The Example of GIRF and GVDC by Applying Switzerland's Data

Sample: from 2000Q1 to 2017Q2 of Switzerland's data

The symbols and definitions of the variables-
   IF - foreign interest rates
   RY – the log of real GDP (= log (gdp/ gdp deflator))
   INF – inflation (= log(cpi))
   ID - domestic interest rate
   DREX - the first difference of the log of real exchange rate (Δe_t).

The result of GIRF

   The empirical result of GIRF is as figure 1, which displays that Swiss Franz is <u>overshooting</u>. The exchange rate present sharp drop at the first quarter but it rebounded sharply in the second quarter, and then slowly adjust toward zero after the 3th quarter. However, it will take a prolonged period (around 3 years) returning to equilibrium.

Figure 1 Response of Monetary Shock in Switzerland

Response of DREX to Generalized One
S.D. ID Innovation
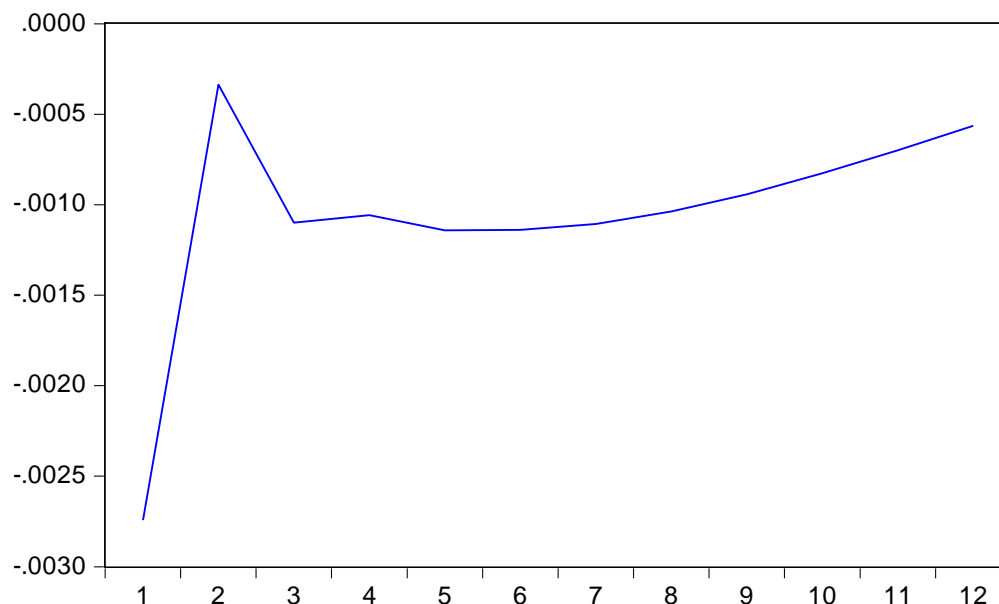
The result of GVDC

The result of GVDC is shown as table 1, which shows that, in Switzerland, monetary policy shocks explain 8.2370% of the exchange rate variation on impact, while 1.8429% of the interest rate variation is explained by exchange rate shocks on impact.

Table 2 are summarized the results of all variables for the short or the long run. By assessing the portion of the forecast error variance of DREX and ID, there are two important results as the followings. First, as to the portions of other four variables' shock on the variance of DREX, after 4 quarters (short run), the portions are 7.66% from IF, 0.71% from RY, 5.20% from INF, 7.06% from ID. After 12 quarter (long run), the portions are respectively 7.57% from IF, 1.17% from RY, 6.29%, and 8.23% from ID. The greatest impact on DREX is from IF in the short run but from ID in the long run. Second, as to the portions of other four variables' shock on the variance of ID, no matter for the short or the long run, the greatest impact on ID is from IF, the portions form IF are 17.32% after 4 quarters, and 58.68% after 12 quarters, which implies close linkage between domestic and foreign interest rates.

Table 1 Forecast error variance decomposition between DREX and ID (%)

	Swiss Frans
Real exchange rate (DREX): The contribution from monetary policy shocks on the 8th quarter	8.2370%
interest rate (ID): The highest contribution from exchange rate shocks on the 8th quarter	1.8429%

Table 2 Forecast Error Variance Decomposition of all variables

Dependent variables	Quarter	Percentage of forecast variance explained by innovations (in %) of each independent variable				
		IF	RY	INF	ID	DREX
ID	1	12.57681	9.535142	0.160243	77.72780	0.000000
	2	10.91847	9.539955	0.167100	79.19459	0.179891
	3	9.185059	8.176272	1.670930	78.50884	2.458904
	4	17.32703	6.768361	1.715402	70.75780	3.431410
	8	53.43755	2.892901	7.141143	34.40756	2.120841
	12	58.68042	1.739669	8.130646	29.60628	**1.842990**
DREX	1	7.835048	0.001241	3.603782	6.076244	82.48369
	2	7.590781	0.261658	5.201801	6.601869	80.34389
	3	7.317745	0.254485	4.901150	6.439691	81.08693
	4	7.665713	0.716802	5.202962	7.046441	79.36808
	8	7.663113	1.126159	5.717414	8.048068	77.44525
	12	7.578933	1.172163	6.295872	**8.237020**	76.71601

The output of GVDC

Period	S.E.	IF	RY	INF	ID	DREX
			Variance Decomposition of IF:			
1	0.280795	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.448441	97.65600	0.189314	0.156798	1.882611	0.115281
3	0.573176	95.61787	0.430348	0.104200	3.347026	0.500557
4	0.727993	91.36323	0.423387	0.221771	7.217948	0.773661
5	0.883668	87.67467	0.358830	0.219543	10.46640	1.280554
6	1.013871	84.91536	0.330180	0.411524	12.45966	1.883283
7	1.120799	82.50014	0.283408	0.500738	14.41076	2.304953
8	1.202894	80.50340	0.248282	0.603226	16.07644	2.568651
9	1.258003	79.40504	0.227803	0.605202	16.95775	2.804203
10	1.290417	78.53435	0.216706	0.622764	17.59617	3.030008
11	1.304646	78.06497	0.218372	0.609922	17.90527	3.201467
12	1.308829	77.82677	0.238333	0.606294	18.00608	3.322525

Period	S.E.	IF	RY	INF	ID	DREX
			Variance Decomposition of RY:			
1	0.004176	3.631897	96.36810	0.000000	0.000000	0.000000
2	0.006736	3.827078	95.68699	0.258769	0.143579	0.083589
3	0.009126	3.520416	92.09845	1.680213	0.995279	1.705640
4	0.010624	4.571704	88.90336	3.522225	0.942700	2.060013
5	0.011764	8.320086	84.04119	4.396807	1.167612	2.074302
6	0.012842	13.69556	76.91555	3.748710	2.881429	2.758750
7	0.014231	19.78575	67.06117	3.277222	6.492753	3.383113
8	0.015807	24.82490	57.86930	3.398241	10.63610	3.271459
9	0.017373	28.38426	51.60624	3.437864	13.80910	2.762531
10	0.018914	30.66531	47.39890	3.295589	16.25842	2.381772
11	0.020277	31.97735	45.06094	3.048337	17.71926	2.194104
12	0.021388	32.49173	43.99226	2.876089	18.48529	2.154625

Period	S.E.	IF	RY	INF	ID	DREX
			Variance Decomposition of INF:			
1	0.004169	0.874514	4.626607	94.49888	0.000000	0.000000
2	0.005221	0.565658	7.223012	89.04145	2.150359	1.019520
3	0.006609	3.057475	8.962809	78.99074	1.746727	7.242252
4	0.007043	2.863536	12.33255	70.38336	3.207281	11.21327
5	0.007561	2.517861	14.73570	69.27474	3.110627	10.36107
6	0.007850	2.479831	15.95759	67.80614	4.097702	9.658737
7	0.008586	2.134616	14.30293	71.97310	3.455175	8.134179
8	0.008941	2.521887	13.55311	72.92594	3.265888	7.733171
9	0.009727	2.684634	11.86772	75.42998	2.818357	7.199309
10	0.010166	3.618900	11.35506	75.30625	2.583926	7.135864
11	0.010965	4.039507	10.38712	76.58677	2.404109	6.582496
12	0.011431	4.891928	10.14880	76.35468	2.218344	6.386250

Variance Decomposition of ID:

Period	S.E.	IF	RY	INF	ID	DREX
1	0.194038	12.57681	9.535142	0.160243	77.72780	0.000000
2	0.239130	10.91847	9.539955	0.167100	79.19459	0.179891
3	0.263403	9.185059	8.176272	1.670930	78.50884	2.458904
4	0.290166	17.32703	6.768361	1.715402	70.75780	3.431410
5	0.324902	32.73157	5.579953	1.588133	56.43745	3.662902
6	0.362780	41.43755	4.790687	4.130613	46.46820	3.172950
7	0.418446	48.95825	3.784959	6.086189	38.69177	2.478836
8	0.484536	53.43755	2.892901	7.141143	34.40756	2.120841
9	0.535829	56.31977	2.366497	7.524164	32.02618	1.763396
10	0.579921	57.64776	2.041586	7.792526	30.87035	1.647779
11	0.611865	58.40148	1.843877	7.816301	30.15625	1.782094
12	0.630346	58.68042	1.739669	8.130646	29.60628	1.842990

Variance Decomposition of DREX:

Period	S.E.	IF	RY	INF	ID	DREX
1	0.052513	7.835048	0.001241	3.603782	6.076244	82.48369
2	0.053517	7.590781	0.261658	5.201801	6.601869	80.34389
3	0.055136	7.317745	0.254485	4.901150	6.439691	81.08693
4	0.056057	7.665713	0.716802	5.202962	7.046441	79.36808
5	0.058213	7.597358	0.759440	5.067049	7.401153	79.17500
6	0.058549	7.528117	1.005346	5.009741	8.083109	78.37369
7	0.059733	7.611366	1.006114	5.575862	7.886954	77.91970
8	0.060124	7.663113	1.126159	5.717414	8.048068	77.44525
9	0.060373	7.613648	1.123506	6.043807	8.005247	77.21379
10	0.060434	7.626977	1.186483	6.116451	7.993462	77.07663
11	0.060702	7.615019	1.176019	6.273226	8.086465	76.84927
12	0.060847	7.578933	1.172163	6.295872	8.237020	76.71601

Cholesky Ordering: IF RY INF ID DREX