



Munich Personal RePEc Archive

Balance of Payments, Exchange Rate, and Foreign Exchange Reserves in China since 1979

Popov, Vladimir

CEMI

2 August 2024

Online at <https://mpra.ub.uni-muenchen.de/121627/>
MPRA Paper No. 121627, posted 04 Aug 2024 08:47 UTC

Balance of Payments, Exchange Rate, and Foreign Exchange Reserves in China since 1979

Vladimir Popov

ABSTRACT

China was extremely successful in recent decades in managing external equilibrium in the short and medium term using three mechanisms to cushion the balance of payments shocks. First, it maintained a flexible rate, so could adjust to the fluctuations in trade balance and capital flows via devaluation/appreciation of national currency. Second, it exercised a capital account control that prevented the sudden and sizeable outflow of capital. And third, its foreign exchange reserves were the largest in the world and large even as compared to its GDP and foreign trade and capital flows, so they could have been used to absorb negative trade and capital account shocks with full sterilization (without a fear of continuous outflow of capital due to capital control). In particular, China survived the Asian currency crisis of 1997 better than the other countries – its reserves even did not decrease in 1997 and its GDP growth rates virtually did not decline.

However, in the long term the abandonment of the policy of foreign exchange reserves accumulation (since the Great Recession of 2008-09) led to the considerable appreciation of the real exchange rate of yuan, the decline in the ratio of export to GDP and the share of investment in GDP. The result was the slowdown of growth: GDP growth rates fell from 14% in 2007 to 5% in 2024.

Keywords: balance of payments, foreign exchange reserves, external and internal equilibrium, exchange rate, slowdown of growth in China.

JEL: F31, F32, F41, N15, O24, O40.

Balance of Payments, Exchange Rate, and Foreign Exchange Reserves in China since 1979

Vladimir Popov

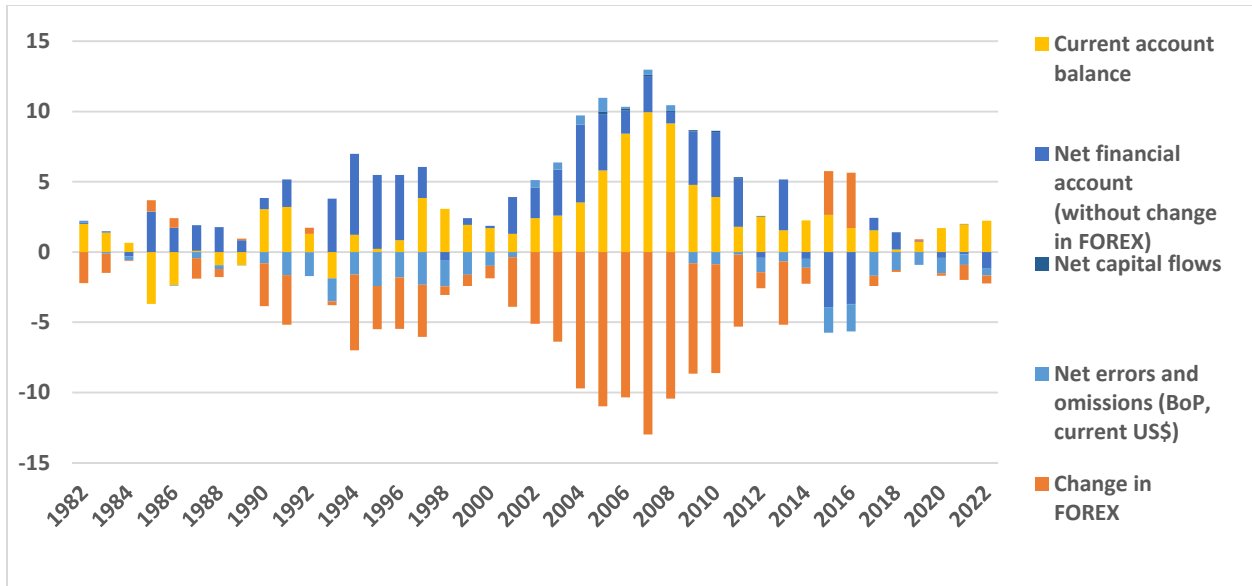
A Brief Historical Context

Since the start of the pro-market reforms in 1979 China gradually deregulated its foreign trade, introduced convertibility of the yuan on current account and liberalized considerably its capital account. Foreign trade increased dramatically, current account, except for several years, was in surplus (fig. 1), there was an inflow of capital (mostly in the form of foreign direct investment), and rapid accumulation of foreign exchange reserves – FOREX (fig. 2). But there occurred considerable changes in this pattern over the years – the size of the surpluses on current and capital accounts (“twin surpluses”) increased greatly in the first decade of the current century (up to 13% of GDP in 2007) and decreased considerably afterwards. The accumulation of FOREX was a balancing item and mirror image of the current and capital account surplus and reached 13% of GDP in 2007, but virtually stopped after 2013. In fact, the absolute amount of FOREX reached maximum in 2014 (3.8 trillion US dollars) and has been declining since then (3.2 trillion in April 2024).

The dramatic change in the patterns occurred after the Great Recession of 2008-09. Before this recession China was exporting more goods and services than importing (earning a surplus on current account) and importing capital from abroad (mostly in the form of foreign direct investment – FDI), earning a surplus on capital¹ account. As fig. 3 suggests, the inflows of capital came mostly in the form of foreign direct investment, whereas portfolio and short term capital flows were either insignificant or negative (outflows). These outflows in particular years were very significant (up to 3 to 5% of GDP), but usually not significant enough to offset completely the inflow of capital in the form of direct investment.

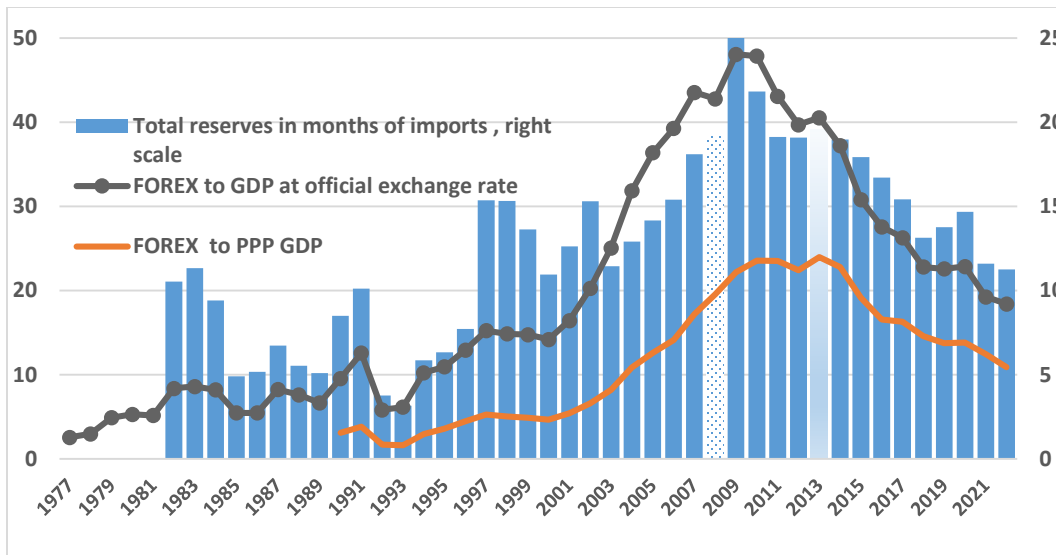
¹ In IMF classification capital account is called financial account (acquisition and disbursement of foreign financial assets), whereas the notion of capital account is used to denote receipts and payments of interests and dividends on foreign assets (which is included into current account in a conventional classification).

Fig. 1. Balance of payments items in China, % of GDP, 1982-2022



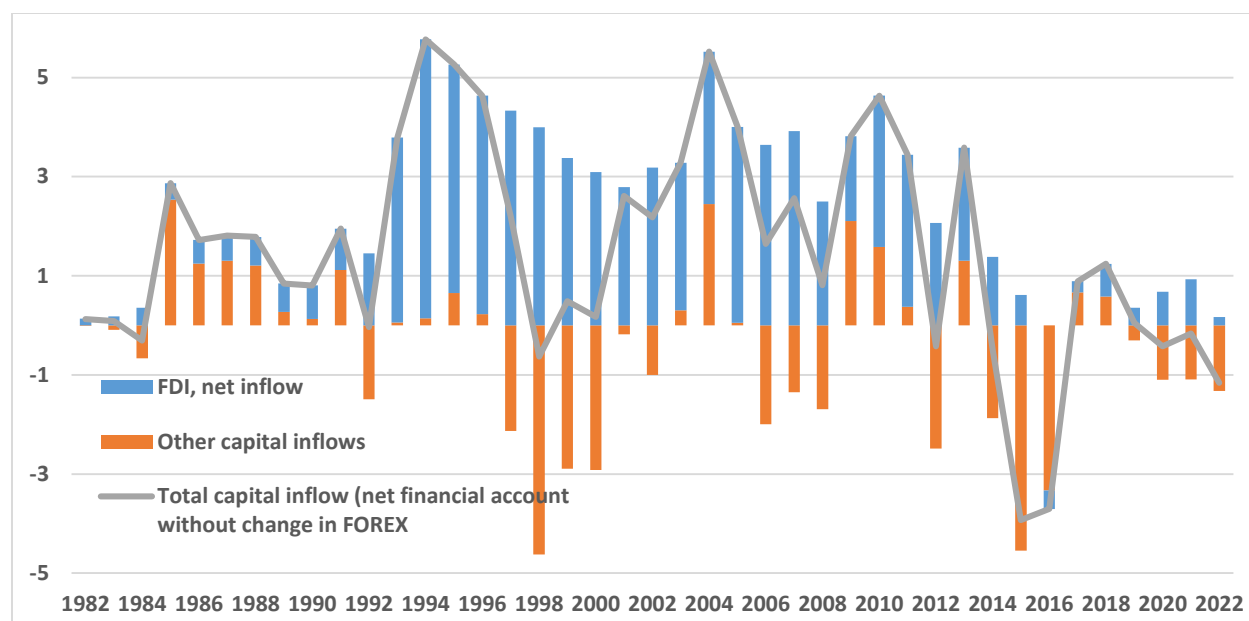
Source: WDI ([World Development Indicators](#)).

Fig. 2. FOREX as a % of GDP (left scale) and in months of import (right scale)



Source: WDI ([World Development Indicators](#)).

Fig. 3. Net capital inflows as a % of GDP – FDI, portfolio and short term flows



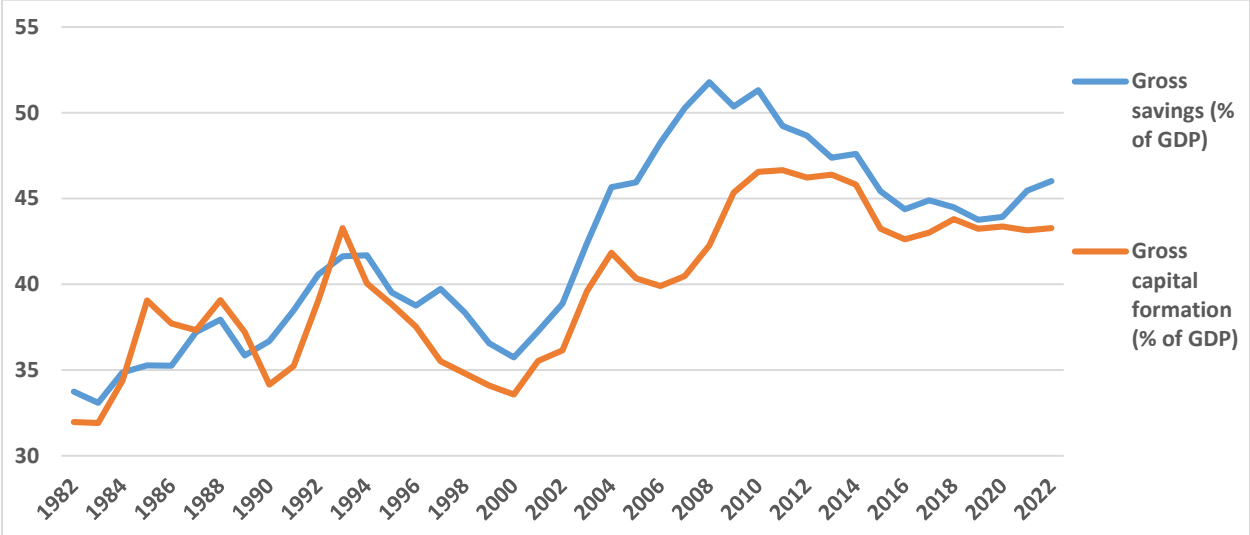
Source: WDI ([World Development Indicators](#)).

Gross savings rate in China was high even before the market reforms, in the 1960s-1970s (with the exception of the 1961-63, when it fell after the Great Leap Forward), but after the 1979 reforms, gross savings increased up to 50% by 2010 from 30-35% in the 1960-70s (fig. 4). The primary reason for such a jump in the savings rate was the acceleration of the growth rates – from 5% in the 1950-60s to 10% in the 1980-2000s. Such an acceleration naturally caused a rapid increase in incomes, whereas increases in consumer spending of households lagged behind, so the savings rate increased.

Not all savings were transformed into domestic investment, part was used to accumulate FOREX, to balance the surplus on current and capital account. Effectively this was the export of capital by the state, financing investment elsewhere, mostly in the United States. Before the Great Recession of 2009-09 such an external financing of the rest of the world reached a maximum of 10% of GDP (fig. 4). This current account surplus of China and the mirror image current account deficit in the US (fig. 5) caused sharp criticism in both countries. In the early 2000s the United States (as well as the IMF and the World Bank) accused China of manipulating the exchange rate, underpricing it deliberately by accumulating FOREX (exchange rate protectionism) and thus gaining unfair

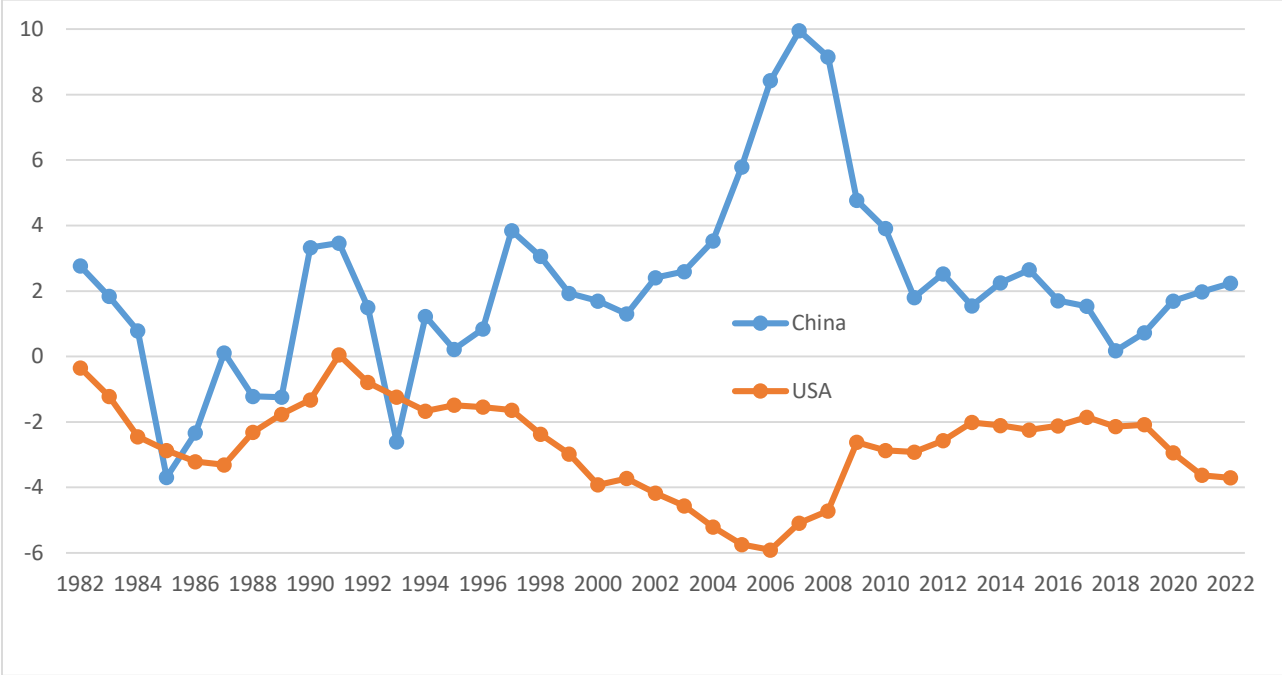
competitive advantages in foreign trade and causing ‘global imbalances’, including the huge US current account deficit with China (fig. 5; Popov, 2010, 2013).

Fig. 4. Gross savings and investment as a % of GDP in 1982-2022



Source: WDI([World Development Indicators](#)).

Fig. 5. Current account balance of China and the US, % of GDP

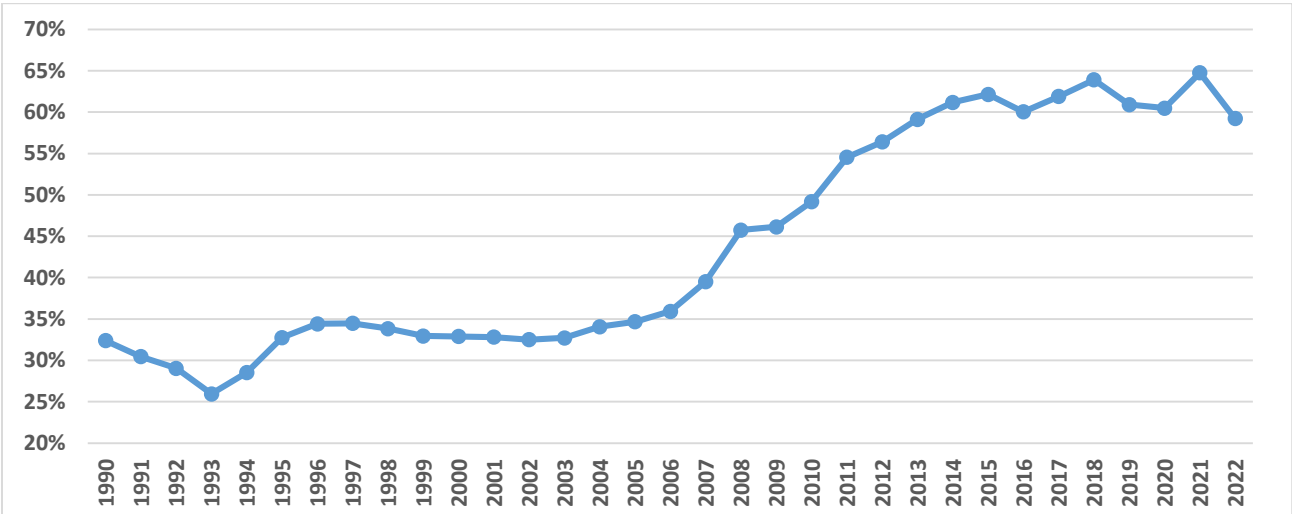


Source: WDI ([World Development Indicators](#)).

In turn, some Chinese economists questioned the need to accumulate more FOREX, stating that Chinese savings should be used for financing investment and government spending for public goods in China rather than for subsidizing the rest of the world. In fact, the ratio of FOREX to GDP increased several times from 1979 to 2009, but afterwards decreased considerably (fig. 2).

Formerly China maintains the flexible exchange rate, but its fluctuations over time are pretty limited, so it is an obvious case of managed float. In the first years of reforms (1978-94) yuan was devalued from about 1 yuan per dollar to 8-9 yuan per dollar, then it was stable for the next 10 years at a level of 8 yuan per 1 dollar, appreciating later to 6-7 yuan per dollar. The real exchange rate (the ratio of Chinese to the US prices) was very low before the Great recession of 2008-09 (only 25 to 35%, lower than in other countries with similar per capita income), but increased afterwards (to 60-65 % by 2015), undermining the competitiveness of the Chinese producers in the international markets (fig. 6).

Fig. 6. Real exchange rate of Chinese renminbi (%) (ratio of Chinese to international prices, as measured by the ratio of dollar GDP at the official exchange rate to PPP GDP)



Source: [World Development Indicators](#).

The exact composition of the Chinese FOREX is not known, Peoples’ Bank of China stopped publishing the data on the structure of FOREX in 2014. In July 2019, China's State Administration

of Foreign Exchange announced that at the end of 2014, US dollar assets accounted for 58% of China's total reserves, down from 79% in 2005; adding that its share of US currency assets was lower than the global average of 65% in 2014. Analysts believe the remaining foreign exchange assets are held mostly in Euros, Japanese Yen, and British pounds. Gold reserves were valued at only 168 billion US dollars in April 2024.

FOREX are usually held in highly reliable and liquid assets, mostly in the US government treasury bills. The total Chinese holdings of US treasury bills amounted to about 800 billion US dollars in the beginning of 2024, 25% of total foreign exchange reserves. But the holdings of treasury bills include debt holdings by institutional and private investors from China, whereas state foreign exchange reserves may be held not only in treasury bills, but in bonds and other financial instruments as well. Some estimates suggest that the share of US dollars in Chinese FOREX fell to 50% in 2020, but increased later to 60% by 2023 (Ferranti, 2023).

China implements a strict system of capital controls, limiting the inflow and outflow of foreign currency. Chinese residents are allowed to open bank accounts in foreign currencies, but can convert no more than \$50,000 worth of yuan into foreign currencies each year². State Administration of Foreign Exchange (SAFE) requires foreign investors to open separate bank accounts for current account transactions and capital account transactions (foreign direct investment, the purchase and sale of equity or debt securities, and trade credit or loans). Capital account transactions need approval from SAFE, which reserves the right to regulate the percentage of foreign currency a company may have as part of its capital account³.

² The relaxation in capital controls in 2023 is part of a policy package announced by Beijing and Shanghai, the country's two biggest cities, to facilitate foreign trade and investment. Expatriates working at foreign enterprises in the Shanghai free trade zone — including employees from Hong Kong, Macao and Taiwan — can transfer their income abroad without restriction, according to the rules. Beijing's policy contains similar measures.

³ The following income is allowed to be put in the capital account:

- Foreign exchange capital transported from overseas or by foreign investors;
- Foreign exchange capital for security deposits of overseas remittances;
- RMB funds returned after legal transfers (or funds returned as a result of revoked transactions);
- Received interest income (must be approved by SAFE-certified bank).

The following usages are still strictly prohibited to justify the conversion of foreign exchange to RMB currency:

- Expenditure beyond business scope or state laws/regulations, directly or indirectly;
- Investing in securities or other financial products not secured by the bank, directly or indirectly (unless currently existing laws or regulations state otherwise);

China was one of the few countries that survived the 1997 Asian currency crisis virtually without any losses due to large stock of FOREX and the existence of capital controls. The GDP growth rates decreased from 8% in 1997 to 7% in 1998-99, and then increased to 8% in 2000, whereas in Indonesia, Malaysia, Singapore, South Korea and Thailand many other East Asian countries output fell by up to 5 to 14% in 1998.

A Brief Review of the Literature

For the emerging market economies, especially for macro-economically unstable countries, the conventional approach recommends exchange-rate-based stabilization in the beginning to achieve macro stabilization and a more or less flexible exchange rates later (either via ‘clean’ or ‘dirty’ float) to manage external balance-of-payments shocks after macroeconomic stability is achieved. In the longer term, it is generally suggested that foreign exchange reserves (FOREX) should be enough to manage shocks – by accounting for around six months’ worth of imports – and should not be used to ‘manipulate’ exchange rates through large accumulations of FOREX, as many East Asian countries have done. The real exchange rate (RER) is seen as endogenous, i.e., it cannot be influenced by government or monetary authority policies in the long run.

Estimates of China’s optimal foreign reserve level as of end-2021 are around USD 2,769.3 billion, which is about USD 454.5 billion lower than the actual foreign reserve level at USD 3,223.8 billion in August 2022 (Dong and Xia, 2022).

For the short term there is an opposite argument: for large countries, it is better to manage external shocks to the capital account and the current account through changes in foreign exchange reserves, either with full sterilization – neutralizing change in the money supply by selling or buying government bonds – or through “fiscal sterilization”, i.e., by increasing or decreasing stabilization funds (sovereign wealth funds) – (Popov, 2012; 2019b). In this case there would be

-
- RMB entrusted loans to non-related enterprises (unless included in the company’s business scope);
 - Constructing or purchasing real estate not for the company’s use (unless the company deals in real estate as part of its business activities).

no shocks to the money supply, inflation, and the RER, so economic agents will not be disoriented by additional volatility. However, for most countries, FOREX and sovereign wealth funds are not large enough to mitigate all negative balance-of-payments shocks, so exchange rate devaluations – implying changes in the RER – become necessary, although this is seen as a ‘second best’ option. It is prudent, however, to avoid decreases in FOREX without sterilization, which can not only result in a depreciation of the RER, but also in a reduction of output if prices are sticky.

The macro textbook theory is based on the Mundell-Fleming model. One of its conclusions is that independent monetary policy is impossible under perfect capital mobility and fixed exchange rate (impossible trinity – fig. 7) because changes in domestic interest rate take the balance of payment out of the equilibrium with the resulting change in foreign exchange reserves (fig. 7): monetary expansion (LM curve shifts to the right), for instance, results in lower interest rates and outflow of capital, which in turn leads to the lower level of foreign exchange reserves and contraction of the money supply (LM curve shifts back to the left). On the contrary, with the flexible exchange rate the monetary policy is 100% efficient – when monetary expansion leads to the decline in interest rates interest rate and outflow of capital, exchange rate of the national currency falls and this leads to the increase in income (IS curve moves right), so the new equilibrium is established at a point of higher income and the same level (world level) of interest rates.

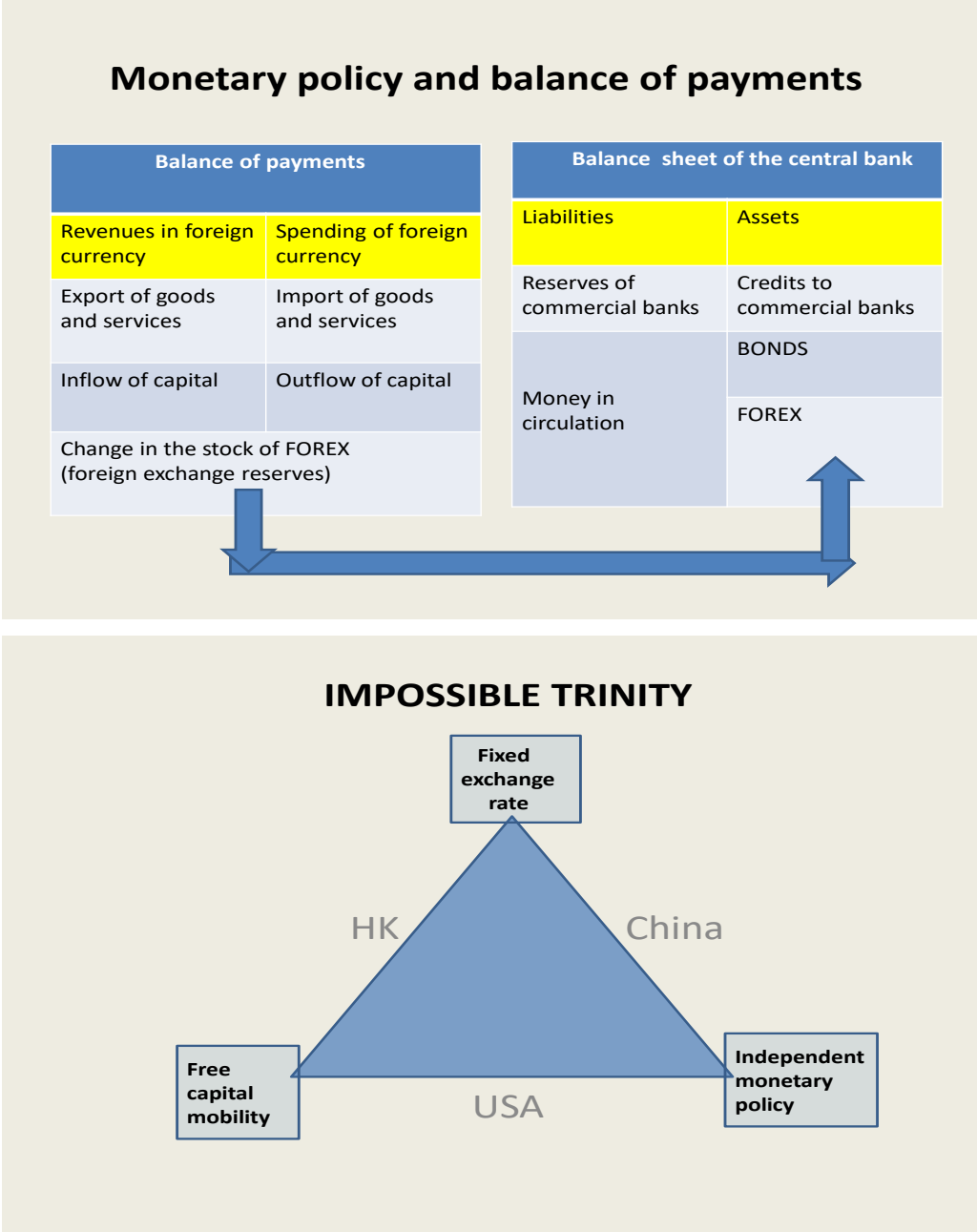
Under the fixed exchange rate the adjustment to the external shock (say, to a fall in prices for exported goods or to an outflow of capital) occurs through changes in the money supply:

- Trade balance (or capital account balance) deteriorates => FOREX fall => M falls => Domestic prices fall => Real exchange rate [$RER = \text{Domestic prices} / \text{Foreign prices} * \text{Nominal exchange rate}$] falls => Trade balance improves (export increases, import shrinks).
- Besides, tight monetary policy (M falls) leads to higher real interest rates, so there is an inflow of capital and an improvement of the capital account that also contributes to the restoration of balance of payment equilibrium.

The problem with this type of adjustment is that monetary contraction, if prices are sticky, affects not only prices, but also output: the reduction of money supply leads to a slowdown of inflation only with a lag and during this lag output (or growth rates of output) falls, so the cost of bringing

the RER back to the competitive level is a recession, like it happened in Russia in 1997-98 and Argentina in 1999-2002.

Fig. 7. Central bank balance sheet, balance of payments and impossible trinity



Under fully flexible exchange rates the adjustment to the external shock (say, to a fall in prices for exported goods or to an outflow of capital) occurs without changes in FOREX and money supply, but through the exchange rate itself:

- Trade balance (or capital account balance) deteriorates => Nominal exchange rate falls (depreciates) => Real exchange rate [$RER = \text{Domestic prices} / \text{Foreign prices} * \text{Nominal exchange rate}$] falls => Trade balance improves (export increases, import shrinks).
- Besides, domestic assets after devaluation become cheaper, so there could be a capital inflow (slowdown in capital outflow).

This type of adjustment is also painful in a sense that it leads to the decline in consumption (net imports declines after devaluation), but domestic prices do not fall (actually, after some time they start to increase, eating up the pro-competitive effect of devaluation), so there is no depressive effect on output. The adjustment through money supply and slowdown of inflation is associated with greater reduction (slowdown of growth) of output than the adjustment through devaluation. The experience of former communist countries, especially countries of Eastern Europe (which had very different exchange rate regimes), that were affected by the outflow of capital in 1997-99, after the Asian (1997) and Russian (1998) currency crises, shows that countries that maintained a flexible exchange rate and adjusted via devaluation of national currencies had smaller losses of output than countries that tried to maintain fixed exchange rates (Popov, 2011; 2019b).

The strongest argument against fixed exchange rates is that they force to abandon the independent monetary policy, whereas one-size-fits-all monetary policy obviously does not work. The reduction of output during the Great Depression, as Eichengreen and Sachs (1985) and Eichengreen and Irwing (2009) showed, was greater in countries that stuck to the gold standard, whereas countries that devalued their currencies (China, Japan, Denmark, Sweden) were able to limit the depth of the recession and to avoid sliding into protectionism.

An even more rigid arrangement is a currency board – a substitute for the central bank, linking the amount of currency in the circulation to the size of FOREX on a one to one basis (no money can be issued by the currency board through purchases of government bonds). Among the opponents of the currency boards are Roubini (1998) and Krugman (2003). The latter notes that “a currency

board fitted a conservative ideology: by eliminating any discretionary monetary policy, it moved us back toward a pre-Keynesian world. That's why Forbes and the WSJ editorial page sang Argentina's praises; and Wall Street economists swallowed the whole thing”.

With regards to the medium- short-term, there is another argument – asymmetric shocks. These latter occur, for instance, when prices of commodities increase. Consider the case of the country that is an oil exporter and another country, which is an oil importer. The increase in oil prices will create a positive trade shock for the exporter and a negative shock for the importer. If both countries have fixed nominal exchange rates, in the former country FOREX would increase, in the latter – decrease. This latter country (oil importer) at the end of the day would not be able to sterilize the decline in FOREX (if the trade shock is significant enough), so the money supply would decrease, prices would fall, and RER would fall as well. Even if prices are perfectly flexible, there would be a need to move resources – labor and capital – from oil sector to other sectors of the economy. And when oil prices will grow again, there would be a need to move resources in the opposite direction (from other sectors to oil). Because oil prices fluctuate a lot, it would be unreasonable to move resources back and forth every time there is a trade shock. With fixed exchange rate the room for maneuver to adjust to these temporary shocks is limited.

With fixed exchange rates, or, even more so - with currency board arrangements, effectively forcing authorities to abandon their independent monetary policy, countries are doomed to adjust to the trade shocks and inflows and outflows of capital through real indicators: when the exchange rate is pegged and prices are not completely flexible, changes in the money supply (caused by the fluctuation of reserves) may affect output rather than prices. And as the recent experience of East Asian and transition economies showed, this kind of real sector adjustment is quite costly. To put it in the simplest form, under fixed exchange rate regime, neither changes in foreign exchange reserves, nor domestic price changes in response to money supply fluctuations provide enough room for maneuver for handling terms of trade shocks and international capital flows.

Most developing and transition economies, with the exception of the smallest ones, like Hong Kong, Singapore and perhaps Baltic states) are large enough to remain not completely exposed to the world market competition and hence to retain some inflexibility of domestic prices with respect

to the world market prices. Nevertheless, they are not large enough to create an appropriate cushion in the form of foreign exchange reserves, bringing down the vulnerability resulting from the international capital flows to reasonable levels.

In most emerging markets foreign exchange reserves are normally enough to withstand only several weeks, if not days of the attack on the currency. More than that, because the major international banks, investment and hedge funds operate with the pools of money comparable with or even exceeding the value of reserves in most countries, the fluctuations of the exchange rate remain the only reliable and efficient safety valve providing protection from external shocks.

China in this respect has several advantages – three mechanisms to cushion the balance of payments shocks. First, it maintains a flexible rate, so can adjust to the fluctuations in trade balance and capital flows via devaluation/appreciation of national currency. Second, it has a capital control that prevents the sudden and sizeable outflow of capital. Third, its foreign exchange reserves are the largest in the world and large even as compared to its GDP and foreign trade and capital flows, so they could be used to absorb negative trade and capital account shocks with full sterilization (without a fear of continuous outflow of capital due to capital control). As was stated earlier, China survived the Asian currency crisis of 1997 better than the other countries – its reserves even did not decrease in 1997 (fig. 2) and its GDP growth rates virtually did not decline.

Obstfeld, Shambaugh, and Taylor (2010) try to explain the size of FOREX by the size of domestic financial liabilities that could potentially be converted into foreign currency (M2), financial openness, the ability to access foreign currency through debt markets, and exchange rate policy – all these factors turn out to be significant predictors of reserve stocks. They show that their empirical financial-stability model seems to outperform both traditional models and recent explanations based on external short-term debt. But even so, nearly half of the size of FOREX for China and some other countries remains unexplained. Besides, the idea that FOREX are supposed to be enough to cover the whole amount of domestic bank accounts that could be converted into the foreign currency implies that there are no capital controls and that this control cannot be even imposed in times of the crisis. Of course, China, as mentioned earlier, exercises strict capital

control, especially on short term flows that are most destabilizing and may not be associated with any efficiency benefits (Stiglitz, 2000).

For the long term there is an argument that accumulation of FOREX is in fact an industrial policy that helps to promote growth (Polterovich, Popov, 2004; Rodrik, 2008; Popov, 2010b, 2013, 2019; 2020; Popov, Jomo, 2020) It is argued that breathtaking Chinese growth in the 1980s-2010s, quite like the rapid growth of Japan, South Korea, Taiwan, and a number of ASEAN countries, has been stimulated by deliberate exchange rate undervaluation through rapid accumulation of FOREX, promoting exports and discouraging imports.

Management of the exchange rate is an important tool of non-selective industrial policy (Popov, 2020) – the maintenance of the undervalued real exchange rate via accumulation of foreign exchange reserves (above the normal amount needed to ensure smooth trade and capital account transactions) is the important instrument of promoting economic growth based on export of tradable goods, although at the expense of non-tradables (Polterovich, Popov, 2004).

There are important differences between import duties and export subsidies and the devaluation of the exchange rate. “Exchange rate protectionism” is more efficient policy to stimulate growth because decisions on import duties and government taxes/spending are affected by a poor quality of institutions (corruption and low efficiency of implementation), whereas low exchange rate policy is indiscriminate and nonselective by nature: it cannot be captured and “privatized” by particular interest groups – this makes it especially efficient growth promoting instrument in poor and middle income countries that generally suffer from corruption (Polterovich, Popov, 2004).

As it is stated in the UN flagship report (UN WESP, 2016), “reserve accumulation can have positive externalities on the production and export of tradables and industrial development and can thus be a feature of the country’s development model. Undervaluation of the exchange rate can increase the competitiveness of exports, without the need for sector- or firm-specific subsidies or interventions”.

As Griffith-Jones and Ocampo (2010) observe, the rationale for the accumulation of foreign exchange reserves “is usually found in either one of two explanations: the “competitiveness” (or, in more pejorative terms, “mercantilist”) and the “self-insurance” motives. This mercantilist view that undervaluation of exchange rate via accumulation of foreign exchange reserves is in fact an industrial policy, aimed at promoting export-oriented growth by benefiting the producers of tradables and exporters at the expense of the producers of non-tradables and importers, is gaining support in the literature (Dollar, 1992; Easterly, 2001; Rodrik, 2008; Bhalla, 2012; Greenwald, Stiglitz, 2013). If there are externalities from export and production of tradables (industrialization, development of high-tech sectors), undervaluation of the exchange rate resulting from the accumulation of reserves is an efficient way to provide a subsidy to these activities and this subsidy is automatic, i.e. does not require a bureaucrat to select possible beneficiaries.

Analysis: Causes and consequences of the accumulation of FOREX

Accumulation of FOREX in China in excess of the normal precautionary needs was not a policy mistake, but a powerful tool of promoting growth. In short, this was a non-selective industrial policy promoting export and production of tradables; it was quite efficient especially in countries with high corruption and poor quality of institutions. The formal model demonstrating how the accumulation of reserves can spur growth, as well as the empirical evidence, is presented in Polterovich and Popov (2004). Differences between countries in stocks of reserves (as a % of foreign trade or of GDP) are huge – some have reserves for 2 months of imports, others – for 2 years of imports, so obviously FOREX are being accumulated not only for the insurance considerations. If the objective reasons for reserve accumulation are separated from policy reasons, it turns out that policy induced accumulation of reserves leads to disequilibrium exchange rate, which in turn causes the increase in export/GDP and trade/GDP ratios, which stimulates growth⁴.

⁴ In particular, the authors use the indicator ΔR_{pol} , policy induced change in foreign exchange reserves, i.e. the accumulation of reserves in excess of the levels needed for servicing external trade and for balance of payments financing – it is computed as a residual from the regression of the increase in the ratio of FOREX to GDP on trade to GDP ratio and investment risk indicators (capital flows variables were not significant). This policy induced change in foreign exchange reserves indicator is used later as one of the explanatory variables in growth regressions. This is also the way to deal with the possible endogeneity problem: policy-induced change in reserve to GDP ratio could be regarded as an exogenous policy variable.

For the 1975-99 period, the best equation explaining changes in FOREX is shown below:
 $\Delta R = 39 - 0.4(R/Y\ 60 - 99) - 6.2lgY - 0.3ICI\ 84 - 90 + 0.2(T/Y) + 0.3(\Delta [T/Y])$,

The policy of reserve accumulation is often considered to be self-defeating because in order to avoid inflation (that would eat up the impact of devaluation on real exchange rate) it is necessary for the monetary authorities to carry out sterilization policy, i.e. to sell government bonds in order to neutralize the impact of purchases of foreign currency on ballooning money supply. But sales of government bonds lead to higher interest rates that in turn attract capital from abroad that contribute to increase in foreign exchange reserves that again should be sterilized, which creates a vicious circle. That is why economists talk about “impossible trinity”: a country cannot maintain at the same time an open capital account, managed exchange rate and independent monetary policy.

But many developing countries exercise control over capital flows (China and India would be the prime examples) and even without such a control, capital mobility – especially for large economies – cannot be considered perfect. In practice, as the statistics shows, the accumulation of foreign exchange is financed through government budget surplus and debt accumulation, but not through money printing⁵ (Polterovich, Popov, 2004). That is to say, most countries that accumulated

$R^2 = 50\%$, $N=72$, all coefficients significant at 3% level or less, where:

ΔR – the increase in the reserves/GDP ratio in 1975 - 99, p.p.,

Y - initial (1975) GDP per capita,

T/Y - average ratio of foreign trade to GDP over the period,

$\Delta[T/Y]$ - the increase in the same ratio over the period,

R/Y_{60-99} - average ratio of FER to GDP in 1960-99,

ICI_{84-90} - average investment climate index in 1984-90 (ranges from 0 to 100, the higher, the better).

The residual from this equation, ΔR_{pol} , is regarded as the policy induced change in foreign exchange reserves. The logic behind such an approach is to net out changes in reserve/GDP ratio caused by objective circumstances, such as the level of development and investment climate, the accumulated level of FER and the level and dynamics of foreign trade (Polterovich, Popov, 2004).

⁵ Formally, the following identities hold:

$$\Delta M = \Delta \text{FOREX} + \Delta B_{CB}$$

$$BD = \Delta B_{CB} + \Delta B_P$$

$$\Delta \text{FOREX} = \Delta M + BS + \Delta B_P,$$

where ΔFOREX – increase in foreign exchange reserves, ΔM – increase in money supply, BS – budget surplus (BD – budget deficit), ΔB_P – increase in bonds held by the public, ΔB_{CB} – increase in bonds held by the central bank.

The last identity implies that the increase in foreign exchange reserves can be financed by the increase in money supply, i.e. inflation tax on everyone (ΔM), budget surplus (BS), accumulation of debt held by the public (ΔB_P).

reserves rapidly exhibited low inflation and low budget deficit (or budget surplus), but increasing holdings of government bonds by the public (see Polterovich, Popov, 2004).

Accumulation of reserves means that the country saves more than it invests, produces more than it consumes, providing its savings to finance investment and consumption in other countries. It is often argued that capital should flow from rich to poor countries because K/L ratios are lower in developing countries and hence the returns on capital are greater. However, there may be crowding out of domestic savings by the foreign savings, so the national debt grows, but investment does not increase and economic development does not accelerate.

Besides, this is only one effect, the other effect is a dynamic one and it works in a completely opposite direction: if a country manages somehow to become competitive in the world markets (either via higher productivity or through lower wages or via low exchange rate), it starts to export more than it imports and develops a trade surplus. If this surplus is stored in the form of foreign exchange reserves, the exchange rate gets undervalued and the trade surplus persists. That is why countries that develop faster than the others usually have a trade surplus (United States since the Civil War of 1861-65 and until the 1970s, Japan and Germany after the Second World War, East Asian Tigers and Dragons and China, of course, more recently). Accumulation of reserves (that are invested in reliable short-term government securities and yield very low interest rates) implies losses to the national economy, but every policy has costs – this is a price to pay for promoting growth.

There are fears that “exchange rate protectionism” can result in “beggar-thy-neighbor policies”: obviously all countries cannot exercise these policies at the same time to achieve undervaluation of their exchange rates. If all countries use these policies, all will lose, and, on top of that, for developed countries this policy does not work (Polterovich, Popov, 2004), so their losses would be the greatest. But for developing countries it works, and there are good reasons, why these countries should have sufficient policy space to use this tool to promote catch up development.

True, trade surpluses resulting from undervaluation of the exchange rate due to reserve accumulation may lead to what is now called “global imbalances”, driving the other countries into

debt, but there is some room for such a scenario that in a sense will only reverse the opposite trend of the 19-20th centuries (US enjoyed a trade surplus for nearly 100 years after the Civil War of the 1860s driving many developing countries into debt – see Popov, 2010 a, b; 2011 for details).

Today the debt of the rich countries is not that high. Australia, France, Greece, Portugal, Spain the UK and the US are net international debtors ([US – the largest – nearly 80% of GDP](#)), but Canada, Germany, Japan, the Netherlands, Norway, South Korea, Switzerland are net creditors, so there is some room for these countries to maintain a current account deficit and to finance it via debt accumulation.

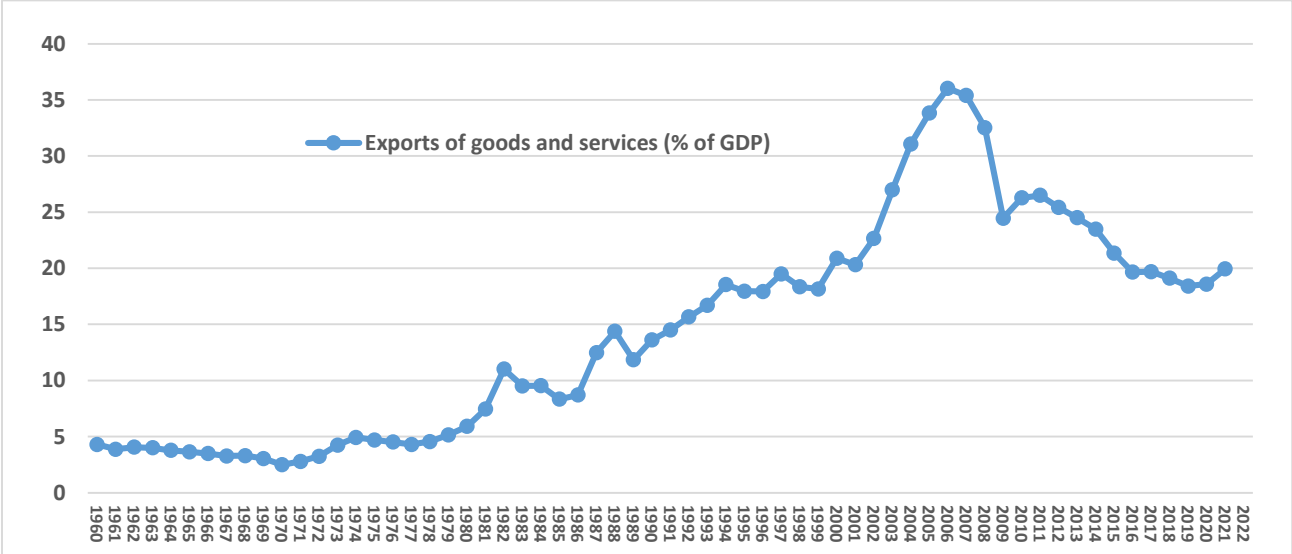
On the contrary, for developing countries FOREX accumulation can work as a powerful industrial policy development tool. Theoretically, every externality could be taken care of through taxes, but in practice selective policies rarely work. And because protectionism is currently *de facto* outlawed by WTO anyway, exchange rate protectionism is the only available tool for promoting catch up development, in a way – the instrument of last resort.

Reserve accumulation in poor countries will not continue forever, it will come to an end, once they will catch up with the West. Meanwhile, developed countries get a chance to consume more than they produce. Why not go into debt to help the Global South catch up with the West sooner?

Acceptance by the West of global imbalances (current account deficits leading to debt accumulation) would help to overcome the major disproportion of our times – income gap between developed and developing countries. This gap was widening for 500 years and only now, after the Second World War, there are some signs that this gap is starting to close (Popov, 2014; 2015). Chances to eliminate this gap sooner rather than later would be better, if the West would go into debt allowing developing countries to have trade surpluses that would help them develop faster. Previously, in 16-20th century, it was the West that was developing faster, accumulating surpluses in trade with “the rest” and using these surpluses to buy assets in developing countries, while “the rest” were going into debt. Now it is time for “the rest” to accumulate assets and for the West to go into debt.

This way or the other, China slowed down (after 2008-09 recession) and later stopped accumulation of FOREX completely. Whether this decision to stop the accumulation of FOREX and to allow yuan to appreciate was made under the pressure of the US (or whether there was a deal reached with the US on that issue) is not exactly known. However, the consequences of this policy change were obvious – China’s positive current account, virtually a mirror image of the US current account deficit, declined, whereas US current account in the same period improved (fig.5). RMB appreciated from 40% in 2007 to 65% in 2021, as measured by the ratio of Chinese prices to the US prices (fig. 6). As a result, exports growth slowed down – China’s exports as a share of GDP peaked at 35% in 2005, but fell to below 20% by 2020 (fig. 8).

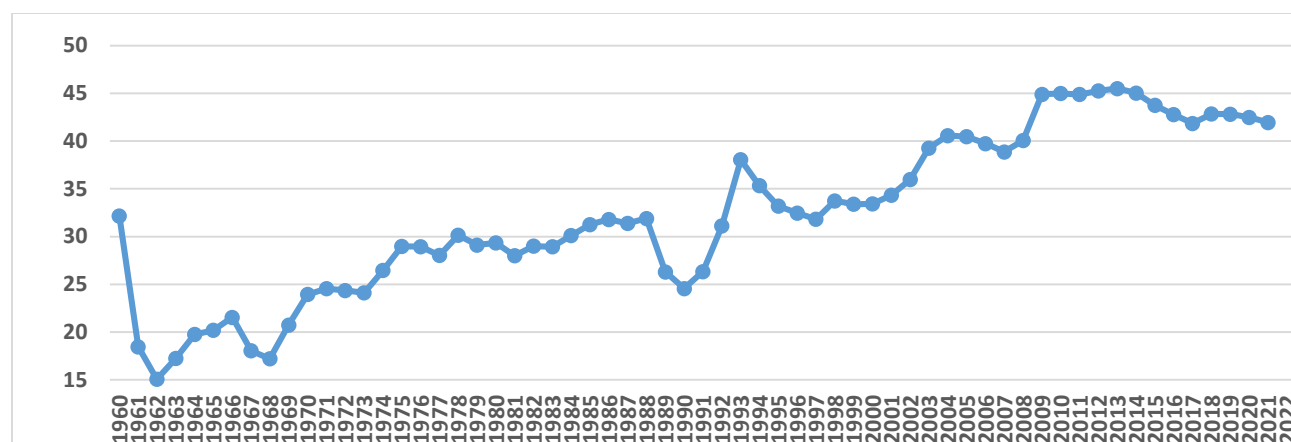
Fig. 8. Exports of goods & services as a % of GDP, 1960-2022



Source: *World Development Indicators*.

Domestic consumption rose, savings, investments and growth inevitably declined (Popov, 2010; Popov, 2013, 2023). The investment share of GDP peaked in 2013 at 45% before declining (fig. 9).

Fig. 9. China: Gross fixed capital formation as share of GDP (%)



Source: [World Development Indicators](#).

Summary and Conclusions

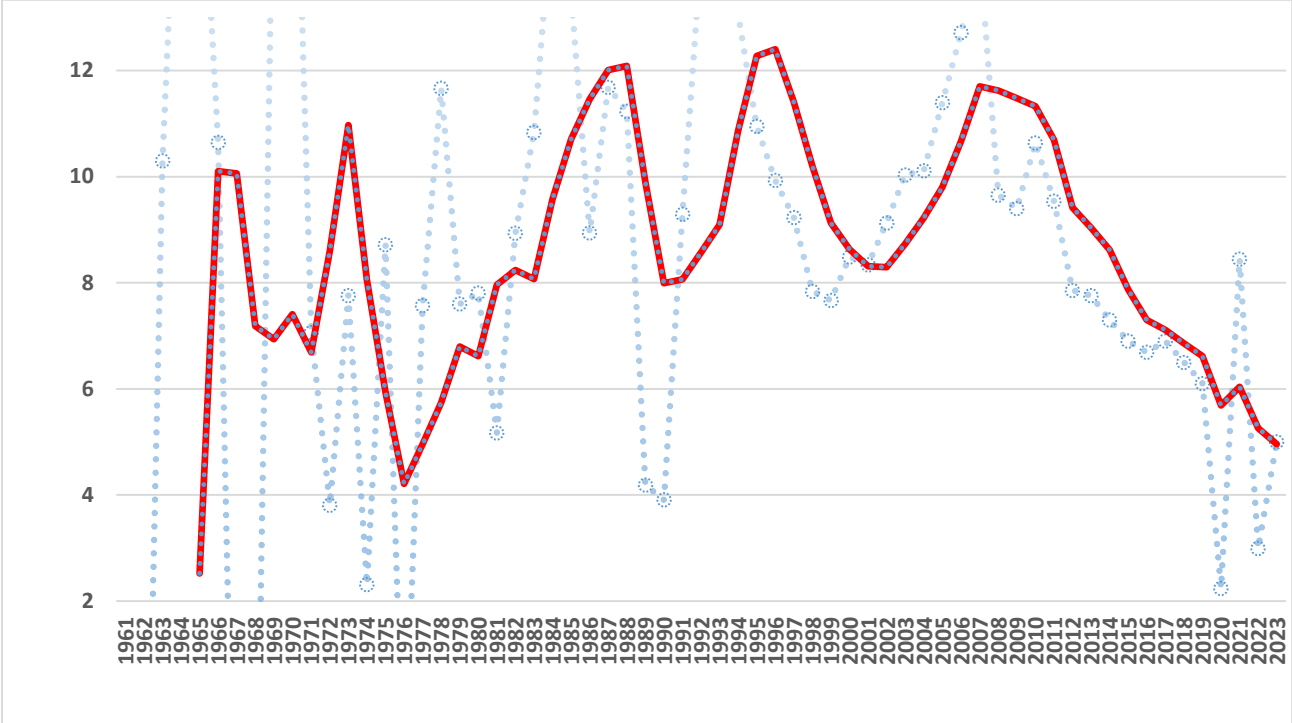
Balance of payments, exchange rate and reserve accumulation are not only the issues of external equilibrium. Exchange rate policy has profound implications for the domestic development (Popov, 2023). The undervaluation of the exchange rate via FOREX accumulation could be considered as the variety of industrial policy, favoring tradable sector, export, investment and growth (Polterovich, Popov, 2004).

Recent slowdown of the Chinese growth is associated partly with the described policy change – cessation of the accumulation of reserves that led to the appreciation of the Chinese currency. In 2007 Chinese GDP grew by 14%. Since that time growth rates were falling virtually constantly and amounted to only 5% in 2024 (fig. 10). Five year moving averages of growth rates today are at the lowest level since the beginning of reforms in 1978, nearly half a century years ago.

Economists have offered various explanations for the slowdown of China's growth, including the decline in the population growth rate and the ageing of the Chinese population. These factors are real, but should not be exaggerated. The working age population and employment both grew at 2% annually from the 1980s, but such growth declined earlier this century before coming to a

complete halt in 2014 for working age population and in 2020 for the total population. This could explain the decline in GDP growth rate by two percentage points yearly.

Fig. 10. China’s annual GDP growth rates, actual and 5-year moving average, 1962-2023 (%)



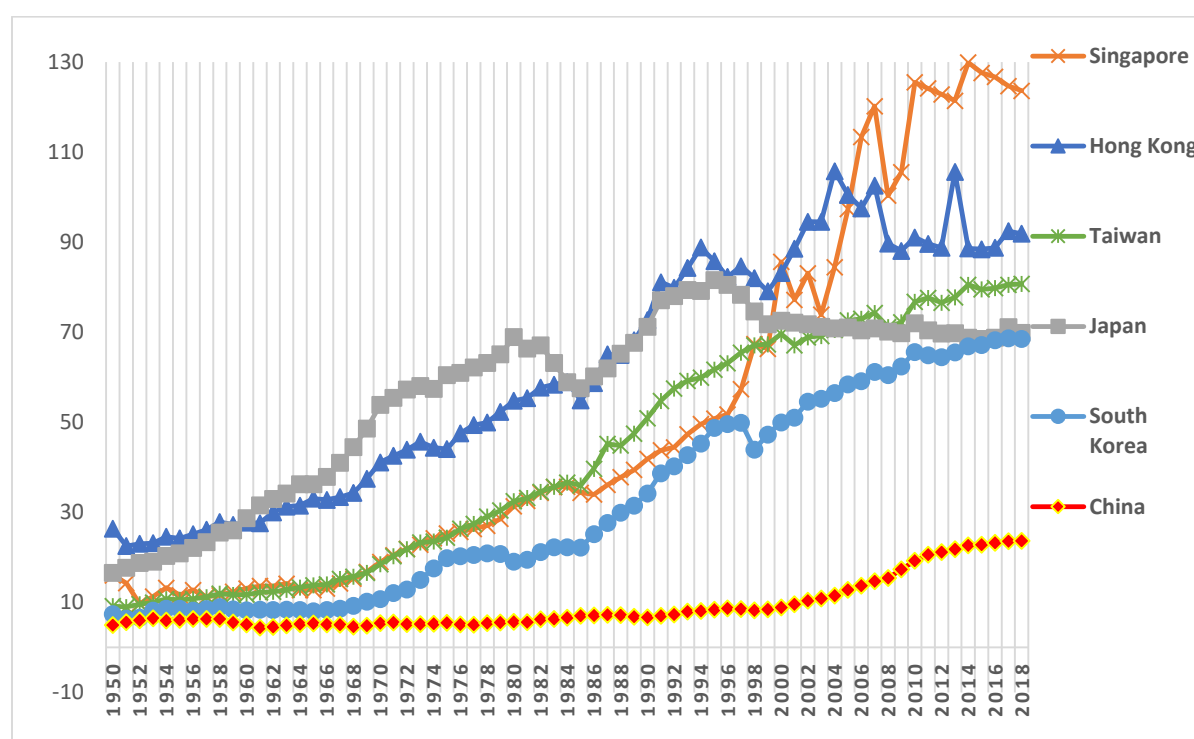
Source: [World Development Indicators](#).

Another factor is exhaustion of the advantages of economic backwardness: it is easier to catch up from a low base, especially because cutting-edge innovation is more difficult and costlier than copying existing technologies, whether for free or even by buying patents and copyrights. Developed economies have rarely grown for extended periods at the breakneck pace rate of the East Asian ‘miracle’ economies when they were ‘catching up’ or converging, and growth tends to slow in fast-growing economies as they approach the technological frontier.

After all, only five countries/territories have successfully gone from ‘developing’ (i.e., less than a fifth of US per capita income) to ‘developed’ (over half of US per capita income) status. These were Japan, South Korea, Taiwan, Hong Kong (HK) and Singapore. But their growth slowdowns

have taken place after their per capita incomes reached over half the US level, whereas Chinese per capita GDP (at purchasing power parity, i.e., even in comparable prices) is currently under a quarter of the US level (fig. 11). In fact, marked slowdowns have only occurred in Japan and HK, whereas the other ‘tigers’ have continued to grow rapidly, avoiding the notorious ‘middle-income trap’. If these experiences are any guide, China’s growth slowdown is still a couple of decades away, if it happens at all (Lin, 2017).

Fig. 11. Per capita PPP GDP in some East Asian economies as shares of US (%)



Source: [Maddison project database \(2020\)](#).

Many Chinese economists speculate whether the slowdown of growth is temporary or permanent. Lin (2017) believes there is a need for industrial policy to avoid the “middle income trap”, whereas Zhang (2017) argues that the market alone can fix the problem, if only obstacles for entrepreneurial innovations are removed. In 2016 Lin, Wang and Morgan (2016) argued that the main factors that led to the slowdown since 2010 are external and cyclical and were optimistic that a reacceleration to 8% in the medium run is possible under favorable conditions.

However, China's growth slowdown also appears to be due to policy choices, involving economic policy changes. The slowdown started over a decade ago – after the “Great Recession” of 2008-09, i.e. before COVID pandemic, before the new wave of sanctions, and before the initiation of “dual-circulation” strategy.

Chinese model of rapid export oriented growth based on accumulation of FOREX to underprice the exchange rate that contributed to high exports, savings and investment (Polterovich, Popov, 2004) started to give way to the one oriented at domestic consumption (Popov, 2010; 2013). The inevitable consequence was the decline in the growth rates (fig. 10).

During the 2008-09 Great Recession China temporarily stopped the appreciation of yuan and put into place a huge package of fiscal stimuli, so the economy slowed down only marginally (from 14% in 2007 to 9% in 2009). There was a similar reaction during the COVID pandemic in 2020-22 and China still retains the policy space to respond in a similar way to the difficulties caused by the US and Western trade restrictions sanctions initiated by Trump (2017-21) and continued by Biden administration.

References

Bhalla, Surjit Singh (2012). *Devaluing to Prosperity. Misaligned Currencies and Their Growth Consequences*. Washington, D.C.: *Peterson Institute for International Economics*, 2012.

Crafts, Nicolas (2018). *Forging Ahead, Falling Behind and Fighting Back British Economic Growth from the Industrial Revolution to the Financial Crisis*. – Cambridge University Press, 2018.

Dollar, Dollar (1992). Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985. In: *Economic Development and Cultural Change*, Vol. 40, No. 3, April, Chicago: *University of Chicago Press*, April 1992, pp.523-44.

Dong, Jinyue and Le Xia (2022). Economic Watch China | Estimating the optimal level of China's foreign reserves September 15, 2022. *BBVA Research*. Hong Kong. https://www.bbvarsearch.com/wp-content/uploads/2022/09/20220915_China_optimal-foreign-reserve.pdf

Eagle, James (2021). Here's How Reserve Currencies have Evolved Over 120 Years. – *Visual Capitalist*. 2021. <https://www.visualcapitalist.com/cp/how-reserve-currencies-evolved-over-120-years/>

Easterly, William (2001). The Lost Decades: Explaining Developing Countries Stagnation 1980-1998; Washington, D.C.: *The World Bank*, February 2001.

Edwards, Sebastian and Igal Magendo (2003). A Currency Of One's Own? An Empirical Investigation On Dollarization And Independent Currency Unions. Nber Working Paper Series Working Paper 9514 (<http://www.nber.org/papers/w9514>)

Eichengreen, Barry (2001). What Problems Can Dollarization Solve? – *Journal of Policy Modeling* 23(3), 267-77.

Eichengreen, Barry and Jeffrey Sachs (1985). Exchange Rates and Economic Recovery in the 1930s. – *Journal of Economic History* 45, 925-946.

Eichengreen, Barry and Douglas Irwin (2009). The protectionist temptation: Lessons from the Great Depression for today – *Ecomonitor*, Mar 19, 2009 (http://www.rgemonitor.com/globalmacro-monitor/256063/the_protectionist_temptation_lessons_from_the_great_depression_for_today)

Eichengreen, Barry (2014). International Currencies Past, Present and Future: Two Views from Economic History. - *Bank of Korea Working Paper* No.2014-31.

Ferranti, M. (2023). Estimating the Currency Composition of Foreign Exchange Reserves. Department of Economics, Harvard University May 9, 2023. <https://arxiv.org/pdf/2206.13751>.

Glick, Reuven and Andrew Rose (2002) “Does a Currency Union Affect Trade? The Time Series Evidence”, *European Economic Review* 46-6, 1125-1151.

Greenwald, B., Stiglitz, J. E. (2013). Learning and Industrial Policy: Implications for Africa. – In: Stiglitz, J., Lin, J., Patel, E. (Eds). The Industrial Policy Revolution II. Africa in the XXI century. International Economic Association Series. London: *Palgrave MacMillan*, 2013.

Griffith-Jones, S., Ocampo J. A. (2008). Sovereign Wealth Funds: A Developing Country Perspective. *Paper prepared for the workshop on Sovereign Wealth Funds organized by the Andean Development Corporation*. London, February 18, 2008. Available at: <http://www.stephanygj.net/papers/SovereignWealthFundsDevelopingCountryPerspective2010.pdf>.

Hanke, Steve H. (2003). The Argentine Straw Man: A Response to Currency Board Critics. - *The Cato Journal*, Vol. 23, 2003.

Housten, Elaine (2023). The 200 Year Pound to Dollar Exchange Rate History - From \$5 in 1800s to Today's \$1.29. *Exchange Rates.org.UK*. Febr. 6, 2023. <https://www.exchangerates.org.uk/articles/1325/the-200-year-pound-to-dollar-exchange-rate-history-from-5-in-1800s-to-todays.html>

IMF (2023). World Currency Composition of Official Foreign Exchange Reserves. *International Monetary Fund*.

Krugman, Paul (2003). Argentina: The Role of Ideology. Typescript, 2003 <http://www.pkarchive.org/crises/ArgentinaRoleofIdeology.html>

Lin, Justin Yifu (2017). Industrial policies for avoiding the middle-income trap: a new structural economics perspective. *Journal of Chinese Economic and Business Studies*, 15:1, 5-18, DOI: [10.1080/14765284.2017.1287539](https://doi.org/10.1080/14765284.2017.1287539)

Lin, Justin Yifu, Guanghua Wan, Peter J. Morgan (2016). Prospects for a re-acceleration of economic growth in the PRC. - *Journal of Comparative Economics*, vol. 44 (4), pages 842-853.

Maddison Project Database, version 2020. Bolt, Jutta and Jan Luiten van Zanden (2020), "[Maddison style estimates of the evolution of the world economy. A new 2020 update](#)".

Montes, Manuel, Vladimir Popov (2001). Bridging the Gap: A New World Economic Order for Development. - In: *Aftermath. New Global Economic Order*. Ed. by C. Calhoun and G. Derluigan. *NYU Press*, 2011.

Obstfeld, Maurice, Jay C Shambaugh, and Alan M Taylor (2010). Financial stability, the trilemma, and international reserves. – *American Economic Journal: Macroeconomics*, 2010, 2 (2), 57–94.

Perez-Saiz Hector, Longmei Zhang, Roshan Iyer (2023). Currency Usage for Cross Border Payments. IMF Working Paper. 2023.

Polterovich, Victor and Vladimir Popov (2004). [Accumulation of Foreign Exchange Reserves and Long Term Economic Growth](#). In S. Tabata and A. Iwashita (eds). *Slavic Eurasia's Integration into the World Economy*. [Hokkaido University, Sapporo. Updated version, 2006](#).

Popov, Vladimir (2010a). [Development Theories and Development Experience](#). - CEFIR and NES working paper #153. Moscow: [Centre for Economic and Financial Research at New Economic School, December 2010](#).

Popov, Vladimir (2010b). Global Imbalances: An Unconventional View. -- CEFIR and NES working paper # 160. May 2010.

Popov, Vladimir (2011). To devalue or not to devalue? How East European countries responded to the outflow of capital in 1997-99 and in 2008-09. - CEFIR and NES working paper #154. January 2011. Published in *Acta Oeconomica*, Vol. 61, No. 3, September 2011.

Popov, Vladimir (2012). Coping with External – Capital and Current Account – Shocks. G-24 Policy Brief No. 70, 04/06/2012.

Popov, Vladimir (2013). Currency Wars: Why Russia and China Are Rapidly Accumulating Foreign Exchange Reserves. PONARS Policy Memo 256, June 2013.
http://pages.nes.ru/vpopov/documents/PONARS-June_2013-accumulation%20of%20FOREX,%20Russia,%20China.pdf

Popov, Vladimir (2014). Mixed Fortunes: An Economic History of China, Russia and the West. Oxford University Press, April 2014.

Popov, Vladimir (2015). Catching Up: Developing Countries in Pursuit of Growth. MPRA Paper No. 65878, August 2015.

Popov, Vladimir (2019a). Slowdown of growth in China: Circumstances or choice. If the past experience of economic miracles is any guide, the slowdown of growth in China should either take place in a couple of decades rather than now, or it should not happen at all. – DOC-RI website, January 28, 2019.

Popov, Vladimir (2019b). Exchange rate and foreign exchange reserve policies.– In: Macroeconomic Policies in Countries of the Global South. Edited by Anis Chowdhury and Vladimir Popov. Nova Publishers, 2019.

Popov, Vladimir (2020). Successes and failures of industrial policy: Lessons from transition (post-communist) economies of Europe and Asia. – Oxford Handbook on Industrial Policy. Ed. by Arkebe Oqubai, Christopher Cramer, Ha-Joon Chang, Richard Kozul-Wright. *OUP*, 2020, p.779-810.

Popov, Vladimir (2023a). Can China maintain high growth rates under the “dual-circulation” decoupling? – *MPRA Paper 117953*, July 2023.

Popov, Vladimir (2023b). US dollar is losing its position of a reserve currency: How the BRICS development bank can ensure soft landing. – *MPRA Paper No. 118342*, August 2023.

Popov, Vladimir, Piotr Dutkiewicz (2017). Mapping a New World Order. The Rest Beyond the West. Edited by Vladimir Popov and Piotr Dutkiewicz. *Edward Elgar*, 2017.

Rodrik, Dani (2008). Real Exchange Rate and Economic Growth. Undervaluation is good for growth, but why? - *Brookings Papers on Economic Activity*, Fall 2008. <https://drodrik.scholar.harvard.edu/files/dani-rodrik/files/real-exchange-rate-and-growth.pdf>

Roubini, Nouriel (1998). The Case Against Currency Boards: Debunking 10 Myths about the Benefits of Currency Boards. Stern School of Business, New York University, February 1998.

Singleton, John, Catherine R. Schenk (2015). The shift from sterling to the dollar, 1965–76: evidence from Australia and New Zealand. – Vol. 68, Issue 4, November 2015. Pp. 1154-76. <https://doi.org/10.1111/ehr.12060>

Stiglitz, Josef (2000). Capital Market Liberalization, Economic Growth, and Instability. – *World Development*, Volume 28, Issue 6, June 2000, pp.1075-1086.

UN DESA (2016). World Economic Situation and Prospects 2016. WESP Report. New York: *United Nations Department of Economic and Social Affairs, United Nations*, 2016.