitations

Conceptually, the reduced-form approach cannot fully distinguish common global shocks or coordinated policy actions from true cross-border transmission and distinguishing between them calls for a structural identification framework with more robust assumptions (Ha et al., 2019). Furthermore, the study does not explicitly consider institutional characteristics that make China's spillovers qualitatively distinct, such as industrial policies, capital account management, and state-owned enterprises, which could influence the nature and duration of its external effects (Xu et al., 2023).

5.4 Recommendations for Future Research

Future research could employ higher-frequency (quarterly or monthly) data and more advanced identification strategies, such as high-frequency surprises or proxy-SVARs, to better capture the timing and nature of U.S. and Chinese shocks, especially around major policy announcements (NBER et al., 2025).

Secondly, models with heterogeneous coefficients and possible non-linear or regime-switching dynamics such as Bayesian panel VARs or pooled mean group estimators—could identify which economies are most exposed to external shocks and whether spillovers intensify during crises or periods of high uncertainty (Kyriazis et al., 2024).

Third, expanding coverage to under-represented regions, and using more disaggregated commodity prices and additional indicators of Chinese activity (such as remote-sensing data) would improve external validity and measurement of trade and commodity channels (Xu et al., 2023).

Lastly, future research could analyse how macroeconomic spillovers interact with geopolitical risk, climate and energy transition policies, digital currencies, and sector-level differences between tradable and non-tradable industries (Yang & Li, 2024).

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Appendix

Appendix 1:

Unit Root Test (ADF) for Level – US_GDP

Null Hypothesis: US_GDP has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.302601	1.0000
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_GDP)
Method: Least Squares
Date: 04/03/26 Time: 17:01
Sample (adjusted): 1977 2024
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
US_GDP(-1)	0.035207	0.010660	3.302601	0.0019
D(US_GDP(-1))	0.234416	0.152247	1.539703	0.1306
C	4.67E+10	1.05E+11	0.443411	0.6596

R-squared	0.432773	Mean dependent var	5.60E+11
Adjusted R-squared	0.407563	S.D. dependent var	4.97E+11
S.E. of regression	3.82E+11	Akaike info criterion	56.23706
Sum squared resid	6.58E+24	Schwarz criterion	56.35401
Log likelihood	-1346.689	Hannan-Quinn criter.	56.28125
F-statistic	17.16668	Durbin-Watson stat	1.924164
Prob(F-statistic)	0.000003		

Unit Root Test (ADF) for Level – US_CPI

Null Hypothesis: US_CPI has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.747621	0.9920
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_CPI)
Method: Least Squares
Date: 04/03/26 Time: 17:05
Sample (adjusted): 1977 2024
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
US_CPI(-1)	0.005024	0.006721	0.747621	0.4586
D(US_CPI(-1))	0.543564	0.128058	4.244663	0.0001
C	0.755072	0.567388	1.330787	0.1900

R-squared	0.327736	Mean dependent var	2.453318
Adjusted R-squared	0.297858	S.D. dependent var	1.582193
S.E. of regression	1.325782	Akaike info criterion	3.462343
Sum squared resid	79.09636	Schwarz criterion	3.579293
Log likelihood	-80.09623	Hannan-Quinn criter.	3.506538
F-statistic	10.96900	Durbin-Watson stat	1.736054
Prob(F-statistic)	0.000132		

Unit Root Test (ADF) for Level – US_FFR

Null Hypothesis: US_FEDERAL_FUNDS_RATE has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.223803	0.2008
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_FEDERAL_FUNDS_RATE)
Method: Least Squares
Date: 04/03/26 Time: 17:07
Sample (adjusted): 1977 2024
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
US_FEDERAL_FUNDS_RATE(-1)	-0.130327	0.058605	-2.223803	0.0312
D(US_FEDERAL_FUNDS_RATE(-1))	0.407164	0.135765	2.999044	0.0044
C	0.615900	0.352974	1.744888	0.0878

R-squared	0.205196	Mean dependent var	0.001875
Adjusted R-squared	0.169871	S.D. dependent var	1.695902
S.E. of regression	1.545160	Akaike info criterion	3.768594
Sum squared resid	107.4384	Schwarz criterion	3.885544
Log likelihood	-87.44625	Hannan-Quinn criter.	3.812789
F-statistic	5.808857	Durbin-Watson stat	1.775907
Prob(F-statistic)	0.005700		

Unit Root Test (ADF) for Level – US_EXPORT

Null Hypothesis: US_EXPORT has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.046857	0.9965
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_EXPORT)
Method: Least Squares
Date: 04/03/26 Time: 17:08
Sample (adjusted): 1977 2024
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
US_EXPORT(-1)	0.024575	0.023475	1.046857	0.3008
D(US_EXPORT(-1))	-0.023409	0.154190	-0.151816	0.8800
C	3.48E+10	3.37E+10	1.033594	0.3068

R-squared	0.024307	Mean dependent var	6.34E+10
Adjusted R-squared	-0.019057	S.D. dependent var	1.34E+11
S.E. of regression	1.35E+11	Akaike info criterion	54.15764
Sum squared resid	8.22E+23	Schwarz criterion	54.27459
Log likelihood	-1296.783	Hannan-Quinn criter.	54.20184
F-statistic	0.560528	Durbin-Watson stat	2.017901
Prob(F-statistic)	0.574842		

Unit Root Test (ADF) for Level – CHN_EXPORT

Null Hypothesis: CHN_EXPORT has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.792027	0.9996
Test critical values:	1% level	-3.574446	
	5% level	-2.923780	
	10% level	-2.599925	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CHN_EXPORT)
Method: Least Squares
Date: 04/03/26 Time: 17:10
Sample (adjusted): 1977 2024
Included observations: 48 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CHN_EXPORT(-1)	0.040223	0.022445	1.792027	0.0799
D(CHN_EXPORT(-1))	0.024179	0.156643	0.154358	0.8780
C	3.80E+10	3.11E+10	1.222588	0.2279

R-squared	0.082796	Mean dependent var	7.80E+10
Adjusted R-squared	0.042031	S.D. dependent var	1.69E+11
S.E. of regression	1.66E+11	Akaike info criterion	54.56322
Sum squared resid	1.23E+24	Schwarz criterion	54.68017
Log likelihood	-1306.517	Hannan-Quinn criter.	54.60742
F-statistic	2.031071	Durbin-Watson stat	1.977160
Prob(F-statistic)	0.143049		

Unit Root Test (LLC) for Level - GDP

Null Hypothesis: Unit root (common unit root process)
Series: GDP_CURRENT
Date: 04/03/26 Time: 17:13
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 950
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	8.21220	1.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on GDP_CURRENT

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	-0.00786	5.E+22	4.E+22	1	1	1.0	48
GBR	-0.00472	3.E+22	3.E+22	1	1	2.0	48
JPN	-0.06742	1.E+23	2.E+23	1	1	4.0	48
FRA	-0.01453	2.E+22	2.E+22	1	1	2.0	48
CAN	0.00811	9.E+21	9.E+21	1	1	0.0	48
ITA	-0.02926	2.E+22	2.E+22	1	1	1.0	48
KOR	0.00761	6.E+21	5.E+21	1	1	3.0	48
ESP	-0.00776	7.E+21	1.E+22	1	1	3.0	48
AUS	0.00431	7.E+21	7.E+21	1	1	0.0	48
NLD	0.01137	2.E+21	3.E+21	1	1	3.0	48
BEL	0.00657	8.E+20	8.E+20	1	1	2.0	48
CHE	0.01948	9.E+20	1.E+21	1	1	4.0	48
MEX	0.01573	9.E+21	7.E+21	1	1	8.0	48
BRA	-0.02895	3.E+22	5.E+22	1	1	3.0	48
IND	0.08143	9.E+21	3.E+22	1	1	4.0	48
SGP	0.05404	3.E+20	5.E+20	1	1	3.0	48
MYS	0.02279	3.E+20	3.E+20	1	1	1.0	48
THA	0.00591	4.E+20	4.E+20	1	1	0.0	48
CHN	0.04582	3.E+23	1.E+24	1	1	5.0	48
VNM	0.06401	9.E+19	6.E+20	1	1	4.0	38

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	0.01986	4.039	1.024	-0.532	0.833		950

Unit Root Test (LLC) for Level - CPI

Null Hypothesis: Unit root (common unit root process)
Series: CONSUMER_PRICE
Date: 04/03/26 Time: 17:17
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 924
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	2.16196	0.9847

** Probabilities are computed assuming asympotic normality

Intermediate results on CONSUMER_PRICE

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	0.00375	1.2912	4.2703	1	1	2.0	48
GBR	0.00274	1.7964	6.3797	1	1	3.0	48
JPN	-0.03116	1.0404	8.0631	1	1	4.0	48
FRA	-0.00909	0.9286	6.1059	1	1	4.0	48
CAN	-0.00103	1.2557	3.7756	1	1	3.0	48
ITA	-0.00866	1.8519	4.5103	1	1	2.0	48
KOR	-0.00120	1.3747	2.5899	1	1	1.0	48
ESP	-0.00483	1.8590	3.7843	1	1	2.0	48
AUS	0.00419	1.3772	3.8878	1	1	2.0	48
NLD	0.01396	2.3525	6.2142	1	1	3.0	48
BEL	0.00848	2.5200	4.8790	1	1	2.0	48
CHE	-0.01846	0.7593	4.2343	1	1	4.0	48
MEX	0.00945	2.3165	34.023	1	1	5.0	48
BRA	0.02058	14.026	60.922	1	1	4.0	43
IND	0.01695	2.0621	63.922	1	1	5.0	48
SGP	-0.00126	2.3581	6.6394	1	1	3.0	48
MYS	0.00433	1.3297	1.7112	1	1	1.0	48
THA	-0.00796	3.6511	3.8202	1	1	1.0	48
CHN	-0.02392	4.6975	15.322	1	1	2.0	37
VNM	0.00409	12.964	46.597	1	1	4.0	28

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	0.00037	0.225	1.019	-0.533	0.835		924

Unit Root Test (LLC) for Level – EXCHANGE_RATE

Null Hypothesis: Unit root (common unit root process)
Series: EXCHANGE_RATE
Date: 04/03/26   Time: 17:20
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 949
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-1.91880	0.0275

** Probabilities are computed assuming asympotic normality

Intermediate results on EXCHANGE_RATE

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	-0.08752	0.0416	0.0206	1	1	8.0	48
GBR	-0.18510	0.0020	0.0014	1	1	6.0	48
JPN	-0.13027	234.21	292.71	1	1	0.0	48
FRA	-0.05943	0.7424	0.7263	1	1	4.0	48
CAN	-0.16427	0.0028	0.0069	1	1	3.0	48
ITA	-0.07473	73041.	77365.	1	1	1.0	48
KOR	-0.10024	9525.6	7325.6	1	1	4.0	48
ESP	-0.07770	540.11	539.43	1	1	3.0	48
AUS	-0.15972	0.0107	0.0130	1	1	0.0	48
NLD	-0.07919	0.0574	0.0299	1	1	8.0	48
BEL	-0.06060	36.373	32.082	1	1	5.0	48
CHE	-0.12989	0.0246	0.0144	1	1	7.0	48
MEX	-0.00741	0.8942	1.0184	1	1	2.0	48
BRA	0.01013	0.0903	0.1317	1	1	2.0	48
IND	0.01424	4.6587	7.7949	1	1	4.0	48
SGP	-0.05731	0.0031	0.0081	1	1	3.0	48
MYS	-0.03300	0.0470	0.0565	1	1	2.0	48
THA	-0.08297	4.6115	6.3635	1	1	3.0	48
CHN	-0.04606	0.2253	0.3161	1	1	3.0	48
VNM	-0.06153	530176	1.E+06	1	1	2.0	37

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.03998	-5.438	1.025	-0.532	0.833		949

Unit Root Test (LLC) for Level – COMMODITIES_PRICE

Null Hypothesis: Unit root (common unit root process)
Series: COMMODITIES_PRICE
Date: 04/03/26   Time: 17:22
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 960
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-2.13879	0.0162

** Probabilities are computed assuming asympotic normality

Intermediate results on COMMODITIES_PRICE

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	-0.15062	101.97	80.183	1	1	4.0	48
GBR	-0.14446	149.83	120.75	1	1	3.0	48
JPN	-0.10493	97.761	106.50	1	1	1.0	48
FRA	-0.17031	90.408	73.879	1	1	6.0	48
CAN	-0.20295	116.69	69.568	1	1	8.0	48
ITA	-0.19825	137.44	111.48	1	1	4.0	48
KOR	-0.15103	124.55	120.08	1	1	2.0	48
ESP	-0.16877	127.11	98.366	1	1	6.0	48
AUS	-0.16292	161.95	149.58	1	1	2.0	48
NLD	-0.15587	139.92	112.21	1	1	3.0	48
BEL	-0.04590	146.93	103.66	1	1	6.0	48
CHE	-0.16111	120.71	95.363	1	1	4.0	48
MEX	-0.12953	146.70	146.18	1	1	1.0	48
BRA	-0.15215	100.04	149.67	1	1	3.0	48
IND	-0.16882	94.785	112.92	1	1	1.0	48
SGP	-0.14690	152.38	119.78	1	1	4.0	48
MYS	-0.21630	173.39	137.60	1	1	4.0	48
THA	-0.13478	93.083	118.41	1	1	3.0	48
CHN	-0.19590	128.94	137.72	1	1	2.0	48
VNM	-0.10252	86.011	84.049	1	1	4.0	48

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.14091	-9.187	1.004	-0.532	0.830		960

Appendix 2:

Unit Root Test (ADF) for first Difference - US_GDP

Null Hypothesis: D(US_GDP) has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.658394	0.0889
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_GDP,2)
Method: Least Squares
Date: 04/03/26 Time: 17:03
Sample (adjusted): 1978 2024
Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(US_GDP(-1))	-0.415410	0.156264	-2.658394	0.0109
D(US_GDP(-1),2)	-0.054725	0.160515	-0.340935	0.7348
C	2.53E+11	1.03E+11	2.454754	0.0181

R-squared	0.209210	Mean dependent var	2.66E+10
Adjusted R-squared	0.173265	S.D. dependent var	4.73E+11
S.E. of regression	4.30E+11	Akaike info criterion	56.47200
Sum squared resid	8.12E+24	Schwarz criterion	56.59009
Log likelihood	-1324.092	Hannan-Quinn criter.	56.51644
F-statistic	5.820290	Durbin-Watson stat	2.020404
Prob(F-statistic)	0.005719		

Unit Root Test (ADF) for first Difference - US_CPI

Null Hypothesis: D(US_CPI) has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.863521	0.0046
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_CPI,2)
Method: Least Squares
Date: 04/03/26 Time: 17:06
Sample (adjusted): 1978 2024
Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(US_CPI(-1))	-0.548295	0.141916	-3.863521	0.0004
D(US_CPI(-1),2)	0.246322	0.152564	1.614549	0.1136
C	1.355747	0.387055	3.502722	0.0011

R-squared	0.255340	Mean dependent var	0.051590
Adjusted R-squared	0.221492	S.D. dependent var	1.485226
S.E. of regression	1.310461	Akaike info criterion	3.440336
Sum squared resid	75.56151	Schwarz criterion	3.558431
Log likelihood	-77.84790	Hannan-Quinn criter.	3.484776
F-statistic	7.543703	Durbin-Watson stat	1.926180
Prob(F-statistic)	0.001524		

Unit Root Test (ADF) for first Difference - US_FFR

Null Hypothesis: D(US_FEDERAL_FUNDS_RATE) has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.322523	0.0001
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_FEDERAL_FUNDS_RATE,2)
Method: Least Squares
Date: 04/03/26 Time: 17:08
Sample (adjusted): 1978 2024
Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(US_FEDERAL_FUNDS_RATE(-1))	-0.880794	0.165484	-5.322523	0.0000
D(US_FEDERAL_FUNDS_RATE(-1),2)	0.345556	0.148816	2.322043	0.0249
C	-0.038678	0.226477	-0.170780	0.8652

R-squared	0.400483	Mean dependent var	-0.008085
Adjusted R-squared	0.373233	S.D. dependent var	1.957930
S.E. of regression	1.550067	Akaike info criterion	3.776174
Sum squared resid	105.7191	Schwarz criterion	3.894269
Log likelihood	-85.74010	Hannan-Quinn criter.	3.820614
F-statistic	14.69623	Durbin-Watson stat	2.053462
Prob(F-statistic)	0.000013		

Unit Root Test (ADF) for first Difference - US_EXPORT

Null Hypothesis: D(US_EXPORT) has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.588269	0.0000
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(US_EXPORT,2)
Method: Least Squares
Date: 04/03/26   Time: 17:09
Sample (adjusted): 1978 2024
Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(US_EXPORT(-1))	-1.307592	0.198473	-6.588269	0.0000
D(US_EXPORT(-1),2)	0.336512	0.142113	2.367919	0.0223
C	8.34E+10	2.26E+10	3.696015	0.0006

R-squared	0.546701	Mean dependent var	2.79E+09
Adjusted R-squared	0.526097	S.D. dependent var	1.89E+11
S.E. of regression	1.30E+11	Akaike info criterion	54.08213
Sum squared resid	7.44E+23	Schwarz criterion	54.20022
Log likelihood	-1267.930	Hannan-Quinn criter.	54.12657
F-statistic	26.53314	Durbin-Watson stat	1.904121
Prob(F-statistic)	0.000000		

Unit Root Test (ADF) for first Difference - CHN_EXPORT

Null Hypothesis: D(CHN_EXPORT) has a unit root
Exogenous: Constant
Lag Length: 1 (Fixed)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.511199	0.0000
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CHN_EXPORT,2)
Method: Least Squares
Date: 04/03/26 Time: 17:11
Sample (adjusted): 1978 2024
Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CHN_EXPORT(-1))	-1.072120	0.194535	-5.511199	0.0000
D(CHN_EXPORT(-1),2)	0.244755	0.154775	1.581356	0.1210
C	8.62E+10	2.87E+10	3.001603	0.0044

R-squared	0.460567	Mean dependent var	5.58E+09
Adjusted R-squared	0.436047	S.D. dependent var	2.24E+11
S.E. of regression	1.68E+11	Akaike info criterion	54.59705
Sum squared resid	1.25E+24	Schwarz criterion	54.71514
Log likelihood	-1280.031	Hannan-Quinn criter.	54.64149
F-statistic	18.78357	Durbin-Watson stat	1.745629
Prob(F-statistic)	0.000001		

Unit Root Test (LLC) for First Difference - GDP

Null Hypothesis: Unit root (common unit root process)
Series: D(GDP_CURRENT)
Date: 04/03/26 Time: 17:14
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 930
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-14.4350	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(GDP_CURRENT)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	-1.26511	4.E+22	9.E+21	1	1	9.0	47
GBR	-1.10425	3.E+22	3.E+21	1	1	19.0	47
JPN	-0.78979	1.E+23	1.E+22	1	1	16.0	47
FRA	-1.14032	2.E+22	5.E+21	1	1	9.0	47
CAN	-1.01231	9.E+21	4.E+20	1	1	47.0	47
ITA	-1.04417	2.E+22	8.E+20	1	1	47.0	47
KOR	-1.31535	6.E+21	5.E+20	1	1	26.0	47
ESP	-0.84125	7.E+21	2.E+21	1	1	9.0	47
AUS	-0.86336	7.E+21	6.E+20	1	1	25.0	47
NLD	-1.05919	2.E+21	8.E+20	1	1	6.0	47
BEL	-1.08044	8.E+20	2.E+20	1	1	10.0	47
CHE	-1.00150	9.E+20	2.E+21	1	1	0.0	47
MEX	-1.09128	9.E+21	1.E+21	1	1	17.0	47
BRA	-0.83977	4.E+22	2.E+22	1	1	3.0	47
IND	-0.52918	1.E+22	1.E+21	1	1	15.0	47
SGP	-0.93883	4.E+20	2.E+19	1	1	47.0	47
MYS	-1.15450	3.E+20	1.E+19	1	1	47.0	47
THA	-0.74863	4.E+20	3.E+19	1	1	31.0	47
CHN	-0.56992	3.E+23	1.E+23	1	1	3.0	47
VNM	-0.20139	1.E+20	3.E+19	1	1	12.0	37

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.88559	-20.623	1.025	-0.533	0.835		930

Unit Root Test (LLC) for First Difference - CPI

Null Hypothesis: Unit root (common unit root process)
Series: D(CONSUMER_PRICE)
Date: 04/03/26 Time: 17:19
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 904
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-10.4933	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(CONSUMER_PRICE)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	-0.65361	0.8679	0.1306	1	1	38.0	47
GBR	-0.59342	1.4405	0.1832	1	1	47.0	47
JPN	-0.36297	1.1002	0.5680	1	1	31.0	47
FRA	-0.35000	0.9372	0.0921	1	1	40.0	47
CAN	-0.52090	1.2365	0.0851	1	1	47.0	47
ITA	-0.69772	1.5677	0.2027	1	1	33.0	47
KOR	-0.66666	1.3052	0.2135	1	1	17.0	47
ESP	-0.65938	1.8405	0.2822	1	1	22.0	47
AUS	-0.58450	1.2745	0.1109	1	1	47.0	47
NLD	-0.49570	2.5078	0.6085	1	1	12.0	47
BEL	-0.62621	2.6097	0.2001	1	1	47.0	47
CHE	-0.34560	0.8574	0.2751	1	1	8.0	47
MEX	-0.18237	2.4470	0.2257	1	1	33.0	47
BRA	-0.44190	15.031	1.5854	1	1	23.0	42
IND	-0.04607	2.2222	2.4013	1	1	0.0	47
SGP	-0.55369	2.2682	0.7961	1	1	9.0	47
MYS	-0.82474	1.3690	0.1959	1	1	13.0	47
THA	-0.72065	3.6093	0.2882	1	1	29.0	47
CHN	-0.51514	4.4182	2.0400	1	1	9.0	36
VNM	-0.43227	13.041	7.7815	1	1	3.0	27

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.40622	-14.500	1.040	-0.533	0.837		904

Unit Root Test (LLC) for First Difference - EXCHANGE_RATE

Null Hypothesis: Unit root (common unit root process)
Series: D(EXCHANGE_RATE)
Date: 04/03/26 Time: 17:21
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 929
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-17.3173	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(EXCHANGE_RATE)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band- width	Obs
DEU	-1.09199	0.0421	0.0060	1	1	17.0	47
GBR	-0.90021	0.0021	0.0005	1	1	20.0	47
JPN	-0.83149	273.85	81.646	1	1	6.0	47
FRA	-1.02908	0.7679	0.0742	1	1	20.0	47
CAN	-0.66375	0.0032	0.0003	1	1	30.0	47
ITA	-1.05167	76686.	3661.9	1	1	47.0	47
KOR	-1.23685	9608.3	1083.7	1	1	16.0	47
ESP	-1.03596	565.32	45.814	1	1	25.0	47
AUS	-0.88697	0.0119	0.0016	1	1	19.0	47
NLD	-1.10532	0.0580	0.0077	1	1	16.0	47
BEL	-1.02002	37.633	3.4139	1	1	23.0	47
CHE	-0.96907	0.0267	0.0027	1	1	16.0	47
MEX	-0.91321	0.9131	0.0717	1	1	20.0	47
BRA	-0.77544	0.0919	0.0043	1	1	47.0	47
IND	-0.79613	4.7851	0.8665	1	1	12.0	47
SGP	-0.58803	0.0034	0.0011	1	1	11.0	47
MYS	-0.90350	0.0478	0.0028	1	1	38.0	47
THA	-0.92528	4.9470	1.3247	1	1	7.0	47
CHN	-0.83674	0.2409	0.0223	1	1	22.0	47
VNM	-0.56731	678831	223792	1	1	7.0	36

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-0.88471	-21.643	1.010	-0.533	0.835		929

Unit Root Test (LLC) for First Difference - COMMODITIES_PRICE

Null Hypothesis: Unit root (common unit root process)
Series: D(COMMODITIES_PRICE)
Date: 04/03/26 Time: 17:24
Sample: 1975 2024
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 940
Cross-sections included: 20

Method	Statistic	Prob.**
Levin, Lin & Chu t*	-23.8343	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate results on D(COMMODITIES_PRICE)

Cross section	2nd Stage Coefficient	Variance of Reg	HAC of Dep.	Lag	Max Lag	Band-width	Obs
DEU	-1.35633	99.639	5.1483	1	1	47.0	47
GBR	-1.29023	153.91	20.653	1	1	18.0	47
JPN	-1.16702	100.59	12.349	1	1	23.0	47
FRA	-1.29999	87.983	6.4090	1	1	31.0	47
CAN	-1.43490	113.15	12.739	1	1	23.0	47
ITA	-1.25795	147.94	6.8410	1	1	47.0	47
KOR	-1.23380	132.23	28.195	1	1	14.0	47
ESP	-1.28329	124.30	9.5766	1	1	37.0	47
AUS	-1.31067	160.71	49.553	1	1	7.0	47
NLD	-1.33423	139.53	6.7019	1	1	47.0	47
BEL	-1.34688	136.19	6.5869	1	1	47.0	47
CHE	-1.32503	117.30	13.854	1	1	47.0	47
MEX	-1.26602	153.51	27.166	1	1	10.0	47
BRA	-1.02654	113.71	86.760	1	1	3.0	47
IND	-1.13060	107.95	27.595	1	1	7.0	47
SGP	-1.25873	157.19	11.692	1	1	35.0	47
MYS	-1.42842	168.94	10.191	1	1	47.0	47
THA	-1.04106	106.54	59.398	1	1	2.0	47
CHN	-1.31807	114.68	10.494	1	1	47.0	47
VNM	-1.28686	90.842	28.533	1	1	5.0	47

	Coefficient	t-Stat	SE Reg	mu*	sig*		Obs
Pooled	-1.26905	-28.458	1.003	-0.532	0.833		940

Appendix 3:

Kao cointegration test:

Kao Residual Cointegration Test
Series: GDP_CURRENT CONSUMER_PRICE COMMODITIES_PRICE EXCHANGE_RATE
Date: 04/03/26 Time: 17:51
Sample: 1975 2024
Included observations: 1000
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 7
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-0.760353	0.2235
Residual variance	4.53E+22	
HAC variance	1.25E+23	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 04/03/26 Time: 17:51
Sample (adjusted): 1982 2024
Included observations: 824 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.028630	0.007203	-3.974885	0.0001
D(RESID(-1))	0.230541	0.034728	6.638455	0.0000
D(RESID(-2))	0.014933	0.036268	0.411747	0.6806
D(RESID(-3))	0.220418	0.038689	5.697202	0.0000
D(RESID(-4))	0.187257	0.044486	4.209308	0.0000
D(RESID(-5))	0.088964	0.045736	1.945162	0.0521
D(RESID(-6))	0.165422	0.044366	3.728543	0.0002

R-squared	0.244230	Mean dependent var	1.22E+10
Adjusted R-squared	0.238680	S.D. dependent var	2.20E+11
S.E. of regression	1.92E+11	Akaike info criterion	54.80577
Sum squared resid	3.01E+25	Schwarz criterion	54.84581
Log likelihood	-22572.98	Hannan-Quinn criter.	54.82113
Durbin-Watson stat	2.063616		

Appendix 4:

VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: GDP_GROWTH INFLATION D_EXCHANGE D_COMMODITY US_GDP_GROWTH US_INFLATION D_US_FFR D_US_EXPORT D_CHN_EXPORT
Exogenous variables: C
Date: 04/04/26 Time: 00:36
Sample: 1975 2024
Included observations: 760

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-22065.36	NA	1.37e+14	58.09042	58.14528	58.11154
1	-20581.78	2928.108	3.41e+12	54.39943	54.94811	54.61072
2	-20058.22	1020.950	1.06e+12	53.23479	54.27728	53.63624
3	-19470.89	1131.389	2.81e+11	51.90233	53.43864	52.49394
4	-18838.80	1202.635	6.59e+10	50.45209	52.48222	51.23386
5	-18037.53	1505.535	9.91e+09	48.55666	51.08060	49.52859
6	-16930.80	2053.282	6.67e+08	45.85736	48.87511	47.01945
7	-13802.28	5730.117	219761.2	37.83759	41.34916	39.18984
8	87688.83	183485.3*	2.8e-111*	-229.0311*	-225.0258*	-227.4887*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Appendix 5:

AR Roots:

Roots of Characteristic Polynomial
Endogenous variables: GDP_GROWTH
INFLATION D_EXCHANGE
D_COMMODITY
US_GDP_GROWTH US_INFLATION
D_US_FFR D_US_EXPORT
D_CHN_EXPORT
Exogenous variables: C
Lag specification: 1 1
Date: 04/04/26 Time: 01:44

Root	Modulus
0.869891	0.869891
0.843874	0.843874
0.250026 - 0.285453i	0.379469
0.250026 + 0.285453i	0.379469
0.281584 - 0.170008i	0.328926
0.281584 + 0.170008i	0.328926
0.278519	0.278519
0.012954	0.012954
-0.011436	0.011436

No root lies outside the unit circle.
VAR satisfies the stability condition.

Appendix 6:

GMM estimators:

System: PVAR_GMM
Estimation Method: Generalized Method of Moments
Date: 03/27/26 Time: 19:59
Sample: 1977 2024
Included observations: 900
Total system (balanced) observations 8100
White Covariance
Linear estimation after one-step weighting matrix

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.424754	0.040979	10.36513	0.0000
C(2)	0.017739	0.023444	0.756654	0.4493
C(3)	0.020374	0.005821	3.500239	0.0005
C(4)	-0.021152	0.025091	-0.842992	0.3993
C(5)	0.959522	0.154229	6.221405	0.0000
C(6)	-0.275756	0.230055	-1.198650	0.2307
C(7)	0.522636	0.243730	2.144320	0.0320
C(8)	-0.637566	0.075683	-8.424178	0.0000
C(9)	0.194854	0.034398	5.664766	0.0000
C(10)	-0.124911	0.083352	-1.498598	0.1340
C(11)	0.810542	0.160950	5.035993	0.0000
C(12)	0.004706	0.004794	0.981676	0.3263
C(13)	-0.037907	0.032282	-1.174252	0.2403
C(14)	0.159160	0.129829	1.225920	0.2203
C(15)	-0.005949	0.258206	-0.023041	0.9816
C(16)	-0.578348	0.436168	-1.325974	0.1849
C(17)	0.221095	0.141896	1.558150	0.1192
C(18)	-0.038090	0.044804	-0.850138	0.3953
C(19)	-0.472879	0.090377	-5.232273	0.0000
C(20)	0.808063	0.153169	5.275629	0.0000
C(21)	-0.017938	0.006218	-2.884837	0.0039
C(22)	-0.000173	0.058747	-0.002946	0.9976
C(23)	-0.878545	0.334700	-2.624873	0.0087
C(24)	0.475473	0.419180	1.134293	0.2567
C(25)	-1.196638	0.491640	-2.433972	0.0150
C(26)	0.710682	0.158809	4.475081	0.0000
C(27)	-0.085816	0.054878	-1.563753	0.1179
C(28)	0.169759	0.043877	3.869014	0.0001
C(29)	0.027944	0.013415	2.083030	0.0373
C(30)	-0.029519	0.006378	-4.628174	0.0000
C(31)	0.075613	0.037727	2.004226	0.0451
C(32)	0.749354	0.174579	4.292348	0.0000
C(33)	-1.039233	0.211811	-4.906405	0.0000
C(34)	2.231864	0.310479	7.188461	0.0000
C(35)	-1.447835	0.112339	-12.88814	0.0000
C(36)	0.486116	0.042325	11.48533	0.0000
C(37)	0.021809	0.007931	2.749912	0.0060
C(38)	0.003745	0.002610	1.434770	0.1514
C(39)	-0.002486	0.000729	-3.410384	0.0007
C(40)	-0.011348	0.004800	-2.364185	0.0181
C(41)	0.809354	0.033010	24.51857	0.0000
C(42)	0.425478	0.050412	8.440070	0.0000
C(43)	-0.060569	0.058013	-1.044051	0.2965
C(44)	-0.271927	0.023075	-11.78460	0.0000
C(45)	0.069635	0.007355	9.468166	0.0000
C(46)	0.022697	0.004885	4.646422	0.0000
C(47)	0.003160	0.001406	2.248070	0.0246
C(48)	-0.002066	0.000670	-3.081654	0.0021

C(49)	-0.003766	0.004097	-0.919167	0.3580
C(50)	0.221478	0.017886	12.38246	0.0000
C(51)	0.606355	0.030804	19.68415	0.0000
C(52)	0.237644	0.037489	6.339039	0.0000
C(53)	-0.100558	0.013182	-7.628339	0.0000
C(54)	0.029178	0.004538	6.430200	0.0000
C(55)	-0.003506	0.005748	-0.609997	0.5419
C(56)	0.002199	0.002148	1.023372	0.3062
C(57)	-0.002496	0.000784	-3.182580	0.0015
C(58)	0.010966	0.003358	3.265640	0.0011
C(59)	-0.006571	0.025870	-0.254019	0.7995
C(60)	0.048042	0.038938	1.233826	0.2173
C(61)	0.400433	0.031763	12.60697	0.0000
C(62)	0.024707	0.009294	2.658540	0.0079
C(63)	-0.016784	0.004922	-3.409845	0.0007
C(64)	0.168373	0.026496	6.354581	0.0000
C(65)	0.031482	0.007240	4.348586	0.0000
C(66)	-0.014182	0.003883	-3.652299	0.0003
C(67)	-0.044065	0.018720	-2.353906	0.0186
C(68)	0.735730	0.090910	8.092966	0.0000
C(69)	-0.184908	0.138508	-1.335003	0.1819
C(70)	0.979575	0.187707	5.218648	0.0000
C(71)	-0.423739	0.067930	-6.237862	0.0000
C(72)	0.261617	0.021902	11.94513	0.0000
C(73)	0.305289	0.047714	6.398319	0.0000
C(74)	0.048782	0.017088	2.854813	0.0043
C(75)	-0.034936	0.006570	-5.317796	0.0000
C(76)	-0.051882	0.037721	-1.375402	0.1690
C(77)	1.351576	0.143664	9.407888	0.0000
C(78)	0.492819	0.240813	2.046477	0.0407
C(79)	1.307355	0.308417	4.238914	0.0000
C(80)	-1.605318	0.109156	-14.70671	0.0000
C(81)	0.822317	0.037261	22.06911	0.0000

Determinant residual covariance	1.50E+13
J-statistic	0.255648

Equation: GDP_GROWTH = C(1)*GDP_GROWTH(-1) + C(2)
*INFLATION(-1) + C(3)*D_EXCHANGE(-1) + C(4)
*D_COMMODITY(-1) + C(5)*US_GDP_GROWTH(-1) + C(6)
*US_INFLATION(-1) + C(7)*D_US_FFR(-1) + C(8)
*D_US_EXPORT(-1) + C(9)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.111533	Mean dependent var	6.330888
Adjusted R-squared	0.103556	S.D. dependent var	10.89882
S.E. of regression	10.31908	Sum squared resid	94876.74
Durbin-Watson stat	2.067608		

Equation: INFLATION = C(10)*GDP_GROWTH(-1) + C(11)*INFLATION(
-1) + C(12)*D_EXCHANGE(-1) + C(13)*D_COMMODITY(-1) +
C(14)*US_GDP_GROWTH(-1) + C(15)*US_INFLATION(-1) +
C(16)*D_US_FFR(-1) + C(17)*D_US_EXPORT(-1) + C(18)
*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.774854	Mean dependent var	7.162209
Adjusted R-squared	0.772833	S.D. dependent var	25.27438
S.E. of regression	12.04629	Sum squared resid	129295.8
Durbin-Watson stat	1.799763		

Equation: D_EXCHANGE = C(19)*GDP_GROWTH(-1) + C(20)

*INFLATION(-1) + C(21)*D_EXCHANGE(-1) + C(22)
*D_COMMODITY(-1) + C(23)*US_GDP_GROWTH(-1) + C(24)
*US_INFLATION(-1) + C(25)*D_US_FFR(-1) + C(26)
*D_US_EXPORT(-1) + C(27)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.294436	Mean dependent var	2.506123
Adjusted R-squared	0.288101	S.D. dependent var	40.65113
S.E. of regression	34.29902	Sum squared resid	1048193.
Durbin-Watson stat	2.021461		

Equation: D_COMMODITY = C(28)*GDP_GROWTH(-1) + C(29)
*INFLATION(-1) + C(30)*D_EXCHANGE(-1) + C(31)
*D_COMMODITY(-1) + C(32)*US_GDP_GROWTH(-1) + C(33)
*US_INFLATION(-1) + C(34)*D_US_FFR(-1) + C(35)
*D_US_EXPORT(-1) + C(36)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.154877	Mean dependent var	0.191916
Adjusted R-squared	0.147289	S.D. dependent var	15.53226
S.E. of regression	14.34286	Sum squared resid	183294.4
Durbin-Watson stat	2.033450		

Equation: US_GDP_GROWTH = C(37)*GDP_GROWTH(-1) + C(38)
*INFLATION(-1) + C(39)*D_EXCHANGE(-1) + C(40)
*D_COMMODITY(-1) + C(41)*US_GDP_GROWTH(-1) + C(42)
*US_INFLATION(-1) + C(43)*D_US_FFR(-1) + C(44)
*D_US_EXPORT(-1) + C(45)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.296139	Mean dependent var	5.551992
Adjusted R-squared	0.289819	S.D. dependent var	2.837160
S.E. of regression	2.390937	Sum squared resid	5093.473
Durbin-Watson stat	2.180778		

Equation: US_INFLATION = C(46)*GDP_GROWTH(-1) + C(47)
*INFLATION(-1) + C(48)*D_EXCHANGE(-1) + C(49)
*D_COMMODITY(-1) + C(50)*US_GDP_GROWTH(-1) + C(51)
*US_INFLATION(-1) + C(52)*D_US_FFR(-1) + C(53)
*D_US_EXPORT(-1) + C(54)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.642912	Mean dependent var	3.428675
Adjusted R-squared	0.639706	S.D. dependent var	2.419242
S.E. of regression	1.452139	Sum squared resid	1878.857
Durbin-Watson stat	1.515484		

Equation: D_US_FFR = C(55)*GDP_GROWTH(-1) + C(56)*INFLATION(
-1) + C(57)*D_EXCHANGE(-1) + C(58)*D_COMMODITY(-1) +
C(59)*US_GDP_GROWTH(-1) + C(60)*US_INFLATION(-1) +
C(61)*D_US_FFR(-1) + C(62)*D_US_EXPORT(-1) + C(63)
*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.123135	Mean dependent var	-0.013989
Adjusted R-squared	0.115262	S.D. dependent var	1.646054
S.E. of regression	1.548287	Sum squared resid	2135.898

Durbin-Watson stat	1.865468

Equation: D_US_EXPORT = C(64)*GDP_GROWTH(-1) + C(65)
*INFLATION(-1) + C(66)*D_EXCHANGE(-1) + C(67)
*D_COMMODITY(-1) + C(68)*US_GDP_GROWTH(-1) + C(69)
*US_INFLATION(-1) + C(70)*D_US_FFR(-1) + C(71)
*D_US_EXPORT(-1) + C(72)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.072694	Mean dependent var	6.208419
Adjusted R-squared	0.064368	S.D. dependent var	8.182157
S.E. of regression	7.914441	Sum squared resid	55810.79
Durbin-Watson stat	1.849349		

Equation: D_CHN_EXPORT = C(73)*GDP_GROWTH(-1) + C(74)
*INFLATION(-1) + C(75)*D_EXCHANGE(-1) + C(76)
*D_COMMODITY(-1) + C(77)*US_GDP_GROWTH(-1) + C(78)
*US_INFLATION(-1) + C(79)*D_US_FFR(-1) + C(80)
*D_US_EXPORT(-1) + C(81)*D_CHN_EXPORT(-1)
Instruments: GDP_GROWTH(-1) INFLATION(-1) D_EXCHANGE(-1)
D_COMMODITY(-1) US_GDP_GROWTH(-1) US_INFLATION(-1)
D_US_FFR(-1) D_US_EXPORT(-1) D_CHN_EXPORT(-1) C
Observations: 900

R-squared	0.068349	Mean dependent var	12.79972
Adjusted R-squared	0.059984	S.D. dependent var	12.57434
S.E. of regression	12.19137	Sum squared resid	132429.0
Durbin-Watson stat	2.150990		

Appendix 7:

IRF: GDP Growth model

Response of US_GDP_GROWTH:

Period	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	2.368632	0.000000	0.000000
	(0.05615)	(0.00000)	(0.00000)
2	1.036395	-0.590694	0.107109
	(0.07559)	(0.07605)	(0.07212)
3	0.593425	-0.389043	0.027835
	(0.06328)	(0.05035)	(0.05425)
4	0.353132	-0.232444	0.002349
	(0.05087)	(0.03645)	(0.03602)
5	0.210800	-0.138005	-0.002657
	(0.03873)	(0.02637)	(0.02269)
6	0.125778	-0.082073	-0.002660
	(0.02836)	(0.01881)	(0.01397)
7	0.075015	-0.048873	-0.001865
	(0.02019)	(0.01320)	(0.00853)
8	0.044730	-0.029122	-0.001184
	(0.01409)	(0.00914)	(0.00519)
9	0.026669	-0.017358	-0.000725
	(0.00969)	(0.00625)	(0.00316)
10	0.015900	-0.010347	-0.000437
	(0.00659)	(0.00424)	(0.00193)

Response of CHN_GDP_GROWTH:

Period	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	0.780007	7.871429	0.000000
	(0.25959)	(0.18195)	(0.00000)
2	-1.567245	1.493766	0.688274
	(0.23324)	(0.25003)	(0.23623)
3	-1.068954	0.686227	0.245651
	(0.14514)	(0.11091)	(0.12001)
4	-0.641609	0.404838	0.077331
	(0.10490)	(0.07436)	(0.06855)
5	-0.381257	0.244027	0.026211
	(0.07581)	(0.05172)	(0.04158)
6	-0.226787	0.146466	0.010339
	(0.05398)	(0.03603)	(0.02533)
7	-0.135059	0.087596	0.004788
	(0.03782)	(0.02491)	(0.01539)
8	-0.080480	0.052295	0.002499
	(0.02612)	(0.01707)	(0.00934)
9	-0.047970	0.031196	0.001398
	(0.01784)	(0.01160)	(0.00568)
10	-0.028596	0.018603	0.000810
	(0.01208)	(0.00783)	(0.00346)

Response of GDP_GROWTH:

Period	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	2.302345	0.695843	11.36495
	(0.39172)	(0.37934)	(0.26503)
2	0.491549	-0.837774	3.342096
	(0.33956)	(0.37965)	(0.37240)
3	0.316128	-0.423681	0.887947
	(0.23067)	(0.18505)	(0.21516)

4	0.213928	-0.201966	0.227622
	(0.15118)	(0.10447)	(0.09449)
5	0.135621	-0.104937	0.056615
	(0.09604)	(0.06409)	(0.03837)
6	0.083055	-0.058385	0.013270
	(0.05994)	(0.03966)	(0.01627)
7	0.050092	-0.033717	0.002625
	(0.03718)	(0.02450)	(0.00784)
8	0.030013	-0.019819	0.000203
	(0.02305)	(0.01514)	(0.00429)
9	0.017931	-0.011743	-0.000230
	(0.01432)	(0.00938)	(0.00251)
10	0.010700	-0.006982	-0.000228
	(0.00892)	(0.00582)	(0.00151)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: US_GDP_GROWTH CHN_GDP_GROWTH GDP_GROWTH
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 8:

IRF: Inflation model

Response of US_INFLATION:

Period	US_INFLATION	CHN_INFLATION	INFLATION
1	1.239921	0.000000	0.000000
	(0.03395)	(0.00000)	(0.00000)
2	0.610411	0.091492	0.007611
	(0.04440)	(0.03296)	(0.02155)
3	0.297481	0.108950	0.013753
	(0.04155)	(0.03899)	(0.02903)
4	0.143071	0.098037	0.017739
	(0.03107)	(0.03528)	(0.03020)
5	0.067647	0.079004	0.019770
	(0.02133)	(0.02894)	(0.02869)
6	0.031316	0.060131	0.020308
	(0.01430)	(0.02270)	(0.02617)
7	0.014153	0.044260	0.019817
	(0.00973)	(0.01744)	(0.02340)
8	0.006268	0.031904	0.018684
	(0.00689)	(0.01330)	(0.02071)
9	0.002790	0.022692	0.017194
	(0.00513)	(0.01015)	(0.01822)
10	0.001347	0.016004	0.015549
	(0.00399)	(0.00779)	(0.01598)

Response of CHN_INFLATION:

Period	US_INFLATION	CHN_INFLATION	INFLATION
1	0.710662	3.782272	0.000000
	(0.14884)	(0.10070)	(0.00000)
2	0.209984	2.695485	0.149751
	(0.16513)	(0.12768)	(0.07356)
3	0.010774	1.898577	0.232575
	(0.16815)	(0.15758)	(0.11392)
4	-0.053909	1.326712	0.271332
	(0.14638)	(0.16210)	(0.13322)
5	-0.062770	0.922186	0.281997
	(0.11792)	(0.15130)	(0.13931)
6	-0.051668	0.638813	0.275484
	(0.09148)	(0.13346)	(0.13732)
7	-0.036031	0.441634	0.259108
	(0.06995)	(0.11364)	(0.13064)
8	-0.021816	0.305057	0.237662
	(0.05357)	(0.09460)	(0.12147)
9	-0.010781	0.210740	0.214216
	(0.04157)	(0.07765)	(0.11120)
10	-0.002970	0.145726	0.190668
	(0.03293)	(0.06325)	(0.10072)

Response of INFLATION:

Period	US_INFLATION	CHN_INFLATION	INFLATION
1	1.203121	0.770869	13.08637
	(0.50533)	(0.49105)	(0.35462)
2	1.182714	0.582099	11.19404
	(0.59252)	(0.55272)	(0.38523)
3	1.090150	0.455240	9.573323
	(0.67938)	(0.66328)	(0.48453)

4	0.972619	0.365379	8.186105
	(0.67878)	(0.72045)	(0.57078)
5	0.852473	0.298720	6.999230
	(0.63296)	(0.72904)	(0.62984)
6	0.739656	0.247387	5.984039
	(0.56991)	(0.70488)	(0.66354)
7	0.638001	0.206710	5.115853
	(0.50379)	(0.66117)	(0.67656)
8	0.548400	0.173794	4.373477
	(0.44105)	(0.60732)	(0.67361)
9	0.470395	0.146753	3.738736
	(0.38423)	(0.54962)	(0.65876)
10	0.402973	0.124302	3.196057
	(0.33400)	(0.49206)	(0.63535)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: US_INFLATION
CHN_INFLATION INFLATION
Standard errors: Monte Carlo (1000 repetitions)
standard deviations in parentheses

Appendix 9:

IRF: Commodity price (GDP Growth) model

Response of D_COMMODITY:				
Period	D_COMMOD ITY	US_GDP_G ROWTH	CHN_GDP_ GROWTH	GDP_GROW TH
1	15.00350	0.000000	0.000000	0.000000
	(0.37466)	(0.00000)	(0.00000)	(0.00000)
2	-0.089421	-2.981948	-2.345979	0.670511
	(0.51417)	(0.40440)	(0.47755)	(0.48867)
3	-0.861749	-1.219186	0.244963	0.047750
	(0.18212)	(0.24632)	(0.17230)	(0.18695)
4	-0.106777	-0.544998	0.406735	-0.040351
	(0.08010)	(0.13933)	(0.09060)	(0.07272)
5	0.009825	-0.351185	0.182175	-0.012912
	(0.03369)	(0.08644)	(0.04736)	(0.03835)
6	-0.010169	-0.228035	0.093333	-0.003827
	(0.01659)	(0.05824)	(0.02828)	(0.02340)
7	-0.011496	-0.140422	0.059513	-0.002786
	(0.00987)	(0.03987)	(0.01865)	(0.01468)
8	-0.006642	-0.085790	0.037767	-0.002001
	(0.00626)	(0.02730)	(0.01260)	(0.00922)
9	-0.003780	-0.052736	0.023222	-0.001242
	(0.00393)	(0.01869)	(0.00852)	(0.00576)
10	-0.002324	-0.032479	0.014228	-0.000753
	(0.00247)	(0.01277)	(0.00576)	(0.00360)

Response of US_GDP_GROWTH:				
Period	D_COMMOD ITY	US_GDP_G ROWTH	CHN_GDP_ GROWTH	GDP_GROW TH
1	0.969226	2.168622	0.000000	0.000000
	(0.07696)	(0.05166)	(0.00000)	(0.00000)
2	0.285622	1.012469	-0.573021	0.085386
	(0.08606)	(0.06928)	(0.07475)	(0.07774)
3	0.019126	0.605082	-0.325670	0.037038
	(0.04997)	(0.06615)	(0.04827)	(0.05758)
4	0.015347	0.388337	-0.168331	0.011981
	(0.02746)	(0.05454)	(0.02981)	(0.03734)
5	0.017830	0.241329	-0.102467	0.005880
	(0.01629)	(0.04285)	(0.02115)	(0.02394)
6	0.011422	0.147899	-0.064645	0.003656
	(0.01032)	(0.03252)	(0.01540)	(0.01519)
7	0.006619	0.090852	-0.039965	0.002214
	(0.00655)	(0.02396)	(0.01102)	(0.00956)
8	0.004015	0.055929	-0.024524	0.001325
	(0.00414)	(0.01726)	(0.00778)	(0.00599)
9	0.002487	0.034428	-0.015076	0.000805
	(0.00263)	(0.01223)	(0.00544)	(0.00376)
10	0.001534	0.021185	-0.009279	0.000494
	(0.00168)	(0.00856)	(0.00378)	(0.00237)

Response of CHN_GDP_GROWTH:				
Period	D_COMMOD ITY	US_GDP_G ROWTH	CHN_GDP_ GROWTH	GDP_GROW TH
1	3.283260	-0.631590	6.937400	0.000000
	(0.25230)	(0.24474)	(0.16803)	(0.00000)
2	1.323040	-2.160031	0.617316	0.370334
	(0.26717)	(0.21462)	(0.23774)	(0.25884)
3	-0.159440	-1.550165	0.298360	0.142793
	(0.11673)	(0.16849)	(0.11139)	(0.13637)

4	-0.141455	-0.873296	0.367911	0.013270
	(0.06555)	(0.12196)	(0.07009)	(0.07990)
5	-0.040381	-0.517934	0.245144	-0.007008
	(0.03749)	(0.09191)	(0.04801)	(0.05220)
6	-0.019133	-0.320961	0.142672	-0.005497
	(0.02260)	(0.06885)	(0.03312)	(0.03317)
7	-0.013830	-0.198577	0.086162	-0.003784
	(0.01401)	(0.05040)	(0.02333)	(0.02083)
8	-0.008990	-0.122128	0.053318	-0.002610
	(0.00884)	(0.03622)	(0.01645)	(0.01307)
9	-0.005468	-0.075081	0.032918	-0.001695
	(0.00562)	(0.02566)	(0.01150)	(0.00820)
10	-0.003336	-0.046197	0.020249	-0.001061
	(0.00358)	(0.01797)	(0.00798)	(0.00515)

Response of GDP_GROWTH:

Period	D_COMMODITY	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	3.689299	0.988760	-0.438606	10.96590
	(0.37491)	(0.37305)	(0.36038)	(0.26437)
2	0.366105	0.363929	-0.958829	3.265945
	(0.39479)	(0.32861)	(0.38041)	(0.37078)
3	-0.047680	0.430665	-0.304832	0.913135
	(0.15035)	(0.25845)	(0.17793)	(0.20993)
4	0.024198	0.339135	-0.131032	0.253732
	(0.04784)	(0.17646)	(0.08119)	(0.09360)
5	0.026458	0.216473	-0.091649	0.074861
	(0.01992)	(0.11574)	(0.05092)	(0.04082)
6	0.012430	0.133554	-0.060385	0.023407
	(0.01182)	(0.07511)	(0.03326)	(0.01965)
7	0.006184	0.082825	-0.036942	0.007704
	(0.00736)	(0.04861)	(0.02145)	(0.01073)
8	0.003734	0.051289	-0.022520	0.002803
	(0.00461)	(0.03146)	(0.01383)	(0.00636)
9	0.002324	0.031635	-0.013856	0.001188
	(0.00291)	(0.02040)	(0.00895)	(0.00393)
10	0.001423	0.019479	-0.008538	0.000582
	(0.00185)	(0.01328)	(0.00581)	(0.00246)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: D_COMMODITY US_GDP_GROWTH CHN_GDP_GROWTH GDP_GROWTH
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 10:

IRF: Commodity price (Inflation) model

Response of D_COMMODITY:

Period	D_COMMODITY	US_INFLATION	CHN_INFLATION	INFLATION
1	15.04977	0.000000	0.000000	0.000000
	(0.40026)	(0.00000)	(0.00000)	(0.00000)
2	-1.038782	-3.443610	-0.190118	0.024436
	(0.57768)	(0.40075)	(0.43496)	(0.28327)
3	-2.385527	-1.960086	-0.538899	-0.042630
	(0.31356)	(0.26237)	(0.28419)	(0.23181)
4	-1.209292	-0.702101	-0.583613	-0.091869
	(0.23229)	(0.13332)	(0.17593)	(0.17503)
5	-0.385973	-0.168717	-0.476048	-0.113703
	(0.11649)	(0.09734)	(0.12589)	(0.14263)
6	-0.066329	-0.018515	-0.346427	-0.118379
	(0.07032)	(0.06576)	(0.09334)	(0.12181)
7	0.012071	0.002475	-0.241875	-0.114479
	(0.04525)	(0.03919)	(0.07042)	(0.10620)
8	0.015826	-0.003222	-0.167527	-0.106676
	(0.02714)	(0.02585)	(0.05447)	(0.09330)
9	0.007246	-0.008333	-0.116547	-0.097259
	(0.01808)	(0.01978)	(0.04300)	(0.08208)
10	0.001220	-0.009871	-0.081623	-0.087378
	(0.01387)	(0.01595)	(0.03443)	(0.07214)

Response of US_INFLATION:

Period	D_COMMODITY	US_INFLATION	CHN_INFLATION	INFLATION
1	0.851932	0.888974	0.000000	0.000000
	(0.04157)	(0.02538)	(0.00000)	(0.00000)
2	0.578191	0.373344	0.097524	0.015433
	(0.05059)	(0.03334)	(0.03617)	(0.02334)
3	0.221988	0.105798	0.105984	0.023726
	(0.03707)	(0.03717)	(0.04512)	(0.03248)
4	0.054290	0.016539	0.083730	0.026303
	(0.02683)	(0.02596)	(0.03902)	(0.03223)
5	0.003114	-0.001745	0.059461	0.025957
	(0.01726)	(0.01409)	(0.02978)	(0.02876)
6	-0.005098	-0.001425	0.040983	0.024356
	(0.00935)	(0.00762)	(0.02189)	(0.02494)
7	-0.003252	0.000826	0.028269	0.022275
	(0.00522)	(0.00521)	(0.01608)	(0.02159)
8	-0.001033	0.001913	0.019680	0.020053
	(0.00367)	(0.00410)	(0.01197)	(0.01874)
9	9.84E-05	0.002110	0.013818	0.017852
	(0.00289)	(0.00334)	(0.00907)	(0.01632)
10	0.000516	0.001954	0.009760	0.015758
	(0.00234)	(0.00279)	(0.00700)	(0.01423)

Response of CHN_INFLATION:

Period	D_COMMODITY	US_INFLATION	CHN_INFLATION	INFLATION
1	0.518942	0.520208	3.721942	0.000000
	(0.14708)	(0.14607)	(0.09836)	(0.00000)
2	0.129556	0.165656	2.648647	0.152289
	(0.17172)	(0.14438)	(0.12743)	(0.07242)
3	-0.039694	0.048869	1.861963	0.234358
	(0.14657)	(0.15068)	(0.15694)	(0.11210)

4	-0.068873	0.026823	1.301513	0.271810
	(0.12280)	(0.12941)	(0.16129)	(0.13104)
5	-0.051890	0.028348	0.908669	0.281721
	(0.09622)	(0.09960)	(0.15103)	(0.13712)
6	-0.030203	0.030967	0.635012	0.275090
	(0.07174)	(0.07400)	(0.13402)	(0.13542)
7	-0.014494	0.030919	0.444535	0.258993
	(0.05304)	(0.05543)	(0.11504)	(0.12919)
8	-0.004801	0.029031	0.311796	0.237988
	(0.03995)	(0.04269)	(0.09671)	(0.12054)
9	0.000831	0.026374	0.219147	0.214990
	(0.03094)	(0.03394)	(0.08031)	(0.11080)
10	0.003984	0.023547	0.154387	0.191819
	(0.02464)	(0.02775)	(0.06625)	(0.10080)

Response of INFLATION:

Period	D_COMMOD ITY	US_INFLATI ON	CHN_INFLA TION	INFLATION
1	0.717413	1.080436	0.783086	13.21012
	(0.51459)	(0.51536)	(0.50922)	(0.34598)
2	0.518430	1.113140	0.580495	11.29089
	(0.65063)	(0.57952)	(0.58025)	(0.39629)
3	0.590511	1.095499	0.458607	9.649922
	(0.63578)	(0.66018)	(0.69622)	(0.51207)
4	0.599885	0.995176	0.381522	8.248519
	(0.59436)	(0.64151)	(0.75674)	(0.60799)
5	0.548897	0.866589	0.324772	7.051314
	(0.52949)	(0.57347)	(0.76757)	(0.67255)
6	0.478176	0.742709	0.278151	6.028129
	(0.45789)	(0.49809)	(0.74437)	(0.70913)
7	0.409483	0.634081	0.238257	5.153478
	(0.39269)	(0.43046)	(0.70040)	(0.72330)
8	0.349377	0.541363	0.203896	4.405739
	(0.33707)	(0.37284)	(0.64536)	(0.72031)
9	0.298207	0.462513	0.174379	3.766489
	(0.29011)	(0.32396)	(0.58586)	(0.70460)
10	0.254752	0.395320	0.149094	3.219987
	(0.25025)	(0.28223)	(0.52613)	(0.67976)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: D_COMMODITY US_INFLATION CHN_INFLATION INFLATION
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 11:

IRF: Trade linkage (GDP Growth) model

Response of US_EXPORT_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	7.656669	0.000000	0.000000	0.000000	0.000000
	(0.17368)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
2	1.413116	1.357773	0.166396	-0.980392	1.314928
	(0.25609)	(0.23576)	(0.18927)	(0.23239)	(0.24488)
3	-0.136686	0.317908	0.358149	-0.413656	0.775869
	(0.13349)	(0.14866)	(0.15194)	(0.10106)	(0.13896)
4	-0.153574	-0.089214	0.356282	-0.096695	0.220571
	(0.06597)	(0.07059)	(0.10567)	(0.04853)	(0.06604)
5	-0.031819	-0.098779	0.265876	-0.031516	0.014831
	(0.03317)	(0.03569)	(0.07212)	(0.02370)	(0.02967)
6	0.006524	-0.050299	0.178632	-0.028530	-0.017930
	(0.01778)	(0.02085)	(0.04982)	(0.01425)	(0.01625)
7	0.007043	-0.024953	0.117619	-0.025031	-0.011834
	(0.01080)	(0.01301)	(0.03499)	(0.00967)	(0.01048)
8	0.003200	-0.015343	0.077989	-0.018103	-0.005978
	(0.00690)	(0.00845)	(0.02488)	(0.00674)	(0.00694)
9	0.001477	-0.010612	0.052056	-0.012029	-0.003509
	(0.00451)	(0.00567)	(0.01785)	(0.00476)	(0.00461)
10	0.000931	-0.007322	0.034801	-0.007898	-0.002379
	(0.00301)	(0.00389)	(0.01287)	(0.00337)	(0.00308)

Response of CHN_EXPORT_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	7.988389	8.097112	0.000000	0.000000	0.000000
	(0.31865)	(0.19461)	(0.00000)	(0.00000)	(0.00000)
2	-0.529497	4.066213	-0.298178	-1.966116	2.150217
	(0.39315)	(0.36472)	(0.28775)	(0.34142)	(0.35751)
3	-1.175129	0.502547	0.114108	-0.455072	1.011399
	(0.22910)	(0.24287)	(0.24960)	(0.17594)	(0.23406)
4	-0.391509	-0.234591	0.203078	0.052054	0.129692
	(0.11195)	(0.11939)	(0.17404)	(0.08042)	(0.10868)
5	-0.030251	-0.134914	0.139583	0.047833	-0.070128
	(0.05072)	(0.05372)	(0.11306)	(0.03616)	(0.04198)
6	0.024613	-0.031611	0.079460	-0.000407	-0.044500
	(0.02154)	(0.02687)	(0.07344)	(0.01888)	(0.01836)
7	0.011109	-0.004785	0.047245	-0.012269	-0.012421
	(0.00958)	(0.01457)	(0.04872)	(0.01138)	(0.00954)
8	0.001928	-0.003419	0.030662	-0.009067	-0.002141
	(0.00476)	(0.00840)	(0.03280)	(0.00755)	(0.00525)
9	7.07E-05	-0.003854	0.020653	-0.005219	-0.000787
	(0.00264)	(0.00529)	(0.02223)	(0.00514)	(0.00309)
10	0.000161	-0.003051	0.013914	-0.003131	-0.000810
	(0.00164)	(0.00354)	(0.01513)	(0.00349)	(0.00194)

Response of US_GDP_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	1.629112	-0.210483	1.574427	0.000000	0.000000
	(0.06377)	(0.05423)	(0.03784)	(0.00000)	(0.00000)
2	0.283573	0.212322	1.036635	-0.435910	0.203723

	(0.08106)	(0.07717)	(0.06218)	(0.07127)	(0.07331)
3	-0.050749	-0.037853	0.735520	-0.248763	0.121315
	(0.05778)	(0.06275)	(0.06083)	(0.04345)	(0.05639)
4	-0.035419	-0.112233	0.515383	-0.119234	0.013566
	(0.04037)	(0.04411)	(0.05503)	(0.02824)	(0.03944)
5	-0.000661	-0.085626	0.349440	-0.070885	-0.021070
	(0.02803)	(0.02993)	(0.04793)	(0.01976)	(0.02701)
6	0.007619	-0.052559	0.232982	-0.049482	-0.019457
	(0.01909)	(0.02036)	(0.04006)	(0.01445)	(0.01850)
7	0.005744	-0.032659	0.154968	-0.034672	-0.012269
	(0.01282)	(0.01400)	(0.03235)	(0.01058)	(0.01260)
8	0.003363	-0.021461	0.103306	-0.023505	-0.007500
	(0.00859)	(0.00972)	(0.02547)	(0.00773)	(0.00852)
9	0.002050	-0.014443	0.068977	-0.015665	-0.004850
	(0.00578)	(0.00681)	(0.01969)	(0.00565)	(0.00575)
10	0.001352	-0.009712	0.046072	-0.010419	-0.003247
	(0.00391)	(0.00479)	(0.01502)	(0.00412)	(0.00389)

Response of CHN_GDP_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	1.656202	0.948197	-0.759141	6.952164	0.000000
	(0.24078)	(0.22821)	(0.24337)	(0.15730)	(0.00000)
2	0.021043	2.915214	-1.567718	0.153393	-0.225645
	(0.25971)	(0.24264)	(0.18665)	(0.22115)	(0.22761)
3	-0.639197	1.024964	-1.203693	-0.084067	0.270648
	(0.14990)	(0.16140)	(0.15464)	(0.10708)	(0.13266)
4	-0.331289	0.189580	-0.785684	0.151115	0.104886
	(0.09289)	(0.09674)	(0.12459)	(0.06239)	(0.08388)
5	-0.080602	0.053236	-0.523024	0.153876	0.001057
	(0.05239)	(0.05455)	(0.09735)	(0.03720)	(0.05000)
6	-0.006965	0.056717	-0.356985	0.095625	-0.003826
	(0.03079)	(0.03302)	(0.07546)	(0.02502)	(0.03078)
7	-0.000589	0.050956	-0.242873	0.056255	0.007342
	(0.01973)	(0.02245)	(0.05828)	(0.01779)	(0.01993)
8	-0.003089	0.036146	-0.163370	0.035867	0.010112
	(0.01338)	(0.01585)	(0.04466)	(0.01293)	(0.01332)
9	-0.003273	0.023593	-0.109161	0.024161	0.007957
	(0.00915)	(0.01119)	(0.03391)	(0.00943)	(0.00904)
10	-0.002334	0.015386	-0.072826	0.016376	0.005330
	(0.00623)	(0.00788)	(0.02551)	(0.00687)	(0.00616)

Response of GDP_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	4.237190	1.795669	-1.332250	-0.264494	10.46109
	(0.37149)	(0.35881)	(0.35363)	(0.34480)	(0.25735)
2	-0.125050	0.853828	0.391975	-0.535729	3.517163
	(0.39001)	(0.36756)	(0.30021)	(0.37012)	(0.37234)
3	-0.421493	-0.058300	0.679984	-0.167955	0.951017
	(0.21625)	(0.23472)	(0.24572)	(0.15078)	(0.21372)
4	-0.138903	-0.189609	0.556400	-0.055077	0.144509
	(0.10176)	(0.10577)	(0.18077)	(0.06679)	(0.09878)
5	-0.009746	-0.113258	0.382603	-0.051705	-0.021665
	(0.04889)	(0.04890)	(0.12671)	(0.03694)	(0.04536)
6	0.011123	-0.056985	0.252200	-0.049427	-0.026727
	(0.02549)	(0.03041)	(0.08727)	(0.02316)	(0.02475)
7	0.007005	-0.033281	0.166532	-0.037688	-0.014548
	(0.01538)	(0.01977)	(0.06021)	(0.01554)	(0.01549)
8	0.003392	-0.022410	0.110837	-0.025601	-0.008036
	(0.00997)	(0.01290)	(0.04194)	(0.01076)	(0.01008)
9	0.002011	-0.015461	0.074025	-0.016870	-0.005144
	(0.00658)	(0.00867)	(0.02951)	(0.00752)	(0.00665)

10	0.001404	-0.010465	0.049453	-0.011165	-0.003493
	(0.00439)	(0.00595)	(0.02093)	(0.00527)	(0.00444)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: US_EXPORT_GROWTH CHN_EXPORT_GROWTH
US_GDP_GROWTH CHN_GDP_GROWTH GDP_GROWTH
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 12:

IRF: Trade linkage (Inflation) model

Response of US_EXPORT_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_INFLATION	CHN_INFLATION	INFLATION
1	7.622695	0.000000	0.000000	0.000000	0.000000
	(0.20606)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
2	0.297946	1.729605	-0.099242	0.854050	0.100371
	(0.29260)	(0.25921)	(0.22324)	(0.21182)	(0.14402)
3	-0.594856	0.944274	0.040948	0.683075	0.135076
	(0.17970)	(0.14546)	(0.14461)	(0.15863)	(0.13325)
4	-0.237969	0.378454	0.069661	0.422871	0.140030
	(0.10654)	(0.09688)	(0.08818)	(0.11218)	(0.11164)
5	-0.020083	0.174682	0.048065	0.262773	0.134764
	(0.05850)	(0.07170)	(0.05960)	(0.08331)	(0.09714)
6	0.025585	0.110022	0.026553	0.173985	0.125640
	(0.03668)	(0.04858)	(0.04175)	(0.06341)	(0.08640)
7	0.020056	0.077525	0.014603	0.119496	0.114701
	(0.02376)	(0.03471)	(0.03009)	(0.04867)	(0.07708)
8	0.012349	0.053086	0.008828	0.082658	0.103045
	(0.01731)	(0.02622)	(0.02224)	(0.03760)	(0.06851)
9	0.009122	0.034776	0.005861	0.057067	0.091454
	(0.01367)	(0.02028)	(0.01679)	(0.02928)	(0.06064)
10	0.007967	0.022148	0.004129	0.039404	0.080441
	(0.01115)	(0.01591)	(0.01296)	(0.02301)	(0.05350)

Response of CHN_EXPORT_GROWTH:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_INFLATION	CHN_INFLATION	INFLATION
1	6.792862	8.076807	0.000000	0.000000	0.000000
	(0.35423)	(0.21624)	(0.00000)	(0.00000)	(0.00000)
2	-3.555330	4.774211	0.567389	1.232185	0.149298
	(0.45919)	(0.36887)	(0.31267)	(0.29991)	(0.19760)
3	-1.735768	1.319286	0.654790	0.644753	0.160350
	(0.32053)	(0.27855)	(0.27260)	(0.26934)	(0.22087)
4	-0.162822	0.216096	0.427418	0.269035	0.145475
	(0.20111)	(0.19639)	(0.19716)	(0.21717)	(0.21152)
5	0.192852	0.067833	0.223123	0.149912	0.131954
	(0.11596)	(0.12614)	(0.11951)	(0.15983)	(0.18686)
6	0.138076	0.079005	0.109679	0.112911	0.120291
	(0.06214)	(0.08941)	(0.07080)	(0.11476)	(0.16291)
7	0.062162	0.071914	0.055871	0.088140	0.108752
	(0.03697)	(0.06419)	(0.04518)	(0.08268)	(0.14243)
8	0.027632	0.051083	0.030288	0.065455	0.097137
	(0.02587)	(0.04547)	(0.03118)	(0.06021)	(0.12455)
9	0.015987	0.032582	0.017180	0.046857	0.085871
	(0.01970)	(0.03293)	(0.02267)	(0.04445)	(0.10870)
10	0.011631	0.020173	0.010042	0.033088	0.075326
	(0.01588)	(0.02451)	(0.01713)	(0.03333)	(0.09466)

Response of US_INFLATION:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_INFLATION	CHN_INFLATION	INFLATION
1	0.914923	-0.106847	0.811793	0.000000	0.000000
	(0.04035)	(0.03126)	(0.02182)	(0.00000)	(0.00000)
2	0.493091	0.106929	0.389223	0.065221	0.008095

	(0.04827)	(0.04522)	(0.03711)	(0.03258)	(0.02261)
3	0.183710	0.140434	0.195283	0.088215	0.015143
	(0.03817)	(0.04050)	(0.03754)	(0.03788)	(0.03071)
4	0.065811	0.101982	0.102978	0.077607	0.018952
	(0.02715)	(0.02724)	(0.02856)	(0.03369)	(0.03127)
5	0.030111	0.063906	0.055448	0.058926	0.020315
	(0.01670)	(0.01964)	(0.01997)	(0.02726)	(0.02922)
6	0.017346	0.039857	0.029886	0.042609	0.020200
	(0.01040)	(0.01504)	(0.01374)	(0.02112)	(0.02645)
7	0.010498	0.025658	0.016097	0.030345	0.019236
	(0.00701)	(0.01144)	(0.00952)	(0.01601)	(0.02359)
8	0.006304	0.016828	0.008734	0.021451	0.017807
	(0.00502)	(0.00861)	(0.00669)	(0.01203)	(0.02085)
9	0.003888	0.011046	0.004822	0.015072	0.016160
	(0.00378)	(0.00647)	(0.00481)	(0.00903)	(0.01832)
10	0.002577	0.007193	0.002733	0.010541	0.014455
	(0.00297)	(0.00488)	(0.00355)	(0.00682)	(0.01604)

Response of CHN_INFLATION:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_INFLATION	CHN_INFLATION	INFLATION
1	1.160414	0.318045	-0.429446	3.463839	0.000000
	(0.13947)	(0.13976)	(0.13264)	(0.09284)	(0.00000)
2	0.722492	1.165570	-0.397915	2.374662	0.150850
	(0.17363)	(0.15927)	(0.14416)	(0.11854)	(0.06842)
3	-0.001146	1.159763	-0.244473	1.679299	0.238404
	(0.15916)	(0.15660)	(0.15711)	(0.14296)	(0.10783)
4	-0.155357	0.827431	-0.117995	1.148590	0.276423
	(0.12919)	(0.12919)	(0.14426)	(0.14457)	(0.12711)
5	-0.098921	0.533990	-0.049054	0.768610	0.283675
	(0.09694)	(0.10360)	(0.12027)	(0.13288)	(0.13323)
6	-0.037434	0.342319	-0.017640	0.512794	0.273725
	(0.07106)	(0.08266)	(0.09431)	(0.11492)	(0.13096)
7	-0.006058	0.222957	-0.004154	0.344091	0.254799
	(0.05231)	(0.06602)	(0.07152)	(0.09564)	(0.12393)
8	0.006787	0.146262	0.001560	0.232473	0.231743
	(0.03927)	(0.05282)	(0.05359)	(0.07783)	(0.11455)
9	0.011837	0.095519	0.003821	0.157972	0.207440
	(0.03032)	(0.04227)	(0.04027)	(0.06262)	(0.10427)
10	0.013696	0.061694	0.004471	0.107920	0.183586
	(0.02408)	(0.03385)	(0.03067)	(0.05019)	(0.09394)

Response of INFLATION:

Period	US_EXPORT_GROWTH	CHN_EXPORT_GROWTH	US_INFLATION	CHN_INFLATION	INFLATION
1	1.020933	0.372476	0.877524	1.022421	13.04912
	(0.49789)	(0.47864)	(0.49454)	(0.48286)	(0.35022)
2	1.174073	-0.273525	0.635377	0.779535	11.16942
	(0.63709)	(0.58070)	(0.58151)	(0.52609)	(0.38058)
3	1.210121	-0.415395	0.438712	0.609765	9.556870
	(0.62390)	(0.63274)	(0.65424)	(0.61038)	(0.48326)
4	1.059432	-0.386189	0.308169	0.501691	8.176724
	(0.57385)	(0.59222)	(0.65058)	(0.65558)	(0.57251)
5	0.882246	-0.336787	0.228043	0.419943	6.995481
	(0.50434)	(0.53861)	(0.60596)	(0.65946)	(0.63367)
6	0.736238	-0.295619	0.177433	0.351647	5.984306
	(0.43827)	(0.48906)	(0.54536)	(0.63334)	(0.66872)
7	0.621521	-0.260463	0.142928	0.294139	5.118775
	(0.38112)	(0.44181)	(0.48176)	(0.58958)	(0.68263)
8	0.528469	-0.228499	0.117650	0.246328	4.378046
	(0.33183)	(0.39599)	(0.42112)	(0.53752)	(0.68028)
9	0.450701	-0.199232	0.098172	0.206829	3.744242
	(0.28908)	(0.35225)	(0.36592)	(0.48313)	(0.66584)

10	0.384826	-0.172852	0.082644	0.174167	3.202011
	(0.25201)	(0.31144)	(0.31687)	(0.42994)	(0.64272)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: US_EXPORT_GROWTH CHN_EXPORT_GROWTH US_INFLATION CHN_INFLATION INFLATION
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 13:

IRF: Financial linkage (GDP Growth) model

Response of D_EXCHANGE:

Period	D_EXCHANGE	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	41.33892	0.000000	0.000000	0.000000
	(0.94659)	(0.00000)	(0.00000)	(0.00000)
2	13.27378	1.509799	-0.098645	0.242807
	(1.35757)	(1.20943)	(1.23416)	(1.29666)
3	4.252487	1.164987	-0.436703	0.208249
	(0.86325)	(0.90640)	(0.67109)	(0.79296)
4	1.364976	0.768344	-0.399382	0.096950
	(0.42844)	(0.61629)	(0.40884)	(0.36822)
5	0.438112	0.482366	-0.281989	0.033456
	(0.19697)	(0.39870)	(0.25923)	(0.15784)
6	0.139913	0.295780	-0.181640	0.007829
	(0.09066)	(0.25102)	(0.16284)	(0.06951)
7	0.044059	0.179073	-0.112458	-0.000366
	(0.04423)	(0.15598)	(0.10117)	(0.03398)
8	0.013445	0.107648	-0.068330	-0.002138
	(0.02352)	(0.09644)	(0.06251)	(0.01859)
9	0.003825	0.064453	-0.041130	-0.001972
	(0.01344)	(0.05960)	(0.03858)	(0.01088)
10	0.000907	0.038504	-0.024637	-0.001421
	(0.00800)	(0.03690)	(0.02384)	(0.00654)

Response of US_GDP_GROWTH:

Period	D_EXCHANGE	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	-0.020357	2.370856	0.000000	0.000000
	(0.08215)	(0.05476)	(0.00000)	(0.00000)
2	-0.040755	1.037170	-0.589743	0.111758
	(0.08637)	(0.07193)	(0.07124)	(0.07518)
3	-0.013293	0.595187	-0.386139	0.023874
	(0.06461)	(0.06125)	(0.04850)	(0.05765)
4	-0.005314	0.354476	-0.230228	-0.002150
	(0.04381)	(0.04960)	(0.03523)	(0.03852)
5	-0.003029	0.211611	-0.136593	-0.005905
	(0.02816)	(0.03804)	(0.02557)	(0.02430)
6	-0.001976	0.126218	-0.081199	-0.004746
	(0.01758)	(0.02804)	(0.01832)	(0.01496)
7	-0.001290	0.075236	-0.048331	-0.003151
	(0.01082)	(0.02008)	(0.01291)	(0.00912)
8	-0.000820	0.044832	-0.028782	-0.001963
	(0.00661)	(0.01408)	(0.00896)	(0.00554)
9	-0.000509	0.026710	-0.017144	-0.001192
	(0.00403)	(0.00972)	(0.00615)	(0.00337)
10	-0.000311	0.015912	-0.010213	-0.000717
	(0.00246)	(0.00663)	(0.00418)	(0.00205)

Response of CHN_GDP_GROWTH:

Period	D_EXCHANGE	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	0.181209	0.770714	7.846451	0.000000
	(0.25609)	(0.26191)	(0.18340)	(0.00000)
2	-0.085365	-1.584228	1.460800	0.787041
	(0.26085)	(0.23437)	(0.24599)	(0.25115)
3	0.004667	-1.071877	0.673978	0.286213
	(0.14447)	(0.14776)	(0.11185)	(0.12954)

4	0.017910	-0.640606	0.398413	0.094536
	(0.08562)	(0.10701)	(0.07472)	(0.07341)
5	0.012340	-0.379648	0.239879	0.034593
	(0.05233)	(0.07728)	(0.05196)	(0.04420)
6	0.006882	-0.225415	0.143715	0.014828
	(0.03200)	(0.05497)	(0.03616)	(0.02685)
7	0.003676	-0.134054	0.085806	0.007314
	(0.01949)	(0.03849)	(0.02497)	(0.01630)
8	0.001982	-0.079789	0.051155	0.003955
	(0.01186)	(0.02658)	(0.01709)	(0.00990)
9	0.001095	-0.047511	0.030480	0.002249
	(0.00721)	(0.01815)	(0.01160)	(0.00601)
10	0.000620	-0.028296	0.018157	0.001310
	(0.00439)	(0.01229)	(0.00782)	(0.00366)

Response of GDP_GROWTH:

Period	D_EXCHANGE	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	-2.570276	2.286641	0.788241	11.06966
	(0.39445)	(0.38093)	(0.36742)	(0.26699)
2	-0.395281	0.485228	-0.791411	3.289332
	(0.38265)	(0.35654)	(0.37422)	(0.38803)
3	0.020971	0.324654	-0.403788	0.872434
	(0.22286)	(0.23732)	(0.18081)	(0.22201)
4	0.046404	0.224135	-0.196989	0.222860
	(0.10235)	(0.15432)	(0.10235)	(0.09817)
5	0.024580	0.143631	-0.105314	0.054868
	(0.04447)	(0.09800)	(0.06290)	(0.04102)
6	0.009958	0.088526	-0.059932	0.012332
	(0.02022)	(0.06133)	(0.03896)	(0.01832)
7	0.003462	0.053592	-0.035111	0.001987
	(0.01020)	(0.03820)	(0.02413)	(0.00929)
8	0.001016	0.032176	-0.020808	-0.000245
	(0.00568)	(0.02382)	(0.01498)	(0.00521)
9	0.000203	0.019242	-0.012381	-0.000533
	(0.00334)	(0.01490)	(0.00934)	(0.00307)
10	-2.66E-05	0.011485	-0.007376	-0.000424
	(0.00202)	(0.00936)	(0.00585)	(0.00184)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: D_EXCHANGE US_GDP_GROWTH CHN_GDP_GROWTH GDP_GROWTH
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 14:

IRF: Financial linkage (Inflation) model

Response of D_EXCHANGE:

Period	D_EXCHANGE	US_INFLATION	CHN_INFLATION	INFLATION
1	40.82400	0.000000	0.000000	0.000000
	(1.11802)	(0.00000)	(0.00000)	(0.00000)
2	2.505554	2.816103	1.460500	10.34591
	(1.60173)	(1.38607)	(1.18469)	(0.90448)
3	2.911638	1.824607	1.124950	8.658301
	(0.60959)	(0.89409)	(0.95082)	(0.70434)
4	2.530338	1.323555	0.860644	7.428604
	(0.52172)	(0.72868)	(0.84944)	(0.70203)
5	2.191196	1.022139	0.647523	6.369049
	(0.46544)	(0.63944)	(0.78208)	(0.70460)
6	1.887401	0.825637	0.484009	5.458973
	(0.41993)	(0.56510)	(0.72251)	(0.70213)
7	1.620795	0.686116	0.361678	4.677164
	(0.38087)	(0.49648)	(0.66271)	(0.69161)
8	1.389354	0.579658	0.271354	4.005818
	(0.34638)	(0.43389)	(0.60204)	(0.67326)
9	1.189687	0.494099	0.205027	3.429663
	(0.31545)	(0.37807)	(0.54196)	(0.64843)
10	1.018058	0.423034	0.156330	2.935505
	(0.28742)	(0.32905)	(0.48411)	(0.61874)

Response of US_INFLATION:

Period	D_EXCHANGE	US_INFLATION	CHN_INFLATION	INFLATION
1	-0.038473	1.235980	0.000000	0.000000
	(0.04787)	(0.03194)	(0.00000)	(0.00000)
2	-0.109645	0.609262	0.096359	0.038821
	(0.05251)	(0.04356)	(0.03443)	(0.02623)
3	-0.045961	0.291470	0.110690	0.028599
	(0.02789)	(0.04157)	(0.04084)	(0.03033)
4	-0.017020	0.137654	0.098039	0.024909
	(0.01764)	(0.03121)	(0.03686)	(0.03068)
5	-0.003282	0.063883	0.078161	0.023010
	(0.01297)	(0.02152)	(0.03005)	(0.02876)
6	0.002898	0.029031	0.058992	0.021546
	(0.01041)	(0.01457)	(0.02336)	(0.02596)
7	0.005380	0.012911	0.043116	0.020048
	(0.00869)	(0.01007)	(0.01776)	(0.02300)
8	0.006086	0.005680	0.030887	0.018424
	(0.00738)	(0.00725)	(0.01340)	(0.02017)
9	0.005970	0.002579	0.021843	0.016713
	(0.00632)	(0.00546)	(0.01011)	(0.01762)
10	0.005504	0.001339	0.015320	0.014987
	(0.00545)	(0.00428)	(0.00768)	(0.01535)

Response of CHN_INFLATION:

Period	D_EXCHANGE	US_INFLATION	CHN_INFLATION	INFLATION
1	0.141338	0.708663	3.781040	0.000000
	(0.14157)	(0.14982)	(0.10331)	(0.00000)
2	0.046480	0.212058	2.698319	0.178183
	(0.16788)	(0.16843)	(0.12695)	(0.07959)
3	0.106370	0.007613	1.896925	0.237350
	(0.11867)	(0.17338)	(0.15459)	(0.10678)

4	0.123692	-0.056190	1.322760	0.265220
	(0.08980)	(0.15089)	(0.15762)	(0.12171)
5	0.123196	-0.063178	0.917308	0.270910
	(0.07134)	(0.12114)	(0.14600)	(0.12625)
6	0.114752	-0.050571	0.633826	0.262557
	(0.05917)	(0.09356)	(0.12785)	(0.12403)
7	0.103300	-0.034029	0.436963	0.245974
	(0.05063)	(0.07120)	(0.10806)	(0.11777)
8	0.091239	-0.019400	0.300882	0.225148
	(0.04416)	(0.05428)	(0.08928)	(0.10934)
9	0.079688	-0.008278	0.207107	0.202706
	(0.03888)	(0.04196)	(0.07273)	(0.09997)
10	0.069121	-0.000567	0.142614	0.180307
	(0.03438)	(0.03315)	(0.05881)	(0.09042)

Response of INFLATION:

Period	D_EXCHANGE	US_INFLATION	CHN_INFLATION	INFLATION
1	4.128525	1.353557	0.596773	12.42073
	(0.50490)	(0.47217)	(0.47078)	(0.33791)
2	3.709913	1.309567	0.423601	10.56395
	(0.64878)	(0.60319)	(0.54315)	(0.39269)
3	3.151552	1.209194	0.321341	9.038738
	(0.56624)	(0.69524)	(0.66073)	(0.47560)
4	2.686362	1.078573	0.252480	7.730218
	(0.50703)	(0.69191)	(0.72201)	(0.55329)
5	2.292470	0.944688	0.203540	6.609931
	(0.45746)	(0.64266)	(0.73323)	(0.60744)
6	1.957686	0.819053	0.167038	5.651347
	(0.41507)	(0.57694)	(0.71067)	(0.63842)
7	1.672466	0.706013	0.138757	4.831425
	(0.37796)	(0.50904)	(0.66782)	(0.65014)
8	1.429136	0.606526	0.116220	4.130264
	(0.34492)	(0.44522)	(0.61428)	(0.64687)
9	1.221373	0.520028	0.097892	3.530748
	(0.31510)	(0.38779)	(0.55653)	(0.63239)
10	1.043897	0.445343	0.082776	3.018187
	(0.28793)	(0.33723)	(0.49868)	(0.60984)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: D_EXCHANGE US_INFLATION CHN_INFLATION INFLATION
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 15:

FEVD: GDP Growth model

Variance Decomposition of US_GDP_GROWTH:

Period	S.E.	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	2.368632	100.0000	0.000000	0.000000
		(0.00000)	(0.00000)	(0.00000)
2	2.654228	94.88437	4.952782	0.162844
		(1.25523)	(1.23233)	(0.25651)
3	2.747582	93.21093	6.626844	0.162229
		(1.59497)	(1.57452)	(0.30580)
4	2.779918	92.66873	7.172726	0.158549
		(1.71668)	(1.69691)	(0.31629)
5	2.791314	92.48393	7.358719	0.157347
		(1.76406)	(1.74447)	(0.31905)
6	2.795353	92.41934	7.423674	0.156983
		(1.78298)	(1.76345)	(0.31987)
7	2.796787	92.39653	7.446600	0.156867
		(1.79057)	(1.77108)	(0.32012)
8	2.797297	92.38845	7.454726	0.156828
		(1.79362)	(1.77415)	(0.32020)
9	2.797478	92.38557	7.457611	0.156814
		(1.79484)	(1.77538)	(0.32023)
10	2.797542	92.38455	7.458636	0.156809
		(1.79533)	(1.77588)	(0.32024)

Variance Decomposition of CHN_GDP_GROWTH:

Period	S.E.	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	7.909982	0.972402	99.02760	0.000000
		(0.63687)	(0.63687)	(0.00000)
2	8.229771	4.524888	94.77568	0.699435
		(1.07615)	(1.20391)	(0.49594)
3	8.330849	6.062171	93.16832	0.769513
		(1.38620)	(1.51308)	(0.56367)
4	8.365679	6.600016	92.62832	0.771663
		(1.51963)	(1.64042)	(0.57140)
5	8.377957	6.787773	92.44184	0.770382
		(1.57693)	(1.69461)	(0.57211)
6	8.382312	6.853922	92.37634	0.769734
		(1.60125)	(1.71757)	(0.57208)
7	8.383859	6.877344	92.35317	0.769482
		(1.61146)	(1.72721)	(0.57202)
8	8.384409	6.885656	92.34495	0.769390
		(1.61570)	(1.73122)	(0.57199)
9	8.384605	6.888608	92.34203	0.769357
		(1.61746)	(1.73288)	(0.57198)
10	8.384674	6.889657	92.34100	0.769346
		(1.61818)	(1.73357)	(0.57198)

Variance Decomposition of GDP_GROWTH:

Period	S.E.	US_GDP_GROWTH	CHN_GDP_GROWTH	GDP_GROWTH
1	11.61667	3.928055	0.358806	95.71314
		(1.32563)	(0.42346)	(1.37941)
2	12.12683	3.768808	0.806516	95.42468
		(1.31240)	(0.53626)	(1.37440)
3	12.17078	3.809105	0.921884	95.26901
		(1.33261)	(0.61159)	(1.42766)

4	12.17647	3.836417	0.948535	95.21505
		(1.34228)	(0.62902)	(1.45197)
5	12.17781	3.847976	0.955752	95.19627
		(1.34607)	(0.63375)	(1.46149)
6	12.17824	3.852355	0.957983	95.18966
		(1.34750)	(0.63524)	(1.46507)
7	12.17839	3.853952	0.958726	95.18732
		(1.34803)	(0.63574)	(1.46640)
8	12.17844	3.854526	0.958983	95.18649
		(1.34823)	(0.63592)	(1.46690)
9	12.17846	3.854731	0.959073	95.18620
		(1.34831)	(0.63599)	(1.46708)
10	12.17846	3.854804	0.959104	95.18609
		(1.34834)	(0.63601)	(1.46715)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: US_GDP_GROWTH CHN_GDP_GROWTH GDP_GROWTH
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses

Appendix 16:

FEVD: Inflation model

Variance Decomposition of US_INFLATION:

Period	S.E.	US_INFLATI ON	CHN_INFLA TION	INFLATION
1	1.239921	100.0000	0.000000	0.000000
		(0.00000)	(0.00000)	(0.00000)
2	1.385075	99.56065	0.436335	0.003020
		(0.33865)	(0.34033)	(0.04001)
3	1.420911	98.98524	1.002522	0.012237
		(0.76650)	(0.76957)	(0.11103)
4	1.431566	98.51595	1.456635	0.027410
		(1.10648)	(1.10768)	(0.19156)
5	1.435476	98.20216	1.751613	0.046230
		(1.33185)	(1.32689)	(0.26801)
6	1.437219	98.01151	1.922408	0.066083
		(1.47007)	(1.45545)	(0.33448)
7	1.438107	97.90026	2.014754	0.084991
		(1.55284)	(1.52668)	(0.38958)
8	1.438596	97.83563	2.062568	0.101801
		(1.60290)	(1.56483)	(0.43398)
9	1.438880	97.79733	2.086625	0.116040
		(1.63412)	(1.58485)	(0.46914)
10	1.439054	97.77382	2.098489	0.127687
		(1.65443)	(1.59524)	(0.49667)

Variance Decomposition of CHN_INFLATION:

Period	S.E.	US_INFLATI ON	CHN_INFLA TION	INFLATION
1	3.848457	3.409993	96.59001	0.000000
		(1.33810)	(1.33810)	(0.00000)
2	4.705612	2.479970	97.41875	0.101276
		(1.12743)	(1.13058)	(0.10313)
3	5.079526	2.128747	97.57470	0.296557
		(1.01648)	(1.05549)	(0.29946)
4	5.257211	1.997797	97.45898	0.543223
		(0.96220)	(1.09481)	(0.54423)
5	5.345293	1.946288	97.24992	0.803788
		(0.94103)	(1.21450)	(0.79997)
6	5.390622	1.922881	97.02563	1.051493
		(0.93430)	(1.36819)	(1.04151)
7	5.415005	1.910030	96.81896	1.271007
		(0.93255)	(1.52421)	(1.25545)
8	5.428840	1.901923	96.64189	1.456186
		(0.93216)	(1.66664)	(1.43703)
9	5.437161	1.896499	96.49655	1.606956
		(0.93197)	(1.78931)	(1.58671)
10	5.442455	1.892841	96.38059	1.726565
		(0.93172)	(1.89128)	(1.70764)

Variance Decomposition of INFLATION:

Period	S.E.	US_INFLATI ON	CHN_INFLA TION	INFLATION
1	13.16415	0.835282	0.342906	98.82181
		(0.70358)	(0.49315)	(0.87058)
2	17.33029	0.947699	0.310675	98.74163
		(0.84195)	(0.50631)	(0.97941)
3	19.83389	1.025651	0.289876	98.68447
		(1.01310)	(0.57055)	(1.15227)

4	21.48197	1.079305	0.276033	98.64466
		(1.15399)	(0.65356)	(1.31439)
5	22.61150	1.116303	0.266597	98.61710
		(1.25850)	(0.73769)	(1.44820)
6	23.40293	1.141968	0.260045	98.59799
		(1.33345)	(0.81443)	(1.55408)
7	23.96495	1.159908	0.255431	98.58466
		(1.38667)	(0.88048)	(1.63644)
8	24.36754	1.172547	0.252147	98.57531
		(1.42444)	(0.93528)	(1.69998)
9	24.65762	1.181515	0.249792	98.56869
		(1.45135)	(0.97966)	(1.74875)
10	24.86746	1.187918	0.248092	98.56399
		(1.47061)	(1.01499)	(1.78604)

Cholesky One S.D. (d.f. adjusted) Innovations
Cholesky ordering: US_INFLATION CHN_INFLATION INFLATION
Standard errors: Monte Carlo (1000 repetitions) standard deviations in parentheses