

**FOR  
AGENDA**

SM/08/217  
Correction 1

July 22, 2008

To: Members of the Executive Board  
From: The Secretary  
Subject: **United States—Selected Issues**

The attached corrections to SM/08/217 (7/2/08) have been provided by the staff.

**Factual Errors Not Affecting the Presentation of Staff's Analysis or Views**

**Page 3, heading, line 2:** for “For More Detailed Results Contact: Vladimir Klyuev.”  
read “Summary of a Forthcoming IMF Working Paper by Vladimir Klyuev.”

**Page 5, para. 7, line 1:** for “Although the boom and bust in housing is often viewed in *regional* terms, it has been a *national* phenomenon.”  
read “Although the recent boom and bust in housing is often viewed in *regional* terms, it has had a stronger *national* component than in previous episodes.”

**Page 9, heading, line 2:** for “Summary of a Forthcoming Working Paper by Tamim Bayoumi and Ola Melander.”  
read “Summary of IMF Working Paper, WP/08/169, by Tamim Bayoumi and Ola Melander.”

Questions may be referred to Mr. Bayoumi (ext. 36333) and Mr. Estevao (ext. 36038) in WHD.

This document will shortly be posted on the extranet, a secure website for Executive Directors and member country authorities.

Att: (3)

Other Distribution:  
Department Heads



## I. WHAT GOES UP MUST COME DOWN? HOUSE PRICES IN THE UNITED STATES

Summary of a Forthcoming IMF Working Paper by Vladimir Klyuev

1. **After several decades of uninterrupted growth, home prices have been declining on a national basis in the United States.** Drops in real estate prices have a key role in the current macroeconomic slowdown, thus making it important to ascertain the potential extent of future price declines. It is widely recognized that the observed declines are serving to align home prices with their fundamentals, leaving open the question of how far prices still are from their equilibrium levels.
2. **This note summarizes estimates of the gap between current home prices and their equilibrium levels, and examines short-run dynamics of price adjustment.** The preferred price measure is the real OFHEO purchase-only index, which adjusts for quality changes and seasonal factors and has wide geographic coverage, and is deflated by the CPI.
3. **Reflecting uncertainties about how to analyze underlying house price trends, two approaches are used to estimate the extent of home-price overvaluation.** First, following earlier staff work, equations for the supply and demand of housing were estimated, in which real home price is a function of the number of homes sold and variables that represent fundamental drivers of housing supply and demand: household size and construction costs on the supply side and real disposable income, the unemployment rate, and the real mortgage rate on the demand side. The model was estimated on annual regional data. Second, to provide an alternative asset-market perspective, a cointegrating relationship between home prices, rents, and interest rates (all in real terms) was estimated on quarterly national data.
4. **Both techniques yield similar results, revealing considerable overvaluation in the last few years, which has not been fully corrected yet.** As Figure 1 illustrates, after stagnating below equilibrium for most of the 1990s, home prices took off in 1997. After catching up with their fair value around 2001, prices accelerated, overshooting equilibrium by a wide margin. Despite real house prices declining by 7 percent subsequently, the two methods suggest they were still 11–12 percent above equilibrium in the first quarter of this year, with a 95 percent confidence interval of about 5–20 percent. At the sub-national level, the picture is qualitatively similar, but the extent of overvaluation differs across regions, with largest overvaluations in the northeast and west, which also have the greatest land constraints.
5. **Turning to house-price dynamics, short-term movements appear to be driven by inventory overhangs and new foreclosures.** Table 1 shows a dynamic equation in which the change in real home prices is regressed on its own lags, the inventory-sales ratio, and foreclosure starts. The results indicate that a 20 percent increase in the inventory-sales ratio leads to a quarter percentage point slowing of house price inflation in the short run. Starts in foreclosures, which obviously add to future inventory, seem to also exert additional

Figure 1. Actual and Equilibrium Real Home Prices; Actual 2000 = 100

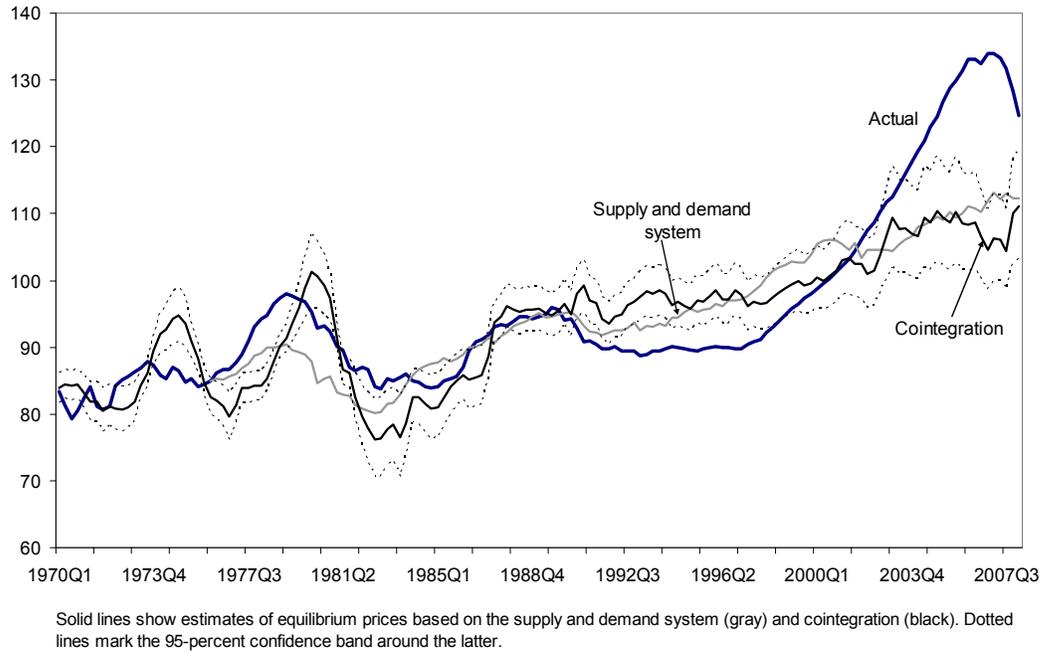


Table 1. Short-Run Determinants of Real Home-Price Appreciation

	Coefficient	Standard error	t-statistic	Probability
Constant	0.005	0.003	1.61	0.11
Lagged dependent variable	0.429	0.124	3.45	0.00
Lagged log (inventory-sales ratio)	-0.013	0.004	-3.42	0.00
Second lag of foreclosure starts	-0.030	0.009	-3.48	0.00
R-squared	0.46			
Durbin-Watson stat	1.98			

Ordinary least squares. Dependent variable: change in the log of real home price on previous quarter. Foreclosure starts enter as a percentage of total mortgages outstanding at quarter-end. Newey-West standard errors. Sample: 1982Q3 - 2008Q1.

downward pressure on prices. This result, which is consistent with microeconomic analysis suggesting foreclosures lower the value of surrounding houses, is particularly pertinent given the rapid recent rise in foreclosures. Home-price dynamics also exhibit some inertia, as attested by the coefficient of 0.43 on the lagged dependent variable. Strikingly, however, the regressions fail to identify any direct impact from the gap between current and equilibrium house prices on short-term house-price inflation.

**6. The gap between actual and equilibrium home prices seems to matter only through its medium-term impact on the inventory-to-sales ratio.** As shown in Table 2, the gap helps to explain the subsequent path of the inventory-sales ratio. However, the short-run impact of the price gap is relatively small (0.22) and the coefficient on the lagged dependent

variable is very large (0.91), suggesting that the gap influences the inventory-sales ratio extremely gradually. This may explain why it was not possible to find a direct impact from the price gap onto house inflation.

Table 2. Evolution of Inventory-to-Sales Ratio

	Coefficient	Standard error	t-statistic	Probability
Constant	-0.059	0.018	-3.36	0.00
Lagged dependent variable	0.912	0.027	33.94	0.00
Lagged price gap	0.225	0.101	2.22	0.03
R-squared	0.86			
Durbin-Watson stat	2.44			

Ordinary least squares. Dependent variable: log of inventory to sales ratio for existing single-family home. Price gap is log of the ratio of actual to equilibrium real home prices, as identified in the cointegrating equation. Newey-West standard errors. Sample: 1982Q3 - 2008Q1.

7. **Although the recent boom and bust in housing is often viewed in *regional* terms, it has had a stronger *national* component than in previous episodes.** While price movements continue to show significant regional variation, the dispersion of growth rates has been significantly smaller since the early 1990s than over the preceding period. In particular, while it used to be common for regional home prices to head in different directions, quarter-on-quarter home-price appreciation was positive in each of the nine Census divisions from 1996 through 2005, and it was negative in every division in the first quarter of this year.

### Conclusions and policy implications

8. **Despite marked price declines across the country in the last few quarters, single-family homes still seem substantially overvalued.** Home prices, as measured by the OFHEO purchase-only index, were 5–20 percent above equilibrium in the first quarter of 2008. While CPI inflation will eliminate gradually some of the overvaluation, the bulk of the adjustment is expected to come through continued nominal home-price declines. Moreover, the most important determinant of home-price dynamics—the inventory-to-sales ratio—is near historic highs, while foreclosures are adding to the inventory and to market pessimism.

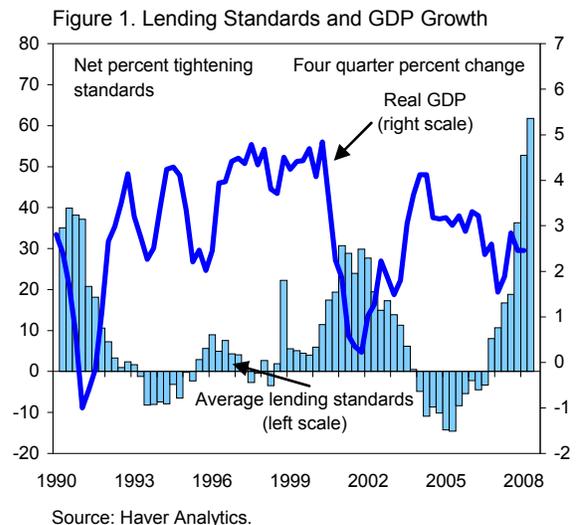
9. **Going forward, the strong downward momentum could push home prices well below equilibrium.** With the gap between actual and equilibrium prices playing only a weak anchoring role, house-price declines will likely persist even after overvaluation is eliminated. The risk that home prices swing below their equilibrium level provides some rationale for government policies directed at relieving pressure on inventories and improving market sentiment by limiting house-price declines as a result of preventable foreclosures.

## II. A U.S. FINANCIAL CONDITIONS INDEX: PUTTING CREDIT WHERE CREDIT IS DUE

Summary of IMF Working Paper, WP/08/161 by Andrew Swiston.

10. **The working paper constructs a measure of economy-wide financial conditions for the United States.** While interest in the effects of monetary policy on the economy is hardly new, the rapidly growing complexity of financial systems requires a broader view of how overall financial conditions affect the real economy, given their potential significance in aggregate economic fluctuations. Also, estimates of the monetary policy effects on economic activity and prices could be biased if monetary policy reactions to financial shocks are not taken into account. The paper also serves as an alternative way of looking at macro-financial linkages to that outlined in Chapter 3 of this document.

11. **The paper brings together an emphasis on prices of financial assets with a concern for capturing the role of credit availability in the business cycle.** Credit availability refers to the willingness of lenders to provide funds at the market interest rate, which encompasses a number of non-price elements. It is closely related to shifts in the supply of credit, and relatively independent of credit demand. Following the lead of other authors, the Federal Reserve's Senior Loan Officer Opinion Survey on Lending Practices (SLOOS) is used to proxy economy-wide credit availability. The SLOOS is highly correlated with real activity, with periods of sharp tightening in lending standards generally matching up with the onset of economic downturns (Figure 1).



12. **The financial conditions index (FCI) constructed in the paper includes a range of variables covering major financial markets and channels of transmission.** The estimation uses vector autoregressions (VARs), which incorporate endogenous responses of financial variables to economic activity—as well as to each other—into estimates of macro-financial linkages. The FCI is calculated by weighting together impulse-response functions of the impact of shocks to each variable on growth over the next eight quarters. Defined in this way, the “index” is not an abstract number but intuitively conveys the impact of current and past financial conditions on GDP growth prospects.

13. **In the calculation credit availability (as measured by lending standards, and not found in most FCIs) is found to be an important driver of the business cycle.** It accounts for over 20 percent of the typical contribution of financial factors to growth. A one standard deviation shock to lending standards (a tightening of net responses by 6.8 percentage points)

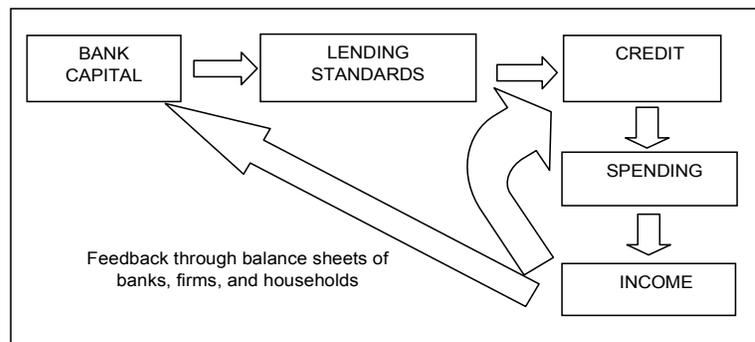
### III. CREDIT MATTERS: EMPIRICAL EVIDENCE ON U.S. MACRO-FINANCIAL LINKAGES

Summary of IMF Working Paper, WP/08/169, by Tamim Bayoumi and Ola Melander

18. **How deep and protracted will the current U.S. economic slowdown be?** One of the main determinants will be how balance-sheet deterioration for banks and other leveraged lenders affects credit and spending. A particular concern is the possibility of an adverse feedback loop from economic activity to the financial system, with second-round effects on the economy through reduced credit availability.

19. **The paper develops a practical framework for policy analysis of macro-financial linkages.** It complements the reduced form Financial Conditions Index discussed in Chapter 2 with a more structural approach examining individual linkages between credit and spending. We start the process by assuming an exogenous negative shock to the bank capital-asset ratio, for example from a rise in bank loan losses. In response, banks tighten their lending standards, reducing credit availability. A credit tightening causes spending to fall, both directly through credit constraints and indirectly through the effects of an economic slowdown on balance sheets of banks, households, and firms (Figure 1).

Figure 1. A Framework for Macro-Financial Linkages

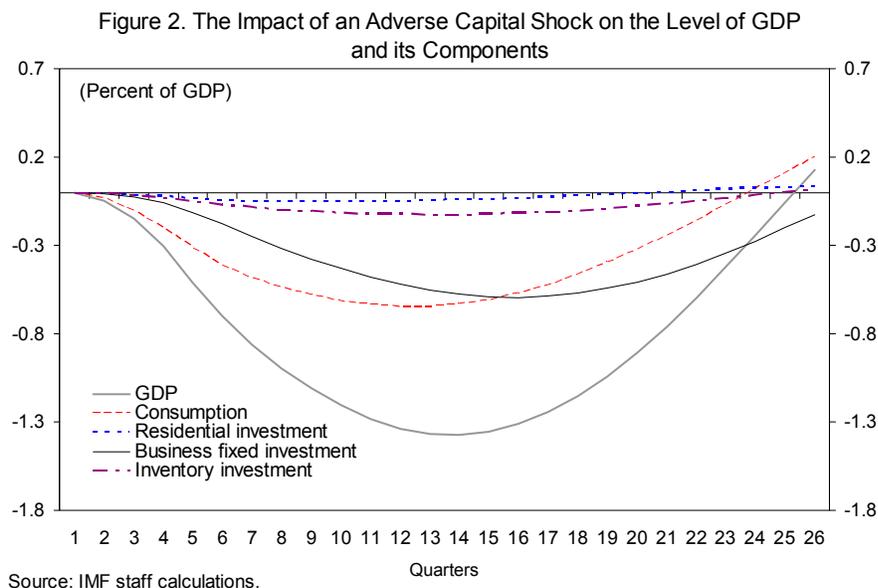


20. **The analysis traces the cycle for: (1) consumer credit and consumption; (2) home mortgages and residential investment; and (3) firms' credit market borrowing and business fixed and inventory investment.** The regression results indicate:

- Squeezes in bank capital gradually lead to a significant tightening in standards for all types of bank loans.
- Bank-lending standards, in turn, feed through into credit flow after a modest delay.
- Changes in credit lower real spending and GDP, with the fastest and largest effect coming from consumer credit onto consumption while effects of credit onto business investment are somewhat smaller and more elongated. Spending effects are particularly small for mortgage borrowing, as most mortgages finance existing homes rather than new ones (and, in any case, finance homes that have already been built).

- There are significant feedbacks from slower activity onto credit through loan losses, which worsen the bank capital-asset ratio, and through borrowers' income and collateral, which reduce the desire of banks to lend to individuals and firms.

21. **An exogenous one percentage-point fall in the capital-asset ratio (close to what has been experienced since last August) ultimately reduces GDP by 1½ percent.** As shown in Figure 2, there is a gradual slowdown of economic activity as lending standards tighten over time, which results in further declines in the capital-asset ratio before lower lending gradually restore capital. The negative effect on GDP grows gradually over time, peaking at 1.4 percent of GDP three years after the initial capital-asset ratio shock and two years after the maximum impact on bank lending standards (the impact on growth peaks at ¾ percent slightly over a year after the initial shock to capital).



22. **Changes in consumption and business fixed investment are the main drivers of the fall in GDP.** Consumption responds more rapidly than business fixed investment to credit constraints, as would be expected given the longer planning horizons involved in investment decisions. The response of residential investment is very minor, reflecting the small estimated effects of mortgage credit on spending, and the contribution of inventory investment is only somewhat larger.

23. **The model can also be used in reserve gear—to examine how financial channels amplify and elongate a shock to real demand.** Figure 3 shows the response to a permanent negative decline in real consumption and investment totaling 1 percent of GDP. A weaker macroeconomic environment lowers the capital-asset ratio and tightens bank lending standards even as it reduces borrowers' credit worthiness. The resulting credit tightening has similar time lags and dynamics for sub-components of spending as a financial shock, with the impact on the level of GDP gradually growing from the initial shock of 1 percent to 2.2 percent after three years before falling subsequently. Thus, the initial demand shock is