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When are fixed exchange rates an appropriate policy tool for growth?

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Contents

Yang Yao

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Yang Yao

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an appropriate policy tool for growth?

Abstract

This policy brief discusses how a fixed exchange rate regime (FERR) may promote economic growth by undermining the Balassa-Samuelson effect. When total factor productivity (TFP) is faster in the industrial sector than in the non-tradable sectors, an FERR can suppress the Balassa-Samuelson effect if adjustment of domestic prices is subject to nominal rigidities. In a companion paper we are able to estimate the home country's industrial-service (quasi-) relative-relative TFP in comparison with the United States. Applying those estimates, our econometric exercises then provide robust results that an FERR dampens the Balassa-Samuelson effect and that the real undervaluation that ensues does indeed promote growth. We also explore the channels for undervaluation to promote growth. Lastly, we compare industrial countries and developing countries and find that an FERR has more significant impacts on developing countries than on industrial countries. However, real exchange rate management only works when a country is well prepared in terms of its economic fundamentals. As China has developed tremendously during the past two decades, it may be that the policy of fixed exchange rate is no longer appropriate.

Keywords: fixed exchange rate regime, real undervaluation, economic growth, China.

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1   Background

It is received wisdom that the exchange rate regime should not matter for economic performance in a perfect market environment as changes in the nominal exchange rate cannot move any real price. Consistent with this theoretical underpinning, most empirical studies find no robust link between exchange rate regimes and economic growth. It is widely acknowledged, however, that peripheral countries may fix exchange rates between their own currencies and the currencies of center countries (notably the US dollar) in a bid to accelerate their economic growth through increased exports. Under the Bretton Woods system, the major peripheral countries applying this practice were Japan and Germany. Today, they are China and other East Asian economies in the China-centered production nexus (and possibly new EU members of Eastern Europe that have been admitted to the euro zone). This apparent discrepancy between academic work and policymaking beckons further understanding of the link between a fixed exchange rate regime (FERR) and economic growth.

Existing empirical studies typically put the exchange rate regime as a dummy variable in their regressions and look at whether its coefficient is positive (e.g. Rose, 2011). This may overlook the economic fundamentals that determine the success of a FERR or real exchange rate management more generally. When commenting on real exchange rate management, Eichengreen (2007) writes:

> "*A stable and competitive real exchange rate … enable[s] a country to exploit its capacity for growth and development – to capitalize on a disciplined labor force, a high savings rate, or its status as a destination for foreign investment. Absent these fundamentals, policy toward the real exchange rate will accomplish nothing.*" (Eichengreen, 2007: p. 9)

Technological progress of the industrial sector that outstrips the rest of the economy is evidence Eichengreen's fundamentals are in place. Under the Balassa-Samuelson effect, higher total factor productivity (TFP) growth in the industrial sector than in the service sector in the home country relative to the reference country leads to real appreciation of the home country currency relative to the reference country's currency. This effect holds regardless of the choice of exchange rate regime. However, this holds only on the assumption that domestic nominal prices adjust quickly to TFP shocks, which may not reflect reality. In addition, the central bank may intervene to stabilize domestic nominal prices when it aims to support the fixed exchange rate in the face of appreciation pressures. As a result, a fixed regime may perform differently than a floating regime. Under a floating regime, the nominal exchange rate would adjust in response to the efficiency gains in the industrial sector, regardless of whether domestic prices adjust. That is, the Balassa-Samuelson effect dictates that real appreciation only stops after these gains are eliminated. When the nominal exchange rate is fixed, however, the Balassa-Samuelson effect may be dampened because the economy loses a fast-adjusting parameter. Real undervaluation may result, so the industrial sector gains a price advantage over non-tradable sectors. This can create three potential drivers of overall growth. The first driver is *a structural effect* that allows the industrial sector to absorb more labor. The overall economy experiences growth boosted by faster efficiency gains in the industrial sector than the rest of the economy. The second driver is *exports*. Real undervaluation makes it more profitable for domestic firms to produce for external demand. To the extent that external demand is autonomous to domestic income, higher exports may directly cause higher growth. The third driver is *investment*. In addition to the direct effect, exports may increase domestic savings (Dollar, 1992), and lead accordingly to a higher rate of domestic investment (Horioka and Feldstein, 1980).

The above-described mechanism may apply more to developing countries than to industrial countries. Developing countries are still in the thick of industrialization, so their industrial sectors can be expected to experience faster efficiency improvement than their non-tradable sectors. Markets also

tend to be less perfect in developing countries than in industrial countries. As a result, a FERR is more likely to cause undervaluation. In addition, these three drivers may play a more prominent role in developing countries than in industrial countries, so undervaluation is more likely to promote overall growth in developing countries.

2   Empirical findings

To explore these mechanisms, Mao and Yao (2015) conduct an empirical study based on a cross-country panel dataset of 159 countries from 1960 to 2010. Notably, we estimate industrial-service (quasi-) relative-relative TFPs of home countries against the United States by combining the sectoral value-added data provided by the World Bank Development Indicators (WDI) dataset and the PPP converters provided by the Penn World Table 8.0. We compare our estimates with the TFP estimates of the countries covered by the EU KLEMS Growth and Productivity Accounts and find that our estimates are reasonably aligned with the EU KLEMS estimates. Based on these estimates, we provide a fine estimate for the Balassa-Samuelson effect and examine how a FERR dampens this effect. We then consider whether real undervaluation created in this manner promotes economic growth. We also examine how growth is obtained through the three channels of higher shares of industrial employment, higher export shares and a higher rate of investment, respectively. Lastly, we conduct a comparative study for industrial and developing countries.

It is widely acknowledged that research results vary depending on the definition of FERR used. We test for real undervaluation with five prevailing definitions of the FERR, that of the IMF, Ilzetzki, Reinhart, and Rogoff (2008, hereafter "IRR"), Reinhart and Rogoff (2002, "RR"), Levy-Yeyati and Sturzenegger (2003, "LS"), and Shambaugh (2004, "JS"). The IMF classification is based on a country's officially declared exchange rate regime. The other four rely on a country's *de facto* exchange rate regime.

Our empirical exercise produces four policy-relevant results.

First, the Balassa-Samuelson effect holds in the sample, but a FERR depresses its function. Under a floating regime, the elasticity of the effect – defined by the percentage change of the home country's real exchange rate relative to that of the United States when the home country's industrial TFP grows one percentage point faster than its service TFP relative to the United States – ranges from 0.11 to 0.16 depending on the FERR definition used. Under a FERR, this elasticity is not significantly different from zero under any of our five definitions, i.e. a FERR causes significant real undervaluation relative to a floating regime regardless of the definition used.

Please note that real undervaluation is here defined differently from conventional practice. In the literature (e.g. Rodrik, 2008), the home country's real exchange rate (sometimes relative to that of the US) is first regressed on the per-capita GDP, and then the residual is defined as the amount of real undervaluation or overvaluation of the country. In our case, real undervaluation of a FERR is defined relative to a floating regime by the elasticity gap of the Balassa-Samuelson effect.

Second, FERR-caused real undervaluation (defined by IRR, RR and LS) boosts economic growth. The IMF categorization, as widely acknowledged, does not reflect a country's exchange rate regime in practice. Thus, it is hardly surprising to find that a FERR so defined does not affect growth. The JS definition is very coarse and may contain noises when applied to growth studies. By our most reliable estimation, a 50 percent undervaluation increases a country's growth rate by 4.5, 6.0, and 7.5 percentage points under the definitions of IRR, RR and LS, respectively. These numbers far exceed the values in the 1–2 percentage point range obtained by Rodrik (2008) and Gluzmann et al. (2008). This can probably be explained by the differences in how their two studies and our study define real

Yang Yao

When are fixed exchange rates
an appropriate policy tool for growth?

undervaluation. In their studies, real undervaluation is defined on the level of the real exchange rate. We define real undervaluation in terms of the elasticity of the Balassa-Samuelson effect, i.e. our measure is more sensitive than the measure of the other two studies. As a result, the "intensity" of undervaluation is higher by our measure than by their measure, and our measure arrives at a larger growth effect than their measure for the same amount of undervaluation.

Note that the economic fundamental in our paper is different from the one considered by Rodrik (2008). He believes that manufacturing sector faces more policy distortions than the non-tradable sector. Real exchange rate management is a way to overcome those distortions. In contrast, real undervaluation is useful in our case because the industrial sector is technologically better prepared than the rest of the economy to promote growth.

Third, FERR-caused real undervaluation increases the shares of industrial employment, exports, and investment. Under the IRR FERR definition, a 10 percent real undervaluation increases the share of industrial employment by 1.71, the share of exports by 4.28, and the share of investment by 1.93 percentage points, respectively. The export and investment channels, however, are more robust than industrial employment for undervaluation to promote growth. Moreover, the fixed regime only loses explanatory power when investment is controlled for in the growth equation, suggesting investment is a stronger channel than exports.

Fourth, when the entire sample is divided into an industrial country sample and a developing country sample, the fixed regime dampens the Balassa-Samuelson effect in both samples (although the dampening effect is much stronger in the developing- country sample). Indeed, while it is insignificantly different from zero in industrial-country fixers, the Balassa-Samuelson effect is significantly negative in developing-country fixers. This result is consistent with the fact that markets are less developed and prices are more rigid in developing countries than in industrial countries. When it comes to the relationship between real undervaluation and growth, the contrast is stark: a fixed exchange rate regime promote growths in developing countries by dampening the Balassa-Samuelson effect, while it does not in industrial countries. Applying the IRR FERR definition, a developing-country fixer grows 6.5 percent faster when higher TFP growth in its industrial sector allows it to gain a 50 percent undervaluation on the basis of the developing-country floaters' average real exchange rate. This effect is larger than what we obtain from the whole sample (4.5 percent).

3   Policy implications

The choice of exchange rate regime is often seen as a macroeconomic policy choice (Rose, 2011) that has no effect on long-run growth rates. The empirical results of Mao and Yao (2015) challenge this view by raising several policy implications for real exchange rate management.

First, they confirm Eichengreen (2007)'s assessment that real exchange rate management only works when a country is well prepared in terms of its economic fundamentals. The success of real undervaluation to promote growth critically depends on the ability of a country's tradable sector, particularly its manufacturing sector, to generate higher rates of growth than the rest of the economy because real undervaluation essentially provides a subsidy to the tradable sector.

Second, the stage of development is an important factor determining whether the fixed exchange rate regime is useful to create real undervaluation. Developing countries are better positioned to succeed than industrial countries in two ways. The industrial sectors of developing countries tend to experience faster technological progress than the rest of the economy. Thus, developing countries are

Yang Yao

When are fixed exchange rates
an appropriate policy tool for growth?

better prepared in their economic fundamentals than industrial countries to benefit from a fixed exchange rate regime. Domestic markets are also less developed in developing countries than in industrial countries. As a result, it is easier for the fixed exchange rate regime to cause real undervaluation when a developing country experiences faster technological progress in its industrial sector than in other sectors.

Third, economic fundamentals matter, i.e. real exchange rate management has to be formed as a contingent policy. Even in developing countries, the rate of industrial sector technological improvement may not exceed that of the service sector. This suggests that the exchange rate regime needs to be adjustable to promote growth. Of course, once an exchange rate regime is adopted, it is not easy to change it. This may explain why fixed exchange rate regimes often fail to promote growth. Real exchange rate management thus requires a fine-tuning feature that adapts readily to changes in economic fundamentals.

Lastly, our results provide clues in assessing the success of China's fixed exchange rate policy. As Figure 1 shows, China began moving to a *de facto* pegging system in 1994 and subsequent growth rates closely track the change of (quasi) relative-relative TFPs.

Two crisis-related cycles can be observed. The first occurs around the 1997 Asian Financial Crisis. Ahead of that crisis, the fixed exchange rate helps China reap the gains created by faster TFP growth in its industrial sector. These gains turn negative post-crisis, with the industrial sector showing slower TFP growth than the service sector. The fixed exchange rate regime hurts China's growth. The second cycle takes place around the 2008 Global Financial Crisis. China joined the WTO in 2001, beginning a new round of economic expansion driven largely by unprecedented export growth.[1] Again, China benefits from its fixed exchange rate regime. As the Global Financial Crisis forces the global economy into a prolonged period of deep adjustment, China's export growth slows. On the technological side, the industrial sector again shows lower rates of TFP growth than the service sector. Accordingly, the fixed exchange rate regime again impairs China's growth. Given that the Chinese economy enjoyed double-digit growth in the mid-1990s and early 2000s, China on balance appears to have gained from its fixed rate regime since 1994. However, it is highly unlikely that China's growth pattern of the mid-1990s and early 2000s can be repeated. The world economy has changed, not to mention the structural change in the Chinese economy as a natural result of economic growth. For China, maintaining a fixed exchange rate regime may no longer be appropriate.

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[1] Between 2001 and 2008, China's export grew by a factor of five. See www.stats.gov.cn.

Yang Yao
When are fixed exchange rates
an appropriate policy tool for growth?

Figure 1   The exchange rate regime, (quasi) relative-relative TFPs, and per capita GDP growth in China

Source: Mao and Yao (2015).

Yang Yao

When are fixed exchange rates
an appropriate policy tool for growth?
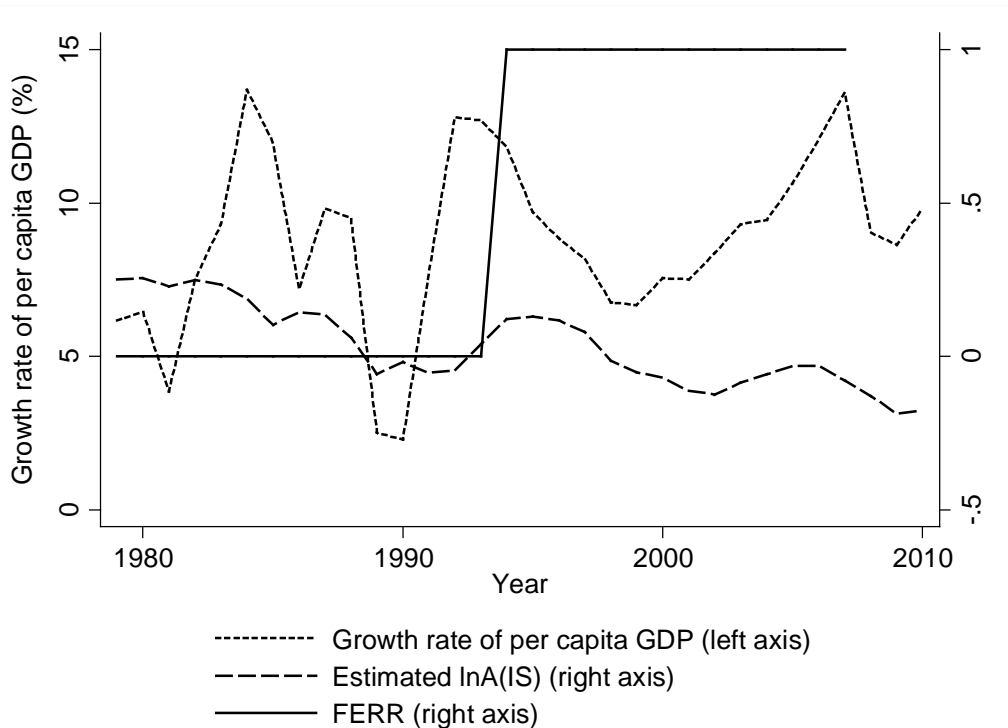
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