



Munich Personal RePEc Archive

# **Monetary Policy, Vagabonding Liquidity and Bursting Bubbles in New and Emerging Markets - An Overinvestment View**

Schnabl, Gunther and Hoffmann, Andreas  
University of Leipzig

10. September 2007

Online at <http://mpa.ub.uni-muenchen.de/5201/>  
MPRA Paper No. 5201, posted 07. November 2007 / 04:31

MONETARY POLICY, VAGABONDING LIQUIDITY  
AND BURSTING BUBBLES IN NEW AND  
EMERGING MARKETS - AN  
OVERINVESTMENT VIEW

GUNTHER SCHNABL  
ANDREAS HOFFMANN

CESIFO WORKING PAPER NO. 2100  
CATEGORY 6: MONETARY POLICY AND INTERNATIONAL FINANCE  
SEPTEMBER 2007

*An electronic version of the paper may be downloaded*

- *from the SSRN website:* [www.SSRN.com](http://www.SSRN.com)
- *from the RePEc website:* [www.RePEc.org](http://www.RePEc.org)
- *from the CESifo website:* [www.CESifo-group.org/wp](http://www.CESifo-group.org/wp)

# MONETARY POLICY, VAGABONDING LIQUIDITY AND BURSTING BUBBLES IN NEW AND EMERGING MARKETS - AN OVERINVESTMENT VIEW

## Abstract

Credit booms have globally fuelled hikes in stock, raw material and real estate markets which have culminated in the recent US subprime market crisis. We explain the global asset market booms since the mid 1980s based on the overinvestment theories of Hayek, Wicksell and Schumpeter. We argue that ample liquidity supply originating in the large industrialized countries has contributed to overinvestment cycles in Japan, East Asia, the new markets in the industrial countries and many emerging market economies. Expansionary monetary policies in response to the burst of bubbles are argued to have contributed to vagabonding bubbles around the globe.

JEL Code: B53, E32, E44, E52.

Keywords: bubbles, boom-bust cycles, Hayek, Wicksell, Schumpeter, emerging markets, capital flows, overinvestment theories.

*Gunther Schnabl*  
*Leipzig University*  
*Marschnerstr. 31*  
*04109 Leipzig*  
*Germany*  
*schnabl@wifa.uni-leipzig.de*

*Andreas Hoffmann*  
*Leipzig University*  
*Marschnerstr. 31*  
*04109 Leipzig*  
*Germany*  
*ahoffmann@wifa.uni-leipzig.de*

September 10, 2007

## 1 Introduction

“*Capitalism without failure is like religion without sin.*” Charles Kindleberger’s (2000) book „Manias, Panics and Crashes“ points out that speculation and crises have always been present: the world economic crisis of the 20th century, the south-sea bubble in the 18th century, and the tulip mania in the first part of the 17th century. Emerging for different reasons, but always nurtured by euphoria, bubbles tend to grow for a while until they unload through a wave of collapsing asset prices and insolvencies. The morning after is characterized by deep recessions as overinvestment, overconsumption and speculative losses have to be digested by enterprises, consumers, and financial institutions.

Although speculative bubbles are easy to identify *ex post*, they are – by definition – not realized *ex ante* by the majority of investors. The reason for the irrational upswing is the persistent hope for a soft landing or the belief that a well timed exit before the turnaround will be possible. In short, individual rational behaviour as “monkey see, monkey do” or the malaise of seeing the neighbour becoming rich explain the phenomenon of bubbles. While Kindleberger (2000) acknowledges that a speculative mania cannot be predicted, he identifies two (interdependent) factors that make them more likely. First, speculation is linked with positive economic expectations (as currently in China or Central and Eastern Europe). Second, ample liquidity makes hyperbolic investment more likely.

Both factors seem relevant for the world economy since the mid 1980s. On the one hand the central banks in the large industrial countries have tended to provide ample liquidity in response to financial turmoil and the threat of recession. On the other hand economic prospects have been very positive in the new (stock) market segments in the industrialized countries and in an increasing number of emerging market economies. In particular East Asia and Central and Eastern Europe which are heading to become new hubs of industrial production have become economic focuses.

From Kindleberger’s (2000) perspective it is not surprising that crises have occurred frequently since the mid 1980s because the worldwide liquidity supply was high and important new markets emerged. The outcome were (inter alia) the Japanese bubble (1989), the Tequila crisis (1994), the Asian crisis (1997/98), the Japanese financial crisis (1998), the

Russian flu (1998), the bursting dotcom bubble in the US and other industrialized economies (2000) and the almost bankruptcy of the LTCM hedge fund (2001).

Since the year 2002 the turmoil of crises has calmed down as historically low interest rates boosted world growth. But since the Federal Reserve, the European Central Bank, the Bank of England and even cautiously the Bank of Japan have continued to tighten the liquidity conditions, concerns about bursting bubbles are increasing. Recently the US real estate market has triggered financial turmoil around the globe, as single hedge funds and banks have come under distress. Also China and Central and Eastern Europe are considered to be other hot spots.

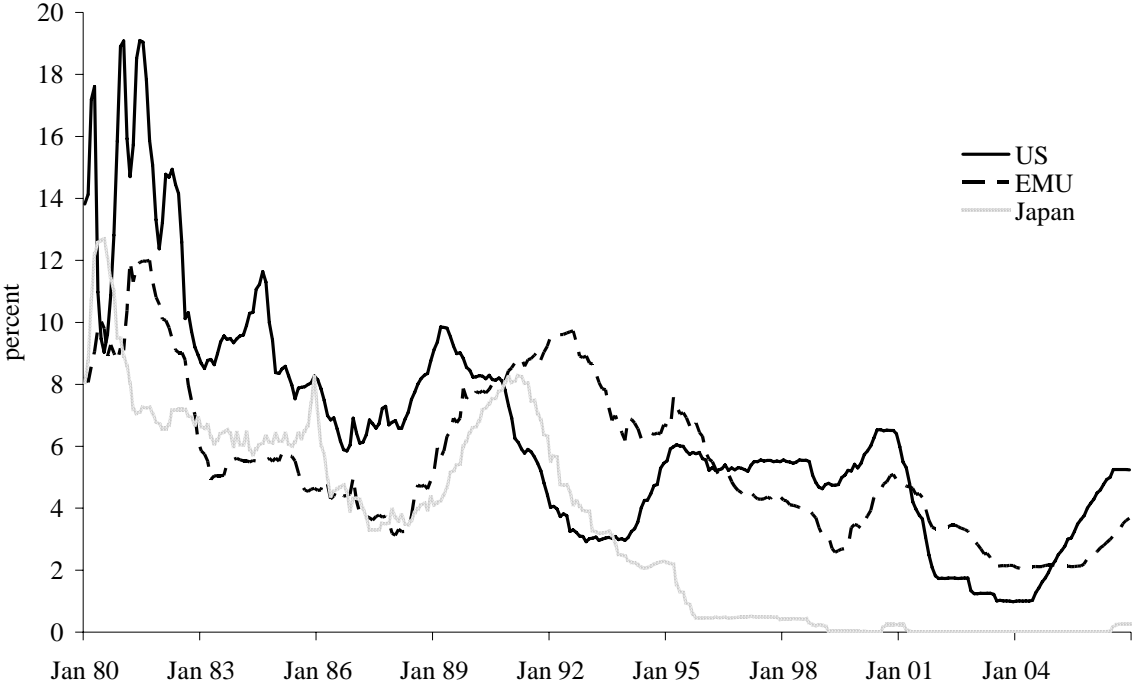
## **2 The Global Liquidity Expansion**

Since the mid 1980s the global liquidity supply has been expanding steadily originating in the large capital markets in Japan, the United States and the euro area. Intermediated by internationalized financial markets and a fast increasing number of hedge funds, liquidity poured from the low yield developed financial markets into the high yield emerging market economies. As most emerging markets tended to stabilize the exchange rate either against the dollar or the euro the vivid capital inflows were translated into rapid foreign reserve accumulation, fast growing money supplies and buoyant credit growth.

### **2.1 The Japanese Liquidity Glut and the Greenspan Put**

The first important step for the worldwide increase of money supply was taken in Japan during the 1980s. Following the September 1985 Plaza Agreement the Japanese yen appreciated by about fifty percent against the dollar far above the originally targeted level. To counteract the resulting deflationary pressure the Bank of Japan cut interest rates in response to the appreciation (Funabashi 1989). The downward trend continued until the end of the 1990s when the Japanese money market rate reached the zero bound and Japan had fallen into the so-called liquidity trap (McKinnon and Ohno 1997) (Figure 1). Between January 1990 and December 2005 the Japanese monetary base had grown by 144 percent while output had expanded by merely 10 percent.

**Figure 1: Money Market Interest Rates in the US, EMU and Japan**



Source: IMF: IFS.

With money supply increasing considerably faster than output in the stagnating Japanese economy the so-called carry trade emerged. International investors and hedge funds borrowed at low interest rates in Japan and lend at high yields in emerging markets. Because Japan and most of the (East Asian) recipient countries stabilized their currencies against the dollar, the currency risk of the carry trade remained widely contained. The (default) risk of the emerging market investments seemed rather low as the capital inflows had a positive effect on the credit worthiness. With interest rates falling, investment and consumption rose contributing to more growth and improved credit ratings. The resulting boom periods allowed for low government deficits and better sovereign ratings. This attracted new capital inflows which reinforced the boom.

The Greenspan era further contributed to the growing global liquidity supply. Just in office as the Chairman of the Federal Reserve Open Market Committee in August 1987, the New York Stock Exchange suddenly slumped. Greenspan – who claimed to favour a discretionary monetary policy which was able to react flexibly to short-term (financial market) developments – rushed to expand the liquidity supply to allow the financial institutions compensation for the losses. The monetary expansion in response to the (potential) financial

instability was justified by the fact that the collapse of one large financial institution would have destabilized the whole financial system by a chain reaction (Woodward 2001).

With Greenspan in office until January 2006, the “Greenspan put” characterized the Federal Reserve’s policy stance for about twenty years. In the face of financial turmoil, the Federal Reserve stood ready to safeguard the financial sector by an increasing liquidity supply. In contrast, when stock markets hiked the Fed’s policy stance remained benign as during the dotcom boom: Greenspan talked about “irrational exuberance” while the federal funds rate was only increased hesitantly (Shiller 2001).<sup>1</sup> When the New Economy bubble finally burst in October 2000 the – up to now – largest expansionary measure was taken. The federal funds rate fell from 6.5 percent in October 2000 to one percent in January 2003 (Figure 1). During Greenspan’s incumbency the money supply M3 had risen by 183 percent while real output had expanded by 70 percent.

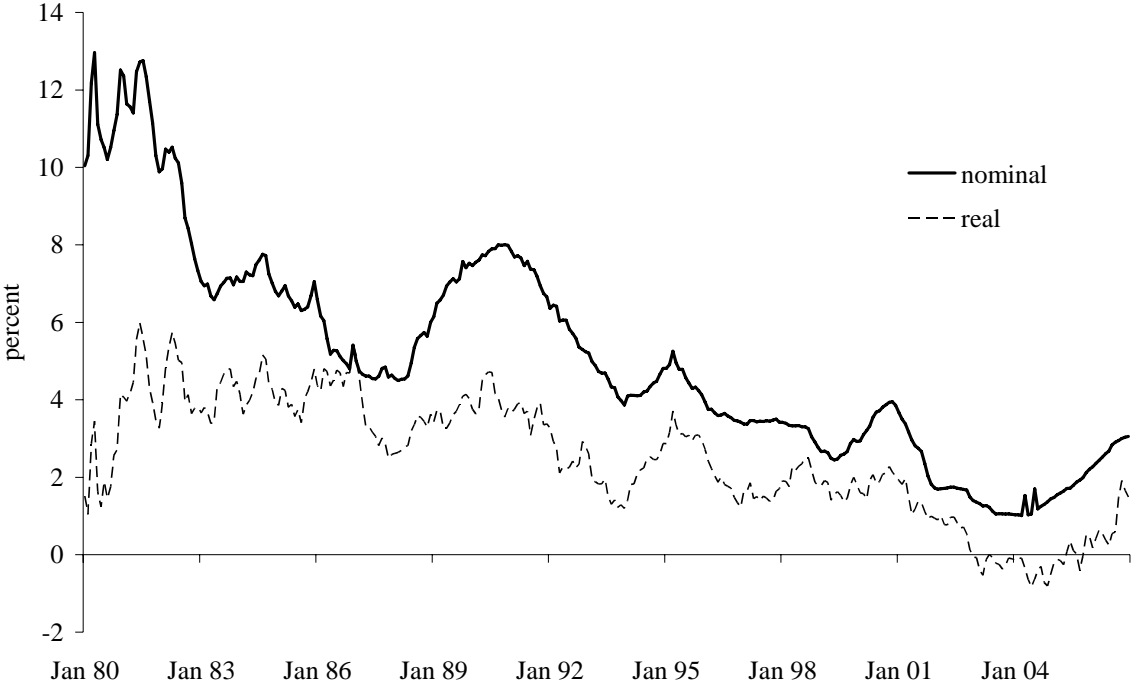
The European Central Bank followed hesitantly. After the ECB had started with a historically low interest rate level into the European Monetary Union and the euro had fallen strongly against the dollar, the ECB kept the interest rate high compared with the counterparts in the US and Japan. After the burst of the New Economy bubble interest rates were cut later and at a slower pace than by the Fed. But also in the euro area the main refinancing rate reached historical lows (Figure 1). Capital flows from the euro area into its small Central, Eastern and South-Eastern neighbouring countries accelerated. In specific, the Central and Eastern European countries with fixed exchange rate regimes experienced substantial accumulations of foreign reserves and monetary expansions.

In summer 2004 before the Federal Reserve started to raise the federal funds rate to today 5.25 percent, the global interest rate level – in Figure 2 approximated by the average interest rate in Japan, US and the euro area (Germany before 1999) – had reached its historical low. In real terms the average short-term interest rate had become negative.

---

<sup>1</sup> Such “asymmetric” central bank behavior with respect to asset market developments is modeled by Illing (2001, 2007).

**Figure 2: Average of US, EMU and Japanese Money Market Rates**



Source: IMF: IFS.

**2.2. Sticky Consumer Prices**

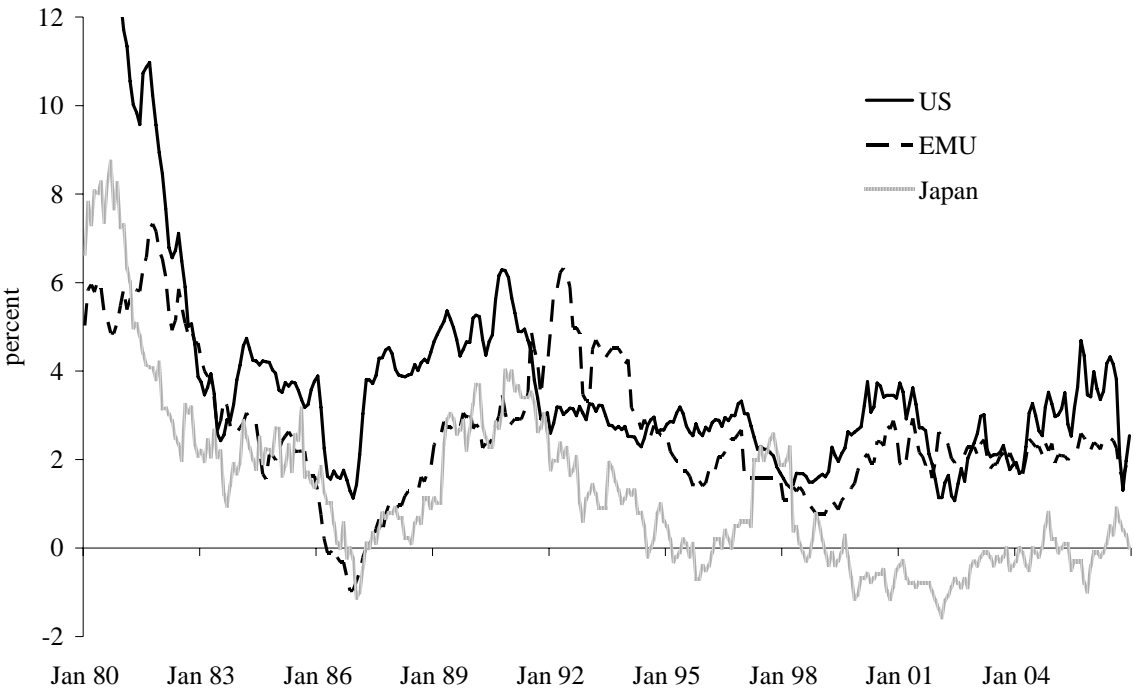
In contrast to the 1970s, when the fast monetary expansion in the industrialized countries led to a worldwide increase of inflation and a slow down of global growth, the declining interest rates since the mid 1980s left consumer price inflation widely untouched. Neither in the large industrial countries (Figure 3) nor in most emerging markets consumer price inflation accelerated beyond a level which could be perceived as detrimental for economic stability.

In Japan during the second half of the 1980s where inflation had fallen to zero in response to the post-Plaza yen appreciation, the general price increases remained moderate while stock and real estate markets skyrocketed. During the post-bubble recession, the resulting deflation persisted despite immense increases of the monetary base (Figure 3). The 144 percent growth of the Japanese monetary base between January 1990 and December 2005 was matched by a 10 percent increase of the consumer price index.

In the euro area, although the European Central Bank continued to “miss” its reference value for M3 growth by far, consumer price inflation was kept close to the 2 percent “target level”. Only little more inflation was observed in the US where the economy continued to boom

under Greenspan’s “magic” monetary policy (Figure 3). Even the sharp decline of the federal funds rate after the burst of the New Economy bubble did not trigger a worrying increase in consumer price inflation. During the incumbency of Alan Greenspan, stock prices had tripled, while inflation had remained moderate. Alternative approaches to inflation measurement like hedonic prices or core inflation which adjusted consumer price inflation by quality improvements and by (soaring) energy and food prices further softened concerns about inflationary pressure.

**Figure 3: Consumer Price Inflation in the US, EMU and Japan**



Source: IMF: IFS.

The academic community reacted in two ways. First, explicit or implicit inflation targeting frameworks (Bernanke and Mishkin 1997, Mishkin 2000) became popular in industrial countries. Because the growth of the money demand and its impact on inflation had become difficult to predict, (expected) inflation was seen as a more reliable monetary policy target. Also an increasing number of emerging market economies adopted inflation targeting frameworks – often instead of (explicit) exchange rate pegs. (Controlled) appreciations of the emerging market currencies helped to achieve ambitious inflation targets.

The rise of inflation targeting regimes was accompanied by criticism concerning monetary policy targets as represented by the (now) second pillar of the ECB monetary policy strategy.

A neo-Keynesian model generation (Woodford 2001) suggests that monetary policy decisions can be made without particular reference to money. Because the (academic) focus of monetary policy shifted from broad money supply towards inflation targeting, moderate observed consumer price inflation as a proxy for future inflation seemed to legitimate high growth rates of money supply. Implicit inflation targeting regimes as used by the Federal Reserve provided additional discretionary leeway for monetary policy decisions.

A second strand of literature – which can be seen as the monetarist view – focused on the impact of the liquidity conditions on asset markets. As stock and real estate prices soared while inflation remained moderate, it was argued that surplus liquidity mainly poured into the asset markets and that consumer prices had ceded to provide a comprehensive measure of inflation (Polleit 2005). With inflation being interpreted as a in the long term (always and everywhere) monetary phenomenon it was proposed to include asset prices, in specific real estate prices, into the monetary policy objective function.

Indeed, bubbles seemed to emerge in stock, raw material, currency and real estate markets in both the industrial countries and in a rising number of emerging market economies. Once a bubble burst somewhere in the world, new bubbles propped up somewhere else: Bubbles vagabonded around the globe, for instance from Japan to East Asia, from East Asia to the New Markets of the industrialized countries, and from there inter alia to the US real estate market, Central and Eastern Europe, China and the raw material exporting countries.

### **3 Boom-and-Bust Cycles in East Asia and the New Markets**

The first wave of bubbles emerged in “mighty” East Asia on its ascension to the worlds’ new industrial hub. The Japanese bubble economy in the 1980s as well as the East Asian boom in the 1990s can be explained by the real and monetary overinvestment theories of Joseph Schumpeter (1983), Friedrich August von Hayek (1976), and Knut Wicksell (2005).

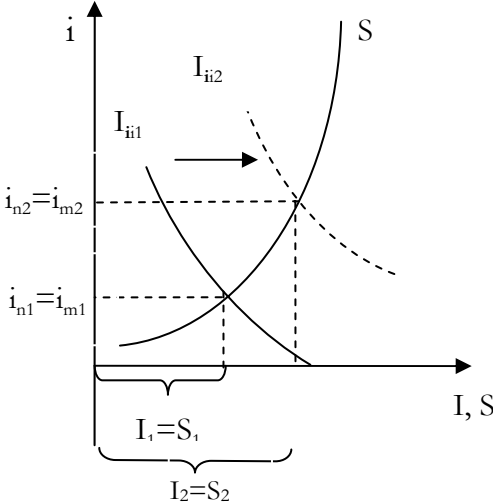
#### **3.1 The Overinvestment Theories**

Schumpeter (1983), Hayek (1976), and Wicksell (2005) developed their overinvestment theories in the early 20th century to explain business cycles as the outcome of innovation (real

overinvestment theories) and benign liquidity conditions (monetary overinvestment theories). In the monetary overinvestment theories the cyclical fluctuations are either caused by a “pervert elasticity” of the private banking sector (Hayek) or by central bank “mistakes” (Wicksell). Asset market bubbles were seen as a side effect of real output fluctuations.

The overinvestment theories are based on the distinction between three types of interest rates: First, the “*internal interest rate*” reflects the expected return of planned investment projects. Second, the “*natural interest rate*” is equivalent to an equilibrium interest rate which balances supply (saving) and demand (investment) on capital markets. Third, the “*the money market rate*” is set by the banking sector (Hayek) or by the central bank (Wicksell). A business cycle is triggered when the internal interest rate rises (Schumpeter) and / or the money market rate falls below the natural interest rate (Hayek and Wicksell).

Figure A: Equilibrium



As in Figure A as long as the natural interest rate  $i_{n1}$  is equal to the money market rate  $i_{m1}$ <sup>2</sup> saving  $S_1$  is equal to investment  $I_1$ . The capital and goods markets are in equilibrium and there is no upward pressure on inflation. In Schumpeter’s framework the economic upswing starts due to an exogenous rise of the internal interest rate  $i_i$ . According to Hayek, Schumpeter’s concept of “new combinations” (i.e. innovations) can be the reason for a rising internal interest rate (Hayek 1976, 95). The expected returns of investment may also rise due to new production processes or technologies – as in the case of the New Economy – or by the discovery of new markets or production locations – as in the case of China and Central and

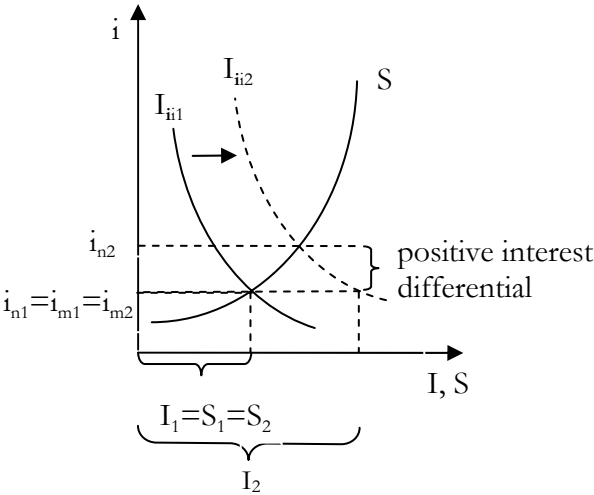
<sup>2</sup> For simplicity it is assumed that the money market interest rate is equal to the capital market interest rate.

Eastern Europe. New financial instruments as in the US subprime market can be seen as another type of innovation.

With a rising internal interest rate investment is growing and the demand on money (capital) markets expands. This leads to a rising natural interest rate ( $i_{n2} > i_{n1}$ ). To maintain the capital and goods markets in equilibrium, in perfect capital markets the money market interest rate would increase as well ( $i_{n2} = i_{m2}$  in Figure A). But in Wicksell’s model the central bank continues to supply liquidity at an unchanged money market rate ( $i_{m1} = i_{m2}$ ).

The positive differential between the natural interest rate and the prevailing money market interest rate ( $i_{n2} > i_{m2}$  in Figure B) drives the economic upswing. Enterprises start investment projects with both high and comparatively low expected returns (Wicksell 2005, 113). In Figure B, which models the upswing, private savings remain constant because additional savings are not rewarded by a higher money market interest rate. As investment continues to grow due to multiplication effects, an investment overhang emerges ( $I_2 > S_2$ ) (Wicksell 2005, 134).

Figure B: Upswing



While in Wicksell’s (2005) framework the central bank is responsible for the “liquidity overhang”, Hayek (1976) assumes that the money creation originates in the private banking sector. The competition among the financial institutions spurs credit growth. The banking sectors’ credit to the private sector exceeds the amount of savings for two reasons (Hayek 1976, 84, 99-103). First, competition among commercial banks holds interest rates down.

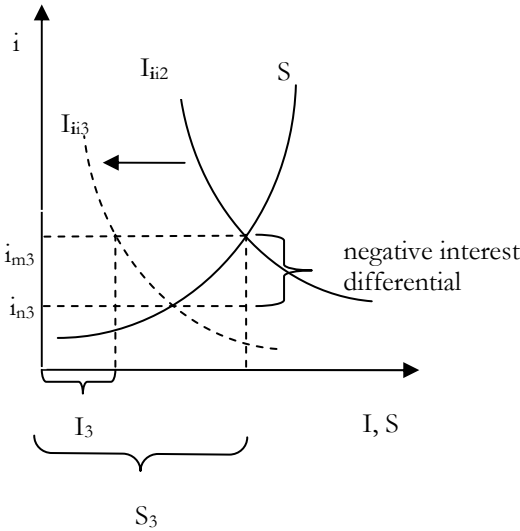
Second the commercial banks underestimate the risks linked to overborrowing. Moral hazard matters when depositors and banks believe that possible losses in the case of speculation will be covered by an (deposit) insurance system (Herring and Wachter 2002, 10). Alternatively, the hope that interest rates will decline rapidly in response to a bursting bubble may contribute to moral hazard.

The upswing continues as the demand for investment goods rises. Wages and consumption increase. Capacity reserves are activated. The positive economic expectations can be transmitted to the asset markets where speculation may set in. According to Schumpeter (1983, 237) price expectations of stocks and other real assets can be disconnected from the real economic development. A speculative mania may emerge, in which speculative price projections and “the symptoms of prosperity themselves finally become, in the well known manner, a factor of prosperity” (Schumpeter 1983, 226). Finally also (sticky) consumer price inflation accelerates (Wicksell 2005: 119-124, 127, 134).

With investment exceeding saving the economic upswing is not sustainable and the turnaround is inevitable. It occurs when consumer and asset price inflation in asset markets accelerate. In Wicksell’s model (2005, 134) the central bank finally increases the interest rate to contain the inflationary pressure. In Hayek’s (1976, 101) framework the banking sector does not renew credit lines after reassessing the risk. With the money market rate rising, the threshold for the profitability of all previous investment projects is lifted. Now, (speculative) investment projects which are characterized by an internal interest rate which is below the risen money market rate become obvious and are dismantled.

The structural adjustment pulls enterprises, consumers and financial institutions into the whirlpool of the crisis (Hayek 1976, 102-103). As single investment projects are dismantled, others become unprofitable as general demand declines (negative multiplication effect). Expectations turn negative which further dampens the investment and consumption activity. A recession follows which will be the deeper the larger the “exuberance” has been. In Wicksell’s theory the central bank aggravates the economic downturn as the response to the inflationary pressure is too harsh and the money market interest rate is held above the natural interest rate (Figure C). The negative interest rate differential contributes to increasing unemployment and declining stock prices.

Figure C: Downswing



According to Hayek (1976) the structural adjustment after the turnaround is a necessary prerequisite for the recovery after the slump. Profitable investment projects (with high internal interest rates) are separated from investment projects with low profitability (low internal interest rates). Schumpeter (1983, 213) argues that “every boom is followed by depression, every depression by a boom”. The “creative destruction” during the downswing is seen as the prerequisite for the new upswing as it clears the market of non-profitable investment projects (Schumpeter 1983, 213). Without such a cumbersome process investment projects with low internal interest rate would be maintained, the necessary restructuring would be postponed, and the following upswing would not be sustainable.

**3.2 Vagabonding Bubbles in East Asia and the New Markets**

Schumpeter’s (1983), Hayek’s (1976) and Wicksell’s (2005) overinvestment theories can be used as tools to analyse the role of the monetary policies in the large industrialized countries for the boom and bust cycles in East Asia and in the New Markets. They also allow a projection of the future path of international financial and economic stability.

Given East Asia’s bright economic perspective during the past three decades, it is in line with Kindleberger (2000) that speculative bubbles have in particular emerged there. Although the overinvestment theories explain business cycles in a closed economy, they also fit for open economies which are linked through international capital markets. In East Asia, the Bank of Japan can be seen as the source of ample liquidity which contributed to bubbles in Japan and its small neighbouring economies. When after the Asian crisis the international capital drifted

back into the safe havens of the industrialized countries, it was absorbed by the IT Markets, i.e. the so-called New Economy or dotcom bubbles.

### *Bubbles in Japan and East Asia*

The first important bubble emerged in the mid 1980s in Japan. After Japan had liberalized its international capital flows in the early 1980s, a substantial trade surplus came into existence which was matched by a trade deficit of the United States. Japan's export surplus was linked to the strength of its (high technology) industry. A euphoria concerning the Japanese economic power emerged.<sup>3</sup> The 1985 Plaza Agreement was a (US led) internationally coordinated attempt to reduce the US-Japanese trade imbalance by a strong appreciation of the yen against the dollar (Funabashi 1989).<sup>4</sup> After the Plaza Agreement had failed to reduce the trade surplus Japan agreed to implement expansionary monetary and fiscal policies to reduce the imbalance via a rising import demand (Louvre Accord in February 1987).

The Plaza and Louvre agreements can be seen as the origin of the Japanese bubble economy. In response to the Plaza appreciation the Bank of Japan gradually lowered interest rates to counteract the strong "high-yen induced" recession (McKinnon and Ohno 1997) (Figure 4). After Japanese growth had picked up again in 1987 the interest cuts continued due to the expansionary macroeconomic policies following the Louvre Accord. The Japanese call money rate declined from 8 percent in December 85 to 3.5 percent in March 88. Thus, as in Wicksell's theory the central bank reduced the interest rate although output expanded.

The outcome was a speculation boom in the Japanese real estate and stock markets (Figure 5).<sup>5</sup> Between 1985 and December 1989 prices at the Tokyo stock exchange tripled. Real estate prices soared and the land price of the Japan's imperial palace reached the worth of whole California (Schnabl and Starbatty 1998, 13). In line with Wicksell's monetary overinvestment theory – and the benefit of hindsight – Bernanke (2000: 150-151) called the Bank of Japan monetary policy during the bubble a "central bank failure".

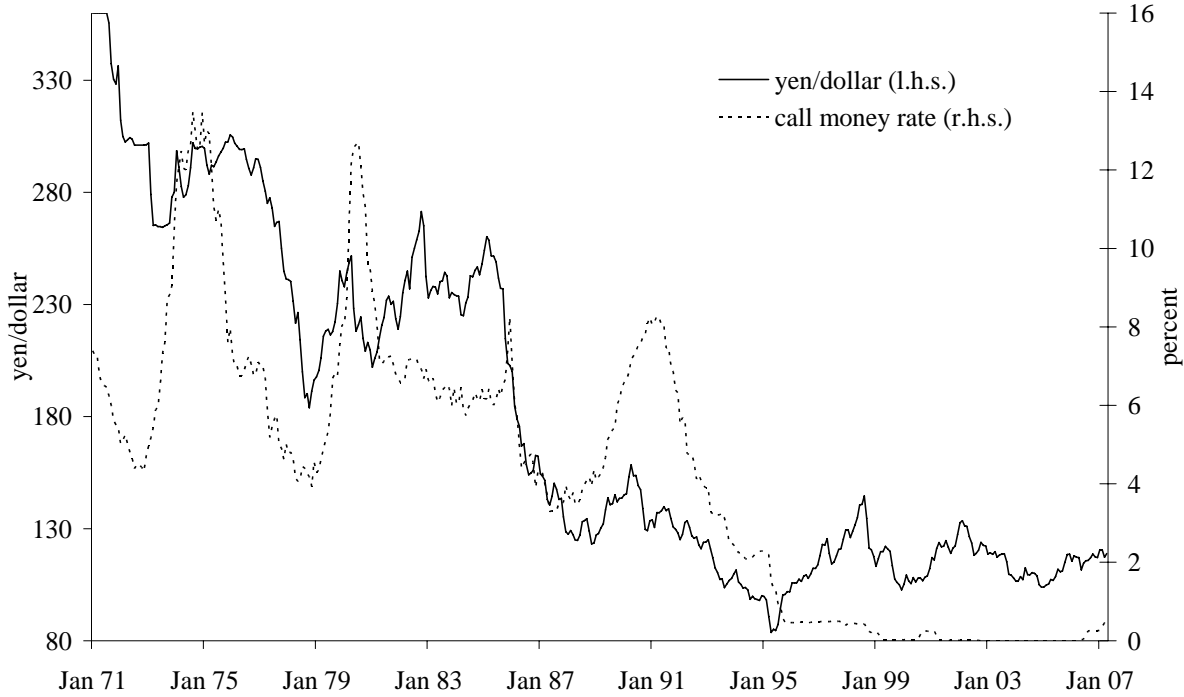
---

<sup>3</sup> Japan's international economic success triggered a "bubble" of (academic) literature which analysed the reasons. One in this respect outstanding book is the "Enigma of Japanese Power" by Karel van Wolferen (1990).

<sup>4</sup> This is reminiscent of current attempts to urge China to appreciate the Chinese yuan to correct the Chinese-US trade imbalance (see for instance "The Case for a New Plaza Agreement" by Cline (2005)).

<sup>5</sup> Other factors such as the liberalization of the Japanese financial market contributed to the bubble. For further analysis see Bayoumi and Collins (2000).

**Figure 4: Yen/Dollar Exchange Rate and Japanese Call Money Rate**



Source: IMF: IFS.

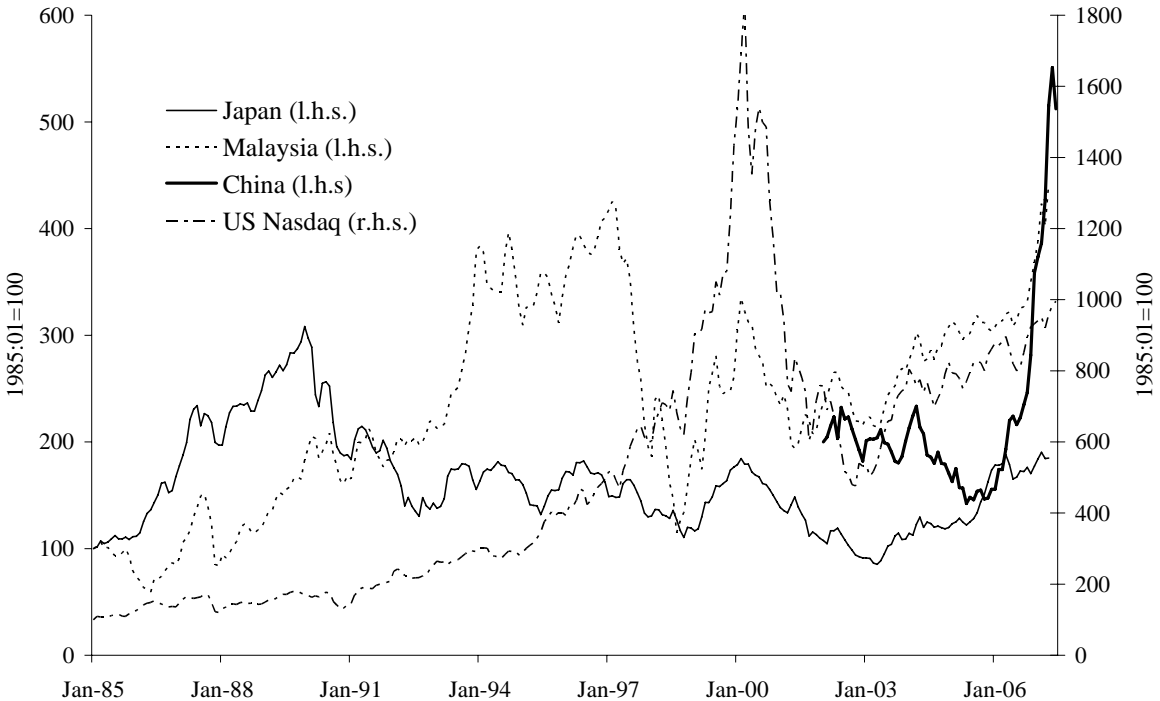
Like in Wicksell’s model, the bubble was pricked in December 1989 by the central bank, which strived to contain the bubble. From May 1988 the Japanese money market rate climbed from 3.5 percent back to 8 percent in June 1990 (Figure 1). The resulting burst of the bubble in December 1989 brought Japan into an unprecedented recession which persisted during the whole 1990s (the “lost decade”). The financial institutions suffered from a severe bad loan problem which was transmitted via a credit crunch to the enterprise sector (Hutchison, Ito and Westermann 2006). Now as in Wicksells’ model, the Bank of Japan was criticized to have held interest rates too high for too long (Bernanke 2000: 150-151). To counteract the deep recession the monetary stance was loosened again and interest rates drifted gradually towards zero (Figure 1).

Hayek (1976, 95-103) provides an explanation why Japan’s post-bubble liquidity glut could not revive the ailing Japanese economy. The injections of cheap liquidity postponed the “creative destruction” in the financial and enterprise sector thereby conserving the structural distortions which had emerged during the bubble. Instead of stimulating Japans economy the monetary loosening brought the bubble to Japan’s small East Asian neighbouring countries. The ailing Japanese financial institutions strengthened their capital ratios by borrowing in

Japan at very low interest rates and lending at high interest rates to the smaller East Asian economies.

This carry trade and hunt for yield in two generations of tiger economies led to rising international liabilities, foreign exchange exposure and buoyant asset markets in South-East Asia. Because all East Asian countries (and Japan) stabilized their currencies against the dollar, the currency risk of the carry trade seemed to be contained. In Figure 5 Malaysia represents the investment boom in the East Asian tiger economies.

**Figure 5: Stock Markets in Japan, Malaysia, the US and China**



Source: IMF: IFS. China 2002:02=100.

In contrast to Japan the cumulative upswing in East Asia was not triggered by the local central banks but as in Hayek’s framework by the private international financial institutions which invested (Japanese) money in the small South-East Asian countries. The central banks of the tiger states contributed insofar as they translated capital inflows into monetary expansion via foreign exchange intervention.

The liquidity supply got tighter when growth in Japan recovered and capital outflows from Japan slowed down after 1995. The South-East Asian stock prices oscillated at a high level

(Figure 5). Rising consumer price inflation, unrealistic stock and real estate prices, real appreciation and growing current account deficits were seen as an indication that the East Asian boom was not sustainable. Foreign exchange intervention against the rising depreciation pressure led to falling foreign reserves and rising interest rates. Finally the currencies of five highly indebted tiger economies crashed. Because the foreign debt was mainly denominated in foreign currency, the financial crisis was inevitable. A painful structural adjustment process followed.

The Asian crisis visualized the financial interdependence between the debtor nations (tiger states) and the creditor country (Japan) which brought the crisis back to Japan (Schnabl and Starbatty 1998, 13). With the Asian crisis Japanese exports to South-East Asia and Japanese FDI in South-East Asia suffered. The Japanese banking sector which was already troubled by an immense domestic bad loan problem was weakened by new loan defaults in the small neighbouring countries. The Nikkei began to fall triggering the Japanese financial crisis which hit its peak with the bankruptcy of major financial institutions. The economic recovery of Japan was retarded for years, the interest rate hit the zero bound and the carry trade accelerated again.

### *The New Economy and Subprime Bubbles*

When emerging markets are struck by crises, international capital pours into the safe havens of the industrialized economies. In line with Hayek, now private capital nurtured the “New Economy” booms. Driven by euphoria about the digital revolution prices of IT (related) enterprises started to hike in the US (Nasdaq) and Europe (as represented by the Nasdaq in Figure 5). Soon Yahoo, Google and others dwarfed the companies of the “old market”. The profits of IT related enterprises, investment banks and hedge funds flourished. Alan Greenspan talked of “irrational exuberance”, while – in contrast to the Bank of Japan in response to the Japanese bubble – US interest rates remained widely unchanged (Shiller 2000). Greenspan argued that policy makers should not try to prick a bubble because it was extremely hard to spot them before they actually burst (Economist 2007).

The exuberance hit its peak in March 2000. In line with Hayek (1976) the turnaround was triggered by a reversal in the private sentiment. Because the extreme price decline in the new markets was expected to come along with huge losses for banks and hedge funds (including

spillovers to the real economy), the Federal Reserve cut its key interests rate rapidly to the historical low of one percent (Figure 1). From this perspective the post-bubble “policy failure” of the Bank of Japan (Bernanke 2000: 150-151) was not repeated in the US. Illing (2007) shows theoretically how interest rate cuts after the turnaround as most recently expected in response to the US subprime crises can prevent a meltdown. In Europe where similar exuberance had taken place, the European Central Bank reduced interest rates less and the European banks and enterprises faced more severe restructurings.

In the US the sharp interest cuts in response to the bursting bubble allowed financial institutions to compensate their losses more easily by new financial transactions. The economic slow down was short and real estate prices started to rise. Once expectations concerning price increases become sustained, according to Hayek (1976) the upward trend can be self-fulfilling. On the demand side of the real estate market, higher prices signal higher profits and more investors are attracted. The reservation price of real estate, which represents the propensity to pay, rises. On the supply side, real estate sales tend to decline as price increases are expected. The upward trend in real estate prices accelerates (Herring and Wachter 2002).

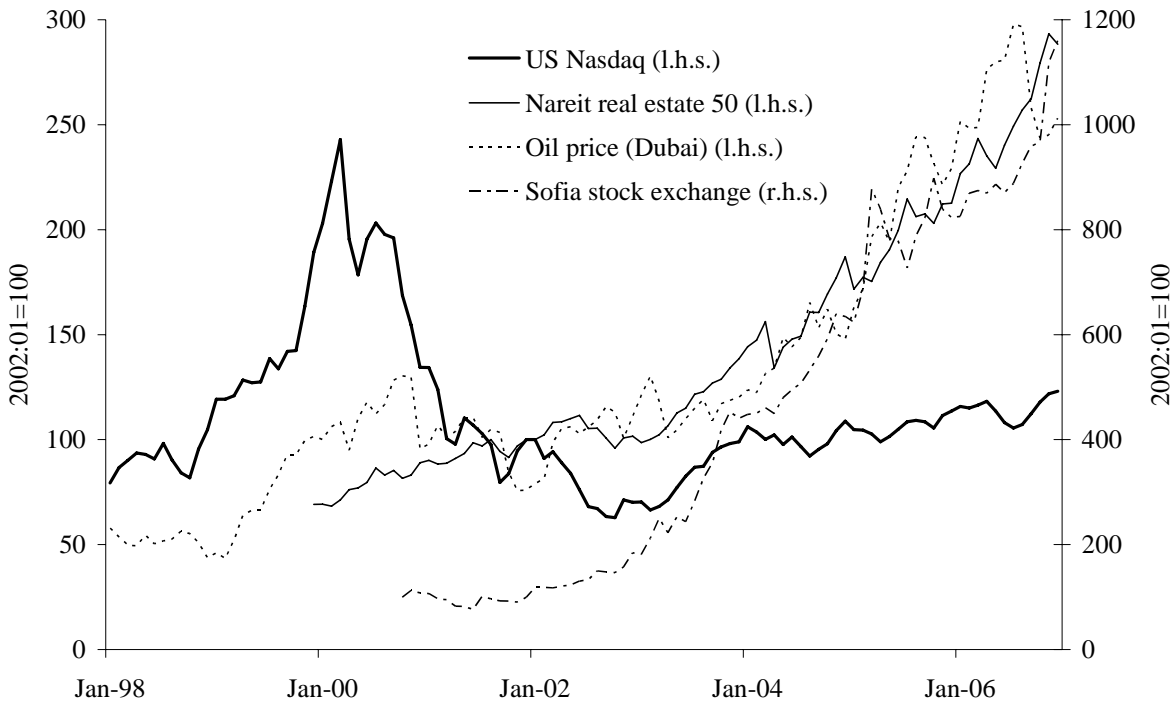
In times of falling interest rates the financial sector can create additional demand for credit not only via a lower price for its products but also by easing the credit conditions. If at a given interest rate the demand for the additional credit is too low, competition among the financial institutions may lead to less restrictive credit conditions, for instance in form of ninja loans (to people with No Income, No Job or Assets) as in the US subprime market. Such a falling quality of investment is more likely in the later phase of the upswing, as prime borrowers (or high yield investment projects) will be served (realized) first.

Thus, fuelled by the rapid monetary expansion a speculation bubble in the US real estate market (as represented by the Nareit index in Figure 6) emerged.<sup>6</sup> The burst of this real estate bubble triggered major concerns about economic instability in the US and important US creditor countries. Rising instability of the US and global financial markets led to increasing expectations that the Federal Reserve would lower interest rates and that the Bank of Japan and the European Central Bank would postpone interest rate increases.

---

<sup>6</sup> Greiber und Setzer (2007) show empirically that increasing money supply has affected real estate prices in both the US and the euro area.

**Figure 6: Stock Markets in China, US, Bulgaria and the Nareit real estate index**



Source: IMF: IFS, Shanghai Stock Exchange.

**4 Upswings in Emerging Markets and the Role of the Exchange Rate Regime**

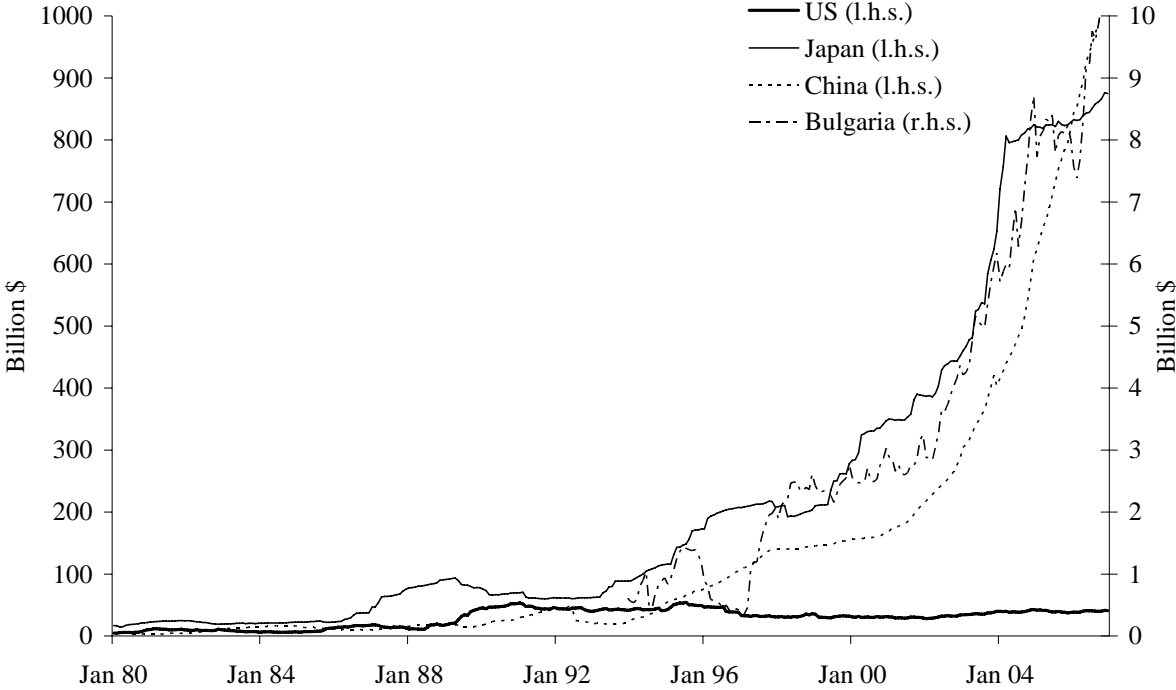
With the US being in the center of the world currency system the low level of interest rates in the US from 2001 into 2005 had international implications, as rising capital outflows from the US brought the dollar under depreciation pressure. In particular, emerging markets with (softly) fixed exchange rates (against the dollar) experienced fast reserve accumulation, brisk monetary expansion and “excessive” credit growth. The prices of (the mostly dollar denominated) raw materials soared (Figure 6).

**4.1 Credit Growth in China and Central and Eastern Europe**

Capital inflows into (inter alia) China and Central and Eastern Europe contributed to accelerating credit growth. In particular the East Asian countries (except Japan) – which traditionally (softly) pegged their currencies to the dollar – became the recipients of rising capital inflows. Now China had emerged as a global economic player which attracted due to the positive economic outlook both large amounts of foreign direct investment and short-term capital inflows. With the Chinese yuan being tightly pegged to the dollar, the rapid reserve

accumulation (Figure 7) was translated into a strong monetary expansion, as sterilization remained incomplete.<sup>7</sup>

**Figure 7: Foreign Reserves in the US, Japan, China and Bulgaria**



Source: IMF: IFS.

While the consumer price inflation in East Asia remained contained the resulting credit growth contributed to new booms, now with a special focus on China. Private international capital markets provided capital to the high growth Chinese economy at very low and widely unchanged interest rates. Despite an average growth rate of around ten percent lending rates in China were around 5.5 percent, substantially below the real growth rate. In contrast the nominal lending rate in the US remained substantially above the real growth rate. From Hayek (1976)’s perspective, the international capital inflows (and indirectly the expansionary policy of the US Fed) kept the Chinese interest rates “artificially” low.

Stocks at the Shanghai Stock Exchange (Figure 5) and other East Asian markets hiked. The now former Chairman of the Federal Reserve Alan Greenspan commented that Chinese share prices were “clearly unsustainable” with a risk of a “dramatic contraction” (Economist 2007). Because for the Peoples Bank of China the scope for restrictive monetary measures was

<sup>7</sup> In the case of China with fixed exchange rates the reserve accumulation is particularly strong as in addition to FDI and short-term capital inflows the current account is positive (McKinnon and Schnabl 2006).

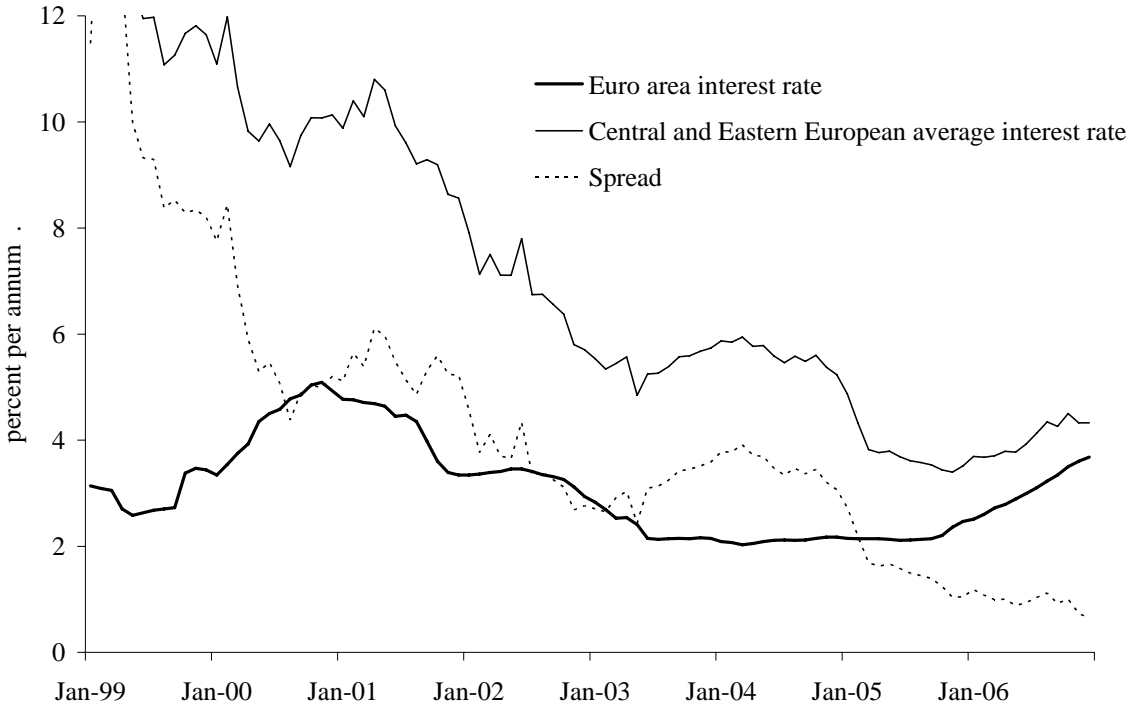
limited under the tight dollar peg (and therefore sterilization was incomplete), the Chinese government sought to slow down the stock market mania by moral suasion, regulatory measures and a stamp tax on stock transactions.

In Europe, after the burst of the new economy bubble, the interest rate cuts of the European Central Bank contributed to capital inflows into Central and Eastern Europe. Similarly to China a positive economic outlook of the region attracted both foreign direct investment and short-term capital inflows. Bank lending from euro area banks to their Central and Eastern European subsidiaries mushroomed due to high interest rate spreads vis-à-vis the euro area (Figure 8). In particular countries with fixed exchange rates – such as Bulgaria (Figure 7) and the Baltics – accumulated large stocks of foreign reserves. Stock, real estate and raw material prices skyrocketed (Figure 6).

While the post-crisis East Asian countries including China (similar to pre-bubble Japan) continue to run current account surpluses, the Central and Eastern European countries exhibit similar macroeconomic characteristics like the East Asian crisis economies before the crisis. In particular in the Central and Eastern European countries with fixed and intermediate exchange rate regimes capital inflows were reflected in rising asset prices, real appreciations and rising current account deficits. Although this deteriorating macroeconomic outlook can be seen as a sign for upcoming instability, in contrast to pre-crisis East Asia the stability of the foreign owned banking sectors and large stocks of FDI are arguments against possible financial turmoil.

Based on the overinvestment theories of Hayek (1976) and Wicksell (2005) there are two possible triggers for an economic turnaround. First, as the investment booms persist the internal interest rates of the new local investment projects tend to decline. Speculative investment might proliferate. Second, the future returns (internal interest rates) hinge on a low interest rate in the creditor country. Also stable exchange rates against the currency of the creditor country matter as in the emerging market economies foreign debt tends to be denominated in foreign currency (original sin) (Eichengreen and Hausmann 1999).

**Figure 8: Central and Eastern European Money Market Interest Rate Spread versus the Euro Area**



Source: IMF: IFS. The Central and Eastern European countries comprise the ten Central and Eastern European new EU member states. Arithmetic average.

The declining marginal productivity of (financial) investment in Central and Eastern Europe during the upswing can be assumed to be reflected by the spread between borrowing and lending rates. As shown in Figure 8 at the beginning of the economic upswing the spread between the euro area (euro) money market rate and the domestic lending rates was large. As capital inflows continued due to competition among banks the lending rates declined and the spreads were squeezed. To sustain profits at lower margins banks have an incentive to extend the lending volumes by taking more risk (Hayek 1976, 99). The share of foreign liabilities as percent of total liabilities in the aggregated balance sheets of the financial sectors increased rapidly together with the aggregated foreign exchange exposure (Backé, Égert and Zumer 2007).

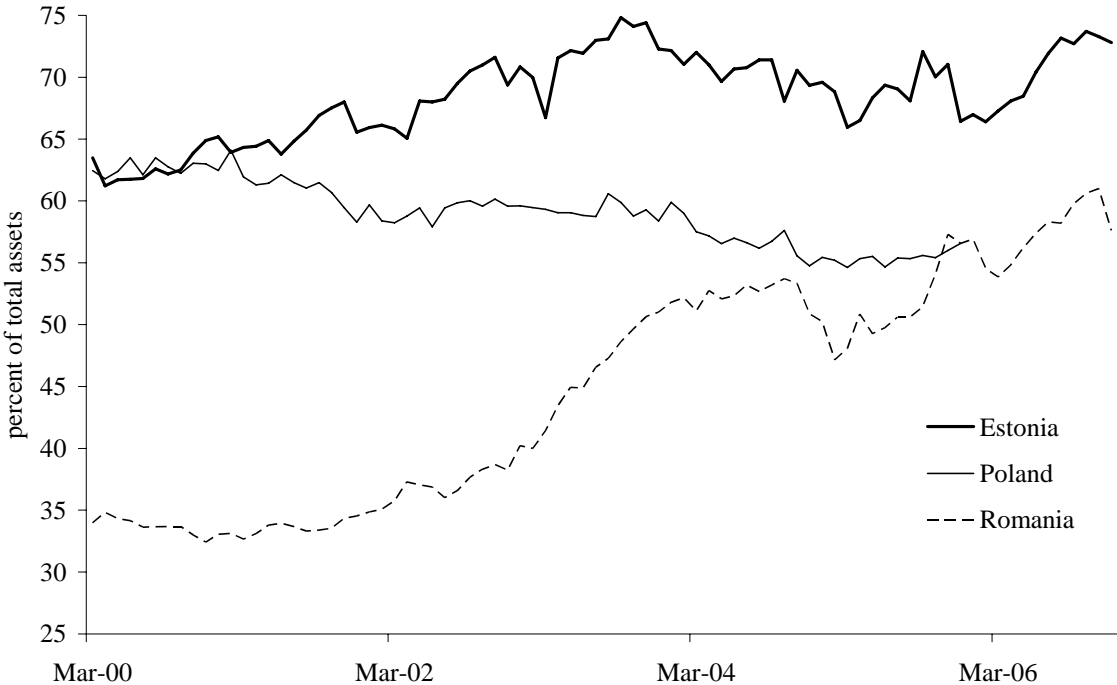
The capital inflows into the emerging markets tend to slow down when interest rates in the large industrial countries rise as since 2004 when the Federal Reserve took the lead in a tighter monetary policy stance. According to Wicksell (2005) and Hayek (1976) an increase of interest rates signals the turnaround of the business cycle. The threshold for the profitability of investment projects is rising and an increasing of number of (speculative) investment projects may turn out as non-profitable. As Martin, Schuknecht und Vanstenniste

(2007, 26) put it the "reversal of capital flows can easily tip countries from a "simple" bust into a full-fledged crisis when there are significant external liabilities – even when public debt is small." Contagion can transport the turmoil across the (emerging) world.

**4.2 The Role of the Exchange Rate Regime**

The overinvestment theories of Schumpeter (1983), Hayek (1976) and Wicksell (2005) were modelled for closed economies and do not provide information with respect to the role of the exchange rate regime for boom and bust cycles. Fixed exchange rates have played a crucial role for the East Asian crisis (Fischer 2001) and for the credit booms in China and Central and Eastern Europe (Schnabl 2007a). As shown in Figure 9, the Central and Eastern European countries with fully flexible exchange rates such as for instance Poland experienced more moderate credit growth than the countries with (softly) fixed exchange rate regimes such as for instance Estonia and Romania. Does this imply that flexible exchange rates are the better policy response for emerging market economies to buoyant capital inflows?

**Figure 9: Credit to the Private Sector in Estonia, Poland and Romania**

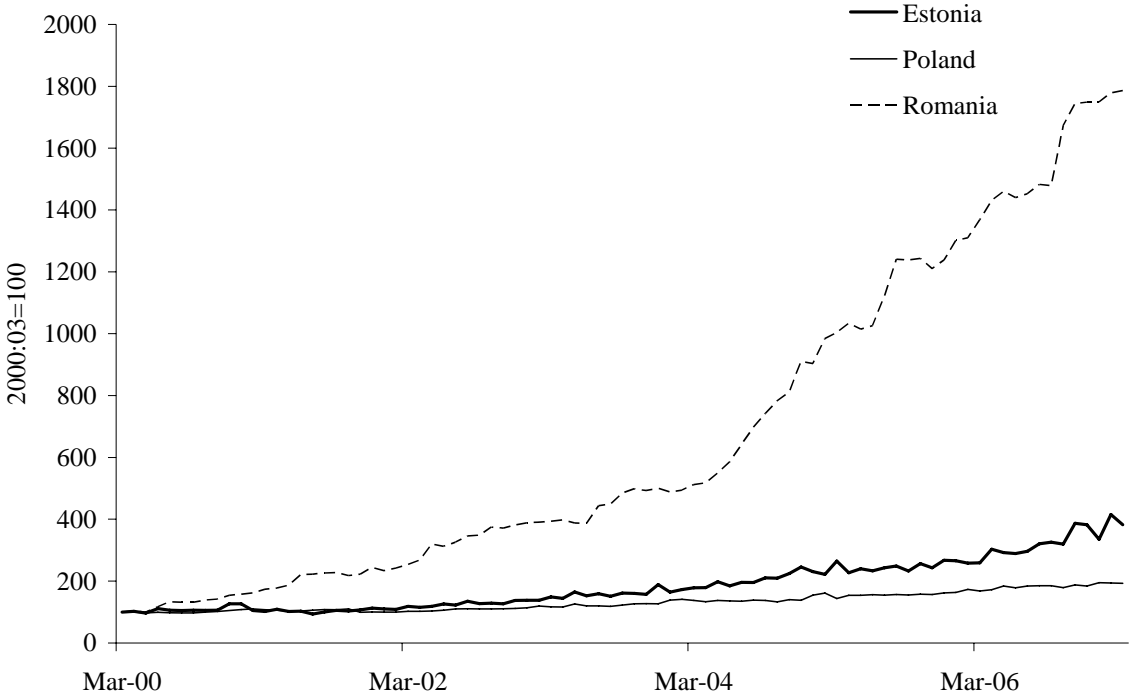


Source: IMF: IFS. Romania includes credit to private non-bank financial institutions.

In general, fixed exchange rates contribute to a more efficient international capital allocation and macroeconomic stability in small open economies (Schnabl 2007b). Because under fixed

exchange rates the central bank of the pegging country mimics the monetary policy of the anchor country, an overinvestment boom in the emerging market can be caused by a low interest rate in the anchor country. This is even more the case because financial stability in the pegging country does not enter the objective function of the anchor countries' central bank. The risk of overinvestment in the emerging markets with fixed exchange rates rises when the monetary conditions in the anchor country are exceptionally loose.

**Figure 10: Foreign Reserves in Estonia, Poland and Romania**



Source: IMF: IFS.

For instance, as in Estonia the exchange rate is tightly pegged, capital inflows are translated directly into a monetary expansion. This favours credit growth and possibly overinvestment, because the scope to control the monetary expansion by sterilization is limited.<sup>8</sup> In contrast, if the central bank leaves the exchange rate to market forces, the appreciation of the domestic currency would slow down exports and growth. The deteriorating growth outlook is likely to dampen capital inflows. Indeed, Poland which has allowed for full exchange rate flexibility has experienced the slowest reserve accumulation among the Central and Eastern European economies (Figure 10). Credit to the private sector as percent of total assets of the banking sector has even declined since 2001 (Figure 9).

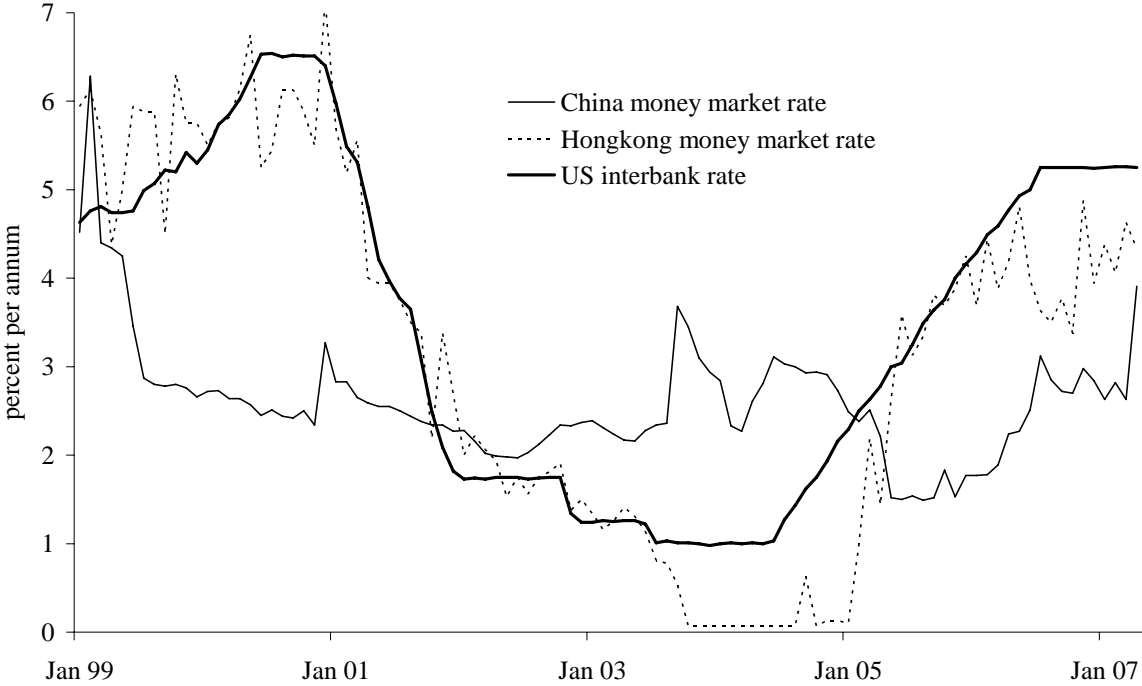
<sup>8</sup> Every attempt to tighten the money supply leads to interest rate increases which attract new capital inflows.

But the cost of fully flexible exchange rates in the face of buoyant capital inflows is significantly lower growth as exports decline. Due to higher uncertainty the risk premium on interest rates will rise slowing down investment and consumption (Schnabl 2007b). The upshot is that a strong appreciation in response to capital inflows will be politically difficult to defend. The likelihood of discretionary foreign exchange intervention against “excessive appreciation” rises. This is even more the case when GDP per capita is low (as currently in China) and if neighbouring countries with fixed exchange rate regimes experience high growth due to buoyant capital inflows (as currently in Estonia).

If the growth outlook improves due to discretionary exchange rate smoothing and if appreciation expectations become sustained this may encourage one way bets on the appreciation. The outcome can be additional speculative capital inflows. For instance, Romania which has allowed for a controlled appreciation of its currency since 2004 has experienced the fastest accumulation of foreign reserves among the Central and Eastern European economies (Figure 10). Credit to the private sector as percent of total assets of the banking sector has increased fast surpassing the level in Poland and approaching the level of Estonia (Figure 9). This implies a fast rising foreign exchange exposure of the Romanian financial sector. Similarly as shown for Japan after the Plaza Agreement, discretionary interest rate cuts which intend to dampen appreciation pressure (instead of foreign exchange intervention) can trigger speculative bubbles also in countries with (widely) flexible exchange rate regimes.

The fact that appreciation expectations contribute to lower interest rates in comparison to a fixed exchange rate regime can also be observed in China. China which has allowed for a controlled appreciation of the Chinese yuan since July 2005 did not experience a slow down in reserve accumulation (although US interest rates continued to increase) (Figure 7). Moreover the short-term interest rate has fallen below the US interest level further stimulating the economic activity of the Chinese economy. In contrast, in Hong Kong which has kept its exchange rate tightly pegged to the dollar the inter bank rate followed more closely the rising federal funds rate (Figure 11). The outcome is that appreciation expectations have further contributed to overinvestment in the Chinese economy by keeping interest rates low in an environment of worldwide increasing interest rates.

**Figure 11: Money Market Rates in China, Hong Kong and US**



Source: IMF: IFS.

**5 Outlook**

We have shown that the overinvestment theories of Schumpeter (1983), Wicksell (2005) and Hayek (1976) allow explaining the boom and bust cycles in worldwide stock, real estate and raw material markets. Low cost liquidity can contribute to irrational investment booms that can make economic miracles self-fulfilling. Although, by definition it is difficult to spot bubbles before they burst the monetary overinvestment theories allow us to project a higher probability of boom and bust cycles in an environment of ample liquidity supply.

The past experiences in East Asia as well as the recent crisis in the US real estate market have shown that expansionary monetary policies in response to financial instability can calm markets. In the view of the monetary overinvestment theories this effect would be only short term. In the long run a too low interest rate during the post-bubble downswing would postpone the “creative destruction” which is a necessary prerequisite for a sustained recovery. This is most evident from post-bubble Japan where structural inefficiencies were reinforced by the zero interest rate policy and where the periods of economic recovery were mainly led by exports and financial investment outside Japan.

The Japanese experience also shows that generous interest rate cuts after bursting bubbles contributed to new bubbles (outside Japan) which sooner or later lead to new financial turmoil. If today decisive interest cuts help to ban the danger of economic turmoil and recession, moral hazard in the banking sector and additional structural inefficiencies would emerge. The long-term adjustment burden would further rise. Yet in the future the scope to postpone the post-bubble adjustment burden by interest rate cuts is limited as world wide interest rates are already close to the zero bound.

## References:

- Backe, Peter / Égert, Balazs / Zumer, Tina 2006: Credit Growth in Central and Eastern Europe. *ECB Working Paper 687*.
- Bayoumi, Tamim / Collins, Charles 2000: *Post-Bubble Blues: How Japan Responded to Asset Price Collapse*. Washington, D.C.
- Bernanke, Ben / Mishkin, Frederic 1997: Inflation Targeting: A New Framework for Monetary Policy? *Journal of Economic Perspectives* 11, 2, 97-116.
- Bernanke, Ben 2000: Japanese Monetary Policy: A Case of Self-Induced Paralysis. In: Mikitani, Ryoichi / Posen, Adam (eds.): *Japan's Financial Crisis and Its Parallels to U.S. Experience*. Washington D.C., 149-166.
- Cline, William 2005: The Case for a New Plaza-Agreement. *Institute for International Economics Policy Briefs 05-4*.
- Economist 2007: The Boiling Point. 23.6.2007, 84.
- Eichengreen, Barry / Hausmann, Ricardo 1999: Exchange Rates and Financial Fragility. *NBER Working Paper 7418*.
- Funabashi, Yoichi 1989: *Managing the Dollar: From Plaza to Louvre*. Washington DC.
- Greiber, Claus / Setzer, Ralph 2007: Money and Housing – Evidence for the Euro Area and the US. *Deutsche Bundesbank Discussion Paper*.
- Hayek, Friedrich 1976: *Geldtheorie und Konjunkturtheorie*. Salzburg.
- Herring, Richard / Wachter, Susan 2002: Bubbles in Real Estate Markets. *Mimeo*.
- Hutchison, Michael / Ito, Takatoshi / Westermann, Frank 2006: The Great Japanese Stagnation: Lessons for Industrial Countries. In: Hutchison, Michael / Westermann, Frank (eds.): *Japan's Great Stagnation Financial and Monetary Policy Lessons for Advanced Economies*. Cambridge, Massachusetts, 1-32.

- Illing, Gerhard 2001: Financial Fragility, Bubbles and Monetary Policy. *CESifo Working Paper 449*.
- Illing, Gerhard 2007: Financial Stability and Monetary Policy – A framework. *CESifo Working Paper No. 1971*.
- Kindleberger, Charles 2000: *Manias, Panics, and Crashes*. New York et al.
- Martin, Rainer / Schuknecht, Ludger / Vansteenkiste, Isabell 2007: Boom and Bust Episodes and the Choice of Adjustment Strategy. *Mimeo*.
- McKinnon, Ronald / Ohno, Kenichi 1997: *Dollar and Yen: Resolving Economic Conflict between the United States and Japan*. Cambridge, Massachusetts.
- McKinnon, Ronald / Schnabl, Gunther 2004: The East Asian Dollar Standard, Fear of Floating, and Original Sin. *Review of Development Economics* 8, 3, 331-360.
- McKinnon, Ronald / Schnabl, Gunther 2006: China's Exchange Rate and International Adjustment in Wages, Prices, and Interest Rates: Japan Déjà Vu? *CESifo Studies* 52, 2, 276-303.
- Mishkin, Frederic 2000: Inflation Targeting in Emerging Market Countries. *American Economic Review* 9, 2, 105-109.
- Polleit, Thorsten 2005: Stable Money: Myth and Reality. *Mimeo*.
- Shiller, Robert 2000: *Irrational Exuberance*. Princeton.
- Schnabl, Gunther 2007a: Exchange Rate Volatility and Growth in Emerging Europe and East Asia. *CESifo Working Paper 2023*.
- Schnabl, Gunther 2007b: Exchange Rate Volatility and Growth in Small Open Economies at the EMU Periphery. *ECB Working Paper 773*.
- Schnabl, Gunther / Starbatty, Joachim 1998: Im Strudel der japanischen Krise. *Frankfurter Allgemeine Zeitung*, 22.08.1998, 13.
- Schumpeter, Joseph 1983: *The Theory of Economic Development*. Cambridge, Massachusetts.
- Van Wolferen, Karel 1990: *The Enigma of Japanese Power*. New York.
- Wicksell, Knut 2005: *Geldzins und Güterpreise*. München.
- Woodford, Michael 2001: Pitfalls of Forward-Looking Monetary Policy. *American Economic Review*, 90, 2, 100-104.
- Woodward, Bob 2001: *Maestro: Alan Greenspan's Fed and the American Economic Boom*, New York.

# CESifo Working Paper Series

for full list see [www.cesifo-group.org/wp](http://www.cesifo-group.org/wp)

(address: Poschingerstr. 5, 81679 Munich, Germany, [office@cesifo.de](mailto:office@cesifo.de))

---

- 2036 Burkhard Heer and Alfred Maussner, Inflation and Output Dynamics in a Model with Labor Market Search and Capital Accumulation, June 2007
- 2037 Konstantinos Angelopoulos, Jim Malley and Apostolis Philippopoulos, Public Education Expenditure, Growth and Welfare, June 2007
- 2038 Maarten Bosker, Steven Brakman, Harry Garretsen and Marc Schramm, Adding Geography to the New Economic Geography, June 2007
- 2039 Steffen Henzel, Oliver Hülsewig, Eric Mayer and Timo Wollmershäuser, The Price Puzzle Revisited: Can the Cost Channel Explain a Rise in Inflation after a Monetary Policy Shock?, July 2007
- 2040 Rosario Crinò, Service Offshoring and White-Collar Employment, July 2007
- 2041 Carsten Hefeker and Michael Neugart, Labor Market Regulation and the Legal System, July 2007
- 2042 Bart Cockx and Muriel Dejemepe, Is the Notification of Monitoring a Threat to the Unemployed? A Regression Discontinuity Approach, July 2007
- 2043 Alfons J. Weichenrieder, Profit Shifting in the EU: Evidence from Germany, July 2007
- 2044 Annika Alexius and Bertil Holmlund, Monetary Policy and Swedish Unemployment Fluctuations, July 2007
- 2045 Axel Dreher, Jan-Egbert Sturm and Jakob de Haan, Does High Inflation Cause Central Bankers to Lose their Job? Evidence Based on a New Data Set, July 2007
- 2046 Guglielmo Maria Caporale and Luis A. Gil-Alana, Long Run and Cyclical Dynamics in the US Stock Market, July 2007
- 2047 Alessandro Balestrino, It is a Theft but not a Crime, July 2007
- 2048 Daniel Becker and Michael Rauscher, Fiscal Competition in Space and Time: An Endogenous-Growth Approach, July 2007
- 2049 Yannis M. Ioannides, Henry G. Overman, Esteban Rossi-Hansberg and Kurt Schmidheiny, The Effect of Information and Communication Technologies on Urban Structure, July 2007
- 2050 Hans-Werner Sinn, Please Bring me the New York Times – On the European Roots of Richard Abel Musgrave, July 2007

- 2051 Gunther Schnabl and Christian Danne, A Role Model for China? Exchange Rate Flexibility and Monetary Policy in Japan, July 2007
- 2052 Joseph Plasmans, Jorge Fornero and Tomasz Michalak, A Microfounded Sectoral Model for Open Economies, July 2007
- 2053 Vesa Kannianen and Panu Poutvaara, Imperfect Transmission of Tacit Knowledge and other Barriers to Entrepreneurship, July 2007
- 2054 Marko Koethenbueger, Federal Tax-Transfer Policy and Intergovernmental Pre-Commitment, July 2007
- 2055 Hendrik Jürges and Kerstin Schneider, What Can Go Wrong Will Go Wrong: Birthday Effects and Early Tracking in the German School System, July 2007
- 2056 Bahram Pesaran and M. Hashem Pesaran, Modelling Volatilities and Conditional Correlations in Futures Markets with a Multivariate  $t$  Distribution, July 2007
- 2057 Walter H. Fisher and Christian Keuschnigg, Pension Reform and Labor Market Incentives, July 2007
- 2058 Martin Altemeyer-Bartscher, Dirk T. G. Rübhelke and Eytan Sheshinski, Policies to Internalize Reciprocal International Spillovers, July 2007
- 2059 Kurt R. Brekke, Astrid L. Grasdal and Tor Helge Holmås, Regulation and Pricing of Pharmaceuticals: Reference Pricing or Price Cap Regulation?, July 2007
- 2060 Tigran Poghosyan and Jakob de Haan, Interest Rate Linkages in EMU Countries: A Rolling Threshold Vector Error-Correction Approach, July 2007
- 2061 Robert Dur and Klaas Staal, Local Public Good Provision, Municipal Consolidation, and National Transfers, July 2007
- 2062 Helge Berger and Anika Holler, What Determines Fiscal Policy? Evidence from German States, July 2007
- 2063 Ernesto Reuben and Arno Riedl, Public Goods Provision and Sanctioning in Privileged Groups, July 2007
- 2064 Jan Hanousek, Dana Hajkova and Randall K. Filer, A Rise by Any Other Name? Sensitivity of Growth Regressions to Data Source, July 2007
- 2065 Yin-Wong Cheung and Xing Wang Qian, Hoarding of International Reserves: Mrs Machlup's Wardrobe and the Joneses, July 2007
- 2066 Sheilagh Ogilvie, 'Whatever Is, Is Right'?, Economic Institutions in Pre-Industrial Europe (Tawney Lecture 2006), August 2007

- 2067 Floriana Cerniglia and Laura Pagani, The European Union and the Member States: Which Level of Government Should Do what? An Empirical Analysis of Europeans' Preferences, August 2007
- 2068 Alessandro Balestrino and Cinzia Ciardi, Social Norms, Cognitive Dissonance and the Timing of Marriage, August 2007
- 2069 Massimo Bordignon, Exit and Voice. Yardstick versus Fiscal Competition across Governments, August 2007
- 2070 Emily Blanchard and Gerald Willmann, Political Stasis or Protectionist Rut? Policy Mechanisms for Trade Reform in a Democracy, August 2007
- 2071 Maarten Bosker and Harry Garretsen, Trade Costs, Market Access and Economic Geography: Why the Empirical Specification of Trade Costs Matters, August 2007
- 2072 Marco Runkel and Guttorm Schjelderup, The Choice of Apportionment Factors under Formula Apportionment, August 2007
- 2073 Jay Pil Choi, Tying in Two-Sided Markets with Multi-Homing, August 2007
- 2074 Marcella Nicolini, Institutions and Offshoring Decision, August 2007
- 2075 Rainer Niemann, The Impact of Tax Uncertainty on Irreversible Investment, August 2007
- 2076 Nikitas Konstantinidis, Gradualism and Uncertainty in International Union Formation, August 2007
- 2077 Maria Bas and Ivan Ledezma, Market Access and the Evolution of within Plant Productivity in Chile, August 2007
- 2078 Friedrich Breyer and Stefan Hupfeld, On the Fairness of Early Retirement Provisions, August 2007
- 2079 Scott Alan Carson, Black and White Labor Market Outcomes in the 19<sup>th</sup> Century American South, August 2007
- 2080 Christian Bauer, Paul De Grauwe and Stefan Reitz, Exchange Rates Dynamics in a Target Zone – A Heterogeneous Expectations Approach, August 2007
- 2081 Ana Rute Cardoso, Miguel Portela, Carla Sá and Fernando Alexandre, Demand for Higher Education Programs: The Impact of the Bologna Process, August 2007
- 2082 Christian Hopp and Axel Dreher, Do Differences in Institutional and Legal Environments Explain Cross-Country Variations in IPO Underpricing?, August 2007
- 2083 Hans-Werner Sinn, Pareto Optimality in the Extraction of Fossil Fuels and the Greenhouse Effect: A Note, August 2007

- 2084 Robert Fenge, Maximilian von Ehrlich and Matthias Wrede, Fiscal Competition, Convergence and Agglomeration, August 2007
- 2085 Volker Nitsch, Die Another Day: Duration in German Import Trade, August 2007
- 2086 Kam Ki Tang and Jie Zhang, Morbidity, Mortality, Health Expenditures and Annuitization, August 2007
- 2087 Hans-Werner Sinn, Public Policies against Global Warming, August 2007
- 2088 Arti Grover, International Outsourcing and the Supply Side Productivity Determinants, September 2007
- 2089 M. Alejandra Cattaneo and Stefan C. Wolter, Are the Elderly a Threat to Educational Expenditures?, September 2007
- 2090 Ted Bergstrom, Rod Garratt and Damien Sheehan-Connor, One Chance in a Million: Altruism and the Bone Marrow Registry, September 2007
- 2091 Geraldo Cerqueiro, Hans Degryse and Steven Ongena, Rules versus Discretion in Loan Rate Setting, September 2007
- 2092 Henrik Jacobsen Kleven, Claus Thustrup Kreiner and Emmanuel Saez, The Optimal Income Taxation of Couples as a Multi-Dimensional Screening Problem, September 2007
- 2093 Michael Rauber and Heinrich W. Ursprung, Life Cycle and Cohort Productivity in Economic Research: The Case of Germany, September 2007
- 2094 David B. Audretsch, Oliver Falck and Stephan Heblich, It's All in Marshall: The Impact of External Economies on Regional Dynamics, September 2007
- 2095 Michael Binder and Christian J. Offermanns, International Investment Positions and Exchange Rate Dynamics: A Dynamic Panel Analysis, September 2007
- 2096 Louis N. Christofides and Amy Chen Peng, Real Wage Chronologies, September 2007
- 2097 Martin Kolmar and Andreas Wagener, Tax Competition with Formula Apportionment: The Interaction between Tax Base and Sharing Mechanism, September 2007
- 2098 Daniela Treutlein, What actually Happens to EU Directives in the Member States?– A Cross-Country Cross-Sector View on National Transposition Instruments, September 2007
- 2099 Emmanuel C. Mamatzakis, An Analysis of the Impact of Public Infrastructure on Productivity Performance of Mexican Industry, September 2007
- 2100 Gunther Schnabl and Andreas Hoffmann, Monetary Policy, Vagabonding Liquidity and Bursting Bubbles in New and Emerging Markets – An Overinvestment View, September 2007