Comments on
"Monetary policy in Iceland during the nineties"

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I enjoyed reading this paper and learnt a lot about Iceland. The authors echo the recurring themes of open-economy macroeconomics. What is the appropriate form of nominal anchor? Should exchange rates be allowed to float freely? Should financial and real-side liberalisation be gradual? How important are the spill-overs from fiscal to monetary policy?

My discussion will centre on the first two questions in the preceding paragraph and the conclusion will touch upon some of the issues raised by the last two questions. But first I will quickly outline the results from the open-economy model which underpins much of the discussion today (see, for example, Devarajan and Rodrik (1991)). If we take a standard Barro-Gordon model and substitute the exchange rate for money and solve for quadratic losses under fixed (f) and floating (nf) exchange rates we get the following expression for the net gain from fixed exchange rates:

$$W_f - W_{nf} = \alpha^2 \phi^2 \left[\left\{ \frac{y^* - \bar{y}}{1-\mu} \right\} - \left\{ \frac{\beta^2 \sigma^2}{(\alpha^2 \phi + (1-\mu)^2)} \right\} \right] \qquad (1)$$

where α and β are the elasticity parameters on an IS function for the real exchange rate and income (or, terms-of-trade shocks), ϕ is the weight attached by the authorities to the real (output) target relative to the nominal one, μ is the weight of non-traded goods in the domestic price index,[1] y is growth rate of real output and has an asterisk for the authorities' expansionary target and a bar for the economy's natural level of growth, and σ^2 is the relative variance of real (income or terms of trade)

[1] Which operates as an inverse proxy for openness in this set-up.

to nominal (money) shocks. The first term in the square brackets represents the benefits from fixed exchange rates and the second term the costs.

Equation (1) tells us that increases in α, β and σ^2 make it more likely that a floating exchange rate will be preferred. Second, the lower $(y^*-\bar{y})$ is, the more likely it is that a floating exchange rate will be preferred. Third, for plausible parameters, reductions in μ (i.e. greater openness) make it more likely that a floating exchange rate will be preferred. Fourth, the partial on ϕ is ambiguous: (i) if fixed exchange rates are preferred (i.e. $W_f-W_{nf} > 0$), then increases in ϕ will make a fixed exchange rate more beneficial (because the perceived inflation bias would be higher); and (ii) if floating exchange rates are preferred, increases in ϕ are ambiguous; but (iii) because the derivative of the term in square brackets with respect to ϕ is unambiguously positive there must be a value of ϕ which makes the monetary authorities indifferent between fixed and floating exchange rates.

This model analysis means that an open economy which is susceptible to large terms-of-trade and/or supply shocks (either through the size of the shocks or through the elasticity of output with respect to those shocks) relative to demand shocks, and whose monetary authorities have a relatively low preference for real output compared to inflation stabilisation may tend to prefer floating exchange rates. Following from what I have read, this sounds like a fair characterisation of the Nordic economies and Iceland, in particular.

In orthodox fashion, Iceland has a goal for price stability. But, as yet, no explicit target for inflation. Iceland's nominal anchor involves a peg of the external value of the króna to a basket of 16 countries with weights determined by relative trade in goods and services in 1994 with a fluctuation band of ±6%. So – because the paperby our Icelandic colleagues suggests in various places that their economy is quite likely to be in a world of asymmetric real shocks – the need for flexibility in the nominal exchange rate is recognised. And certainly the unusually large number of countries involved in the peg (16) means that there has been an attempt to mitigate the occurrence of idiosyncratic shocks at the cost of a directly identifiable external nominal anchor. That is, it is not clear to me that the average inflation rate of the 16 counterpart countries over the previous cycle is significantly lower than that of Iceland or likely to be lower over the next.

If the Icelandic authorities believe that shocks facing them are idiosyncratic then the next question to consider is whether the shocks driving the exchange rate are real (determined by equilibrium conditions in goods markets) or nominal (money or asset markets). Table 1 presents some indicative results from Chadha and Hudson (1997) and are generally in line with the consensus emerging from other studies (see, for example, Canzoneri et al. (1997)). The paper decomposes the variance of the effective real exchange rate for 17 OECD countries and finds that, for the most part, variations in the real exchange rate are accounted for by the identified real supply and real demand shocks, rather than by money demand shocks.[2] The table presents the results for the G-5 and four Scandinavian countries.[3] As the table shows, the finding of real shock dominance seems to apply across countries, over both the short and medium term. And as the paper also finds that such real shocks are generally idiosyncratic across countries, this might suggest that interest rate movements, and hence changes in nominal exchange rates, will typically be the preferable method of stabilising the real exchange rate.[4] This is because, when shocks are primarily real, real exchange rate adjustment will tend to be faster with floating exchange rates; adjustment through domestic inflation will be more sluggish as output typically has to respond to the inflationary or deflationary impulse before prices do.

But recall that even if we find that asymmetric real shocks dominate nominal shocks this is not the whole of the answer because of the authorities' credibility problem.[5] Specifically, optimal policies in the face of observed nominal and real shocks are still likely to lead to positive and persistently high rates of inflation. This is because, as well as stabilising in the face of shocks, authorities tend to face incentives which lead to the systematic generation of unanticipated inflation. The tendency by the authorities to generate unanticipated inflation leads agents to bid up the equilibrium inflation rate and create an inflation bias. The solution to this

[2] Identified money demand shocks are simply interpreted as shocks to the relative demand for money which would be automatically accommodated by a fixed exchange rate i.e. the price of the currency is held constant with respect to shifts in the money demand and supply functions.

[3] Time constraints prevented the extension of this analysis to Iceland, but it seems likely that the qualitative results would be the same.

[4] The idiosyncrasy of shocks is measured in various ways in the paper but the finding of first and second principal components which explain relatively low overall variances of the shocks (15–30% and 10–15% respectively) for each 17-country series of identified structural shocks is the most strongly suggestive of idiosyncrasy.

[5] Where ϕ is large enough to make fixed exchange rates preferable.

Table 1
The proportion of incremental real exchange rate variation explained by real versus nominal shocks in the G-5 and four Scandinavian countries over the short and medium term
In percentages

Shock horizon	Real		Nominal	
	2 years	5 years	2 years	5 years
France	54	55	46	45
Germany	76	75	24	25
Japan	95	95	5	5
United Kingdom	81	81	19	19
United States	96	96	4	4
Denmark	92	92	8	8
Finland	96	96	4	4
Norway	93	93	7	7
Sweden	94	94	6	6

inflation bias typically requires some domestic institutional mechanism which penalises the authority so that the marginal incentive to inflate is equalled by the marginal cost of doing so. Typically, if a nominal exchange rate peg is seen as the way of eliminating the domestic economy's inflation bias, as for example Giavazzi and Pagano (1988) suggest, a nominal peg would act to delegate monetary policy to another country's conservative central banker. And if the benefits arising from the elimination of this bias are greater than the costs associated with asymmetric real shocks then a fixed exchange rate regime may be preferable.

In fact, a pegged-but-adjustable exchange rate with wide bands is not very far, in technical terms, from an inflation target with an escape clause. But note now that if a domestic solution to the credibility problem could be found, i.e. without the need for an exchange-rate-based nominal anchor, then such a regime would – in macroeconomic terms – always be superior to an exchange rate peg because asymmetric shocks could be dealt with. And what then is the prospective welfare loss of an exchange rate peg versus a domestic inflation target? There are two related ones: (i) the loss of the tool of domestic output stabilisation and the possibility of pro-cyclical monetary policy; and (ii) the presence of asymmetric shocks will lead to agents rationally expecting some de- or revaluation of the nominal exchange rate at some point and this will act to reduce the

credibility of the exchange rate peg (see Obstfeld (1994)). The general point is that any reputational mechanism may tend to do little to buttress the credibility of governments which otherwise have strong incentives to inflate.

This is where the inflation target may come in. Such a target may eliminate the inflation bias by imposing a penalty on a central bank for missing the target; again this is not especially different from the penalty imposed by leaving an exchange rate peg. But the corollaries of the case for an explicit inflation target are many (see Haldane (1995)). For example, the debate on the inflation target can lead to some discussion of the constitutional status of the central bank. An independent central bank may reduce an inflation bias by: (i) increasing the credibility of the government's commitment to price stability; (ii) assuring a higher priority on inflation fighting in the net preferences of the public sector; and (iii) putting up barriers to the monetisation of government expenditure.[6] But a large number of subsidiary questions need to be addressed before this gain necessarily follows. Is the goal for price stability announced or enshrined in some act concerning the operational independence of the central bank? Is there a degree of political consensus (particularly from the financial sector (see Posen (1993)) for such a goal which would act to underpin, and possibly even protect, the decisions of the central bank? Given the paper's emphasis of the importance of asymmetric supply shocks, how would Iceland write an escape clause in the event of supply shocks?

If inflation targets were adopted would it then be likely that a freely floating exchange rate would aid stabilisation policy in Iceland? One simple method in trying to understand this is shown in Figures 1 and 2 which decompose changes in the effective nominal and real króna and sterling (as an example) exchange rate into variances attributable to a spectrum from low (0) to high (π) frequency variations for two sub-periods 1979−92 and 1992−97. This analysis is similar in spirit to that presented in Table 1, where we were trying to gauge the role of nominal and real shocks in determining variations of the exchange rate at different horizons, but where the univariate nature allowed us to split the analysis into sub-samples relatively easily.

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[6] This might be perceived by agents to be a significant problem in Iceland where real interest rates are 5% and the trend real growth rate of the economy is 3%. In steady state, this would require a large primary surplus.

Figure 1
**Spectral analysis of nominal and real exchange rates
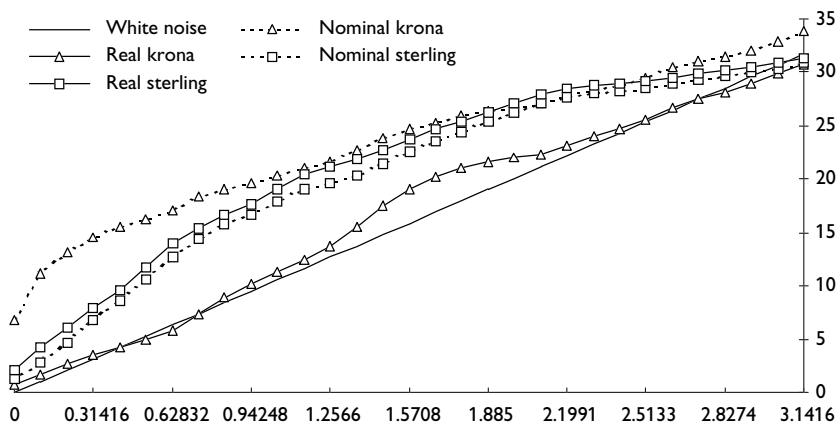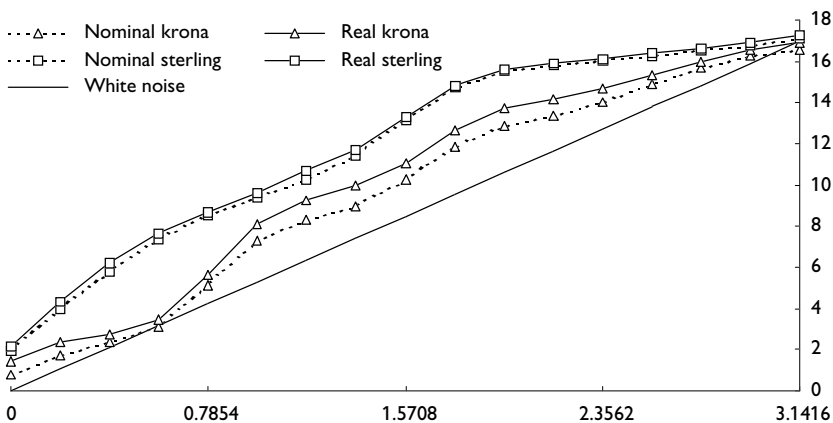in the United Kingdom and Iceland, 1979–92**

Figure 1 shows that nominal króna changes over the earlier period do not resemble a random walk, with a considerable variation explained by low frequency (trend) movements – implying, as suggested in the paper, an inflation bias over this period. The króna real exchange rate, on the other hand, looks very much like a random walk at all frequencies and so there would appear to be little impact on the real exchange rate of nominal exchange rate movements. This is an intuitive result and fits the result familiar from, for example, a Cagan-style money demand function where higher inflation rates have less impact on real activity because expectations are forward-looking. The extent of financial and real-side indexation in Iceland is a structural reason why high inflation may not impact very strongly on relative prices. Note that nominal and real sterling exchange rates have similar spectral densities at all horizons, suggesting that real shocks drive innovations in the nominal exchange rate: the charts also suggest that the nominal and real exchange rates have higher variation at business cycle frequencies.[7]

[7] Structural VAR work at the Bank by Astley and Garratt (1997) and Chadha and Hudson (1997) corroborates the view that real shocks dominate. The suggestion that business cycle frequencies dominate may intuitively support the view that the exchange rate acts to mitigate the business cycle.

Figure 2
**Spectral analysis of nominal and real exchange rates
in the United Kingdom and Iceland, 1992–97**

Note: 0 represents the persistence of trend movements and as we move to π we add the variation of the contribution of each higher frequency. Each series cumulates to the window size of the estimation: approximately 30 for Figure 1 and 16 for Figure 2.

Figure 2 shows that, in the period of moderate inflation for both countries, the real and nominal exchange rates display similar spectral densities, with greatest persistence at business cycle frequencies. For Iceland this may suggest that, at moderate inflation rates, the nominal exchange rate provides an important method of adjustment.

All this suggests that under Iceland's recent moderate inflation the nominal and real exchange rates have looked very much like what would prevail if Iceland operated an inflation target. So why change? I wonder whether an explicit target for inflation would ultimately be more controllable than one for a nominal exchange rate with wide bands. The added benefit may then also be the sort of debate on the need for low inflation which has been so healthy in the United Kingdom. And with the continuing need for labour market and fiscal policy reform there may tend to be regular pressure to alter a nominal exchange rate peg to a new (uncertain) equilibrium. It might ultimately also be better to concentrate scarce policy resources on continuing to hit a medium-term inflation objective.

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