



EUROJÄRJESTELMÄ  
EUROSYSTEMET

# RESEARCH NEWSLETTER

1/2009

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### Publisher

Bank of Finland

ISSN 1796-9131  
(online)

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## Editorial

Standard life-cycle and permanent income reasoning suggest that households accumulate assets early in the life cycle in order to secure adequate resources for consumption later in life when income is expected to be lower, for example, due to retirement. This consumption-smoothing phenomenon has greatly influenced the way economists think about the determinants of household debt dynamics.

The extent to which a household is willing to postpone current consumption depends on its preferences, in particular its time preference or subjective real interest rate. For households that have a strong preference for current consumption – impatient households – the real interest rate, by implication, must be particularly high in order to induce them to trade current for future consumption. Otherwise, they will enter the financial markets to borrow for current consumption. Household debt, in this standard reasoning, thus reflects in essence intertemporal trade between an impatient borrower and a patient saver.

While this standard life-cycle reasoning has not gone unchallenged, and a number of empirical puzzles remain unresolved in the context of the underlying life-cycle models, its implications for household debt dynamics can be somewhat extreme. First of all, these models envisage accumulation by households of uncollateralized debt, essentially borrowing against expected future labour income. However, in many countries most household debt is collateralized. More specifically, homes and other durables serve to collateralize most household debt in many countries, and typical debt contracts require that the borrower take an equity stake in the goods that serve as

collateral. Furthermore, a down payment imposes an initial equity share on the durable good purchased, and the debt's amortization dictates the pace at which the equity share increases. Without such an equity requirement, standard models of consumption smoothing imply that a borrower's debt would increase over time to the maximum level the borrower can service via his total labour income.

On the other hand, credit market innovations that reduce these equity requirements can have not only far-reaching macroeconomic implications but also important financial repercussions. Recent research suggests that such credit market innovations have contributed to the reduction in volatility of key macroeconomic variables in the US economy, a phenomenon the economics profession has dubbed the Great Moderation. However, increased household indebtedness tends to raise the sensitivity of household balance sheets to interest rate and income shocks. Although further retrenchment of credit granting to the household sector could result in reduced consumption and slower output growth, the perception of households already running near maximum debt levels effectively prevents lenders from extending further credit. It is the combination of high debt levels and the possibility of adverse interest rate and income shocks that contribute most to the financial fragility of the household sector and that could cause systemic instability in the financial sector.

Although recent research contributions, including those of the Bank of Finland, suggest that households are not a major source of credit risk and loan losses for banks, further research is clearly needed in order to gain a deeper understanding of the dynamics

of household debt as well as the macroeconomic and financial implications of excessive household debt accumulation and the implied debt-sustainability problems.

*Jouko Vilmunen*

## Credit crunch? – An empirical test of cyclical credit policy

One of the key issues in the macro-finance literature is to understand to what extent, and through which channels, financial market events are transmitted to the real economy. The currently fashionable DSGE macro-models depend heavily on the assumption of perfect financial markets. But many authors tend to the view that events in the financial markets can have important implications for the real economy. And the ongoing economic crisis has clearly given much credence to this view. For example, the crisis has already been ascribed at least partly to pro-cyclical credit policies. In particular, it has been suggested that lending has been far too lenient during the pre-crisis period and has thus contributed to a build-up of excessive credit risk. Now, in the midst of the crisis, the banks' credit granting seems to have tightened prodigiously, and this has dragged the real economy further down. Variants of these views have surfaced in connection with numerous historical crises, which has inspired tighter supervision of the financial system, public intervention to ease the credit crunch, and urgent monetary-policy response to banks' lending behaviour.

Although the hypothesis of pro-cyclical credit policy – that the banks change their lending behaviour over the course of the business cycle – is reasonable and is supported by some empirical evidence, it has turned out to be difficult to establish rigorously by empirical tests. The primary reason for this is the difficulty in identifying how much of banks' pro-cyclical lending behaviour is demand versus supply driven. The literature has reported on different methods and

different types of data for tackling the problem, but the results are still opaque. Another difficulty relates to the fact that cyclical behaviour in bank lending can take different forms, including changes in collateral requirements, changes in the way banks' lending policy reacts to loan applicants' individual characteristics, as well as changes in the criteria that bank's apply in granting loans.

Risto Herrala in his study 'Credit crunch? – An empirical test of cyclical credit policy' develops a new approach for directly testing possible cyclical behaviour of banks' credit granting. His analysis is based on stochastic frontier analysis, a well-established methodology for efficiency analysis that can be applied to micro-level data on household borrowing. His method identifies three types of pro-cyclicality in credit policy: in the criteria for granting credit limits (tailoring), in the expected value, and in the variation in borrowing limits. This is achieved by allowing the parameters of frontier models to change at different points of the business cycle. As an illustration, Herrala uses household borrowing data from Finland, a country that experienced a pronounced boom-bust cycle with associated pro-cyclical movements in bank lending in the early-1990s recession years.

Herrala finds strong evidence for the presence of credit constraints on household borrowers in accordance with theory but does not find evidence of a general tightening of credit policy during the economic downturn. Rather, the bank's credit policy seems to have tightened in respect of certain minority groups of borrowers such as students, while easing in respect of most households. At the same time, cyclical changes in lending behaviour seems most closely related to changes in the 'tailoring' of credit limits, ie in the criteria for credit granting. During the boom period, the banks' collateral requirements varied across educational groups, whereas during the credit contraction the variation was in the effect of income on limits.

Herrala argues that his evidence is consistent with the ‘institutional memory hypothesis’, according to which credit policy would have eased after the crisis as banks became more lenient in granting credit limits. The evidence is also consistent with the view that ‘tailoring’ of limits has been extended to account for age and education-specific features of households. At the same time, the idiosyncratic variance of limits has decreased, which suggests that banks’ lending behaviour has become more consistent.

More empirical research is needed on this issue, but Herrala’s study is a promising attempt to innovatively apply existing econometric techniques to study bank’s credit policies. The method may provide a means of tackling the difficult issue of how credit constraints affect household behaviour and eventually impact macroeconomic developments over the business cycle.

Juha Kilponen

## On the correlation between defaults and losses given default

The role of credit risk in the financial markets has expanded greatly since the 1990s. New markets for financial instruments, such as securitizations and credit default swaps, have made it possible to transfer credit risk from original creditors to other investors. Theoretical advances in modeling credit risk, with applications in pricing and risk management, contributed to this development. Financial regulators also recognized the need to update banks’ solvency requirements with respect to credit risk and launched the Basel II capital adequacy reform, which is now in force in the EU, and the USA is expected to follow suit. Yet the current financial crisis, which grew out of subprime mortgages and the fancy financial derivatives partly constructed from them, has demonstrated that understanding and

modeling the many relevant aspects of credit risk has been inadequate.

Key elements of any credit risk asset are the obligor’s probability to default, the potential loss given that a default occurs, and the co-movement between these two. The loss given default is strongly affected by the value of collateral, if that is provided for in the credit contract. For example, if a mortgage holder defaults on her payments as a result of sudden unemployment, the value of her house may well cover the remaining principal on mortgage loan as well as the interest due, so that there will be no loss to the lender. However, if the same factors which increase the propensity to become unemployed also drive house prices down, such as negative aggregate demand shocks, there will be a positive correlation between the number of defaults and the amount lost in defaults. As a result, the credit protection provided by collateral may be weakest just when it is most needed.

Such a double-whammy effect has long been recognized in credit risk research. However, as Peter Palmroos shows in his study ‘Effect of Unobserved Defaults on Correlation between Probability of Default and Loss Given Default on Mortgage Loans’ (BOF DP 3/2009), it seems that a key consideration may have been ignored in the empirical estimation of the correlation between defaults and losses. He shows that it can make a big difference whether the correlation is calculated on the basis of observable defaults only; ie those in which collateral value does not provide full protection, so that the lender incurs an actual loss. He presents mathematical closed-form solutions both for the conditional, using only observed defaults, and the unconditional correlation for two alternative distributional assumptions.

Palmroos’s results imply that the estimated correlation between defaults and losses given default, based solely on observed defaults, may be much lower in good times than in bad times. This is because the

conditional correlation using only observed defaults depends on the level of house prices relative to credit amounts. His findings may thus explain the earlier empirical results that the default-loss given default correlation tends to be lower in normal times than in economic downturns. In downturns, we simply observe a bigger proportion of all defaults resulting from declining house prices providing less than 100 per cent collateral coverage.

Palmroos's results also underline the importance of structural modeling of credit risks as a complement to reduced form models. Reduced form models typically rely on exogenous parameters, often estimated from aggregate data. His analysis indicates that, in the case of correlation between default and loss given default, subtle effects may be missed unless the model incorporates the fundamental factors and mechanisms driving defaults and collateral values.

Esa Jokivuolle

## Specialisation in foreign trade reveals countries' comparative advantage

The structure of a country's foreign trade says a great deal about the competitiveness of the different sectors, especially if detailed statistics can be compared with corresponding data on other countries. Several BOFIT Discussion Papers published at the end of 2008 examine in detail the foreign trade data for Russia and China. The competitiveness of Russian exports of manufactured goods is studied in respect of three markets: Europe, China and CIS countries. It seems that Russian manufactures are truly competitive only in the CIS countries and that even there their advantage seems to be waning. For China, the situation is vastly different. China has been able to substantially increase its exports of high-tech products. This has occurred partly because semi-finished components flow from one country to another in Southeastern Asia, as each country

contributes a small segment of the total processing of the final product. This means that a large share (perhaps as much as half) of China's value added in goods exports leaks into other countries.

BOFIT Discussion Paper 23/2008 (Olga Garanina: What beyond oil and gas? Russian trade specialisation in manufactures) examines the degree of specialisation in Russia's exports of manufactured goods, starting in 1998. The trade balance for Russian manufactures is declining rapidly, albeit the situation varies across the trading partners. Russia's key trading partners are the European Union (EU), Commonwealth of Independent States (CIS) and China. With the aid of the Grubel-Lloyd index, a measure of relative advantage and intra-sectoral trade, one sees that Russia has fallen markedly behind the EU and China in international trade in industrial products. Russia has been notably more successful in the CIS markets, where it has increased its exports of manufactured goods. But even here Russia is losing ground as the primary supplier of capital-intensive goods. It appears that Russian companies are unable to take full advantage eg of the country's relatively high level of education.

BOFIT Discussion Paper 31/2008 (Judith Dean, K.C. Fung and Zhi Wang: How vertically specialized is Chinese trade?) looks at the explosive increase in vertical specialisation in China's foreign trade. Although this vertical specialisation is largely explained by the growth in China's foreign trade, the two phenomena have not previously been studied in the same context. This is partly due to the great difficulty in measuring the degree of vertical specialisation in China's foreign trade. Identification of intermediate goods and their usage is difficult eg because a large share of China's foreign trade comprises products that are imported into China and soon exported again. This study, in estimating the vertical specialisation in China's foreign trade, takes account of the above-mentioned factors. A new approach to

identifying China's intermediate products is developed by employing two input-output tables and detailed trade data. Vertical specialisation is estimated in two different ways, using the method of Hummels et al. (2001) and the authors' own adjusted trade data. The second method is similar to the first except that it uses the method of Koopman et al (2008) for splitting the input-output table according to whether the export product is of the usual type or is a processed product. This study is successful in showing that there is an extensive supply network for intermediate goods in Asia. Use of the two methods in this study also enables estimation of how much of China's value added leaks into other countries. In 2002, share of imports in China's exports amounted to 25% to 46%, and up to as much as 52% to 95% in some sectors. Both estimation methods indicate that the specialisation-degree in China's exports is lower in respect of the more highly developed customer-countries.

#### References

Hummels, D – Ishii, J – Yi, K (2001) The Nature and Growth of Vertical Specialization in World Trade. *Journal of International Economics*, 54, 75–96.

Koopman, R – Wang, Z – Wei, S-J (2008) How much of Chinese exports is really made in China? Assessing domestic value added when processing trade is pervasive. NBER Working Paper 14109.

Iikka Korhonen

### Conferences and seminars

On 4–5 June 2009, the Research Unit and SUERF (Société Universitaire Européenne de Recherches Financières) will jointly host a conference entitled 'Housing markets – A shelter from the storm or cause of the storm?'. The call for papers is open until 15 February

2009 at [http://www.bof.fi/en/tutkimus/konferenssit/tulevat\\_konferenssit/suerf2009.htm](http://www.bof.fi/en/tutkimus/konferenssit/tulevat_konferenssit/suerf2009.htm).

In March 2009 the Bank of Finland Institute for Economies in Transition (BOFIT) will host an international seminar on the long-term growth potential of the Russian and Chinese economies. For further information visit the conference website at [http://www.bof.fi/bofit\\_en/tutkimus/cfp/cfp\\_2008.htm](http://www.bof.fi/bofit_en/tutkimus/cfp/cfp_2008.htm).

#### Bank of Finland Research Seminars:

Friday, 6 Feb 2009, 13.30–15.00. Prof. Jean-Charles Rochet. Toulouse School of Economics. The future of banking regulation: BASEL II after the crisis.

Thurs, 5 Mar 2009, 13.30–15.00. Prof. Klaus Adam. Mannheim University.

Thurs, 7 May 2009, Ph.D. David Vestin. Bank of International Settlements.

Please register in advance via Marjut Salovuori at [seminars@bof.fi](mailto:seminars@bof.fi). For further information visit the seminar site <http://www.bof.fi/en/tutkimus/konferenssit/tutkimusseminaarit/>.

#### BOFIT seminars:

Tues, 17 Feb 2009, 10.30. José Sanchez Fung. University of Kingston, London and BOFIT. The day-to-day interbank market, volatility, and central bank intervention in a developing economy.

Tues, 24 March 2009, 10.30. Zuzana Fungacova (BOFIT) and Laurent Weill (University of Strasbourg). How market power influences bank failures: Evidence from Russia.

Please register in advance via Liisa Mannila ([firstname.lastname@bof.fi](mailto:firstname.lastname@bof.fi), + 358 10 8312268). For further information visit the seminar site [http://www.bof.fi/bofit\\_en/tutkimus/seminaarit/tiistai/seminaarit.htm](http://www.bof.fi/bofit_en/tutkimus/seminaarit/tiistai/seminaarit.htm).

## Recent Bank of Finland research publications

### Scientific monograph

Maritta Paloviita: Dynamics of inflation expectations in the euro area, E:40, 2009.

### Bank of Finland Discussion Papers

Toivanen Mervi: Financial interlinkages and risk of contagion in the Finnish interbank market, BOF DP 6/2009.

Seppo Honkapohja: The 1990s financial crises in Nordic countries, BOF DP 5/2009.

Sherrill Shaffer – Iftekhar Hasan – Mingming Zhou: New small firms and dimensions of economic performance, BOF DP 4/2009.

Peter Palmroos: Effects of unobserved defaults on correlation between probability of default and loss given default on mortgage loans, BOF DP 3/2009.

Alistair Milne – Geoffrey Wood: The bank lending channel reconsidered, BOF DP 2/2009.

Leonardo Becchetti – Rocco Ciciretti – Iftekhar Hasan: Corporate Social Responsibility and Share-holder's Value: An Empirical Analysis, BOF DP 1/2009.

Alistair Milne – Geoffrey Wood: Shattered on the Rock? British financial stability from 1866 to 2007, BOF DP 30/2008.

Iftekhar Hasan – Loretta J Mester: Central bank institutional structure and effective central banking: cross-country empirical evidence, BOF DP 29/2008.

Jukka Lassila – Tarmo Valkonen: Population ageing and fiscal sustainability in Finland: a stochastic analysis, BOF DP 28/2008.

Christa Hainz – Laurent Weill – Christophe J Godlewski: Bank competition and collateral: theory and evidence, BOF DP 27/2008.

### BOFIT Discussion Papers

Judith Dean – K.C. Fung – Zhi Wang: How vertically specialized is Chinese trade?, BOFIT DP 31/2008.

Jenni Pääkkönen: Optimal Law Enforcement and Welfare in the Presence of Organized Crime, BOFIT DP 30/2008.

Yu-Fu Chen – Michael Funke: China's new labour contract law: No harm to employment?, BOFIT DP 29/2008.

Iftekhar Hasan – Haizhi Wang – Mingming Zhou: Do better institutions improve bank efficiency? Evidence from a transitional economy, BOFIT DP 28/2008.

Elena Fedorova – Mika Vaihekoski: Global and local sources of risk in Eastern European emerging stock markets, BOFIT DP 27/2008.

Andrei Yakovlev: State-business relations and improvement of corporate governance in Russia, BOFIT DP 26/2008.

Matthieu Bussière – Tuomas Peltonen: Exchange rate pass-through in the global economy – The role of emerging market economies, BOFIT DP 25/2008.

Andrei Shumilov: Performance of business groups: Evidence from post-crisis Russia, BOFIT DP 24/2008.

Olga Garanina: What beyond oil and gas? Russian trade specialisation in manufactures, BOFIT DP 23/2008.

Juuso Kaaresvirta – Aaron Mehrotra: Business surveys and inflation forecasting in China, BOFIT DP 22/2008.

Zuzana Fungáčová – Laura Solanko: Risk-taking by Russian banks: Do location, ownership and size matter? BOFIT DP 21/2008.

Pierre-Guillaume Méon – Laurent Weill: Is corruption an efficient grease? BOFIT DP 20/2008.

Alexei Karas – Koen Schoors – Gleb Lanine: Liquidity matters: Evidence from the Russian interbank market, BOFIT DP 19/2008.

Laurent Weill: How corruption affects bank lending in Russia, BOFIT DP 18/2008.

Anatoly Peresetsky – Alexander Karminsky: Models for Moody's bank ratings, BOFIT DP 17/2008.

Iikka Korhonen – Svetlana Ledyeva: Trade linkages and macroeconomic effects of the price of oil, BOFIT DP 16/2008.

Tuuli Koivu – Aaron Mehrotra – Riikka Nuutilainen: McCallum rule and Chinese monetary policy, BOFIT DP 15/2008.

## Forthcoming publications

### Bank of Finland Discussion Papers

Juha Kilponen –Juuso Vanhala: Productivity and Job Flows: Heterogeneity of New Hires and Continuing Jobs in the Business Cycle.

Bill B. Francis – Iftekhar Hasan – Xian Sun: Political connections and the process of going public: evidence from China.

Risto Herrala: Credit crunch? – An empirical test of cyclical credit policy.

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RePec (Research Papers in Economics; NEP, new economics papers on central banking)

<http://lists.repec.org/mailman/listinfo/nep-cba>

