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Monetary Policy Shocks From the EU and US: Implications for Sub-Saharan Africa

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Following the financial crisis, interest rates in both the Euro Area ("EU") and United States ("US") were lowered to historical lows implying that at some point in the future, increases are likely. As Tables 1 and 2 indicate, sub-Saharan African ("SSA") economies have a high degree of exposure to the EU and US both in terms of trade and debt, making them susceptible to foreign monetary policy shocks. Given these facts, the question becomes, what would be the consequences of a contractionary foreign monetary policy shock from either the EU or US on the real economies of these SSA countries?

Percent (%) of Total Trade	Exports EU	Imports EU	Exports US	Imports US
South Africa	21.4	27.7	9.3	9.4
Ghana	36.9	22.2	8.2	7.4
Kenya	16.6	16.0	4.3	5.9
Tanzania	23.9	13.2	2.4	3.5
Uganda	25.2	17.4	2.2	3.9
Mauritius	36.9	23.1	13.9	2.5
Gabon	18.6	59.2	42.1	7.7
Cote d'Ivoire	44.7	37.7	7.8	3.8
Botswana	31.3	37.3	16.1	9.0
Senegal	29.9	44.8	0.5	4.2
Rwanda	26.3	20.0	4.4	6.4

Table 1: SSA Country Trade with EU and US

Percent (%) of Total External Debt	Euro	USD	Debt as % of GNI*
South Africa	10.1	69.4	22.2
Ghana	11.9	62.6	73.0
Kenya	16.8	44.4	52.5
Tanzania	4.6	46.5	79.8
Uganda	5.1	59.9	53.7
Mauritius	45.4	34.7	20.8
Gabon	41.7	27.5	69.7
Cote d'Ivoire	49.7	39.2	117.1
Botswana	5.6	16.6	10.0
Senegal	15.5	43.2	59.3
Rwanda	6.2	51.4	56.4

Table 2: SSA Country External Debt Denomination

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Introduction

Surprisingly, despite multiple attempts at addressing how the international transmission of monetary policy shocks works, the literature remains split on whether or not the recipient country can expect an economic contraction or expansion and what the primary transmission mechanism will be. If increases in foreign interest rates cause slowdowns in foreign demand for SSA goods, or cause domestic central banks to increase interest rates in order to keep real debt levels and capital inflow stable, economic contractions in the SSA countries are likely. However, if increases in foreign interest rates cause appreciations of that currency thus leading to an increase in foreign demand for SSA goods, or cause domestic central banks to lower rates in order to stimulate the economy, economic expansions are possible in the SSA countries.

To shed light on these puzzles, I engage in a new empirical investigation specifically looking at how monetary policy shocks from different regions, namely the EU and US, affect a set of infrequently examined sub-Saharan African ("SSA") countries. I study 11 SSA countries including the floating exchange rate economies of South Africa, Ghana, Kenya, Tanzania, Uganda, Mauritius, and the fixed exchange rate economies of Gabon, Cote d'Ivoire, Botswana, Senegal, and Rwanda. The economic theory just discussed, and thus the flexibility in the domestic central bank response, will in part depend on the nature of the exchange rate regime

I first identify the exogenous EU and US monetary policy shocks. With some assumptions on accuracy of the private sector's beliefs and information set, it is possible to show that this shock can be represented by the change in a given forward-looking variable before and after a policy announcement made by either the European Central Bank ("ECB") or Federal Open Market Committee ("FOMC"). As in Barakchian and Crowe (2013), I create this monetary policy shock series using six different federal funds futures contracts with horizons from one to six months for the US. For the EU shock series, I use Eurodollar futures.

Figure 1 shows the monetary policy shocks series for both the EU and US generated by this identification method, as well as the respective GDP responses to a contractionary monetary policy shock. As can be seen, a contractionary monetary policy shock results in a significant fall in GDP in both the EU and US, implying that the identification of the shock series is likely appropriate.

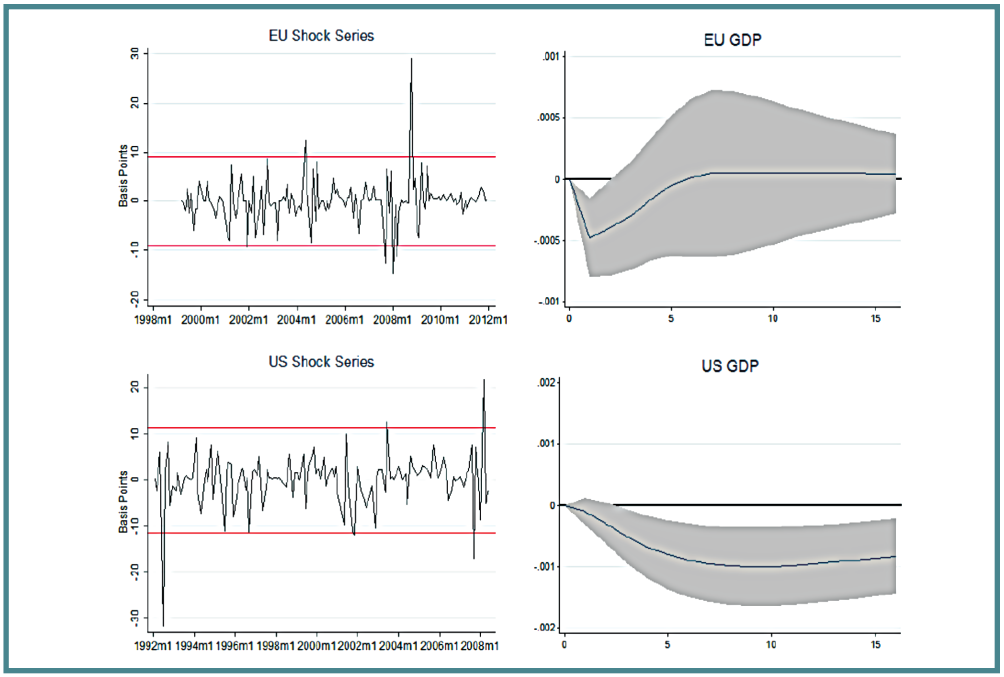

FIG 1 – EU and US Monetary Policy Shock Series with GDP Responses

Having identified the exogenous monetary policy shock, I insert this shock series into a structural vector autoregression ("SVAR") for each SSA country using the additional variables $Shock_t$, $Trade_t$, $RGDP_t$, CPI_t, XR_t, and IR_t. $Shock_t$ represents either the EU or US monetary policy shock cumulated to be an I(1) variable, $Trade_t$ is real bilateral trade balance with either the EU or US, $RGDP_t$ is real GDP, CPI_t is the consumer price index, XR_t is the nominal bilateral exchange rate with either the EU or US, and IR_t represents an appropriate nominal central bank interest rate used by the given SSA country. The SVAR methodology does not require strong assumptions on relationships between variables, simply relying on correlations between the lags and present values. Furthermore, according to Bernanke and Blinder (1992), the most important part for ensuring the statistical properties of the estimated coefficients, and thus the accuracy of the impulse responses, is that the shock be appropriately identified. If this is the case, the ordering of the variables becomes irrelevant other than the placement of the shock series. Since the shock coming from the EU and US is unlikely to be affected by any of the SSA variables, it is ordered first in the SVAR.

Results

For floating exchange rate countries, the SVAR indicates that, regardless of whether the monetary policy shock comes from the EU or US, economic contractions are likely with interest rates acting as the dominant transmission mechanism. To show these results in more detail, Figures 2 and 3 show examples for Uganda following a EU and US monetary policy shock respectively. In both cases, the increase in domestic interest rates by the central bank, due to concerns over high levels of external debt, as well as significant reliance on international capital flows, causes a slowdown in the SSA economy as interest rates dominate the increase in trade that occurs from the appreciation of the foreign currency.

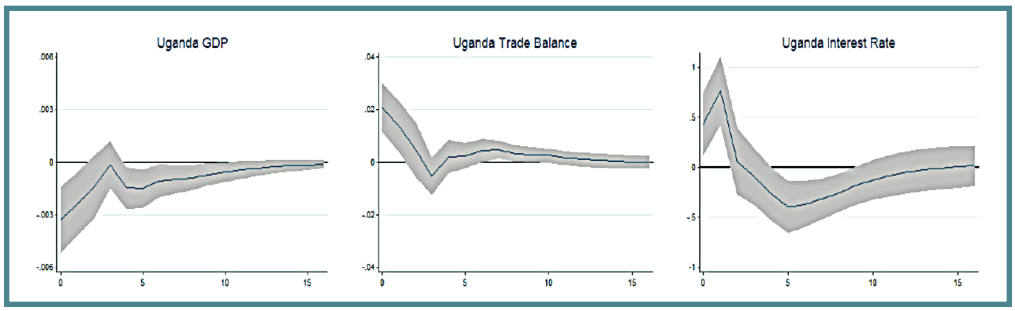

FIG 2 – Uganda Economic Response to EU Shock

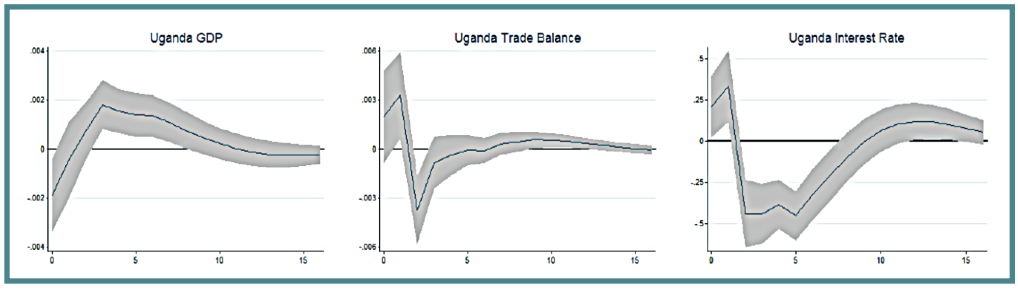

Fig 3 – Uganda Economic Response to US Shock

Fixed exchange rate countries have more diversity in the results. Following the EU monetary policy shock, some countries experience GDP contractions while others experience expansions with both interest rates and trade acting as transmission mechanisms. This dichotomy in results is based on whether income or substitution effects dominate the trade channel in the EU, as well as the response of the central banks, which depends on the use of capital controls as a tool to fix the exchange rate. Those countries that rarely use capital controls will be forced to increase interest rates to maintain the exchange rate peg, causing a slowdown in the economy, while countries that use significant capital controls to protect the exchange rate peg are more likely to lower interest rates, thus stimulating investment in the economy. Figure 4 shows an example for Senegal who, because of low capital control usage, increases interest rates to defend the peg, which causes an economic contraction.

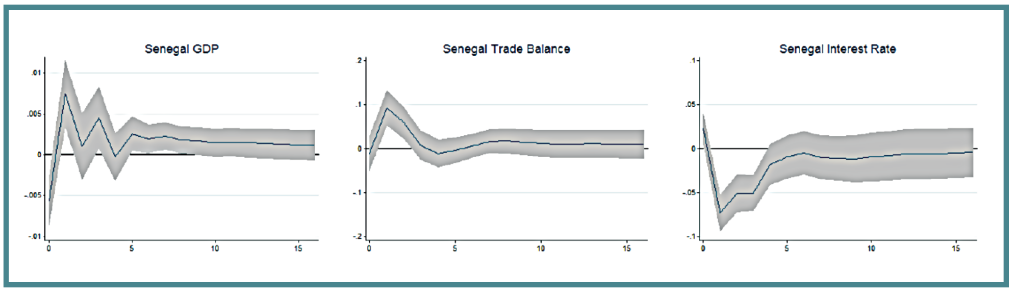

FIG 4 – Senegal Economic Response to EU Shock

Lastly, following the US monetary policy shock, fixed exchange rate countries experience expansions with neither interest rates nor trade playing a significant role. A third factor is likely dominating, and given the amount of US aid going to these countries over the period under analysis, this factor may be an important component of GDP responses. Figure 5 shows an example of GDP, interest rates, and trade for Botswana and one can see that the expansion is not caused by either interest rates or trade.

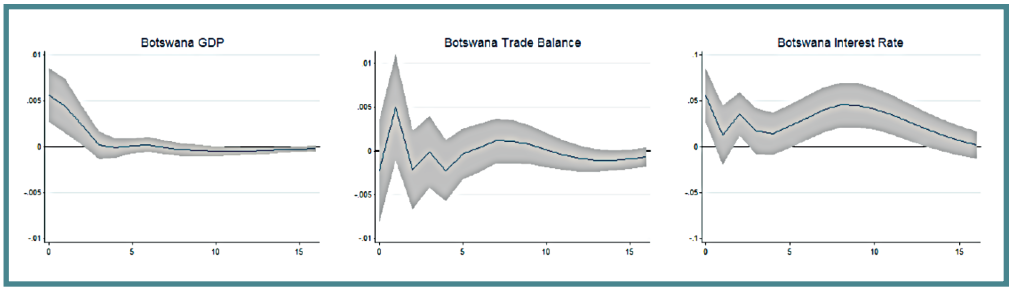

FIG 5 – Botswana Economic Response to US Shock

Summary

Given the importance that international linkages played in the financial crisis, developing countries have to know what to expect and how to react to foreign shocks. In this analysis I look at how monetary policy shocks from the EU and US affect a set of SSA countries with both floating and fixed exchange rates. I find that floating exchange rate countries, regardless of which country originates the monetary policy shocks, are likely to experience economic contractions due to the increase in domestic interest rates that occurs because of their reliance on external debt and capital. For fixed exchange rate countries, following the EU shock, those who do not use capital controls to fix the peg are likely to experience contractions as they are forced to increase interest rates, while those that do use capital controls experience expansions as they are able to lower rates, with trade playing a role in both possibilities. Following the US shock, aid appears to be dominant in allowing fixed exchange rate countries to experience expansions.

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