Concerns about deflation - falling prices of goods and services - have loomed large in recent policy discussions. The debate is shaped by the deep-seated view that deflation, regardless of context, is an economic pathology that stands in the way of any sustainable and strong expansion. On the other hand, deflation may actually boost output. Lower prices increase real incomes and wealth. And they may also make export goods more competitive.

Whether deflation is seen as symptom or cause, its cost is ultimately an empirical question. As a symptom, it depends on its underlying drivers; as a cause, on the relative strength of various channels. While the impact of goods and services price deflations is ambiguous a priori, that of asset price deflations is not. Asset price deflations erode wealth and collateral values and so undercut demand and output. Yet the strength of that effect is an empirical matter. One problem in assessing the cost of goods and services price deflations is that they often coincide with asset price deflations.

To answer these questions, the authors have created a data set that spans more than 140 years, from 1870 to 2013, and covers up to 38 economies. The data include information on both equity and property prices as well as on debt.

The authors address the issue by distinguishing persistent from more transitory price declines. According to them, persistent deflations should be expected to be more costly than transitory ones. They define persistent deflations as those for which the price level declines cumulatively over at least a five-year period, based on annual consumer price data. Deflations were very common before the Second World War. The bulk of persistent deflations took place during that phase: only four have occurred post-war (in Japan (twice), China and Hong Kong SAR). That said, transitory deflations have not been rare in the post-war era: there have been well over 100 deflation years in the sample of 38 economies.

The intensity of deflations, measured by the yearly average percentage change, as well as their duration was considerably greater in the pre-war era. In terms of average and cumulative price declines, the Great Depression was no outlier. This is partly because prices had already been falling for many years previously and partly because of the sizeable dispersion in price declines across countries, which makes the average less representative.

A preliminary assessment of the link between deflations and growth does not suggest a clear negative relationship. Price deflations have coincided with both positive and negative growth rates, and a comparison of all inflation and deflation years suggests that, on balance, inflation years have seen only somewhat higher growth. The difference in average growth rates is highest and statistically significant only during the interwar years, particularly in the period 1929-38 that includes the Great Depression. In the post-war era, in which transitory deflations dominate, the growth rate has actually been higher during deflation years, at 3.2% versus 2.7%. This comparison indicates only a weak association between deflation and slower growth.
In order to explore the extent to which the weak association between deflation and growth changes once asset price deflations are also considered, the authors rely on an extended data set that includes historical series for property (house) prices. To assess the correlation between output growth and the change in goods and services prices and asset prices, they ran a regression of output growth on the contemporaneous annual percentage change in the individual price indices, also allowing for the possibility that the correlations may change during deflations in the respective indices.

On balance, the relationship between changes in the consumer price index and output growth is episodic and weak. Higher inflation is consistently associated with higher growth only in the second half of the interwar period, which is dominated by the Great Depression. At other times, no statistically significant link is apparent except in the post-war era, in which higher inflation actually coincides with lower output growth, with no significant change in the correlation during deflations.

By contrast, output growth and asset price changes are significantly positively correlated over the full sample and in most subsamples. The relative performance of equity and property prices varies across sub periods, but they all have a positive relationship with growth in the post-war era. That of property prices is especially sizeable during this period. Moreover, the positive and statistically significant coefficients on the interaction terms suggest that, post-war, the link with asset price declines is stronger than the link with increases. In particular, the coefficient of the change in property prices more than doubles when these prices decline.

A first look at persistent asset price deflations in isolation points to very similar conclusions to the above analysis. Output growth is consistently lower during both property and equity price deflations, and the slowdown is statistically significant except in the classical gold standard period for house prices. The importance of property prices is again greater in the post-war period. Though, on average, output actually falls consistently after property prices peak, it does so after equity prices peak, with a lag, only in the interwar years.

Once the authors control for persistent asset price deflations and country-specific average changes in growth rates over the sample periods, persistent goods and services (CPI) deflations do not appear to be linked in a statistically significant way with slower growth even in the interwar period. They are uniformly statistically insignificant except for the first post-peak year during the post-war era where, however, deflation appears to usher in stronger output growth. By contrast, the link of both property and equity price deflations with output growth is always the expected one, and is consistently statistically significant.

The paper then tries to establish the intensity of the link between post-peak output slowdowns and the debt outstanding at the outset of persistent deflation episodes. The results point to little evidence in support of the debt deflation hypothesis, and suggest a more damaging interaction of debt with asset prices, especially property prices. Focusing on the cumulative growth performance over five-year horizons for simplicity, there is no case where the interaction between the goods and services price peaks and debt is significantly negative. By contrast, signs indicate
that debt makes property price deflations more costly, at least when interacted with the credit gap measure. Overall, these results suggest that high debt or a period of excessive debt growth has so far not increased in a visible way the costs of goods and services price deflations. Instead, it seems to have added to the strains that property price deflations in particular impose on balance sheets.

The historical data set used in the paper raises questions about the prevailing view that goods and services price deflations, even if persistent, are always pernicious, and suggests that asset price deflations, and particularly house price deflations in the post-war era, have been more damaging. It also cautions against presuming that the interaction between debt and goods and services price deflation, as opposed to debt’s interaction with property price deflations, has played a significant role in past episodes of economic weakness. However, the caveat lies in the facts only a few drivers of output costs have been utilised, and only a few episodes of persistent deflation in the post-war period have been considered. This should caution against drawing sweeping conclusions or firm inferences about the future.

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The stabilization of exchange rates is one of the most important macroeconomic events across economies, especially in emerging market economies (EMEs). A central bank response to exchange rate movements may be desirable in economies with relatively underdeveloped financial systems as consumption comoves more strongly with income. Taking cost-benefits analysis of foreign exchange intervention in consideration, the paper examines different intervention strategies. The paper examines the foreign exchange intervention on two rules - first is leaning against exchange rate misalignment which requires an estimate of the equilibrium value of the exchange rate, and second is leaning against the wind which does not require any equilibrium estimate, the paper analyses possible set of strategies depending on degrees of transparency, and different kinds of agents fundamentalists, speculators, and the central bank. The effectiveness of foreign exchange intervention is measured against five criteria stabilizing the exchange rate, reducing current account imbalances, discouraging speculation, minimizing reserves volatility and limiting intervention costs.

Focusing on some of the major economies in Asia, the paper quotes that many regional central banks intervened in foreign exchange markets, in part to rebuild foreign reserve stocks in post-Asian crisis period, because of sharp erosion of reserves and sudden exchange rate depreciations especially in Indonesia, Korea, Malaysia, the Philippines and Thailand. Such accumulation of reserves was continued almost monotonically for many economies. But during the advent of the more recent global financial crisis, Korea and Malaysia utilized their reserve to cushion their subsequent depreciation, while the rate of reserves accumulation fell close to zero for India, Indonesia, the Philippines and Singapore. Following the crisis, massive capital inflows to EMEs resulted from the unconventional policies in major advanced economies and consequently put upward pressure on Asian currencies and raised the issues of potential spillovers. These unconventional policy measures in advanced economies heightened capital flows in the EMEs, and increased exchange rate volatility for economic and financial vulnerabilities.

The authors' model (which is built on Carlson and Osler (2000)) assumes that there is an underlying fundamental demand for foreign exchange transaction subjected to random shocks. Rational risk-averse speculators and a central bank are incorporated in the model. The authors' model is partial equilibrium in contrast to a general equilibrium framework which simplifies and provides flexibility to address number of questions associated with foreign exchange intervention. The paper analyses effects of trade-offs inherent in different intervention strategies based on multiple objectives of policymakers. In some economies, foreign exchange intervention appears to be consistent with a strategy of 'leaning against the wind' to smooth exchange rate fluctuations because of positive correlation between exchange rates and foreign exchange reserves. However, for other economies, there appears to be little correlation between reserves and the exchange rate because their respective central banks may have targeted some level of the exchange rate instead.

In order to assess the effectiveness of intervention, the paper discussed motives of the central banks'
activities and found that the most common reason cited for emerging market central banks to intervene in foreign exchange markets was to limit exchange rate volatility and smooth the trend path of the exchange rate. As high exchange rate can reduce a country’s competitiveness and a low exchange rate lead to an unsustainable growth spurt and inflation and hence central banks wish to step into the foreign exchange market intervention when they see current exchange rate appears to be either overvalued or undervalued. However, it is possible that this is an understatement for two reasons. First, it is inherently hard for central banks to measure equilibrium value of the exchange rate (somewhere it is defined as a fundamental value of exchange rate at which the current account is equal to zero). Second reason is that it may be indistinguishable for economies seeking to generate exchange rate depreciation from trying to generate 'beggar-thy-neighbor' exchange rate depreciations. Other dimensionalities are related with managing accumulated foreign exchange reserve due to associated cost of carry, and ensuring adequate liquidity in order to counter disorderly markets and to avoid financial stress during the financial crisis.

However, active trading by risk-averse, rational speculators may push the exchange rate persistently away from equilibrium fundamental value, especially if their returns are influenced by variables that do not co-move with the exchange rate. If speculators engage in the carry trade, their returns depend on the behavior of both the exchange rate and interest rate. As the central banks have major objective of stable foreign exchange market, their intervention strategy of leaning against the wind transparently may be optimal among different approaches. For reduction in exchange rate misalignment relative to some know target, the one of the most effective strategies is a transparent policy targeting. Though these strategies may encourage speculation, some degree of opaqueness may limit exchange rate misalignment and reduces the expected costs of carrying foreign exchange reserves on the central bank balance sheet. If central banks' intervention is comparatively strong, then there is strong possibility of higher volatility in their reserves which implies a natural limit on amplitude of central banks' intervention may be more effective in stabilizing exchange rate movements.

Concluding the findings, the paper says that there is no dominant intervention strategy. First finding is that the actions of speculators under some circumstances can reduce the volatility of exchange rates, but then they lead to increase in exchange rate misalignment. Second finding is the intervention that reduces exchange rate volatility, leads to high level of speculation, reserves volatility and intervention costs through reduction in risks of speculation and its feedback loop cycle. Third is uncertainty about the fundamental value of the exchange rate results in foreign exchange intervention being less efficient and beyond some level of uncertainty, the intervention is destabilizing. Fourth finding is that intervening rule of leaning against the wind reduces the exchange rate volatility, but tends to increase exchange rate misalignment. Fifth finding is higher cost of intervention in case of interest rate shocks-driven exchange rate movements as these movements drive a positive correlation between the stock of reserves and the carrying cost of those reserves. Sixth finding is that an addition of element of opaqueness relative to transparent intervention, offers both cost and benefits. Though it tends to increase the volatility of exchange rates, current account balances and reserves, it reduces the size of speculative flows and the costs of carrying reserves.

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