E C O N O M I C S B U L L E T I N

Inflation persistence and exchange rate regimes: evidence from developing countries

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Abstract

Using data for 102 developing countries, it is shown that inflation persistence is particularly low in countries on hard pegs, and particularly high in countries with severe inflationary problems. Inflation persistence is similar under floating and soft pegs. The finding of low inflation persistence in hard pegs is a new result.

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INTRODUCTION

Inflation is well known to display significant persistence – an inflationary shock does not die away immediately (Fuhrer and Moore, 1995). Dornbusch (1982) shows that if the monetary authorities adopt an accommodatory stance by allowing the money supply to respond more to the price shock, then inflation will be more persistent. Since floating exchange rates confer more monetary independence on a country, it is natural to think that inflationary shocks will be accommodated more under floating rates, and will therefore be more persistent.

Empirical evidence in favour of this proposition has been provided by Alogoskoufis and Smith (1991), Alogoskoufis (1992) and Obstfeld (1995). The evidence offered by these authors compares persistence estimates for OECD countries over different periods characterised by different exchange rate regimes. This evidence has been questioned by Burdekin and Siklos (1999) on the grounds that shifts in persistence do not particularly coincide with shifts in exchange rate regime, and in fact appear to reflect other factors (such as the outbreak of wars). In addition, Anderton (1997) and Bleaney (2001) show that, since 1984, inflation persistence has not been any lower in countries that were members of the European Monetary System than in OECD countries that floated their exchange rates.

Two further points could be made. One is that, since the abandonment of the Gold Standard, pegs have been to another currency rather than to gold, so that importing the inflation persistence of the anchor currency through pegging does not necessarily mean reducing it (Bleaney, 2001). The other point is that, if there are few obstacles to devaluation, a peg may not be characterised by significantly less monetary accommodation than a float. To address the first point, it seems most appropriate to focus on data from a period when monetary accommodation has been low. This has been particularly the case since about 1980, when monetary authorities in the OECD countries began to recognise that a tough response to inflation shocks was necessary to keep inflationary expectations down (Clarida *et al*., 1998). To cater for the second point, it is desirable to include countries on different types of peg. Some pegs offer much more serious obstacles to devaluation than others. Adoption of the currency of another country (dollarisation), the establishment of legally enforced automatic mechanisms for tightening monetary policy in response to losses of foreign exchange reserves (currency boards), and sharing a currency with other countries whose agreement is required for a devaluation (as in the African Financial Community) can all be described as "hard" pegs where devaluation is much more difficult or even impossible. Since there are no examples of such hard pegs amongst the OECD countries (at least until the creation of the euro), the focus of this paper is on developing countries. This differentiates our work from previous research, which has focused on OECD economies.

1. SAMPLE SELECTION AND METHODOLOGY

We use annual data for 102 developing countries (excluding transition economies) from 1984 to 2000, as listed in the Appendix. Our inflation measure is the change in the log of the consumer price index from one calendar year to the next (p), transformed as

[$p/(1+p)$], so as to avoid too much distortion from outlying high observations (the transformed index has a maximum of one). Inflation persistence is estimated as the parameter a in the following regression:

$$p_{it} = ap_{it-1} + e_i + u_t + v_{it} \quad (1)$$

where e represents a country fixed effect and u a time fixed effect, countries being indexed by i and time by t, and v is an error term. We present estimates of a from (1) and also from a modified version with u_t omitted (i.e. without time fixed effects).

The sample is split by exchange rate regime, which is observed on 31 December of each year. The IMF's official classifications of exchange rate regimes are aggregated into three categories as follows (IMF classifications in parentheses – for more details see XXXX, 2003):
Hard Pegs (No Separate Legal Tender, Currency Board);
Soft Pegs (Peg to a Single Currency, Peg to a Composite of Currencies, Crawling Pegs and Bands, Limited Flexibility);
Floats (Managed Floating, Independently Floating).
For an observation to be included, the exchange rate regime must be the same on 31 December of year t and year $t-1$.

We also split the sample into countries defined as having experienced severe inflationary problems, and the remainder. "Severe inflationary problems" are defined as an average inflation rate of over 25 % p.a. throughout the period, or at least one year in which inflation exceeded 170 %. The countries in this category are listed in the Appendix.

2. RESULTS

Table 1 shows the results. Taking the sample as a whole (the top part of the table), inflation persistence appears quite high – between 0.5 and 0.6 for both floats and pegs, whether or not the equation allows for year effects. When pegs are split into hard pegs and soft pegs, however, dramatic differences appear. The estimate of inflation persistence is approaching 0.7 for soft pegs, but below 0.21 for hard pegs. Moreover persistence is significantly (positively) correlated with inflation for soft pegs and floats.

Omitting countries with severe inflationary problems reduces the estimates of inflation persistence considerably (other than for hard pegs), to below 0.4 for floats and about 0.3 for all pegs. For soft pegs it brings the estimate down to just above 0.4, although the difference in coefficients between hard and soft pegs is still statistically significant. Omitting high-inflation countries also eliminates the correlation between inflation persistence and the level of inflation, except when all pegs are combined (which is explained by the fact that hard pegs have both lower average inflation and lower inflation persistence). The countries with severe inflationary problems have very high inflation persistence (above 0.75), as is shown by the last line in the table. One reason for this may be that high inflation was much more of a problem in the 1980s than the 1990s, so that in many of these countries there has in effect been a structural break in the inflation process. By not allowing for this, the specification biases upwards the estimate of inflation persistence for these countries.

We have also tested whether inflation persistence varies with per capita GDP, openness and size of country as measured by population. The results were always negative after allowing for the factors described above.

3. CONCLUSIONS

It is not clear that soft pegs offer much of an obstacle to the monetary accommodation of inflationary shocks, because devaluations can be frequent. Our results show that inflation persistence is much the same under soft pegs as under floating. It is significantly lower under hard pegs (currency boards or a shared currency), where the scope for monetary accommodation of inflation shocks is much reduced.

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Appendix

Countries included in the sample (*on hard peg for some or all of the time;
with severe inflationary problems):

Algeria, Antigua and Barbuda*, Argentina*#, Bahrain, Bangladesh, Belize, Benin*, Bhutan, Botswana, Brazil#, Burkina Faso*, Cameroon*, Cape Verde, Central African Republic*, Chad*, Chile, Colombia, Comoros, Democratic Republic of Congo#, Republic of Congo*, Costa Rica, Côte d'Ivoire*, Djibouti*, Dominica*, Dominican Republic, Ecuador#, Egypt, El Salvador, Equatorial Guinea*, Ethiopia, Fiji, Gabon*, Gambia, Ghana#, Grenada*, Guatemala, Guinea, Guinea-Bissau*#, Guyana, Haiti, Honduras, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kenya, Laos#, Liberia, Libya, Madagascar, Maldives, Malawi, Malaysia, Mali*, Mauritania, Mauritius, Mexico#, Morocco, Myanmar, Nepal, Nicaragua#, Niger*, Nigeria, Oman, Pakistan, Panama*, Papua New Guinea, Paraguay, Peru#, Philippines, Rwanda, St. Lucia*, St. Vincent and Grenadines*, São Tomé and Principe, Saudi Arabia, Senegal*, Seychelles, Sierra Leone#, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan#, Suriname#, Swaziland, Syria, Tanzania, Thailand, Togo*, Trinidad and Tobago, Tunisia, Turkey#, Uganda#, Uruguay#, Vanuatu, Venezuela#, Vietnam, Zambia#, Zimbabwe.

Table 1. Inflation Persistence Estimates for Different Samples

Regime	Sample Size	With year effects		Without year effects	
		Persistence coefficient (*t*-statistic)	Coefficient correlated with inflation?	Persistence coefficient (*t*-statistic)	Coefficient correlated with inflation?
Floating	493	0.556 (15.2)	No	0.596 (17.2)	Yes
All pegs	806	0.558 (17.4)	Yes	0.547 (17.1)	Yes
Soft pegs only	544	0.678 (17.7)	Yes	0.693 (18.5)	Yes
Hard pegs only	260	0.151 (2.52)	No	0.209 (3.48)	No
Omitting countries with severe inflationary problems					
Floating	336	0.284 (5.43)	No	0.381 (7.55)	No
All pegs	722	0.307 (17.4)	Yes	0.309 (8.22)	Yes
Soft pegs only	473	0.401 (8.55)	No	0.436 (9.48)	No
Hard pegs only	249	0.155 (2.35)	No	0.208 (3.29)	No
Countries with severe inflationary problems					
All	268	0.764 (17.7)	No	0.818 (20.7)	No

Notes. Estimates refer to the parameter *a* in equation (1). See text for definition of regimes and severe inflationary problems. Where the persistence coefficient is correlated with inflation the correlation is always positive.