Andrew G Haldane: Haircuts

Remarks by Mr Andrew G Haldane, Executive Director, Financial Stability, of the Bank of England and member of the Financial Policy Committee, summarising a forthcoming paper in the Journal of Monetary Economics "Complexity, Concentration and Contagion", 1 August 2011.

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During the summer months, I have my hair cut slightly shorter than during the winter months. This helps keep my head a little cooler in the summer heat and my ears a little warmer in the winter cold. Anyone who has seen them will know this is a smart strategy for my ears, to say nothing of my head. This strategy is explicitly *counter*-cyclical. When the temperature goes up, my hair-length comes down and vice-versa. I am not alone. National statistics show that expenditure on haircuts increases as temperatures rise.

The financial system also makes choices about haircuts. The haircuts in question are the amount of collateral a borrower places with the lender over and above the face value of borrowing. But collateral haircuts tend to behave rather differently to personal haircuts. They fall when the financial temperature is increasing and rise when the chill sets in. This strategy is explicitly *pro*-cyclical. It will tend to result in financial markets being hot-headed in the summer and frozen-eared in the winter.

Table 1 demonstrates this pattern. It compares haircuts on a range of financial instruments used to back borrowing – so-called securities financing. They are shown on two dates, before (June 2007) and after (June 2009) the financial crisis. Haircuts rose by up to 90 percentage points in the space of these two years, as the scorching pre-crisis summer gave way to a frozen crisis winter. In other words, haircuts exhibited a rather dramatic pro-cyclicality over the course of the crisis.

Table 1:

Typical haircut on term securities financing transactions (per cent)

	June 2007[1]	**June 2009**[1]
Medium-term G7 government bonds	0	1
Medium-term US agencies	1	2
AAA-rated prime MBS	4	10
Asset-backed securities	10	25
AAA-rated structured products	10	100
AAA- and AA-rated investment grade bonds	1	8
High-yield bonds	8	15
G7 countries equity	10	15

Source: Committee on the Global Financial System (2010).

[1] Prime counterparty.

This haircut cycle played an important causal role in the crisis. Secured financing became an increasingly important source of credit in both bank and non-bank markets over the past decade. In the US, the repo market financed roughly half of the growth in investment banks' balance sheets between 2002 and 2007. In the UK, the securitisation market trebled in size over the same period. Those were the heady days of summer. Since then the US repo market has shrunk by 40%, while the UK securitisation market remains frozen.

Pro-cyclicality in the haircuts applied to secured financing transactions in turn amplified the cycle in credit. Thin haircuts made it cheaper for banks to mobilise collateral to finance borrowing when the credit cycle was in the upswing, adding momentum to the upward pendulum of asset prices and credit. And fat haircuts immobilised collateral when the credit cycle reversed, exaggerating the downward pendulum swing.

A further factor amplifying these swings came from the fact that much of the secured financing took place *within* the financial sector. In the run-up to crisis, banks and near-banks entered into secured financing transactions with one another, inflating both counterparties' balance sheet. In the UK, fully two-thirds of the trebling in balance sheets between 2002 and 2007 can be explained by expanding claims on other parts of the financial system.

These cross-system dependencies in financing have "externality-like" effects. During a generalised boom, individual banks lend freely to one another and all of the moving parts of the financial system are lubricated. The system co-ordinates itself on a high liquidity equilibrium. Liquidity has positive spillover effects or externalities; liquidity is a public good. And with rising asset prices and liquidity and falling haircuts, the credit multiplier is high and self-reinforcing.

But that cycle can just as quickly reverse. In a situation of stress, individual banks hoard rather than lend liquidity. The system then co-ordinates itself on a low liquidity equilibrium. Liquidity then has negative spillovers, imposing negative externalities; illiquidity is a public bad. And with asset prices and liquidity falling and haircuts rising, the credit multiplier becomes self-reinforcing downwards.

Given these pro-cyclicalities, there have been recent proposals by both policymakers and academics to regulate collateral requirements.[1] This is one possible arm of so-called *macroprudential* policy. Within the UK, haircuts on secured financing or OTC derivative transactions have been identified as one possible tool for executing macroprudential policy.[2] The UK's new interim Financial Policy Committee, housed in the Bank of England, will provide advice to government on possible macroprudential tools over the next year or so.

The debate on haircuts as a policy tool is live internationally too. In a recent speech in Atlanta, US Treasury Secretary Tim Geithner proposed the introduction of international minimum standards for margins on derivatives transactions.[3] This would be akin to the international minimum standards for capital adequacy introduced through the Basel agreements. Since 1934, the US authorities have had regulatory powers to impose minimum margin requirements on lending against equity and some other assets – so-called Regulation T. But these policies have not been used actively, with minimum margins unchanged since 1974.

To date, analysis of the macroprudential role of haircuts has been largely descriptive. A recent paper, co-authored with Prasanna Gai and Sujit Kapadia, attempts to fill that gap.[4] We

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1 For example, Committee on the Global Financial System (2010), "The role of margin requirements and haircuts in procyclicality", *CGFS Publications No. 36*, Geanakoplos, J (2010), "Solving the present crisis and managing the leverage cycle", *Federal Reserve Bank of New York Economic Policy Review*, August, 16 (1) and Kashyap, A K, Berner, R and Goodhart, C, "The Macroprudential Toolkit", forthcoming in the *IMF Economic Review*.

2 http://www.hm-treasury.gov.uk/d/consult_newfinancial_regulation170211.pdf.

3 http://www.treasury.gov/press-center/press-releases/Pages/tg1202.aspx.

4 "Complexity, Concentration and Contagion", which is forthcoming in the *Journal of Monetary Economics*, Vol 58 (5).

develop a model of a banking network, inter-connected through unsecured interbank lending and secured funding markets. This financial web exhibits classical tipping point properties. It is even-tempered most of the time. Indeed, having a tight-knit circle of financial friends helps keep the financial system strong and stable. Risks are diffused across the system. A problem shared is a problem halved. The system is in a high-liquidity equilibrium.

But, on occasion, the system can be pushed beyond its tipping point. Connectivity then generates contagion. A problem shared is a problem multiplied. The best of financial friends become the worst of enemies. In the model, one of the key channels for contagion is the secured financing market as banks hoard rather than lend liquidity when haircuts rise. The liquidity feast then turns to famine as secured and unsecured financing markets dry up. The system switches to a low-liquidity equilibrium. These liquidity droughts were perhaps *the* defining feature of the financial crisis during 2007 and 2008.

In the model, the likelihood of such systemic liquidity crises depends critically on two key structural characteristics of the financial system – the two c's: concentration and complexity. The greater the concentration within the financial system, the greater the potential for systemic collapse as larger banks spread a disproportionate amount of financial pain around a densely networked financial system. A greater degree of system complexity has a similar effect, creating more channels for contagion and heightening banks' incentives to hoard liquidity when the weather worsens. The two c's are very much features of today's financial system. On the face of it, that bodes ill for future systemic crises.

So what role might policy play in avoiding those crises? The model provides a test-bed to consider a range of policy options, including for haircuts policy. An illustrative policy experiment, based on a simulation of the model in which haircuts spike sharply, is shown in Chart 1. Up the vertical axis is a measure of the probability of a systemic liquidity crisis. Along the horizontal axis is the initial size of the haircut on secured financing transactions.

The three lines trace three policy options. Consider first the "baseline" path without policy intervention. Provided haircuts remain high come rain or shine – in the example, above around 20% – the probability of a liquidity crisis remains very low. But if haircuts are lowered even modestly, resilience is eroded. In the example, lowering haircuts from 20% to 5% raises the crisis probability by an order of magnitude, from less than 0.1 to almost 1. In other words, a hands-off haircuts policy runs a significant risk of systemic collapse if haircuts are pro-cyclically trimmed during the upswing.

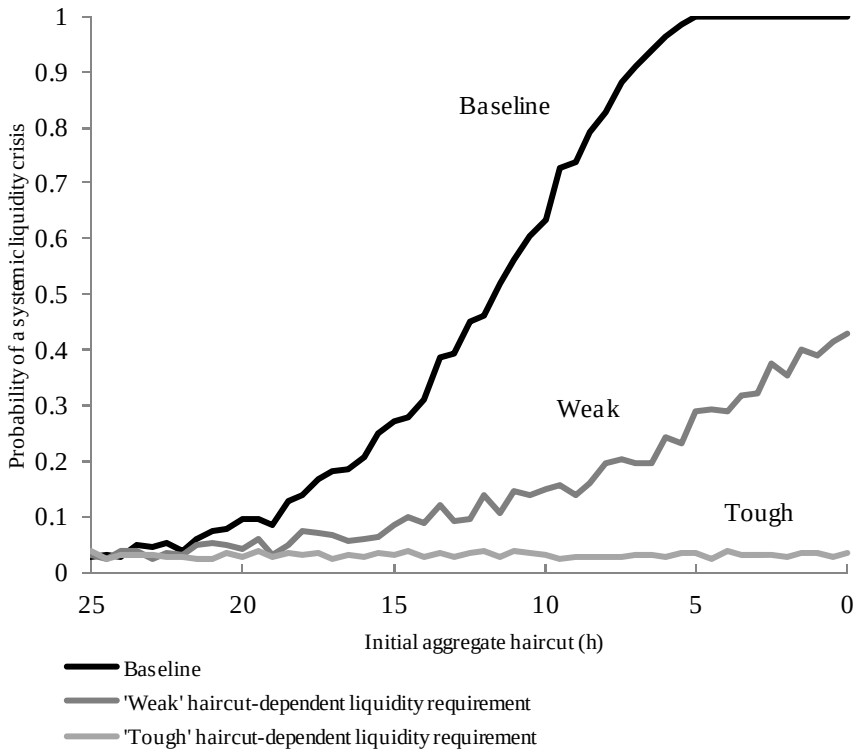
To prevent this, policy makers could seek to control haircuts directly. In the example, significantly greater resilience could be achieved by imposing a haircut limit of 20%. Alternatively, policy makers could seek to lean against the pro-cyclical tendencies of the financial system as systemic risk increases. The other two lines in Chart 1 show different sets of activist policy intervention. Both require banks to build up larger liquid asset buffer stocks in the event of haircuts being trimmed. This lessens the need for banks to hoard liquidity, so reducing system-wide liquidity stress.

The two policies differ in how aggressively they respond to such excesses – "weak" and "tough". Either way, the effects are striking. Even the weak policy shrinks the probability of collapse by more than half, whatever the initial level of haircuts. And under the tough policy, the financial system is effectively inoculated against haircut-induced pro-cyclicality.

It may be over-optimistic to think policy could eliminate the adverse effects of haircut-induced pro-cyclicality. For example, we have little theoretical understanding of how haircut-based policies might affect banks' behaviour. And we have little empirical case law on the implementation of these policies. For example, haircuts policy might be circumvented by banks substituting towards unsecured finance. So any quantitative calibration of the effects of a haircut-based policy rule is necessarily tentative. Nonetheless, the model simulations are suggestive – and, at least qualitatively, encouraging.

Chart 1:

Aggregate haircuts and probability of a systemic liquidity crisis



Source: Gai, Haldane and Kapadia (2011).

This financial network set-up can be used to assess a number of other topical policy issues. These include:

- ***Central clearing:*** Central clearing of financial transactions tackles the complexity of, and concentration within, the financial system at source. The dense knitting of the financial web is unravelled and replaced with a simple hub-and-spokes topology. This will tend to reduce the liquidity hoarding incentives of investors, so making for more resilient funding markets in the event problems strike. Provided the central clearing house is beyond reproach, this topology also reduces the contagious consequences of individual bank stress: liquidity cascades are headed-off at the clearing house. The proviso is important, though. Robustness of the central clearing basket becomes more important as more eggs are placed in it. This calls for a sea-change improvement in risk management practices among the clearing houses, as more financial transactions come to be centrally cleared to meet G20 commitments. Otherwise the too-important-to-fail problem simply re-emerges in a different guise.

- ***Liquidity policy:*** One implication of the model is the importance of banks maintaining buffers of the highest-quality liquid assets. These have a doubly beneficial effect. First, they reduce banks' need to hoard liquidity in situations of stress. Second, high-quality assets reduce the amplitude of the haircut cycle in the first place, as Table 1 demonstrates. The first reduces the impact of a liquidity event, the second its probability. The upshot is a fall in the chances of a systemic liquidity crisis. The new Basel III liquidity regulation uses a strict definition of what counts as liquid assets. The model underlines the importance of sticking to that definition. The model suggests that financial system robustness would be further enhanced by

targeting liquidity requirements on the most connected banks in the system, as this would lean against the destabilising effects of system-wide concentration.

Hot heads make for bad decisions, frozen ears for uncomfortable ones. Financial markets have felt the effects of this change in the weather more dramatically than most. Suitably designed, macroprudential policy can help moderate those swings in temperature, thereby improving the health of the financial system.