

Knowledge, Information and Credit Creation: The Impact of Monetary Policy

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Published in *Papeles de Economía Española*, special issue on
Money, Financial System and Economic Growth, 101, 2004, 99-113.

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February 2004

Introduction

The nature and effects of monetary policy have been the subject of much discussion in recent years. This has been particularly the case in Europe, given the change in institutional arrangements with the establishment of European Monetary Union, and the centralisation of national monetary policy in the European Central Bank.

The most common practice now (as in Europe and the US) is for monetary policy to consist of the setting of the central bank repo rate¹, which is the rate at which liquidity is supplied to the market. Recent thinking on monetary policy has focused on a range of issues surrounding the setting of that rate. First there is the question of how changes in the central bank repo rate are transmitted to aggregate demand: the transmission mechanism. Second there is the question of the relationship between aggregate demand and inflation, since most central banks have inflation control as their primary goal. The transmission mechanism is seen as operating through a range of different channels, of which considerable emphasis in the recent theoretical literature has been placed on the bank credit channel.

The way in which bank credit supply and demand are affected by changing conditions in the money market draws attention to decision-making at the micro level. Indeed asymmetric information as between borrowers and lenders has been the focus of New Keynesian analysis of the bank credit channel. Post Keynesian analysis however has focused on knowledge, as a broader concept than information, applied to decision-making under uncertainty. This focus has also been applied to the central bank's monetary policy decision-making. Here too uncertainty has to be addressed in the form of uncertainty as to the knowledge basis for the monetary policy decision itself.

The purpose of this paper is to consider the distinction between knowledge and information, and to consider its implications for the credit market. We then consider the significance of this analysis for monetary policy, both in terms of the effect of monetary policy on the credit market, but also for the monetary policy decision itself. We also briefly consider the regional impact of monetary policy as a case study to illustrate the argument.

Knowledge and Information

The term ‘information’ is used synonymously with knowledge in the New Keynesian literature. We start with this usage in order to distinguish it from the way in which knowledge is understood in Post Keynesian analysis. We will find a direct correspondence between the knowledge/information distinction and the uncertainty/risk distinction.

For New Keynesian analysis, there is a benchmark of full information which includes, not only full knowledge of the present, but also full knowledge of the probability distributions governing the future. This corresponds to the concept of certainty equivalence, shared for example with New Classical analysis. Whatever is not captured by this knowledge is categorised as a shock, which is a completely unpredictable event, of which there is no prior knowledge whatsoever. The subject matter of knowledge, which is termed in this approach ‘information’, is therefore dualistic. Either it is knowable (at least up to a probability distribution²) or it is unknowable. There is therefore no room for uncertainty as anything other than quantifiable risk, so the two terms tend to be used interchangeably (just like knowledge and information).

Where New Keynesians depart from New Classicals is in considering circumstances where information is knowable, and known by some parties, but not revealed to others, that is, the information is asymmetric. This has powerful consequences which we consider in the next section, but here we focus on the prior issue of the knowability of information.

The subject matter of decision-makers in the economy, just like the subject matter of economists and policy-makers themselves, is complex. This complexity takes the form of individual behaviour which evolves and is creative within social structures which themselves evolve. Thus in reality individuals do not fit the characteristics of rational economic man because they can be creative and can change in a way which is not satisfactorily captured in a change in preferences, and because individual behaviour is significantly conditioned by social convention. Evolving social conventions and social institutions mean that the structure for individual behaviour is not constant. Post Keynesians therefore argue that the conditions are lacking for frequency distribution data to generate meaningful probabilities. Indeed, it is precisely because the basis is not present for individuals to formulate certainty-equivalent expectations that they rely on social conventions and institutions, which thus lend a crucial element of stability to social and economic behaviour. One of the most important of these institutions is money, a safe asset widely acceptable in payment and used to denominate the contracts which allow economic activity to proceed (Davidson, 1972).

Post Keynesian analysis would classify as information only the kind of knowledge which could feasibly approximate to certainty, that is, knowledge of data series, which are knowable. But, as critical realists point out (Lawson, 1997, 2003), the ‘empirical’ level is different from the ‘real’ level, at which causal mechanisms

operate. It is also different from the ‘actual’ level of real experience. Knowing the values in data series does not mean that we know the reality of actual experience or the mechanisms which generate it. The issue then concerns the status of these data, as a basis for decision-making.

Post Keynesian analysis is founded on the distinction between risk and uncertainty, where the latter is understood as unquantifiable risk. Building on Keynes’s (1921) work on probability, Post Keynesians argue that only very limited aspects of social reality approximate sufficiently closely to stable structures to warrant analysis based on frequency distributions.³ The conditions described above for certainty-equivalent information are the same conditions as are required for quantifying risk. The Post Keynesian concept of knowledge therefore addresses the majority of circumstances, where risk cannot be quantified and where knowledge is therefore held with uncertainty.

This analysis is therefore non-dualistic with respect to knowledge (Dow, 1990). Rather than thinking in terms of information as being knowable (up to a probability distribution) or unknowable (as in a shock), the analysis focuses on the varying degrees of certainty with which knowledge may be held. Keynes showed how knowledge is built up from experience (direct, as in personal experience, or indirect as in published data), theoretical propositions as to causal mechanisms, conventional knowledge, and intuition. Conventions and intuition are important, since the first two elements are rarely sufficient to justify decisions. This is a matter of degree; the more evidence can be adduced to a proposition, the more reliable it is, the lower the degree of uncertainty, and the lower the need to fall back on conventional opinion and intuition.

The elements are combined with the exercise of judgement in order to provide reasoned grounds for belief in the proposition. The process is aided by what would be regarded as an impediment to New Classical or New Keynesian analysis: vagueness of language (Coates, 1996). Uncertain knowledge and the grounds for accepting one proposition over another cannot be captured in precise language.

The knowledge/information distinction can perhaps usefully be explained in terms of the distinction in the management and organisation literature between 'knowing how' and 'knowing that'. Anyone familiar with instruction manuals for what ought to be straightforward activities susceptible to 'knowing that', like assembling furniture or operating computer software, knows that precise instructions are never sufficient for 'knowing how'. They must be supplemented by prior 'knowledge how' based on experience which cannot be translated into precise instructions. The issue is all the more profound for organisations where the 'components' and the environment are human and social, and the capabilities required cannot be reduced to complete instructional information sheets.

While New Classical and New Keynesian analysis confines the unknowable to 'shocks' which can only be reacted to, Post Keynesian analysis focuses on decision-making under uncertainty of varying degrees. Decisions must be, and are, taken in a reality about which we are uncertain. New Keynesian analysis broaches this territory up to a point, by considering circumstances where information, while knowable, is concealed. In particular they consider the credit decision where the borrower conceals the true risk from the lender. We turn now to the credit market to consider the implications of the discussion in this section of knowledge and information, uncertainty and risk.

The Credit Market

Bank credit is central to both New Keynesian and Post Keynesian theory. Investment is a key element of aggregate demand, and bank credit is a key source of finance. For this to be the case, there must be some segmentation in reality between different sources of finance, which New Keynesians identify as market imperfections. In particular, it is argued that small and medium-sized enterprises have only very limited access to capital markets, so that their choice of finance tends to be restricted either to retained earnings or to bank finance (Fazzari, Hubbard and Peterson, 1988). This is something which is of course open to change, and indeed there has been a series of developments, some initiated by the business sector, and some promoted by government, to widen access to capital markets. But the reasons for differential access in fact derive from the same issues of knowledge and information (or uncertainty and risk) we are considering here. We will proceed to discuss these issues in terms of bank credit, and then extend them to capital markets.

The creation of credit is the outcome of both demand and supply conditions, each of which rests fundamentally on issues of knowledge, as set out in Minsky's (1970, 1982) extension of Keynes's analysis of borrower's and lender's risk (see further Dow and Earl, 1982, chapters 11, 12, and Dow, 1998). We focus here first on the credit demand of firms to finance production and real investment, and will also consider below the (now considerable) creation of credit to finance purchase of financial assets.

When a firm is contemplating raising finance for an expansion of productive capacity, a fundamental consideration is the expected value of that expansion, and the degree of confidence in that expectation. This is a classic instance of the limitations of statistical probability analysis. While there may be some similarities between one

investment project and the next, they cannot be regarded as repeated experiments. Even if the physical characteristics are repeated, the external environment in terms of the market, and the products and technology of competitors, is always open to change which cannot be predicted with much accuracy. This is what Shackle (1955) referred to as a 'crucial experiment'.

Nevertheless, firms do take investment decisions, so they must form a view about expected return and the degree of uncertainty surrounding it without the aid of frequency distributions based on repeated experiments. Subjective expected utility theory suggests that decision-makers get round problems of lack of objective probability statistics by constructing subjective probability statistics. New Keynesians use the term uncertainty to apply to risk which is reducible in time as the unknown information becomes available (only knowable information is considered). Uncertainty is therefore represented by subjective beliefs about this forthcoming information. (Rothschild and Stiglitz, 1971; Bernanke, 1993). Indeed Jaffee and Stiglitz (1990) explicitly emphasise the subjective nature of risk evaluation, and the role of judgement, in the credit market, as impeding the operation of market forces.

The important difference between this approach and the Post Keynesian approach is that the latter highlights the important incidence of states of high uncertainty as those in which firms are unwilling to settle on an assessment of expected value. This is a situation in which the firm is unwilling to 'place bets' (Runde, 1995). In such situations, the rational behaviour for the firm is to exert liquidity preference, that is, to avoid being committed to illiquid real (or financial) assets. The firm stays liquid until conditions become such that an assessment can be made with less uncertainty.⁴ Where a firm takes a positive decision, to proceed with an investment, or to rule out a particular investment, that is a case of acting 'as if'

certain. Where the firm decides only not to make a decision, then uncertainty becomes a material factor in the decision.

The firm then considers the expected value of the project in relation to the interest charge on bank credit. But, even where a positive decision is under consideration, the degree of confidence in the expected value will influence the firm's final decision. Where confidence in the expectation is low, the expected value will be discounted, relative to the cost of credit. As a generalisation, other things being equal, the more borrowing a firm undertakes, and thus the more highly it is leveraged, the greater the discount.

The bank considering the loan application must similarly form a view as to the expected value of the project and the confidence it is reasonable to hold in that expectation. New Keynesian theory considers the banks' procedures for making a risk assessment when the firm conceals its knowledge of the 'true' default risk from the bank. The banks then make decisions based on the argument that rational behaviour on the part of firms encourages opportunism. Firms will switch to higher risk projects if borrowing costs rise (assuming a known risk-return trade-off), that is, moral hazard. In addition, lower-risk borrowers who cannot switch into high-risk projects will drop out of the credit market, worsening the risk profile of the bank's loan book: adverse selection. This is the basis for the argument that, under rising costs of reserves to the banks, the rise will not be passed on, but rather borrowers will be rationed.

But Post Keynesian theory suggests that, while borrowers and lenders may indeed have different knowledge on which to base their assessments of the risk of default on the loan, neither has access to a 'true' risk assessment. For each, then, the risk assessment is subject to different, and potentially varying, degrees of uncertainty. Since each bases the assessment to some degree on conventional opinion, there is

scope for periodic revisions of the assessment which may have no identifiable counterpart in the real conditions of the investment project.

The special role of the banks in the financial system can itself be seen to be based on knowledge issues (George, 1997). The first identifiable feature of banks is that, unlike other financial instruments, their liabilities are used as a means of payment. Because the redeposit ratio is high, banks are in the unique position of being able to borrow short and lend long. Given the illiquidity of the debt contract, banks have built up a comparative advantage in assessing the risk attached to such contracts. There is considerable discussion about the best way of building such knowledge. In particular, there is debate about the relative merits of the German banking system (see for example Edwards and Fischer, 1994), where the close involvement in client companies provides a knowledge base which combines the knowledge capabilities of the companies and the banks. On the other hand, the close relationship may jeopardise the liquidity of the relationship, making it more difficult to call in loans, or more generally to sever the borrower-lender relationship.

But, even with special expertise built up over years of experience, banks do not have access to 'true' risk, and must themselves rely also on conventional judgement and intuition. The greater the degree of uncertainty attached to a risk assessment, the greater the risk premium on the loan. A loan deal will only be agreed if the return expected by the borrowing firm, discounted by perceived borrower's risk, exceeds the rate charged by the bank. The bank will require that the rate be sufficient to cover the marginal cost of funds plus the estimated risk premium. Where a bank has so little confidence in its capacity to assess risk that no such premium can be estimated, the loan application is refused.

This may appear to be relatively straightforward, such that we could reasonably construct a credit market diagram which referred only to ‘credit-worthy’ borrowers, or where the actual rate charged would be supplemented by a risk premium. But Minsky’s financial instability hypothesis focuses attention on the degree to which such assessments may change, in a systematic manner, through the business cycle. The analysis also extends the population of borrowers to those seeking to finance purchase of financial assets, as well as real assets.

During the boom conditions of the economic upturn, expectations of increasing returns on investment in both real and financial assets are held with confidence by both borrowers and lenders, so that perceived risk is low for both parties. Credit levels increase, as does the degree of financial leverage; but since the value of collateral, and incomes from which interest is paid, are also rising, there seems to be no cause for concern. But increasing leverage increase the fragility of the financial system. Any adverse development (such as a major fraud, or mismanagement, for which the incentives are high in boom times) can have consequences which spread through the debt structure. The resulting asset sales encourage a turnaround in asset prices, increasing default risk and encouraging widespread liquidity preference. For the banks, this takes the form of reduced willingness to lend, and increasing risk premiums on loans that are granted, adding further fuel to the downturn. What has been described is a systematic pattern in the risk assessment by borrowers and lenders over the business cycle.

While past experience of business cycles might be thought to encourage more cautious behaviour, it is not clear that it is rational for banks or borrowers to exercise more caution. What we have seen is the monetary authorities imposing caution by means of regulatory restrictions. But even there the scope is somewhat limited.

Capital adequacy ratios only act as a constraint if there is a shortage of capital. But it is in the nature of the business cycle that the capital market is willing to provide capital in upturns, but not so much in downturns, adding further fuel to the credit cycle. For banks and borrowers, since the timing and severity of the cycle turnaround are inherently uncertain, it is rational to proceed on the basis of conventional judgement, and to revise expectations in line with that judgement. The confidence in expectations may thus be sustained in a stable manner for a considerable time, but then be subject to major reversals.

Further, bank lending policy may be driven more by strategic considerations than a strict risk assessment in relation to expected returns. Thus, for example, Chick (1993) demonstrates that banks were driven by competition from non-bank financial intermediaries into liability management, whereby they sought to make loans, and only then sought to fund them with deposits, or from the inter-bank market. The credit explosion of the 1970s, therefore, may be explained more by struggle over market share within the financial sector than by macroeconomic factors.

The debt crisis of the 1980s can be seen in similar light. The penetration of developing country markets in the 1970s was not led by a new expertise in risk assessment in these countries; subsequent evidence reveals the lack of knowledge among the lending banks. Rather, banks were following the market leader, Citibank, unaware that, even if Citibank's initial lending was sustainable, it didn't follow that additional lending was sustainable. The subsequent crisis was created from default risk which was increased as much by rising interest charges and falling export sales as by any change in assessment of the circumstances by the banks.

The behaviour of capital markets through this episode is also revealing, when considering the role of knowledge in the provision of finance more generally. Data on

the external position of the borrowing developing countries were publicly available, such that there was good reason to expect that there might be defaults. Yet it was only when Mexico defaulted in 1982 that there appeared to be a new awareness of the risks involved. But it was only later that Citibank increased its provision for bad debts, and only then that other banks followed suit, and capital markets seriously revised their views as to the banks' balance sheets, such that capital shortage became a real issue for the banks. It is clear that opinion, first in the banks, and then in the capital market, was being driven by a conventional optimism. But it was vulnerable to jolts, such as Mexico's default, which brought about a major revision of opinion. Knowledge changed, although the relevant 'information' had been available all along.

But the New Keynesian belief in the feasibility of making 'true' risk assessments persists. Thus, following the South-East Asian crisis of the 1990s, it was concluded by some (including the IMF) that the cause was poor local governance, of which an important element was the concealing of 'true' risk from the international capital market. But Post Keynesian theory explains the crisis in terms of Minskian financial instability (Arestis and Glickmann, 2002). Capital inflows were governed by conventional judgements which exaggerated the returns which could reasonably be expected and downplayed the risks attached; but then the initial Thai devaluation sparked off a sudden reversal in conventional opinion, which encouraged a reversal of capital flows.

Promoting financial stability has been one of the traditional functions of central banks. But monetary policy is now concerned with more of a fine-tuning approach, considering from month to month the repo rate best suited to pursuing the goal of monetary stability. Indeed financial stability has tended to be associated more with the bank supervision function, conducted by separate agencies. In the next

section we consider the issues posed by the Post Keynesian view of knowledge and uncertainty, and its implications, both for the effect of monetary policy, and for the way in which monetary policy decisions are arrived at. We consider some implications of the analysis for the regional impact of monetary policy.

Monetary Policy

Monetary policy addressed to monetary stability attempts to manipulate the level of aggregate demand such that it does not push the economy up against supply constraints, causing inflation. Monetarist theory of monetary policy had emphasised direct transmission to aggregate demand through the stock of money. But in recent decades attention has been directed to a range of different routes for the transmission of monetary policy, including interest rate channels, asset price channels, credit channels and expectations and uncertainty (Bank of England, 1999; de Bondt, 2000, chapter 2). Here we focus on the last two sets of channels. But, rather than treating them separately, we will emphasise the interdependence between credit, expectations and uncertainty.

In order to analyse the effects of monetary policy, we introduce a stylised model of the credit market and its interrelations with the money market. This is a model designed to illustrate the process by which the two markets interrelate, and where we can identify the role played by knowledge and uncertainty. It is not intended as an equilibrium framework, but rather as a process framework. At the same time, the framework aims to clarify something which has become very muddled in the process of highlighting the central role of credit in monetary theory and policy. Monetarist theory had emphasised money (of which the largest portion is made up of bank deposits), with the credit side of the balance sheet seen as being passively driven

by high-powered money. New Keynesian credit theory, and indeed the horizontalist version of Post Keynesian theory, have instead focused on the asset side of the balance sheet, with the liabilities side seen as being passively driven by loans, to the extent of even identifying credit as money. The model to be used below is more fully discussed in Dow (1996) and Chick and Dow (2002).

Figure 1 *Interaction between the Credit Market and the Money Market*

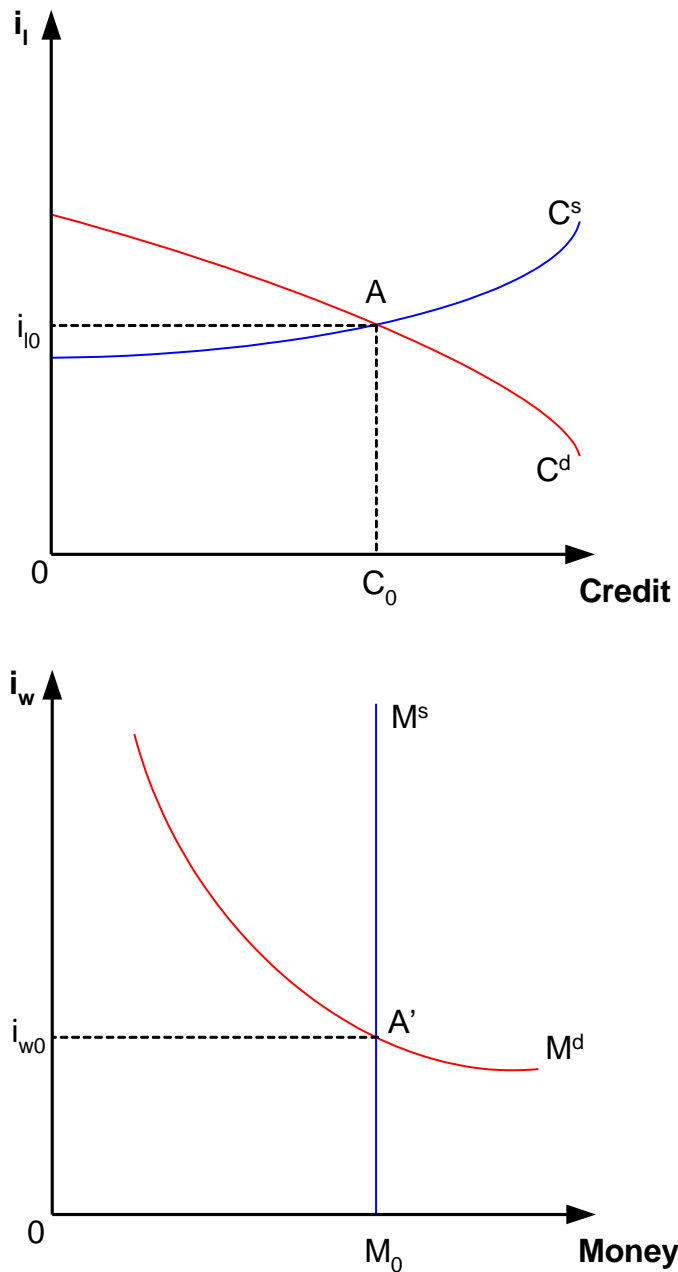


Figure 1 shows the credit market and money market separately. The starting-point is the credit market, on the grounds that bank deposits arise out of credit creation rather than vice versa. The price variable is the actual loan rate, i . The supply of credit by the banks is constrained by the marginal cost of funds (rather than a stock of reserves, given the lender-of-last-resort facility), and by the availability of capital so that the banks can observe the required capital adequacy ratio. Given the oligopolistic nature of the bank credit market, loan charges are determined by a mark-up on the marginal cost of funds. The credit supply curve is perfectly elastic for low levels of credit, at an interest rate which is composed of the wholesale rate, i_w , plus a basic mark-up, which is greater the less competitive the banking system and also the greater the general uncertainty about borrower risk assessment. This is the loan rate for prime, or lowest risk, customers; higher risk customers will pay a specific risk premium on top of this rate.

For increasing levels of credit (as banks move ‘down the queue’ of borrowers) there will be higher lender’s perceived systemic risk, which reduces the elasticity of the supply curve. Further, since equity markets also perceive higher levels of risk with higher levels of credit, the capital constraint will have more bite the more credit increases. The credit supply curve is thus an increasing function of the level of credit, and becomes steeper if perceived risk increases.

The position and slope of the demand for credit curve similarly depend on expected returns, but also on the risk perceived by borrowers to be attached to their expectations of returns, as well as to the cash-flow by which the interest payments are to be met in the meantime. As uncertainty rises, the demand curve shifts down; as perceived risk rises, the curve becomes steeper.

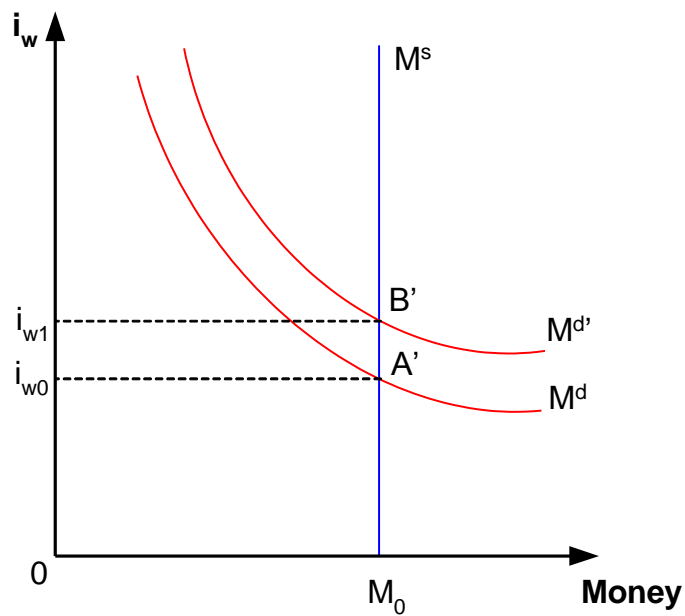
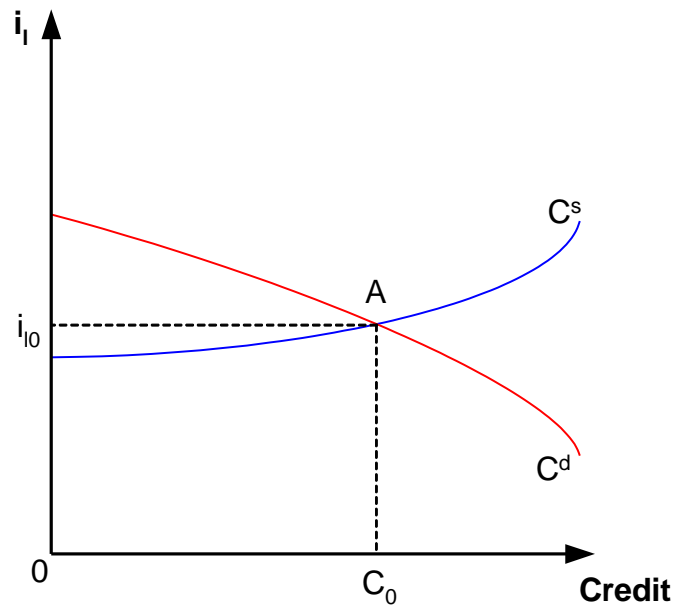
Putting the two curves together, and assuming that the credit market clears at point **A**, we arrive at a level of credit, C_0 at an average loan rate i_{l0} . The counterpart of this credit is a level of bank deposits, ie money. This is shown by carrying this total down into the money market diagram as a given total, M_0 . The word ‘given’ is used advisedly; the money stock is exogenous to the money market as a subsystem, but is endogenous to the credit market as a subsystem. The price in the money market is the wholesale rate, i_w . The wholesale rate shown is the one which underpins the credit supply function. If the wholesale rate were to rise, this would increase the intercept of the credit supply function. The two markets are interdependent.

The demand for money is shown as a conventional downward-sloping function. The curve is liable to shifts depending on the state of confidence in expectations of asset prices. In particular, speculative demand may increase if the expectation forms that asset prices are likely to fall. But further, precautionary demand may increase as asset-holders lose confidence in their ability to predict asset price movements (uncertainty increases).

Supposing the central bank predicts with some confidence that, other things being equal, inflation will rise above an acceptable level, so the decision is taken to raise the repo rate from i_{w0} to i_{w1} . We can show this in Figure 2 as a rightward shift in the demand for liquidity as the central bank acts to enforce the rate increase in the wholesale market at point **B'**. While we start apparently in equilibrium, we need to keep at the back of our minds the fact that the central bank had perceived inflationary pressure building up, so a process is already in train. Is the economy experiencing a boom, such that demand and supply of credit are high and perceived risk low, and

liquidity preference low? Or is the economy reeling from a supply-side shock which is causing cost-push inflation?

Figure 2 *Increase in the repo rate, offset by change in banks' mark-up*



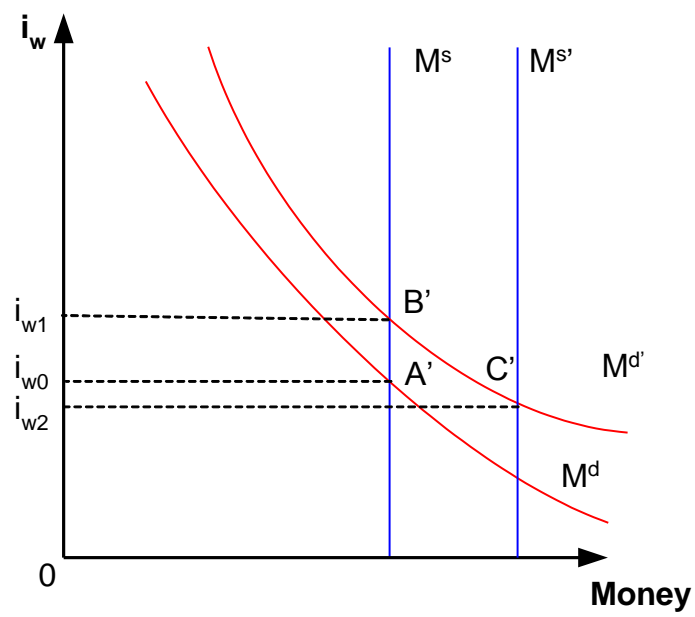
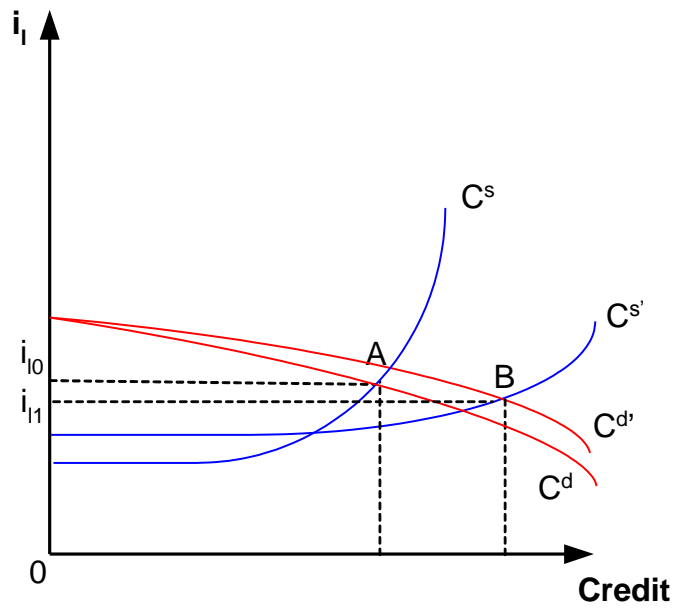
The immediate issue of how the rise in the wholesale rate affects the credit market depends on whether or not the banks pass on the interest rate rise. While banks will tend to automatically change their posted base rate along with changes in the central bank repo rate, this does not necessarily translate into a change in actual loan rates. They might choose not to pass on the full increase for any of the following reasons:

1. Banks had been sluggish in responding to a previous fall in interest rates
2. The banking sector is oligopolistic, inducing price stickiness
3. The banks are not convinced that the central bank will successfully enforce the increase in repo rate.

Then the banks will absorb any increase in the marginal cost of funds by reducing the mark-up, such that the supply of credit curve's intercept with the vertical axis remains where it is, with no further consequences. Otherwise, the credit supply curve would shift up, raising loan rates and reducing the level of new credit and thus of money creation, putting further upward pressure on interest rates.

But we need to consider what is happening to the state of expectations and thus the slopes of the credit demand and supply curves. Suppose the economy is booming. Then the two curves may continue to flatten out as perceived risk continues to fall. Even if this is combined with an increase in the intercept of the credit supply curve, as in Figure 3, the outcome at **B** may be increased credit, and even possibly a fall in the actual loan rate (reinforced further by a fall in liquidity preference), further adding to inflationary pressure. Further, the increase in credit creates new deposits, easing conditions in the money market such that the interest rate falls, at **C'**. The central bank will need to continue intervening if it wants to keep interest rates high.

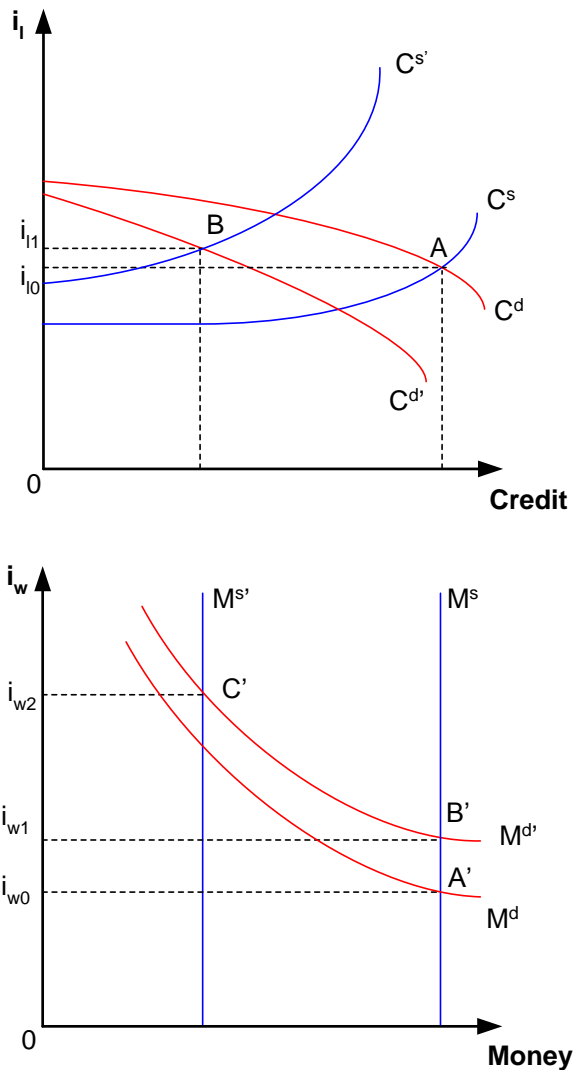
Figure 3 Increase in the repo rate, at same time as reduced perceived risk



Alternatively, suppose the economy is experiencing an economic slowdown induced by a sharp increase in the price of a key input (such as oil). Then perceived risk may be increasing, steepening the two curves at the same time as the credit curve shifts up (as in Figure 4), causing a reduced level of credit and a large rise in actual loan rates, at *B*. This process of falling credit growth, and thus deposit growth, puts further upward pressure on the wholesale rate (at *C'*). This may be further reinforced by the increase in liquidity preference associated with such circumstances, which would shift the M^d curve up further. The increase in costs to firms resulting from the increase in debt-service costs could add further to cost-push inflationary pressure (Chick, 1993).

This analysis has simply been indicative of some of the possibilities in terms of the transmission of a change in repo rate to the credit market. What requires emphasis here is the crucial role played by the expectations which determine the slopes of the credit market curves and the demand for money curve. Since decisions are being taken in the credit market under uncertainty, and money is the asset which is preferred under conditions of high uncertainty, the outcome depends crucially on the confidence associated with the knowledge underpinning these decisions. Conventional judgement may keep the curves stable for long periods, but it is always susceptible to shifts, with consequences for loan rates and credit levels.

Figure 4 *Increase in the repo rate, at same time as increased perceived risk*



The central bank itself faces problems of uncertainty in terms of the confidence it holds in its knowledge base. Just as economic agents are uncertain about the mechanisms governing the reality within which they must make decisions about future expenditure, so the central bank faces uncertainty about monetary policy decisions. The central bank has access to information in the form of data series, but the knowledge required of the transmission mechanism also requires theoretical knowledge and the exercise of judgment. This has become acknowledged in recent years by central banks, which have actively sponsored research into ‘model

uncertainty' (see for example Issing, 1999). Here too, therefore, the distinction between knowledge and information is central (Dow, forthcoming). When the central bank is particularly uncertain, the conclusion is that it is rational only to make small, gradual changes which can easily be reversed if the effects differ from expectations. The practice of monetary policy itself thus generates knowledge about the transmission mechanism, on a trial-and-error basis.

There is a further range of important factors behind the transmission of monetary policy in terms of the financial structure of the economy concerned. This can be central to analysing the way in which the single European monetary policy impacts on different member states (Chick and Dow, 1996; de Bondt, 2000). Indeed the range of transmission mechanisms for national economies means that there is considerable scope for regional variation with respect to each (see further Dow and Rodriguez Fuentes, forthcoming). But here we focus particularly on knowledge issues. Even if a common monetary policy generates exactly the same loan rate schedule among banks operating across the regions or nations concerned, there is still scope for differential impact when we focus on knowledge issues in credit markets.

Banks extend credit on the basis of their best assessment of default risk. That assessment, according to Keynes's theory of uncertainty and expectations as discussed above, is compiled from direct knowledge ('information'), theoretical (indirect) knowledge, conventional knowledge and intuition, all combined by judgement. More weight is attached to assessments based on more direct and indirect knowledge, and less reliance on conventional knowledge and judgement. Porteous (1995) has shown that, particularly for small and medium-sized enterprise, the knowledge base of banks is sounder the closer the proximity. Thus knowledge about borrowers in remoter regions will be less sound.

Less reliable knowledge does not necessarily mean less credit. If we consider the case of the debt build-up which led to the debt crisis of the 1980s, the problem was essentially one of unreliable knowledge on the part of the banks. But, since the rapid expansion of developing country debt in the 1970s was built on a flimsy knowledge foundation, there was all the more scope for a sharp reversal in the banks' risk assessment. What we would therefore expect is that the provision of credit to peripheral regions would be more volatile than closer to the Centre, making these economies more vulnerable and therefore more likely to exercise higher liquidity preference.

Any tightening of monetary policy may therefore have a disproportionate effect on peripheral economies. On the credit supply side, if the monetary tightening induces a general revision of expectations, those with respect to peripheral economies tend to be more vulnerable than elsewhere, so there is likely to be a more significant curtailment of credit. On the liquidity preference side, the consequences for the regional economy of a reduction in credit are likely to encourage a stronger preference for liquidity, and the concomitant withdrawal from expenditure.

Conclusion

Knowledge is at the heart of financial systems, and particularly of banking. We have discussed knowledge here as something much broader than information. While information is held with certainty, knowledge is generally held with uncertainty, of varying degrees. Further, since uncertain knowledge relies on conventions, intuition and judgement as well as experience and theory, it can promote stability at some times, but instability at other times when conventions and intuition change.

Knowledge (of borrower risk) is what underpins credit decisions by banks. Shifts in knowledge therefore can cause shifts in credit creation. Similarly, different knowledge of different cohorts of borrowers (eg in different regions) produces a particular pattern of credit creation; the less reliable the knowledge, the more volatile the pattern of credit creation.

The central bank itself faces uncertainty about how its policy is transmitted to the economy. Monetary policy consists of the central bank, as a large player, attempting to create conditions in the money market which will steer credit creation in the desired direction. But the central bank is entering into a process where the state of expectations may be sufficiently strongly set that it is difficult to counteract them. Monetary policy affects expenditure plans through a variety of routes, including the state of conventional expectations and the confidence held in them. To consider monetary policy as operating only on knowable information misses out the much broader canvas of borrowing and lending decisions.

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¹ Repos are repurchase and sale agreements; the repo rate is the annualised rate implied by the difference between the buying price and selling price. A repo is equivalent to borrowing funds for a fixed period for a fixed cost with the added consideration of variation of asset price change in the intervening period relative to the repurchase price.

² New Keynesians measure risk in terms of mean-preserving spread, rather than simply variance (Rothschild and Stiglitz, 1970; Newbery and Stiglitz, 1981). But the critical factor is that it is quantifiable in some way.

³ See Runde and Mizuhara (2003) for a collection of the most recent understandings of the implications of Keynes (1921).

⁴ See Dow and Dow (1988) for a discussion of liquidity preference applied to all sectors, going beyond the traditional notion of allocation of a fixed financial portfolio.