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journal homepage: www.elsevier.com/locate/jimfMeasuring the effects of dollar appreciation on Asia: A FAVAR approach[☆]Zheng Liu, Mark M. Spiegel^{*}, Andrew Tai

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ABSTRACT

Exchange rate shocks have mixed effects on economic activity in both theory and empirical VAR models. In this paper, we extend the empirical literature by considering the implications of a positive shock to the U.S. dollar in a factor-augmented vector autoregression (FAVAR) model for the U.S. and three large Asian economies: Korea, Japan and China. The FAVAR framework allows us to represent a country's aggregate economic activity by a latent factor, generated from a broad set of underlying observable economic indicators. To control for global conditions, we also include in the FAVAR a "global conditions index," which is another latent factor generated from the economic indicators of major trading partners. We find that a dollar appreciation shock reduces economic activity and inflation not only for the U.S. economy, but also for all three Asian economies. This result, which is robust to a number of alternative specifications, suggests that in spite of their disparate economic structures and policy regimes, the dollar appreciation shock affects the Asian economies primarily through its impact on U.S. aggregate demand; and this demand channel dominates the expenditure-switching channel that affects a country's export competitiveness.

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1. Introduction

Anticipation of U.S. monetary policy normalization led to significant appreciation of the dollar from mid-2014 to mid-2015. The dollar appreciation has raised concerns about potential spillover effects on economic activity of the trading partners of the United States.

In principle, a dollar appreciation should raise foreign net exports to the United States through an expenditure switching effect because it reduces the relative price of foreign goods sold in the U.S. market (Mendoza, 1995; Calderon et al., 2002). All else equal, this expenditure switching effect would be a drag on U.S. economic activity.¹

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¹ The presence of global monetary policy spillovers raises the question of the scope for international policy coordination. Most studies find that the effective scope for policy coordination is limited, although it has been argued that in exceptional circumstances, such as the global financial crisis, the potential gains from coordination can be large (e.g. Coeuré, 2016).

In general, however, a dollar appreciation can have ambiguous effects on the economic activity of the trading partners of the United States. The ambiguity arises from the Harberger-Laursen-Metzler (HLM) effect. In particular, if a foreign currency depreciates against the dollar, the relative price of its exported goods falls and its terms of trade deteriorates. If the terms-of-trade deterioration is transitory, then domestic households would reduce savings to smooth consumption. Thus, all else equal, the reduction in savings would lead to a decline in the country's current account balance (Svensson and Razin, 1983). If the terms of trade deterioration is permanent, however, Obstfeld (1982) shows that there is a negative wealth effect that may increase domestic savings and thus increase the current account balance. Therefore, the net effect of a dollar appreciation shock can be ambiguous.²

Despite the ambiguity through the terms-of-trade effect, the expenditure-switching effect that reduces U.S. activity following a dollar appreciation shock implies a reduction in overall demand in the United States, including demand for foreign goods. This may in turn depress a foreign country's exports to the U.S., and thereby its overall economic activity. This possibility has been stressed by U.S. monetary policymakers in their assessment of the global implications of U.S. monetary policy during the global financial crisis and the subsequent recovery. For example, Ben Bernanke (Bernanke, 2014) recognized the possibility that appropriate monetary policy for the United States may have undesirable consequences for its trading partners, particularly for emerging market economies that are vulnerable to abrupt changes in the pace of capital movements. But he stressed that any "costs" of these policies to those countries must be assessed against the benefits of supporting recovery in the advanced economies. Similarly, Federal Reserve Vice Chair Stanley Fischer noted that while the onset of policy tightening in the United States in 2015 may have put pressure on some emerging market assets, one reason for optimism was again that the policy tightening was taking place "...against the backdrop of a strengthening U.S. economy and in an environment of improved household and business confidence" (Fischer, 2014). The implications of both of these speeches is that the strength of U.S. demand is also of important concern for emerging market countries that rely on the U.S. as a market for their exports.

Furthermore, the sensitivity of a country's economic activity to a dollar appreciation shock may depend on the country's domestic policy regime and in particular, its exchange rate regime. The well-known "trilemma" argument implies that a flexible exchange rate regime allows a small open economy to have relatively independent monetary policy even though its capital account is open. Nonetheless, a dollar appreciation shock can still lead to real depreciation for a country if its monetary authority resists changes in domestic interest rates in response to the shock. For a country that tightly manages its exchange rate against the dollar, the impact of a dollar appreciation shock would be quite different. For such an economy, a dollar appreciation shock results in a real appreciation of its domestic currency relative to the rest of the world, which in turn reduces the competitiveness of the country's exports, exacerbating the adverse impact of the decline in U.S. demand resulting from the dollar appreciation.

One notable example of such a managed dollar exchange rate is China. China's currency (the renminbi, or RMB) closely followed the dollar over this period, as shown in Fig. 1. As the dollar began appreciating in anticipation of policy normalization in the middle of 2014, the trade-weighted renminbi exchange rate also appreciated. By the end of our sample, the real effective exchange rate (REER) of the U.S. dollar had appreciated 2.77 percent, while that of the RMB had appreciated even more (3.21 percent). In contrast, both the trade-weighted South Korean won and the trade-weighted Japanese yen depreciated over the same period, although less than one might expect because the United States is the destination for only a modest share of these countries' exports relative to their trade with the rest of Asia and Europe.³

Empirical evidence suggests that in a country with a currency peg, domestic interest rates closely follow changes in the interest rates of the base country (Shambaugh, 2004). As a result, increases in interest rates in industrial countries lead to contractions of economic activity in pegging countries, but have modest impacts on countries with a floating exchange rate regime (di Giovanni and Shambaugh, 2008). Broda (2004) also finds that countries with flexible exchange rate regimes are more insulated from terms of trade shocks.⁴ Similarly, Kim (2001) finds that expansionary U.S. monetary policy shocks from 1974 through 1996 tended to increase economic activity in the non-U.S. G6, primarily due to the implications of U.S. monetary shocks for global interest rates.⁵

In contrast to the exchange rate regime, there is less evidence that capital controls have a systematic impact on a nation's sensitivity to external monetary shocks (e.g. Miniane and Rogers, 2007). The failure of capital controls to viably insulate a country from external monetary shocks has been associated with outstanding stocks of foreign currency debt (Towbin

² This ambiguity can be resolved for a variety of special cases. For example, Kraay and Ventura (2000) demonstrate that in the case where investors allocate a marginal change in wealth in the same proportion as their existing asset holdings, a positive shock to income in a debtor country will increase its current account deficit. It has also been shown that the magnitude of the so-called expenditure-switching effect of an exchange rate change can be mitigated by firms pricing their goods to market (e.g. Devereux and Engel, 2003). Alternatively, Agénor and Aizenman (2004) demonstrate that countries that face borrowing constraints may disproportionately save the proceeds of positive terms of trade shocks, improving their current account.

³ The Korean won REER depreciated by 0.40 percent, while the yen REER depreciated by 1.85 percent.

⁴ In a recent paper, Schmitt-Grohé and Uribe (2013) find little impact of terms of trade shocks for a mixed group of poor and emerging market economies in a VAR framework. Kim and Yang (2012) examine the impact of U.S. monetary policy shocks on a number of East Asian countries, including Korea, Japan and China, using monthly data from June 1999 through June 2007. Their study characterizes China as pursuing a de facto crawling peg against the dollar, while the exchange rate regimes in Korea and Japan are more flexible.

⁵ There is also evidence of spillovers from the unconventional U.S. policies pursued during the global financial crisis (e.g. Bowman et al., 2015; Chen et al., 2016).

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