1. Liquidiry lost and found

When central bankers discussed liquidity in 2008, they found a neglected territory full of the ruins of old conceptual structures that were not quite inhabitable. The first sign that something is conceptually amiss is the widely acknowledged difficulty in defining it. Reserve Bank of Australia Governor Glenn Stevens [2008: 84] remarks that “is widely used but rarely defined”. In popular usage, it was often preceded by the word ‘excess’, but the implication that liquidity was a thing with measurable dimensions was misleading:

That expression – ‘excess liquidity’ – simply became shorthand, I think, for the low structure of global interest rates, the associated ease of obtaining credit and the tendency for leverage to rise. [Stevens, 2008: 84]

Note that one thing not present on this list is money – a striking reversal of the traditional Keynesian treatment of liquidity and money essentially as synonyms, ‘liquidity preference’ being a schedule of demand for money. The word should be used more carefully, he argued, and proceeded to explore three distinct things ‘liquidity’ can mean. The first two were ‘abilities’:

1. ‘transactional liquidity’, “the ability to buy and sell assets without significantly affecting the price”; and

2. ‘funding liquidity’, “the ability of an intermediary to raise the necessary cash to fund, or continue to fund, its chosen set of assets”. [ibid: 84]

The last was a measurable quantity:

3. “funds at the central bank – what we in Australia call exchange settlement funds... balances... used by banks and other participants in the payments system to settle their obligations with each other and with the Reserve Bank.” [ibid: 85]

At last we have a monetary aggregate, capable of being the object of demand – but it is the narrowest one possible. It is narrower even than ‘cash’ or ‘base money’, which would also
include currency, and it is much narrower than ‘means-of-payment’. It is strange after decades in which the functional definition of money has progressively expanded that it should suddenly seem easier to pare it back to the most restrictive definition of all.\footnote{Kearns and Lowe [2008: 143] also use the same senses of ‘liquidity’, but what Stevens calls ‘transaction liquidity’ they call ‘market liquidity’.
}

Stevens is far from alone in having trouble defining ‘liquidity’. It is a cipher, a noun depending on a network of verbs and adjectives. It has led multiple lives in multiple discourses, theoretical and practical. If John Hicks’s “casual examination” of its etymology is correct [1962: 787-89], Keynes was responsible for its arrival in the lexicon. He launched it almost simultaneously on two careers – one, through his contribution to the Macmillan Report [1931], in the practical world of bankers, central bankers, accountants and financial journalists; and one, via the Treatise [1930] and the General Theory [1936], among the theoretical economists. Already these were hardly separate spheres, and after the postwar professionalization of the policymakers they would interbreed more often. But they remained domains with different conceptual needs, and ‘liquidity’ continued to perform different conceptual functions. Add to this the inevitable proliferation of visions and models in each sphere, and we have a linguistic mess.

In the first edition of the New Palgrave Dictionary of Economics, Cramp [1987: 211] forgoes a definition, writing that liquidity is

\begin{quote}
a highly complex phenomenon. Its concrete manifestation is powerfully affected by changes in financial institutions and practices, which have been occurring with extraordinary rapidity in recent decades. It calls for analysis both at the microeconomic and the macroeconomic level, with unusually strong dangers of committing fallacies of composition.
\end{quote}

In a sign of the times, the second edition of the New Palgrave [Durlauf and Blume, 2008] drops the entry for ‘liquidity’ entirely. In the form of ‘liquidity preference’ or demand for money, it was long at the centre of macroeconomics and the theory of the monetary policy transmission process. But since the 1990s, it has been more common to cut money out of the models. The monetarist project foundered on the difficulties in finding a stable relationship between a set of monetary assets and other macroeconomic variables. In any case, policy works by setting a base interest rate, and supplying whatever quantity of base money the system demands at that rate. Models have represented the transmission process accordingly, with aggregate demand depending directly on an interest rate, exogenous or set according to some variant of the Taylor rule (after Taylor [1993]) in a ‘policy reaction function’. The money supply is not so much endogenous as irrelevant. This has been a central feature marking what been called the ‘new consensus’ [Arestis, 2007] or ‘new synthesis’ [Woodford, 2009] in macroeconomics.

Shortly before the crisis, a long-time observer of the nexus between monetary theory and policy, Goodhart [2007: 2], reported his “shock” at the speed and completeness of the
turnaround from the days of monetarism, when monetary aggregates were everything, to a consensus view that they are nothing. A key figure in the ‘new consensus’, Michael Woodford, has been quite explicit on the matter. In a paper entitled “How important is money in the conduct of monetary policy?” he answers, “very little”, and argues that central bankers tend to agree with him. He cites former US Federal Reserve Governor Larry Meyer’s statement that “money plays no role in today’s consensus macro model, and it plays virtually no role in the conduct of monetary policy.” [Woodford, 2008: 1561-62] In 2001 Mervyn King, then Deputy Governor of the Bank of England (and now Governor) quoted the same statement, and remarked:

[A]s central banks became more and more focused on achieving price stability, less and less attention was paid to movements in money. Indeed, the decline in interest in money appeared to go hand in hand with success in maintaining low and stable inflation. [King, 2002: 112]

Some post-Keynesians have taken this development in the mainstream as a vindication of their many years in the wilderness defending ‘endogenous money’ – but a bittersweet one, because they have been given no credit. Nicholas Kaldor, for one, had been making this case when it was very unfashionable, in his debate with Milton Friedman. (See Kaldor [1970; 1986].) In making it he called into question not only the idea of an exogenous, policy-determined money supply, but even the usefulness of the Keynesian ‘liquidity preference’ apparatus, which he argued opened the way for the neoclassical synthesis and later monetarism itself. Instead he advocated the conception of a fully elastic money supply at a rate set by the central bank: in effect, a monetary theory of the interest rate in which money does not matter, because of the power of the central bank. Post-Keynesian ‘horizontalists’ or ‘accommodationists’ have continued in this tradition. In a recent textbook representative of this tradition, Smithin [2009: 80] sharply differentiates ‘horizontalist’ theory from a liquidity preference theory, and casts doubt on the usefulness of any concept of ‘liquidity’ to macroeconomic theory:

From the point of view of pure theoretical principle, an obvious problem with structuralist arguments [of Minsky, Chick, Dow, etc.] about illiquid positions, desired ratios of liquid to non-liquid assets, changes in financial fragility, etc., is that if money is truly endogenous, meaning that credit is always freely obtainable at a given interest rate at each point in time, then such things would cease to have any meaning. It would always be possible to acquire the funds to satisfy any current demands for payment... [ibid: 84]

2 Note, however, that King was himself ambivalent about the trend, predicting that “the absence of money in the standard models which economists use will cause problems in future” [ibid: 128]

3 After Moore [1988], the term ‘horizontalist’ refers to a view about the shape of the money supply curve: infinitely elastic at a policy-chosen interest rate.

4 See, e.g., Moore [1988], Lavoie [1992]. Pollin [1991] coined the term ‘accommodationist’, reflecting the idea that the central bank accommodates the public’s demand for money, whatever it may be. He contrasted this school of thought with that of the ‘structuralists’ such as Minsky and Chick, with whom he sympathised. For a recent overview of both sides of this debate within post-Keynesianism, see Lavoie [2006] and Dow [2006].
Neither the post-Keynesian accommodationists nor the mainstream ‘new consensus’ macroeconomists would deny that liquidity problems can still emerge in a modern capitalist economy. The recent financial crisis has given an unequivocal demonstration of the possibility of units being unable to satisfy demands for payment, with potentially systemic consequences. But it has also demonstrated the ability of central banks to alleviate a shortage of liquidity, and it is quite possible to read the worst liquidity breakdowns as policy failures – most notably, for example, the failure to bail out Lehman Brothers in September 2008. Liquidity remains, on this view, essentially an issue of prudential regulation rather than macroeconomic policy, a technical plumbing problem that can usually be left to specialists. As with plumbing, the need for urgency in a crisis does not mean one needs to worry unduly about it in normal times.

In this paper I argue a contrary view, that liquidity matters not only in a crisis, but in ‘normal times’ also. I seek to clarify and defend a structuralist approach to liquidity. The essentials of the approach derive from Minsky’s vision, for whom “the most basic element of the economy is cash flow and the most basic constraint on the behaviour of every economic agent is the ‘survival constraint’ which requires that cash outflow not exceed cash inflow.” [Mehrling, 1999: 139] I contrast this vision with what is still our most familiar treatment of liquidity, the textbook neoclassical-Keynesian treatment of ‘liquidity preference’, in which liquidity is treated essentially as a problem of stock equilibrium. In the next section I return to the problem of defining liquidity. I suggest that difficulties in pinning it down either definitionally or in terms of a statistical regularity arise from its nature as a social relation. Liquidity is not inherent in particular assets or institutions; it depends on the network of market relationships which tie them together. In section 3 I develop a concept of liquidity preference based on the cash flow management strategies of particular units. I emphasise that units may manage liquidity on the liability side of their balance sheets as much as the asset side, and that liquidity management involves managing flows as well as stocks. In section 4 I tentatively sketch an approach to the difficult problem of thinking about liquidity at the macro-level.

2. Liquidity as a social relation

Given the knots that are often tied into in trying to define ‘liquidity’, the Oxford English Dictionary’s is heroically terse: “the interchangeability of assets and money”. But that big word ‘interchangeability’ contains multitudes. Like ‘liquidity’ itself, ‘interchangeability’ is a noun derived from an adjective, but it goes one necessary step further, the adjective (‘interchangeable’) being itself derived from a verb (‘interchange’). A noun, from an adjective, from a verb. This is a key to the difficulties ‘liquidity’ presents, and the complexities of the phenomena it refers to.

The verb is necessary, because liquidity is related to processes of exchange. A unit ‘liquidates’ an asset by exchanging it for means-of-payment. This is an inherently social
action, a transaction with two sides (the alchemists never did manage it alone in the laboratory). But the verb is not enough, because an asset is liquid even when it is not being liquidated: the adjective ‘liquid’ refers to the potential for liquidation. This adjective, ‘liquid’, is applied not only to assets themselves, but to the markets in which they are traded, and also to economic units (financial institutions, non-financial firms, other institutions, households and individuals). In fact, to describe an asset as ‘liquid’ is already to say something about either a market in which it can be bought and sold, or an institution with a commitment to redeem it.

Liquidity is, then, a social relation. I mean this in the sense in which Marx described capital as a social relation: “A cotton-spinning machine is a machine for spinning cotton. Only under certain conditions does it become capital.” [Marx, 1847: ch. 5] Something is capital only by virtue of its functional place in a wider network of relationships, and can lose this status when the network changes. Similarly, to speak of ‘liquidity’ as the quality of an instrument is to attribute to it some degree of potential for liquidation, and so implicitly describes not only the instrument but the market and institutional networks through which it has this potential.

Tooke [1844: 10] wrote that money can always buy commodities but commodities cannot always buy money. But ‘liquidity’ is really a measure of an instrument or institution’s ability to ‘buy money’, or means-of-payment. The holder of a liquid instrument cannot necessarily force any other unit in particular to exchange means-of-payment for it, but can expect such an exchange from some other unit, given the state of the market.

Quantifying this capacity for liquidation – this ‘liquidity’, noun – is tricky but not impossible. It is tricky because, as Bronfenbrenner [1945] pointed out, the liquidity of an asset has three dimensions: a probability, a time period and a percentage. Probability, because the holder may be more or less certain of value obtainable on liquidation; a time period, because there may be a trade-off between value obtained and time spent in marketing; and a percentage, because the other dimensions are specified in terms of a proportion of the asset’s ‘full value’.

In practice, of course, the asset-holder will have only a rough rather than precise idea of these dimensions. In any case, they clearly depend on the state of the market on which the asset is to be sold, or on the state of the institution which is committed to redeeming it.

Fischer Black provides a complementary definition of a liquid market, in which the loose points – “small amounts”, “large amounts”, “very near”, “long periods of time” – provide space for degrees of liquidity, quantifiable dimensions:

- a continuous market in the sense that almost any amount of stock can be bought or sold immediately;
- an efficient market, in the sense that small amounts of stock can be bought or sold very near the current market price, and in the sense that large amounts can be bought or sold over long periods of time at prices that, on average, are very near the current market price. [Black, 1971: 30]

The passive voice elides it, but clearly such a market depends on active institutional underpinnings – market makers and deep pools of buyers and sellers. This brings us to the
question of institutional liquidity. Any institution – firm, household, bank, whatever – can be attributed liquidity to the extent that it can access enough means-of-payment to meet its committed and desired net cash outflows over a given period. Note that there are two variables here, one a stock of sorts – access to means of payment – and the other a flow. I elaborate on the treatment of institutional liquidity below.

Market and institutional liquidity depend on one another. Institutions often depend on markets for access to means of payment, and a market’s liquidity depends on the institutions trading in them. Liquidity is a network of dynamic relationships between units, mediated by means-of-payment and other financial instruments.

In what sense can we talk about liquidity in a macroeconomic, aggregative sense? There seems to be a need for such a concept, as writers often refer to ‘excess’ or ‘tight’ liquidity. But as Stevens remarks (as quoted at the beginning of this paper), it can be difficult to pin it down. Because it is the product of relations among participants in a complex network, and not exogenous to those relations, we run into “unusually strong dangers of committing fallacies of composition”, as Cramp puts it in his Palgrave definition. Keynes warns in the General Theory that “there is no such thing as liquidity of investment for the community as a whole”. [Keynes, 1936: 155]

Nevertheless, in the chapter immediately following the warning, Keynes introduced what would become for a long time the dominant macroeconomic treatment of liquidity – the theory of liquidity preference. Here he had little trouble giving a quantitative macroeconomic sense to liquidity: the money supply. It is true that he left ambiguous the question of where to draw the line between money and bonds – “at whatever point is most convenient for handling a particular problem”. [ibid: 167] But whatever decision is made here, we are left with a clear, finite, exogenously-determined set of assets. The interest rate equilibrates supply and demand for money, with the position and shape of the demand schedule determined by income and the level of liquidity preference, so that the rate can be taken as “a measure of the unwillingness of those who possess money to part with their liquid control over it.” [ibid: 167]

There is no trouble here in giving some sense to ‘liquidity’ the noun: it just means ‘money’. If you pardon the fact that any precise nomination of what fits the description will be somewhat arbitrary, there seems no trouble in giving a sense to phrases like ‘awash with liquidity’ or ‘excess liquidity’: they just mean ‘too much money’. But if it is this simple, why does a central bank governor in 2008 have to mince his words so?

A hint of the problem was present at the outset, in the very footnote where Keynes mentions the arbitrariness of the line between ‘money’ and ‘bonds’:

For example, we can treat as money any command over general purchasing power which the owner has not parted with for a period in excess of three months, and as debt what cannot be recovered for a longer period than this... [Keynes, 1936: 167]
By such a definition, the supply of money cannot be considered to be simply set by the authorities. Any unit could expand it by lending cash to another for a period of less than three months: the cash remains in existence, and there is a new asset which also fits the definition of money. The amount of liquidity in the system cannot be understood as set from outside. In a world in which means-of-payment itself can be issued by private units, even restricting the use of ‘money’ for means-of-payment alone does not escape this problem. Stevens’ still more restrictive definition of liquidity – as exchange settlement funds with the central bank – excludes all privately created ‘inside money’. But there is a price. The demand of the private system for this ‘outside money’ is highly variable, depending on fluctuations in the desire or ability of the financial system to economise with it in building a pyramid of private liabilities from that apex. It was precisely such a fluctuation, during the recent financial crisis, that motivated Stevens’ musings on liquidity in the first place. Restrict ‘liquidity’ to ‘outside money’, and we only find we need a new word to talk about something very much like ‘liquidity’ further down the pyramid.

Keynes was well aware of the problems in assuming an exogenous money supply, though he did not address them in the *General Theory*, where his main concern was to establish – against the traditional Quantity Theory – the variability of demand for money, or income-velocity.5 But post-WWII Keynesian-neoclassical synthesis macroeconomics, at least in its textbook IS-LM form, presented the central bank as setting the money supply via open market operations.6 It was of course acknowledged that bank deposits formed the bulk of the money supply, but an assumption of a constant or predictable reserve multiplier was enough to keep the central bank in control.

The traditional liquidity preference story is simply not well set up to deal with monetary endogeneity. It focuses on the equilibrium demand for a given set of assets. Though it may endogenise income flows via the effect of the interest rate and expectations on investment, it does not deal with the financial relationships associated with investment. It has nothing to say about the balance sheet decisions which create private means-of-payment and liquid substitutes. In the following section I sketch an alternative treatment of liquidity preference, focusing on the expectations and strategic behaviour of individual units, based on a Minskyan

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5 Keynes gave more sophisticated accounts of banking and the financial sphere in the Treatise on Money and elsewhere in his oeuvre, and opinions differ as to why they were left out of the General Theory. Dow [1997: 67] argues that he was “abstract[ing] from bank liquidity preference”, legitimately, but only in the institutional context of the UK in the 1930s. Robinson [1971: 81-82] argues that he bastardised his insights into the monetary sphere for strategic reasons, so as to take on the orthodoxy just one sacred cow at a time. Moore [1988: 171-208] believes, like Dow, that he was simplifying in order to focus attention elsewhere, but describes how the place of the banks became a sticking point in the debate following publication, so that Keynes was “forced under heavy pressure to concede that the banks ‘hold the key position’ in the process of economic expansion”.

6 These models are still found in typical textbooks today. Blanchard and Sheen [2009], for example, includes a model in which the central bank sets the money supply directly, given a constant bank reserve multiplier, and a ‘new consensus’ model in which the central bank sets the interest rate.
concern with cash-flow constraint. I then discuss the networks in which these strategies play out, suggesting a way of conceptualising liquidity at the macro-level.

3. Liquidity preference as behaviour towards cash-flow risk

In the traditional Keynesian liquidity preference story, each unit’s demand for money balances is based on a combination of transactions, precautionary, speculative and finance motives. The first two are typically treated as having a stable relationship to income. The speculative motive is where most of the action is, moving the system on the basis of the shifting expectations of wealth holders about future movements in the interest rate. Wealth holders adjust their asset portfolios between bonds and money to avoid capital losses. A certain class of unit – managers of financial wealth (including perhaps wealthy households and those who they employ to manage their assets) – calls the shots, and they call them entirely on the asset side of their balance sheets: there is no treatment of borrowing. The finance motive, introduced by Keynes [1937] only after the General Theory, introduces new kinds of unit into the story – firms about to invest and the banking system with its ‘revolving fund’ – but this does not change the story very much. An increase in the necessary size of the revolving fund increases the demand for money, but the expectations of the active speculators continue to be decisive, because of the size and fluidity of their portfolios.

A cash-flow focused theory of liquidity preference changes the picture considerably. It simultaneously narrows and widens the set of financial instruments under consideration. It narrows it because it conceives liquidity strategies as revolving ultimately around access to means of payment, not money more broadly. But it also widens it, because it recognises a larger range of strategies units use to secure this access, involving more financial instruments and practices. Finally, it focuses not just on the holders of financial wealth, but on the strategic behaviour of a variety of specialised financial units. Banks and other intermediaries are especially important to the story, as they specialise in providing means-of-payment and other liquid stores of value to non-financial units. Their balance sheets and liquidity management needs and practices are quite different from the implicitly dominant rentier unit of the traditional model.

Each economic unit – whether a household, a firm, a bank, a central bank, a government treasury, or whatever – has a balance sheet of assets and liabilities and a pattern of cash inflows and outflows. Assets and liabilities are tied to future flows. Assets include (1) financial assets entitling the holder to future cash flows of greater or lesser certainty, periodic or contingent or on-demand; (2) real assets the unit can use to generate future inflows of greater or lesser certainty, given its competitive position in the market(s); and (3) real assets not associated with an actual cash-flow but providing a service that would otherwise be rented. Liabilities are mainly promises to pay cash – either streams of future payments, contingent payments, or payments on demand – but they may include contracts for future services.
Cash flows can be divided into three types, following Minsky [2008: 223]:

i. income: relating to the process of production, including purchases/sales of goods and services and factor payments;

ii. balance sheet: payments mandated by previously agreed financial contracts, e.g. interest and principal repayments, redemption of demand-deposit liabilities, obligations from derivative contracts, etc.; and

iii. portfolio: payments involving the transfer or creation of capital goods, real estate or financial instruments.

Different kinds of units can be distinguished from one another by their typical cash-flow patterns and balance sheets, and the different kinds are functionally related to one another in networks knitted together by recurring flows and potential flows. A typical household, for example, will have regular income inflows and outflows, from and to firms; smaller regular balance sheet flows relating to savings and debt, and occasional portfolio flows. Financial units, including banks, are distinguished by the fact that their income flows are typically much smaller than their balance sheet and portfolio flows. Their liquidity management thus involves very different logics from that of households or non-financial firms. The modern state has two quite different institutional types: the central bank and the treasury.

Units of all kinds commit themselves to *positions* which shape their future expected patterns of inflows and outflows. A position is a configuration of anticipated and potential inflows and outflows which is not fully reversible. A unit changes its position through projects. For example, when a firm invests in a new plant partly out of internal funds and partly by borrowing from a bank, it (i) forfeits its potential call on the liquid assets that made up the internal funds; (ii) commits to a future stream of interest and principal payments to the bank; (iii) commits a revolving fund for wages and materials necessary to run and maintain the plant; and (iv) in return expects an inflow of quasi-rents that would eventuate without the plant.

Each of the future flows involved in a project is uncertain to greater or lesser degree. They each have an expected value and a subjective probability (or simply uncertain) distribution of possible values above and below the expected value. The project as a whole can be thought of as combining the uncertainties into a set of expected net inflows over each future period, with a distribution of possible net inflows around the expected point. Each unit is involved in any number of such projects, independent to some extent from one another, which together form

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7 Decisions about where to draw a line between different unit types depends on the purpose of the model being built. It may or may not be useful to divide, for example, households between those with large wealth holdings and those without; or to divide between certain different kinds of financial institution. It is usually important to divide between banks with the power to create means-of-payment and other financial institutions without that power.
its overall position, itself thinkable in terms of expected net inflows in each period and a
distribution of possible net inflows around them. This is the unit’s overall position. Many of
the myriad uncertain outcomes will have covariances with one another, so that they do not
have a simple additive relationship with one another. The business cycle, for example, affects
many flows at the same time.

Units must meet net outflows with cash. They are thus compelled to develop a strategy for
‘making position’ in the event that outflows exceed inflows for a given period. Making
position ultimately revolves around forcing a flow of means-of-payment, because at the
moment of payment, only means-of-payment will do (though over any given period, a unit
may be able to implicitly cover a payment by delaying it, effectively forcing credit from the
unit to whom the payment is due.) But actually holding reserves of means-of-payment is only
one position-making strategy. Others include holding liquid assets which can be quickly sold
or redeemed with its issuing unit for means-of-payment, maintaining a pre-negotiated line of
credit with another unit, or planning to issue a new security onto a market.

All these ways of making position carry costs, and in most cases the costs themselves are
uncertain. Holding means-of-payment sacrifices higher yields on other assets. Holding liquid
assets involves risks of capital loss, either while they are on the balance sheet, or in needing
to sell them too quickly. (See the discussion of the three dimensions of asset liquidity above.)
Reliance on borrowing also carries the risks that market conditions will make the credit cost
more than anticipated or even unavailable at the time it is needed. Since the cost and
availability of credit depends on creditors’ assessments of the creditworthiness of the would-
be debtor, and/or of the value of collateral, there is further risk that the position of the
borrower makes credit more costly or unavailable, potentially generating a downward
liquidity-solvency spiral.

Position-making strategies are like insurance policies, carrying a cost but reducing the
uncertainty resulting from the uncertain pattern of future cash-flows. *Liquidity preference can
be presented in terms of a unit’s trade-off between expected returns (appropriately
discounted) and the risks arising from cash-flow deficits in future periods.* A higher level of
liquidity preference means the unit is willing to sacrifice more expected return to enjoy lower
cash-flow risk.

I would like to highlight two important consequences of this way of thinking about liquidity
preference. First, liquidity management is not a decision about position-making strategies
which takes the position itself as given. Projects are decided upon partly with respect to the
cost of hedging the cash-flow uncertainty they add to a unit’s position. Therefore the
anticipated cost of making position enters each unit’s decisions on which projects to embark
upon, or on how to adjust a position. This is the form in which the liquidity constraint
appears. For many units (those with a buffer of assets or access to credit) it is not as an
absolute limit on a unit’s balance sheet expansion, but a nebulous limit involving how much
cash-flow risk the unit is willing to take on. Nevertheless, the perceived cost of making position is a channel by which financial conditions can affect investment and thus the ‘real’ economy. Liquidity is not neutral.

Secondly, liquidity management is not only about a portfolio of assets. It involves the liability side of the balance sheet also. Many liquidity strategies do not appear on the balance sheet at all, because they involve actions that will be attempted only when the need arises – such as a call on a line of credit or the issuance of new securities. However, it may still make sense to think of liquidity management in terms of a ‘portfolio’, in that a unit may diversify its options: each position-making strategy involves uncertainty over cost and availability, and there will be covariances between particular strategies. It is also possible to think of a unit’s access to credit as related to its expected future returns and/or assets which can be offered as collateral: borrowing is, in a sense, a securitisation of future inflows or less-liquid assets. The value of these ‘shadow assets’ depends upon the judgement of potential creditors, given returns on alternative placements, with benchmarking provided by third party ratings agencies.

It may seem that this approach to liquidity preference sidelines the speculative motive in favour of the precautionary. In a way this is true: I believe the precautionary motive is an important ‘moving part’ for firms and financial intermediaries in particular, which is neglected in treatments of liquidity preference that take the household wealth-manager as the norm. For Keynes, the speculative motive was more about maintaining capital certainty than access to means of payment. But in an age of chronic inflation and floating exchange rates, strategies aimed at maintaining real capital value and strategies aimed at maintaining access to means of payment should be treated as separate motivations – though they may both influence a unit’s demand for a particular kind of instrument. However, a speculative motive still plays a role in liquidity preference as I have defined it. A unit needs access to means-of-payment to take advantage of new placement or project opportunities: tying up purchasing power in an illiquid position comes at an opportunity cost if a better opportunity comes along. Also, a unit will care about the capital value of its assets partly for liquidity reasons, because a fall in its value lowers the cash-flow it can generate when liquidated or used as collateral.

This approach to liquidity provides a way of understanding real-world aspects of liquidity and liquidity crises that the traditional liquidity preference story does not. For many years banks and other financial institutions have in fact managed liquidity on the liability side of their balance sheets. Often, banks hold securities not in order to sell them to generate a cash-

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8 A number of writers discussing the recent financial crisis have highlighted the connection between liquidity and collateral. See, for example, Debelle [2011] and Adrian and Shin [2008].
flow when necessary, but for use as collateral in repurchase agreements with the central bank and with one another, and to signal prudence to potential creditors.  

The variety of position-making activities is recognised in modern prudential regulation, if theory has not yet caught up. For example, the Australian Prudential Regulation Authority’s banking standards regulates liquidity not simply in terms of a quantity of assets held but in terms of strategy, recognising the following as acceptable parts of the mix [APRA, 2008: 3-6]:

- maturity mismatch limits;
- liquid holdings;
- diversification of liabilities;
- access to wholesale markets;
- foreign currency and other markets;
- intra-group liquidity;
- holdings of less liquid assets that can nevertheless be sold, used in repurchase agreements or securitised; and
- access to industry-based (i.e. privately arranged) emergency liquidity facilities.

The post-war world in which liquidity meant essentially a buffer stock of government securities is long gone.

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9 Guy Debelle [2011], RBA Assistant Governor (Financial Markets), has argued that “the pendulum has swung too far in focusing on liabilities.” But the reason for the continued importance of asset quality, he says, is to assure creditors that they will be repaid.
4. Liquidity as a macro-phenomenon

The macroeconomic aspects of liquidity raise much more difficult problems than those relating to the liquidity strategies of individual units. Here I merely sketch a few aspects of an approach, suggesting possibilities for future work.

In the traditional Keynesian liquidity preference story, the market for money is the central organiser of liquidity for the system as a whole. Keynes set this quite explicitly against the alternative approach to interest rate determination focusing on the supply of and demand for loanable funds. The money market is where aggregate demand for money meets an exogenous supply of money, conceived either as completely made up of ‘outside money’ (i.e. a liability of the state rather than any private institution), or some combination of outside and inside (bank) money whose quantity is under the control of the authorities due to a stable bank reserve multiplier.

This approach is no longer adequate. In many banking systems today, banks hold very little in the way of ‘outside money’, and the supply of it is in any case difficult for the central bank to control. As Kearns and Lowe [2008: 155] describe, “there are... simply not enough ‘outside assets’ in Australia for banks to hold the bulk of their liquid assets in securities issued by entities other than the banks.” Australian banks maintain a total stock of liquid assets of about $350 billion, but there is only $55 billion worth of Commonwealth Government bonds on issue, alongside $70 billion of state government bonds and $45 billion of supra-national (international organisation) debt in Australia.

Figure 1 shows the recent evolution of asset-management by Australian banks. It can be seen that holdings of reserves – currency and central bank deposits – and government securities have fallen to an almost negligible proportion of domestic assets – totalling 0.2 and 0.5 per cent of total domestic assets respectively, compared with around 8 and 30 per cent in the 1960s. The rest of their liquid holdings are the liabilities of other banks, a stock which is extremely flexible, capable of rapid modification. Note the jump in 2007, when demand for liquidity rose at the outset of the international crisis: the banks simply “issued securities to one another, allowing each to record an increase in their liquid assets”. [Kearns and Lowe, 2008: 154-55] The traditional liquidity preference story has little to say about this situation, which is evidently not about the supply and demand for a fixed stock of ‘outside’ assets.
Figure 1: Banks’ liquid assets

Despite their evident fluidity, the supply and demand for money need not be abandoned as a focus for dealing with liquidity at the macroeconomic level. They must simply be approached in a different way, with both supply of and demand for monetary instruments determined by the interdependent liquidity strategies of different kinds of unit, and with a major but not commanding role played by the central bank.

According to the analysis laid out in the previous section, the liquidity management of individual units has implications for their demand both for means-of-payment and for a broader set of instruments, liquid to greater or lesser degree. Because to borrow is, in effect, to create and sell an instrument which becomes another unit’s asset, liquidity management on the liability side also has implications for the supply of various instruments. Liquidity management is of course not the only influence on the demand and supply for financial instruments, but it is an influence.

In Keynes’s [1936] Chapter 17 analysis of liquidity (which was central to Minsky’s [1975] interpretation of Keynes), he notes that demand for liquidity has an influence on the valuation of a wide variety of assets. Units will pay more for an asset that is more easily saleable than an illiquid asset with the same expected profile of returns. This excess is the liquidity premium. A similar effect would arise from liquidity preference as I have defined it in the previous section: liquidity strategies induce units to pay more for certain instruments than
they would if they were unconcerned with using them to obtain means-of-payment when necessary. The size of the premium a unit will pay depends not only on the particular characteristics of the instrument and its market, but also on its place within the unit’s overall portfolio of liquidity strategies. (For example, a unit with access to a cheap line of credit may be willing to pay less of a liquidity premium to hold a Treasury bond than it would without such access.)

Liquidity therefore casts a shadow over a full range of assets. But means-of-payment have a special place. The point of liquidity management is to secure access to it. Liquidity strategies substitute for holding means-of-payment directly, but to do so they must be credible. There must be networks supporting them, through which the unit can obtain means-of-payment when necessary: networks of markets and institutions.

Things would be simpler if all means-of-payment at least were 'outside money', and intermediaries and markets simply increased its velocity, or economised on demand for it (two ways of saying the same thing). But in fact, the vast bulk of means-of-payment takes the form of private bank deposits. We have a two-tier system of liquidity, in which banks must make position in central bank money, while non-banks make position primarily with bank deposits.

The history of financial innovation is in part a history of the economisation of means-of-payment. The emergence and consolidation of new kinds of institutional intermediary, and new kinds of market, allow units to hold a smaller precautionary quantity of means-of-payment than they otherwise would to satisfy a given level of liquidity preference. This may be because a unit can replace it with (1) an instrument an institution commits to exchanging for means-of-payment on demand or at short notice; (2) an instrument which can now be traded on a more liquid market; (3) a line of credit with an institution (whether explicitly pre-negotiated or simply anticipated); or (4) the anticipated opportunity to place a liability of its own on a more liquid market.

This is most familiar with respect to banking – the classic and still dominant liquidity ‘transformer’ – borrowing short and lending long. Bank deposits and banknotes came to be trusted as immediately convertible into ‘money proper’ by every unit that held them, despite the fact that banks were able to convert only a small proportion at a time. This was possible because only a fraction of deposit-holders needed to exercise their call on the bank in any given period – and this fraction would be fairly predictable, with the banks managing their own liquidity so as to cope with potential fluctuations. Once bank deposits came to function themselves as means of payment, banks could stretch liquidity still further because a larger proportion of base money would remain within the system. As late as the 1930s it was still being debated whether banks created new money or merely increased the velocity of ‘money-proper’. Now bank deposits are universally treated themselves as ‘money-proper’, but not much hangs on the judgement either way. Non-bank intermediaries can ‘transform’ liquidity
in the same way, by borrowing short and lending long, even if their own liabilities do not function directly as means-of-payment. As discussed above, the growth in importance of such intermediaries in the post-war period sparked similar debates about whether those liabilities counted as money or simply served to increase the velocity of (or lower the demand for) bank deposits.

The emergence or deepening of a secondary market for an asset ‘transforms’ liquidity in a similar way, by facilitating the possibility of converting a long-term debt into means-of-payment more-or-less on demand. Of course, there is no institution guaranteeing the conversion, although market-making institutions are essential to the liquidity of most financial markets. But the same principle applies: the instruments maintain their liquidity so long as not too many holders attempt to convert into means-of-payment at once. In both institutional and market cases, aggregate perceived liquidity increases precisely because each individual unit expects to be able to make the conversion on demand, even though they would not all be able to if too many tried at the same time.

Sometimes new institutions and markets emerge that do not transform the liquidity of non-financial units directly. Instead, they work indirectly, by transforming the liquidity of financial intermediaries. The emergence and deepening of money markets in the 1950s and 1960s is an example – stretching the liquidity of the banking system and facilitating the emergence of non-bank intermediaries by providing a network for the exchange of reserves. [Minsky, 1957] The development of mortgage securitisation networks and markets in the 1990s and 2000s is another.\(^{10}\)

It is perceived liquidity that influences units’ decisions, but these perceptions are not free-floating. They are tied to more-or-less reasonable expectations of being able to access means-of-payment when necessary. Units really do feel constrained by their access to liquidity, and are right to do so. Liquidity preference certainly shifts over time as units feel more or less averse to payment risks. But at a systemic level, it is possible for the liquidity preference of non-financial units to remain the same, and the underlying quantity of ‘outside’ money remain the same, and yet the level of perceived liquidity to rise, because of changes in the liquidity management practices and networks of intermediaries.

Capitalism is prone to liquidity crises, and in some periods more than others. Crises are situations in which too many units try to exercise some shared form of liquidity at once and find that they do not have the access to means-of-payment they were counting on. These crises have a tendency to spread from instrument to instrument, institution to institution, and market to market, because of a ‘domino effect’ of payment failures, and because of a spreading loss of faith in certain liquidity strategies. Because of the potentially catastrophic

effect of such crises, it has always been one of the key functions of central banks to act as ‘lender-of-last-resort’, supplying its own liabilities to shore up networks of payments. The fact that the central bank stands ready to act in that capacity greatly increases trust in an institution so supported – and therefore increases the perceived liquidity of their liabilities and the markets they trade in.

Since World War II, central banks have tended to periodically expand the class of institutions they will support with lender-of-last-resort facilities, as well as the kinds of liquidity strategy they will underwrite in this way. They have often been forced to do so, either by the outbreak of a crisis or in an attempt to forestall one. In the late 1950s, for example, the Australian central bank extended lender-of-last resort facilities beyond the trading banks for the first time – to money market dealers. It did not take a crisis to bring this about, only the realisation that one was possible: the dealers were becoming increasingly important to the financial infrastructure, but had fragile balance sheets. The central bank’s decision to support them did not only keep them alive, but had broader impacts on the financial system, because the dealers were necessary to the existence of the nascent money market, and played a crucial role in the liquidity strategies of the hire-purchase finance companies (of which the central bank disapproved). [Beggs, 2010: 24-28]

As Minsky [2008: 43-108] has shown, the same pattern played out several times in the United States between the 1960s and the 1980s: private financial innovation threw up a liquidity-economising innovation, which grew slowly at first but with increasing speed; a payments crisis developed around the new market or institution class; the central bank was forced to bail it out one way or another; and finally, after a chastened post-crisis lull, the innovation would become a permanent part of the financial furniture, because the implicit or explicit backing of the central bank increased confidence in the innovation – i.e., reinforced its perceived liquidity.\textsuperscript{11} The reaction of central banks to the recent global financial crisis is another episode in a familiar story – although now some central banks, including the RBA, have also become market-makers of last resort, shoring up not only troubled institutions but supporting the liquidity of particular markets more directly. [Mehrling, 2010]

5. Conclusion

In this paper I have sketched a treatment of liquidity which follows Minsky in keeping cash-flow at the centre of analysis. I have emphasised that liquidity is a social relation - that is, it is not inherent in assets or the balance sheets of individual units, but depends on networks of relations between institutions. I do not expect this to be a controversial point. Perhaps it is even obvious. But it seems that many difficulties involved in defining liquidity result from a

\textsuperscript{11} In fact, given the centrality of this message to Minsky’s theoretical oeuvre, the bailout and not the crisis itself might be seen as the real ‘Minsky moment’. Though Minsky has a reputation as a doom-sayer, it should be noted that his answer to the question posed in his famous [1962] paper “Can ‘it’ happen again?” (i.e., the financial collapse leading to the Great Depression) was ‘probably not’ – because of the countervailing action of the modern state. Minsky is a prophet of ‘upward instability’ in asset and goods prices, not of financial collapse.
desire to pin it down to a particular set of assets, and the difficulties are much reduced when its contingent character is fully acknowledged. That liquidity is difficult to quantify at a macroeconomic level is not surprising when we see it as emerging out of a network of institutions, all projecting uncertain needs and abilities (demands and supplies) into an uncertain future.

My treatment has two basic elements. The first is a reconception of liquidity preference in terms of position-making strategies. Each unit faces a trade-off between the cash-flow uncertainty and expected return of its position. Managing liquidity may involve a 'portfolio' of diverse strategies - not only the holding of liquid assets, but also the maintenance of lines of credit and plans to borrow.

The second is a consideration of the macroeconomic dimension of liquidity in terms of interlocking liquidity strategies. The place of banks is especially important, because they are the dominant suppliers of means-of-payment to the rest of the system, managing their own liquidity in terms of their reserves of 'outside' central bank money. The system is therefore multi-tiered and cannot be reduced to the supply and demand for a single outside asset. I discussed the evolution of the financial system as often involving (among other things) a progressive economisation of outside money and inside means-of-payment. Central banks have, in their role as lender or market-maker of last resort, found themselves as accomplices in this evolution, often without intending to be.

This paper has only provided a bare sketch of an approach. Taking it further into more formal models or detailed analyses of historical or contemporary financial systems brings difficult problems. It is clearly significantly more complicated than the traditional liquidity preference story. A full macroeconomic model of interlocking liquidity strategies could get prohibitively complex long before it approached the institutional complexity of the financial system of today. Stock-flow consistent modelling may be a useful way to build exploratory models, but care would need to be taken with decisions about the appropriate aggregation: it is common in such models to aggregate the whole banking sector's balance sheet, but much of the action must take place between individual banks. Perhaps aggregation could take place at a sub-sector level, separating institutions of the same type but pursuing different strategies (e.g., conservative banks and risk-loving banks). Intertemporal general equilibrium models would be unlikely to capture this treatment of liquidity very well, because of the overriding importance of uncertainty and dynamics over time. Agent-based modelling, dealing with the interaction of many units of different kinds with different rule-based behaviour, might be a way forward. More traditional macroeconomic models working with sequences of temporary equilibria could also work.

The liquidity concepts discussed here could also be employed in more modest empirical studies of particular crisis episodes or longer periods of financial evolution. It would be worthwhile to analyse empirically the liquidity strategies of particular institutions and kinds
of institution to better understand them and how they relate with those of other institutions to
which they are connected. A map could be built up piece by piece. Arguably the kind of
detailed, empirically calibrated models built up for 'stress testing' banks is already going
down this road. There are a number of exciting possibilities for future research, which could
flesh out the practical meaning of liquidity.

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