Discussion

of

"The Role of Monetary Aggregates in the Policy Analysis of the Swiss National Bank" by Gebhard Kirchgässner and Jürgen Wolters

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1. Basic Conclusions of the Paper

The analysis of Kirchgässner and Wolters (2009, KW henceforth) corroborates the findings of Baltensperger, Jordan and Savioz (2001),[1] who find compelling evidence for M3 as information variable in the Swiss monetary policy process. Using data covering the period from 1983 to 2008, KW extend the analysis and estimate money demand equations for the monetary aggregates M1, M2 and M3. They obtain economically sensible estimates, in particular a unit income elasticity for M1 and M3. For all money aggregates, they report a negative sensitivity to the 3-month LIBOR, which confirms the prerequisite of controllability for a money aggregate to be used in policy analysis. Money demand is estimated to be stable over the sample period. In particular the interest semi-elasticity of M1 and M2 demand is estimated to be robustly negative. This is less so for M3 demand, see below.

KW find that excess M1 and M2 money, defined as the deviations from the long-run M1 or M2 demand, respectively, are better predictors for annual inflation than annual nominal M1 and M2 growth. Nominal M3 growth, on the other hand, contains relevant information which improves annual inflation forecasts based on excess M3 money only.

Finally, updating estimates of the M3 demand and the inflation forecasting equations with data up to 2009Q1, KW forecast inflation to decrease to rates

a Oesterreichische Nationalbank, Economic Studies Division, P.O. Box 61, A-1011 Vienna, phone +43140420-7221, fax +43140420-7299, sylvia.kaufmann@oenb.at. – I thank Carlos Lenz for providing me with the most recent available real and nominal GDP time series including the first release of the 2009Q3 observations. Of course, I assume responsibility for all results and remaining errors. Finally, the views expressed in the comment are personal and do not necessarily reflect those of the OeNB.

1 Their data sample covers the period from 1978 to 1999.

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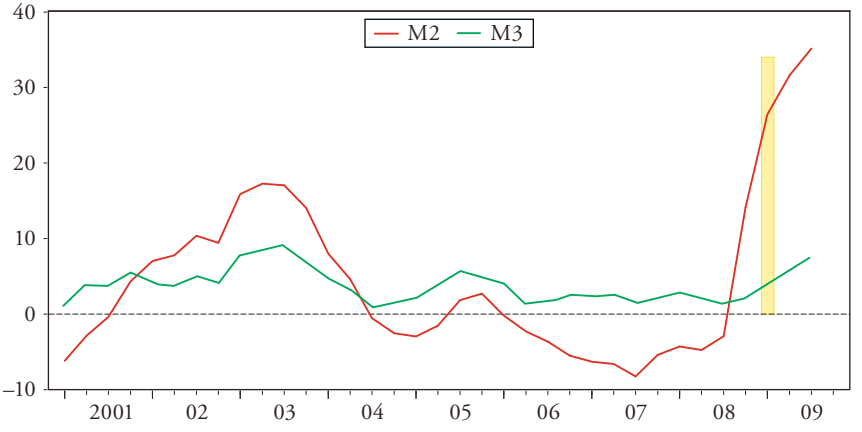
below 2% in 2010 and 2011.[2] So far, the unprecedented liquidity volumes (see Figure 1) injected by the Swiss National Bank (SNB) to prevent the collapse of the financial system apparently did not put upward pressures on future inflation prospects and this provides some leeway to gradually implement exit strategies.

Figure 1: Annual M2 and M3 Growth Rates, the Bar Indicates the First Quarter of 2009



Source: author's calculations.

The next section discusses some valuable features of the results concerning the relevance of money aggregates for policy analysis. Given that KW use seasonally unadjusted data, their analysis can readily be reproduced. In doing so, I then show that inflation forecasts for 2010 and 2011 crucially depend on whether model coefficients, either in the money demand or in the forecasting equation, are updated or not. From that exercise I conclude that model coefficients should not be updated when it is obviously the case that end-of-sample data are influenced by unusual events. Including the most recent observed values of M2 and M3 growth, inflation is forecasted to increase above 2% at the three year horizon.

2 In the actually published version, KW include data up to 2009Q2 and forecast inflation to rise above 2% at the two year horizon when based on M2 annual growth.

2. M3 Relevance for Policy Analysis

As already mentioned, the significant negative interest semi-elasticity (see equations (2a)–(2b) in KW) documents the controllability of money demand. It is noteworthy that this semi-elasticity decreases the wider the monetary aggregate considered is. For M1, the semi-elasticity is highest with −7.76, while for M3 it is −2.36. In the latter case, however, the semi-elasticity becomes significant only when the data series extend beyond 1997 (see Figure 4c in KW). With data series running up to the end of 1992 only, one would even obtain, when evaluated at the point estimate, a positive interest rate semi-elasticity. This is mainly due to a change in sign and significance of the effect that inverse M3 velocity has on real M3 growth (see bottom panel in Table 4). We may conclude that M3 controllability has increased over time and that M3 demand has become more stable in recent years. There may be many reasons for these features, financial innovation and financial deepening certainly being two of them.

The evaluation of the forecasting properties further documents the superiority of M3 over M2 and M1 as a relevant policy indicator. Nominal M3 growth is the only one of the three money aggregates to be positively correlated with future inflation at a horizon of one and a half to four years. It is the only monetary aggregate that provides significant additional information in forecasting future inflation. Note that the negative correlation between future inflation and nominal M1 and M2 growth is even counterintuitive to a mean-reverting behaviour of prices and money in a stable money demand framework. Estimating separate error correction equations for nominal money growth and for inflation in these cases may yield further insights into the weak exogeneity properties of the variables.

3. Inflation Forecasts: Sensitivity to End-Of-Sample Outliers

KW note that including the most recent observations of 2008Q4 and 2009Q1 (1) has a considerable effect on the estimate of M2 demand and (2) leads to outlying residuals, hence outlying excess M2 money measures. Quite remarkably, inflation forecasts remain virtually the same irrespectively of whether the observations 2008Q4 and 2009Q1 are included or not.[3] However, this result may depend on

3 The following comment refers to inflation forecasts contained in the version presented during the conference. At the two (2011Q1) and three year (2012Q1) horizon, based on annual M2 growth, cumulative inflation was forecasted to remain below 1.5%, and based on annual M3 growth, rates were forecasted to remain between 1 and 1.2%.

the fact that the model coefficients are updated with observations that may be judged as outliers given that they stem from the financial crisis period.

With data downloaded from the website of the SNB, despite the shorter observation sample (1984Q1–2009Q1), all results of KW can be reproduced.[4] In particular, estimating the specifications reported in Table 4 of KW, we obtain virtually the same point estimates for M2 and M3 demand.

In the following, based on equation (3) of KW, annual inflation is directly forecasted at the one, two and three year horizon:

$$\pi_{t+k} = \alpha_0 + \alpha_1 \pi_t + \alpha_2 \Delta_4 mi_t + \alpha_3 eci_t + u_t \tag{1}$$

$$k = 4,8,12 \text{ and } \pi_t = p_t -$$

where π_t is annual inflation, $\Delta_4 mi_t$ and eci_t refer alternatively to annual M2 or M3 growth and to excess M2 or M3, respectively. In each panel of Table 1, inflation forecasts first are based on the money demand and the forecasting equations estimated with data up to 2008Q3. The forecasts reported in the second line are based on a money demand estimated with data up to 2009Q1, and those in the third line are based on updated coefficients in the forecasting equation. Each line provides forecasts conditioned on data as of 2008Q3 and as of 2009Q1, respectively.

In general, forecasts based on M2 are more variable than those based on M3. We observe that updating the coefficients of the equations leads to lower inflation forecasts at all horizons, in particular when the forecast period begins in 2008Q3. At the three year horizon, the inflation forecast decreases from 1.71% to 0.48% when the model is accommodated to the most recent observations. However, when the forecast conditions on observations as of 2009Q1, at the three year horizon the forecasts increase from 2.03% to over 2.6% when we allow the model to accommodate to the most recent observations. This contrasts the results in KW. Keeping in mind the period of unconventional monetary policy measures triggered by the financial crisis, the reliability of the forecasts based on M2, if not questioned at all, would have to be further assessed.

On the other hand, the inflation forecasts based on M3 are quite consistent over all estimation and forecast settings. At the three year horizon, inflation is forecasted to remain below 2%. These results are consistent with KW. Overall, we may be in accordance with them that Swiss inflation prospects, assessed with data available as of 2009Q1, have not been at stake.

4 All data is available upon request. As noted previously, recent nominal and real GDP series were obtained from Carlos Lenz.

Table 1: Inflation Forecasts Based on M2 and M3.

The money demand and the forecasting equations are estimated alternatively up to 2008q3 and 2009q1. Annual inflation is forecast over the next four, eight and twelve quarters, conditioning either on observations as of 2008q3 (columns 09q3, 10q3, 11q3) or 2009q1 (columns 10q1, 11q1, 12q1).

	End of estimation period		Forecast horizon					
			1 year		2 years		3 years	
Money aggregate	Money demand	Forecast	09q3	10q1	10q3	11q1	11q3	12q1
M2	2008q3	2008q3	2.43	0.03	1.75	1.93	1.71	2.03
	2009q1	2008q3	1.80	−0.14	0.50	2.06	0.46	2.68
	2009q1	2009q1	1.53	0.11	0.44	2.14	0.48	2.64
M3	2008q3	2008q3	1.91	0.35	1.36	0.69	0.84	1.24
	2009q1	2008q3	1.91	0.35	1.37	0.69	0.85	1.24
	2009q1	2009q1	1.83	0.33	1.37	0.62	0.85	1.15

Source: Author's calculation.

4. Money Growth: Still Rising

Actually, we are in the position to update the forecasts published in KW. We have additional two observed values for the monetary aggregates, the price index and the interest rate, and a first release of GDP up to the third quarter of 2009. Figure 1 obviously reveals that money growth has still been rising during 2009Q2 and 2009Q3, annual M2 growth reaching 32% and 35%, respectively. M3 has been accelerating to an annual rate of 6% and 7% during the last two quarters, the historical mean being 3.8%. If we condition on these observations, using M2 growth, inflation is forecasted to rise to around 2.3% at the two- and three-year horizon (see Table 2). Given that M3 has been accelerating, too, we observe that inflation, based on M3 information, is forecasted to increase to 2.69% at the three-year horizon.

We conclude from this exercise that in the nearest future, monetary developments will have to be closely followed if inflation prospects are not to be put at stake. This also hinges on exit strategies from unconventional liquidity provision being formulated and implemented in due course.

Table 2: Inflation Forecasts Based on M2 and M3.

The money demand and the forecasting equations are estimated with data up to 2008q3. Annual inflation forecasts are conditioned on observations as of 2009q3

Money aggregate	End of estimation period		Forecast horizon		
	Money demand	Forecast	1 year 10q3	2 years 11q3	3 years 12q3
M2	2008q3	2008q3	−0.29	2.33	2.25
M3	2008q3	2008q3	0.69	1.68	2.69

Source: Author's calculation.

5. Conclusion

The analysis of KW yields interesting and relevant results. The evidence for the superiority of M3 is compelling, both in terms of stability, i.e. the smooth behaviour during the crisis period, and as indicator for future inflation.

The analysis also gives additional food for thoughts. A significant negative interest rate semi-elasticity of M3 demand is only estimated with data running beyond 1997. Apparently, controllability of M3 has improved over time, and this raises the interesting issue that the relevance of monetary aggregates in monetary policy analysis may change over time.

Finally, as in the present economic and financial environment inflation forecasts strongly depend on whether coefficients of the money demand and the forecasting equation are updated or not, future research will have to assess of how to handle end-of-sample outlier or extreme values in forecasting models.

References

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