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What Accounts for the Structural Changes: Good Policies, Good Practices or Good Luck? A Decomposition Analysis for the Recent Chinese Economy

Junyong LI[1], Quansheng GAO[2]

Abstract

We present a structural driver decomposition framework to distinguish three competing explanations for economic structural changes in the Chinese economy: good policies, good practices and good luck. Empirical results suggest that structural changes in the Chinese economy can be divided into three clear phrases: the Great Fluctuation (1993-1997), the Great Moderation (1998-2004), the Great Stability since 2005. We find that the dramatic fluctuation in the Great Fluctuation period is attributed to the combination shock of "good policies", "good practices" and "good luck". Both "good policies" and "good practices" account for much of the decline in the structural changes in the Great Moderation period and "good luck" shock is the leading explanation for the decline in structural breaks in the Great Stability period.

Keywords: structural changes; driver decomposition; good policies; good practices; good luck; Chinese economy.

Introduction

In general, economic structural change may be attributed to different causes: conscious policies or factors beyond the control of policy-makers; a better understanding of the capabilities and effects of monetary policy; technical change; to better inventory management and various improvements in financial markets; the growth of a market economy and natural market forces; the external environment; or a combination of all these elements. A large body of research has investigated the source(s) of structural change in an attempt to disentangle the relative contributions of three competing explanations: good policies, good practices (good technology) and good luck (Ahmed, Levin & Wilson, 2004). Schwartz (2006) calls them

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pluck (intentional, strategic remediation of economy growth), stuck (endogenous, path-dependent change) and luck (environmental change). The effects of "good policies" highlight passive monetary policy as a driver of the higher output volatility. The effects of "good practices" mean that better business technologies, better inventory investment and management improvements and changes in access to external finance and labour market changes may have reduced volatility in production. Finally, "good luck" suggests that the economy enjoys smaller benign macroeconomic shocks or a sharp drop of propagation mechanisms, or both.

In the literature, there is not much knowledge about the three sources of structural change that happens to an economy. Many studies focus on investigating the drivers of the Great Moderation, a phenomenon that describes a substantial decline in the volatility of output growth and inflation in the U.S. and all OECD economies over the postwar period. Clarida, Gali and Gertler (2000) claim that a shift in the systematic component of monetary policy has been the driving force of the Great Moderation. Mayer and Scharler (2011) contend that the less pronounced reaction of the Federal Reserve to output gap fluctuations accounts for the Great Moderation. Lubik and Schorfheide (2004) also document that "good policies" is the main explanation behind the macroeconomic stability based on an estimated sticky-price model of the U.S. economy. In contrast, McConnell and Perez-Quiros (2000) find support for the "good practices" explanation, such as improved inventory management, by identifying a change in the behavior of inventories in the 1980s. A number of authors provide strong evidence in favor of the "good luck" hypothesis. Benati and Mumtaz (2008) conclude that the Great Moderation can be explained by a decline in the volatility of demand and supply shocks. Gali and Gambetti (2009) suggest that structural change, as opposed to just good luck, is an explanation for the Great Moderation. Some similar empirical papers on this issue include Ahmed, Levin and Wilson (2004), Gambetti, Pappa & Canova (2008) and Sims & Zha (2006).

There is abundant evidence suggesting that Chinese economy has undergone significant economic and structural changes accompanied with its rapid economic growth since the beginning of the economic reforms. The substantial reduction of output volatility in Chinese macro-economy since the mid-1990s has also attracted attention in recent years. For example, using a random walk filter approach, Liang and Teng (2007) have reported a marked decline in the volatility of total output in China's business cycle between 1952 and 2003. Utilizing statistical analysis and constructing a multi-equation structural macro-economic model, Yin (2011) finds that China's economy has become more stable in the twenty first century than it was in the 1990s. He shows that the causes of the stability of the Chinese business cycle are primarily on domestic factors, including the stability of domestic demand and the automatic stabilization mechanism existing in the credit market. He attributes the sources of volatility in the Chinese economy to foreign and domestic demand shocks, with the former having a greater effect on the volatility of Gross Domestic Product (GDP) while the latter having a greater effect on the

Consumer Price Index (CPI). He also finds that traditional monetary policy money supply targeting has little effect on the stability of GDP and CPI. By means of frequency domain and VAR approaches, He and Chen (2014) suggest that most of the decline in macroeconomic volatility attributes to "good luck". They further conclude that "good policies" and "good practices" play a minor role in smoothing China's economic fluctuations.

This paper investigates the evolutionary pattern and the driving forces of structural changes in an attempt to disentangle the relative contributions of three competing explanations: good policies, good practices and good luck. In this paper we focus not only on persistence and volatility of inflation and output but also on the more extensive economic structure changes. In fact, a reduction in output volatility may be considered as a result of structural changes in one economy. The onset of the decline in output volatility may only indicate part changes in the dynamics of one economy and in the transmission and practice of economic policy. However, it is well known structural changes in the Chinese economy have taken form in the scale of the various industries as well as in macroeconomic variables.

Contrary to investigating structural changes by analyzing output volatility, we combine dynamic factor model (DFM) and a test method proposed by Breitung & Eickmeier (2011) to detect multiple structural breaks at unknown points in the conditional mean and a single break in the innovation variance in DFM. The premise of the DFM is that a small number of unobserved common dynamic factors, which are driven by the common structural economic shocks, can be used to observe co-movements of an economic time series.

This article goes beyond the other studies by providing a more appropriate method. Many present studies use VAR type models such as structural VAR or time-varying VAR. One potential problem is that the relatively limited amount of information is incorporated in these models, which may lead to biases in the estimates of the VAR coefficients and that of persistence and volatility. Another problem is that if the dynamics of the economy are characterized by some latent variables, it is difficult to identify structural shocks correctly through VAR.

To investigate structural changes in one economic performance, we start from the Structural Factor-Augmented VARs (SFAVAR) model which incorporates a huge number of economic indicators from different sectors of the economy (Bernanke, Boivin, & Eliasz, 2005). By grouping macro-economic variables in SFAVAR, we can get a structural model including effects of "good policies", "good practices" and "good luck". The proposed method encompasses patterns of structural stability along with general trends of business-cycle activity and provides an explicit explanation of "good policies", "good practices" and "good luck".

Another contribution of this paper is that we find some new time patterns of China's macro-economic structure changes since 1993. Our method first identifies four latent factors that drive structural changes in the Chinese macro-economy,

namely, real activity, money and credit, inflation, and external shocks. We then detect the break points for different variables. By constructing the pooled Wald test statistics and calculating the break points rate, i.e., the ratio of the total variables for which a structural break is found, our results suggest that although Chinese macro-economy since the mid-1990s has undergone substantial reduction of volatility, the structure changes are not a single picture.

Unlike most studies on the topic, explanations of economic stability and structure changes are rarely clear cut and not mutually exclusive. We propose a method of driver decomposition that is different from variance decomposition to identify the drivers of structure changes. Once the DFM is estimated, each economic variable can be divided into the sum of a common component and an idiosyncratic component. The common component can be further divided into a practice component and a policy component. All the information is used to construct so-called driving index to capture the driving forces of Chinese economic structural changes. We find that no single driver fully explains the causes of structure changes for different stages and that the main elements may interact in complicated ways.

Decomposition of Driving Forces of an Economy

We begin with the so-called generalized dynamic factor model proposed by Hallin and Liska (2007). Let y_t be a $T \times N$ covariance stationary time series, where $t = 1,\ldots, T$ denotes the time period and $i = 1,\ldots, N$ indicates the cross-section unit. Suppose that y_t has a mean equal to zero and a variance equal to one. The static DFM expresses y_t as a small number of unobserved latent factors f_t, plus an idiosyncratic disturbance u_t:

$$y_t = \Omega f_t + u_t \tag{1}$$

where Ω represents factor loading matrix.

If we add an extra endogenous variable x_t that can be observed by policymakers in Equation 1, we get SFAVAR model:

$$y_t = \Omega f_t + \Theta x_t + u_t = \Lambda g_t + u_t,\ g_t = \Upsilon g_{t-1} + v_t \tag{2}$$

where $g_t = [f_t\ x_t]'$, $\Lambda = [\Omega\ \Theta]$ and the dynamics of the economy is described by the second expression in Equation 2.

For detailed economic variables, if we take a partition of y_t, Equation 2 can be interpreted as Equation 3 (Mumtaz, 2010). Here, the superscript r, π, m, and a in Equation 3 denote real activity, inflation, money and asset prices,

respectively. The first equation in Equation 3 describes the relationship between GDP growth and the real interest rate and a demand shock u_t^r. The second equation in Equation 3 represents the relation between inflation and the deviation of output from potential output and a supply shock u_t^π. The third equation in Equation 3 is an interest rate rule, according to which the central bank adjusts the policy in response to fluctuations in inflation and output, and a monetary policy shock u_t^m. The fifth equation in Equation 3 indicates asset prices with asset shock u_t^a are allowed to have a contemporaneous relationship with short term interest rates.

$$\begin{bmatrix} y_{i,t}^r \\ y_{i,t}^\pi \\ y_{i,t}^m \\ R_t \\ y_{i,t}^a \end{bmatrix} = \begin{bmatrix} \Lambda^r & 0 & 0 & 0 & 0 \\ 0 & \Lambda^\pi & 0 & 0 & 0 \\ 0 & 0 & \Lambda^m & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & \Psi^a & \Lambda^a \end{bmatrix} \begin{bmatrix} f_t^r \\ f_t^\pi \\ f_t^m \\ R_t \\ f_t^a \end{bmatrix} + \begin{bmatrix} u_t^r \\ u_t^\pi \\ u_t^m \\ 0 \\ u_t^a \end{bmatrix} \quad (3)$$

Since $y_{i,t}^r$ contains a panel of real activity variables in an economy, f_t^r can be interpreted as the result of the corresponding real activity factor that can be considered as the proxy of "good practices". Similarly, $y_{i,t}^\pi$, $y_{i,t}^m$ and $y_{i,t}^a$ represent information sets of inflation, money supply and asset price movements, respectively. The three unobserved factors f_t^π, f_t^m and f_t^a can be interpreted as the result of inflation factor, monetary and credit factor and asset price factor, respectively, which can be considered as the proxy of "good policies". Λ^r, Λ^π, Λ^m and Λ^a are the corresponding matrices of factor loadings. As in Bernanke, Boivin, & Eliasz (2005), the short-term nominal interest rate R_t is assumed to be a factor that can be observed by the econometrician and the monetary authority. We treat the demand shock, the monetary policy shock and the supply shock as the proxy of "good luck".

Thus if we group the variables of interest, y_t in Equation 3 can be further be interpreted and decomposed into as follows:

$$\begin{bmatrix} \text{Economic} \\ \text{variables} \end{bmatrix} = \begin{bmatrix} \text{Effect of practices} & \text{Effect of policies} \end{bmatrix} \times \begin{bmatrix} \text{Good practices} \\ \text{Good policies} \end{bmatrix} + \begin{bmatrix} \text{Good} \\ \text{luck} \end{bmatrix}$$
$$= \begin{bmatrix} \text{"good practices"driver} \end{bmatrix} + \begin{bmatrix} \text{"good policies"driver} \end{bmatrix} + \begin{bmatrix} \text{"good luck"driver} \end{bmatrix} \quad (4)$$

There are several interesting aspects of Equation 4 we would like to emphasize. Since some factors can be extracted by similar variables, we assume that the vector of economic variables is divided into two subsets of similar variables: a subset of variables related to the "good policies" and a subset of variables related to the "good practices". The common force that moves these variables, i.e., the dynamic factor that determines the structure of the economy and the dynamics of the whole economy, can be divided by "good policies", "good practices" and "good luck". Thus, factors, together with the structural change instrument, also enter the DFM through Equation 4.

Equation 4 not only has an economic interpretation, but can also provide a better description of the drivers of the structural change than single observable variables. Once Equation 2 is estimated, each economic variable can be divided into the sum of a common component and an idiosyncratic component. The common component can be further divided into a practice component and a policy component. Here we simply regard that the practice component is corresponding to real activity variables and the policy component is corresponding to the other variables. Thus Equation 4 implies that every variable can be decomposed into three types of drivers: "good policies", "good practices" and "good luck". Then the drivers of economic changes can be captured by evaluating the relative contribution of "good policies", "good practices" and "good luck" and their evolution over time.

Given a variable *i* and a period *j*, if the value of the practice component is greater than that of the idiosyncratic component, we regard the economic variable is controlled by the effect of "good practices" other than that of "good luck". We can calculate the total share for all variables for the case of one component is greater than another component. We call the total share by the driving index of "good practices" over "good luck". That is, for the *i*th variable, if the value of the practices component is larger than the value of the practices component, let $D^{ij}_{pr-l}=1$, else let $D^{ij}_{pr-l}=0$, the driving index D^{j}_{pr-l} of "good practices" over "good luck" in the *j*th period is defined as

$$D^{j}_{pr-l}=\sum_{i=1}^{N} D^{ij}_{pr-l} / N$$

The driving index we proposed is familiar with the concept of average rejection frequencies investigated by Breitung and Eickmeier (2011). In order to assess the sources of the Great Moderation in the US, they find that average rejection frequencies are high in 1984-1985. They then conclude that there is a structural break around that time and the Great Moderation started. We can obtain the index because one advantage of Dynamic Factor GARCH is that it can easily capture multivariate information and disentangle common and idiosyncratic parts of each series.

Data and Number of Factors

Data

For accuracy and data availability considerations, 63 economic time series are examined in this paper. The data we employed in our quantitative analysis is quarterly observations from the China Statistical Yearbook spanning 1993Q1-2009Q2. We choose 1993 as the starting point for two reasons. First, Deng Xiaoping's tour of Southern China in 1992 is considered to be the start of a new wave in China's reform and opening-up. Second, in 1993, the international standard of National Income and Product Accounts is used as the basis of the Chinese national accounting system for the first time. The period of 1992-2009 is also used by Fan, Yu and Zhang (2011) to investigate the responsiveness of the Chinese government's monetary policies to economic conditions.

The components and number of variables are shown in Table 1. The name of variables and the unit-root test for each variable are provided in the appendix. The values from the three months in a quarter are averaged to obtain quarterly values for monthly series. If logarithms are taken, they were logarithms of the average value of the monthly indexes. The estimation of the DFM requires stationary time series. Generally speaking, to get a stationary time series, output variables, consumption variables, credit variables and part of the fixed asset investment variable need to be second-differenced; fiscal and tax variables, import and export variables, money variables and price indexes need to be first-differenced after logarithms are taken; exchange rate data needs to be first-differenced directly.

Table 1. Data examined in this paper. Here "Nv" denotes the number of variable in one component of one type of factor

Real activity factor	Nv	Monetary and credit factor	Nv	Inflation factor	Nv	External factor	Nv
Output	6	Money	4	Employment	6	Import	1
Consumption	3	Credit	8	Price	4	Export	1
Investment	14	Capital market	4			Exchange	3
Fiscal and tax	8					Foreign reserves	1

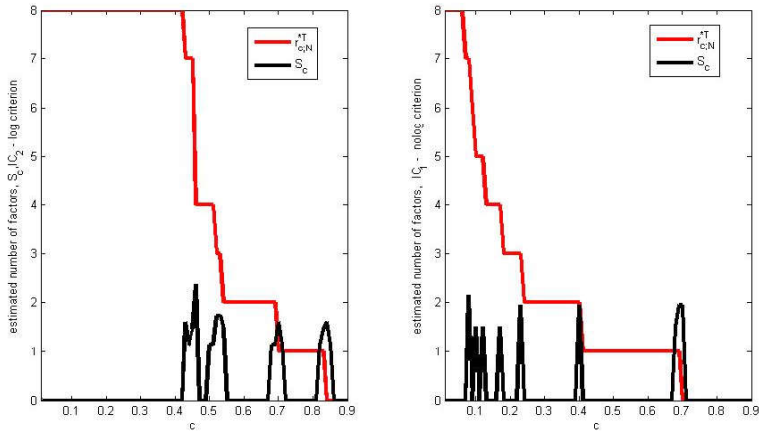

Figure 1. The number of factors: the BN criterion

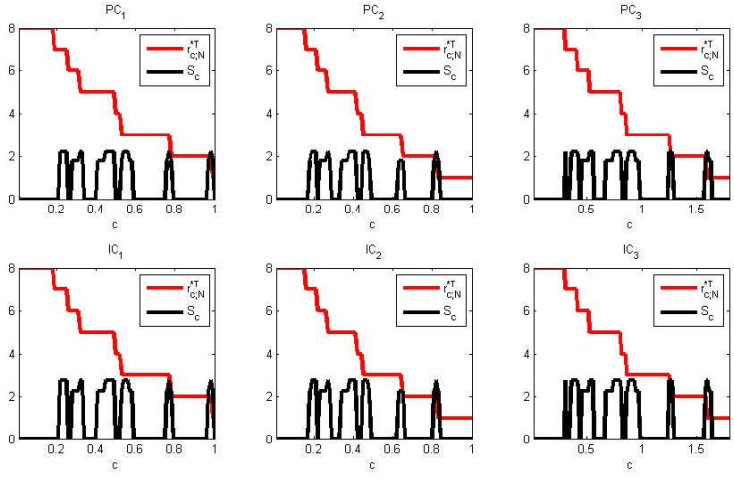

Figure 2. The number of factors: the HL criterion

Number of Factors

We now determine the number of dynamic and static factors. The number of factors represents the number of economic shocks that hit the economy. We first use the criteria proposed by Bai and Ng (2002) (BN)to guide the selection of the number of factors. The BN approach looks for the largest dynamic eigenvalue that is bounded as N goes to infinity by making use of a penalty function that depends on a constant c. For each value of c, the criterion is computed together with its variance S_c for different subsamples and the optimal number of dynamic factors $r_{c,N}^{*T}$ is given. The number of dynamic factors can be obtained by looking for the first zero variance interval (the second stable region) of c corresponding to a stable value of $r_{c,N}^{*T} < r_{\max}$. By inspection of Figure 1, the BN approach proposes 4 dynamic factors (from the right panel of Figure 1) and 4 static factors (from the left panel of Figure1).

The second criterion is proposed by Hallin & Liska (2007) (HL) to determine the number of dynamic factors. By inspection of *Figure 2* we can say that we have 5 dynamic factors (the upper panel of Figure 2) and 5 static factors (the lower panel of Figure 2).

Taken together, since we need $r = q(s+1)$, we choose for each dynamic factor a number of lags $s = 0$ for $q = 4$ giving $r = 4$ in the remainder of this paper. This is the same number as the amount of data structure categories. We then form 4 groups of variables with similar economic content as the following 4 structure categories:

(1) Real activity factor. This factor includes variables such as industrial production, consumption, investment, fiscal, tax and other similar variables.

(2) Monetary and credit factor. It explains a number of money stock variables, together with data on deposits, bank reserves, credit, loans variable and so on.

(3) Inflation factor. It incorporates data from the evolution of a variety of consumer prices, producer prices, wages, employment/unemployment and so forth.

(4) External factor. It summarizes data such as exports, imports, foreign exchange reserves and reference exchange rate of Renminbi.

Robustness Check on the Number of Factors

Table 2. The first 16 principal components of factor model

Number	Share	Number	Share	Number	Share	Number	Share
1	0.477	**5**	**0.775**	9	0.874	13	0.926
2	0.583	6	0.808	10	0.890	14	0.936
3	0.666	7	0.835	11	0.904	15	0.945
4	**0.731**	8	0.855	12	0.916	16	0.953

We can also use principal components analysis (PCA) to obtain the number of static factors in the DFM. In Table 2 we report the values for the largest 12 factors. The first four eigenvalues explain 73.1% of the total data variance while the first five eigenvalues describe approximately 77.5% of the variance. According to this criterion, we choose 4 or 5 static factors which is the same as shown in the section 3.2.

Estimated Results of the Four Factors

Given the number of dynamic factors, we use the Dynamic Factor GARCH model provided by Alessi, Barigozzi and Capasso (2006) with the following process for each factor:

$$g_t = \Upsilon g_{t-1} + v_t, \; v_t \sim GARCH(1,1)$$

The estimation procedure of Equation 2 is familiar with the method of Alessi, Barigozzi and Capasso (2006). In Figure 3 we provide the estimated results of the real activity factor, money and credit factor, inflation factor and external shock factor. The most salient difference between DFM and the other methods is that DFM focuses on the latent factors instead of the quantity of the economic variables. We can see that the pattern of those four factors is unambiguous and does not show any characteristics, which means that the change of economy comes from structural shock and the co-movement among economic variables other than sole quantity shock.

Table 3. The driving index (%) based on "good practices", "good policies" and "good luck"

the driving index	the Great Fluctuation	the Great Moderation	the Great Stability
D^{j}	49.55	55.88	39.64
$D^{j}_{pr\text{-}l}$	51.60	52.04	43.85
$D^{j}_{pr\text{-}po}$	50.00	58.82	40.00

Time Pattern of Structural Changes

Tests of Structural Breaks

We first turn to detect whether the 4 groups of variables have experienced clear structural breaks. Our test methods come from Breitung and Eickmeier (2011) who studied the implications of structural breaks in the factor loadings. Suppose economic variables are subjected to a common break at time T^*. Let the principal components (PC) estimator of g_t is $\hat{g}_t$, we estimate the following regression:

$$y_{it} = \lambda_i' \hat{g}_t + \varphi_i' g_t^* + \varepsilon_{it}$$

where $\hat{g}_t^* = \begin{cases} 0 & t = 1,2,...,T^* \\ \hat{g}_t & t = T^*+1,...,T \end{cases}$.

Under the null hypothesis we assume:

$$H_0 : \varphi_i = 0 \qquad i = 1,2,...,N$$

In case of T^* known, this null hypothesis of no structural breaks can be tested with a Wald test which has an asymptotic χ^2 distribution under H_0. We use the usual Wald test statistics denoted by Wa_i to test this null hypothesis.

If we estimate the following regression:

$$\hat{\varepsilon}_{it} = \theta_i' \hat{g}_t + \phi_i' g_t^* + \tilde{\varepsilon}_{it}$$

where $\hat{\varepsilon}_{it} = y_{it} - \lambda_i' \hat{g}_t$ denotes the estimated idiosyncratic component, we can obtain a Lagrange-Multiplier statistic denoted by LM_i.

Under some given assumptions, Wa_i and LM_i have a χ^2 limiting distribution with *r* degrees of freedom. The individual tests can be combined by constructing the pooled test statistics $(\sum_{i=1}^{N} Wa_i - rN)/\sqrt{2rN}$ and $(\sum_{i=1}^{N} Sc_i - rN)/\sqrt{2rN}$, which are the standardized versions of the average test statistics.

Three Clear Stages of Structural Changes

Following standard practice, we assume that the break did not occur in either the first or last 5% of the samples. We then get 61 possible break points. We generally allow for a break in the variance of the idiosyncratic component.

For each possible break date, we calculate the relevant Wald statistics and Score statistics. The ratio of break points for different variables is shown in the appendix. The two largest ratios of break points are national government expenditure and loans to industrial sector, which are 85.24% and 83.61% respectively. Currency in circulation and deposits from government departments show no break points. The number of ratios larger than 50% is 16, about 26.4% of the total variables, and the number of ratios between 30% and 50% is 13, about 20.6% of the total variables.

Considering the intensity of the structural break points, the two sequences of total Wald statistics and total Score statistics are plotted in Figure 4. Their similar trends throughout the period of observation indicate that the results do not depend on which test we select. Considering the extensity of the structural break point, we calculate the break point rate, i.e., the share of the 63 variables for which a structural break is found. Figure 5 reveals that two types of break point rates match closely. The break point rate is greater than 40% from1993 to1997, whereas most of the break point rates are greater than 30% and less than 40% from 1998 to 2004, and less than 20% of the variables exhibit structural breaks since 2005, which decreases to a ratio of 10% since 2006. Throughout the period of observation it can be observed from *Figures 4* and *5* that the trends follow identical behavior.

Since 1993, intensity and extensity of structural breaks have shown an upward trend, and climbed to a peak in 1995. Most obviously, it shows a dramatic decline in the subsequent years of 1995-96. After a structural break in 1996, we do not detect any structural breaks during 1996 and 1997. However, the structural change depicts a mixed trend from 1998 to 2004. There are two stronger structural break times, i.e., 1997-1998 and 2002-2004. Thus the structural change follows an up and down behavior. The structural change becomes moderate compared with the period before 1997. Since 2004 the structural change suggests a fall trend, and we did not detect any structural breaks. Thus we obtain the central theme of this paper: China's economic structural breaks have changed over time and have declined dramatically, and have remained stationary until today.

Acording to these observations, China's structural changes can be divided into three distinct stages: the first stage (1993-1997) is characterized by sustained large-scale structural breaks and we call this phenomena the "Great Fluctuation"; the second stage (1998-2004) sees a significant structural break and slowdown, and we call this phenomena the "Great Moderation", whereas the third stage (2005-present) is characterized without any structural breaks and we call this phenomenon the "Great Stability".

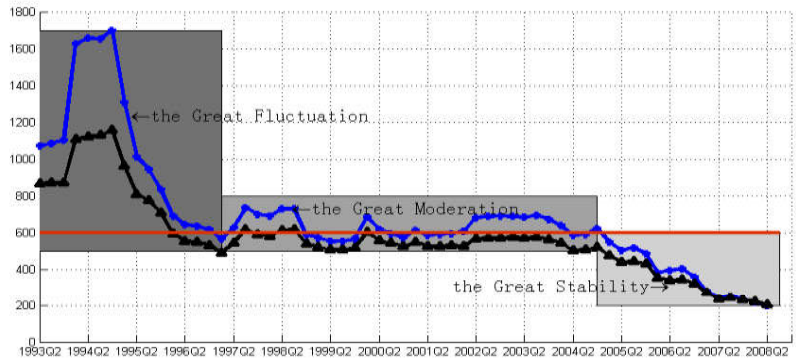

Figure 4. Test statistics. Here * represents Wald statistic, represents LM statistic. The horizontal line presents the 5% critical value

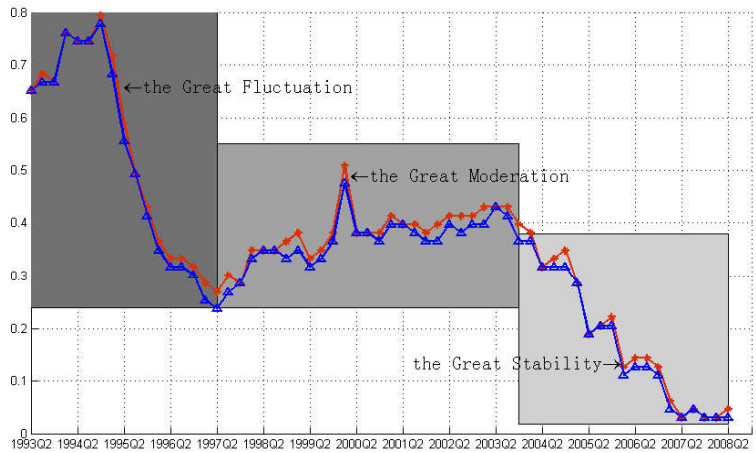

Figure 5. The break point rates. Here * represents Wald statistic, represents LM statistic

From the Chinese economic operations and cyclical adjustment policies point of view, Chinese government has implemented moderately tight fiscal and monetary policy after 1994, practiced proactive fiscal policy and monetary policy since 1998 and followed prudent fiscal and monetary policies since 2005. Especially, China seeks to achieve more stable, domestic-demand-leading economy since 2005 while export-and-investment-leading policy is the main tool to accelerate economic growth before 2005. All of these characteristics coincide with the

provided three stages of the "Great Fluctuation", the "Great Moderation" and the "Great Stability".

Diving Forces and Stylized Historical Facts of China's Structural Changes

We now turn to detecting driving forces of structural change in the Chinese economy. The results for the three different indexes of the three stages are shown in *Table 3*. The results can be interpreted from historical perspectives.

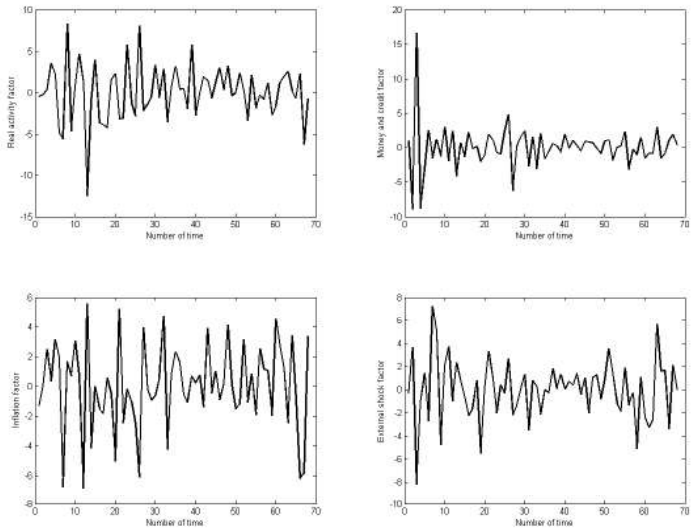

Figure 3. The results of real activity factor, money and credit factor, inflation factor and external shock factor

The "Great Fluctuation":1993-1997

During this phrase, the driving index of "good practice" over "good luck", "good policies" over "good luck" and "good practices" over "good policies" are equal to 49.55%, 51.60% and 50.00%, respectively. The structural change is not dominated any of the three sources. In other words, the fluctuation of structural change attributes to a combination of fiscal and monetary disturbances, technology shocks and exogenous disturbance between 1993 and 1997.

Regarding "good policies", since there is a surge in fixed-asset investment in the latter half of 1992, which is followed by major food price rises in 1993, China witnesses serious inflation in 1992-1995. The Chinese government imposes appropriately tight fiscal and monetary policies. After the new policies are launched,

the Chinese government steps up efforts to control money supply and finally reduced the consumer price index.

Regarding "good practices", China has an anticipated and deeper structural change, spurred mainly by economic reforms and the growth of the internal market. There has been a rapid growth in the production of the electrical domestic appliances and their interlinked sectors (steel, plastics, electricity, etc.), microelectronics, telecommunication and energy (Valli & Saccone, 2009). To avert the undue hardship caused by indiscriminate administrative restraints, traditional tools of tightening credit quotas, reducing ratified investment projects and price surveillance become more selective and flexible (Zhang and Wan, 2005). The bank system is required to separate commercial and policy-based lending, to provide interest subsidies for priority projects through the budget and to do better loan assessment and portfolio management.

Regarding "good luck", Deng Xiaoping's "Southern Tour" touches off an investment boom in 1992. At the same time, a series of foreign exchange reforms and fiscal incentives (tax rebates) are implemented to stimulate export growth. In 1992-96, the annual inflows of foreign direct investment reached US$41.73 billion in 1996. The rapid growth during this period is generally based on the internal market that had rapid accumulation and growth.

The "Great Moderation": 1998-2004

During this phrase, the driving index of "good practices" over "good luck" and "good policies" over "good luck" is equal to 55.88% and 52.04%, respectively, and the dominance index of "good practices" over "good policies" is equal to 58.52%. In this stage, technology shocks, structural reforms and monetary disturbances play an important role.

As to "good policies", the proactive fiscal policy and prudent monetary policy are adopted in 1998 to counteract the negative impact of the 1997 Asian financial crisis. In light of the weak global recovery in early 2002, the Chinese government has been pursuing a sound monetary policy while using fiscal policy to boost domestic demand. However, challenges remain for China's economic development, including weaker demand and persistent employment pressure.

As to "good practices", macroeconomic management in this period leans more towards market-oriented levers. The indirect policy instruments and mechanism are improved, with improvements in productivity caused largely by reallocating resources to more productive uses (Valli & Saccone, 2009). China's decentralization of the economy leads to the rise of non-state enterprises, which tends to pursue more productive activities than the centrally controlled state-owned enterprises (SOEs). Also, permission is given for enterprises based on market principles. In addition, foreign direct investment in China brings new technology and processes that boosted efficiency. At the same time, China's economic transition also reaches a critical stage. Significant internal developments force the government to consider

more aggressive reforms. The focus of reform turns to banking, finance and the rapid expansion of international economic relations. Some of the government's greatest challenges lay ahead. These challenges include reform of urban SOEs, sustaining economic growth and coping with the Asian financial crisis (Lai, 2006).

As to "good luck", the Asian financial crisis constitutes a major negative external shock. Although the contagion of collapsing exchange rates and large-scale capital flight do not spread across China's borders, exports fell sharply in 1998 and in the first half of 1999. A substantial part of the increase of exports in middle and high technology products are provided mainly by joint-ventures and foreign companies operating in China. In addition, uncertainties over the global economic outlook have an impact on China's exports and economic growth.

The "Great Stability":2005-present

During this phase, the driving index of "good practices" over "good luck" and "good policies" over "good luck" only accounts for 39.64% and 43.85%, respectively, and the dominance index of "good practices" over "good policies" accounts for 40%. We can see that shocks from "good luck" are largely responsible for the change in this stage.

With respect to "good policies", prudent fiscal and monetary policies have been adopted and designed to avoid dramatic government intervention in the economy in 2005. The central bank has raised the reserve ratio only five times over six years since 2000. In 2008, China launches moderately relaxed monetary policies and proactive (or expansionary) fiscal policies, and puts into force many measures to expand domestic demand and secure economic growth.

With respect to "good practices", China has benefited much from adopting modern technologies coming from more advanced countries and transferring large masses of the labor force from low productivity sectors to sectors with higher productivity. However, the social and economic inequalities increase strongly despite the economic growth that has been achieved. In particular there is a marked increase in pollution and in overall inequality indexes, such as the Gini index, and a strong rise in income and wealth inequalities among families and among regions (Valli & Saccone, 2009). China's less differentiated education system increases inequalities in the access to higher education and high quality schools. Although China still maintains a basic direction of market-oriented reform and opening to the outside world, the delay of the reform in some key areas prevents development of private enterprises, which leads to hugely inefficient uses of resources.

With respect to "good luck", the Chinese government announces that China's currency would no longer be pegged to the dollar but instead would be a managed float regime with reference to a basket of currencies in 2005. The Chinese economy has also become more and more integrated into the world economy. After entrance into the World Trade Organization, from 2001 up to the 2008-2009 global crisis, rapid growth is spurred by the rise of exports and a large inflow of foreign

direct investment. Years of economic reform have reduced institutional rigidities hampering the adjustment of the economy to exogenous shocks.

Conclusion

We apply three competing explanations for the source of structural changes: "good policies", "good practices" and "good luck". Empirical results suggest that China's economic structural breaks since 1993 have declined dramatically and have remained stationary until the present day. We divide the structural changes in the Chinese economy into three phrases: the Great Fluctuation (1993-1997), the Great Moderation (1998-2004) and the Great Stability since 2005. We conclude that the dramatic fluctuation in the Great Fluctuation period is attributed to the combination shock of "good policies", "good practices" and "good luck". We find that "good policies" and "good practices" account for much of the decline in the structural change in the Great Moderation period. The "good-luck" shock is the leading explanation for the decline in structural breaks in the Great Stability period. However, our work can be improved with more sophisticated models that are able to consider the role played by industrial upgrading, technical innovation, the preferences of policymakers, the behavior of consumers and firms, and so on, in influencing the structural changes in the Chinese economy.

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