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VARIABLE INTEREST RATES

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Together with virtually permanent net borrowing from the central bank and the absence of taxation of normal household bank deposits the dominance of variable rate financial contracts is one feature that distinguishes Finnish banking from that in many other countries. It is commonly argued that this characteristic makes the interest rate a less appropriate instrument of counter-cyclical policy than in other countries. Economic agents are said to be unresponsive to changes in interest rates because the relevant rate of interest for both saving and investment decisions is not the one prevailing at the time the decision is made but rather the expected average rate over the period in question. On the other hand, prices are reputed to be more sensitive to changes on the total stock of debt (and the total stock of wealth) not just the cost of new financial contracts.

This paper explores this aspect of variable rate interest contracts as well as three other related features: impact on prices, risk bearing and liquidity. While a rise in interest rates is thought to be restrictive and to curb inflation in other countries, in Finland it is thought to ratchet up inflation in the short-run through the impact on costs¹. Risk bearing is relevant because it differs in the two systems. In a variable rate system real interest rate risk is non-existent for both the lender and the borrower as long as reference rates move with the relevant price index. In a fixed rate system the borrower or lender can eliminate nominal interest rate risk by matching the maturity

1 This may be an indication that rational expectations do not hold sway in this sphere. If they did, the long-term restrictive impact would be shifted forward, negating the short-run impact. On the other hand, expectations of the inflationary impact of a rise in interest rate may become self-validating.

of the contract with the horizon of the investment or saving project. Liquidity is relevant because in a fixed rate contract system the liquidity of a far smaller set of agents is directly affected when short-term interest rates are altered, but on the other hand bank profitability is affected which may lead to short-run quantity adjustment.

Interest Rate Elasticity

The validity of the conventional conclusion that the responsiveness of economic agents to interest rate changes is lower in a variable rate system than in a fixed rate one depends very much on views regarding the functioning of financial markets, which in turn depend on assumptions about transactions costs, information, expectations, preferences of different economic agents and attitudes towards risk. When it is argued that variable rates make interest rate policy less effective, the system in comparison to which it is less effective is seldom specified in detail. The obvious casual counterpoint is a fixed rate system in which ultimate lenders and borrowers are able to match the maturity of their finance with the expected "maturity" of their investment or saving projects. A more thorough analysis of arrangements in other countries suggests that this maturity matching is not always possible and, when it is, not necessarily relevant.

In some countries, (e.g. United States, United Kingdom) long-term fixed rate investment finance is not provided by banks, which specialize in short and at most medium term lending, but rather by the capital market where the typical investor is either an individual or, increasingly, a pension fund or insurance company whose liabilities are generally not indexed linked. In recent years, however it has become virtually impossible to issue traditional fixed rate bonds. Uncertainty about inflation has made economic agents, unwilling to conclude long-term nominal contracts at fixed rates of interests

Companies and other ultimate borrowers have had to finance longer term investment by rolling over short-term bank and other finance or by issuing indexed-linked bonds.

In practice, interest rate arrangements elsewhere have become more like those in Finland. This has, nonetheless, not prevented the active use of interest rates (see table). On the contrary one possible explanation, in addition to monetary targeting, for the increase in nominal interest rate volatility in the past few years is that larger changes in short term interest rates are now needed to affect average expected real rates over the relevant time horizon in conditions of greater price variability.

The relevance of fixed or variable rates depends in part on the existence and degree of perfection of the secondary market. If there are active secondary markets as, for example, in the United States, the relevant rate of interest may then be the expected average short-term rate over the horizon of the investment (or savings) decisions even if fixed term contracts are available. This claim may seem somewhat rash in that an agent who has obtained fixed rate finance confronts the same coupon payments throughout the life of the loan irrespective of what happens to short-term rates and the effective yield on the debt which he contracts to repay and which may be sold in the secondary market. However, the expected average short-term rate is relevant in the sense that it constitutes the opportunity cost against which the investment decision should be judged. Even though the investor with a fixed rate debt contract is assured of cheap finance if interest rates rise, he has

an alternative use of funds - placing them in the financial market at a higher rate than he paid for them - which should be taken into account when making his investment decision. Similarly, if rates fall, the relevant rate of interest is the average expected short-term rate because the agent may then be able to refinance his expensive borrowing at lower rates. Both of these propositions abstract from changes in capital value. When interest rates change there is a capital gain or capital loss on marketable issues. If the debtor refinances when rates fall, he will have to buy back his own debt at a price above the issue price. This will offset the gain from lower rates. If interest rates rise and the expected return on the asset acquired by borrowing does not change, he will suffer an implicit capital loss offsetting the interest rate gain.

It can be argued that there are only a few countries where secondary markets in financial contracts are so efficient that long rates are good approximations of expected short-term rates. Indeed, without financial markets, capital losses and gains may have less of an impact, because most financial contracts are in nominal terms. However, the practice of re-contracting means that the same effect can be obtained even without such markets. Loans can frequently be repaid or recalled before maturity, though recontracting fees, generally of a fixed size, are then sometimes levied.

Although the growth of secondary markets and contract re-negotiation have increasingly blurred the distinction between fixed and variable rate loans, the existence of transactions costs, of liquidity constraints and of capital gains and losses on marketable debt mean that it may still

be of some relevance. Secondary markets in capital goods are imperfect, so that an ultimate borrower who has invested in capital equipment may not be able to liquidate his assets and take advantage of unexpected increases in short-term rates of interest. In addition although perhaps less important than in the past, there often are still penalties and almost always costs associated with loan re-contracting.

Apart from market imperfections, differences between agents in expectations, attitudes towards risks and time horizons can cause the long-term rates to diverge from the expected average of short-term rates. For example, if borrowers typically have a long-term horizon because of the long lead times and payback periods of their investment projects and if lenders have a shorter horizon, long-term rates may be consistently above short-term rates. Alternatively, if economic agents are averse to capital risk and have the same differential time horizons as above, long-term rates will typically exceed short-term rates for liquidity preference reasons. In both of these cases, it is assumed that insufficient knowledge of the future and/or high transactions cost prevents arbitrage between the long and short market segments and that the long-term rate is not the average of expected short-term rates. In these conditions a variable rate contract will mean that on average the rate of return and the cost of capital are lower than they would be if fixed rate contracts were issued. Abstracting from risk, this may have implications for the level of interest rates and perhaps through them also for saving and investment decisions, but it should not affect the overall efficiency of the interest rate as an instrument of counter-cyclical policy.

Inflation

Interest rates, defined in widely different ways, are ascribed a number of different roles. As the relative price

of future and current consumption, interest rates shape saving and investment decisions. As determinants of the relative price of different assets, interest rates influence portfolio composition, liquidity, and the balance of payments. As sources of current income, they influence expenditure. As the yield on financial assets, they reflect capital values and affect wealth. As costs to business, industry, and households, they affect pricing decisions. It is this latter aspect, at the cost of the former, that is stressed when it is argued that the type of interest rate system may affect inflation¹.

The argument that variable rate contracts boost inflation because interest rates on both old and new loans change whenever the reference rate is altered depends very much on pricing behaviour, related demand effects and the operation of the financial market. On the reasoning in previous sections, changes in relevant interest rates should be no more or no less inflationary in a variable rate system than in a fixed rate system. On the other hand, in a variable rate system interest rates do not contain the nominal interest rate risk premium found in long-term fixed rate contracts so that the overall interest rate may then be lower. *Ceteris paribus*, this will lead to a once-and-for-all cut in cost pressures. Ultimate agents who bear risk may, however, make allowance for it in their pricing decisions.

Risk

Risk is associated with financial claims far more closely than with other goods. Since a financial asset is a claim on future consumption, there is always some risk associated with it. Default risk, capital risk and income or interest rate risk are conventionally treated in this context. Even an asset like

¹ The argument focusses on the increases in costs and ignores the rise in income which an increase in interest rates causes. The redistribution of income will generate a rise in prices only to the extent that the reaction to the increase in cost is greater than the reaction to the increase in income. This differential response can be rationalized by assuming diminishing marginal utility from income.

money which has a certain capital value is risky in the sense that the price level may change, thus enabling the agent to consume more or less than at the time the asset was acquired.

One of the consequences of the variable rate system used in Finland is that Finnish banks, unlike those in many other countries, do not accept interest rate risk on an extensive scale.¹ In other countries, as in Finland, the maturity of bank claims is in general longer than that of bank liabilities.² Unlike Finland, the contracts in other countries are often at fixed rates. Elsewhere banks thus assume an interest rate risk. If interest rates rise, the costs of their funds rise more quickly than that of their assets, which will reduce profitability. Conversely if interest rates fall they will benefit as the return on their assets increase.

In the long run offsetting adjustments in loan rates or other terms may be made, but in the short-run the see-sawing back and forth in profitability may place pressure on bank liquidity. Acceptance by the banks of this interest rate risk and the consequent short-run volatility of profits can be seen as one explanation for the size and volatility banks interest rate margins. Since banks bear an interest rate risk, they may feel compelled to charge a risk premium which is reflected in larger margins.³ Variability

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- 1 As was indicated above, there is, however, a trend away from the acceptance of interest rate risk by banks in other countries.
- 2 The concept of the maturity of a bank loan, in contrast to a financial claim traded in a market by brokers and other agents, is perforce rather hazy because of early repayment and rolling over of outstanding loans and more importantly, because of the multidimensional long-term relationship between the bank and the customer. This latter aspect has become increasingly important as the banks have come to offer a greater range of financial and other services to their customers and to view them as a whole rather than looking at each transaction as isolated and independent.
- 3 Even though Finnish banks do not bear interest risk, their margins are, internationally compared, large. Reasons for this are to be sought in other factors: dense branch office networks, cross-product subsidisation, oligopolistic pricing, etc.

in profits can be attributed to the fact the profits built up in periods of falling rates are consumed in periods of rising rates.

What is the explanation for the failure of Finnish banks to perform the interest rate transformation? One answer rests upon the proposition that there is or has been chronic excess demand for finance at administered rates of interest. One of the conventional effects of price control is deterioration in the quality of the product whose price is controlled. The failure of banks in Finland to perform interest rate transformation may be reflection of this phenomenon. The interest rate risk premium is shifted on to the borrower and the quality of the financial "product" offered is reduced. Interest rates may therefore not be as much below equilibrium as they would otherwise be.

One of the consequences of the use of variable rate contracts is the shift of the risk associated with changes in nominal interest rates on to the borrower. With fixed rate contracts the borrower knows his nominal financing costs and the lender his nominal receipts ex ante. In effect they can insure themselves against nominal interest rate variability. Value is attached to the certainty about future nominal expenditure and income, and this is one explanation for the conventional upward slope of the yield curve. If, as in the United States in the past few years, interest rates do not adjust to ex-post inflation, a variable rate system may create substantial real burdens or provide major real benefits for ultimate borrowers and lenders as the financial system then does not serve as a cushion.

In real terms, however, risk may be quite different. If short-term nominal interest rates move in step with the rate of inflation, a variable rate loan has some features of an indexed contract. The real cost of the loan then varies with the rate of inflation while the real cost of a fixed rate contract varies inversely with the rate of inflation. Moreover, since the nominal income of the

typical borrower moves more or less in line with inflation, variable rate loans may be preferred especially if long-term rates contain an inflation or other premium which causes a cash flow problem in the early years of the loan.

The use of variable rate contracts in countries like Finland where inflation has been volatile may be a reflection of this constellation of factors. Ultimate agents may, when market conditions allow, pass the risk premium on in product prices.

Since one of the differences between fixed and variable rates relates to the locus of risk bearing, the ability of different agents to bear risk should be noted. The fact that most borrowers receive income that varies at least to some degree with inflation was cited as an indication that they may be able to bear this risk. On the other hand, one of the functions of banks and financial institutions is the management and reduction of risk. If they are better able to do this than ultimate economic agents, the onward shifting through variable rate contracts or shorter maturities may not be optimal for the economy.

Liquidity

Although the risk adjusted price effects may not differ greatly in variable and fixed rate systems, the liquidity impact can be an important channel for the transmission of monetary policy. However it is a moot point whether liquidity effects are greater in a fixed or a variable rate system. In conditions of rapid inflation, the temporal pattern of cash flow generated by an investment project may be weighted towards its end while, with high nominal rates on fixed-term contracts, interest payments may be weighted toward the early part of the period. The borrower may thus face a shortage of liquidity, which may be more severe in a fixed rate regime than in a variable

rate or indexed regime because in the latter the borrower does not pay an interest rate risk premium. The shortage can be alleviated by further borrowing, but financial institutions may be hesitant to extend credit to allow borrowers to pay interest that is due.

In a variable rate system, the rates paid by all borrowers as well as the interest income received by all lenders will rise when the reference rate rises. If lenders are unwilling to re-invest their increased interest income or if borrowers are otherwise unable to obtain liquidity, the level of activity may be affected. For example, if the increase in demand for liquidity leads to a rise in interest rates, lenders may begin to hesitate to extend credit for reasons of risk: rising interest rates may increase the likelihood of default more than it increases the funds that can be set aside in loan loss reserves. On balance, however, it would seem that liquidity effects would be greater in a fixed rate system.

Perhaps more important than the impact on the liquidity of ultimate borrowers is the impact on banks, which is quite different in variable and fixed rate systems. In a variable rate régime there is no direct impact. All deposit and lending rates change when the reference rate changes. In a fixed rate system where the banks engage in maturity transformation, a fall in interest rates will give rise to an endowment effect. Bank profitability will improve because funding costs will drop more quickly than lending revenue. In the opposite case of an increase in interest rates, bank profitability will decline in the short-run, which will tend to reduce bank lending.

In all likelihood the two effects are not symmetric because bankruptcy places a lower limit on the reduction in profitability while the upper limits are more amorphous. (E.g. threat of new entrants into banking, windfall profits taxation, etc). The asymmetry of the two effects is one factor contributing to the customary asymmetry attributed

to monetary policy as an instrument of counter-cyclical policy. The short-term decline in profitability engendered by an increase in rates can be expected to affect bank liquidity because sufficient profitability enables the banks to purchase additional funds. The rise in funding costs will, in the absence of interest controls, lead the banks to raise interest rates on new loans, but the decline in profitability and the pressure on the banks own liquidity will cause it use the funds flowing in through loan repayment and normal funding to meet its own increased cash outflow needs first, and only subsequently those of its customers. Higher interest rates may also induce the banks to tighten their credit standards because of increased default risk. Availability effects may thus be important in the short-term in a fixed rate system.

The role of liquidity constraints and quantity adjustment may be welcome from the point of view of the efficiency of counter-cyclical monetary policy. The short-term interest elasticity of demand for credit is reputed to be low so that inducing the banks to reduce the quantity of credit may lead to faster adjustment in real activity than changes in price. In the longer term, price effects can be expected to come into their own. The fact that there has been a shift away from fixed rate lending in other countries may have reduced the short-run quantity effect and be one trend responsible for the large swings in both nominal and real rates: with reduced liquidity effects, larger changes in prices are needed to induce changes in the behaviour of ultimate economic agents.

Restrictive monetary policy in Finland is traditionally held to operate through the quantity or availability channel. The above analysis suggests that in the short run the same effects may be important in other countries and that in terms of policy efficiency and price stability, it may be desirable that policy works in this way.

Conclusions

As new financial channels emerge in Finland, monetary policy operates less through induced or imposed liquidity effects and more through price effects. An increase in the importance of fixed rate contracts would 1) redeem short-term availability effects, 2) shift some of the interest rate risk into the banks, and 3) increase the variability of bank profitability.

Despite claims to the contrary, it would appear that the variable interest rate convention cannot explain or justify the degree of rigidity in interest rate policy that has been observed in Finland. When relevant rates of interest are compared across countries Finnish rates show less variability despite greater fluctuation in the rate of inflation than elsewhere. Irrespective of the use of fixed or variable rate contracts, the rate of interest relevant for investment and saving decisions is - or should be - the average, risk-adjusted, after-tax expected short-term interest rate.

The main difference between fixed and variable interest systems is in the locus of risk bearing. In a variable rate system ultimate agents, not banks, bear nominal interest rate risk. In a fixed rate system banks bear the risk which should be reflected in the size and volatility of profits.

There may also be important differences in liquidity effects. In a fixed rate system liquidity effects, which are sometimes thought to be important in a variable rate system, are also important in the short run; both directly through the cash flow channel and indirectly through the bank profitability channel. The greater use of fixed rate contracts in bank lending would cause monetary policy to impinge on bank profitability in the short-run, which could be expected

to lead to short-term quantity adjustment and longer term price adjustment, both of which might be desirable in terms of improving monetary policy as an instrument of counter-cyclical policy and as a means of promoting efficiency in resource allocation. The growth of the market in taxed securities, some of which have fixed-rate features, and the growth of government debt in the market imply that conditions are evolving in this direction.

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Table 1

Variability of the Interest Rates on Long-term Government Bonds in Selected OECD Countries, standard deviation calculated from quarterly data covering longest possible period in 1960-19

<u>Country</u>	<u>Standard deviation</u>
Austria	0.82
Finland	1.05
Japan	1.08
Germany	1.24
Netherlands	1.98
Belgium	2.00
Sweden	2.08
United States	2.11
Canada	2.14
Australia	2.22
France	2.19
New Zealand	2.34
Italy	3.31
United Kingdom	3.38
Denmark	3.69
Ireland	4.02
Portugal	4.51

Source: IFS and TAKO

Note: Rates are average yields to maturity on long-term government debt in all countries except Finland where the effective rate on new issues of long-term government bonds is used.

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