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Effects of Exchange Rate Revaluation under Price Controls and Endogenous Quality Adjustment

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7.1 Introduction

When a country under a fixed exchange rate system – whether \textit{de jure} de facto – exhibits large and persistent current account surpluses, it is often pressed to revalue the exchange rate (i.e. let the home currency appreciate against foreign currencies). Well-known examples are West Germany in the 1960s (which ended up revising the dollar–Deutschemark rate in 1961 and 1969) and Japan in the early 1970s (which acquiesced in the Smithsonian Agreement to revise the dollar–yen rate in 1971). More recently, China has been under intense pressure from its major trading partners to revalue the renminbi.

While the popular discourse on international relations tends to focus on the nominal exchange rate (hereafter denoted by \(E\)), it is the real exchange rate (defined as \(E^*P/P\), where \(P^*\) and \(P\) are the foreign and domestic CPI) that ultimately matters to resource allocations including the current account balance. It is thus important to examine how a nominal revaluation (a reduction of \(E\)) will affect the real exchange rate (\(E^*P/P\), holding the foreign CPI (\(P^*\) constant.

The standard theory offers two different predictions regarding the relationship between the nominal and real exchange rates, depending on the flexibility of prices. When there is downward rigidity in goods prices, the domestic CPI (\(P\) after a nominal revaluation will not fall as much as the value of foreign currency (\(E\)), causing a real appreciation of the home currency (a fall in \(E^*P/P\)); this provides an implicit basis for Keynesian analysis (e.g. one using the Mundell–Fleming model). In contrast, when goods prices are completely flexible, a nominal revaluation (a fall in \(E\)) will cause an equiproportionate fall in the domestic CPI (\(P\), leaving the real exchange rate (\(E^*P/P\)) unchanged; this is a representation of monetary neutrality in the international context, often dubbed the purchasing power parity (PPP). In any case, the standard theory predicts that the nominal exchange rate will have a weakly positive effect on the real rate \(d(E^*P/P)/dE \geq 0\).

This chapter argues that, contrary to the commonly held views, the nominal and real exchange rates can move in opposite directions \(d(E^*P/P)/dE < 0\) if
there exist government-imposed price controls. More specifically, the chapter considers a small open economy with tradable and nontradable sectors, where the tradable price \( P_T \) is determined by the nominal exchange rate \( E \) and the international price \( P_T^* \), while the nontradable price \( P_N \) is capped by a ceiling \( \bar{P}_N \) (i.e. \( P_N \leq \bar{P}_N \)). The quality of the tradable good is assumed to be constant, while the quality of the nontradable good (hereafter measured by \( z \)) is assumed to be adjustable, enabling the nontradable sector to eliminate excess demand even when the price ceiling happens to be binding (\( P_N = \bar{P}_N \)). The domestic CPI (\( P \)) will depend not only on the goods prices (\( P_T, P_N \)) but also on the quality of the nontradable good (\( z \)).

Suppose now that the economy is initially in a distorted equilibrium with a binding price ceiling and a suboptimal good quality in the nontradable sector. Then it can be shown that a nominal revaluation (a fall in \( E \)) will lead to a real depreciation (an increase in \( E/P^*_T/\bar{P}_N \)), causing the quality-adjusted CPI (\( P \)) to fall more than the nominal exchange rate (\( E \)).

The above result, which might seem a little odd at the first sight, is actually quite intuitive. In the initial equilibrium, the binding price ceiling in the nontradable sector is depressing the relative price (\( P_N/P_T \)), forcing the quality level (\( z \)) to be suboptimal. The revaluation and the subsequent fall in the tradable price (\( P_T \)) will mitigate the initial distortion, enabling the nontradable producers to raise the quality of their products in return for the higher relative price. Thus, the revaluation reduces the quality-adjusted CPI not only by causing a lower tradable price (lower \( P_T \)) but also by inducing quality improvement (higher \( z \)); the existence of the latter effect causes the fall in \( P \) to outweigh the fall in \( E \) in magnitude, thereby causing the real exchange rate (\( E/P^*_T/\bar{P}_N \)) to depreciate.

The result of this chapter teaches us a lesson that the effect of exchange rate policy on the real economy can be influenced by institutional factors in a nontrivial way: those who simplistically believe that nominal revaluations should reduce current account surpluses could end up deceiving themselves if the economy is distorted by a price ceiling in the first place. This lesson seems particularly relevant to developing countries (including economies in transition), where the incidence of government control over prices is reportedly high (Mishkin 2000).

The remainder of the chapter is organized as follows: the next section (Section 7.2) presents a simple closed-economy model to illustrate how a price ceiling interacts with quality of the good. This is to set the stage for a more complex, open economy analysis. Section 7.3 develops a two-sector model of a small open economy under a fixed exchange rate system. Using the model, the general equilibrium with a binding price ceiling is characterized and the effect of a nominal revaluation on the real exchange rate is analyzed. Section 7.4 briefly discusses policy implications of the model, focusing on the possible revaluation of the Chinese renminbi. Section 7.5 concludes the chapter.