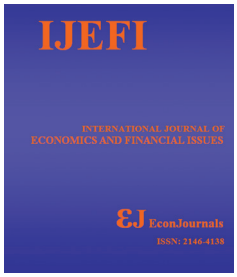

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China's Economy and the Global Financial Crisis

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ABSTRACT

The aim of this article is to provide a brief overview of the increasing importance of China's economy around the world economy, and to discuss the impacts of the global financial crisis on China's economy. While China's economic growth remained well above international averages, its drop was of the same order of magnitude as for the US. The question is that how China responds to the global financial crisis. Using two individual vector auto-regression (VAR) models, I analyze the relationship between China's output and two foreign outputs including US and Germany over the period of 1979-2013. The results of VAR Granger-casualty show that China's output and US output does affect each other. Also, China's output affect Germany output, but not vice versa. Besides that, China's output illustrates variance decomposition (VDC) of US output with 3.21%, and US output explains VDC of China's output with 0.14%. China's output illustrates VDC of Germany output with 7.84%, and Germany output explains VDC of China's output with 1.36%. Therefore, the impact of US output shock on China is greater than Germany output shock.

Keywords: Global Financial Crisis, China's Economy, Vector Auto-regression Model
JEL Classifications: G01, E37, C32, F43

1. INTRODUCTION

China's economy has emerged as a major economic power in the new global economy during the last two decades. Much of China's high economic growth attribute to large-scale capital investment and rapid productivity growth. From 1978 to 2010, the share of China's gross domestic product (GDP) based on purchasing power parity (PPP) exchange rates[1] increased from 1.7% to 9.5% in the world economy. The rising share of China in the world economy has had contribution to global growth. In 2013, the share of China's GDP in the world economy equaled 6.1%.

Chinese trade volume has doubled once every 4 years since the 1980's, and gaining speed after the economic reforms launched in 1992. With this rapid growth, China's share of world exports had risen to 12% in 2013, and then China has become the world's leading exporter. China's exports have reduced the consumer price indices around the world, but at the same time, this competition has generated dislocations for many producers in other countries. On the other hand, China's imports ranked second in the world at about 1.95 trillion US dollars in 2013.

During the global financial crisis and aftermath, China's stimulus package has been a major prop for global commodities prices. In China, the rising inflation has led to a monetary tightening which in turn had a major effect on global commodity prices. Therefore, the main question of this article is to know what major sources explain China's vigorous economic growth and how China responds to the global financial crisis.

Empirical studies such as Hu and Khan (1997) identified three major sources including the accumulation of capital (Perkins, 1988; 1989; Chow, 1993), productivity and global integration to explain the vigorous economic growth of China. Other studies stressed the importance of foreign direct investment (FDI) as a key factor in determining potential growth in China (Berthelemy and Demurger, 2000). In the same way, China's production processes showed high strengths in terms of innovation, not only on the level of production but also by incorporating the administration and planning processes acquired due to the innovation, which was brought in through FDI (Buckley et al., 2007). Willett et al. (2011) investigated economic growth in the United States and

1 A PPP exchange rate is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States (WHO, 2015).

other countries during the global financial crisis through 2009 and found that, while countries like China and India had been able to maintain high growth rates, their shortfalls of economic growth below past trends have not been that much different than for the United States itself.

Some related studies have also investigated the relationship between macroeconomic variables of China with other countries. For instance, using cointegrated and autoregressive vectors, De la Cruz Gallegos (2012) showed that Chinese economy has a positive causal relationship on United States, Canada, European Union and Japan on selected economics variables including employment, economic growth and productivity. But, in the Mexican case the relationship is negative, which is consistent with other studies and show the existence of competition between countries.

Accordingly, Gosse and Guillaumin (2013) implemented structural vector auto-regression (VAR) model with exogenous influences from the world economy represented by US financial data, but no output effect. The International Monetary Fund (IMF) (2014) found that during the global financial crisis, China's expansion provided a buffer for emerging market growth, whilst China's recent slowdown has reduced growth in these economies.

Some studies have investigated the relationship between China's foreign trade and economic growth. For instance, Ho et al. (2015) used quarterly data from 2005 to 2013, and found evidence of unidirectional causality between GDP and export in China. Jiang et al. (2017) investigated the impact of recent financial crisis on six major stock markets including United States, Britain, Germany, Hong Kong, Japan, and China during pre-crisis period, crisis period and post-crisis period. Using a VAR model and conducted Granger causality tests, they found that financial crisis has reinforced the interdependence relationship of global stock markets, and general co-movements of global stock markets persist after the crisis and remained stronger in some economies. For Germany, Japan and Hong Kong, the impact of the global financial crisis was stronger because they are highly open economies. But in the China case, as the degree of openness is relatively low and the Chinese stock market was supervised by the government to a certain extent, therefore, the crisis has not much affected the economy as compared with other countries.

Following the literature review, this research article provides a brief history of China's economic growth, and discusses somehow about the impacts of the global financial crisis on China's economy. While China's high growth rate during the crisis was the envy of most other countries, its growth was lowered by the global financial crisis, offering that the decoupling of China's growth from the advanced countries may not be as great (Li et al., 2012).

Correspondingly, I use the impulse responses of a VAR model to compare the effect of foreign output shocks originating from the US and Germany on the Chinese economy (as two top trading partners with China). From 1979 to 2013, the impact of a US output shock on China is greater than Germany output shock. Exposure to China has grown more rapidly than exposure to the US, reflecting the rapid growth in cross-strait trade intensity between China and US in the last decade. Also, Europe economies that have booming trade with China are likely to exhibit similar results, questioning the common practice of using Germany as a proxy for foreign output effects in the region. Then, I provide two examples motivating the need to include both US and Germany output effects in modeling of China's economy. This analysis is divided into the following subheadings: Section 2 analyze China's economy during the global financial crisis and aftermath. Section 3 presents the theoretical framework. Section 4 presents data and methods. Section 5 provides empirical results and final section presents the key points emerging from the investigation.

2. CHINA DURING THE GLOBAL FINANCIAL CRISIS AND AFTERMATH

The global financial crisis of 2007-2008 and aftermath, threatened the total collapse of large financial institutions, which was prevented by the bailout of banks by national governments, but stock markets dropped worldwide and pushed the US and global economies into the recession (Fredrick and Addison, 2015). The crisis spread from real estate to other sectors of economy and across the globe leads to the global financial crisis. Although China could maintain relatively high economic growth, the negative effects from the global financial crisis on China were considerably stronger than is often realized. This misconception arose largely because China continued to have one of the highest rates of economic growth across the globe, recording 9.6% in 2008 and 9.2% in 2009. What is typically missed is that, while most countries would be delighted to have such growth, these rates reflected a substantial drop from the 14.2% growth in 2007 (Li et al., 2012). In terms of the falls in growth rate during the crisis period and aftermath, China was hit hard as many of the advanced economies. The Economist Intelligence Unit (EIU) projects that China's real GDP growth will slow considerably in the years ahead, averaging 6.3% from 2014 to 2020, and 4.1% from 2021 to 2030 (Morrison, 2015).

The global financial crisis spread through several channels, but financial channels were the most important in the early stages. Financial institutions from several countries, especially in Europe, had invested heavily in securities linked to the US real estate market. These investors suffered huge losses, and generated a general flight to safety which led to large capital outflows from emerging market economies that had few direct linkages with the US real estate market (Li et al., 2012). China proved to be largely immune to these wealth and capital flow effects. FDI in China decreased during the beginning of financial crisis and rebounded to almost the pre-crisis level later. In 2007, China's net FDI equaled $139.1 and decreased to $114.79 billion and $87.17 billion in 2008 and 2009, dropping 17.4% and 24.06% year on year, respectively, increased to $185.75 billion in 2010, and $170.45 billion in 2011.

The crisis affected the economic outlook and risk attitudes across the globe and China's stock market was no exception. Starting in October 2007, the stock market in China crashed, wiping out more than two-thirds of its market value, and a same story happens to the real estate market, since most of the people believe that investing

in property is safer than putting money in the banks. Nevertheless, the impact was less than the trade channel.

Consequently, the falling demand in advanced economies had a huge impact on their demand from China. China's exports fell about 17% in 2009, before recovering to growth in 2010, as the advanced countries began to grow again. The rebounds of economic growth in advanced countries have been modest, which in turn limited the size of the rebound in China's exports. China maintains a sustainable economic growth over the long-term because of development of the domestic market.

In China, the impact on economic growth was roughly the same as in the country of origin clearly shows that not only China have a major impact on the world economy but also the world economy can have a major impact on it. This should not be surprising since China's exports make up roughly 41% of its GDP after 2010 and China depends heavily on western demand for its goods. The high level of export dependence implies that China is strongly coupled rather than decoupled with the global economies, while on the financial side its restrictions have kept the strength of its coupling substantially weaker, although well above zero (Li et al., 2012).

It is important to know; how did china maintain a high growth rate during the crisis? In 2008, China adopted a combination of an active fiscal policy and a loose monetary policy by introducing a $586 billion stimulus package for 2009 and 2010, which in turn prompted a surge in bank lending. Substantial funds from bank lending was funneled into the stock and property markets rather than real economic activities, which contributed to the partial recovery of China's stock markets from the lows reached in early 2009. After adopting the expansionary fiscal policy, China's debt-to-GDP ratio was still lower than 20% at the end of 2009. In 2010, the Chinese central government budget deficit remained only 1.7% of GDP, as compared with 8.9% in the United States.

In 2011, China held foreign exchange reserves of about $3 trillion, the highest level in the world. Therefore, China could take advantage of its strong reserve position to adopt a large stimulates package without having to worry about high borrowing costs to fund its government spending, or generating a balance of payment crisis. While China has been loosening its control on international financial flows since WTO entry in 2001, they have enough effectiveness to limit international financial flows. Most financing for development in China continues to be from domestic sources. Foreign-funded banks remain too small to play an influential role in the financial system. In addition, China has only slowly pursued liberalization of its domestic financial sector. Between 2007 and 2009, the total losses in China's financial system were limited to just over 2% of China's pre-crisis GDP (Li et al., 2012).

China's economy still faces some major challenges including low domestic consumption levels, high dependence on exports, and serious questions about the efficiency of the extremely high levels of investment. Then, a substantial rebalancing of the economy is needed to provide a more sustainable domestic growth strategy, and reduce the treat that importing countries will take protectionist measures against China's exports. A stimulus plan to inject $586 billion into China's economy was quite successful in reducing the size of the slowdown in economic growth, but it carried adverse side effects in terms of increasing inflation and contributing to what many see as a real estate bubble, therefore showing signs of a short-run Philips curve where rapid expansions of aggregate demand tend to increase both economic growth and inflation. These inflationary concerns in turn stimulated the most recent tightening of monetary policy. On the other hand, nonperforming bank loans have been a problem for some time, and the rapid expansion of credit during the stimulus program has brought this problem to the fore again. As most of the Chinese banks remain dominated by the government, banks will not refuse to offer new loans if the authorities demand that they do so, even as old loans sour. New lending by banks was equivalent to 31% and 21% of GDP in 2009 and 2010, respectively, and 39% and 34% of GDP if off-balance-sheet lending is factored in. By March 2011, China's credit-to-GDP ratio had already risen to 166% as compared to 120% at the end of 2008, and it has risen to alarming levels in the past 2 years due to massive off-balance-sheet financing, and raised a red flag for future asset quality problems in banks.

3. DATA AND METHODS

In this research article, the relationship between China's output and foreign outputs (here, US and Germany) have been examined, separately. The quarterly data for all variables are retrieved from GVAR Toolbox 2.0, covering the sample period from 1979:01 to 2013:01. Table 1 shows the data description. The variables include domestic output (Here Y for China's output), foreign outputs (DEUY for Germany output, and USY for US output), inflation (CPI), interest rate (IR), real exchange rate (EX), and crude oil spot price (OIL). Exogenous oil price inflation is added to the Phillips curve to solve any potential price puzzle (Kim and Roubini, 2000).

To identify the relationship between variables, suppose that the economy is described by the following VAR (p):

$$y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + u_t \quad (1)$$

Where y_t is a (n×1) vector of all endogenous variables, A_i is a (n×n) matrix of parameters for i = 1,2,…,p and u_t is a (n×1) vector of residuals with $u_t \sim N(0,\sum_u)$ I proceed to test the existence of co-integrating relations among the domestic and foreign outputs using the Johansen co-integration test and VAR Granger causality, respectively. Likewise, variance decompositions (VDC) serve as tools for evaluating the dynamics interactions and strength of causal relations between variables in the system. The zero restrictions are tested by computing the modified Wald test statistic. This method is applicable whether the VAR's stationary, integrated of an arbitrary order, or co-integrated of an arbitrary order.

4. EMPIRICAL RESULTS

Before conducting any econometric analysis, the time series properties of the data must be analyzed. This section first conducts Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) tests to

establish the order of integration for all variables. Table 2 presents the results of the tests for presence of a unit root in the levels and in the first differences for all variables. The results clearly do not provide evidence against the unit roots in the levels. Meanwhile, the test for a unit root in the first difference series indicated strong rejection of the null hypothesis in all series. Therefore, all data series are integrated of order one. So, the first difference of the data series of the variables is stationary.

A trade interpretation of business cycles confirms cointegration between domestic output, foreign outputs and the other variables (Mills and Pentecost, 2003). The Johannsen test confirms the existence of the long-run relationship between variables based on maximal eigenvalue and trace statistic of the stochastic matrix. Table 3 shows the results from the cointegration tests. Both tests reject the null of zero cointegrating vectors. The hypothesis that there is at least one cointegrating vector cannot be rejected on the other hand; that is, based on the cointegration test, there is no support for both variables in the system being stationary. Based solely on the evidence in Table 3, I conclude that there exists a cointegrating relationship between variables.

Consequently, the long-run relationship is estimated with the Engle-Granger two step procedure using US and Germany outputs for foreign output in two following models:

$$y_{1,t} = -209.46+3.67\ USY-8.99\ FX+1.54\ OIL+e_{y1,t} \quad (2)$$

$$y_{2,t} = -421.94+6.39\ DEUY-15.83\ FX+1.42\ OIL+e_{y2,t} \quad (3)$$

Table 1: Data d escription

Data	Description
Y	China output
DEUY	Germany output
USY	US output
CPI	Consumer price index
IR	Interest rate
EX	Real exchange rate
OIL	Crude oil spot price

I used US output in model I (equation 2) and Germany output in model II (equation 3) as foreign output, separately. I considered oil price and foreign outputs as exogenous variables, and the real exchange rate least exogenous. Furthermore, domestic output (here China's output) is followed by domestic inflation and the monetary reaction function. The ADF statistics for tests of non-stationary on the residuals, $e_{y1,t}$ and $e_{y2,t}$, showed that they are stationary with an associated MacKinnon (1996) around 5% critical value of −3.44, then confirming co-integration in both models. Both models confirm that foreign output has positive effect on China's output, exchange rate has negative effect on China's output, and oil price has positive effect on China's output.

The existence of a long-run relationship between data series means that these variables are causally related at least one direction. Is change in US output or Germany output causing a change in China's output? To answer this question, I implemented the Granger non-causality based on VAR model as residuals in both equation 2 and 3 are stationary. I first determine the optimal order of the VAR model using Schwarz Information Criterion and Hannan-Quinn point toward two lags. Then, I constructed two VAR models in their levels with a total of two lags. Table 4 presents the Chi-square statistic and probability values constructed under the null hypothesis of non-causality. It can be observed that China's output and US output does affect each other very much. The results show that China's output affect Germany output, but Germany output does not affect China's output. In both models, IR, inflation and oil price does affect China's output. Also, in both models, oil price does affect US output and Germany output. In both models, inflation does affect by China's output, exchange rate and oil price. In addition, IR does affect by inflation in Models I and II. In both models, exchange rate does affect by foreign output and IR.

VDC is useful in quantifying causal linkage between variables. The results show the extent to which a variable is exogenous explains most of its shock can be found; it then does not allow variances of other variables to contribute to it being explained. Obviously, in term of the own shock being explained, China's output itself and secondly

Table 2: Unit root tests

Variables	DEUY	USY	Y	CPI	FX	IR	OIL
ADF							
Levels	−2.53	−2.69x	1.39	−2.68	−0.11	−2.09	−0.89x
First differences	−9.43	−9.43	−2.65	−2.87	−11.00	−8.95	−8.95
PP							
Levels	−2.27	−2.43	3.84	−1.87	−0.16	−1.96	−1.04
First differences	−9.61	−7.63	−9.26	−3.98	−10.99	−9.11	−13.03

ADF: Augmented Dickey Fuller, PP: Phillips-Perron

Table 3: Johansen Cointegration test

Hypothesized number of CE (s)	Based on maximal eigenvalue of the stochastic matrix						Based on trace statistic of the stochastic matrix					
	Eigenvalue		5% Critical value		P-value		Trace statistic		5% Critical value		P-value	
	US	Germany	US	Germany	US	Germany	US	Germany	US	Germany	US	Germany
None	94.76	123.03	69.82	69.82	0.0002	0.0000	43.00	68.68	33.88	33.88	0.0031	0.0000
At most 1	51.76	54.36	47.86	47.86	0.0205	0.0108	23.40	24.00	27.58	27.58	0.1572	0.1344
At most 2	28.36	30.35	29.80	29.80	0.0725	0.0432	15.95	15.96	21.13	21.13	0.2280	0.2270
At most 3	12.42	14.39	15.49	15.49	0.1380	0.0730	10.0	14.22	14.26	14.26	0.2119	0.0508
At most 4	2.42	0.16	3.84	3.84	0.1200	0.6861	2.42	0.16	3.84	3.84	0.1200	06861

US output to lesser degree illustrates its relative erogeneity with over 90.47% and 55.91% of own variances being explained by their own innovations in panel A and B of model I, respectively. Besides that, I found that China's output illustrates VDC of US output 3.21% in panel B of model I, and US output explains VDC of China's output with 0.14% in panel A of model I. Also, in term of the own shock being explained in model 2, China's output itself and secondly Germany output to lesser degree illustrates its relative erogeneity with over 87.19% and 67.26% of own variances being explained by their own innovations in panel A and B of model II. Furthermore, I found that China's output illustrates VDC of Germany output 7.84% in panel B of model II, and Germany output explains VDC of China's output with 1.36% in panel A of model II (Table 5).

Figure 1 shows China's output response to the US and Germany shocks in two VAR models, separately. Each part on the left side and on the right side of Figure 1 represents the response in China's output to the same sized output shock originating from the US and Germany, respectively. The five parts on each panel represent the impulses resulting from estimates over different sample periods, starting from 1979 when cross-strait links were initiated and then sequentially omitting the earliest 5 years from subsequent samples. This Figure also illustrates the speed at which China's exposure to both economies has risen over time. Omitting the years 1979 to 1984 more than doubles the output rise caused by a positive foreign output shock; the earliest 5 years have almost non-existent cross-strait trade. After 1984, the trade growth has consistently increased with the lifting of cross-strait trade restrictions, as seen in Figure 1; the gap at each 5-year interval grows consistently larger through time. The largest increase in the gap occurs when omitting the years 1994 to 1999, representing the particularly intensive trade that has taken place since 1999.

This increased exposure to foreign outputs shocks seems to fit quite closely with the nature and intensity of China's economic linkages with the US and Germany. As economic linkages deepen

Table 4: Test for Granger-Causality

Model I: US output as foreign output						
Dependent variable	**Y**	**USY**	**FX**	**IR**	**CPI**	**OIL**
Y	-	6.26 (0.0438)	0.89 (0.6418)	5.37 (0.0681)	7.40 (0.0247)	17.61 (0.0001)
USY	9.63 (0.0081)	-	0.56 (0.7550)	3.95 (0.1387)	0.42 (0.8108)	14.65 (0.0007)
FX	1.64 (0.4398)	6.65 (0.0359)	-	9.77 (0.0076)	1.51 (0.4711)	4.24 (0.1195)
IR	2.01 (0.3664)	1.53 (0.4650)	2.81 (0.2453)	-	28.99 (0.0000)	7.43 (0.0243)
CPI	25.84 (0.0000)	1.96 (0.3744)	9.47 (0.0088)	1.75 (0.4160)	-	9.22 (0.0100)
OIL	3.86 (0.1454)	1.32 (0.5181)	6.60 (0.0369)	6.22 (0.0447)	9.98 (0.0068)	-
Model II: Germany output as foreign output						
Dependent variable	**Y**	**DEUY**	**FX**	**IR**	**CPI**	**OIL**
Y	-	1.29 (0.5251)	0.21 (0.8990)	14.18 (0.0008)	5.78 (0.0557)	13.56 (0.0011)
DEUY	10.51 (0.0052)	-	1.31 (0.5188)	1.60 (0.4487)	1.42 (0.4907)	31.06 (0.0000)
FX	1.25 (0.5362)	6.43 (0.0401)	-	5.67 (0.0594)	1.33 (0.5149)	5.43 (0.0663)
IR	3.07 (0.2156)	4.92 (0.0853)	3.57 (0.1680)	-	31.01 (0.0000)	8.13 (0.0171)
CPI	24.43 (0.0000)	1.16 (0.5594)	5.57 (0.0616)	3.35 (0.1868)	-	8.78 (0.0124)
OIL	5.39 (0.0674)	0.61 (0.7386)	5.93 (0.516)	7.55 (0.0228)	9.44 (0.0089)	-

Table 5: Variance decomposition

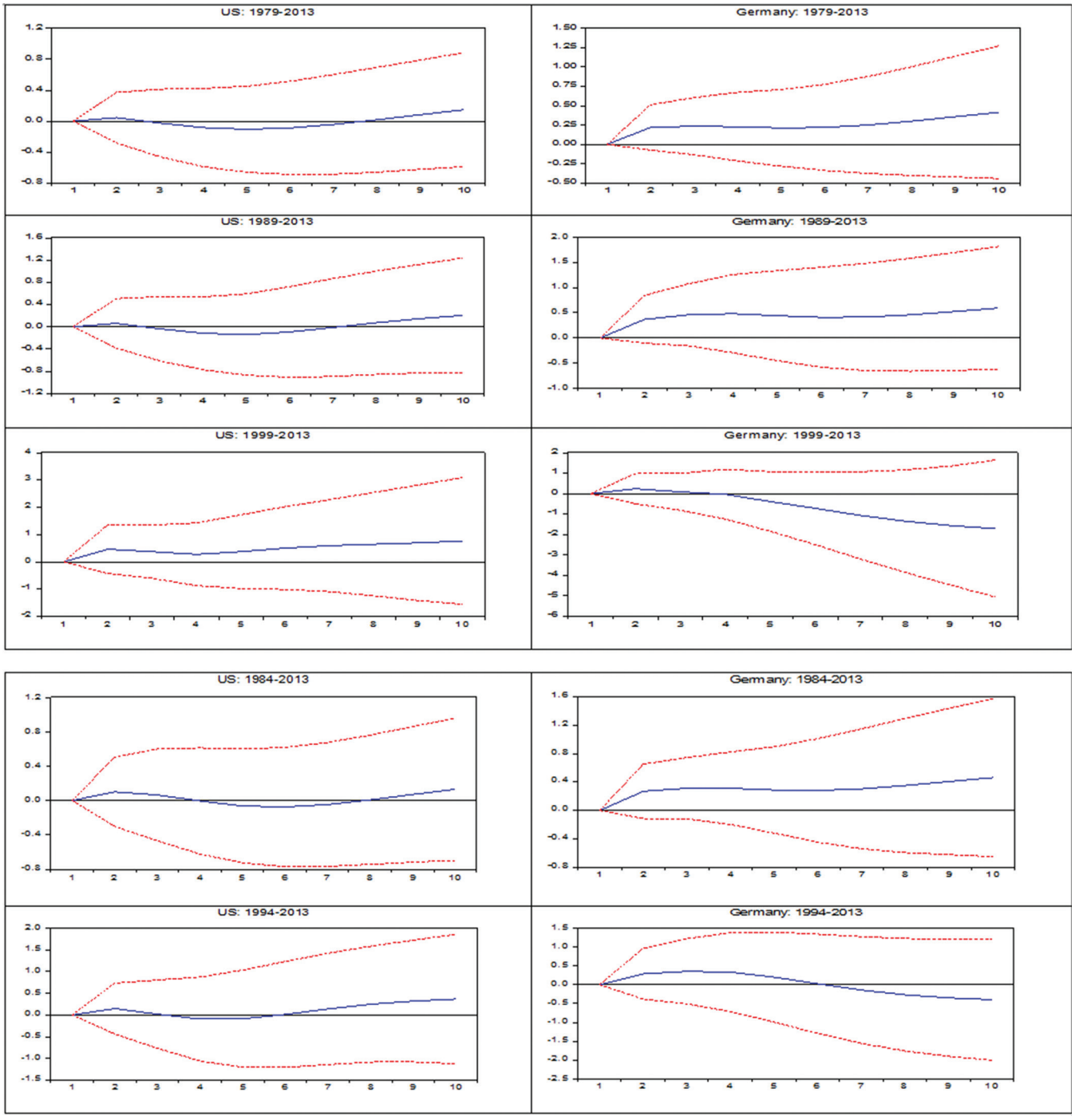
Panel A of Model I. Variance decomposition of Y							Panel A of Model II. Variance decomposition of Y					
Period	**Y**	**USY**	**CPI**	**FX**	**IR**	**OIL**	**Y**	**DEUY**	**CPI**	**FX**	**IR**	**OIL**
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	93.65697	0.030988	2.034139	0.694501	0.001545	3.581859	94.51870	0.685875	1.438067	0.452731	0.021234	2.883388
3	91.10971	0.025384	3.973799	1.502816	0.350858	3.037428	92.57630	0.924465	2.943308	0.701485	0.273581	2.580856
4	90.77223	0.065775	4.647333	1.658775	0.645106	2.210785	92.45718	0.993244	3.439073	0.566106	0.696497	1.847903
5	90.99028	0.109962	4.426344	1.400263	0.895232	2.177917	92.39993	0.981064	3.160873	0.482447	1.162763	1.812922
6	91.20059	0.122305	3.826944	1.133914	1.166570	2.549674	91.84029	0.967081	2.610545	0.759308	1.654030	2.168747
7	91.26238	0.108285	3.207095	1.021777	1.494559	2.905901	90.86148	0.989941	2.135341	1.359242	2.179961	2.474039
8	91.15101	0.093042	2.743264	1.029952	1.884232	3.098497	89.67068	1.065352	1.872941	2.076131	2.745045	2.569849
9	90.87963	0.098884	2.488231	1.072294	2.323108	3.137852	88.41950	1.193008	1.826466	2.726900	3.343547	2.490579
10	90.47364	0.137508	2.428833	1.089573	2.794414	3.076030	87.19336	1.361603	1.943954	3.219891	3.963113	2.318080
Panel B of Model I. Variance decomposition of USY							**Panel B of Model II. Variance decomposition of DEUY**					
1	0.676810	99.32319	0.000000	0.000000	0.000000	0.000000	3.433753	96.56625	0.000000	0.000000	0.000000	0.000000
2	2.119923	96.84269	0.002645	0.195669	0.410923	0.428152	5.834720	90.12021	0.022273	0.330969	0.021155	3.670672
3	2.943694	92.96040	0.009644	0.754780	0.506082	2.825398	7.025699	89.57160	0.024057	0.275650	0.021317	3.081676
4	3.386634	86.19671	0.107248	1.969873	0.515321	7.824212	7.893530	88.92985	0.161771	0.285057	0.016512	2.713278
5	3.536229	78.12216	0.398936	3.903858	0.511302	13.52751	8.296369	85.69655	0.644370	0.852232	0.041919	4.468558
6	3.525293	70.79777	0.843618	6.250847	0.499404	18.08307	8.339828	80.85706	1.457803	2.043497	0.137807	7.164003
7	3.452721	65.09209	1.317180	8.609365	0.482252	21.04639	8.218757	76.08340	2.404831	3.516453	0.290652	9.485910
8	3.366802	60.95552	1.716890	10.70817	0.465924	22.78669	8.065842	72.20922	3.297777	4.910546	0.474550	11.04206
9	3.285399	58.02238	1.992980	12.44460	0.456069	23.79857	7.934996	69.33502	4.035954	6.039559	0.674669	11.97980
10	3.213281	55.91379	2.138833	13.83251	0.456464	24.44512	7.837185	67.25910	4.593061	6.872059	0.886641	12.55195

between the economies, the estimated impact of a shock increases. Moreover, since the economic influence of US on China has been increasing much faster than the Germany influence, historical samples will tend to overstate the influence of the US relative to Germany. For instance, the 1979-2013 sample indicates a US shock will have a greater effect than one from Germany. Given cross-strait integration has been almost exclusively through trade, the results provide strong evidence of the importance of the trade channel to China. As a result, existing statements concerning the predominance of US shocks in other East Asia countries such as China are likely to be overstated using this framework. This dynamic approach does allow broad statements to be made about the current impact of a Germany output shock. Transmission of Germany shocks to China is exclusively through trade, and Figure 1 shows that the magnitude of these shocks reflects the nature of cross-strait trade.

5. CONCLUSIONS

In this research article, I presented a brief history of the impact of global financial crisis on the China's economy. For analyzing the impact of foreign output on the China's output, I provided two individual VAR models and considered two major trading partner with China including US and Germany as a sample of

Figure 1: China's output responses to US and Germany output shocks



European countries for the period between 1979 and 2013. The results of VAR Granger causality showed that China's output and US output does affect each other very much. Also, China's output affect Germany output, but not vice versa.

The findings showed that China's output illustrates VDC of US output with 3.21%, and US output explains VDC of China's output with 0.14%. Also, China's output illustrates VDC of Germany output 7.84%, and Germany output explains VDC of China's output with 1.36%. The results of IRF in both VAR models, showed that although a full set of impulses were produced, I considered only the foreign output sourced shocks here. My analysis concentrates on foreign output shocks emanating from Germany and the US. Finally, I considered two applications around the Chinese economy to demonstrate the importance of accounting for China in the modeling of foreign output effects. It was found that using the US or Germany as foreign output failed to show the full extent of China's reliance on external markets, or its export-led growth recovery after the global financial crisis.

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