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A model of a heterodox exchange rate based stabilization

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ABSTRACT

This paper attempts to explain the ERBS syndrome in Turkey by appeal to weak credibility cum sticky prices. By developing a model specifically for the 2000–2001 heterodox ERBS program in Turkey, I also depart from the existing literature which has focused almost exclusively in Latin America. What I aimed in this model is to generate the macroeconomic dynamics observed after the implementation of the program in Turkey. In order to assess the model's quantitative performance; it is calibrated by using data restrictions mainly from the Turkish economy. In addition to replicate the general qualitative effects of a currency peg, the model can successfully account quantitatively for the responses of consumption and current account balance and real exchange rate observed in Turkey. The closeness of the predicted consumption boom in the model and the actual boom in Turkey is particularly remarkable: 10.08% predicted increase in total consumption spending vs. 9.6% actual. And 37.06% predicted increase in durables spending vs. 39.5% actual. Overall, results indicate that sticky price model can explain the ERBS syndrome in Turkey to a great extend under the assumption that disinflation program is perceived by the public as non-credible.

1. Introduction

The empirical regularities observed in exchange-rate-based-stabilization (ERBS) programs (the so-called ERBS syndrome), namely a boom–bust cycle in consumption and economic activity, substantial real exchange rate appreciation and related deterioration in external accounts which often leads to balance of payments crisis; generated an extensive literature. Various theories have been put forward in order to replicate these dynamics and find an explanation to them. Based on explanations that the models have relied on, theoretical literature can be separated into two main categories: demand-side based models and supply-side based models. The most popular demand-side theory "weak credibility" has been introduced by Calvo (1986) as the driving force of the ERBS syndrome. It was predicated on the idea that given a long history of failed disinflation policies stabilization attempts in chronic inflation countries are likely to suffer from lack of credibility. Later, Calvo and Vegh (1993) developed this theory further by adding non-traded good and sticky prices. Models of weak credibility rely on intertemporal substitution effects as the key channel through which stabilization plans may have real effects. When the reduction in the rate of devaluation is not credible, in the sense that the public expects that the program will be abandoned at some point in the future, the fall in the nominal interest rate resulting from the lower devaluation rate and perfect capital mobility, is viewed as temporary. Because of the cash-in-advance constraint this temporary fall in the nominal interest rate reduces the effective price of consumption today relative to the future. Hence, demand for both traded and non-traded goods increases and leads to an initial expansion in the non-traded goods sector and a current account deficit. Since prices are sticky, the slow convergence of inflation results in a sustained real exchange rate appreciation, which eventually reduces the demand for non-traded goods. As a consequence, output falls and a recession sets in. The recession may occur either before or when the program ends. Furthermore, the real effects caused by a noncredible stabilization do not depend on whether the program is eventually abandoned, as the public expected, or not.

The most common criticism of weak credibility is that it relies critically on intertemporal elasticity of substitution which is small in developing countries. Recently, Atolia and Buffie (2011) have overcome the problem regarding intertemporal elasticity of substitution and established the additional quantitative power of weak credibility hypothesis via its impact on durables spending. Incorporating durable consumer goods particularly improves the quantitative power of the weak credibility by generating a strong consumption boom even with very low values for the intertemporal elasticity of substitution.

This paper is another attempt to explain the ERBS syndrome by appeal to weak credibility cum sticky prices. To explain the empirical regularities observed during the 2000–2001 ERBS program in Turkey, I work with a variant of the model developed in Atolia and Buffie (2011), which is a currency substitution model of a small open economy that operates under an open capital account and a crawling peg exchange rate. My model differs in two respects, however: First, I relax

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the assumption that imported and non-traded durables are consumed in fixed proportions in order to create a more powerful surge in imported durables. Second, based on the empirical evidence for Turkey, I analyze a heterodox program where bond sales finance the fiscal deficit and money growth occurs only through capital inflows. Furthermore, by developing a model specifically for the 2000–2001 heterodox ERBS program in Turkey, I also depart from the existing literature which has focused almost exclusively in Latin America. What I aimed in this model is to generate results that can account for the consumption boom, current account deficit and real exchange rate appreciation observed during the program in Turkey both quantitatively and qualitatively. The remainder of the paper is organized into five sections. Section 2 presents the policy measures of the 2000–2001 ERBS program in Turkey and discusses the macroeconomic developments after the implementation of the program. Section 3 lays out the model, provides a brief sketch of the solution procedure and calibration, then follows with numerical results. Section 4 presents the results from the flexible price version of the model to help make the case for relevance of sticky prices. Section 5 analyzes the real effects of an anticipated non-credible ERBS in comparison to the original model which analyzes the real effects of an unanticipated non-credible ERBS. Finally, Section 6 contains concluding remarks.

2. Policy measures and macroeconomic developments after the implementation of the program

Turkey introduced an ERBS program in January 2000. The daily values of the foreign exchange basket for the next 12 months were announced to the public. The programmed depreciation of the Turkish currency, Turkish Lira (TL in short), was equal to the WPI inflation target (20%) for the year of 2000. The exit strategy[1] was announced in conjunction with the launching of the program. The exchange rate policy was to be assisted by a monetary policy similar to a currency board. Net domestic assets of the central bank were not to exceed their end-1999 level at the end of each quarter. Fiscal deficit was to be financed mainly by selling bonds. Sterilization was completely excluded. Therefore, base money was to be changed only in connection with balance of payments inflows or outflows, with interest rates being fully market determined. The program appeared to be successful in the first 10 months of its implementation. By November 2000 however, IMF officials started to express their concerns on the widening current account deficit. On November 22nd, a financial distress emerged in domestic banking sector and turned into a full-blown liquidity crisis in no time when the sustainability of the peg was called into question. After a few months of muddling through, a second attack hit the TL in late February. The overnight interest rates jumped to sky-high levels and the central bank sold $5.2 billion within two days. Two days later, the exchange rate system collapsed and domestic currency depreciated by 40% in a day. The currency peg was abandoned and replaced with a regime of free floating.

Main macroeconomic developments after the inception of the program are in line with the general dynamics displayed by other ERBS programs. Upon the announcement, nominal interest rates declined immediately.[2] The sharp decline in interest rates was accompanied by a surge in spending. The real rate of growth in imports rose from −2% in 1999:3 to 5.2% in 1999:4 and jumped to quarterly rates of 34.9% and 25.2% in the first half of 2000. The surge in sales of durable goods and cars was remarkable. The growth rate in sales of durable goods jumped from 4.3% in December of 1999 to 62% in January of 2000, while the rate of growth of car sales jumped from 29% to 107.5%. Strong domestic purchases of foreign durables, largely automobiles, caused a huge spike in imports and trade deficit almost doubled.[3] Automobile production increased by 47.8% in 2000. But the growth rate of car sales had already reached 148.4% by August 2000, meaning 2/3 of the cars sold were imported automobiles. Because of the very strong upturn in domestic demand, real GDP which has fallen 5% in 1999, expanded at a rate of 7.4% in 2000. The recovery in domestic demand was not homogeneous however. By the end of the third quarter, the real rate of growth of expenditure on durables consumption reached 40% while it was only 9.6% for total private consumption.

The program succeeded in reducing the inflation, but not enough to prevent the sizable real appreciation associated with ERBS episodes. Due to slow convergence of inflation, real exchange rate appreciated 16% by the end of 2000. Real appreciation was accompanied by net capital inflows of 15.6 billion US dollars (6% of GDP). Surge in domestic absorption coupled with real appreciation of the domestic currency led to the rapid expansion in current account deficit reaching 9.8 billion US dollars (almost 5% of GNP) by the end of the year.[4]

Following the collapse of the ERBS, the economy fell into a severe recession in February 2001, which continued almost until the last quarter of 2002. Real GDP declined by 7.5% after expanding at a rate of 7.4% in 2000. Of the consumption expenditures, the deepest slump was witnessed in durables, with contractions of 20.32% and 36.12% in the first half of 2001. Unlike durables, total private consumption expenditures decreased by 3–12% in real terms within the first six months of 2001. As a result of the severe downturn in domestic absorption, the current account balance tilted to a surplus of 3.3 billion US dollars from a deficit of 9.8 billion US dollars.

3. A model of ERBS for Turkey

3.1. The model

There are three financial assets in the model: domestic currency M, foreign currency F, and indexed treasury bonds. Both domestic and foreign currencies provide liquidity services. Considering the fact that Turkey has been a highly dollarized economy I prefer foreign currency rather than a foreign bond as the foreign asset. Over the 1990s, the ratio of foreign currency deposits to broad money has been 45–47% on average in Turkey. The share of foreign currency deposits in total deposits rose from 25.5% in 1990 to 45.9% in 1999 and reached 57.6% by the end of 2001[5] even though the average real rates of return on TL denominated assets were generally higher than those on foreign currency denominated deposits.[6] A study conducted by the Fed (2003) also confirms that Turkey has been one of the highly dollarized economies in the world. In that study, Turkey ranked as the fifth largest US currency holder with an estimated $10 billion in circulation in 2002. Another reason for choosing foreign currency rather than a foreign bond is to make sure that foreign and domestic currency assets are not perfect substitutes. In an optimizing, perfect foresight model with an open capital account, domestic and foreign bonds are perfect substitutes and the domestic interest rate differs from the foreign rate only by the percentage depreciation of the exchange rate. Thus is not consistent with the data from developing countries. [7]

[1] Until June 2001, the rate of crawl was supposed to be consistent with the targeted inflation rate. After then, there would be a gradually widening band around a central parity.

[2] Nominal interest rates on 3-month maturity of Treasury secondary market securities fell from 96.4% in September 1999 to 51.6% in December upon the announcement of the program and continued to fall until mid-summer (OECD, 2001; Table. 6).

[3] The Central Bank of Republic of Turkey, 2000, “Inflation Report”.

[4] Current account balance had a deficit of 0.7% at the end of 1999.

[5] Bahmani-Oskooee and Domac (2002).

[6] Between 1990 and 2000, the average real rates of return on TL denominated deposits were 20% while the same rate was about 3% for foreign currency denominated deposits. See Civcir (2005).

[7] Tanner (1998) examines ex-post deviations from uncovered interest parity in 34 countries and finds that in industrialized countries; UIP deviations are largely explained by unanticipated real exchange rate growth whereas in developing countries including Turkey, deviations are mainly explained by real interest differentials. He attributes this difference to the greater variability of inflation, higher and more variable risks and capital controls in developing countries. Colak and Karahan (2012) test the uncovered interest parity for Turkey between 2002 and 2011. Their results don't support the validity of UIP for Turkey.