

## Harald Hau and Sandy Lai Local Asset Price Dynamics and Monetary Policy in the Eurozone



Harald Hau  
University of Geneva and  
Swiss Finance Institute.



Sandy Lai  
University of Hong Kong.

With hindsight the debate over whether Europe constitutes an optimal currency area overlooked the elephant in the room. Following Robert Mundell's considerations, the expert debate in the 1990s focused on the question of whether Europe's capital and labor markets were sufficiently integrated to cope with different real shocks. Financial stability considerations and the fear that a common European monetary policy might endogenously trigger asymmetric financial boom and bust cycles in periphery countries did not feature in the debate and was not foreseen by the US critics of the common European currency either.

Yet such a financial cycle has morphed into the most profound challenge facing the Eurozone: an initial boom triggered by excessively low real rates inflated real price and wage levels in periphery countries, created a debt overhang problem, and engendered the massive transformation of private debt into public debt with joint liability among Eurozone countries. The resulting low growth, mass unemployment and potentially large fiscal transfers all undermine the political legitimacy of the common currency project.

This short article summarizes new evidence on how low real rates in some Eurozone countries encouraged risk-taking on the part of households, created capital flows from low-risk money market funds into riskier equity funds, and inflated equity prices. We highlight that the segmentation of the European equity market is an important element of the asymmetric transmission of monetary policy: we show that monetary policy that is too expansionary for a Eurozone country generates local equity fund inflows, largely boosts local asset prices, and thus magnifies the local boom; whereas an integrated capital market would distribute the inflationary effect over the equity market of the entire currency union.

### ONE NOMINAL RATE, BUT MANY REAL RATES

A central bank controls the short-term nominal rate throughout the currency union. But differences in the local inflation rate imply that the real rate can be very different from country to country within the currency union. Figure 1, Panel A illustrates this heterogeneity of real short rates for eight Eurozone countries during the period from 2003 to 2011. Arguably more relevant for the risk allocation of households are the expected real short rates plotted in Figure 1, Panel B, which subtract household expectations of future inflation from the nominal rate. First differences of real rates shown in

Panels C and D indicate considerable variation in monetary policy conditions across different countries within the Eurozone.

Did this local variation in monetary policy conditions trigger a corresponding variation in household risk-taking? In other words: is there a risk-taking channel of monetary policy? Europe's fragmented capital markets provide a unique way of addressing this question. Spanish investors mostly hold their financial assets with Spanish money market, bond, and equity funds, whereas the capital market investments of French or Austrian households are intermediated by French and Austrian funds, respectively. Using this association between household locations and fund locations, we can aggregate net flows into the local equity and money market funds as a measure of local household risk-taking for the eight Eurozone countries. We exclude Luxembourg, Belgium and Ireland from this analysis because their fund flows are more likely to be co-determined by non-residents or corporate investments (especially in Ireland).

### IS THERE MORE RISK-TAKING IF THE REAL RATE DECREASES?

The correlation between decreases in the real short rate and the corresponding quarterly fund flows is indeed strong, as shown in Figure 2, Panel A. It is of considerable economic and statistical significance: a decrease in the real short-term interest rate by ten basis points predicts a quarterly equity fund inflow of about one percent of fund assets and a permanent inflow of about 1.4 percent. At the union level, this corresponds to an aggregate net equity inflow of 8.7 billion EUR. For money market funds, we find the reverse correlation of similar magnitude. This suggests that households shift their portfolios from riskless money market investments to high risk equity investments when faced with decreased local real rates.

### DO HOUSEHOLDS REACT TO THE REAL SHORT RATE OR THE LOCAL BUSINESS CYCLE?

The risk-shifting behavior of households could plausibly be a response to the investment opportunities provided by the local business cycle. A booming local economy could simultaneously trigger higher inflation and thereby lower real rates and make local stock market investment more desirable. To remove this alternative channel, we identify local funds that predominantly invest in other countries, for example, a Spanish equity fund investing in UK equity. If the equity investments of Spanish households are driven indirectly by the Spanish business cycle, rather than by the local real short rate, we should see hardly any correlation between Spanish short rate changes and Spanish fund flows into funds with a foreign investment focus outside Spain. Figure 2, Panel B, shows that the equity flow sensitivity is similarly strong for those flows that are not destined for the local economy. This suggests that household risk-shifting towards risky equity investment is mainly

driven by changes in the local real short rate but not by return expectations related to the local business cycle. If investment opportunities related to the local business cycle were to have caused the local fund flows, we would expect Panel A and B to look very different.

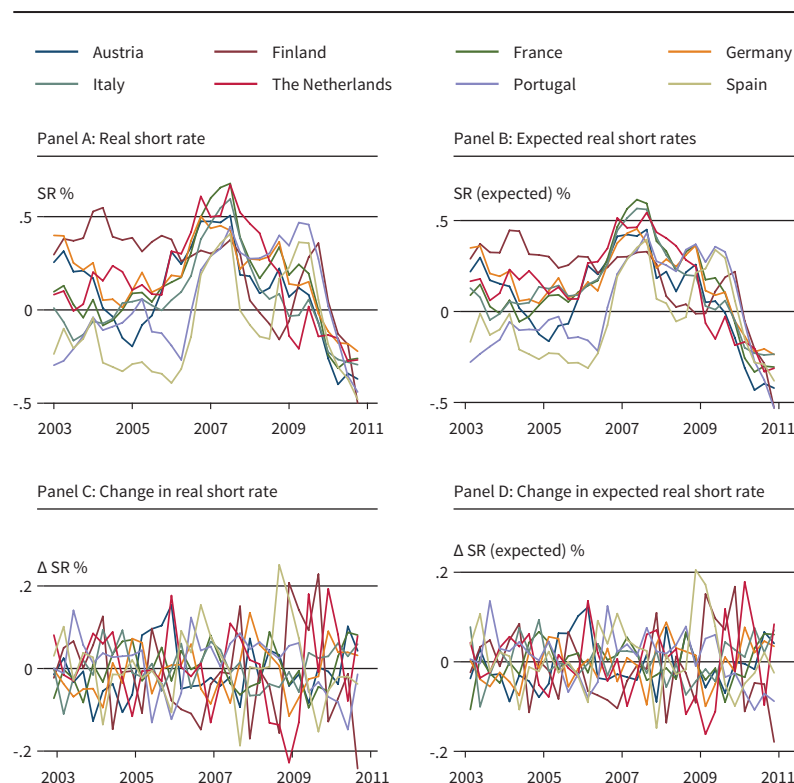
### EQUITY PRICE INFLATION DURING THE FINANCIAL BOOM

The last and most controversial element of the puzzle concerns the distortion of asset prices over the boom and bust cycle. Equity prices influence the investment and employment policies of financially constrained firms (Hau and Lai 2013), and equity price inflation can therefore contribute to overinvestment. In order to investigate the asset price effect of equity fund flows, we divide the publically listed companies in each of the eight Eurozone countries into those investable by funds (with sufficient amount of equity publically traded) and those that funds consider non-investable because of a low amount of freely traded equity. Figure 3 marks investable stocks by red circles and the 20 percent least investable stocks by black crosses. Public investability is not strongly related to stock size and non-investable stocks exist in most industries. A measure of local equity price inflation can be constructed from the return difference between investable and non-investable stocks over the sample period.

To constrain the inference of asset price inflation driven by the monetary policy effect of real short rate variations, we use a system of two equations that jointly estimate the equity flow dynamics triggered by real short rate changes and the relationship between these estimated equity flows and the return difference of investable and non-investable stocks in each country.

Figure 1

#### Cross-country variation of real monetary policy rates



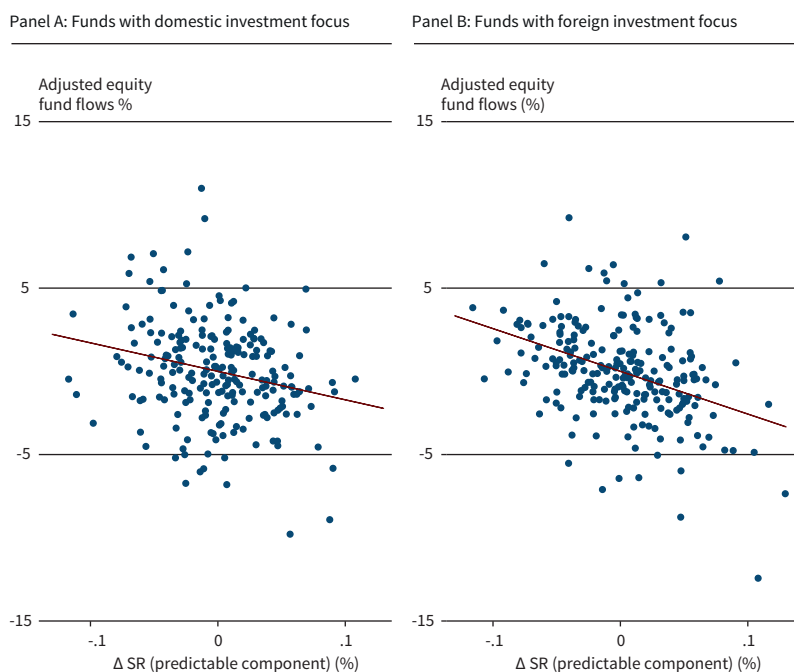
Note: Plotted in Panels A and B are the quarterly real short-term interest rate (SR) and expected real short-term interest rate [SR (expected)], respectively, for each of the eight Eurozone countries in the period 2003/q1-2010/q4. Panels C and D plot the quarterly change of the real short rate ( $\Delta SR$ ) and the quarterly change of the expected real short rate [ $\Delta SR$  (expected)].

Source: Hau and Lai (2016).

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Figure 2

#### Equity fund flows and real short rate changes

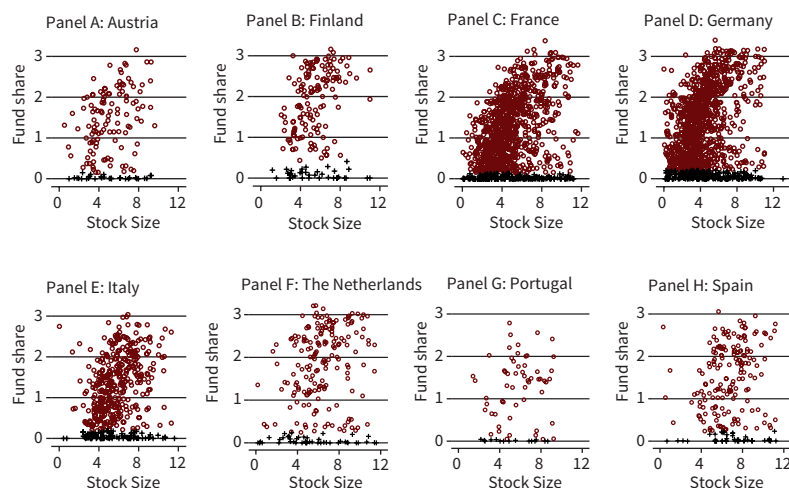


Note: The figure shows the quarterly adjusted equity fund flows (from 2003/q1 to 2010/q4) for the eight Eurozone countries against the quarterly predicted change of their respective local real short-term interest rates ( $\Delta SR$ ). Panel A plots the flows for equity funds with a domestic investment focus; and Panel B, for equity funds with a foreign investment focus.

Source: Hau and Lai (2016).

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Figure 3



Note: The aggregate fund ownership shares for stocks in eight Eurozone countries are plotted against the stock size (log scale). The 20% of stocks with the lowest fund ownership share in each country are marked by black crosses, and all other stocks are marked by red circles.  
Source: Hau and Lai (2016). © ifo Institute

We find that a ten basis point decrease in the local real short rate creates a two percent valuation gap between investable and non-investable stocks accounted for by equity inflows. We highlight that this represents an economically large effect. Assuming that the central bank varies its nominal target rate by a full percentage point, we would expect the union-wide asset price inflation to vary by 20 percent. Alternatively, a local inflation effect of one percentage point can inflate local stock prices by just as much. The corresponding income effect for households is likely to boost consumption, which can feed back into higher local inflation. The risk-shifting channel, combined with Europe's financial market segmentation, is therefore a powerful accelerator of asymmetric local boom and bust cycles.

### THE ROLE OF FINANCIAL OPENNESS

As foreign investors are the sellers whenever variations in the local real short rate trigger equity inflows, a more internationally diversified target portfolio of local households helps to diffuse the equity price pressure. The average home bias of European household portfolio differs considerably and can be proxied by the share of the local market capitalization held by all domestic equity funds. If we give more weight to countries with more home bias in equity investment, we should expect to see a larger local equity price inflation for the same magnitude of real short rate decreases.

This intuition is indeed borne out by the data. Replacing equal weights for all eight countries by regression weights proportional to the equity share of local funds in the local market capitalization, we find that the equity inflation effect doubles. This means that for countries with a relatively closed equity market, a one-percentage-point variation in the real short rate explains variations in the aggregate equity market valuations of 40 percent.

### CONCLUSION

A currency union such as the Eurozone sacrifices local monetary autonomy for the sake of capital mobility and fixed internal exchange rates. But the ensuing variation in local monetary policy conditions inside the currency union can give rise to financial instability, as argued in this summary of recent research. Bordo and James (2014) come to similar conclusions for the gold standard period, which saw a comparable trade-off. Financial market segmentation and home biases in investment magnify the financial stability risk in a currency union. The greater financial fragility of a large common currency area was not foreseen at the inception of the euro.

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