

The Minimum Coupon Rate and the 4-Per-Cent Market

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Since the end of 1996 the Danish capital market has seen a number of bond issues with a coupon rate of 4 per cent. These issues were primarily a consequence of the fact that the minimum coupon rate is at a historically low level and that the yield curve has been exceptionally steep.

This article describes the forces driving the 4-per-cent market and also considers the actual fixing of the minimum coupon rate and the consequences which the method used has proved to have for the capital market.

The minimum-coupon-rate rule

The provisions for taxation of capital gains on bonds acquired by persons subject to ordinary Danish income tax (private investors) are set out in the Capital Gains Act. Taxation varies depending on whether the bond complies with the minimum-coupon-rate rule. A bond meets this rule if the coupon rate is greater than or equal to the minimum coupon rate applying in the period of issue of the bond¹⁾.

When a private investor acquires securities which comply with the minimum-coupon-rate rule that investor will be taxed only on the interest income. If the securities do not comply with the rule both interest income and capital gains are taxed. This means that - ceteris paribus - it is in the private investor's interest to acquire securities which comply with the minimum-coupon-rate rule and for which the coupon rate is as low as possible. In this way non-tax-liable capital gains are maximized²⁾.

The minimum-coupon-rate rule applies only to private investors, whereas other (Danish) investors are liable to tax on both interest income and capital gains. In principle, these investors are indifferent to whether they invest in securities which comply with the minimum-coupon-rate rule or in securities which do not.

The minimum coupon rate is fixed on the basis of the yield level in a period up to July 1 and January 1 every year³⁾. The minimum coupon rate may be adjusted extraordinarily if there are strong fluctuations in the level

¹⁾ Cf. Section 14 of the Danish Act on Taxation of Gains and Losses on Assets, Liabilities and Financial Contracts (the Capital Gains Act).

²⁾ The minimum-coupon-rate rule applies only to private investors' placement of "free funds". On the other hand, pension savings are subject to taxation on an ongoing basis in accordance with the provisions of the Danish Real-Interest-Tax Act.

³⁾ The minimum coupon rate for index-linked bonds has been fixed at 2.5 per cent irrespective of the interest-rate conditions prevailing in the index-linked-bond market.

Table 1 *Development in the minimum coupon rate*

Date of entry into force	Minimum coupon rate	Date of entry into force	Minimum coupon rate
October 2, 1985	9	July 1, 1992	8
January 1, 1986	9	January 1, 1993	8
<i>April 2, 1986*</i>	7	<i>May 18, 1993*</i>	7
July 1, 1986	8	July 1, 1993	6
January 1, 1987	10	January 1, 1994	5
July 1, 1987	10	July 1, 1994	6
January 1, 1988	10	January 1, 1995	7
July 1, 1988	9	July 1, 1995	7
January 1, 1989	9	<i>December 22, 1995*</i>	6
July 1, 1989	9	January 1, 1996	6
January 1, 1990	9	July 1, 1996	6
July 1, 1990	9	<i>October 22, 1996*</i>	4
January 1, 1991	9	January 1, 1997	4
<i>June 17, 1991*</i>	8	July 1, 1997	4
July 1, 1991	8	January 1, 1998	4
January 1, 1992	8		

* = Extraordinary fixing of the minimum coupon rate.

of interest rates between two ordinary fixing dates. Table 1 shows both the ordinarily and extraordinarily fixed minimum coupon rates which have applied since the rule was introduced in 1985.

The minimum-coupon-rate rule was introduced in order to limit the tax advantage arising from the difference in taxation of interest income and capital gains¹⁾. Fixing a minimum coupon rate for open bond series prevents the issue of securities at prices far below par on which the yields comprise foreseeable non-tax-liable capital gains rather than interest income²⁾. Since the issuer, rather than the individual taxpayer, is subject to

¹⁾ Before the Capital Gains Act gains and losses on assets were only included in an income return if the assets had been acquired either in connection with business activities or speculation. The assets could also be taxed in certain cases if they were acquired in such a way as to be classified as income-generating activity. At the beginning of the 1980s there were several examples of "finance packages" whereby purchase of bonds issued with a discount, and thus with a considerable foreseeable non-tax-liable capital gain, was financed with borrowed funds on which the interest was fully deductible. These arrangements contributed to the introduction of the minimum-coupon-rate rule. A significant objective of the minimum-coupon-rate rule of the Capital Gains Act was thus to limit access to tax speculation by purchasing bonds with large foreseeable non-tax-liable capital gains.

²⁾ It should be noted that even with a high coupon rate it is possible to issue bonds at prices far below par, provided that the average maturity of the bond is long enough. An example is a 100-year bullet issue with a coupon rate of 6 per cent. Due to the long maturity, however, the foreseeable non-tax-liable capital gains are distributed over a period which is so long that in practice these bonds are subject to taxation terms which make them less attractive to private investors.

Box

Fixing of the minimum coupon rate

The minimum coupon rate is fixed on the basis of a reference yield calculated and published daily by Copenhagen Stock Exchange A/S. The reference yield is calculated as an average of the yields to maturity on open, fixed-yield krone-denominated bonds. The calculation does not include callable bonds at prices above par nor bonds with residual maturities of less than 3 months. Bonds from group III of the official price list are not included either. The yields to maturity are weighted together using the market value of the volume of circulating bonds in the respective series.

The *ordinary fixing* of the minimum coupon rate is based on the average of the reference yields over a period of 20 trading days prior to December 15 and June 15. The minimum coupon rate is calculated as the reference yield multiplied by 7/8 and rounded off to the nearest number of whole percentage points.

On the *extraordinary fixing* of the minimum coupon rate the reference yield for 10 consecutive trading days must be more than 2 percentage points higher or more than 1 percentage point lower than the reference average which underlies the fixing of the prevailing minimum coupon rate. The average of the reference yield for these 10 trading days is the basis for the extraordinary fixing of the minimum coupon rate.

The basis for the ordinary fixing of the minimum coupon rate for the first half of 1998 was the reference yield in the period from November 15 to December 13. The average reference yield during this period was 5.61 per cent. The average multiplied by 7/8 is 4.91 so that the minimum coupon rate was fixed at 4 per cent.

this regulation the minimum-coupon-rate rule is clear and simple to administer by both the tax authorities and the investor.

Bonds with a coupon rate equivalent to or above the minimum coupon rate at the time of issue are popularly called "blue-stamped", while bonds with a coupon rate below the minimum coupon rate are called "black-stamped" bonds¹⁾. The blue stamp is given to a bond series if all issues in the series comply with the minimum-coupon-rate rule. Issue of only one bond without the blue stamp in an otherwise blue-stamped series means that the series no longer complies with the minimum-coupon-rate rule. On the other hand, if the minimum coupon rate increases there will be no

¹⁾ These terms originate from the previous practice at Danish abattoirs of quality stamping bacon with blue or black ink. Blue was for first-class bacon and black for second-class bacon.

change in the taxation status of a bond series if issue in the series is discontinued.

In practice, issues on the Danish capital market are almost exclusively blue-stamped. The largest issuers on Copenhagen Stock Exchange A/S - the Kingdom of Denmark and the mortgage-credit institutes - have thus issued black-stamped bonds to only a limited extent.

The mortgage-credit institutes issue primarily blue-stamped bonds because the institutes normally seek to minimize the capital losses on issued bonds. This capital loss is not tax-deductible for private borrowers who raise bond loans. Moreover, if market interest rates drop an increase may be seen in the value of the borrower's debt commitment. This increase is greater if the callable loan has been raised at a deep discount than if it was raised at a price close to par. In certain cases it may be advantageous to the borrower to minimize these yield-related fluctuations in the value of the debt.

As a matter of principle the central government does not issue bonds at a nominal interest rate below the minimum coupon rate.

Compiled at the beginning of 1998 outstanding black-stamped bonds listed on the Copenhagen Stock Exchange amounted to just over kr. 8 billion in nominal terms. The total nominal outstanding was more than kr. 1,850 billion¹⁾.

As appears from the above, the minimum coupon rate reflects the current level of interest rates. However, for practical reasons a minimum coupon rate fixed on ordinary terms applies for a period of six months, unless market interest rates fluctuate to such an extent that the minimum coupon rate is adjusted extraordinarily. Consequently, the correlation between the current interest-rate level and the minimum coupon rate between two fixing dates is not perfect. The maximum discount on issue of a blue-stamped bond therefore also fluctuates over time. With one minimum coupon rate for all bonds, irrespective of maturity, the slope of the yield curve will also affect the maximum discount of blue-stamped bonds on issue.

The emergence of the market for blue-stamped 4-per-cent bonds illustrates the significance of these two factors to the development of a bond-market segment which presents certain tax advantages. In this connection it must be emphasized that in isolated terms the absolute minimum-coupon-rate level does not determine whether a bond issue entails a tax advantage. The crucial factor here is the size of the minimum coupon rate

¹⁾ Bonds issued before the introduction of the minimum-coupon-rate rule in 1985 received the blue stamp irrespective of their coupon rate.

in relation to the market yields for the maturities at which the blue-stamped bond is issued.

The market for 4-per-cent bonds

In October 1996 the minimum coupon rate was lowered extraordinarily from 6 per cent to 4 per cent. This was the second time since the introduction of the minimum-coupon-rate rule in 1985 that the minimum coupon rate was reduced by as much as 2 percentage points at one time. The adjustment was released by the general decline in interest rates and the closure of the large 6-per-cent mortgage-credit bond series. On their closure these series were eliminated from the basis for calculation of the minimum coupon rate. This entailed a decrease in the reference yield, cf. also below.

On the lowering of the minimum coupon rate the yield curve was unusually steep. For a period prior to the lowering it therefore had not been possible to issue blue-stamped bonds with short maturities at prices below par. So for a relatively long period prior to the reduction there had been a shortage of newly-issued medium- and short-term bonds which could be attractive to private investors.¹⁾ The issues in the 4-per-cent market partly redressed the balance. In mid-January 1998 4-per-cent bonds for a total of kr. 97.5 billion had been issued.

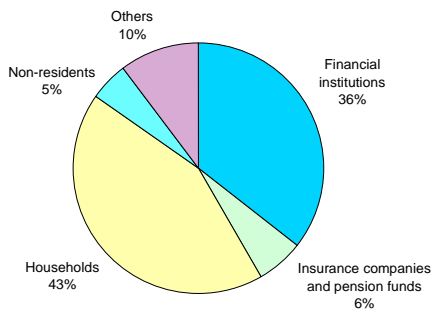
Distribution of ownership on the 4-per-cent market

Not surprisingly, the breakdown of ownership of 4-per-cent bonds shows that private investors (households) hold more than 40 per cent of the 4-per-cent bonds. However, it is noteworthy that the financial institutions also hold a significant proportion.

The relatively large portfolios held by the financial institutions may be related to their expectations of a premium on 4-per-cent bonds due to the scarce supply if the minimum coupon rate increases. In this situation new issues of blue-stamped 4-per-cent bonds would no longer be possible. However, by purchasing bonds already issued private investors will still be exempt from capital gains tax, making these "old" bonds particularly attractive to private investors. Previously a premium of this kind developed on bonds with low coupon rates which were blue stamped because they were issued prior to the introduction of the minimum-coupon-rate rule.

¹⁾ In the period prior to the lowering of the minimum coupon rate "par bonds" were constructed in order to meet private investors' demand for attractive bonds with shorter maturities and with a high credit rating. These bonds are based on restructuring of government securities with short residual maturities. The par bonds were issued at a coupon rate which gave a price at par at the time of issue. These bonds are black-stamped, but the absence of capital gains or losses at the time of issue means that the classification is of no significance to the taxation of private investors, provided that they hold the bonds until maturity.

Chart 1 *Ownership distribution of 4-per-cent bonds, 4th quarter 1997*



The financial institutions' large ownership share may also be related to the normal practice for bonds in individual new issues to be first acquired by the financial institution(s) which acted as manager(s) of the loan. These financial institutions will then handle the further distribution of the bonds in step with "retail" demand from private investors.

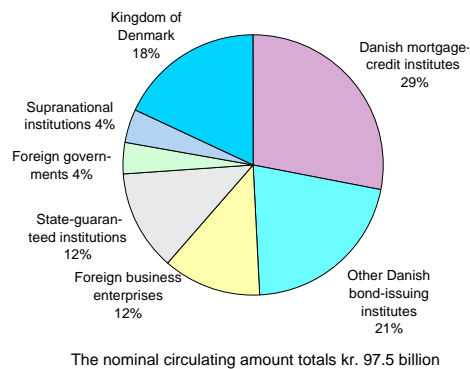
Issuers of 4-per-cent bonds

The accumulated demand from private investors for attractive short-term and medium-term bond products, combined with the significant reduction of the minimum coupon rate, meant that pre-tax yields in the period immediately following the adjustment of the minimum coupon rate were low compared to the rest of the yield structure. It was thus a good time to borrow in the market. The favourable conditions attracted a number of national as well as international borrowers who were able to benefit quickly from the attractive yield level via individual 4-per-cent issues.

Swap spreads were an important factor behind these issues of individual loans in the 4-per-cent market. Swap spreads indicate the yield discount available to the issuer by e.g. swapping the fixed nominal yield on the loan for a variable yield. Typically issues of individual loans in the 4-per-cent market have been conditional on access to use swaps to adjust the borrowing terms since the borrower was not necessarily interested in a fixed-interest loan denominated in Danish kroner. A typical loan raised by a non-resident borrower is thus first issued in Danish kroner at a fixed interest rate and then swapped to e.g. D-marks at a variable interest rate. The interest rate on this final loan is the crucial factor for the issuer. The demand for such bond loans thus depends on the borrowing terms on the Danish capital market and on the interest and exchange-rate terms for swaps.

In the first months after the minimum coupon rate was lowered the absence in the market of issuers already well-known by Danish private investors, such as the Kingdom of Denmark and the mortgage-credit institutes, was significant. This made it possible in the initial phase to accommodate a relatively high number of issues from borrowers who had not previously been active in the Danish capital market.

Chart 2 *Issuers of 4-per-cent bonds, mid-January 1998*



The reasons that significant issues in the 4-per-cent market by the mortgage-credit institutes were delayed by a few months include that, as mentioned above, the mortgage-credit institutes normally recommend private individuals to raise loans with a limited capital loss. Therefore conventional 30-year mortgage-credit loans in bond series with a coupon rate of 4 per cent were not offered.

Another explanation is that most major bond issuers with an ongoing issue requirement have the separate objective of building up a large volume of outstanding bonds in each series in order to ensure good liquidity in the series. In Denmark this applies to the Kingdom of Denmark and to some extent also the mortgage-credit institutes. If there is uncertainty concerning the future level of the minimum coupon rate, and thereby of the bond series available for issues, the planning of financing strategies must take into account whether the minimum coupon rate may rise before the number of circulating bonds has reached an adequate volume. The resistance of the coupon rate to fluctuations in the minimum coupon rate is thus an independent decision-making parameter.

These underlying factors entailed that initially issues in the 4-per-cent market were affected by the fact that a large proportion of the borrowers had not previously been particularly active in the Danish capital market. The 4-per-cent issues have therefore contributed to opening up Copenhagen Stock Exchange A/S to new types of issuers who continuously assess the international capital markets with a view to achieving attractive issue terms. Against this background the 4-per-cent market has contributed to the internationalization of the Danish bond market. For many years international investors have had access to the market. The new aspect is that international issuers are now also more aware of the opportunities on the Danish capital market.

The impact of the minimum-coupon-rate rule on the capital market

As described above, the minimum-coupon-rate rule has contributed to developing particular segments of the Danish bond market, which would not have emerged without this special tax. This segmentation of the bond

market is also apparent in other countries which apply minimum-coupon-rate provisions in their tax legislation. It is thus not a unique Danish phenomenon related to the 4-per-cent market as such.¹⁾

Danish experience of use of minimum-coupon rates extends over a period of more than 12 years during which market interest rates have been both high and low, and the yield curve has shown both a positive and a negative slope. So there is a basis to evaluate the consequences of this tax rule for the capital market. However, it must be emphasized from the outset that the minimum-coupon-rate rule has in practice fulfilled its purpose in a clear and administratively simple way.

Bond series receive the blue or black stamp once and for all, provided that the bonds comply with the minimum-coupon-rate rule during the issue period. This regulation at issuer level has certain obvious tax-control advantages, but also entails a risk of creating *illiquid bond series*.

As previously stated, a separate objective of most major bond issuers with an ongoing financing requirement, including the Kingdom of Denmark, is to create good liquidity by building up a large volume of outstanding bonds in each series. If a low-coupon-rate bond is used and the minimum coupon rate subsequently rises, issue in the series will be discontinued. The volume of bonds in circulation is thus not as large as required and all other things being equal liquidity will deteriorate. In the event of a given financing requirement the diminished liquidity will not only apply to the closed series which no longer complies with the minimum-coupon-rate rule, but also to the series replacing it.

Illiquidity may also arise if blue-stamped bonds at a low nominal yield are in short supply after an increase in the minimum coupon rate. Previously-issued blue-stamped bonds at low coupon rates are still available to private investors without taxation of capital gains. These bonds will therefore typically be purchased by private investors who will hold them until maturity. Low-coupon-rate bonds which received the blue stamp because they were issued prior to the introduction of the minimum-coupon-rate rule are normally cited as examples of such illiquid bonds. Mortgage-credit borrowers requiring early redemption of their loans may be affected by the fact that this segment of the bond market is firmly locked by a particular investor group. In this situation early redemption by purchasing the underlying bonds in the market can take place only at a premium in relation to the market level of interest rates.

¹⁾ It should be noted that the minimum-coupon-rate rule is not the only example of taxation rules which influence the capital market. For example, the Real-Interest-Tax Act also entails the locking-in of bonds and the issue of securities which for investors not liable to pay real-interest tax give a yield after tax significantly below the yield on otherwise equivalent securities.

Locking-in effects thus distort the pricing of the bonds, resulting in inappropriate segmentation of the market on the basis of terms of taxation.

The minimum-coupon-rate rule adds an *element of uncertainty* to the capital market since the future development in the minimum coupon rate is unknown. This uncertainty affects decisions to issue or purchase bonds with a certain coupon rate. The shorter the future period for which the minimum coupon rate is fixed, the greater the uncertainty.

The uncertainty concerning the minimum coupon rate is mostly due to the method by which it is fixed. In view of the specific design of this method, cf. the Box, the uncertainty concerning the level of the reference yield rate is in fact of most significance. The market participants therefore closely monitor the fixing of the reference yield.

Since the minimum coupon rate is fixed on the basis of the market interest rates the future level of the minimum coupon rate will always be subject to uncertainty. It is impossible to eliminate this market-based element of uncertainty unless the minimum-coupon-rate rule is abolished completely or the minimum coupon rate is fixed regardless of the level of market interest rates, which is the method applied to index-linked bonds.

However, some of the uncertainty concerning the future minimum coupon rate can be attributed to a number of more technical factors which could be changed without abandoning the basic principles behind the minimum-coupon-rate rule.

Consequences of fixing the reference yield

As mentioned previously, the reference yield is fixed as a weighted average of the yields to maturity on open, fixed-yield krone-denominated bonds listed on Copenhagen Stock Exchange A/S. The calculation excludes callable bonds at a price above par, as well as bonds with a residual maturity of less than 3 months.

The reference yield is calculated as an average of bond yields in order to reduce the volatility of the reference yield and to prevent manipulation.

Chart 3 shows the development in the reference yield from 1996 until the beginning of February 1998. The chart also includes a critical reference yield of 5.72 per cent. Should the average of the reference yields at the time of fixing the minimum coupon rate be below this level, the minimum coupon rate will be 4 per cent or lower. It will be 5 per cent or higher if the average of the reference yields is 5.72 per cent or more.

The calculation of the reference yield includes only open bond series. The *closing of bond series* may therefore affect the reference yield, regardless of the development in market interest rates.

Chart 3 *Development in the reference yield in 1996-98*



This is a particular problem in relation to the long-term callable mortgage-credit bonds. These are normally issued in a cycle whereby new series are opened every third year with simultaneous closure of the "old" series. This issuing method means that at certain points in time the outstanding volume of open bonds suddenly drops. The issue of bonds in the new mortgage-credit-bond series will then slowly increase the volume of open bonds until the mortgage-credit bonds are closed, the volume of open bonds in circulation drops, and the cycle starts over again. Since mortgage-credit bonds typically have higher yields to maturity than government bonds the closure of the mortgage-credit bonds causes the reference yield to fall sharply.¹⁾ The subsequent opening of and issue of bonds in the new mortgage-credit series then gradually increases the volume of open bonds at a higher yield to maturity than the yield on government securities, thereby driving up the reference yield. During the 3 years after the opening of the new bond series the issue of mortgage-credit bonds will *ceteris paribus* cause the reference yield to rise slowly until the bonds are closed, at which point the reference yield will again fall sharply.

¹⁾ The higher yield on mortgage-credit bonds than on government bonds is attributable partly to differences in conversion and credit risk, as well as liquidity, but also to the fact that with a (normal) positively sloping yield curve mortgage-credit bonds, which normally have longer maturities, will have higher yields than government securities. The reasons for yield differentials between mortgage-credit and government bonds has been previously discussed in articles in the Monetary Review, most recently in "The Yield Differential between Mortgage Credit and Government Bonds" by Mads Gosvig, Danmarks Nationalbank, *Monetary Review*, 4th Quarter 1997.

Such strong fluctuations in the reference yield are inappropriate since they can result in a varying minimum coupon rate, even if the general level of interest rates is unchanged. This was the case in the second half of 1996 when the closure of mortgage-credit-bond series with a total volume in circulation of approximately kr. 500 billion, corresponding to just under half of the total volume of open bond series in circulation, caused the reference yield to drop by 65 basis points overnight, cf. Chart 3. This decline contributed to the subsequent extraordinary lowering of the minimum coupon rate by 2 percentage points. This had only taken place on one previous occasion.

The calculation of the reference yield includes *callable bonds*. Yields to maturity are typically higher for callable bonds than for corresponding uncallable bonds because investors require compensation for the conversion risk. So the reference yield is higher than if it had depended solely on yields on uncallable bonds, e.g. government bonds.

The present compilation method takes this into account to a degree, however, by excluding callable bonds at prices above par from the calculation of the reference yield. Since the conversion premium rises in step with the price, this eliminates the callable bonds with the largest conversion premium.

However, the exclusion of *callable bonds above par* from the calculation of the reference yield gives only a marginal reduction of the impact of the conversion premiums on the reference yield. At the same time this provision presents another problem, i.e. that even small fluctuations in the yield level can cause callable bonds to trade below/above par. This entails

Table 2 *Average volatilities for the period
January 1996 - January 1998*

	Volatility (per cent)
5-year government bond	15.11
10-year government bond	11.24
30-year government bond	10.13
30-year mortgage-credit bond	8.34
Average government securities, 0-3 year	16.68
Average government securities, +3 year	13.05
Average all government securities	12.23
Average all bonds	7.62
Reference yield	15.56
Reference yield excluding "leaps"	14.04