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Tax Treatment of Revenue Based Payments

Paper

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Tax Treatment of Revenue Based Payments

Nadine Wiedermann-Ondrej
Abstract

The influence of taxes on financing decision has long been discussed and different opinions exist concerning this subject. However, the importance of tax shield must not be underestimated because taxes can alter the effective interest rate of an instrument significantly.

Generally it is assumed that payments of instrument that provide for revenue based compensation are not tax deductible because these instruments are normally qualified as equity. However, a detailed analysis of the various tax laws shows that this need not necessarily be the case. Payments that depend on the profits of a corporation can obtain an interest treatment if an instrument is structured according to the qualification criteria of a specific tax law. The deductibility can then decrease the effective interest rate of the issuing corporation. If a debt treatment can be obtained the question of the timing of interest payments has to be answered. In contrast to dividend distributions interest payments generally are not deductible as they occur but as they accrue. Especially in the case of fluctuating payments it is normally obligatory to determine the deductible amount in each accrual period. The time value of money aspect of interest payments is implemented differently in the various tax laws and can therefore change the effective tax rate. However, it is of great importance to consider these aspects before the issuance of a specific instrument.

The first part of the paper analyses the necessary requirements for a debt treatment and possible obstacles to an interest deduction. In order to qualify for a debt treatment it is important to consider these facts before the issue of an instrument because a later reclassification of the instrument might change the cost of capital substantially. Even if an instrument is qualified as debt an interest deduction can be denied due to various limitations and restrictions. The second part of the paper examines the timing of revenue based payments that are considered as interest. Depending on the situation the taxpayer may or may not choose one of the described methods. However, it is important to know the impact of each method in order to able to determine the cost of a specific instrument. Another question raised in this paper concerns the discount rate used for the net present calculation and if the method used by IRS is of economic substance.

This paper demonstrates the influence of the different methods of taxing revenue based payments and shows that the preferable method depends on the development of the profits. This paper emphasizes the impact of taxes on revenue based payments and the importance of the various approaches of tax authorities to execute such compensations.
1. INTRODUCTION.................................................................................................................. 4
2. TAX BENEFITS OF DEBT .................................................................................................. 5
3. MAKE SURE THE INSTRUMENT IS DEBT....................................................................... 6
   3.1. DEBT-EQUITY DISTINCTION...................................................................................... 6
   3.2. BE AWARE OF THIN CAPITALIZATION................................................................. 8
4. TAX DEDUCTIBILITY OF INTEREST ........................................................................... 10
   4.1. LIMITATIONS OF INTEREST DEDUCTION .............................................................. 10
   4.2. ARM’S LENGTH PRINCIPLE..................................................................................... 10
5. TIMING OF REVENUE BASED PAYMENTS................................................................ 12
   5.1. NO SPECIAL RULE.................................................................................................... 12
   5.2. NONCONTINGENT BOND METHOD .......................................................................... 12
   5.3. WAIT AND SEE APPROACH.................................................................................... 14
6. MODEL.............................................................................................................................. 14
   6.1. TIME VALUE OF MONEY ....................................................................................... 15
   6.2. FLUCTUATING PROFITS ........................................................................................... 17
   6.2.1. Increasing Profits................................................................................................. 18
   6.2.2. Decreasing Profits ............................................................................................... 20
   6.3. DISCOUNT RATE ........................................................................................................ 21
   6.3.1. Discount Rate equals Comparable Yield .............................................................. 21
   6.3.2. Discount Rate equals Comparable Yield after Taxes ........................................... 22
   6.3.3. Discount Rate is lower than Comparable Yield after Taxes ................................. 23
   6.3.4. Discount Rate is higher than Comparable Yield .................................................. 23
   6.3.5. Comparison of different discount rates ............................................................... 24
7. CONCLUSION.................................................................................................................. 27
8. BIBLIOGRAPHY ............................................................................................................. 28
1. Introduction

The influence of taxes on financing decision has long been discussed and different opinions exist concerning this subject. Myers admits that the net present value of tax shields can be substantial.\(^1\) Cordes and Sheffrin have shown that the tax advantage of debt depends on the effective tax rate of a company\(^2\) and MacKie-Mason comes to the conclusion that there is a relationship between tax shields and the marginal tax rate and that the marginal tax rate is affecting financing decisions.\(^3\)

Although the financing decision of a company depends on many factors where taxes are only one aspect among many apparently the influence of taxes on the cost of capital can be significant. This paper supposes that the financing decision has already been made in favor for an instrument that provides for revenue based payments. The first part of the paper analyses the necessary requirements for a debt treatment and possible obstacles to an interest deduction. In order to qualify for a debt treatment it is important to consider these facts before the issue of an instrument because a later reclassification of the instrument might change the cost of capital substantially. Even if an instrument is qualified as debt an interest deduction can be denied due to various limitations and restrictions.

The second part of the paper examines the timing of revenue based payments that are considered as interest. The tax treatment of revenue based payments can differ according to the various legal systems and therefore the cost of capital can change considerably. Depending on the situation the taxpayer may or may not choose one of the described methods. However, it is important to know the impact of each method in order to able to determine the cost of a specific instrument.

This paper demonstrates the influence of the different methods of taxing revenue based payments and shows that the preferable method depends on the development of the profits. This paper intents to emphasize the impact of taxes on revenue based payments and the importance of the various approaches of tax authorities to execute such compensations.

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2. Tax Benefits of Debt

Although it is not always clear whether an instrument qualifies as debt or equity this distinction is essential for tax purposes as different taxation schemes are applied. Interest can usually be deducted from taxable income whereas dividends do not reduce taxable income. On the other hand most countries provide for a shareholder relief if a dividend is received in order to avoid double taxation. Another important difference between debt and equity is the timing of taxation of payments. Most countries accrue interest income or deductions throughout the term of an instrument which leads to an additional income or a reduction of taxable income and therefore an increase or decrease in taxes. This means that taxes can be reduced or have to be paid even though no cash flow of the interest payments took place.

From an issuer perspective it is beneficial to issue debt as the deductibility of interest reduces taxable income and therefore taxes. As a result the cost of capital can also be reduced.

The tax benefits of debt are the tax savings that result from deducting interest from taxable income. Therefore the benefit of tax shields is

\[ \sum_{i=1}^{n} \frac{r_d \cdot D}{\tau_c} \]

where \( r_d \) is the interest rate on debt \( D \). \( \tau_c \) is the marginal corporate tax rate. \( n \) is the number of years and \( t \) is a specific year.

Following the traditional approach of Modigliani and Miller the discount rate for tax shields that are as risky as the debt generating it is assumed to be the interest rate on debt. It should be noted that \( \tau_c \) can vary over time if the corporate tax rate is progressive.\(^4\) If the company is not profitable the tax deductibility leads to no direct tax advantage of debt as no taxes are paid in the case of a loss.

If revenue based payments can qualify for a debt treatment the annual payments are deductible from taxable income and therefore reduce the cost of capital. The tax shields in this case depend on the rate of return and the annual profits.

\[ \sum_{i=1}^{n} \frac{\tau \cdot R}{\tau_c (1 + r_e)} \]

This equation is similar to the tax shields of debt except that the rate of return of equity subsidizes the rate of return of debt. The tax deductibility of the payments makes it possible for the issuer to issue financial instruments at a higher rate while the effective

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rate stays constant or retain the rate of return of equity while lowering the effective rate. The benefits depend on the marginal tax rate which differs from country to country.

3. Make Sure the Instrument is Debt

For tax purposes it is important to know whether instruments are classified as debt or equity. The tax qualification can also be different from the qualification of accounting or regulatory agencies.\(^5\)

3.1. Debt-Equity Distinction

It is important to be sure to qualify for the tax status which was intended for the instrument because a reclassification can be costly.\(^6\) Typically equity is seen as a participation in the entrepreneurial risks and rewards of a business.\(^7\) A shareholder generally will have some managerial rights and the distribution of dividends depends on the decisions of the board of directors. Usually there is no repayment of principal foreseen. Debt is typically seen as an unqualified obligation to pay a sum certain at a fixed maturity date along with a fixed percentage of interest.\(^8\) The creditor does not take entrepreneurial risk, has no managerial rights and can enforce the payments of interest and principal.\(^9\)

Each country has its own set of rules or regulations concerning the equity-debt distinction which differ heavily from each other. One of the possible approaches is based on the form of the instruments. The name of the instrument is taken as the determining factor for tax treatment. This reasoning has led to tax arbitrage and tax avoidance and to differentiating results for economically identical instruments. This is the reason why many countries follow the substance over form approach which analyses the instrument on the basis of its economic characteristics.


\(^7\) See also US v. Title Guarantee & Trust Co., 133 F2d 990 (6th Cir. 1943).

\(^8\) This definition of debt is similar to the decision of the Court of Appeals of the United States in the case of Gilbert v. CIR, 248 F2d 399, 402 (2nd Cir. 1957).

The implementation of the substance over form doctrine concerning financial instruments differs from country to country. Some countries – like the USA – have adopted a factor approach which attempts to categorize instruments according to their dominant debt or equity feature. The classification is based on listings or definitions of equity or debt features. The instrument should then be taxed according to its predominant characteristic. This causes a lot of questions as the issuer might classify the instrument differently from the investor or the tax authorities. Consequently the tax authorities or the courts make case-to-case rulings which can be timely, costly and controversial. This system based on facts and circumstances results in considerable uncertainty for instruments which are close to the debt-equity border and leads to an inadequate taxation as there is the possibility that due to this all or nothing approach a significant part of the instrument is not taxed according to its character.

Other countries have adopted an approach which defines debt or equity according to one or more determinative factors. If therefore an instrument contains these specified factors it can be considered as debt or equity respectively. This method guaranties more certainty than the factor approach but enables tax avoidance strategies at the same time.

Another possible method is known as bifurcation which splits an instrument into a debt and equity part. This seems a logical consequence if an instrument has components such as conversion rights, options or futures. This approach seems to be appropriate way to tax instrument as it avoids an all or nothing approach and takes into consideration the minor components of an instrument. Taxation of the instrument would follow the qualification of each part. Unfortunately in practice this method raises as many questions as the facts and circumstances method because there are endless ways to structure an instrument with different rights and obligations and therefore bifurcation can lead to different results with economically the same instruments. This results in legal uncertainty.

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11 For example Austria has adopted an approach which classifies profit-sharing rights as equity if the instrument embodies right to profit participation and liquidation profit, § 8 (3) KStG.

Considering these approaches it is important to know the tax law in order to obtain the necessary qualification of an instrument. If the issuer wants to qualify for a deduction of these payments a debt classification is necessary as interest is typically deductible. Revenue Based Payments are typically characteristic of equity and therefore lead towards an equity treatment. Therefore all the other features of the instruments should prove that the underlying instrument is debt. In case of the facts and circumstances method typical characteristics of debt would be the fixed return of principle, no subordination to other creditors, name of the instruments should support debt treatment and no managerial rights to the investors. Special attention should be given to shareholder loans as this might be seen as an evidence for equity as the shareholders typically do not enforce payments and are therefore not considered as typical creditors.

### 3.2. Be Aware of Thin Capitalization

Even though an instrument taken by itself is considered to be debt in substance there can still be a reclassification if thin capitalization rules apply. Under the thin capitalization rules debt typically gets reclassified as equity if the loan is given by shareholders of a closely held corporation and a specified debt-equity ratio is exceeded. The reason for this rule is that there is a concern that the loan is not at arm’s length because third parties would not have made the loan under similar terms and the shareholders will not enforce the payments if the corporation is unable to pay. Therefore the loan of the shareholder is exposed to entrepreneurial risk and should be regarded as equity.\(^\text{13}\)

Many countries have therefore adopted rules which govern cases of thin capitalization. Interestingly the subject gains importance when it comes to international transaction as authorities fear that it can come to an erosion of taxable income. This is the case when a corporation in a high taxation country lends money to a corporation that is implemented in a law taxation country. As a result taxable income in the high taxed country is reduced while taxable income of the low taxed country is increased. This leads to total tax savings. For example the German thin capitalization rules generally disallow related party interest charged to a German corporation if the debt-equity ratio exceeds 1.5:1.\(^\text{14}\)

In the United States Sec 163(j) IRC avoids a tax base erosion caused by interest payments of US corporations to foreign corporations. The so called earning stripping rules implemented in Sec 163(j) IRC apply if a US corporation is actively engaged in a US trade or business and the receiving corporation is tax exempt.\(^\text{15}\) The deduction of interest


\(^{14}\) The thin capitalization rules apply to all German corporations with one significant direct shareholder (more than 25% shareholding) if the interest payments subject to the thin-capitalization rules exceed € 250,000 annually and the shareholder can not qualify for the safe-harbor debt-equity ratio, § 8a KStG.

paid or accrued directly or indirectly to a related person is denied if no tax or a reduced rate of tax is imposed with respect to such stock. Sec 163(j) IRC applies if the debt-equity ratio exceeds 1.5 to 1, the corporation pays or accrues disqualified interest and the corporation has excess interest expense. The corporation has excess interest expense if the corporation’s net interest expense exceeds 50% of its adjusted taxable income plus any excess limitation carried forward to such year.

The Bush-Administration is even planning to tighten the earnings stripping rules. For example the safe harbor of the debt-equity ratio shall be eliminated and the limitation of the adjusted taxable income shall be reduced to 25%. Also the current 3-year carry forward of excess limitation shall be revoked so that taxpayers cannot use disallowed interest expense in another taxable year. These adjustments would limit the interest deduction of a foreign debt significantly.
4. Tax Deductibility of Interest

4.1. Limitations of Interest Deduction

The fungibility of money is an interesting tool for tax planners to shift taxable income from one jurisdiction to another. As a consequence debt is used to move profits and losses and take advantage of lower tax rates or losses of other companies in order to reduce the effective tax rate. Authorities have reacted to such tax planning strategies and a wide range of special rules concerning the deduction of interest have been implemented. In general interest deductions are limited with disallowance provisions, capitalization provisions or deferral provisions.

In the case of disallowance provisions interest deductions are denied permanently. For example many jurisdictions deny an interest deduction for corporations which financed the purchase of shares with debt. The reasoning behind that rule is that the corporation can generally benefit from a participation exemption for the dividends received and therefore an interest deduction should be denied. Another disallowance provision is the denial of interest paid to purchase shares tax-exempt securities. Capitalization provisions require that the interest must be capitalized together with an asset and can only be taken into account in the course of depreciation as far as depreciable assets are concerned or in case of a sale of the property. An example for capitalization provision would be the straddle rules in the United State according to Sec 263(g) IRC. Deferral Provisions disallow an interest deduction until a later date. This can be the case if interest deductions are denied until a certain event takes place.

In fact each country has adopted special rules concerning interest deduction and it is beyond this paper to list them all. For financing purposes it should underlined that the benefit of tax shields highly depends on these rules and a separate evaluation is necessary for each country in order to obtain the planned tax deduction.

4.2. Arm’s Length Principle

Even though an instrument is treated as debt and there is no provision that limits the deductibility of interest it is possible that part of its interest is not deductible to the extent that they are not at arm’s length. Due to the arm’s length principle only the part of interest is tax deductible that would have been granted to an independent creditor. This simple rule is generally adopted in every country in order to avoid misuse and erosion of the tax base.

21 Or in the case of the United States a dividend received deduction.
22 For example Sec 265(a)(2) IRC of the United States which denies the interest deduction of debt which was used to purchase or carry tax-exempt obligations.
23 Another popular capitalization rule is the capitalization of interest during the production period of certain property.
The implementation of the arm’s length principle differs widely. Some countries do not specify how the arm’s length should be interpreted. Especially in the case where no other debt instrument with the same conditions can be identified it is difficult to say what independent creditors would have agreed on.

One important rule concerning the arm’s length principle is known as disguised dividends. A distribution to shareholders does not necessarily need to be declared as such. Every economic benefit conferred by the corporation to the shareholder for which the shareholder does not give equivalent value in exchange is regarded as a disguised dividend. In this case the tax law assumes that a distribution has taken place which is taxed as an ordinary dividend. Accordingly no interest deduction for the part that is not at arm’s length is allowed.\(^{24}\) A typical example for disguised dividends is a shareholder loan to the company where the consideration is not at arm’s length.\(^{25}\)

In the international field the arm’s length principle gains importance due to tax planning that uses loans to shift taxable income from a jurisdiction with high tax rates to a jurisdiction with low tax rates. In order to avoid transactions that lack economic substance but only seek tax benefits the OECD has implemented transfer pricing rules that provide guidelines for multinational companies and tax authorities. These guidelines describe various methods how the arm’s length can be computed. Interestingly the US-guidelines implemented in Sec 482 IRC and the relevant regulations have adopted a slightly different approach.\(^{26}\) Sec 482 IRC authorizes the Internal Revenue Service (IRS) to distribute, apportion, or allocate gross income, deductions, credits, or allowances between or among businesses that are owned or controlled directly or indirectly by the same interests to prevent evasion of taxes or to clearly reflect the income of any such businesses.\(^{27}\)

Another rule in the United States that governs the compensation of advances is Sec 7872 IRC which imputes interest to below-market loans. Sec 7872 IRC applies to transactions if the loan is below market and falls within one of four specified categories. These categories also involve corporation-shareholder loans. If such a loan is below market


\(^{25}\) In the United States the principal of disguised dividends is implemented in Sec 301 IRC.


constructive interest are deducted from taxable income of the corporations and added as interest income to the taxable income of the creditor.

Generally the arm’s length principle apply to situations where the creditor and the debtor are under common control and therefore can issue instruments with terms and conditions that would not have entered into by an independent investor. If an instrument is publicly traded it will rarely be the case that one of the previous rules are applicable.

5. Timing of Revenue Based Payments

One important difference between debt an equity is the timing of payments. Dividends are only taken into account when there is an actual distribution whereas interest is taxed as it accrues. As a consequence a debt treatment results in an even taxation of income.

In the case that revenue based payments can qualify for a debt treatment it is important to consider the proper method of timing which is applicable to the instrument.

5.1. No special rule

Some jurisdictions do not have special rules for revenue based payments that are treated as debt. In this case the revenue based payments typically are taken into account when an actual payment takes place. Therefore the issuer has an interest deduction corresponding to that amount paid and the investor must include the interest payments to the taxable income. The tax shields of those payments are computed on the basis of the amount of those payments.

5.2. Noncontingent Bond Method

Under the noncontingent bond method it is assumed that the contingent payments – for example payments that depend on the profit of a corporation – are not contingent. Therefore interest accrues on the debt instrument as if it were a fixed-payment debt instrument. This fixed-payment debt instrument is constructed by using the instruments comparable yield and a projected payment schedule.

The United States provide special rules for contingent payments. The applicable methods depends on whether the instrument is issued for money or publicly traded property or instruments that are themselves publicly traded. If such an instrument provides for one or more contingent payments the noncontingent bond method applies to the instrument.28

The regulations provide four steps for the computation of the amount of income, deductions, gain or loss under the noncontingent bond method:

1. Determine the comparable yield;
2. Determine the projected payment schedule;
3. Determine the daily portions of interest;

28 Reg. 1.1275-4(a)(1).
4. Adjust the amount of income or deductions for differences between projected and actual contingent payments.\textsuperscript{29}

In general, the comparable yield for a contingent payment debt instrument is the yield at which the issuer would issue a fixed rate debt instrument with terms and conditions similar to those of the contingent payment debt instrument. This will be the case if the instrument has similar terms concerning subordination, term, timing of payments and general market conditions.\textsuperscript{30} In all cases, the yield must be a reasonable yield for the issuer and may not be less than the applicable federal rate (AFR) which is published by the IRS monthly.\textsuperscript{31}

The projected payment schedule for a debt instrument includes noncontingent payment and a projected amount for contingent payment. In general, if a contingent payment is based on market information, the amount of the projected payment is the forward price of the contingent payment.\textsuperscript{32} If a contingent payment is not based on market information, the amount of the projected payment is the expected value of the contingent payment as of the issue date.\textsuperscript{33}


If the projected payment schedule and the instrument’s issue price do not produce the comparable yield, then the schedule must be adjusted to produce the comparable yield.\textsuperscript{34} If an instrument provides for market-oriented and nonmarket oriented payments the adjustment must primarily be made with the market oriented payments.\textsuperscript{35} In most cases, the issuer’s determination of the projected payment schedule will be respected unless it was set with a principal purpose to overstate, understate, accelerate, or defer interest accruals on the debt instrument.\textsuperscript{36}

5.3. Wait and See Approach

If the instrument does not fulfill the requirements of the noncontingent bond method the contingent payments must be taken into account according to the wait and see approach. This method requires that the instrument has to be split into its noncontingent and contingent payment components. The noncontingent payments are treated as a separate debt instrument where the issue price equals the issue price of the overall obligation. When a contingent payment is made it is divided into a principal and an interest component.\textsuperscript{37} The principal component of a contingent payment is computed with a discount rate.\textsuperscript{38} The remainder of the payment is treated as interest and can therefore be deducted from taxable income of the issuer or has to be included in taxable income of the investor.\textsuperscript{39}

6. Model

The Model compares the different tax treatments of revenue based payments and calculates the net present value of the three different methods. The net present value analysis is one hand accepted due to capturing of the time value of money, on the other hand it has its limitations. One important obstacle is the discount rate which represents the opportunity cost of capital. This calculation has the implicit assumption that markets are efficient and the company has unlimited access to this market. The reinvestment assumption implies that the cash flows can be reinvested at the discount rate or cash


\textsuperscript{38} Usually the applicable federal rate is taken as the discount rate.

outflows can be disinvested. These assumptions of course distort the result of a net present value calculation.

The net present value calculation is taken as basis concept for the following model because tax authorities – especially the IRS with the noncontingent bond method and the wait and see approach – demand the net present value calculations of the taxpayer in order to compute the interest deduction of a specific year.

The discount rate represents the opportunity cost of capital. It is assumed that the company can invest the indefinite amount of money with similar risk at a given rate of return. In the case of a financing decision the assumption is similar. In this case the discount rate represents the cost of an alternative financing. This assumption is followed by the IRS because the comparable yield for a contingent payment debt instrument is the yield at which the issuer would issue a fixed rate debt instrument with terms and conditions similar to those of the contingent payment debt instrument. In other words the comparable yield is an alternative instrument with the same underlying risks and conditions. The payment schedule than must be adjusted to produce the comparable yield. This is done with a net present value analysis. The later the payments are due the higher the comparable yield must be.

**6.1. Time Value of Money**

Generally we can compare four different methods of computing the net present value of revenue based payments of financial instruments. We can consider the cost of a typical equity instrument which cannot qualify for an interest deduction and the cost of a debt instrument with revenue based payments to which the three different approaches apply. It captures the importance of the time value of money.\(^{40}\)

The cost of equity finance is not reduced by tax shields. The compensation of equity is \(r_e\) and depends upon the revenues \((R)\) of a corporation. The net present value of the payments is compounded with a discount rate that is equal to the rate of an alternative financial instrument.

\[
\sum_{t=1}^{n} \frac{rR}{(1+r)^t}
\]

A typical debt instrument \((D)\) considers fixed interest payments of \(Dr_i\) which are tax deductible and therefore the cost of this instrument is reduced by the factor \((1 - \tau_c)\). The discount rate again is the rate equal to an alternative financial instrument.

\[
\sum_{t=1}^{n} \frac{r(1-\tau_c)D}{(1+r)^t}
\]

If an instrument provides for revenue based payments and is treated as debt the cost of capital is reduced by the tax shield. However, the various methods compute the tax shield in different ways and therefore the tax shield vary significantly.

In the case of revenue based payments that are qualified as debt and no special rule is applicable the cost of capital is reduced by \( (1 - \tau_c) \). The deductibility of the payments occurs when the payment is made.

\[
\frac{\sum r(1-\tau)R}{1+r}
\]

The noncontingent bond method applies an interesting approach to revenue based payments. First the comparable yield \( r_c \) must be determined and the payment schedule must be adopted in order to represent the comparable yield. For tax purposes the revenue based payments are transformed into annually fixed interest payments.

\[
\frac{\sum rD}{1+r} = \frac{\sum rR}{1+r}
\]

Interest then accrues annually due to the comparable yield. The cost of this instrument still is the cash outflows of the revenue based payments while the tax shields are computed on the basis of an underlying debt instrument with fixed and annually constant interest payments.

\[
\frac{\sum rR - r\tau D}{1+r}
\]

The wait and see approach bifurcates an instrument into two components. The cost of capital therefore can be rewritten as:

\[
\frac{\sum Rr - \left[ D(1+r)^{-1} \tau \right] + \left[ Rr - Rr(1+r) \right] \tau}{1+r}
\]

The cost of an instrument where the revenue based payments are governed by the wait and see approach comprises of the cash outflow of the revenue based payments and the tax shields that are based on the interest accrual of the noncontingent part and the discounted contingent part of the instrument.

Comparing these three different methods the cash outflow of the revenue based payments remains stable as the terms of the instrument are not changed by tax systems. The influence of taxes only affects the tax shields and therefore can alter the cost of capital.
6.2. Fluctuating Profits

One important difference between interest and revenue based payments is the fluctuation of profits. At a given point of time companies either estimate decreasing or increasing profits due to the business cycle. These estimates are important in order to determine the rate of return of the revenue based payments. If a company estimates increasing profits the rate of return typically will be higher in order to compensate the time value of money aspect. On the other hand if the company estimates decreasing profits the rate of return is typically lower. Considering the same amount of profits but simply altering the schedule of the payments the rate of return of both scenarios must different in order to result in the same internal rate of return.\[41\]

Example:

A Company expects the following profit development:

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Profit</td>
<td>0</td>
<td>0</td>
<td>10,000</td>
<td>20,000</td>
<td>30,000</td>
<td>33,000</td>
<td>36,300</td>
<td>39,930</td>
<td>43,923</td>
<td>48,315</td>
</tr>
</tbody>
</table>

From 2011 the profit increases 10 % per year. The company wants to issue an instrument per 1.1.2006 with a principle payment of 1,000. The tax rate is 35%.

The yield for a comparable instrument with the same terms and conditions would be 10 %. With the given payment schedule the rate of return must be 4.62% in order to result in a rate of return of 10%. The net present value calculation for such an instrument would then be:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal</td>
<td>1,000</td>
<td>-1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit</td>
<td>0</td>
<td>0</td>
<td>10,000</td>
<td>20,000</td>
<td>30,000</td>
<td>33,000</td>
<td>36,300</td>
<td>39,930</td>
<td>43,923</td>
<td>48,315</td>
</tr>
<tr>
<td>Revenue Based Payments</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-46</td>
<td>-92</td>
<td>-139</td>
<td>-153</td>
<td>-168</td>
<td>-185</td>
<td>-203</td>
</tr>
<tr>
<td>Cash Flows</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
<td>-46</td>
<td>-92</td>
<td>-139</td>
<td>-153</td>
<td>-168</td>
<td>-185</td>
<td>-203</td>
</tr>
<tr>
<td>Discount Rate</td>
<td>0.909</td>
<td>0.826</td>
<td>0.751</td>
<td>0.683</td>
<td>0.621</td>
<td>0.564</td>
<td>0.513</td>
<td>0.467</td>
<td>0.424</td>
<td>0.386</td>
</tr>
<tr>
<td>NPV RBP[42]</td>
<td>0</td>
<td>0</td>
<td>-35</td>
<td>-63</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
</tr>
<tr>
<td>NPV CF[43]</td>
<td>1,000</td>
<td>0</td>
<td>-35</td>
<td>-63</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
</tr>
<tr>
<td>[\Sigma \text{NPV}]</td>
<td>0</td>
<td>0</td>
<td>-35</td>
<td>-63</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
<td>-86</td>
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</tr>
</tbody>
</table>

If the company expects decreasing profits that are inverse the increasing profits the rate of return must be 3.28% in order to result in an internal rate of return of 10%.

\[41\] Which resembles the comparable yield after the computation of the IRS.

\[42\] Net Present Value of Revenue Based Payments.

\[43\] Net Present Value of Cash Flows.
As can be seen in this example the net present value of the revenue based payments of the increasing and decreasing scenario are identical. If we have a look at the cash flows it is obvious that the total cash outflows are higher in the case of increasing profits. In both scenarios the total net present value is zero because the discount rate is assumed to be the comparable yield. If we consider a comparable straight debt instrument with a yield of 10% the total amount of the interest payments would 1,000 (before taxes). Of course this is an inadmissible comparison because a straight debt instrument does not have the same terms and conditions as an equity instrument and therefore the interest rate will typically be lower.

The above analysis acts on the assumption that revenue based payments are not tax deductible. If we can achieve a debt treatment we would obtain tax shields due to the deductibility of the qualification as interest.

### 6.2.1. Increasing Profits

Taking the above figures as a starting point the tax shield for each method can be determined. The noncontingent bond method computes the tax shields according to an equivalent debt instrument and therefore results in a straight line. If no specific method is employed the tax shield follow the profit development and therefore result in a line that increases as the profits increase. The wait and see approach splits the instrument and treats one part of the instrument as separate instrument with underlying interest payments and the contingent payments as part of principle and interest payments. As a consequence the noncontingent part of the tax shields result in a straight line and the contingent part follows the profits development with the constriction that only the interest part is tax deductible. It should be noted that tax shields are only possible if the company as a whole is profitable.
Comparing the different flows in each year it is clear that the typical equity instrument results in the highest cost because no tax shields can be considered. The noncontingent bond method leads to a cash inflow in years where no profits are realized because the tax shields assume a debt instruments with annual interest payments. The wait and see approach also provides for tax shields when there are no profits but because the computation of this tax shields involve the noncontingent part of the instrument but the tax shields are lower than the tax shields according to the noncontingent bond method. When no rules are employed the net present value of the cash flows are zero in years where no profits can be realized. If the company is profitable the net present value develops as a percentage of the profits.
If we now consider the cash flows with each method the following table can be created:

<table>
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<tr>
<th></th>
<th>Equity</th>
<th>Debt</th>
<th>NBM</th>
<th>Wait and See</th>
<th>No Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Based Payments</td>
<td>-1.209</td>
<td>-1.000</td>
<td>-1.209</td>
<td>-1.209</td>
<td>-1.209</td>
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<tr>
<td>Tax Shields</td>
<td>0</td>
<td>350</td>
<td>350</td>
<td>339</td>
<td>423</td>
</tr>
<tr>
<td>Net Payments</td>
<td>-1.209</td>
<td>-650</td>
<td>-859</td>
<td>-870</td>
<td>-786</td>
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</tbody>
</table>

The cash outflows – these figures are not compounded yet – in the case of revenue based payments are always 1,209 as this is part of the term of the financial instrument. Only in the case of a straight debt instrument the payments can be reduced to 1,000 in order to compensate a yield of 10%. The tax shields of a debt instrument and an instrument that is governed by the noncontingent bond method is 350 in both cases because the noncontingent bond method assumes an underlying straight debt instrument. The wait and see method treats part of each payment as principal and therefore has a lower tax shield whereas the “no rule” approach results in the highest tax shields.

6.2.2. Decreasing Profits

In case the company has decreasing profits the tax shields of the noncontingent bond method do not change because the assumption of the underlying debt instrument remains unchanged. In this case the wait and see approach is not as profitable as with increasing profits because the compounding of payments leads to lower interest payments in earlier years. If no rule is employed the tax shields are a percentage of the revenue based payments and lose less value when compounded.

Considering the cash flows in the case of decreasing profits the payments have a similar tendency as with increasing profits exempt from the fact that the total payments are lower due to the comparable yield.
Considering decreasing profits the cash outflows of the revenue based payments are lower than a comparable straight debt instrument because both must result in the comparable yield. The noncontingent bond method nonetheless computes the tax shields according to an underlying debt instrument. Again the wait and see approach bifurcates the instrument in a way that the payments are considered part principal part interest with a regular interest deduction due to the noncontingent part of the instrument. The tax shields of the “no rule” approach are not as high as with the noncontingent payments because they are calculated on the basis of the lower cash outflows.

<table>
<thead>
<tr>
<th></th>
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<th>Wait and See</th>
<th>No Rule</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-857</td>
<td>-1.000</td>
<td>-857</td>
<td>-857</td>
<td>-857</td>
</tr>
<tr>
<td>Tax Shields</td>
<td>0</td>
<td>350</td>
<td>350</td>
<td>220</td>
<td>300</td>
</tr>
<tr>
<td>Net Payments</td>
<td>-857</td>
<td>-650</td>
<td>-507</td>
<td>-637</td>
<td>-557</td>
</tr>
</tbody>
</table>

### 6.3. Discount Rate

#### 6.3.1. Discount Rate equals Comparable Yield

The net present values of the four different formulas are highly dependent on the discount rate. Assuming that the discount rate equals

\[ r_c = r_d = r_f \]  \hspace{1cm} (9)

The net present value of the instrument that provides for revenue based payments where no special rules are applied and the instrument that is treated under the noncontingent
bond method is identical. This assumption is not unlikely because if the corporation is not considering taxes the projected cost for capital should result in the same rate of return. The fact that the discount rate equals the return of the instruments implies that an alternative instrument would be achievable at the same cost. The noncontingent bond method is based on that assumption. The yield of the all payments of a contingent debt instruments should result in a yield that is comparable to an instrument that does not provide for contingent payments. This yield is than taken as the basis for the annual computation of interest.

The wait and see approach leads to a lower net present value than the noncontingent bond method because the compounded revenue based payments are compounded again in order to compute the net present value.

6.3.2. Discount Rate equals Comparable Yield after Taxes

Assuming that the comparable instrument is also debt the interest are tax deductible and the cost of capital can be reduced. This leads to the following formula:

\[ r_c = r_c(1 - \tau) \]  

(10)

As a result the net present value of the typical debt instrument would be zero because the two alternatives are indifferent. If profits are stable the net present values of debt instruments that are treated under the noncontingent bond method and under the “no rule” approach also is zero. As soon as profits are fluctuating also the net present values change.

Assuming increasing profits the payments according to the conditions of the instrument should lead to absolute higher amounts to compensate for a comparable instrument. Therefore

\[ \sum r_c D < \sum r R \]  

(11)

Due to the discount rate both instruments lead to the same yield before taxes. Taking taxes into account the net present value of the “no special rule” approach is higher than the net present value of the noncontingent bond method. This is due to the fact that the revenue based payments are higher than the equivalent interest payments and therefore lower the net present value. The tax shields of the revenue based payments only ameliorate the result. With the noncontingent bond method the tax shields are accrued annually and consistently but they computed on the basis of the lower compensated debt instrument. In absolute numbers this means that the noncontingent bond method takes the disadvantage of the higher revenue based payments in absolute numbers and the disadvantage of the lower tax shields of the debt instruments. The wait and see approach leads to a lower net present value as only a part of the revenue based payment is treated as debt.
In case of increasing profits the net present value of all revenue based payments is negative because the discount rate assumes an instrument with regular tax deductible interest payments. As profits are increasing and therefore payments are higher at the end of the term the absolute payments must be higher in order to result in the same yield after taxes.

Assuming that the company has decreasing profits the payments the compensation of the equity instrument should provide lower absolute compensation because the payments are due in earlier years.

\[ \sum_{t} rD > \sum_{t} rR \]  

(12)

When the net present value is computed for these payments they should result in the same yield. Due to the lower absolute payments the tax shields of the revenue based payments are lower than the tax shields of a typical debt instrument. As a result the noncontingent bond method results in a higher net present value than the “no special rule” approach because it takes advantage of the lower absolute revenue based payments and the higher tax shield of an underlying debt instrument.

6.3.3. Discount Rate is lower than Comparable Yield after Taxes

If the discount rate is lower than the comparable yield after taxes

\[ r_s < r (1 - \tau_c) \]  

(13)

the same results are achieved as with formula (12) except that with constant profits the net present value behave like the net present value of increasing profits.

In the case of decreasing profits the net present values can turn negative if the \( r_d \) is significantly lower than \( r_c(1 - \tau_c) \). The reason for this change is the assumption that the discount rate is the rate of an alternative instrument and if capital can be obtained at such a low rate it is profitable to take advantage of the alternative instrument.

6.3.4. Discount Rate is higher than Comparable Yield

In the case that the discount rate is higher than the comparable yield

\[ r_s > r \]  

(14)

the noncontingent bond method leads to the highest net present value if profits are increasing. This result is due to the fact that the tax shields which are already taken into account in years where there is no payment count heavier than the higher tax shields of the wait and see approach in later years. The net present value of a typical debt instrument in this scenario is lower than tax deductible revenue based payments because there is an annual cash outflow at the beginning of the term of the debt instrument.
The opposite result is achieved with decreasing profits. Due to the high discount rate the cash outflows at the beginning of the maturity of the instrument are given more weight than the cash outflows at the end of the maturity. As a result the tax shields at the end of the instrument’s maturity with is governed by the noncontingent bond method at given less weight than the lower but earlier tax shields of the “no special rule” approach.

6.3.5. Comparison of different discount rates

The net present values of an instrument highly depend on the discount rate. If the discount rate is higher the net present value will be higher as well. One can now ask the question, which of the four mentioned methods results in the highest net present value.

As can be seen the net present values change according to the discount rate. If the discount rate is low a debt instrument would be the most favorable instrument because this instrument leads to the lowest cash outflows. Interestingly the profitability of a debt compared to an equity instrument changes at 31%.
In the case of decreasing profits the noncontingent bond method results in lower payments and higher tax shields and is therefore ranked first place when a low discount rate is applied. If the discount rate is higher than the comparable rate the ranking is reversed.

The “no special rule” approach is exactly between the wait and see method and the noncontingent bond method if a low discount rate is employed. This is due to the fact that revenue based payments are either higher or lower than the absolute payments of a debt instrument and therefore lead to a higher or lower net present value depending on increasing or decreasing profits. The tax shields are always computed on the basis of the higher or lower payments. The wait and see approach usually lead to an inferior result because only part of the revenue based payment is considered as an interest payment.
If we have a closer look at the two above graphs there are two discount rates that are interesting. If the discount rate is 10% – which we assumed to be our comparable yield – it results in a net present value of zero no matter if profits are increasing or decreasing. This is the comparable yield is identical with the internal rate of return of the instrument. At this point the net present values of the noncontingent bond method, the wait and see approach and the “no rule” approach is also identical.
But if we consider that the payments of a comparable instrument are tax deductible as well the discount rate should not be 10% but 6,5% (10%*(1-35%)). At this point the net present value of a typical debt instrument is zero with increasing and decreasing profits.

The noncontingent bond method for instruments that provide for contingent payments combines in the case of increasing profits the disadvantages of the higher absolute payments of revenue based payments and the disadvantage of the lower tax shields if the discount rate is lower than the comparable rate. In the case of decreasing profits the noncontingent bond method results in lower payments and higher tax shields and is therefore ranked first place. If the discount rate is higher than the comparable rate the ranking is reversed.

The “no special rule” approach is exactly between the wait and see method and the noncontingent bond method. This is due to the fact that revenue based payments are either higher or lower than the absolute payments of a debt instrument and therefore lead to a higher or lower net present value depending on increasing or decreasing profits. The tax shields are always computed on the basis of the higher or lower payments.

The wait and see approach usually lead to an inferior result because only part of the revenue based payment is considered as an interest payment.

7. Conclusion

Revenue based payments do not automatically lead to an equity treatment. Taking certain criteria into consideration the instrument can be structured to guaranty a debt treatment for tax purposes. Special attention should be given to rules of tax law which especially tend to reclassify debt instruments that are held by shareholders. The analysis has shown that is clearly profitable to qualify for a tax deduction of revenue based payments. No matter what method of consideration is employed the cost of capital is always reduced.

If a debt treatment can be achieved it is necessary to know how interest payments are taken into consideration. Depending on the applicable method the result changes considerably. The taxpayer may or may not be able to choose his favorable method but it is of particular importance to know the tax impact of each method.

The paper has also shown that discount rate plays an important role in the calculation of the different methods. Of course the discount rate – the opportunity cost of capital – differs from company to company. Nevertheless it is questionable if an alternative finance instrument is not tax deductible as it is assumed by the IRS. Even if a comparable instrument also provides revenue based payment this does not automatically mean that they are not tax deductible. Assuming the same conditions it is more likely that the opportunity cost has to be reduced by tax shields. In this case the different method do not lead to same net present value and therefore one method is more favorable that the other.

Summarizing it can be stated that taxes can change the cost of financing considerably and it is therefore essential to know the effect of tax law provisions implemented in the various countries.
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Tobin, J.J. (2003): Are proposals to enhance the earnings stripping rules missing the (policy) point, 32 Tax Management International Journal 264;


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<thead>
<tr>
<th>Author</th>
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</thead>
<tbody>
<tr>
<td>Carlos Reyes</td>
<td>European Portability Rules for Social Security Benefits and their Effects on the National Social Security Systems</td>
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<td>On the Intention-Behaviour Discrepancy: Empirical Evidence from Succession on Farms in Finland</td>
</tr>
<tr>
<td>Christoph R. Weiss</td>
<td></td>
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<tr>
<td>Kyösti Pietola</td>
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<td>Timo Fischer</td>
<td>European Co-ordination of Long-term Care Benefits: The individual Costs of Migration between Bismarck and Beveridge Systems <em>Illustrative Case Studies</em></td>
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<td>Effective tax rates as a determinant of Foreign Direct Investment in Central- and East European Countries A Panel Analysis</td>
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<td>Die Zahlstelle im Anwendungsbereich des EU-Quellensteuergesetzes</td>
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<td>Christina Gruber</td>
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</tr>
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<tr>
<td>------</td>
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<tr>
<td>12</td>
<td>Internationale Kooperation im asymmetrischen Gefangenendilemma - Das OECD Projekt gegen schädlichen Steuerwettbewerb</td>
</tr>
<tr>
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<td>The “Shadow of Succession” in Family Firms – A Non-Parametric Matching Approach</td>
</tr>
<tr>
<td>14</td>
<td>Europäisches Sozialrecht</td>
</tr>
<tr>
<td>15</td>
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</tr>
<tr>
<td>16</td>
<td>National Tax Policy, the Directives and Hybrid Finance</td>
</tr>
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<td>17</td>
<td>Labour tax policies and strategic offshoring under unionised oligopoly</td>
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<tr>
<td>18</td>
<td>Between Tax Competition and Harmonisation: A Survey on Tax Competition</td>
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<td>Hybrid Instruments and the Indirect Credit Method – Does it work?</td>
</tr>
<tr>
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<td>Tax Treatment of Revenue Based Payments</td>
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<table>
<thead>
<tr>
<th>Author</th>
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<tbody>
<tr>
<td>Carlos Reyes</td>
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