Commentary: Some issues in modelling and forecasting inflation in South Africa

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The paper presented by Aron and Muellbauer provides a carefully executed modelling and forecasting exercise on South African inflation. Insights emerge on the producer price index (PPI); the consumer price index (CPI), including its core interpretation relevant to the South African inflation-targeting framework (CPI/consumer price index excluding mortgage interest cost for metropolitan and other urban areas (CPIX)); and housing costs and rent.

The critical conclusions that emerge from the paper are an affirmation of the importance of structural modelling of inflation and the significance of unit labour cost; the output gap; import prices; the real exchange rate; trade openness; and the interest rate differential in modelling and forecasting.

In the case of the PPI, the particular importance of the foreign-exchange channel of monetary transmission (real exchange rate and interest rate differential); the asymmetric short-term role of food price inflation; and the nature of the role of the level of the output gap, which imply that in South Africa inflation targeting stabilises output as well as prices, are all additional results of particular interest.

Finally, the paper also provides useful cautionary advice on the best practice of approaching the introduction of the new CPI measure in 2009.

However, the paper raises some significant questions that invite further investigation.

The most fundamental of these relates to the interaction of openness, prices and productivity growth in the modelling. In their paper, Aron and Muellbauer allow for the presence of mark-up pricing (price over unit labour cost). Specifically, they note a substantial impact of their openness measure in reducing the mark-up, though they allow that in the short run price stickiness, together with the impact of openness on labour costs and import costs, may raise the mark-up.

However, the South African evidence on the interaction between inflation, productivity and openness suggests that the association is potentially complex, and thus perhaps worthy of further investigation in the context of either structural or forecasting models of inflation. The literature on the question is reasonably extensive.

Early evidence of cost-push inflation was provided by Fedderke and Schaling (2005), while Fedderke, Kularatne and Mariotti (2007) confirmed the presence of significant industry-level pricing power in the South African manufacturing industry, with Edwards and van de Winkel (2005) providing supporting evidence for later periods. Aghion, Braun and Fedderke (2008) again confirmed not only the presence and non-declining time trend in industry and firm-level mark-ups, but also identified an impact of the pricing power on productivity growth in South African manufacturing.[1]

However, the results presented by Rodrick (2008) pose some challenge to these findings, consistent as they have been over time in terms of both the presence and persistence of mark-up pricing in South African manufacturing. Rodrick, much as does the Aron and Muellbauer paper, points to a significant opening of the South African economy in the 1990s, suggesting that the pricing power of the manufacturing sector must have been under pressure. A declining price of manufacturing relative to other sectors of the economy is interpreted as corroborating evidence.[2]

What is of significance for the Aron and Muellbauer results is that Aghion et al. (2009) have further explored the interaction between trade liberalisation and productivity growth, including the channel exercised via the pricing power of industry, both theoretically and in an application to South African data. The study highlights that the impact of trade liberalisation is likely non-linear, and operates both directly on productivity growth and indirectly through differential impacts on industries or firms conditional on their distance from the technological frontier and scale.

Aghion et al.'s findings confirm the presence of an (insignificant) catch-up effect, positive benefits from scale, compounded by the fact that large sectors close to the technological frontier grow fastest. The strongest impact of trade liberalisation is found to emerge through indirect rather than direct channels of influence.

Crucial to the present context, however, is that the pricing power of industry continues to have a negative impact on productivity growth, even when there is control for the impact of trade liberalisation. What is more, while in Aghion et al. (2008) a 0,1 unit increase in the Lerner index of pricing power resulted in a loss of 1 per cent in productivity growth, under Aghion et al. (2009) the change in the pricing power measure results in a loss of 2–3,5 per cent in productivity growth.

The point here is that made at the outset of this digression. The interaction between inflation, productivity and openness in South Africa (and perhaps elsewhere) is complex. For a modelling exercise that claims to place structural associations at its heart, further investigation of these

associations may be fruitful, especially given the magnitude of the impact afforded the mark-up on inflationary pressures. Empirically, it would appear that the question of whether mark-ups have declined under trade liberalisation (Rodrick–Aron–Muellbauer), or show little sign of falling (Aghion et al.) is of central monetary policy importance, given the results of the Aron–Muellbauer results. Significant data collection and quality control questions arise in this context.

Further questions that arise from Aron and Muellbauer's paper relate to the openness measure used in the paper, and pioneered in the authors' earlier work (see Aron and Muellbauer, 2007). The measure aims to incorporate both observables (tariffs and surcharges) and unobservables (quotas and non-tariff barriers), capturing the latter by means of a smooth non-linear stochastic trend, obtained from the variance in the import penetration ratio not explained by the business cycle and exchange rate. While suggestive, for a developing or emerging-market economy in which imports are arguably substantially influenced by the capital goods and technological catch-up requirements of output growth, the interpretation of the openness measure remains a source of some potential ambiguity.

Further conceptual questions arise in terms of the inclusion of food prices in the PPI rather than the CPI measure.

In terms of modelling questions, the use of the Autometrics estimation procedure pioneered by Hendry remains sufficiently new (and challenging to many applied econometricians) to merit more explicit justification and treatment in the paper. Questions of endogeneity potentially requiring instrumentation strategies are raised by a number of the empirical specifications estimated in the paper. While reference is made to earlier work suggesting that results are robust to instrumentation, it is not clear to the reader what modelling strategy was adopted in the earlier work.

Given the emphasis on forecasting in the paper, and the reference to the work of Hendry and Clements in emphasising the impact of structural breaks on forecasting, it comes as some surprise to the reader that more emphasis is not placed on the impact of breaks and robustness of the model to potential breaks in the discussion of results. Elaboration on these dimensions would be useful in interpreting the results.

Further on the forecasting front, to evaluate the usefulness of the structural model presented by the authors, it would have been helpful to compare the forecasting ability of the preferred models with alternative structural models presented in the literature.

Finally, I, for one, would have valued a more extended discussion of the inflation-targeting dummy interpretation in Aron and Muellbauer's paper,

since the authors argue that their results indicate that inflation targeting rapidly became embedded in price expectations, and the new policy framework quickly embedded in interest rate expectations. Given the significance of this finding to monetary policy conduct in South Africa, greater detail would have been useful, particularly at a time when the inflation-targeting approach is, once again, a matter of public debate.

Despite this set of comments, the authors have provided another significant contribution to the debate on the drivers and forecasting of inflation in South Africa.

Notes

[1] In related vein, both Fedderke and Szalontai (2009), and Fedderke and Naumann (2009) confirm a negative impact of industry concentration on investment.

[2] In a more direct challenge, du Plessis and Gilbert (2008) have questioned the presence of significant pricing power in the South African industry. On a dataset of 25 listed firms from the Johannesburg Securities Exchange they find little evidence of mark-up pricing in South Africa.

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