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Asset Prices and Inflation
Is there a predictive Link?

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The relationship between asset prices and consumer price inflation has been in the limelight again in the last decade. The reason has been the observed linkages in the early 1990s between housing as well as stock market prices and consumer prices in Japan and the U.K. Rapid asset price appreciation in these countries was followed, with a lag, by consumer price inflation. Such developments have even sparked off debates about the need to replace conventional consumer price measures with a broader definition which includes asset prices. It seems important, therefore, to ascertain whether asset prices influence consumer prices in general, for a broader spectrum of countries. We choose a sample including major industrial countries as well as emerging markets, and test for the significance of housing prices and share prices in predicting inflation. Longer, higher frequency, time series data as well as cross-section information are used to establish asset price – consumer price links for the sample as a whole, and for particular individual countries.

I Introduction

The significance of asset prices for monetary policy formulation has been intensely discussed, at least in the context of industrialized countries. The recent interest in this issue has been probably due to the developments in Japan and the U.K in the 1990s – and the late 1980s – when asset price inflation had seemed to foreshadow consumer price inflation; goods and services price inflation had remained low in a period of accelerated house and stock price inflation, only to rise sharply a few years later. These observations have even given rise to proposals that inflation indices should incorporate asset prices, so that monetary policy will respond automatically to inflation impulses from asset markets.

The possible role of asset prices in creating instability, requiring intervention by fiscal as well as monetary policy measures, had been put forward quite early by Minsky (1986). But it is generally acknowledged that trying to stabilize asset prices is fraught with a number of problems, including the lack of adequate information or uncertainty about whether asset price changes are due to fundamental underlying factors or not. However, responding to asset price movements as a part of a package put together for inflation targeting is viewed in more favorable light. The motivation is, in this case, inflation control, and not asset price stabilization per se. Be it be so, the manner in which asset prices impinge on current or future inflation is not very clear, and also has not been empirically tested for a large enough sample of countries to warrant generalization.

In what follows, we review the discussions and conclusions in the literature about the link between asset prices - such as house prices and stock price indices – and consumer price inflation. Empirical verification of these links is done using a large sample of developed and emerging market nations. The work on this topic has been so far limited to the experiences of industrialized countries. [1] We also include an expanded array of asset prices, consisting of

[1] An exception is the work on India by Ray and Chatterjee (2003).

house prices, stock prices, oil prices, and general primary commodity indices as possible inputs feeding into goods and services price inflation.

The following section briefly reviews the literature on this subject of asset price influences on consumer price inflation, including the empirical work on the topic. Section III describes the data and the models to be estimated, while the last section sums up the results and draws conclusions.

II. Cause and Effect: Does The Link Between Asset Prices and CPI Always Hold?

The basic question addressed in this paper is whether information regarding inflation in various asset prices can be useful in future goods and services price inflation, represented by CPI, wholesale or retail price indices, or even the GDP deflator. While empirical evidence on this subject is the starting point for this paper, it is useful to start with a discussion of the theoretical justifications for expecting a transmission mechanism from asset prices to goods and services price inflation.

The transmission from asset prices to CPI inflation (and other related measures of goods and services price inflation) takes place through the impact of asset price changes on aggregate consumption and investment, or through the information content of asset prices regarding expected inflation. An increase in the prices of assets held, whether they be houses or stocks, signals an increase in life time wealth, and, according to Modigalini's Life Cycle Theory and related approaches, should lead to an increase in private consumption expenditure. But such reasoning has been disputed by observing that part of the population that dos not possess houses will, instead, cut down on consumption, so that the net effect on consumption is uncertain (Vickers, 2000).

The postulated relationship between asset prices and aggregate investment, in turn, is bsd on Tobin's 'Q' theory of investment (Tobin, 1969). With an increase in equity prices, the market value of capital rises relative to replacement cost, which implies a rise in Tobin's 'Q'. since firms can obtain more capital goods for equity issued, they will find it profitable to increase investment, which, as with increased consumption, pushes up CPI inflation through aggregate demand pressure.

Thus, while equity price changes can affect CPI inflation through the investment channel, real estate and house price increases affect goods and services price inflation through impacts on consumption. So far the discussion has been confined to the demand side of the economy. But a rise in asset prices can also have an impact through the supply side also. Residential property price increases may get fed into higher wage demands, and affect CPI inflation through mark-up pricing on costs.

It may be also postulated that inasmuch as the asset prices contain information about future expected inflation, and since actual inflation adjusts to expectations, asset prices can be used to predict future inflation. The Fisher Equation $i = r + \pi e$ depicts the nominal interest rate as changing one to one with expected inflation so that investors do not lose out on account of future inflation. Thus, the asset price contains information about future expected

inflation, and it follows, about actual future inflation. But while the predictive power of asset prices with regard to future inflation is highlighted in this fashion, no arguments are advanced about the cause and effect relationship.

When discussing leading indicators for CPI inflation, the term structure of interest rates is also pointed out as a candidate (Mishkin, 1990). According to the expectation theory of of the term structure, long-term nominal interest rates reflect expected future short-term nominal rates. If real interest rates and risk premiums remain invariant over a period of time, the yield spread, i.e., the long term nominal rate minus the short-term rate, provides a measure of expected future inflation.

Given these theoretical justifications for the predictive power of asset prices in relation to consumer price inflation, it is only to be expected that an intensive debate would rage about the need to reflect this wisdom in monetary policy-making. The conventional measures, CPI, WPI, or the retail price index, does include asset prices directly, but are, as argued, affected anyhow by those prices, even if with a lag. Such an insight indicates a possible need for controlling asset price inflation from the point of view of containing CPI inflation, without any reference to changes in the underlying 'fundamentals' of asset valuation. Thus, the inflation targeting approach of monetary authorities can respond to inflationary or deflationary impulses generated form asset markets, without bothering to weed out 'fundamental' changes from the rest. It may be noted that this conclusion does not lead to any position being taken about stabilizing asset prices in general, and quite appropriately so, since asset prices are inherently volatile and highly susceptible to investor moods and sentiments (see Bernanke, B., and M. Gertler, 2000).

In such an inflation-targeting approach to asset price stabilization, the causation is assumed to run from money to asset prices to consumer prices. It is generally accepted that asset prices respond faster than the prices of goods or labour, which are so-called 'customer market 'prices, subject to contracts o similar considerations. So monetary shocks first affect asset prices, as, for instance, portrayed in the monetary approach to exchange rate determination. However, while it is accepted that with sticky goods prices, monetary shocks are transmitted to the real economy via asset price changes, there is no consensus about the practical feedback into actual monetary policy-making. Possibly, the main reason for this is the knowledge that the effect of monetary policy on asset prices is not time-invariant, and that unforeseen developments can cause changes in this linkage from period to period. In fact, the predictive power of asset prices would also be contingent on the prevailing macroeconomic environment. The predictive power is expected to be more in the wake of an accommodative monetary policy which lowered interest rates and increased aggregate demand and output, than when inflation surges have developed due to supply-side shocks (see Borio, Kennedy and Prowse, 1994).

Empirical Evidence: Do Emerging markets Show a Different Pattern?

The developments in Japan and the U.K in the late 1980s and the early 1990s provide some actual evidence for the link between asset prices and consumer price inflation. In Japan,

strong growth with almost zero percent inflation in the 1980s had been made possible by holding down unit labour costs, often by increases in productivity. In the same period, stock prices almost tripled. But consumer price inflation caught up later, rising to 4%, and the tighter monetary policy adopted to control inflation also affected stock prices adversely.

Such a link showing a lagged relation of CPI inflation to asset prices is evident from the U.K experience also. Easy credit conditions fueled housing prices, which reached n inflation rate of 35% in 1988, and stock prices also rose sharply, doubling between 1985 and 1987. But CPI inflation remained around 4% during this period. However, consumer price inflation responded later, rising to 9% in 1990, so that in hindsight, it would be possible to say that the sharp rise in asset price inflation in the late 1980s should have been taken as warning signals for future goods and services price inflation (see Goodhart, 1995).
Coming to the experiences of emerging market economies, though a number of them have carried out economic reforms in the late 1980s and the 1990s, tests for links between asset prices and inflation for these countries for a longer period may not give strong results. Prior to the reform processes, these were financially repressed economies, and, under such conditions, asset prices would not naturally live up to their reputation for flexibility – relative to goods prices. It follows that considerations of monetary policy impinging on asset markets with future consequences for CPI inflation would be irrelevant for these economies prior to the period of economic reforms.

There is, indeed, a prevailing view that the stock market in developing economies, including in some of the major emerging market economies, is a sideshow, of no consequence to the 'real' economy (see Singh, 1994 for a study of India). With stock possession limited in most of these countries to major institutional investors, a rise in the stock indices cannot be expected to increase aggregate consumption expenditure through the wealth effect.

Nor does it seem to be the case that asset price increases have led to higher investment through the Tobin's 'Q' effect in these countries. It is true that stock markets expanded in some of these countries as the firms turned to this avenue for raising funds as a kind of forced substitute for credit, which had become scarce under a government controlled regime. However, this expansion in stock market capitalization could not have led to higher investment of any large magnitude, given the prevalence of excess capacity – as in India – in many of the large firms due to lack of effective demand and stagnant exports under a regime of controlled trade. But while such is our presumption, the empirical part of the paper will provide the conclusive statement in this regard.

It is, however, possible that changes in house prices have had more of an impact on consume price inflation. This stems from the interplay between asset prices, imperfections in the credit market and economic activity. Firms and households may be constrained in the credit markets due to various credit restrictions, or even due to asymmetric information in developing or emerging market economies. The influence of credit market conditions on economic activity had been considered very early by Fisher (1933). While stock price inflation does not increase the wealth of the average consumer in developing nations, the

situation is different with a rise in house or property prices. Such asset price inflation increases the value of collateral available for credit, making higher consumption or investment a reality.[2]

However, despite this justification for considering property prices in inflation estimation even for developing nations, empirical work along these lines is virtually non-existent. As Ray and Chatterjee (2003), perhaps the sole exception in this regard, have pointed out for the case of India, monetarist and structural explanations of inflation have reigned supreme in work on these countries. The monetary approach emphasizes the role of deficit financing leading to excessive money growth, while the structural approach tracks various constraints in the country such as inappropriate sectoral prices, lack of adequate rainfall etc.[3] The structural approach has been used also in the case of industrialized countries; in the Scandinavian Model of Inflation, the difference in productivity growth between the competitive and the home goods sectors of the economy influences aggregate inflation levels (see Lindbeck, 1979).

Given the nature of the transmission mechanism between asset prices and inflation, it is clear that a lagged effect is to be expected, if at all a link can be established empirically. Goodhart and Hoffman (2000) conduct a study for eleven OECD countries, including selected countries in Europe, North America and the Far East. Asset prices as well as the yeild spread was used for the period 1996 to 1998, with lags of four to eight quarters. Property prices performed best out of the asset prices used, with share prices and the yield spread performing well only in some of the countries in the sample. Perhaps this strong result for property prices relative to stock prices in predicting consumer price inflation is to be expected for the OECD countries where the average share of property in aggregate wealth is much higher than that of equity holdings.

The indirect effect of asset price changes, through changes in the collateral for loans, on economic activity and consumer price inflation is investigated in Kent and Lowe (1997). The experiences of some emerging markets in Eastern Europe, for the latter half of the 1990s, are studied by Christoffersen and Slok (2000). They find that for six countries in the region, changes in stock prices – and also in short term interest rates and the real exchange rate – affect industrial production and consumer price inflation with a lag. The Asian experience is focussed on in Browne et al., (1998), where the interplay of different lagged asset prices, along with that of imported inflation, on aggregate inflation is analyzed. Looking specifically at India, Ray and Chatterjee (2003) use a VAR approach including stock prices, money growth, GDP growth and interest rates to conclude that share price inflation does have predictive content with respect to commodity price inflation.

In this paper, we look at a large sample that includes industrial countries and emerging market economies in different regions of the globe, and evaluate the impact of a

[2] Part of the additional credit may, of course, be used for further addition to asset holdings, which could even lead to financial instability along the lines described by Minsky (1986). See also Bernanke and Gertler (1997) and Kiyotaki and Moore (1989).

[3] See Balakrishnan (1991).

fairly wide spectrum of asset prices on goods and services price inflation. We also try to include specific variables capturing the effects of credit market imperfections, which may be quite important in the case o emerging market economies.

III. Data And Model Specifications

In the array of asset prices chosen to investigate the possibility of predicting consumer price inflation, we include share prices, property and house prices, crude petroleum and gasoline prices and a general index of primary commodity prices. It may be noted that petroleum imports represent up to 70% of the total import bill in countries like India, so that a direct impact of petroleum price increases on aggregate inflation is inevitable.

In general, the different asset prices may be affecting consumer price inflation at different lag lengths. The prices of oil and other primary commodities would be marked up with only a short lag length into goods prices. The exchange rate, which affects import prices, should also be operative at a short lag length for the estimation of CPI inflation. Actually, the predictive content of exchange rates is often not very high, since exchange rate changes can have their epicenter abroad, and need not reflect fundamental or lasting changes in the domestic economy. Also, exchange rate changes may also be reversed quite soon at times. Property prices are included in CPI calculations only in few countries. In the case of property prices as well as house prices, the indirect link through wealth effects in consumption feeding on to consumer price inflation is present, and this effect should be operating at a longer lag length – than the direct mark-up effect. Perhaps adopting a lag of four to eight or ten quarters would be appropriate in estimation of CPI inflation using these asset prices.

The short-term, 3 month interests rate, as well as the term structure given by the difference between the long term and the short-term interest rates are used as determinants of future consumer price inflation. The term structure is expected to be an indicator of future inflation when real interest rates and risk premiums are stable. The rate of change of wage rates is included to capture the direct mark-up effect on cost. Using the rate of GDP growth captures demand pressure on consumer price inflation. The favourite candidate for inflation forecasting in the monetary approach, the rate of growth of the money supply, is also a compulsory input for our estimation process.

Credit market imperfections are represented in a simple fashion by including the difference between the lending and the deposit rates of interest. This difference is usually quite high, several percentage points, for the financially repressed developing countries as well as for emerging market economies. The link between asset prices and the real economy is also expected to be weak for such economies.

We have collected quarterly data for the period 1980 – 2004, for all the variables (see the entire list with definitions and sources in Table A.1 in the appendix), for the following categories and countries:
Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Spain, Sweden, U.K, Norway, Switzerland.

Other developed OECD countries: Australia, Canada, Japan, Mexico, New Zealand, and U.S.A.
Emerging Markets: China, HongKong, India, Korea , Malaysia, Singapore, Thailand.

The dependent variable in all estimations, time series as well as cross-country, is the rate of consumer price increase. The explanatory variables used are (not always all in the same estimation) the lagged percentage change in the share price, house price or property price, wage rate, GDP, money supply, petroleum price, a proxy (interest rate differential between deposit and lending rates) for credit market imperfections, and the term structure of interest rates. The lags chosen differ from variable to variable.]

Some authors have used the output gap in place of the GDP growth rate in the inflation prediction equations. But the output gap, which is an indicator of excess demand pressure, has not been noted to perform well for some countries (see Coe and McDermott, 1997). Aslo, the calculated potential output is obtained by using the Hodric-Prescott filter, and is not necessarily an exact estimate since estimates of future GDP are used to filter out the trend.

***Correlation Analysis*:**

We first take recourse to simple correlation analysis to se e if stock and house prices can be used to predict future inflation. Current asset prices are correlated with future consumer price changes, at a one to three year horizon from the respective asset price changes. So a four to twelve year lag is used in the correlation analyses. These exercises are carried out for each country in the sample. Results are captured in Table 1 and figure 1 in the section on empirical results below .

Estimated Equations;

Though the correlation analysis described above would provide some useful insights, there are some inherent drawbacks to this approach, which is taken care of in regression analysis. Hence the following equations have been estimated for individual countries in the sample:

Period 1980.1 – 2004.4:

1) $pt = \alpha 0 + \alpha 1\ gdp(t-i) + \alpha 2\ m\ (t-i) + \alpha 3\ w\ (t-i) + \alpha 4\ oil\ (t-i) + \varepsilon t$

2) $pt = \alpha 0 + \alpha 1\ gdp(t-i) + \alpha 2\ m(t-i) + \alpha 3\ w(t-i) + \alpha 4\ oil(t-i) + \alpha 5\ (rL-rD) + \alpha 6\ stock(t-i) + \alpha 7\ term\ (t-i) + \varepsilon t$

3) $pt = \alpha 0 + \alpha 1\ gdp(t-i) + l2\ w(t-i) + \alpha 3\ pcm\ (t-i) + \alpha 4\ e(t-i) + \alpha 5(rL-rD) + \alpha 6\ stock(t-i) + \alpha 7\ term(t-i) + \varepsilon t$

Period 2004.1-2004.4 (cross-section):

4) $pt = \alpha 0 + \alpha 1\ gdp(t\text{-}i) + \alpha 2\ m(t\text{-}i) + \alpha 3\ w(t\text{-}i) + \alpha 4$ Interest Differntial +

$\alpha 5$ house(t-i) + εt

For an explanation of symbols and definition of variables as well as for sources of data, please see table A.1 in the appendix.

Please note that as complete time series for house prices were not available for all countries in the sample, the time series runs use stock prices to capture the impact on CPI from asset prices. In the cross-section run, house prices are used.

Equation 1) uses only demand pressure, cost push and monetary variables to explain consumer price inflation pt. All explanatory variables are lagged, with possibly differing lag specifications. 'gdp ' is the growth rate of GDP, 'm' the rate of growth of money supply, 'w' the pecentage change in wages, and 'oil' the rate of crude petroleum price increase.

The asset price determinants of future inflation are added on in equation 2). This 'stock' is the rate of change of the stock price index, 'house' is the rate of change in the house or property price, and 'term' is the term structure of interest, the difference between long and short-term rates. The term (rL-rD), the difference between deposit and lending rates, is added to capture the effect of financial repression.

In equation 3), some other asset prices are tested out, such as a general primary commodity index. The exchange rate is also added to capture the effect of imported inflation, particularly through commodity inputs. Finally, equation 4) is a cross-section estimation across all countries in the sample, where it is examined whether differntial inflation rates are due to differing asset price developments within the sample.

IV Empirical Results

Correlation Analysis:

Table 1 :Correlation between Consumer Price Inflation and Lagged Stock Price Changes

	Correlation At Lag 3	At Lag 4	At Lag 5	At Lag 6	At lag 7	At Lag 8	At Lag9	At Lag 10	At Lag 11	At Lag 12
Sweden		0.06	0.11	0.19	0.22	0.27	0.24			
UK		0.05	0.01	0.04	0.06	0.07	0.05			
Italy		0.14	0.15	0.16	0.18	0.21	0.22	0.22	0.22	0.20
Korea	-0.07	-0.05	0.02	0.08	0.10	0.20	0.24	0.26	0.20	

India	0.06	0.07	0.06	0.07	0.14	0.15	0.22	0.25	0.22	
Japan		0.05	0.11	0.11	0.11	0.13	0.11			
France		0.05	0.06	0.04	0.06	0.05				
Thailand		0.13	-0.05	0.11	0.23	0.37	0.33	-0.27		
Singapore	0.23	0.28	0.29	0.23	0.22	0.15	0.04			

(See Figure 1 in Appendix)

From Table 1 and Figure 1, it may be noted that the correlation between consumer price inflation and stock price changes seem to peak at around eight lags for most of the countries. It peaks a little earlier, at five lags for Singapore, and a little later, at nine to ten lags for India and Korea. The correlations seem weakest – or more unstable across lags – for France and Thailand.

Regressions Analysis

The estimation results for the time series estimates of equations 1) to 3) for each country in the sample is provided in Table 2.

Table 2

Estimated Equations for 1980.1 – 2004.4

Country	Dependent Variable	Lagged dependent Variable	Stock price lagged	Term Structure	Interest rate distortion	Change in money supply lagged	GDP change lagged	Oil price change lagged	Wage inflation lagged	Constant	Adj R Squared	
Sweden	CPI Inflation		0.074 (2.697**)	-0.051 (0.56)	0.929 (3.31**)		0.051 (0.057)		0.5812 (2.873**)	-1.51 (1.09)	0.31	
Sweden	CPI Inflation	0.9413 (31.50***)	0.0184 (2.092**)							0.073 (0.465)	0.93	
Italy	CPI inflation		0.033 (1.94**)		0.4727 (7.136***)			0.009 (0.454)	1.5991 (7.006***)		0.69	
Italy	CPI Inflation	0.9773 (48.18***)	0.014 (3.42**)					0.023 (0.63)	0.085 (1.3)		0.98	
UK	CPI Inflation		0.048 (1.44*)		0.211 (3.22**)	0.1017 (3.467**)			1.749 (8.194***)		0.42	
France	CPI InflaTIO		-0.017 (0.875		0.812 (3.967				1.4706 (9.719	-2.08 (2.28**	0.60	

	N		)		**)				***)	)		
France	CPI Inflation			0.4461 (1.94**)	1.207 9 (3.76* *)			-0.018 (1.03)	1.6019 (8.902 ***)	-4.242 (2.67**)	0.63	
Japan	CPI INflation		-0.015 (0.87)	-0.014 (0.24)	1.344 (6.503 ***)	- 0.0075 (0.244)	-0.008 (0.232)	0.0076 (0.80)		-2.684 (3.93**)	0.41	
Japan	CPI Inflation	0.8699 (18.58 ***)			0.039 9 (1.40*)						0.84	
India	CPI Inflation		0.060 2 (2.255 **)			0.2176 (3.037 **)				4.51 (4.07**)	0.14	
India	CPI Inflation	0.8455 (15.04 8***)	0.029 (1.989 **)			0.0634 (2.001 **)					0.72	
Korea	CPI Inflation		0.043 2 (2.25* *)			0.0252 (1.541 *)		0,0257 (1.461*)		4.115 (11.62 ***)	0.11	
Korea	CPI INflation	0.844 (15.39 ***)	0.014 7 (1.51*)			-0.001 (0.142)		0.0208 (2.369**)		0.631 (2.194 **)	0.78	
Thailan d	CPI Inflation		0.011 3 (1.22)		0.179 4 (4.18* *)	0.0012 (2.581 **)		0.0196 (1.61*)			0.61	
Singapo re	CPI Inflation		0.008 (o.73)		0.087 1 (4.326 **)					0.798 (3.64**)	0.24	
Singapo re (1986.1-2004.4)	CPI Inflation		0.026 9 (2.359 **)		0.057 (2.512 **)						0.16	
Singapo re	CPI Inflation	0.7634 (16.22 ***)			0.027 3 (2.576 **)						0.83	

In the table, the 't' statistics are given within brackets below the respective coefficients, with one to three stars denoting significance at 10,5 and 1% levels respectively. The estimations have been done for the 1980-2004 period, using quarterly data. In some cases, runs with insignificant results for some variables have not been reported. In general, all variables were tested out for all countries, but wage rates were not available on a quarterly basis for the Asian countries from the same source, IMF's International Financial Statistics, as for the European countries.

Coming to the crux of the matter directly, lagged stock prices were found to be significant in explaining consumer price inflation for Sweden Italy, the U:K, India and Korea. A lag of eight quarters uniformly gave the best results, except for India and Korea, where a lag of nine quarters was found most suitable.

Turning to detailed results for individual countries, the equations for Sweden show that the stock price, interest rate differential between lending and deposit rates, and wage inflation are significant determinants of inflation, significant at the 10% level. Lagging the dependent variable improves the overall fit, and the stock price variable is robust in being significant in such estimations. The results for Italy are similar to those for Sweden; the significant variables in terms of predictive power for inflation are stock prices, the differential between lending and deposit rates, and labour cost hikes. For both these countries, a lag of 8 quarters for stock prices and a lag of four quarters for the wage rate gave the best fit. The interest rate differential was not lagged. Also, the term structure of interest rates was not found to have any impact on inflation. The same variables also turn up significant in the run for the ***United Kingdom***, but the stock price variable has less significance compared to the outcomes for ***Italy and Sweden***. For all the three countries, wage inflation is the most important determinant of future consumer price inflation.

Interest rate differentials are also significant variables in the estimations for ***France and Japan.*** For France, the term structure interest rates as well as wage inflation are significant, the latter being highly so, at the 1% level. Thus, for all the European countries in the sample, wage inflation is a good predictor of CPI inflation. But for France, the change in stock prices has no predictive power with regard to consumer price inflation. The stock price variable is insignificant for Japan also.

For ***India and Korea***, lagged stock prices as well as lagged (four quarters) changes in money supply are significant determinants of inflation. For Korea lagged (four quarters) oil prices are also significant, but at a low level as is the case for the Korean money supply variable. The interest rate differential between lending and deposit rates turns out to be significant at the 5% level for both ***Thailand and Singapore***, but lagged stock price has no impact on inflation. However, lagged stock prices are significant for Singapore when the estimation is done for the period 1986.1 to 2004.4. In the case of Thailand, lagged oil price changes as well as lagged money supply changes are also seen to be significant determinants of consumer price inflation.

The results may be also summed up in terms of the importance of various determinants of CPI inflation across the spectrum of countries, as follows:

Lagged stock price: Significant for Sweden, Italy, UK; India and Korea. Lag of 8 quarters best suited for Sweden, UK and Italy and a lag of nine quarters for India and Korea. Significant for Singapore for the later period 1986.1 to 2004.4, at a lag of five quarters.
Lagged GDP changes: Not significant for any country in the sample.
Lagged money supply changes: UK; India, Korea, Thailand, at a lag of four quarters.
Lagged wage inflation: Significant for Sweden, Italy, UK and France, at a lag of four quarters.
Lagged oil price change: Significant at a lag of four quarters for Korea and Thailand.
Interest rate differential: The difference between lending and deposit rates came out significant (with no lag) for Sweden, Italy, UK; France, Japan, Thailand and Singapore.

Term Structure of interest rates: significant only in the estimation for France.

The cross-section analysis using house price changes to represent asset price inflation was conducted for a larger sample, consisting of the following twenty one countries and regions: Australia, Belgium, Canada, China, Denmark, Hong Kong, France, Germany, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Singapore, South Africa, Spain, Sweden, Switzerland, The United Kingdom, and U.S.A. The estimated equation 4') for the period 2004.1 – 2004.4 4 is given below: Only the estimation giving the best overall fit is reported.

4') CPI % = 0.02223 * Money supply change + 0.0718 House Price (-8)

(0.823) (2.805**)

+ 0.2558* GDP% (-4) + 0.2396 * (rL – rD); R squared = 0.43.

(3.033*') (2.558**)

while the overall explanatory power is not high, the lagged house price change variable is significant at the 5% level, indicating that differences in inflation rates between countries can be attributed to some extent to the country-specific developments in housing prices. Lagged GDP changes and the proxy for credit market imperfections, i.e., the difference between lending and deposit rates, are also significant.

Concluding remarks

Our results indicate that asset prices do have a role in predicting consumer price inflation, looking forward into a one to two year time horizon. The possibility of using housing and real estate prices for this purpose, which is stressed in the literature, is underlined in this paper also with a cross-section analysis of industrial countries and emerging market nations. The estimation results indicate that house prices can explain some of the differences in inflation rates between countries in the sample.

Stock prices have not been shown to be as good predictors of consumer price inflation as real estate and housing prices in the literature on the asset price – consumer price linkages. Our finding is that for a number of countries, both developed and emerging market nations, lagged stock prices are useful predictors of consumer price inflation. This variable was, in fact, seen to be more significant than some conventional explanatory variables like the GDP gap or its proxy. The estimation results indicate that lagged asset price changes (usually at around eight quarters, rather strikingly!) can be fruitfully used along with labor market costs, money supply changes and credit market imperfections to predict consumer price inflation some quarters ahead.

Table A.1

Variable Definitions and Sources of Data

Notation	Definition	Data source
P	% change CPI	International Financial Statistics IMF
Gdp	Growth rate of GDP	IFS, IMF
Oil	Crude petroleum price	IFS, IMF
M	% change money supply	IFS, IMF
W	Growth rate of wages	IFS, iMF
rL	Bank ;Lending rate	IFS, IMF
rD	Deposit rate	IFS, imF
Stock	Share price index %change	IFS IMF
House	% change in house price	***The Economist and national sources.***
Term	Change in term structure, i.e., (long run interest rate – short-term interest rate.)	IFS, IMF

Appendix

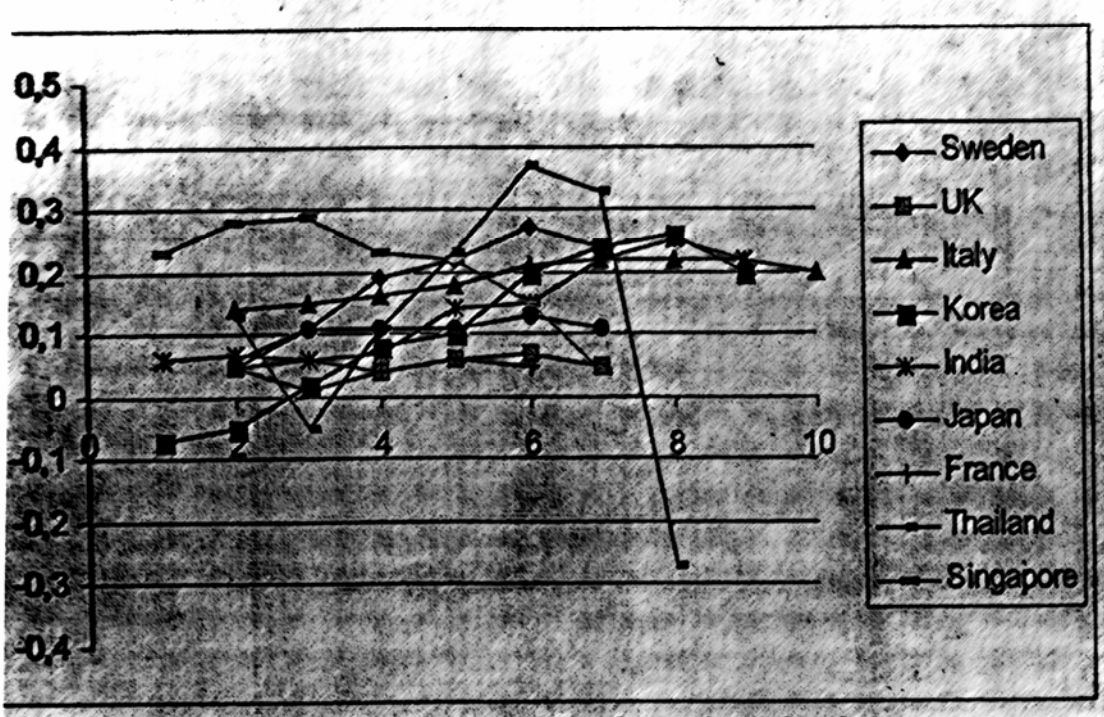

Figure 1: Correlations CPI - lagged stock prices

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Asset Prices and Inflation: Is there a Predictive Link?

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Abstract:

The relationship between asset prices and consumer price inflation has been in the limelight again in the last decade. The reason has been the observed linkages in the early 1990s between housing as well as stock market prices and consumer prices in Japan and the U.K. Rapid asset price appreciation in these countries was followed, with a lag, by consumer price inflation. Such developments have even sparked off debates about the need to replace conventional consumer price measures with a broader definition which includes asset prices. It seems important, therefore, to ascertain whether asset prices influence consumer prices in general, for a broader spectrum of countries. We choose a sample including major industrial countries as well as emerging markets, and test for the significance of housing prices and share prices in predicting inflation. Longer, higher frequency, time series data as well as cross-section information are used to establish asset price – consumer price links for the sample as a whole, and for particular individual countries.

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