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-RESEARCH ARTICLE-

EVALUATING THE XR TARGETING POLICY USING SOME ECONOMIC STABILITY VARIABLES - THE CHINESE ECONOMY AS MODEL FOR THE PERIOD 1990-2023

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─Abstract─

The research addressed the evaluation of the exchange rate (referred to as XR henceforth) targeting policy using some economic stability variables in China, as the XR targeting policy is a modern and effective method within the targeting mechanisms,

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to achieve economic stability, which is the prelude to achieving economic growth and development. Some developed countries, including China, seek to adopt the XR targeting policy to achieve the planned goals. Despite the great benefits achieved by the XR targeting policy, it has some negative aspects, as it hinders the likelihood of using a monetary policy which is not dependent, and the impact of shocks that occur in the country of the anchor currency can be transmitted internally. In addition to what was mentioned, the local currency in the target country can be exposed to a speculative attack. The research relied on the advanced econometrics method, by using the autoregressive distributed lag model ARDL, for measuring the relationship between some economic stability variables (GDP, trade balance, unemployment, international reserves - as independent variables) and the real XRs (dependent variable). The most important conclusions reached by the research are that, based on the standard tests and short-term parameters, the unemployment rate significantly affects the real XRs, while international reserves do not significantly affect the real XRs. As for the long-term parameters, the gross domestic product, the trade balance and the index of the consumer price significantly affect real XRs, while international reserves have a significant but weak impact.

Keywords: XR Targeting, Economic Stability, The Impossible Trilogy.

INTRODUCTION

The use of monetary policy is a monetary strategy including the suitable XR regimes and the tools necessary for the achievement of the goal of monetary policies. operating in a predictably and systematically for stabilizing expectations and increasing the macroeconomic policy efficiency (Karakostas, 2021). Developed countries have adopted economic policies that are consistent with the nature of the economy and the goals to be achieved, as some countries have adopted the XR targeting policy as an intermediate stabilization tool to achieve economic stability and economic growth and development. The XRs, which target policy contributes to controlling the inflation rate and thus they reduce the risks investors face, as creating a stable economic environment is an important factor that attracts investors. The targeting policy can also provide a suitable basis for implementing the monetary policy mechanism and thus reducing time mismatch.

The purpose of implementing the XR targeting policy in developed countries is different from that in the developing world. In the developed world reaching a high level of maturity, the aim of this policy is often to gain a competitive advantage, by devaluing the local currency. In developing countries, which often suffer from weakness or inflexibility of their productive apparatus, the XR targeting policy is applied for the purpose of controlling inflation. When targeting the foreign XR, the target XR should be set. If the target XR is higher than the equilibrium, the XR will overvalue inevitably causing a foreign exchange crisis. If it is below, the XR will undervalue having positive

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impacts on economic growth and employment, regardless of a slight inflation rate increase. The key indicators determining the level where the target XR is fixed are the payment balance and the unemployment rate (Krušković, 2020).

XRs may be "automatic stabilizers" for the macroeconomy, and the arranged reforming progress of the XR formation mechanism and enhancing XR flexibility can efficiently raise the economic and financial system resilience in response to external shocks (Feng et al., 2021).

LITERATURE REVIEW

XR Targeting

One of the monetary policy strategies has long been the policy of targeting XR. With gold standard, amounts of gold determine the value of the currency. Currently, the local currency value is determined against the currency of a country with a large economy and low inflation, according to a fixed XR system. There is another alternative, which is the creeping inflation target or peg, whereby the currency can decline at a fixed rate, so the inflation rate with the large economy possibly becomes bigger than the inflation rates in the country with the pegged currency (Morina et al., 2020).

There are several important and different fixed XR systems, like fixed pegs and flexible pegs under which the country is committed to fixed nominal ones in relation to another currency for an indefinite time later. With a flexible peg, long-term commitment to a specific XR value does not exist. The XR is fixable relative to another for a long period, with the possibility of periodic devaluations (the nominal XR rise) and revaluations (the nominal XR drops) (Abbas, 2022). In typical fixed XR systems, all countries peg their XR to that of a central one and intervene in the foreign exchange markets to keep fixed XRs. Intervention is needed if the private supply does not equate demand for its currency, at the fixed XRs. After World War II, a fixed XR system called Bretton Woods operated worldwide, in which every country fixed or pegged their currencies to the US dollar (Yakubu et al., 2022).

Pros and cons Of Targeting The XR

Pros

When a central bank adopts a policy of fixing the XR at a certain value, it must deal in the foreign exchange markets to compensate for any over demand or supplies of foreign currency that arises at the fixed XR (Adeleye et al., 2022). It is the opposite of flexible XR systems in which the currency supply and demand determines the values. According to the XR targeting policy, the nominal target of the XR directly helps in the stability and control of the inflation rates by linking the inflation rate of internationally traded goods to the inflation rate in the nominal countries. The XR can achieve this goal, as international market determines the foreign price of traded goods, and thus the prices of

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these goods are fixed locally through targeting the XR (Krekó & Oblath, 2020). Thus, fixed XRs can help provide lower inflation rates after high inflation or hyperinflation (Din et al., 2024), yet, and yet, the XR targeting policy can provide a mechanism for implementing monetary policy that can mitigate the problem of time mismatch. Another XR targeting policy benefit is that this policy is characterized by being simple, clear, and understandable by the public (Usman, 2023).

Negative points Of XR Targeting

Despite the XRs target policy, criticisms appear. Assuming free international capital movement, the country following the XR targeting policy becomes unable to adopt an independent monetary policy to confront internal shocks resulting from shocks in the country of origin. Shocks to the home country will be directly affected by the country adopting the XRs targeting policy, as domestic interest rates (in the target) are dependent on changes in interest rates in the home country (the anchor currency). Thus, countries operating under fixed XRs and free capital movement in the short terms sacrifices two macroeconomic tools, the interest rates and the XRs, not only reducing their response to shocks, but can also causing XR crises (Blanchard, 2016).

Implementing The XR Targeting Policy

The XRs targeting policy can be applied in both advanced industrial countries and the developing world, but the mechanism adopted for the targeting policy varies according to the nature of the economy and the purpose of the policy. The application of the targeting policy can be reviewed as follows:

Implementing The XR Targeting Policy in Developed Industrial Countries

The purpose of implementing this policy in advanced industrial countries is often to gain international competition for exports, so the XR is evaluated at less than its value, for local products to become cheaper compared to foreign products. This policy is implemented in advanced countries because they have reached an advanced stage of maturity and their production base has been integrated, as they are characterized by a highly flexible production system, which makes them think about international competition through a policy of targeting an XR that is less than its value (Boburmirzo & Boburjon, 2022).

The biggest cost for industrial countries that adopt an XR targeting policy is the lack of independence of the local monetary policy. However, when adopting an independent and responsible local monetary policy, implementing the XR targeting policy positively affects the overall economy.

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Implementing An XR Targeting Policy in Developing Countries

Implementing XRs targeting policy in the developing world (especially those in transition) that suffer from weak political and monetary institutions is of great importance to combat inflation and achieve macroeconomic stability, as the XRs targeting policy is the last resort. This requires transparency in the work of targeted XR systems in emerging markets, to ensure the success of the policy and avoid financial disasters (Olamide et al., 2022). Although the XR targeting policy has succeeded in reducing inflation rates for many developing economies, it faces some criticism, as inflation rates can be reduced by the high supply of traded goods and services through imports, but there are many goods and services that cannot be traded globally, and thus the XR targeting policy stops at this point (Yüksel & Baycan, 2022).

The Trilemma - Policy Options

Three natural goals are associated with the international monetary system, as they are achievable in an open economy, the first is XRs stability, the second is monetary policies independence, and the third is freedom of international capital flow (Shin-ichi, 2024). Which can be illustrated by Figure (1), and the open economy can often choose two of the three goals at the vertices of the triangle, as the choice of policy is determined by the edge of the triangle that defines these two goals.

Figure 1: The Policy Trilemma in Open Economies (Jones, 2013).

According to the political trilemma, two of the three options by the vertices of the triangle can be chosen by a country (Shin-ichi, 2024). In any economy, only two of the three goals can be achieved, as Figure (1) shows, one edge (vertices) of the triangle can be chosen, and the goal opposite this edge can be given up. When choosing the third vertex, the country can set its own monetary policy, which is characterized by the freedom of international capital flow, through economic openness, with XR flexibility,

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as when the goal of XR stability is given up. Thus, the three objectives conflict with each other, as XRs stability cannot be guaranteed with XR flexibility, and since the XR depends on domestic and foreign monetary policy, changes in foreign monetary policy led to XR volatility, even when a sound monetary policy with low inflation. Under a fixed XR system, intervention in the foreign exchange market must be made to maintain the alignment of currencies at their specified values. Economists define foreign exchange markets intervention as buying or sale of foreign currency to manipulate the XR (Witjaksono et al., 2023). Since monetary policy determines the basic value of XR, it no longer achieves stability in the domestic economy. As a result, commitment to the peg means abandoning the independence of monetary policy (Krušković, 2020).

XR Targeting Shocks Reserves

XR Targeting and Shocks

A flexible XR in the macroeconomy acts as automatic stabilizers, but adopting a fixed XR policy means limiting the ability of the domestic economy to respond to shocks (Morina et al., 2020). Flexible XRs have been a shock absorber in most of the years after the World War II, and changes in XRs cause changing the terms of trade for a country, as the main advantage of flexible XRs in relation to a fixed XRs is that it adapts the XR in response to shocks, and thus it acts as a shock absorber mitigating the impact of external shocks on output and employment in the economy (Ragan, 2016). Thus, the XR regime followed in a particular country has a strong impact on the use of monetary policy by the central bank to achieve economic stability, as the flexible XR enhances the monetary policy effect on aggregate demand, while the fixed XRs prevents policymakers by monetary policies for stabilizing the economy, as it requires using it to keep the basic XR at its official value (Morina et al., 2020).

Under the assumption that a drop in global demand decreases in global raw material prices, which are the main exports of some countries. This is accompanied by a drop in demand for the local currency (a decrease in the supply of foreign exchange) in the foreign exchange market. Part (ii) of Figure (2) is the impact on real GDP, as the AD curve shifts to the left. While part (i) shows the effect on the foreign exchange markets, as the supply curve of foreign exchange shifts to the left. The effect of this shock can be explained in two cases. The first, if the central bank fixes the XR; and the second, when the central bank allows the freedom to determine the XRs according to market conditions (Lawal et al., 2022). When the central bank XR is at e0, foreign exchanges supply drops from S0 to S1, increasing the demand for foreign currency.

The central bank meets extra demand by selling sufficient foreign exchange reserves to keep XRs at e0. Yet, the negative aggregate demand shock reduces domestic output and employing people, as in part (ii) of Figure (2). If this shock is large and persistent, domestic wages will fall and the AD curve will shift downward, to AD1, and then real

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GDP will return to potential output level Y1. Eliminating the recession may be slow and painful (Ragan, 2016). Although adopting this policy enables the basic value of the XR to remain at the official value, it has some drawbacks. Under the XR targeting policy, monetary policy is no longer available to stabilize the domestic economy (Shin-ichi, 2024). If the XR is flexible, when the global prices of raw materials drop, the foreign exchange supply and the value of the country's currency drops too.

The XR rises from e0 to e1. The AD curve shifts to the left, decreasing in GDP, as is the case with a fixed XR. Due to the decrease in demand, the sectors of the domestic economy that produce raw materials will be in a state of recession. The value of the local currency drops to in the domestic contraction go down, as other export sectors in the economy expand because their products become less expensive in the world markets. Part (ii) of Figure (2) shows that the AD curve shift to the left, i.e. to AD2, is less than with a fixed XR. So, a flexible XR causes the decline in global need for domestic goods and leads to a less severe recession than with a fixed XR (Shin-ichi, 2024).

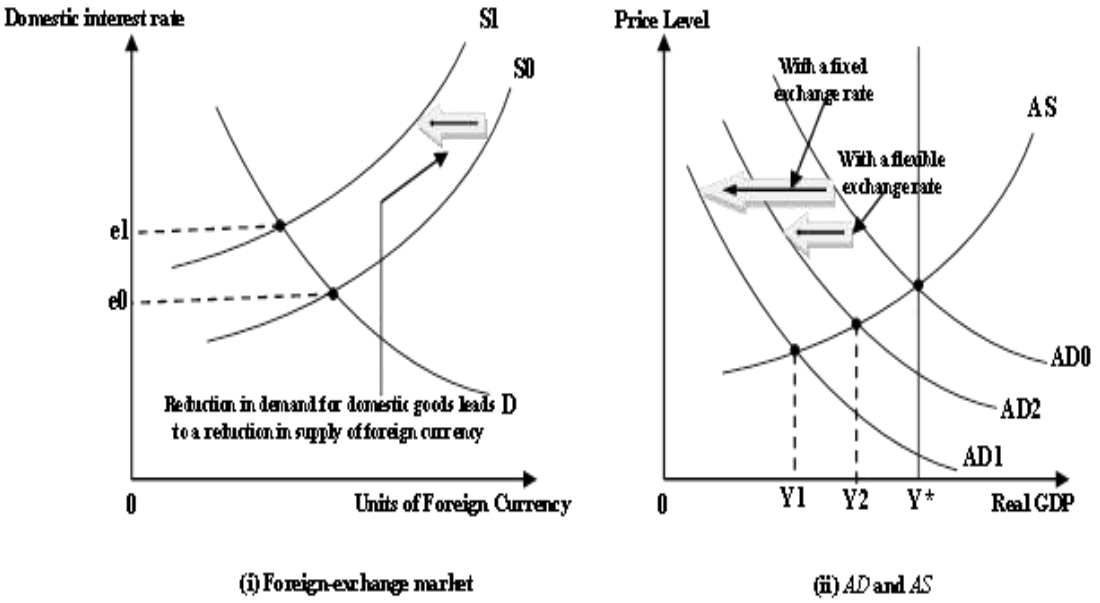

Figure 2: Flexible XRs as a Shock Absorber (Ragan, 2016).

Targeting the XR And Foreign Reserves

To avoid fluctuations of XRs, some central banks peg the currency against another. Figure (3) is the intervention in the foreign exchange market, because the S curve is the supply of the local currency, and D0 its demand. The equilibrium XR is r0, the central bank aims for. If the demand rises to D1, the central bank increases the supply of the

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local currency, i.e. sells the local currency and limits the growth in the XRs. Yet, if the demand for the local currency goes down to D2, the central bank supplies more, buying the local currency to restrict the decline in the XRs (Witjaksono et al., 2023).

When the central bank buys the local currency, it uses its foreign currency reserves. However, when the central bank sells the local currency, its foreign currency reserves increase (Siklar & Akca, 2020). When the demand for domestic currency fluctuates but remains on average at D0, the central bank's foreign exchange reserves fluctuate, but they do not run out or upsurge unceasingly. If the demand for domestic currency permanently falls to D2, the central bank has to purchase domestic currency and sell foreign currency daily for maintaining the XR at r0. This will deplete the central bank's foreign exchange reserves, and the value of the domestic currency will then fall. If the demand for domestic currency permanently increases to D1, the central bank will sell domestic currency and buy foreign currency every day. Foreign currency will accumulate at the central bank in an unwanted manner, which will subsequently appreciate the value of the domestic currency (Hayat & Jabbar, 2022).

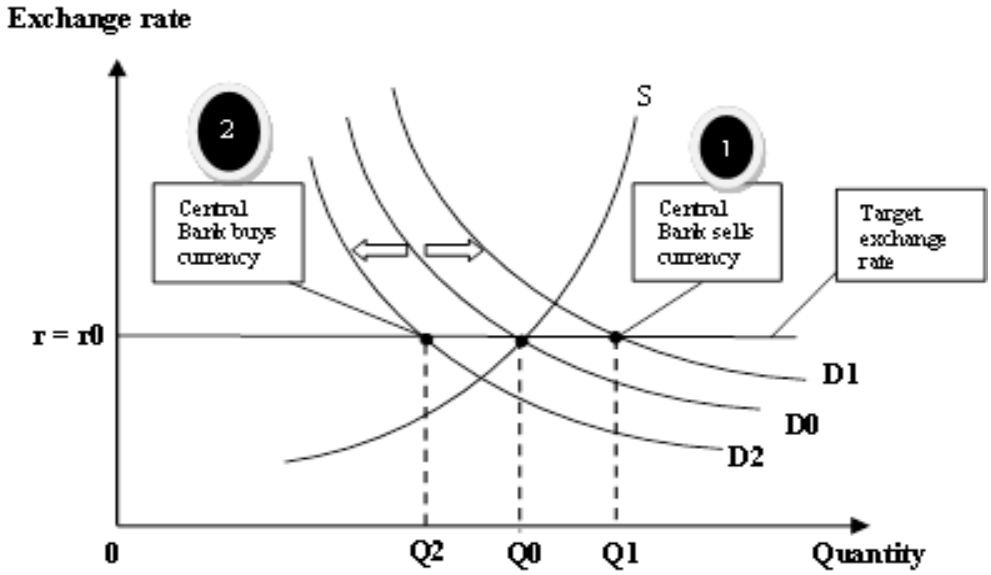

Figure 3: Intervention in The Foreign Exchange Market (Blanchard, 2016).

This analysis shows the reasons for Chinese government intervention, sporadically over decades, for preventing the value of its currency from rising, as the monetary authorities allow no values of the yuan to rise, which leads to slowing the growth of the Chinese economy (Feng et al., 2021).

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METHODOLOGY

This study is important because of the XR targeting policy significance, as an intermediate variable and a nominal anchor, as the XR targeting policy is a modern and major economic policy, which has an important and primary role in achieving economic stability. And its reflection on economic growth and growth.

The research objective is the World Bank data on the variables under study were relied upon. The research aims to analyze the XR targeting policy, and some economic progress stability variables in the Chinese economy.

The research problem is summarized in answering the following questions:

1. Has the XR targeting policy succeeded in achieving economic stability in the Chinese economy?
2. Do economic stability variables are significant in the real XR in the Chinese economy?

The research follows the hypothesis that the XR targeting policy can contribute to achieving a kind of economic stability, especially the overall price level stability, and its important role in reducing the risks that investors may face. Economic stability variables can also be important in the real XR.

The research relied on the scientific inductive approach, through extrapolating the development of some economic phenomena and their impact on the aggregate levels. Besides adopting the advanced econometrics methodology, through the ARDL, to measure the real XRs function by some economic stability variables in the Chinese economy:

$$RE = c + \lambda \mathrm{RE}_{t-1} + \beta_1 GDP_{t-1} + \beta_2 \mathrm{TB}_{t-1} + \beta_3 \mathrm{UN}_{t-1} + \beta_4 IR_{t-1} + \beta_5 \mathrm{CPI}_{t-1} + \sum_{i=1}^{n} a_1 \mathrm{RE}_{t-i} + \sum_{i=0}^{m} a_2 \mathrm{GDP}_{t-i} + \sum_{i=0}^{m} a_3 \mathrm{TB}_{t-i} + \sum_{i=0}^{m} a_4 \mathrm{UN}_{t-i} + \sum_{i=0}^{m} a_5 \mathrm{IR}_{t-i} + \sum_{i=0}^{m} a_6 \mathrm{CPI}_{t-i} + \mu_t$$

RESULTS

Data Analysis

The relations between the real XRs and some economic stability variables can be analyzed, at constant prices 1990 = 100, for the Chinese economy for the period 1990-2023, as follows :

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Gross Domestic Product

When analyzing this product's progress for the research period, it becomes clear that it achieved growth rates throughout the period, as the highest growth rate was achieved in 2007 at a rate of (17.43%). It also achieved growth in 2008 at a rate of (9.97%), (despite the worldwide financial crises that struck the American economy, and its impact spread to the global economy during that period), and this explains the strength, durability and diversity of the Chinese economy, as its effect was reflected in reducing the impact of shocks.

Table (1) shows that the lowest growth rate was achieved during the research period in 2020 at a rate of (0.32%), due to the Corona pandemic that started in the Chinese economy and its impact spread to the global economy, and its impact in stopping most economic activities and then declining the gross domestic product. The compound growth rate of the gross domestic product for the period 2004-2023 was (9.28%).

Trade Balance

When analyzing the development of the trade balance, it becomes clear that it achieved a surplus throughout the research period, and this is a clear reflection of the strength and diversity of the gross domestic product, as the highest growth rate of the trade balance surplus was achieved in 1994 at a rate of (470.42%), which coincided with the highest growth rate of the real XR (depreciation of the local currency) at a rate of (81.14%). In 2020, despite the Corona pandemic crisis, the trade balance surplus achieved a growth rate of (13.96%), a good nature indicator of the economy and its ability to limit the crises.

The compound growth rate of the trade balance for the period 2004-2023 was (8.92%).

Inflation Rate

The progress of the time series made it clear that the highest inflation rate was achieved in 1994 at a rate of (24.26%), which was reflected in the largest rise in the real XRs (currency devaluation) at a rate of (81.14%). Starting from 1997, the inflation rate recorded stability at a rate of (2.79%), as the relative stability in the inflation rate continued for most of the following years. This effect was clearly reflected in the real XR. Thus, changes in price levels are a major real XR determinant in the economy of China.

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Table 1: The development of some economic stability variables (at constant prices 1990 = 100 million Chinese yuan) and the actual XR in the Chinese economy for 1990-2023

Growth Rate%	Real XR*	Growth Rate%	Total Reserves	Growth Rate%	Unemployment, Total (% of Total Labor Force)	Inflation Rate%	Growth Rate%	Trade Balance	Growth Rate%	GDP	Years
	4.78		164904.26		2.25			94406.18		1887286.73	1990
10.57	5.29	50.14	247595.06	5.33	2.37	3.56	18.34	111724.88	12.59	2124983.68	1991
6.94	5.66	-49.74	124438.25	0.00	2.37	6.35	-7.88	102919.79	16.20	2469162.33	1992
16.32	6.58	0.32	124836.79	13.50	2.69	14.61	-75.91	24791.06	14.46	2826101.13	1993
81.14	11.92	154.34	317508.93	7.81	2.90	24.26	470.42	141414.04	9.73	3100953.35	1994
10.08	13.12	15.28	366038.97	3.45	3.00	16.79	24.83	176528.34	7.98	3348553.33	1995
4.76	13.74	27.91	468185.19	4.00	3.12	8.31	-53.70	81737.32	8.09	3619427.38	1996
0.14	13.76	27.15	595285.71	3.53	3.23	2.79	463.75	460792.77	7.99	3908745.13	1997
-2.42	13.43	5.04	625301.02	0.31	3.24	-0.77	0.67	463889.60	7.71	4210025.29	1998
-3.52	12.96	7.10	669695.61	0.31	3.25	-1.40	-3.59	447233.92	7.81	4538945.65	1999
-2.93	12.58	6.05	710184.87	0.31	3.26	0.35	14.92	513964.24	10.34	5008464.60	2000
-2.07	12.32	27.18	903210.59	16.56	3.80	0.72	-0.12	513330.43	9.76	5497494.99	2001
-2.28	12.04	36.30	1231049.4	11.58	4.24	-0.73	30.58	670290.81	10.60	6080245.14	2002
-1.12	11.90	38.23	1701668.5	8.02	4.58	1.13	-48.99	341885.93	11.64	6788205.70	2003
1.11	12.03	44.16	2453086.6	-1.97	4.49	3.82	29.70	443428.22	13.43	7699889.58	2004
-2.54	11.73	29.83	3184775.6	0.67	4.52	1.78	70.36	755433.03	13.72	8756542.43	2005
-4.18	11.24	24.43	3962956.1	-1.99	4.43	1.65	39.31	1052396.17	15.25	10091573.19	2006
-2.77	10.93	30.24	5161442.2	-1.81	4.35	4.82	27.04	1337002.85	17.43	11850251.75	2007
-6.83	10.18	9.63	5658591.8	5.52	4.59	5.93	-5.15	1268137.69	11.59	13223286.56	2008
-2.05	9.97	23.56	6991658.3	2.83	4.72	-0.73	-28.52	906410.58	9.97	14541683.15	2009
0.60	10.03	14.10	7977493.2	-4.03	4.53	3.18	2.03	924779.07	14.61	16666209.86	2010
-2.34	9.80	1.00	8057084.4	0.44	4.55	5.55	-14.53	790382.11	12.17	18694172.33	2011
-1.78	9.62	-0.92	7983264.5	0.66	4.58	2.62	15.32	911484.62	7.56	20107581.91	2012
-0.73	9.55	9.56	8746627.3	0.44	4.60	2.62	3.72	945351.62	7.29	21572524.51	2013
-0.55	9.50	-2.22	8552379.9	0.65	4.63	1.92	23.77	1170070.76	6.49	22971953.89	2014
2.70	9.76	-12.75	7462299.5	0.43	4.65	1.44	32.40	1549118.72	5.52	24240420.17	2015
7.47	10.48	-4.84	7100754.6	-1.94	4.56	2.00	-11.66	1368493.25	6.23	25750097.40	2016
1.19	10.61	4.59	7426398.4	-1.97	4.47	1.59	-12.27	1200536.25	9.73	28254514.18	2017
-2.46	10.35	-6.10	6973242.5	-3.58	4.31	2.07	-17.62	988965.67	8.24	30582684.31	2018
5.53	10.92	3.23	7198429.4	5.80	4.56	2.90	14.23	1129741.99	4.29	31894727.53	2019
1.06	11.04	1.60	7313288	9.65	5.00	2.42	13.96	1287500.22	0.32	31995231.53	2020
-9.86	9.95	-5.51	6910602.1	-9.00	4.55	0.98	3.80	1336364.79	12.28	35925486.13	2021
-1.36	9.81	-1.17	6829599.9	9.45	4.98	1.97	33.32	1781644.57	2.80	36931162.35	2022
1.23	9.93	9.43	7473549.6	-6.22	4.67	0.23	-3.36	1721802.88	4.39	38552968.92	2023
Compound growth rate %											**Timeframes**
9.19		14.20		3.43			16.65		9.28		1990-2000
-2.06		22.01		1.65			4.00		11.77		2001-2011
0.27		-0.55		0.16			5.44		5.57		2012-2023
2.17		11.87		2.17			8.92		9.28		1990-2023

*The real XR was calculated according to the following formula: eP/Pf.

The table was prepared by the authors based on the World Bank for Reconstruction and Development, international statistics and data files, statistical bulletins for different years. At the link https://data.albankaldawli.org/country/china?view=chart

The simple growth rate was calculated according to the following equation: $\boldsymbol{r = \frac{P_t - P_{t-1}}{P_t} * 100}$

The compound growth rate was calculated according to the following equation: $\boldsymbol{R = \left[\left((PT/P0)\text{^}(1/N)\right) - 1\right] * 100}$

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China aims at the XRs as nominal anchors according to evidence which indicates a stable long-term relationship between domestic prices and the XRs. Earlier than 1994, the growth in domestic prices continuously declined in the value of the yuan; post 1994, the XR stability improved the stability of domestic prices. In addition, as the economy of China integrates with the world by foreign trade and investment, the linkage by the XRs between domestic and global prices of tradable goods more entrenched. So, the XRs are now less valuable as a tool to transfer expenditure, but more beneficial as nominal anchors. After that, currency appreciation coexisted with sustained expansions in exports and foreign investment inflows (Xu, 2000).

Unemployment Rate

Unemployment rates have been relatively stable for most of the research years, indicating the strength, durability and diversity of the Chinese economy. The lowest unemployment rate was recorded in 1990 at (2.25%). The highest unemployment rate was recorded in 2020 at (5.00%), due to the Corona pandemic crisis. Thus, the economy of China is characterized by high employment rates.

The compound unemployment growth rate for the period 2004-2023 was (2.17%).

International Reserves

When tracking the development of the time series, it becomes clear that international reserves, although they declined in 1992 by a rate of (49.74%), witnessed growth for most of the research years, as the highest growth rate was recorded in 1994 by a rate of (154.34%), coinciding with the highest growth rate of the real XR (decline in the local currency) by a rate of (81.14%), thus it becomes clear that despite the growth of international reserves, the XR witnessed a decline, meaning that the Chinese economic policy does not rely on using international reserves to protect the XR of the local currency.

The huge trade surpluses that China achieved over several years allowed it to accumulate huge international reserves, thus exceeding its precautionary needs to cover imports wisely, and cover its modest international obligations (Lafrance, 2008).

The compound growth rate of international reserves for the period 2004-2023 was (11.87%).

Real XR

The development of the time series made the real XR steady appreciating (depreciating) from the beginning of the period until 1997, when the real XR was the highest (13.76), partly reflecting the change effect in the general price level on the real XRs. The key argument for the yuan devaluation is that China's exports weakened greatly from the large devaluations of currencies in other East Asian economies in 1997, and without devaluating the yuan, the competitiveness loss of exports of China is permanent. These

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exports were negatively affected by the Asian financial crises. Its growth decreased largely towards the end of 1998 (Xu, 2000).

On July 21, 2005, China somewhat appreciated the yuan and formally adjusted the XR regime. This is interpreted as simply a result of global pressures aimed at reducing the imbalance in international trade. The Chinese authorities consider external and internal concerns in managing the XR. The decision of July 21st has shown that its impact is limited (Goujon & Guérineau, 2006) China's growing influence on global financial and economic developments has attracted many "People's Bank of China watchers" and the rise in the methods to monitor other central banks (Shu & Ng, 2010).

China's intervention policy of limiting appreciating its currency, against the dollar and other currencies, provides a tension with many of its trading partners, in particular, some indicate that China deliberately "manipulates" its currency for gaining unfair trade rewards at the expense of its trading partners. It is argued that the undervalued Chinese currency was crucial in the large annual American trade deficit with China and widened job losses in America, such as in the manufacturing sectors (Morrison & Labonte, 2012).

2021 witnessed a stable cross-border capital flow balance and supply and demand foreign exchange were basically balanced, and market expectations. The market supply managed a floating XR system and demand showed to many currencies worked as an automatic stabilizer to adjust the macroeconomic and payment balance. Market and policy factors efficiently corrected XR deviations (Report, 2022).

The real XR subsequently experienced some volatility with some relative stability, (local currency appreciation) declining to (9.93) by the end of 2023. The compound growth rates of the actual XRs for the period 2004-2023 were (2.17%).

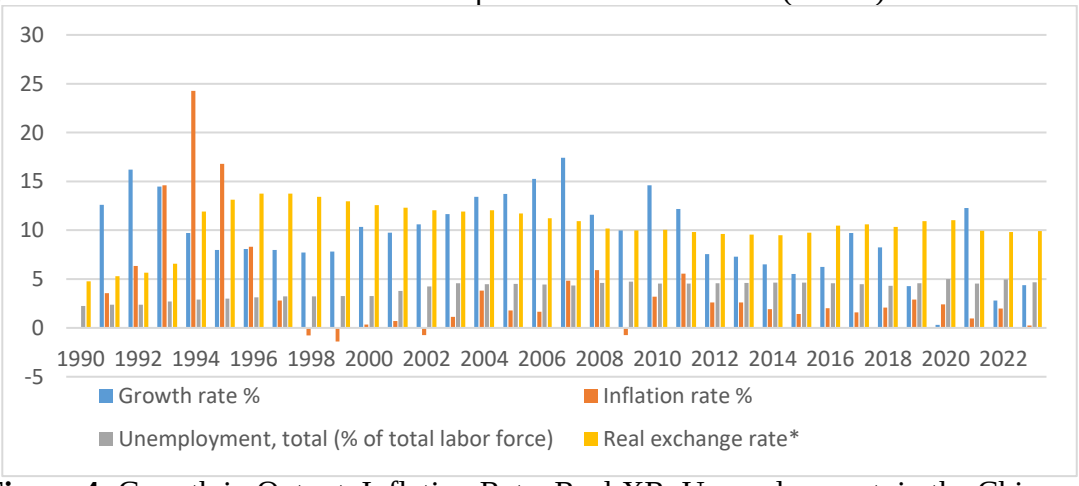

Figure 4: Growth in Output, Inflation Rate, Real XR, Unemployment, in the Chinese Economy for the Period 1990-2023

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The graph was from the authors based on Table (1).

Figure (4) is the gross domestic product growth, the inflation rate, the unemployment rates, and the real XR for the research period.

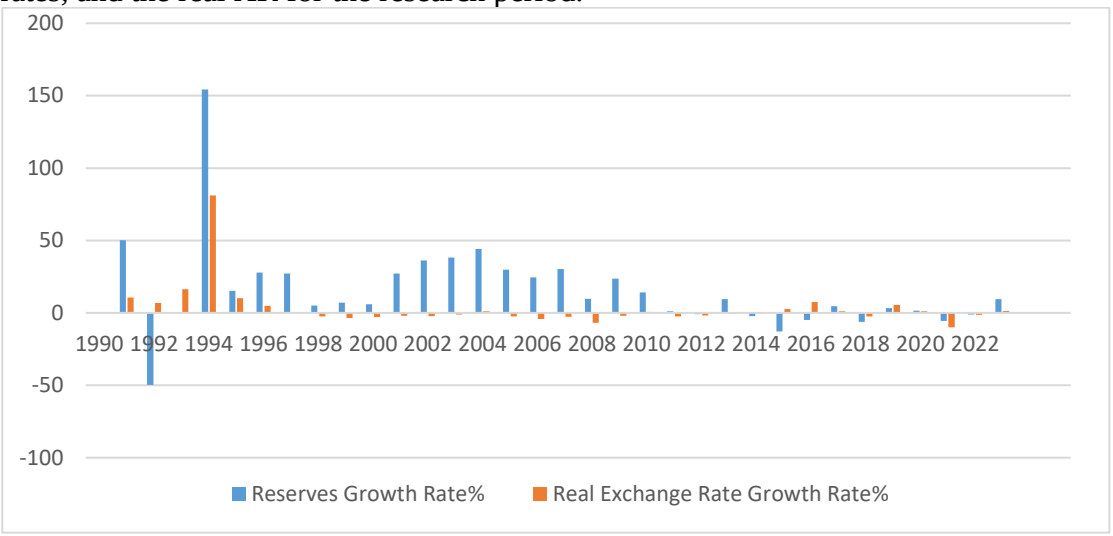

Figure 5: Real XR Growth, Reserves Growth Rate, In the Chinese Economy for The Period 1990-2023

The chart was from the authors based on Table (1)

Figure (5) from the author based on table (1) is the growth rate of both the real XRs and international reserves during the research period, as the growth of reserves often exceeds the growth of the real XRs.

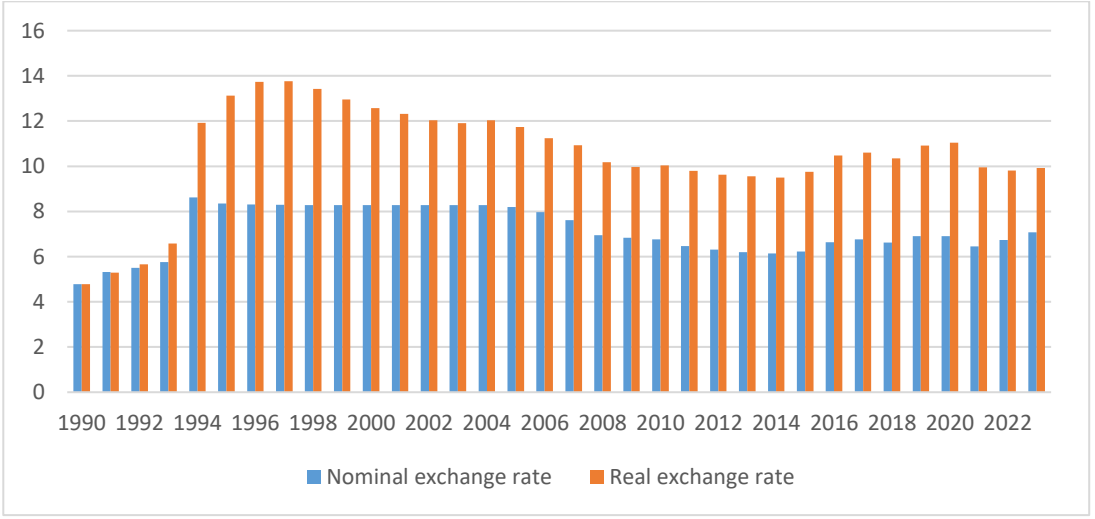

Figure 6: The Evolution of the Nominal and Real XR Between the United States and China for The Period 1990-2023

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Chart (6) based on table (1) and the appendix is the evaluating the nominal and real XR between the USA and China during the research period, as the gap widens starting from 1994, explaining the targeting policy through devaluing the local currency.

Analysis of the Results of Standard Tests

The research relied on a set of economic stability variables, for the purpose of conducting appropriate standard tests, as it relied on annual data for the values of the variables and at constant prices 1990=100, which can be explained in the function below:

RE=F(GDP,TB,UN,IR,CPI)

Since:

-RE is the real XR (dependent variable)

As for the independent variables:

-GDP is the gross domestic product.
-TB is the trade balance.
-UN is unemployment.
-IR is international reserves.
-CPI is the consumer price index.

Unit Root Test

Table (2) shows the variable RE is not stable at the level, i.e. it suffers from the unit root problem. After taking the first difference, the variable stabilized at a significant level of 1%, in the case of the secant presence only, a sect and a general trend, and with not a scent and general trends. The GDP variable is unstable at the level, but it is stable after taking the first difference, in the case of a categorical and general trend at the 1% significance level. While the TB variable is stable at the level when categorical and general trends at the 1% significance level, and it is also stable at the first differences at the 1% significance level, when only a categorical, a categorical and general patten, and with not categorical and general trends.

The variable UN unsterilized at the level, and stabilized at the first difference at a significance level of 1%, when there is only a categorical variable, a categorical variable and a general trend, and without a categorical variable and an overall pattern. As for the variable IR, it stabilized at the level when there is a categorical variable and a general trend, at a significance level of 10%, and stabilized at the first difference in the case of the presence of only a categorical variable, at a significance of 5%.

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Table 2: The Unit Root augmented Dickey-Fuller test for

UNIT ROOT TEST RESULTS TABLE (ADF) Null Hypothesis: the variable has a unit root							
	At Level						
		RE	**GDP**	**TB**	**UN**	**IR**	**CPI**
With Constant	t-Statistic	2.0301-	4.4109	1.3514-	2.1341-	1.7084-	1.9377-
	Prob.	0.2731	1.0000	0.5905	0.2333	0.4170	0.3117
		n0	n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	2.0413-	1.3560-	4.3801-	1.5018-	3.2572-	5.9684-
	Prob.	0.5552	0.8552	0.0080	0.8086	0.0929	0.0002
		n0	n0	***	n0	*	***
Without Constant & Trend	t-Statistic	1.5193-	9.4895	0.7920	1.4325	0.4102-	4.2881
	Prob.	0.1185	1.0000	0.8792	0.9592	0.5271	1.0000
		n0	n0	n0	n0	n0	n0
	At First Difference						
		d(RE)	d(GDP)	d(TB)	d(UN)	d(IR)	d(CPI)
With Constant	t-Statistic	7.8831-	0.9683-	5.9055-	5.8646-	3.1526-	2.5223-
	Prob.	0.0000	0.7509	0.0000	0.0000	0.0326	0.1198
		***	n0	***	***	**	n0
With Constant & Trend	t-Statistic	6.4113-	6.6815-	6.0496-	6.2666-	3.1025-	2.7176-
	Prob.	0.0001	0.0000	0.0002	0.0001	0.1228	0.2366
		***	***	***	***	n0	n0
Without Constant & Trend	t-Statistic	8.2762-	0.8289	4.9552-	5.3319-	1.1408-	1.8776-
	Prob.	0.0000	0.8851	0.0000	0.0000	0.2253	0.0586
		***	n0	***	***	n0	*

Notes: a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant

b: Lag Length based on SIC

c: Probability based on MacKinnon (1996) one-sided p-values.

The authors prepared this table based on the E-views10 program.

As for the variable CPI, it stabilized at the level when there is a categorical variable and a general trend, with a significance of 1%, and stabilized at the first difference, without a categorical variable and a general tendency, with a significance of 10%.

After interpreting the unit root test outcome shown in Table (2), it clarifies that part of the variables stabilized at the level, while the other part stabilized at the first difference (especially the dependent variable), and this means that the appropriate model for measurement and analysis purposes is the autoregressive allocated time lag model ARDL.

Estimating the XR function by the ARDL

According to Table (3), the determination R-squared coefficient = 0.963253 so the independent variables show 96.32% of the change in the dependent variable, and the rest is because of the random variable or other variables not included in the model.

The value of the adjusted coefficient of determination Adjusted R-squared = 0.948221.

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And the value of F-statistics = 64.07727, significant at 1%. Thus, the estimated model is significant at the 1% level.

Table 3: Results of the ARDL Model for the XR Function

Variable	Coefficient	Std. Error	t-Statistic	Prob*.
RE(1-)	0.219438-	0.160797	1.364689-	0.1861
RE(2-)	0.197355-	0.082827	2.382751-	0.0263
GDP	4.64-E-07	5.39E-08	8.592739-	0.0000
TB	6.73-E-07	3.67E-07	1.832348-	0.0805
UN	1.040799-	0.408584	2.547332-	0.0184
UN(1-)	0.939503	0.430022	2.184779	0.0398
IR	8.40-E-08	1.93E-07	0.434173-	0.6684
IR(1-)	7.81-E-07	1.92E-07	4.070900-	0.0005
CPI	0.139568	0.015037	9.281482	0.0000
C	6.054877-	1.246318	4.858213-	0.0001
R-squared	0.963253	Mean dependent var		10.85750
Adjusted R-squared	0.948221	S.D. dependent var		1.812382
S.E. of regression	0.412409	Akaike info criterion		1.316702
Sum squared resid	3.741778	Schwarz criterion		1.774744
Log likelihood	11.06723-	Hannan-Quinn criter.		1.468530
F-statistic	64.07727	Durbin-Watson stat		2.122023
Prob(F-statistic)	0.000000			

Note: p-values and any subsequent tests account for no model choice

The authors prepared the table according to the E-views10 program.

Based on the graph (7), the optimal slowdown periods are (2, 0, 0, 1, 1, 0), depending on the Akaike criteria.

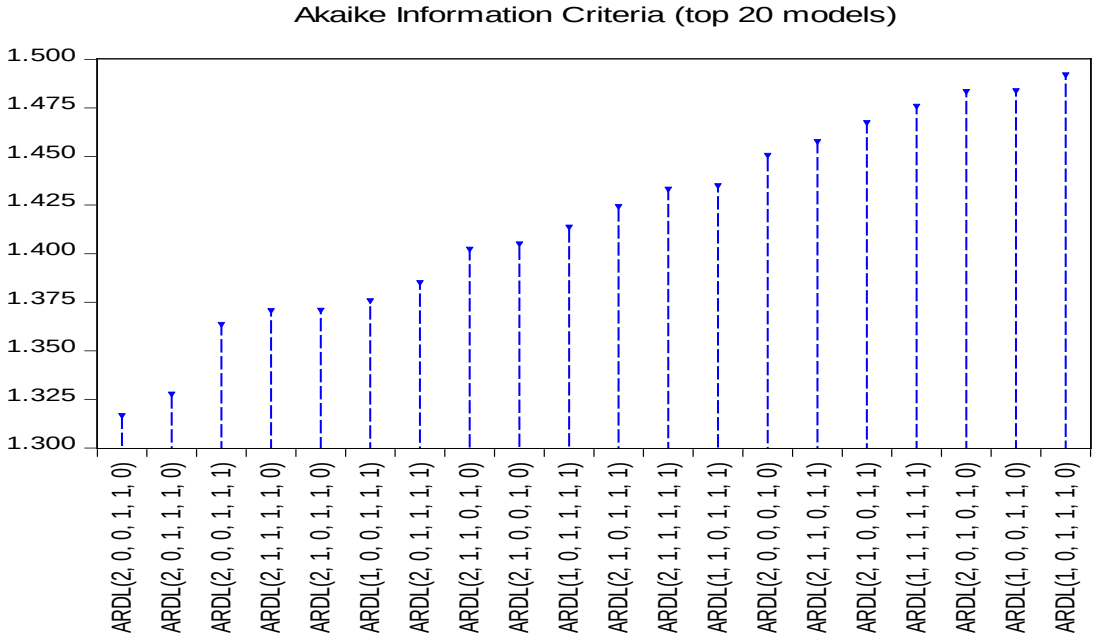

Figure 7: Optimal Deceleration Periods

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The figure was prepared by researchers based on the E-views10 program.

Bounds Test

According to the bounds test in Table (4), the value of F-statistic = 20.67761, bigger than the upper limit (4.15) at a significance 1% with a long-term equilibrium relation between the variables.

Table 4: Bounds Test

F-Bounds Test		**Null Hypothesis: No levels relationship**		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	20.67761	%10	2.08	3
K	5	%5	2.39	3.38
		%2.5	2.7	3.73
		%1	3.06	4.15

The authors based on the E-views10 program prepared this table.

Diagnostic Tests

Lagrange Factor Test for Serial Correlation between Residuals Serial Correlation LM Test

The serial correlation test shown in Table (5), the probability values for both F-statistic and Chi-Square are not significant at the 5% level, there is no problem of autocorrelation between residuals.

Table 5: Results of The Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.107950	Prob. F(2,20)	0.1477
Obs*R-squared	5.571084	Prob. Chi-Square(2)	0.0617

The table was prepared by the authors according to the E-views10 program.

Heteroskedasticity Test

The Heteroskedasticity Test, in Table (6), the probability of F-statistic and Chi-Square is not significant at the 5% level. Thus, the null hypothesis is accepted, stating that the estimated model suffers nothing of heteroskedasticity.

Table 6: Results of the Heteroskedasticity Test

Heteroskedasticity Test: Harvey			
F-statistic	1.402409	Prob. F(9,22)	0.2464
Obs*R-squared	11.66592	Prob. Chi-Square(9)	0.2328
Scaled explained SS	6.124665	Prob. Chi-Square(9)	0.7274

The authors prepared the table according to the E-views10 program.

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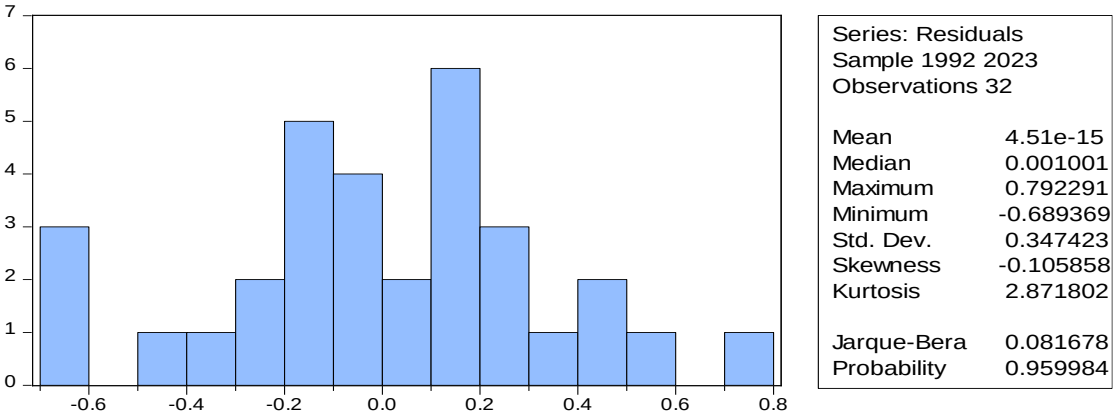
Histogram-Normality Test

From the graph (8), the probability of the Jarqur-Bera statistics is (0.9599), i.e. not significant at the 5% level so the estimated model follows the normal distribution of random errors.



Graph 8: Distribution of Random Errors

The table was prepared by the authors based on the E-views10 program.

Testing The Predictive Performance of The Error Correction Model

Figure (9) is the unconstrained error correction model predictive performance, as the Thiel coefficient is (0.017), which is close to zero. It is also clear that the bias ratio BP = (0.000065), near zero. The variance ratio VP = (0.003423), also near zero. As for the covariance ratio CP, it reached (0.9965), very close to one. Thus, we conclude that the estimated model can be adopted for the purposes of forecasting in the future and drawing up future economic policies.

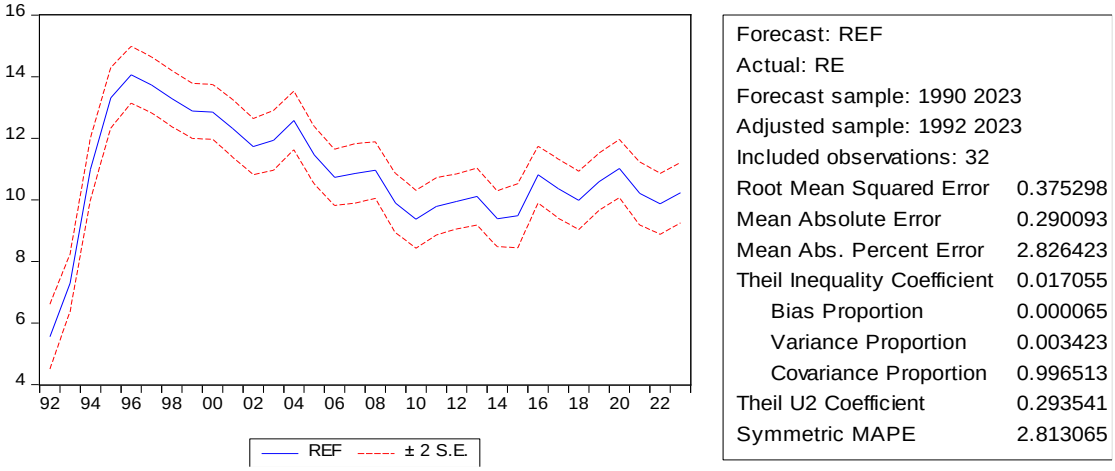


Figure 9: Predictive Performance of The Error Correction Model

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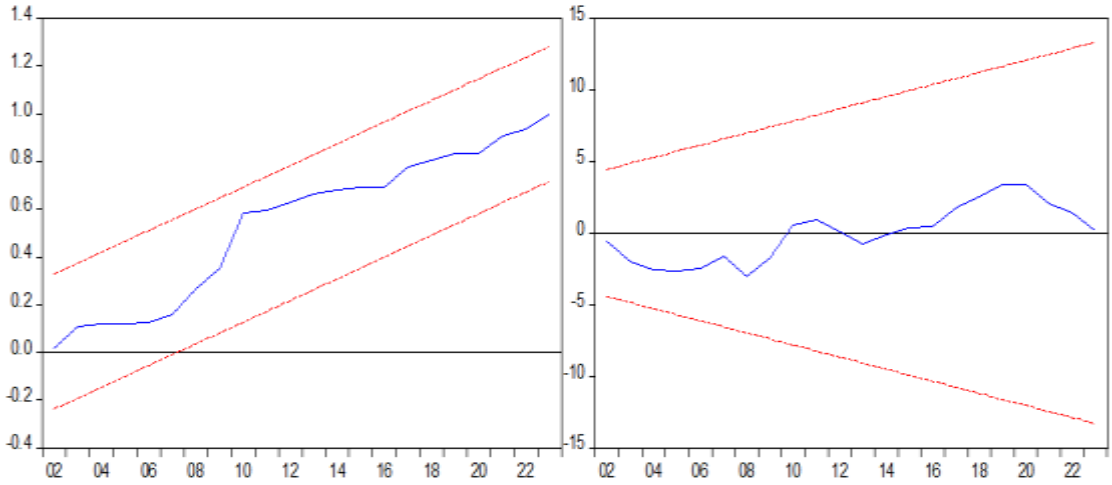
The table was from the authors according to the E-views10 program.

Stability Diagnostics

The CUSUM test, in part A of Figure (10), shows the sum of the residuals accumulates between the two critical limits, which indicates that the estimated parameters are stable at a significance level of 5%. The CUSUM Of Squares test, in part B, shows the sum of the residuals accumulates between the two values, so the variables included are stable at a significant level of 5%.



A **B**

Figure 10: Structural Stability Model Parameters by the author

Estimating the short-term parameters, the error correction parameter and the long-term

Estimation of the short-term parameters and the error corrections

Table (7) shows the short-term parameters. The real XR in the previous year has a significant result at the level of 1% and is positive on the current XR, meaning a rise in the real XRs (depreciating the local currency) in the previous year will increase the real XRs in the current year. While the unemployment rate significantly affects the level of 1% and is negative on the real XR, meaning that an increase in the unemployment rate by 1% decrease in the real XR (a rise in the value of the local currency) by 1.04. This can be justified by the fact that the high unemployment rates in an economy such as China motivates economic policy makers to take expansionary measures, and when the economy is active and employment increases, and then production, the surplus will be directed to exports, and then foreign currencies will flow inward, which raises the value of the local currency.

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Table 7: The Short-Term Parameters and The Error Correction Model

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(RE(-1))	0.197355	0.063236	3.120955	0.0050
D(UN)	1.040799-	0.317972	3.273237-	0.0035
D(IR)	8.40-E-08	1.20E-07	0.697923-	0.4925
CointEq*(1-)	1.416793-	0.104385	13.57272-	0.0000
R-squared	0.892070	Mean dependent var		0.145000
Adjusted R-squared	0.880506	S.D. dependent var		1.057517
S.E. of regression	0.365561	Akaike info criterion		0.941702
Sum squared resid	3.741778	Schwarz criterion		1.124919
Log likelihood	11.06723-	Hannan-Quinn criter.		1.002433
Durbin-Watson stat	2.122023			

The authors prepared the E-views10 program for the E-views10 program.

International reserves do not significantly effect on the real XR in the short term. So, the Chinese economy, international reserves do not play an important role in supporting the XR, as the surplus is often directed towards foreign investments.

Table (7) is the error correction parameter (-1.416), i.e. negative and significant at the 1% level and greater than one at absolute value. This shows that the speed of adaptation is good to address imbalances in the short term, to achieve balance in the long term. It needs 1/1.416=0.706 of a year to adapt.

Estimating long-term parameters

Table 8: Results of long-term landmarks

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	3.27-E-07	1.65E-08	19.79474-	0.0000
TB	4.75-E-07	2.59E-07	1.834383-	0.0802
UN	0.071497-	0.196974	0.362977-	0.7201
IR	6.10-E-07	4.06E-08	15.03678-	0.0000
CPI	0.098509	0.003817	25.81093	0.0000
C	4.273649-	0.639162	6.686331-	0.0000
EC = RE - (-0.0000*GDP*0.0000- TB -0.0715*UN -0.0000*IR + 0.0985*CPI				
(4.2736-				

EC = RE - (-0.0000*GDP*0.0000- TB -0.0715*UN -0.0000*IR + 0.0985*CPI
(4.2736
The authors prepared the E-views10 program for the E-views10 program.

Table (8), according to the long-term parameters, shows the gross domestic product positively significantly affect at the level of 1%, because a significant part of the product

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is directed towards exports, and the resulting flow of foreign currencies and then their effect on the real XR. The trade balance significantly impacts at the level of 10% and is positive on the real XR, since the trade balance surplus means a rise in the flow of foreign currencies, and in the pursuit of the economic policy adopted in China to gain a competitive advantage through the XR policy will reduce the value of the local currency (raise the real XRs)

The international reserves significantly affect sat the level of 1% and is positive but weak on the real XRs confirming that the economic policy in China using international reserves to support the XR, as the surpluses of these reserves are often invested abroad. The consumer price index has a significant effect at the 1% level, and is positive on the real XR, i.e. an increase in the consumer price index by one unit rise in the real XRs (depreciating the local currency) by (0.0985). This is consistent with economic logic.

DISCUSSION

In conclusion, some discussions can be raised regarding the theoretical and analytical aspects. China targets a stable and competitive XR, as partial development strategy that promotes the expansion of tradable activities. This is consistent with what was found by (Frenkel, 2014). It is also partially consistent with what was found by (Goujon & Guérineau, 2006), who believe that China's XR policy has been targeting internal and external objectives over the past 25 years - not just export competitiveness. Therefore, both need to be considered when there is an interpretation of any adjustment to the XR policy. If there is convergence in some aspects of monetary policy between different economies, this does not mean that the economic conditions of each country are similar, due to the difference in institutional structure and preferred model of economic development. This is consistent with what was stated by (Jones, 2013).

The credibility of monetary policy is linked to low XR volatility, which is measured by inflation rates, and this is consistent with what was concluded by (Y C Swallow, 2016). Although targeting the foreign XR encourages employment and economic growth, “trilemmas" of macroeconomic policies affect central bank decisions. This is consistent with what was stated by (Krušković, 2020).

Targeting the XR in China has become more useful as nominal anchors, as XR stability offers a stable anchor for stability of domestic prices helps achieve sustainable economic growths in the long run partially consistent with what was concluded (Xu, 2000). As for the standard aspect of the research, it came in contrast to what is familiar, as most research focused on the effect of XR on some economic stability variables, while our research focused on evaluating the real XR (as a dependent variable), through the effect of some economic stability variables (as independent variables). The standard tests showed a long-term equilibrium relation between the variables. In the short term,

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the unemployment rate negatively and significantly affects the real XR. While international reserves have no significant effect on the real XR. Momentarily, it became clear that the gross domestic product positively and significantly affects the real XRs, the trade balance positively and significantly affects the real XR, and that international reserves have a positive but weak significant effect on the real XRs. Also, the consumer price index has a positive moral effect on the real XRs.

CONCLUSIONS

The XRs target policy is an important intermediary tool for achieving stability, especially the stability of the general price levels. Yet, it can limit the independence of monetary policy to confront some shocks, as monetary policy is no longer available to stabilize the economy. It can also make domestic monetary policy subordinate to the monetary policy of the anchor currency country. The purpose of implementing the targeting policy differs in advanced economies from developing economies. In some advanced economies that adopt the XR targeting policy, the currency is often devalued to gain competition, while in developing economies, the goal is to control the local inflation rates.

By reviewing the development of some economic stability variables, it becomes clear that the growth of output and the trade balance surplus continued throughout the research period, albeit at varying rates, and this is an indicator of the strength and diversity of the Chinese economy, and the effectiveness of the XR targeting policy. It is also clear that inflation rates have been stable for most of the research years, as well as the unemployment rate, and this may reflect the XR targeting policy for the purpose of stimulating local production and increasing exports, and the impact of this policy in reducing inflation rates and increasing employment. International reserves have witnessed growth for most of the research years, which often coincided with the rise in the real XR (depreciating the local currency), explained by the fact that international reserves are not used to support the value of the local currency, but rather the adoption of a policy of devaluation of the currency has increased in the accumulation of international reserves. According to the results of standard tests, it is clear from the estimation of short-term parameters that the unemployment rate has a significant effect on the real XR, as the rise in the unemployment rate declines in the real XR (a rise in the value of the local currency). When the unemployment rate rises, the government may take incentive measures to stimulate the economy, which encourages exports and then revenues and supply of foreign currency, which raises the value of the local currency. While international reserves do not have a significant effect on the real XR, this is because the Chinese economy does not use reserves to support the currency, but rather they are often used for foreign investments. As for the long-term parameters, the gross domestic product significantly affects the real XRs, as part of the product directed at exports will contribute to increasing foreign currency revenues, which influences the

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real XR. The trade balance significantly affects the real XR, as the trade balance surplus contributes to the inflow of foreign currencies, which requires intervention to maintain the value of the currency within the target rate. International reserves have a positive but weak significant impact on the real XRs, as the surplus of international reserves is often directed to foreign investments. The consumer price index has a significant impact on the real XRs, explaining the effect of the general price level in the long run on the real XR.

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