CAPITAL BUDGETING
(Penganggaran Modal)

Outline

- q Pendahuluan
- q Discounted Cash Flow (DCF) Techniques
  - Net Present Value (NPV)
  - Payback Period (PP)
  - Internal Rate of Return (IRR)
  - Profitability Index (PI)
- q Ringkasan

What is Capital Budgeting?

- Capital: aset yang digunakan dalam suatu produksi;
- Budget: perencanaan arus kas secara rinci mengenai suatu proyek selama proses berlangsung;
- Capital Budgeting : secara terminologi sebuah proses untuk menentukan pengambilan keputusan investasi dan menentukan apa saja yang dilakukan di dalamnya.
- Kriteria: memaksimalkan laba pemilik saham.

- Menurut *Andrew Graham:*

  “Capital budgeting is a process used to evaluate investment in long term of capital assets”

  Capital asset adalah aset yang dimiliki perusahaan dengan usia atau masa pemanfaatan lebih dari satu tahun.
- Menurut *Eugene F.Brigham*:

  “Capital budgeting is the decision process that Managers use to identify those projects that add to firm’s value, and such as it perhaps the most important task faced by financial managers and their staff.”

Why is Capital Budgeting Important?

§ Menentukan strategi perusahaan

§ Hasil yang didapat akan berkelanjutan untuk mengurangi fleksibilitas

§ Menggunakan pengeluaran yang besar

§ Wrong decision: konsekuensi yang besar bagi kelanjutan perusahaan.

Langkah-langkah Capital Budgeting:

- § Menganggarkan aliran kas (kas masuk dan kas keluar)
- § Menelaah risiko dari alur kas
- § Menentukan discount rate yang sesuai untuk investasi
- § Mengevaluasi alur kas (find NPV)
- § Membuat keputusan (accept/ reject).

Capital Budgeting Project Categories:

- § Mengganti operasional yang profitable
- § Penggantian untuk mengurangi biaya
- § Memperluas penjualan produk yang sudah ada
- § Memperluas pasar dengan mengeluarkan produk baru
- § Keputusan penyeimbangan perusahaan
- § Merger.

NPV

- § NPV: Mencari dan mengevaluasi potensi dari sebuah investasi.
- § Latar belakang: hasil dari investasi yang dilakukan adalah lebih besar dari jumlah nominal investasi.
- § Method: NPV = $PV_{inflows}$ – cost
  = net gain in wealth
- § Jika NPV ≥ 0, maka projek kita terima; apabila sebaliknya, maka projek dibatalkan.
- § Risk adjusment: semakin tinggi resiko, semakin tinggi biaya modal, nilai NPV semakin kecil.

Example

- § Assume: perusahaan berencana untuk investasi sebesar $9,000 saat ini
- § Investasi proyek ini akan berjalan selama 4 tahun
- § Expected cash flow pada akhir masa investasi adalah $2,000; $3,000; $3,000; $4,000
- § Interest rate = 10%
- § Cash flow diagram

Finding The NPV

$FV = PV(1+r)^n$ or $PV = FV/(1+r)^n$

So..we can find for NPV:

$PV_1 = \$2,000/(1+ 0.1)^1 = \$1,818.18$

$PV_2 = \$3,000/(1+0.1)^2 = \$2,479.34$

$PV_3 = \$3,000/(1+0.1)^3 = \$2,253.94$

$PV_4 = \$4,000/(1+0.1)^4 = \$2,732.05$

$NPV = PV_0 + PV_1 + PV_2 + PV_3 + PV_4$

NPV =(9,000) + 1,818.18 + 2,479.34 + 2,253.94 + 2,732.05 = $283.51

Payback Period (PP)

- Jumlah tahun yang ditentukan dalam meng cover suatu biaya investasi proyek
- Berapa lama atau berapa tahun yang diperlukan untuk uang investasi proyek itu kembali?

no	advantages	disadvantages
1	Menyiapkan indikasi resiko dan likuiditas sebuah proyek	Tidak menghiraukan TVM
2	Mudah untuk dihitung dan dimengerti	Tidak menghiraukan cash flow
3		Tidak ada spesifikasi untuk menerima hasil payback

Example

- Perusahaan investasi sejumlah $100 dalam sebuah bisnis.
- The free cash flow (FCF) adalah sebagai berikut:

	Collected payback:
Year 1 : $40	$40
year 2 : $30	$70
year 3 : $30	$100
year 4 : $24	$124
year 5 : $15	$139

How long your company received the payback?

So…the payback is in year 3

Shorter payback is better

Internal Rate of Return (IRR)

- Rate of Return: kecepatan uang yang kembali kepada perusahaan.
- Formula:

- Tertulis dalam % per tahun.
- Example:

1. Perusahaan melakukan investasi saat ini sejumlah $100. Setiap tahun, perusahaan menerima cash inflow $3.

   Jadi..rate of return dari investasi tersebut adalah 3% per tahun.

2. Jumlah investasi adalah $100 saat ini.

   1 tahun kemudian, cash inflow $60.

   2 tahun kemudian mendapatkan cash inflow sebesar $60.

   Berapakah nilai rate of return?

   rate of return = hidden = internal

   Using Present Value formula

   $NPV = -100(1+r)^{-0} + 60(1+r)^{-1} + 60(1+r)^{-2} = 0$

   Berapakah nilai r?

So, we find “r”:

We can do some trial & error:

Guess for r = 14% or 0.14

$-100(1+r)^{-0} + 60(1+r)^{-1} + 60(1+r)^{-2} = 0$

$-100(1.14)^{-0} + 60(1.14)^{-1} + 60(1.14)^{-2} = 0$

-1.2 = 0…..NOT TRUE

If r = 13% or 0.13

$-100(1.13)^{-0} + 60(1.13)^{-1} + 60(1.13)^{-2} = 0$

0,09 = 0….almost exactly the same.

Maka, nilai r adalah 13%, IRR = 13%.

Profitability Index (PI)

- Disebut juga rasio biaya manfaat.
- PI = $\frac{\text{PV of an investment's future cash flow}}{\text{Initial cost}}$
- Jika NPV positif : PI > 1
- Jika NPV negatif : PI < 1

- Jika biaya investasi $200
- PV dari future cash flow adalah $220, maka nilai NPV adalah $20.
- Maka:

  Profitability index = $220/$200 = 1.1
- Ini artinya bahwa per $1 nilai investasi, akan memiliki nilai NPV sebesar $1.10

Kelebihan dan Kekurangan PI

- Kelebihan:

  1. Secara umum akan mengidentifikasikan keputusan dengan menggunakan NPV.

  2. Mudah dimengerti dan dikomunikasikan.

  3. Akan berguna apabila dana investasinya terbatas.

- Kekurangan:

  1. Akan menyebabkan kesalahan dalam mengambil keputusan jika digunakan untuk menilai jumlah investasi yang kompleks.

Capital Rationing

§ Capital rationing terjadi ketika perusahaan memutuskan untuk tidah membiayai semua proyek investasi dengan nilai NPV yang positif.

§ Biasanya perusahaan melakukan setting limit bawah dari totaljumlah pengeluaran yang harus dilakukan pada tahun anggaran berikutnya.

Hal ini dikarenakan oleh:

1. Perusahaan ingin menghindari biaya langsung (flotation costs) dan biaya tidak langsung dengan mengeluarkan kembali modal usaha.

   Solution: meningkatkan nilai biaya modal dengan melakukan semua biaya-biaya yang sudah ditetapkan, dan mengambil semua investasi yang memiliki positif NPV dengan menambah biaya modal.

2. Perusahaan tidak memiliki cukup manajemen, pemasaran atau staf IT untuk mengimplementasikan semua proyek.

   Solution: menggunakaan linear program untuk memaksimalkan NPV untuk tidak memaksakan lebih banyak staf.

End of Chapter

MAKING CAPITAL INVESTMENT DECISIONS

Key Concepts and Skills

- Memahami bagaimana menentukan arus kas yang relevan untuk berbagai jenis investasi yang diusulkan.
- Memahami berbagai metode untuk operasi perhitungan cash flows.

Chapter Outline

- Project cash flow
- Incremental cash flow
- Pro forma financial statement and project cash flow
- More about project cash flow
- Alternative definitions of operating cash flow
- Some special cases of discounted cash analysis.

Relevant Cash Flow (Arus Kas yang Relevan)

- Arus kas yang harus disertakan dalam analisis penganggaran modal, dimana itu akan terjadi (atau tidak terjadi) jika proyek diterima.
- Cash flow ini dinamakan Incremental Cash Flows.
- Stand alone principle memungkinkan kita untuk menganalisis setiap proyek yang berada dalam pemisahan dari perusahaan dengan hanya fokus pada incremental cash flow.

Common Types of Cash Flow

- Fokus pada incremental cash flow yang dihasilkan dari proyek. Biaya – biaya yang dipertimbangkan:

  1. Sunk costs, biaya yang sudah ada di masa lalu, yang tidak dapat diubah dengan adanya keputusan hari ini.

  2.Opportunity cost, biaya yang didapat dari manfaat proyek lain.

  3. Side effect :

  a. Positif (bermanfaat untuk proyek yang lain).

  b. Negatif (biaya untuk proyek lain).

- Perubahan pada net working capital (modal kerja bersih), dimana current assets dan current liabilities tidak di catatkan dalam notes payable.
- Beban keuangan, seperti bunga yang dibayarkan (interest paid) dan dividend
- Pajak.

Pro Forma Statements and Cash Flow

- Penganggaran modal, sangat bergantung pada laporan pro forma akuntansi, khususnya laporan laba rugi.
- Penghitungan Cash flow:

Ø Operating cash flow (OCF) = EBIT + depreciation – taxes.

Ø OCF = Net Income + depreciation (jika tidak ada pengeluaran untuk bunga).

Ø Cash Flow From Assets (CFFA) = OCF – Net Capital Spending (NCS) – perubahan pada NWC.

Note: CFFA juga diketahui sebagai Project Total Cash Flows.

More on NWC

- Mengapa kita harus mempertimbangkan perubahan NWC secara terpisah?

ü GAAP mensyaratkan pencatatan penjualan pada laporan laba rugi pada saat dilakukan, bukan pada saat kas di terima.

ü GAAP juga mensyaratkan bahwa COGS dicatat pada saat penjualan dilakukan, baik kita telah membayar sales atau belum.

ü Finally, kita harus membeli perlengkapan sebagai pendukung persediaan dalam penjualan, meskipun belum ada uang yang terkumpul.

Depreciation

- Beban penyusutan yang digunakan dalam penganggaran modal haruslah sesuai dengan yang diatur oleh IRS sebagai tujuan pajak.
- Depresiasi itu sendiri bukanlah pengeluaran non cash, oleh karena itu, ini tidak relevan karena akan mempengaruhi pajak.
- Depreciation tax shield = D x T

  where, D = depreciation

  T = marginal tax rate

How to calculate Depreciation?

- Straight line depreciation

Ø Depreciation: (Initial cost – salvage)/ number of years.

Ø Sedikit aset yang di depresiasikan dengan menggunakan straight line untuk tujuan pajak.

- MACRS

Ø Harus mengetahui kelas aset yang sesuai untuk tujuan pajak.

Ø Multiply percentage diberikan dalam tabel sebagai initial cost.

Ø Penyusutan sampai nol.

Ø Ditentukan pada pertengahan tahun.

After Tax Salvage Value (Nilai Setelah Pajak)

- Jika nilai salvage itu berbeda dengan “book value” dari sebuah aset, maka disitu akan dikenakan pajak.
- Book value = Initial cost – accumulated depreciation.
- After tax salvage value =

  salvage – tax (salvage – book value)

Example

- Pembelian equipment sebesar $100,000, memerlukan biaya untuk pengantaran dan pemasangan sebesar $10,000. Berdasarkan informasi yang ada, equipment ini dapat dijual kembali dengan harga $17,000 setelah masa penggunaan 6 tahun. Marginal tax rate perusahaan adalah 40%.
- Berapakah pengeluaran untuk penyusutan pada setiap tahunnya dan after-tax salvage pada tahun ke 6 untuk setiap situasi?

1. Straight Line Depreciation

- Penghitungan depresiasi yang paling tepat adalah metode straight line depreciation.

ü D = (110,000 – 17,000)/ 6 = 15,500

ü Book value pada tahun ke 6 = 110,000 – 6(15,500) = 17,000

ü After-tax salvage = 17,000 – 0.4 (17,000 – 17,000) = 17,000

2. 3 years MACRS

Year	MACRS percent	Depreciation
1	0.3333	0.3333(110,000) = 36,663
2	0.4445	0.4445(110,000) = 48,895
3	0.1481	0.1481 (110,000) = 16,291
4	0.0741	0.0741(110,000) = 8,151

Book value pada tahun ke 6 = 110,000 – 36,663 – 48,895 – 16,291 – 8,151 = 0

After-tax salvage = 17,000 – 0.4(17,000 – 0) = $10,200

Contoh 3; seven years MACRS

year	MACRS percent	Depreciation
1	0.1429	0.1429(110,000) = 15,719
2	0.2449	0.2449(110,000) = 26,939
3	0.1749	0.1749(110,000) = 19,239
4	0.1249	0.1249(110,000) = 13,739
5	0.0893	0.0893(110,000) = 9,823
6	0.0892	0.0892(110,000) = 9,812

Book value pada tahun ke 6 = 110,000 – 15,719 – 26,939 – 19,239 – 13,739 – 9,823 – 9,812 = 14,729

After-tax salvage = 17,000 – 0.4(17,000 – 14, 729) = 16,091.60

Replacement problem (example)

- Original Machine

1. Initial cost = $100,000
2. Annual depreciation = 9,000
3. Purchased 5 years ago
4. Book value = 55,000
5. Salvage today = 65,000
6. Salvage in 5 years = 10,000

- New Machine

1. Initial cost = 150,000
2. 5-years life
3. Salvage in year 5 = 0
4. Cost savings = 50,000 per year
5. 3-years MACRS depreciation
6. Required return = 10%
7. Tax rate = 40%

Computing cash flow

- We use incremental cash flow
- Jika kita membeli mesin baru, maka kita menjual mesin lama
- Apakah konsekuensi dari menjual mesin lama pada saat ini ataukah pada saat 5 tahun yang akan datang?

Pro-Forma Income Statement

year	1	2	3	4	5
Cost saving	50,000	50,000	50,000	50,000	50,000
Depreciation					
New	49,995	66,675	22,215	11,115	0
Old	9,000	9,000	9,000	9,000	9,000
Incremental	40,995	57,675	13,215	2,115	(9,000)
EBIT	9,005	(7,675)	36,785	47,885	59,000
Taxes	3,602	(3,070)	14,714	19,154	23,600
Net Income	5,403	(4,605)	22,071	28,731	35,400

Incremental Net Capital Spending

- Year 0

Ø Cost of new machine = 150,000 (outflow)

Ø After-tax salvage on old machine = 65,000 – 0.4(65,000 – 55,000) = 61,000 (inflow)

Ø Incremental net capital spending = 150,000 – 61,000 = 89,000 (outflow)

- Year 5

Ø After-tax salvage on old machine = 10,000 – 0.4(10,000 -10,000) = 10,000 (outflow), karena kita sudah tidak mendapatkan lagi.

- Cash Flow From Assets

year	0	1	2	3	4	5
OCF		46,398	53,070	35,286	30,846	26,400
NCS	-89,000					-10,000
Changes in NWC	0					0
CFFA	-89,000	46,398	53,070	35,286	30,846	16,400

- Cash flow menggunakan CFFA, kita dapat menghitung NPV dan IRR.
- NPV = 54,801.74
- IRR = 36.28%
- Haruskah perusahaan mengganti peralatan?

Metode Lain untuk Menghitung OCF

- Bottom Up Approach

  1. Digunakan jika tidak ada interest expense

  2. OCF = NI + depreciation

- Top-Down Approach

  1. OCF = Sales – costs – taxes

  2. Jangan memasukkan atau menghitung non cash perform

- Tax Shield Approach

  1. OCF = (Sales – Costs)(1 – T) + Depreciation x T

Contoh: Pemotongan Biaya

- Perusahaan akan membeli komputer dengan biaya sebesar $1 million. Itu akan menghemat biaya inventori dan manajemen sebesar $300,000. Life time komputer selama 5 tahun dan menggunakan metode depresiasi 3 tahun MACRS. Nilai salvage value $50,000 pada akhir tahun ke 5. Tidak ada implikasi pada net working capital. Marginal tax rate 40%. Interest rate 8%.

Comprehensive Problem

- Sebuah investasi sejumlah $1,000,000 mengalami depresiasi 7 tahun MACRS. Dibutuhkan $150,000 dalam inventori yang mana akan meningkatkan jumlah hutang (account payable) sebesar $50,000. Juga akan menambah jumlah pendapatan sebesar $150,000 pada kas tahunan. Nilai pajaknya 40%. Berapakah nilai incremental cash flow pada tahun 0, 1, 7 dan 8?

COST OF CAPITAL
(Biaya Penggunaan Dana)

Chapter Outline

- Cost of Capital: Introduction
- Cost of Equity
- Cost of Debt
- Cost of Preferred Stock
- Weighted Average Cost of Capital
- Divisional and Project Costs of Capital
- Flotation Costs

Pentingnya Biaya Penggunaan Dana

- Keuntungan yang diberikan kepada investor adalah sama dengan biaya untuk perusahaan.
- Cost of capital memberikan pandangan mengenai indikator bagaimana pasar menilai resiko dari aset yang kita punya. Mengetahui cost of capital juga dapat membantu perusahaan dalam menentukan tingkat keuntungan dari proyek anggaran modal.

Required Return = Cost of Capital

- Required Return = Discount Rate = Hurdle Rate = Cost of Capital
- Untuk mengetahui nilai required return suatu investasi, kita dapat menghitung NPV dan menentukan diambil atau tidaknya investasi tersebut.
- Perlu untuk menyimpan/menyisihkan sedikitnya tingkat keuntungan sebagai kompensasi dari pendanaan yang dilakukan investor.
- Required return; dari sudut pandang investor.
- Cost of capital; dari sudut pandang perusahaan.

Cost of Capital

- Keuangan perusahaan: modal dan hutang.
- Cost of capital: cost of equity dan cost of debt.
- Biaya-biaya tersebut ditentukan oleh pasar.
- Perusahaan memberlakukan gabungan (mix), Debt/Equity (D/E) merefleksikan taget struktur modal.
- Menghitung cost of captal:
  1. Menghitung cost of equity
  2. Menghitung cost of debt
  3. Kombinasi keduanya.

Cost of Equity

- Keuntungan yang diharapkan oleh investor, pemegang saham terhadap investasi pada perusahaan.
- Karena biaya ini tidak secara langsung dikontrol, maka harus di estimasikan.
- 2 metode menghitung cost of equity:
  1. Dividend Growth Model (DGM)
  2. CAPM (Capital Asset Pricing Model)

Dividend Growth Model

- Nilai g = konstan

  $P_0 = D_0(1 + g)/ R_e - g = D_1/ R_e - g$
- Dimana: R_e adalah keuntungan yang ditentukan untuk pemegang saham, P_0 = harga, D_0 adalah dividend saat ini atau yang lalu, D_1 = dividend yang akan datang.
- So, untuk menghitung R_e adalah:

  $R_e = D_1/P_0 + g$
- Dimana D_1/P_0 adalah dividend yield (hasil dividen); g adalah growth rate dari dividen.

Contoh 1

- Bentex Ltd. Membayar dividen sebesar 40 sen untuk setiap sahamnya. Nilai dividen ini diperkirakan akan meningkat sebesar 6% setiap tahunnya. Jika harga pasar dari saham Bentex adalah $6 per lembarnya, estimasikan biaya dari equity.
- D_0 = \$0.40; g = 6%; P_0 = \$6, R_e =?
- $D_1 = D_0(1+g)$ = \$0.40(1.60) = \$0.424
- $R_e = (D_1/P_0) + g$ = (\$0.424/\$6) + 0.06 = 0.1307, maka biaya modalnya adalah 13.07%.

Contoh 2

- Misalkan perusahaan ABC memprediksikan untuk membayar dividen sebesar $1.50 per sahamnya tahun depan. Growth dari dividen itu sendiri sebesar 5.1% per tahun. Harga saham saat ini adalah $25. Berapakah nilai modalnya?
- D_1 = $1.50; g = 5.1%; P_0 = $25; R_e =?
- $P_0 = D_1/R_e - g$
- $R_e = D_1/P_0 + g = 1.50/25 + 0.051 = 0.111 = 11.1\%$

Contoh: estimasi pertumbuhan nilai dividen (g)

- 1 metode yang digunakan untuk memprediksikan tingkat growth adalah dengan melihat historical average.

Year	Dividend	Change	Return
2000	1.23	-	
2001	1.30	(1.30 – 1.23)/ 1.23	5.7%
2002	1.36	(1.36 – 1.30)/ 1.30	4.6%
2003	1.43	(1.43 – 1.36)/ 1.36	5.1%
2003	1.50	(1.50 – 1.43)/ 1.43	4.9%

Average = (5.7 + 4.6 + 5.1 + 4.9)/ 4 = 5.1%

CAPM atau SML

- CAPM untuk mencari nilai dari equity (cost of equity):

  $R_E = R_f + \checkmark_E \times (R_M - R_f)$

- Dimana:

  R_E = return dari equity

  R_f = free rate resiko

  $\checkmark_E$ = beta systematic risk

  $R_M - R_f$ = market rate premium

Cost of Preferred Stock

- Saham preference membayar dividen secara tetap.
- Dividen akan selalu dibayarkan pada setiap tahunnya.
- Keuntungan saham preference adalah Rp
- Rumus:

  $P_0 = D/Rp$ $Rp = D/P_0$
- Example: Perusahaan dengan saham preference memiliki pembayaran deviden setiap tahunnya sebesar $3. Jika harga saham per-lembarnya adalah $25, berapakah nilai dari cost saham preference tersebut?
- 25 = 3/Rp, Therefore….Rp = 3/25 = 0.12 = 12%

Cost of Debt

- Biaya hutang merupakan pengembalian yang diminta dari perusahaan.
- Perusahaan fokus pada hutang jangka panjang (Bonds).
- Dengan menghitung Yield to Maturity atau YTM.
- Cost of debt ini NOT coupon rate.

- Formula:

$$P_0 = C\left[\frac{1-\frac{1}{(1+R_D)^T}}{R_D}\right]+\frac{F}{(1+R_D)^T}$$

- C is coupon interest payment,
- R_D is required market return or YTM,
- T is the number of periods left until repayment,
- F is face value.

WACC (Weighted Average Cost of Capital)

- WACC adalah target pengembalian keuntungan terhadap aset yang kita miliki, berdasarkan persepsi nilai pasar terhadap resiko dari aset tersebut.
- Besarnya jumlah sesuai dengan seberapa besar pendanaan yang kita lakukan.
- Rumusnya:

$$WACC = w_E * R_E + w_P * R_P + w_D * R_D$$

Struktur Modal Tertimbang (Capital Structure Weight)

- Notasi:

ü E = Nilai pasar dari Equity

ü P = Nilai pasar dari saham preference

ü D = Nilai pasar dari Debt (hutang)

ü V = Nilai pasar dari perusahaan; V = E + P + D

- Weights
  - w_E = E/V = percent financed with equity
  - w_P = P/V = percent financed with preference stock
  - w_D = D/V = percent financed with debt
- $w_E + w_P + w_D = 1$

Example – WACC dan Weights

Cost of debt = 5.7 %, Cost of equity = 14.0 %

Cost of preference shares = 9.0 %

Source of Capital	M.Value	Weight
• Long term debt	$40 m	40%
• Pref. shares	$10 m	10%
• Equity	$ 50 m	50%
• Total	$100 m	100 %

WACC = (E/V)*R_E + (P/V)*R_P + (D/V)*R_D

= (0.5)*0.14 + (0.1)*0.09 + (0.4)*0.057

= 0.1018

WACC = 10.18% (Unadjusted)

WACC – Penyesuaian (Adjusted)

- Perusahaan mendapat potongan biaya pajak karena adanya beban bunga dari hutang yang dilakukan untuk pendanaan.
- Jika Tc adalah pajak yang dikenakan kepada perusahaan, maka after tax cost of debt adalah Rd x (1 - Tc). Maka nilai WACC setelah disesuaikan dengan pajak adalah:
- WACC = $w_E * R_E + w_P * R_{PS} + w_D * R_D * (1 - T_C)$ or
- WACC = $(E/V) * R_E + (P/V) * R_{PS} + (D/V) * R_D * (1 - T_C)$
- Berdasarkan contoh sebelumnya: jika tax rate is 30%, then

  WACC = (0.5)*0.14 + (0.1)*0.09 + (0.4)*0.057(0.7)

  = 0.0950 or 9.5%.

Contoh Soal (Extended)

Equity	Debt
50 juta saham	$1 billion hutang yang belum diselesaikan (Face value)
Harga: $80/ lembar saham	Quota saat ini = 110%
Beta = 1.15	Coupon rate 9%, semiannual coupons
Market risk premium = 9%	Jangka waktu 15 tahun
Risk free (Rf) = 5%	Tax rate = 40%

Step 1: Calculate cost of equity and cost of debt
Step 2: Calculate the market value of each source of
financing and the weights
Step 3: Calculate the WACC adjusting for tax.

- Berapakah nilai cost of equity?
  - $\beta_E = 1.5$, $R_f = 5\%$, $R_M - R_f = 9\%$, $R_E = ?$
  - $R_E = 5\% + 1.15(9\%) = 15.35\%$
- Berapakah nilai cost of debt?
  - t = 15y x 2=30; Price = $1100; C = $90/2 = 45; F = $1000; by trial & error semi yield = 3.9268
  - $R_D = 3.927\% \times 2 = 7.854\%$
- Berapakah after-tax cost of debt?
  - $R_D(1-T_C) = 7.854(1-0.4) = 4.712\%$

- Berapakah nilai struktur modal tertimbang ?
  - E = 50 juta x $80 = $4 miliar
  - D = $1 b x 110% = $1.1 miliar……Or

    $1 b/1000 = 1 juta obligasi

    1 m bonds x $1100 = $1.1 miliar
  - V = 4 + 1.1 = 5.1 miliar
  - w_E = E/V = 4 / 5.1 = 0.7843
  - w_D = D/V = 1.1 / 5.1 = 0.2157
- Beraoakah WACC?
  - WACC = $w_E * R_E + w_D * R_D * (1 - T_C)$
  - WACC = 0.7843(15.35%) + 0.2157(4.712%) = 13.06%

Table: Cost of Equity and Debt

I. The Cost of Equity, R_E

A. Dividend growth model approach (from Chapter 8):

$$R_E = D_1/P_0 + g$$

where D_1 is the expected dividend in one period, g is the dividend growth rate, and P_0 is the current stock price.

B. SML approach (from Chapter 13):

$$R_E = R_f + \beta_E \times (R_M - R_f)$$

where R_f is the risk-free rate, R_M is the expected return on the overall market, and β_E is the systematic risk of the equity.

II. The Cost of Debt, R_D

A. For a firm with publicly held debt, the cost of debt can be measured as the yield to maturity on the outstanding debt. The coupon rate is irrelevant. Yield to maturity is covered in Chapter 7.

B. If the firm has no publicly traded debt, then the cost of debt can be measured as the yield to maturity on similarly rated bonds (bond ratings are discussed in Chapter 7).

Table WACC

III. The Weighted Average Cost of Capital, WACC

A. The firm's WACC is the overall required return on the firm as a whole. It is the appropriate discount rate to use for cash flows similar in risk to those of the overall firm.

B. The WACC is calculated as:

$$WACC = (E/V) \times R_E + (D/V) \times R_D \times (1 - T_C)$$

where T_C is the corporate tax rate, E is the *market* value of the firm's equity, D is the *market* value of the firm's debt, and $V = E + D$. Note that E/V is the percentage of the firm's financing (in market value terms) that is equity, and D/V is the percentage that is debt.

Menggunakan WACC Untuk Proyek (Example)

Project	Req. Ret.		IRR		WACC
A	20%	reject	17%	accept	15%
B	15%	accept	18%	accept	15%
C	10%	accept	12%	reject	15%

- Asumsi: nilai WACC = 15%
- Jika kita menggunakan nilai WACC untuk seluruh proyek (investasi) untuk semua resiko
  - Accept A and B, reject C
- Jika keuntungan yang ditetapkan berdasarkan resiko spesifik yang digunakan:
  - Accept B and C, reject A

Biaya Flotasi (Flotation Cost)

- Pengembalian keuntungan tergantung kepada resiko, bukan dari pertumbuhan dana investasi.
- Bagaimanapun, biaya untuk mengeluarkan saham baru tidak dapat diabaikan.
- Pendekatan dasar:
  - Hitung berat tertimbang dari biaya flotasi
  - Gunakan target beban karena perusahaan akan mengeluarkan saham untuk hutang jangka panjang:

    $$f_A = (E/V)*f_E + (D/V)* f_D$$

  - Dimana f_A adalah beban dari rata-rata nilai flotasi, f_E adalah porsi flotasi biaya dari equity, dan f_D adalah porsi hutang.
  - True cost of project = Cost/(1-f_A).

Contoh:

- Perusahaan memiliki struktur target pendanaan sebuah proyek yaitu; equity 80% dan hutang 20%. Biaya beban untuk equity adalah 20%, dan biaya terhadap hutang adalah 6%. Jika perusahaan memerlukan $65 juta untuk menyediakan fasilitas terbaru, berapakah biaya sesungguhnya setelah menghitung biaya flotasi?

$f_A = (E/V) \times f_E + (D/V) \times f_D$

$= 0.8*0.2 + 0.2*0.06$ $f_A = 0.172$ or 17.2%

- Jika biaya flotasi 17.2%, maka yang dibutuhkan untuk meningkatkan biaya $65 juta adalah:
- $\$65/(1 - f_A) = 65/0.828 = \$78.50$ juta.
- Perusahaan perlu meningkatkan $78.5 juta ke dalam pencatatan untuk biaya flotasi dan mencatat pengeluaran $65 juta untuk investasi.
- Jika 78.5/65 = 1.2077, maka dapat diperkirakan bahwa setiapa dolar yang digunakan dalam investasi ini, perusahaan harus meningkatkannya menjadi $1.2077 untuk membiayai proyek tersebut.

END OF CHAPTER

Chapter Eighteen

Dividend Policy: Does It Matter?

18

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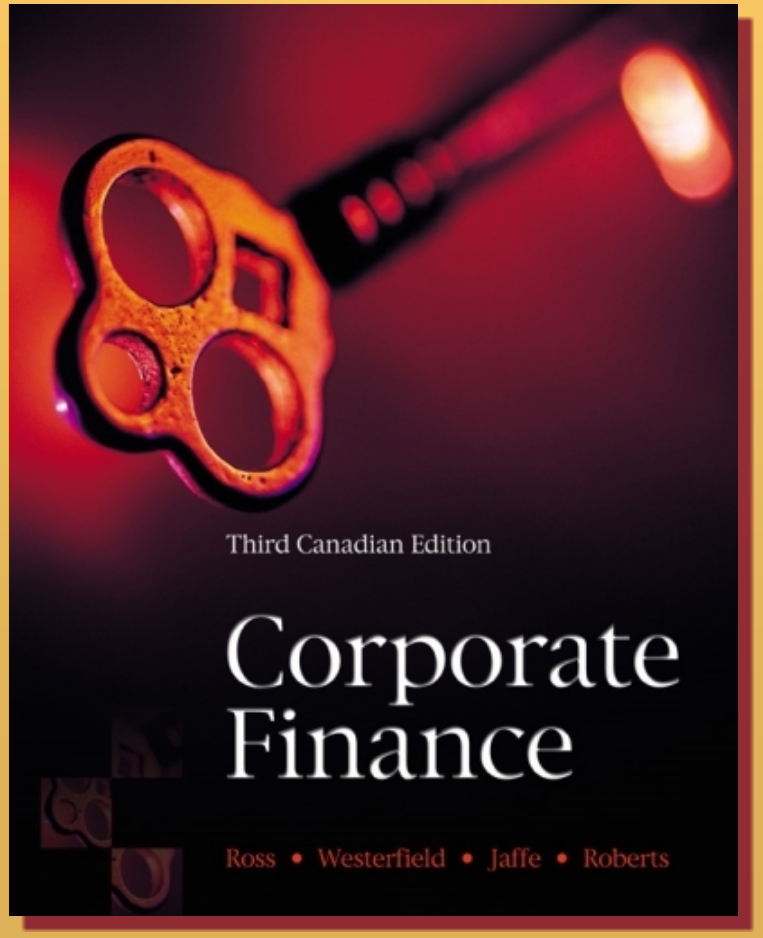


Chapter Outline

18.1 Different Types of Dividends

- Many companies pay a **regular cash dividend**.
  - Public companies often pay quarterly.
  - Sometimes firms will throw in an extra cash dividend.
  - The extreme case would be a liquidating dividend.
- Often companies will declare **stock dividends.**
  - No cash leaves the firm.
  - The firm increases the number of shares outstanding.
- Some companies declare a **dividend in kind**.
  - Wrigley's Gum sends around a box of chewing gum.

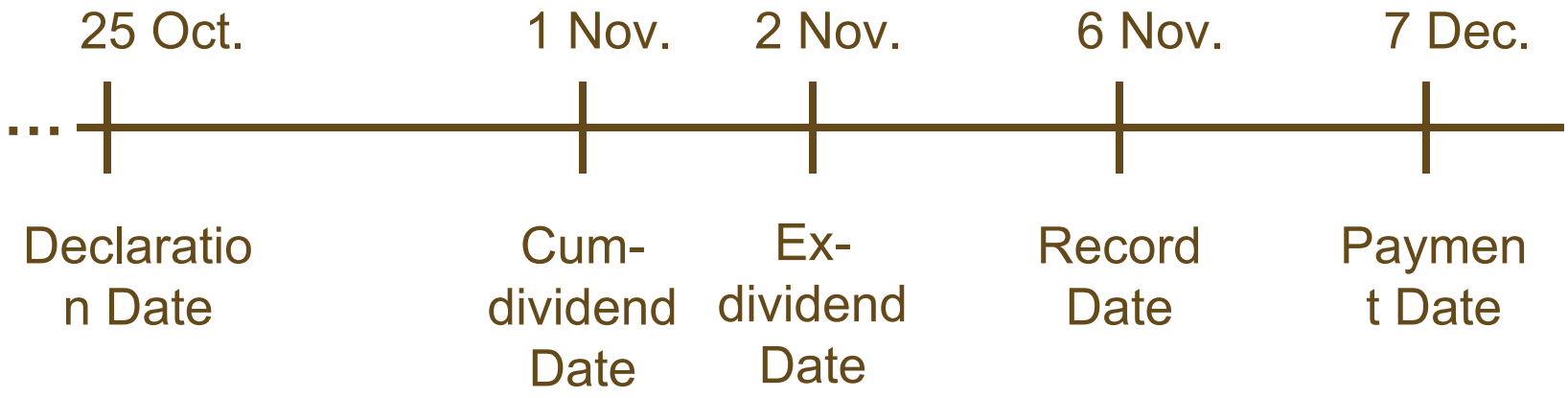
18.2 Standard Method of Cash Dividend Payment

Cash Dividend - Payment of cash by the firm to its shareholders.

Ex-Dividend Date - Date that determines whether a stockholder is entitled to a dividend payment; anyone holding stock before this date is entitled to a dividend.

Record Date - Person who owns stock on this date received the dividend.

Procedure for Cash Dividend Payment



Declaration Date: The board of directors declares a payment of dividends.

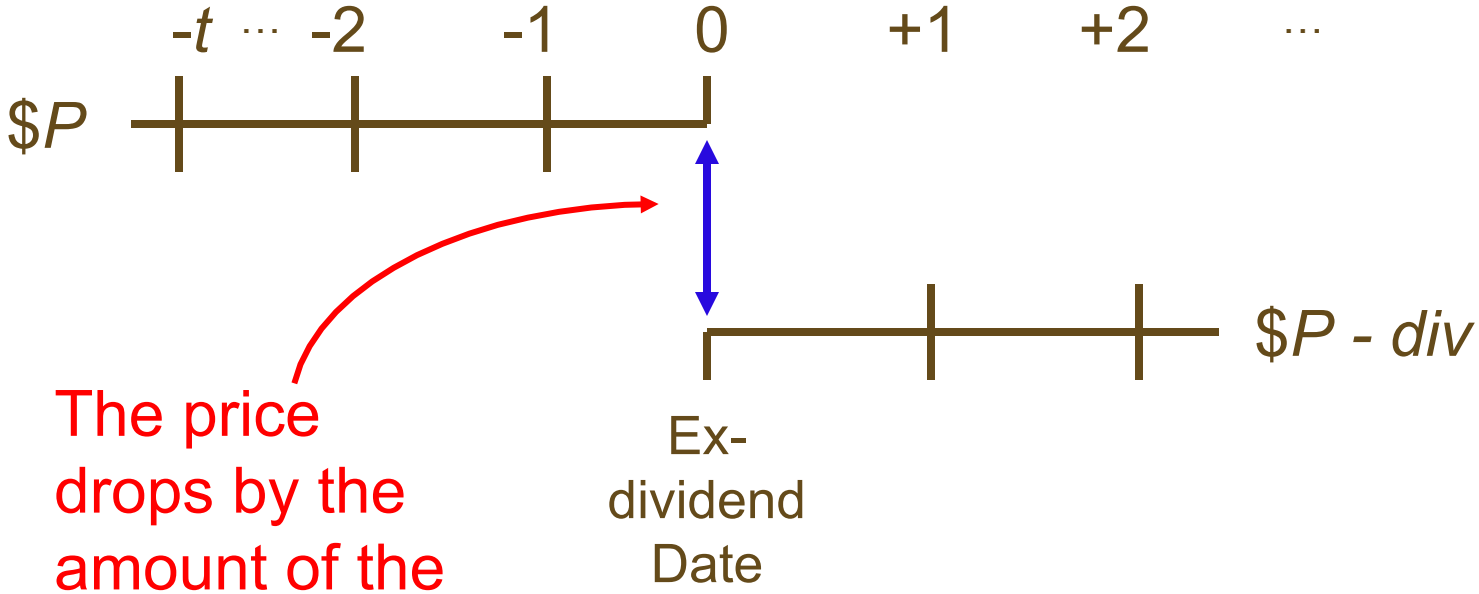
Cum-Dividend Date: The last day that the buyer of a stock is entitled to the dividend.

Ex-Dividend Date: The first day that the seller of a stock is entitled to the dividend.

Record Date: The corporation prepares a list of all individuals believed to be stockholders as of 6 November.

Price Behaviour around the Ex-Dividend Date

- In a perfect world, the stock price will fall by the amount of the dividend on the ex-dividend date.



Taxes complicate things a bit. Empirically, the price drop is less than the dividend and occurs within the first few minutes of the ex-date.

18.3 The Benchmark Case: An Illustration of the Irrelevance of Dividend Policy

- A compelling case can be made that dividend *policy* is irrelevant.
- Since investors do not need dividends to convert shares to cash they will not pay higher prices for firms with higher dividend payouts.
- In other words, dividend policy will have no impact on the value of the firm because investors can create whatever income stream they prefer by using homemade dividends.

The Benchmark Case: An Illustration of the Irrelevance of Dividend Policy

Example: York Corporation , an all-equity firm

- At date 0, the managers are able to forecast cash flows perfectly.
- The firm will receive a cashflow of $10,000 at date 0 and $10,000 at date 1
- The firm will dissolve at date 1.
- The firm has no additional +ve NPV projects

An Illustration of the Irrelevance of Dividend Policy (cont.)

I) Current Policy:Dividends set equal to cashflow

- Dividends (Div.) at each date = $10000
- The firm value will be :

$$V_0 = DIV_0 + \frac{DIV_1}{1 + r_s}$$

$$V_0 = \$10000 + \frac{\$10000}{1.1} = \$19090.91$$

An Illustration of the Irrelevance of Dividend Policy (cont.)

- Assume 1,000 shares are outstanding, then:

$$P_0 = \$10 + \frac{\$10}{1.1} = \$19.09$$

- After the imminent dividend is paid, the stock price will fall to $9.09 (19.09-10)

An Illustration of the Irrelevance of Dividend Policy (cont.)

I I) Alternative Policy: Initial dividend > cash flow

- Pay $11 per share immediately i.e., $11 X 1000 shares = $11,000 as total dividend.
- The extra $1,000 must be raised by issuing new stock.

	Date 0	Date1
Total dividends to old shareholders	$11,000	$8,900
Dividends per share	$11	$8.9

Note: at date1, the new shareholders will get $1,100 of the total cashflow

leaving only $8,900 to old shareholders.

An Illustration of the Irrelevance of Dividend Policy (cont.)

- The PV of dividends per share with the alternative policy:

$$P_0 = \$11 + \frac{\$8.9}{1.1} = \$19.09$$

- The indifference proposition:

  -The PV of the stock in both scenarios is the same.

  -The change in dividend policy did not affect the value of a share.

Modigliani and Miller (MM) proposition

MM proposition: Investors are indifferent to dividend policy

Assumptions:

1) No taxes, brokerage fees, etc.
2) Homogeneous expectations
3) The investment policy of the firm is set ahead of time

Homemade Dividends

- ABC Inc. is a $42 stock about to pay a $2 cash dividend.
- Bob Investor owns 80 shares and prefers $3 cash dividend.
- Bob's homemade dividend strategy:
  - Sell two shares ex-dividend

	homemade dividends	$3 Dividend
Cash from dividend	$160	$240
Cash from selling stock	$80	$0
Total Cash	$240	$240
Value of Stock Holdings	$40 × 78 = $3,120	$39 × 80 = $3,120

Dividend Policy is Irrelevant

- Since investors do not need dividends to convert shares to cash, dividend policy will have no impact on the value of the firm.
- In the above example, Bob Investor began with total wealth of $3,360:

$$\$3{,}360 = 80\ \text{shares} \times \frac{\$42}{\text{share}}$$

- After a $3 dividend, his total wealth is still $3,360:

$$\$3{,}360 = 80\ \text{shares} \times \frac{\$39}{\text{share}} + \$240$$

- After a $2 dividend, and sale of two ex-dividend shares,his total wealth is still $3,360:

$$\$3{,}360 = 78\ \text{shares} \times \frac{\$40}{\text{share}} + \$160 + \$80$$

Irrelevance of Stock Dividends: Example

XYZ Inc. has two million shares currently outstanding at $15 per share. The company declares a 50% stock dividend. How many shares will be outstanding after the dividend is paid?

A 50% stock dividend will increase the number of shares by 50%:

$$2 \text{ million} \times 1.5 = 3 \text{ million shares}$$

After the stock dividend what is the new price per share and what is the new value of the firm?

The value of the firm was $2m × $15 per share = $30 m. After the dividend, the value will remain the same.

Price per share = $30m/ 3m shares = $10 per share

Dividends and Investment Policy

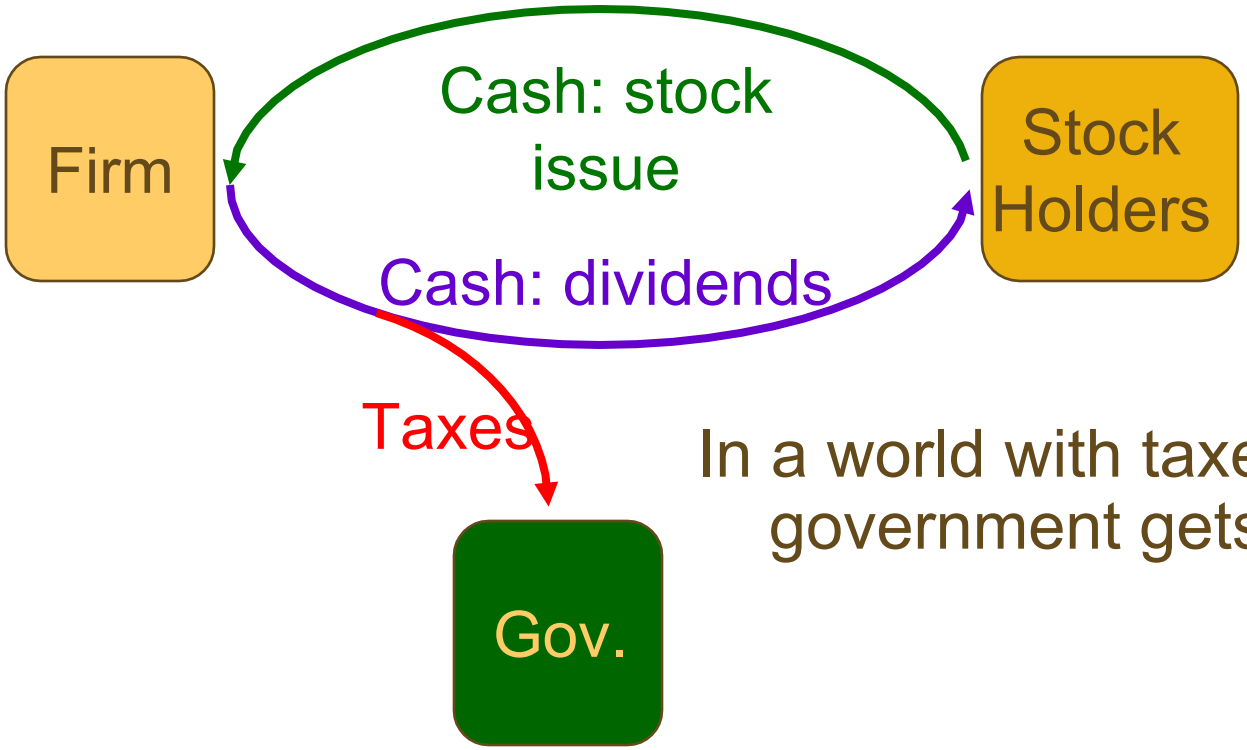
- Firms should never forgo positive NPV projects to increase a dividend (or to pay a dividend for the first time).
- Recall that one of the assumptions underlying the dividend-irrelevance arguments was “The investment policy of the firm is set ahead of time and is not altered by changes in dividend policy.”
- A final note:

  -Dividends are *relevant*

  -Dividend *policy* is irrelevant

18.4 Taxes, Issuance Costs, and Dividends

In a tax-free world, cash dividends are a wash between the firm and its shareholders.



In a world with taxes, the government gets a cut.

18.4 Taxes, Issuance Costs, and Dividends

In Canada,

- Individual investors face a lower dividend tax rate due to the dividend tax credit.
- Capital gains for individuals are taxed at 50% of the marginal tax rate.
- The *effective* tax rate on dividend income is higher than the tax rate on capital gains.

In general, in the presence of personal taxes:

- A firm should not issue stock to pay a dividend.
- Managers have an incentive to seek alternative uses for funds to reduce dividends.
- Though personal taxes mitigate against the payment of dividends, these taxes are not sufficient to lead firms to eliminate all dividends.

18.5 Repurchase of Stock

- Instead of declaring cash dividends, firms can rid itself of excess cash through buying shares of their own stock.
- Recently share repurchase has become an important way of distributing earnings to shareholders.
- When tax avoidance is important, share repurchase is a potentially useful adjunct to dividend policy.

Stock Repurchase versus Dividend

Consider a firm that wishes to distribute $100,000 to its shareholders.

A. Original balance sheet

Assets		*Liabilities & Equity*	
Cash	$150,000	Debt	0
Other assets	850,000	Equity	1,000,000
Value of Firm	1,000,000	Value of Firm	1,000,000

Shares outstanding = 100,000

Price per share = $1,000,000 / 100,000 = $10

Stock Repurchase versus Dividend

If they distribute the $100,000 as cash dividend, the balance sheet will look like this:

Assets		***Liabilities & Equity***	
B. After $1 per share cash dividend			
Cash	$50,000	Debt	0
Other assets	850,000	Equity	900,000
Value of Firm	900,000	Value of Firm	900,000

Shares outstanding = 100,000

Price per share = $900,000/100,000 = $9

Stock Repurchase versus Dividend

If they distribute the $100,000 through a stock repurchase, the balance sheet will look like this:

Assets ***Liabilities & Equity***

C. After stock repurchase

Cash	$50,000	Debt	0
Other assets	850,000	Equity	900,000
Value of Firm	900,000	Value of Firm	900,000

Shares outstanding = 90,000

Price per share = $900,000 / 90,000 = $10

Share Repurchase (Real-World Considerations)

- Lower tax
- Tender offers
  - If offer price is set wrong, some stockholders lose.
- Open-market repurchase
- Targeted repurchase
  - Greenmail
  - Gadflies
- Repurchase as investment
  - Recent studies have shown that the long-term stock price performance of securities after a buyback is significantly better than the stock price performance of comparable companies that do not repurchase.

18.6 Expected Return, Dividends, and Personal Taxes

- What is the relationship between the expected return on the stock and its dividend yield?
- The expected *pretax* return on a security with a high dividend yield is greater than the expected *pretax* return on an otherwise-identical security with a low dividend yield.
- After tax is a different story; otherwise-identical securities should have the same return.

Evidence on Dividends and Taxes in Canada

- Prior to 1972, capital gains were untaxed in Canada
- In 1985, a life-time exemption on capital gains was introduced.
- Anticipation of the tax break on capital gains caused investors to bid up prices of low-dividend yield stocks.
- Firms responded by lowering their dividend payouts.
- The dividend tax credit works to reduce taxes on dividends received from Canadian firms.

18.7 Real World Factors Favouring a High Dividend Policy

- Desire for Current Income
- Resolution of Uncertainty
- Tax Arbitrage
- Agency Costs

Desire for Current Income

- The homemade dividend argument relies on no transactions costs.
- To put this in perspective, mutual funds can repackage securities for individuals at very low cost: they could buy low-dividend stocks and with a controlled policy of realizing gains, pay their investors at a specified rate.

Resolution of Uncertainty

- It would be erroneous to conclude that increased dividends can make the firm less risky.
- A firm's overall cash flows are not necessarily affected by dividend policy—as long as capital spending and borrowing are not changed.
- Thus, it is hard to see how the risks of the overall cash flows can be changed with a change in dividend policy.

Tax Arbitrage

- Investors can create positions in high dividend-yield securities that avoid tax liabilities.
- Thus, corporate managers need not view dividends as tax-disadvantaged.
- There is some evidence that tax arbitrage does occur in Canada but not to the extent necessary to eliminate taxes on dividends completely.

Agency Costs

- Agency Cost of Debt
  - Firms in financial distress are reluctant to cut dividends. To protect themselves, bondholders frequently create loan agreements stating dividends can only be paid if the firm has earnings, cash flow, and working capital above pre-specified levels.
- Agency Costs of Equity
  - Managers will find it easier to squander funds if they have a low dividend payout.

18.8 A Resolution of Real-World Factors?

- Reasons for Low Dividend
  - Personal Taxes
  - High Issuing Costs
- Reasons for High Dividend
  - Information Asymmetry
    - Dividends as a signal about firm's future performance
  - Lower Agency Costs
    - capital market as a monitoring device
    - reduce free cash flow, and hence wasteful spending
  - Bird-in-the-hand: Theory or Fallacy?
    - Uncertainty resolution
  - Desire for Current Income
- Clientele Effect

18.9 What We Know and Do Not Know About Dividend Policy

- Corporations “Smooth” Dividends.
- Dividends Provide Information to the Market.
- Firms should follow a sensible dividend policy:
  - Don’t forgo positive NPV projects just to pay a dividend.
  - Avoid issuing stock to pay dividends.
  - Consider share repurchase when there are few better uses for the cash.

18.10 Summary and Conclusions

- The optimal payout ratio cannot be determined quantitatively.
- In a perfect capital market, dividend policy is irrelevant due to the homemade dividend concept.
- A firm should not reject positive NPV projects to pay a dividend.
- Personal taxes and issue costs are real-world considerations that favour low dividend payouts.
- Many firms appear to have a long-run target dividend-payout policy. There appears to be some value to dividend stability and smoothing.
- There appears to be some information content

FINANCIAL LEVERAGE AND CAPITAL STRUCTURE POLICY

Capital Restructuring

- Perubahan capital structure mempengaruhi value sebuah perusahaan.
- Capital restructuring: perubahan jumlah leverage perusahaan, tapi tidak merubah nilai aset perusahaan.
- Perusahaan: meningkatkan leverage: issue debt dan repurchasing shares.
- Perusahaan: mengurangi leverage: issue new shares dan mengurangi jumlah hutang

Choosing a Capital Structure

- Apakah tujuan utama dari manajer keuangan?
- Memilih struktur modal yang akan meningkatkan kekayaan shareholders.
- Perusahaan dapat memaksimalkan value perusahaan atau meminimalisasikan WACC

Dampak Leverage

- Bagaimana leverage mempengaruhi nilai EPS dan ROE perusahaan?
- Ketika perusahaan meningkatkan jumlah pembiayaan hutang, maka perusahaan juga menambahkan jumlah pengeluaran bunga tetap
- Jika perusahaan dalam keadaan yang baik, memiliki return earnings yang tinggi, maka mereka membayar fixed cost dan memiliki dana berlebih untuk shareholders
- Jika perusahaan dalam keadaan buruk, memiliki sedikit keuntungan, mereka tetap membayar fixed cost dan memiliki kekurangan dana untuk dibayarkan kepada shareholders
- Leverage dapat memperngaruhi variasi EPS dan ROE dari 2 kondisi tersebut.

Break-Even EBIT

- Menentukan nilai EBIT ketika EPS dalam jumlah yang sama antara struktur modal yang sebenarnya dan yang di proyeksikan
- Jika EBIT yang diperkirakan lebih besar dari BEP, maka leverage memberikan manfaat bagi shareholders perusahaan
- Namun, jika EBIT memiliki nilai kurang dari BEP, maka leverage tidak bermanfaat bagi shareholders

Example: Break- Even EBIT

- EBIT/ 500,000 = (EBIT – 250,000)/ 250,000
- EBIT = [500,000/ 250,000](EBIT – 250,000)
- EBIT = 2EBIT – 500,000
- EBIT = $500,000
- EPS = 500,000/ 500,000 = $1.00

Teori Struktur Modal

- Modigliani dan Miller (M&M) struktur modal

1. Proposition I: Value perusahaan
2. Proposition II: WACC dan return on equity

- Value perusahaan berasal dari cash flow yang masuk ke perusahaan dan resiko dari aset
- Perubahan value perusahaan:

1. Perubahan resiko terhadap cash flows
2. Perubahan cash flows

Teori Struktur Modal dengan 3 Kasus yang Berbeda

- Kasus 1, asumsi:

1. Tidak ada pajak perorangan dan perusahaan
2. Tidak ada bankruptcy costs

- Kasus 2, asumsi:

1. Pajak perusahaan, tidak ada pajak perorangan
2. Tidak ada bankruptcy cost

- Kasus 3, asumsi:

1. Pajak perusahaan, pajak perorangan
2. Bankruptcy cost

Kasus 1, proposition 1 dan 2

- Proposition 1

ØValue perusahaan tidak dipengaruhi oleh perubahan struktur modal

ØCash flow perusahaan tidak berubah, maka value perusahaan juga tidak berubah

- Proposition 2

ØWACC perusahaan tidak dipengaruhi oleh struktur modal

Kasus 1, Proposition 2

- WACC = Ra = (E/V)Re + (D/V)Rd
- Re = Ra + (Ra – Rd)(D/E)

Notes:

1. Ra = cost dari resiko bisnis perusahaan, contoh: resiko aset perusahaan.
2. (Ra – Rd)(D/E) = “cost” resiko keuangan perusahaan, misal: keuntungan tambahan yang diminta oleh shareholders sebagai kompensasi terhadap resiko leverage.

Example: case I

- Data: Required return on assets= 16%; cost of debt = 10%; percent of debt = 45%
- Berapakah cost of equity?

  Re = 16 + (16 – 10)(0.45/ 0.55) = 20.91%
- Jika cost of equity adalah 25%, berapakah debt- to- equity ratio?

  25 = 16 + (16 – 10)(D/E)

  (D/E) = (25 – 16)/ (16 – 10) = 1.5
- Berdasarkan informasi diatas, berapakah nilai persentase equity di perusahaan?

  E/V = 1/ 2.5 = 40%

Case II – Cash Flow

Asumsi:

- Interest + tax deductible
- Perusahaan menambah hutang, ,mengurangi pajak, dan sebaliknya
- Berkurangnya nilai pajak akan menambah cash flow perusahaan
- Bagaimana bertambahnya nilai cash flow akan mempengaruhi value perusahaan?

	Unlevered Firm	Levered Firm
EBIT	5,000	5,000
Interest	0	500
Taxable Income	5,000	4,500
Taxes (34%)	1,700	1,530
Net Income	3,300	2,970
CFFA	3,300	3,470

Interest Tax Shield

- Annual interest tax shield

  Tax rate x interest payment

  6,250 dengan 8% debt = 500 interest expense

  annual tax shield = 0.34(500) = 170
- Present value of annual interest tax shield

  Asumsi perpetual debt

  PV = 170/0.08 = 2,125

  PV = D(Rd)(Tc)/ Rd = DTc = 6,250(o.34) = 2,125

Case II – Proposition I

- Value perusahaan akan bertambah dengan PV dari annual interest tax shield

o Value levered firm = value an unlevered firm + PV of interest tax shield

o Value dari equity = value perusahaan – value dari hutang

- Asumsi: perpetual cash flows

  $Vu = EBIT(1-T)/Ru$

  $VL = Vu + DTc$

Example

- Data:

a. EBIT = 25,000,000; tax rate = 35%; Debt = $75,000,000; cost of debt = 9%; Unlevered cost of capital = 12%
b. Vu = 25 juta (1-0.35)/0.12 = $135.42 juta
c. VL = 135.42 + 75 (0.35) = $161.67 juta
d. E = 161.67 juta – 75 juta = $86.67 juta

Case II – Proposition II

- WACC berkurang jika D/E bertambah, ini karena subsidi dari pemerintah terhadap pembayaran bunga

  $Ra = (E/V)Re + (D/V)(Rd)(1-Tc)$

  $Re = Ru + (Ru – Rd)(D/E)(1 – Tc)$
- Contoh

  $Re = 12 + (12-9)(75/86.67)(1-0.35) = 13.69\%$

  $Ra = (86.67/161.67)(13.69) + (75/161.67)(9)(1-0.35)$

  $Ra = 10.05\%$

Example: Case II – Proposition II

- Jika perusahaan berinisiatif merbah struktur modalnya, maka debt-to-equity ratio menjadi 1.
- Apa yang akan terjadi terhadap cost of equity setelah adanya struktur modal baru?

  Re = 12 + (12-9)(1)(1-0.35) = 13.95%
- Apa yang akan terjadi dengan WACC?

  Ra = 0.5(13.95) + 0.5(9)(1-0.35) = 9.9%

Case III

- Ditambah dengan bankruptcy cost
- Jika D/E bertambah, maka probability terhadap bankruptcy juga bertambah
- Probability ini akan menambah ekspektasi terhadap bankruptcy cost
- Pada titik yang sama, penambahan value terhadap interest tax shield akan diimbangi oleh ekspektasi bankruptcy cost
- Dan pada posisi ini, value perusahaan akan berkurang, dan WACC akan mulai bertambah sebesar dari jumlah hutang yang semakin besar.

Conclusions

- Case I: no taxes atau bankruptcy cost: struktur modal tidak optimal
- Case II: ada pajak perusahaan, tapi tidak ada bankruptcy cost: struktur modal 100% berasal dari hutang; setiap penambahan nilai dolar akan menambah cash flow perusahaan
- Case III: pajak perusahaan dan bankruptcy cost: optimalisasi struktur modal merupakan bagian dari hutang dan equity; hal ini akan terjadi jika manfaat dari penambahan nilai hutang akan diimbangi dengan penambahan biaya bankruptcy yang diperkirakan.

The Value of The Firm

- Value perusahaan = marketed claims + nonmarketed claims

ü Marketed claims: claims dari shareholders dan bondholders

ü Nonmarketed claims: claims dari pemerintah dan potensial shareholders

- Value perusahaan secara keseluruhan tidak akan dipengaruhi oleh perubahan struktur modal
- Bagian dari value antara marketed claims dan nonmarketed claims akan dipengaruhi oleh keputusan struktur modal.

Quick Quiz

- Jelaskan efek dari leverage terhadap EPS dan ROE
- Apakah yang dimaksud dengan break-even EBIT, dan bagaimana menghitungnya?
- Bagaimana menentukan optimalisasi struktur modal?
- apakah perbedaan antara liquidasi dan reorganisasi?

Comprehensive Problem

- Asumsikan bahwa perpetual cash flow pada Case II- proposition I, EBIT = $50,000,000; tax rate = 40%; debt = $100 juta; cost of debt = 9%; dan unlevered cost of capital = 12%.

  berapakah nilai equity perusahaan tersebut?

BONDS AND STOCK VALUATION

Chapter 7 Outline

- Bonds and Bond Valuation
- More on Bond Features
- Bond Ratings
- Some Different Types of Bonds
- Bond Markets
- Inflation and Interest Rates

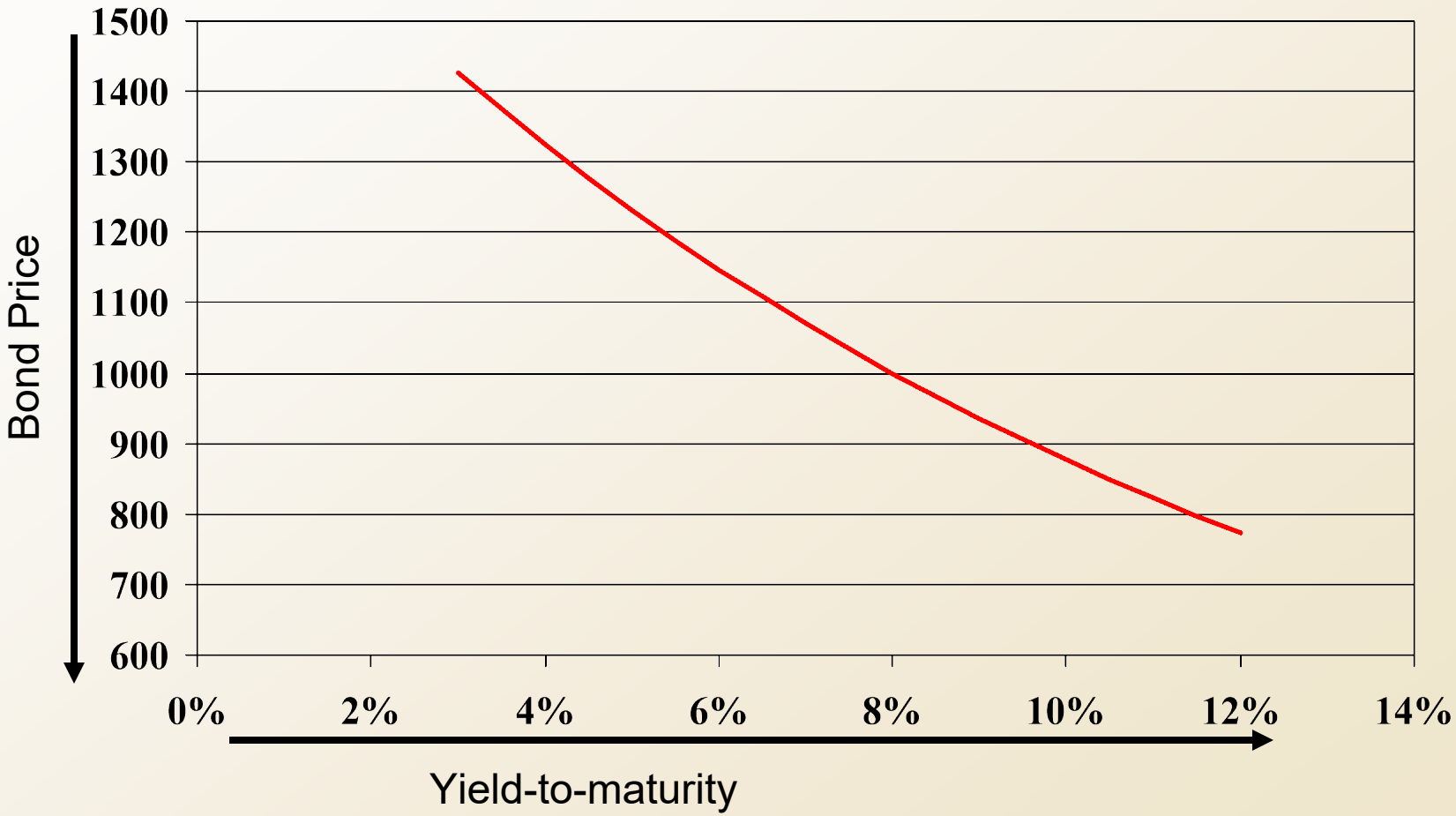
Bond Definitions

- What is a Bond?
  - Debt security
- Par value (face value) = $1000
  - The principal that needs to be repaid
- Coupon rate
  - Quoted rate as a percentage of face value
- Coupon payment
  - The interest payment on a bond based on coupon rate
- Maturity date
  - Date when principal is repaid.
- Yield or Yield to maturity (YTM)
  - Required market rate

Bond Valuation

- Bond Value = Present Value of Cash Flows
- Bond Value = PV of coupons + PV of par
- Bond Value = PV annuity + PV of lump sum
- Remember, as interest rates increase present values decrease
- So, as interest rates increase, bond prices decrease and vice versa

Graphical Relationship Between Price and Yield-to-maturity



The Bond-Pricing Equation

- Bond Value = PV annuity + PV single sum

$$\text{Bond Value} = C\left[\frac{1-\frac{1}{(1+r)^t}}{r}\right] + \frac{F}{(1+r)^t}$$

Valuing a Bond - Examples

- 1) Consider a bond with a coupon rate of 10%, par value is $1000 and 20 years to maturity. The yield to maturity is 11%. What is the value of the bond?
  - Using the formula:
    - B = PV of annuity + PV of lump sum
    - $B = 100[1 - 1/(1.11)^{20}] / .11 + 1000 / (1.11)^{20}$
    - B = 796.33 + 124.03 = 920.36
- 2) A bond has a 10% annual coupon and $1000 face value and 20 years to maturity. The yield to maturity is 8%. What is the price of this bond?
  - Using the formula:
    - B = PV of annuity + PV of lump sum
    - $B = 100[1 - 1/(1.08)^{20}] / .08 + 1000 / (1.08)^{20}$
    - B = 981.81 + 214.55 = 1196.36

Bond Prices: Relationship Between Coupon and Yield

- If : YTM > coupon rate then bond price < par value
  - Selling at a discount, called a discount bond
- If: YTM < coupon rate then bond price > par value
  - Selling at a premium, called a premium bond
- If: YTM = coupon rate then par value = bond price
  - Selling at par

Example 7.1 p196

- A $1000 bond has coupon rate of 14% with semiannual coupons, YTM is quoted as 16% and maturity 7 years. What is the price of the bond?
  - How many coupon payments are there?
  - What is the semiannual coupon payment?
  - What is the semiannual yield?
  - $B = 70[1 - 1/(1.08)^{14}] / .08 + 1000 / (1.08)^{14} = 917.56$

Interest Rate Risk

- Change in value due to changes in interest rates
- Long-term bonds have more price risk than short-term bonds
- Low coupon rate bonds have more price risk than high coupon rate bonds

Quiz

- Consider a bond with a 10% annual coupon rate, 15 years to maturity and a par value of $1000. The current price is $928.09.
  - Will the yield be more or less than 10%?
- Suppose a bond with a 10% coupon rate and semiannual coupons, has a face value of $1000, 20 years to maturity and is selling for $1197.93.
  - Is the YTM more or less than 10%?
  - What is the semiannual coupon payment?
  - How many periods are there?

Table 7.1

I. Finding the Value of a Bond

Bond value = $C \times [1 - 1/(1 + r)^t]/r + F/(1 + r)^t$

where

C = Coupon paid each period

r = Rate per period

t = Number of periods

F = Bond's face value

II. Finding the Yield on a Bond

Given a bond value, coupon, time to maturity, and face value, it is possible to find the implicit discount rate, or yield to maturity, by trial and error only. To do this, try different discount rates until the calculated bond value equals the given value (or let a financial calculator do it for you). Remember that increasing the rate *decreases* the bond value.

Differences Between Debt and Equity

- Debt
  - Not an ownership interest
  - Creditors do not have voting rights
  - Interest is considered a cost of doing business and is tax deductible
  - Creditors have legal recourse if interest or principal payments are missed
  - Excess debt can lead to financial distress and bankruptcy
- Equity
  - Ownership interest
  - Common stockholders vote for the board of directors and other issues
  - Dividends are not considered a cost of doing business and are not tax deductible
  - Dividends are not a liability of the firm and stockholders have no legal recourse if dividends are not paid
  - An all equity firm can not go bankrupt

The Bond Indenture

- Contract between the company and the bondholders and includes
  - The basic terms of the bonds
  - The total amount of bonds issued
  - A description of property used as security, if applicable
  - Sinking fund provisions
  - Call provisions
  - Details of protective covenants

Bond Classifications

- Security
  - Collateral – secured by financial securities
  - Mortgage – secured by real property, normally land or buildings
  - Debentures – unsecured
  - Notes – unsecured debt with original maturity less than 10 years
- Seniority
- Registered vs. Bearer Forms

Bond Ratings

	Investment Quality		Speculative	
	High Grade	Medium Grade	Low Grade	Very Low Grade
S & P	AAA AA	A BBB	BB B	CCC, CC C, D
Moody's	Aaa Aa	A Baa	Ba B	Caa, Ca C, D

Types of Bonds

- Treasury Securities
  - Federal government debt: T-bills, T-notes, T-bonds
- Municipal Securities
  - Debt of state and local governments
  - Interest received is tax-exempt at the federal level
- Zero coupon bonds or Deep Discount bonds
  - Make no periodic interest payments (T-bills)
- Floating rate bonds
  - Coupon rate floats depending on some index value
- Disaster bonds
- Income bonds
- Convertible bonds
- Put bonds

Bond Markets

- Primarily over-the-counter transactions with dealers connected electronically
- Extremely large number of bond issues, but generally low daily volume in single issues
- Makes getting up-to-date prices difficult, particularly on small company or municipal issues
- Treasury securities are an exception

Treasury Quotations

- Highlighted quote in Figure 7.4

8 Nov 21	132:23	132:24	-12	5.14

  - What is the coupon rate on the bond?
  - When does the bond mature?
  - What is the bid price? What does this mean?
  - What is the ask price? What does this mean?
  - How much did the price change from the previous day?
  - What is the yield ?

Inflation and Interest Rates

- Real rate of interest – adjusted for inflation
- Nominal rate of interest – quoted rate that has not been adjusted for inflation
- Fisher Effect – relationship between real, nominal and inflation rate.
- $(1 + R) = (1 + r)(1 + h)$, where
  - R = nominal rate
  - r = real rate
  - h = expected inflation rate
- Approximation
  - $R = r + h$

Example 7.6 p221

- If we require a 10% real return and we expect inflation to be 8%, what is the nominal rate?
- R = (1.1)(1.08) – 1 = .188 = 18.8%
- Approximation: R = 10% + 8% = 18%
- Because the real return and expected inflation are relatively high, there is significant difference between the actual Fisher Effect and the approximation.
- If real rates are required – deflate the nominal rate by the inflation rate:

$$r = \left[\frac{(1+R)}{(1+h)}\right] - 1$$

End Chapter 7

Chapter 8 Outline

- Common Stock Valuation
  - Cash Flows Dependent
  - Dividend Growth Model
- Stock price quotes

Issues in Share Valuation

- If you buy a share of stock, you can receive cash in two ways
  - The company pays dividends
  - You sell your shares, either to another investor in the market or back to the company
- As with bonds, the price of the stock is the present value of these expected cash flows
- Uncertainty of cash flows
- Indefinite life

Developing The Model

- The price of the stock is really just the ***present value of <u>all</u> expected future dividends + present value of selling price***

$P_0 = D_1/(1+R) + P_1/(1+R)$ (if sell at end period 1)

$P_0 = D_1/(1+R) + D_2/(1+R)^2 + P_2/(1+R)^2$ (if sell at end period 2)

$P_0 = D_1/(1+R) + D_2/(1+R)^2 + D_3/(1+R)^3 + P_3/(1+R)^3$ (sell per. 3)

- Or.. Just ***the present value of future dividends***

$P_0 = D_1/(1+R) + D_2/(1+R)^2 + D_3/(1+R)^3 + \ldots..$ (indefinite life)

- So, how can we estimate all future dividend payments?

Three Special Cases

- Constant dividend
  - The firm will pay a constant dividend forever
- Constant dividend growth
  - The firm will increase the dividend by a constant *percent* every period
- Supernormal growth
  - Dividend growth is not consistent initially, but settles down to constant growth eventually

Zero Growth

- $D_1 = D_2 = D_3 \ldots = D_t$ constant dividend or zero growth
- $P_0 = D_1 / R$
- Suppose a stock is expected to pay the same $0.50 dividend every quarter indefinitely and the required return is 10% with quarterly compounding. What is the price?
  - $P_0 = 0.50 / (0.025) = \$20$ (yearly figures:$2/0.10)

Dividend Growth Model – constant g

- Dividends are expected to grow at a constant percent per period (g%)
- $D_0 < D_1 < D_2 \ldots D_{t-1} < D_t$ $\quad D_t = D_{t-1}(1+g)$ or $D_t = D_0(1+g)^t$

$$P_0 = \overbrace{\frac{D_0(1+g)}{(1+R)}}^{D1} + \overbrace{\frac{D_1(1+g)}{(1+R)^2}}^{D2} + \overbrace{\frac{D_2(1+g)}{(1+R)^3}}^{D3} + \ldots$$

$$P_0 = \frac{D_0(1+g)}{(1+R)} + \frac{D_0(1+g)^2}{(1+R)^2} + \frac{D_0(1+g)^3}{(1+R)^3} + \ldots$$

- With a little algebra, this reduces to:

$$P_0 = \frac{D_0(1+g)}{R-g} = \frac{D_1}{R-g}$$

$$P_t = \frac{D_t(1+g)}{R-g} = \frac{D_{t+1}}{R-g}$$

DGM – Example 1

- Suppose Big D, Inc. just paid a dividend of $.50. It is expected to increase its dividend by 2% per year. If the market requires a return of 15% on assets of this risk, how much should the stock be selling for?
  - $D_0 = 0.50$
  - $g = 2\%$
  - $R = 15\%$
  - $P_0 = ?$

$$P_0 = \frac{D_0(1+g)}{R-g} = \frac{D_1}{R-g}$$

$$P_0 = \frac{0.50(1+0.02)}{(0.15-0.02)} = \frac{0.51}{0.13} = \$3.92$$

DGM – Example 2

- Suppose Pirates Inc. is expected to pay a $2 dividend in one year. If the dividend is expected to grow at 5% per year and the required return is 20%, what is the share price today?
  - Dividend = $2 g = 5% R = 20% P_0 = ?

$$P_0 = \frac{2}{(0.20 - 0.05)} = \$13.33$$

  - Why isn't the $2 in the numerator multiplied by (1+.05) in this example?

Share Valuation - Example 8.3 p238

- Gordon Growth Company is expected to pay a dividend of $4 next period and dividends are expected to grow at 6% per year. The required return is 16%.

  What is the current price?
- D1 = $4, g = 6%, R = 16%, P_0= ?

$$P_0 = \frac{D_0(1+g)}{R-g} = \frac{D_1}{R-g}$$

- P_0 = 4 / (.16 - .06) = $40

Share Valuation - Example 8.3 p238 continued..

- What is the price expected to be in year 4?

$$P_t = \frac{D_t(1+g)}{R-g} = \frac{D_{t+1}}{R-g} \longrightarrow P_4 = \frac{D_4(1+g)}{R-g} = \frac{D_5}{R-g}$$

  - $D_5 = D_1(1+g)^4$
  - $P_4 = 4(1+.06)^4 / (.16 - .06) = 5.05/0.10 = 50.50$

- What is the implied return given the change in price during the four year period?
  - $50.50 = 40(1+\text{return})^4$; return = 6%

Nonconstant Growth

- Suppose a firm is expected to increase dividends by 20% in one year and by 15% in two years. After that dividends will increase at a rate of 5% per year indefinitely. If the last dividend was $1 and the required return is 20%, what is the price of the stock?
- Remember that we have to find the PV of *all* expected future dividends.

Nonconstant Growth – Solution

- Compute the dividends until growth rate levels
  - $D_1 = 1(1.2) = \$1.20$
  - $D_2 = 1.20(1.15) = \$1.38$
  - $D_3 = 1.38(1.05) = \$1.449$
- Find the expected future price
  - $P_2 = D_3 / (R - g) = 1.449 / (.2 - .05) = 9.66$
- Find the present value of **all** expected future cash flows (dividends + price in year 2)
  - $P_0 = 1.20 / (1.2) + 1.38/(1.2)^2 + 9.66 / (1.2)^2 = 8.67$

Quick Quiz

- What is the value of a stock that is expected to pay a constant dividend of $2 per year if the required return is 15%?
- What is the value if the same company starts increasing dividends by 3% per year, beginning with the next dividend? The required return stays at 15%.

Using the DGM to Find R

- Start with the DGM:

$$P_0 = \frac{D_0(1+g)}{R-g} = \frac{D_1}{R-g}$$

- Rearrange and solve for R

$$R = \frac{D_0(1+g)}{P_0} + g \qquad R = \frac{D_1}{P_0} + g$$

- Components of R:
  Dividend Yield (D_1/P_0) + Capital Gains Yield (g)

Finding the Required Return - Example

- Suppose a firm's stock is selling for $10.50. They just paid a $1 dividend and dividends are expected to grow at 5% per year. What is the required return?

$$R = \frac{D_0(1+g)}{P_0} + g = \frac{D_1}{P_0} + g$$

  - R = [1(1.05)/10.50] + .05 = 15%
- What is the dividend yield?
  - 1(1.05) / 10.50 = 10%
- What is the capital gains yield?
  - g =5%

Table 8.1 - Summary of Stock Valuation

I. The General Case

In general, the price today of a share of stock, P_0, is the present value of all of its future dividends, $D_1, D_2, D_3, \ldots$:

$$P_0 = \frac{D_1}{(1+R)^1} + \frac{D_2}{(1+R)^2} + \frac{D_3}{(1+R)^3} + \cdots$$

where R is the required return.

II. Constant Growth Case

If the dividend grows at a steady rate, g, then the price can be written as:

$$P_0 = \frac{D_1}{R-g}$$

This result is called the *dividend growth model*.

III. Supernormal Growth

If the dividend grows steadily after t periods, then the price can be written as:

$$P_0 = \frac{D_1}{(1+R)^1} + \frac{D_2}{(1+R)^2} + \cdots + \frac{D_t}{(1+R)^t} + \frac{P_t}{(1+R)^t}$$

where

$$P_t = \frac{D_t \times (1+g)}{(R-g)}$$

IV. The Required Return

The required return, R, can be written as the sum of two things:

$$R = D_1/P_0 + g$$

where D_1/P_0 is the *dividend yield* and g is the *capital gains yield* (which is the same thing as the growth rate in dividends for the steady growth case).

Reading Stock Quotes

- Sample Quote

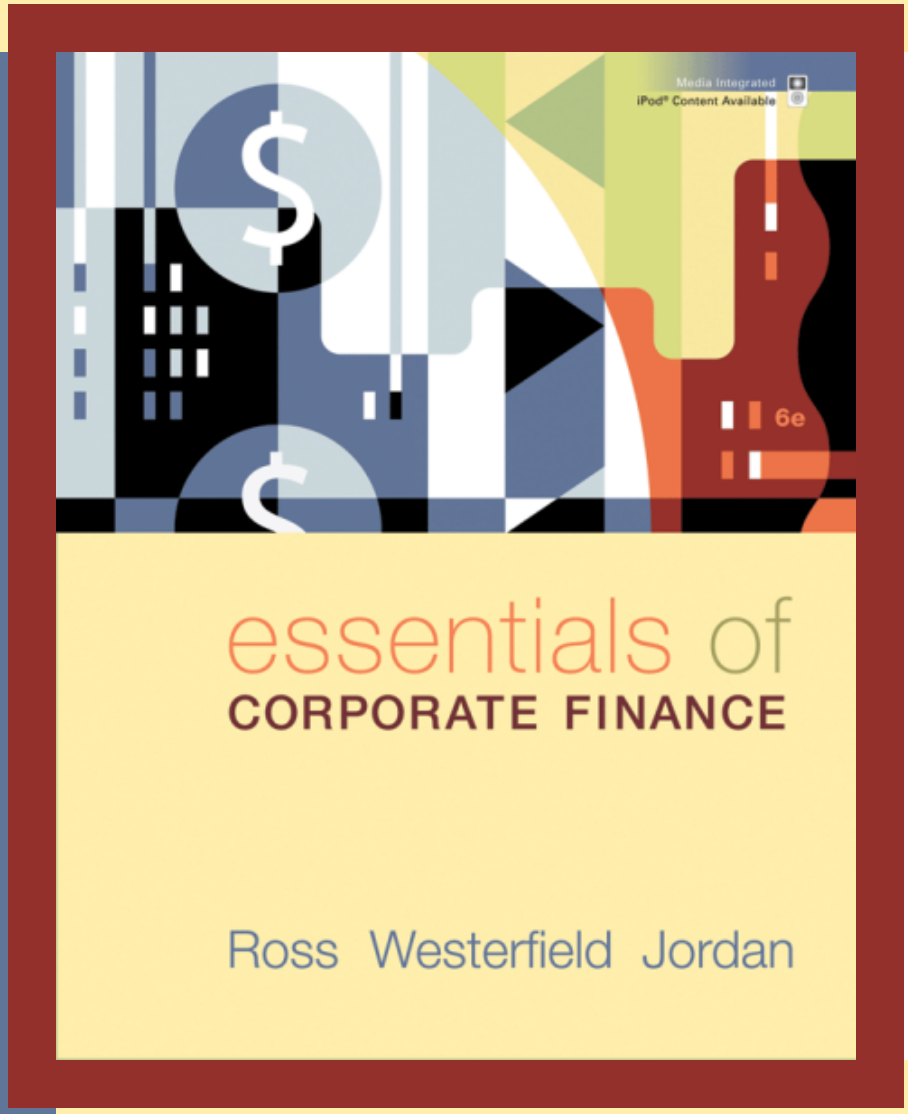
YTD%	52wk H/L		Stock (symbol)	Div	Yld	PE	Vol	close	net ch.
4.5	57.50	38.60	HarrahEntn HET	1.20	2.3	20	10943	52.03	0.35

- What information is provided in the stock quote?
  - Yearly change in price
  - Highs and Lows
  - Dividend and Dividend Yield
  - P/E and volume
  - Closing Price and Net change

Lecture 4 - Summary

- Bonds
  - Features
  - Valuation
  - Types
  - Markets & Quotes
- Nominal and Real interest rates
- Share Valuation
  - Zero Growth - Perpetuity
  - Constant Growth – DDM or DGM
  - Nonconstant Growth

End Lecture 4



Chapter 6

Interest Rates and Bond Valuation

Key Concepts and Skills

- Know the important bond features and bond types
- Understand bond values and why they fluctuate
- Understand bond ratings and what they mean
- Understand the impact of inflation on interest rates
- Understand the term structure of interest rates and the determinants of bond yields

Chapter Outline

- Bonds and Bond Valuation
- More on Bond Features
- Bond Ratings
- Some Different Types of Bonds
- Bond Markets
- Inflation and Interest Rates
- Determinants of Bond Yields

Bond Definitions

- Bond
- Par value (face value)
- Coupon rate
- Coupon payment
- Maturity date
- Yield or Yield to maturity

PV of Cash Flows as Rates Change

- Bond Value = PV of coupons + PV of par
- Bond Value = PV annuity + PV of lump sum
- Remember, as interest rates increase, the PVs decrease
- So, as interest rates increase, bond prices decrease and vice versa

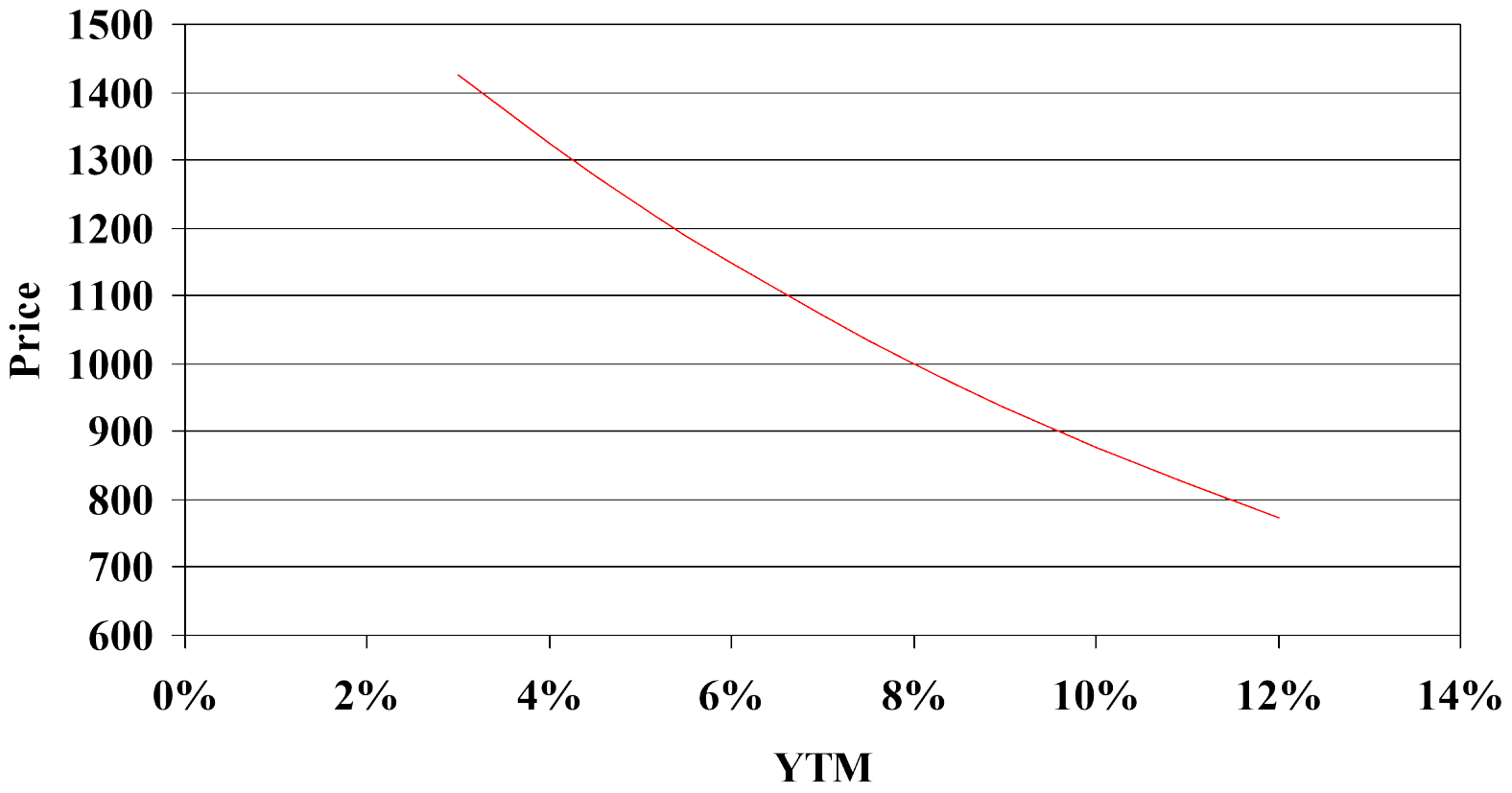
Valuing a Discount Bond with Annual Coupons

- Consider a bond with a coupon rate of 10% and coupons paid annually. The par value is $1,000 and the bond has 5 years to maturity. The yield to maturity is 11%. What is the value of the bond?
  - Using the formula:
    - B = PV of annuity + PV of lump sum
    - B = $100[1 – 1/(1.11)^{5}] / .11 + $1,000 / (1.11)^{5}
    - B = $369.59 + 593.45 = $963.04
  - Using the calculator:
    - N = 5; I/Y = 11; PMT = 100; FV = 1,000
    - CPT PV = -963.04

Valuing a Premium Bond with Annual Coupons

- Suppose you are looking at a bond that has a 10% annual coupon and a face value of $1,000. There are 20 years to maturity and the yield to maturity is 8%. What is the price of this bond?
  - Using the formula:
    - B = PV of annuity + PV of lump sum
    - B = $100[1 – 1/(1.08)^{20}] / .08 + $1,000 / (1.08)^{20}
    - B = $981.81 + 214.55 = $1,196.36
  - Using the calculator:
    - N = 20; I/Y = 8; PMT = 100; FV = 1,000
    - CPT PV = -1,196.36

Graphical Relationship Between Price and YTM



Bond Prices: Relationship Between Coupon and Yield

- If YTM = coupon rate, then par value = bond price
- If YTM > coupon rate, then par value > bond price
  - Why?
  - Price below par = “discount” bond
- If YTM < coupon rate, then par value < bond price
  - Why?
  - Price above par = “premium” bond

The Bond-Pricing Equation

$$\text{Bond Value} = C\left[\frac{1-\frac{1}{(1+r)^t}}{r}\right] + \frac{F}{(1+r)^t}$$

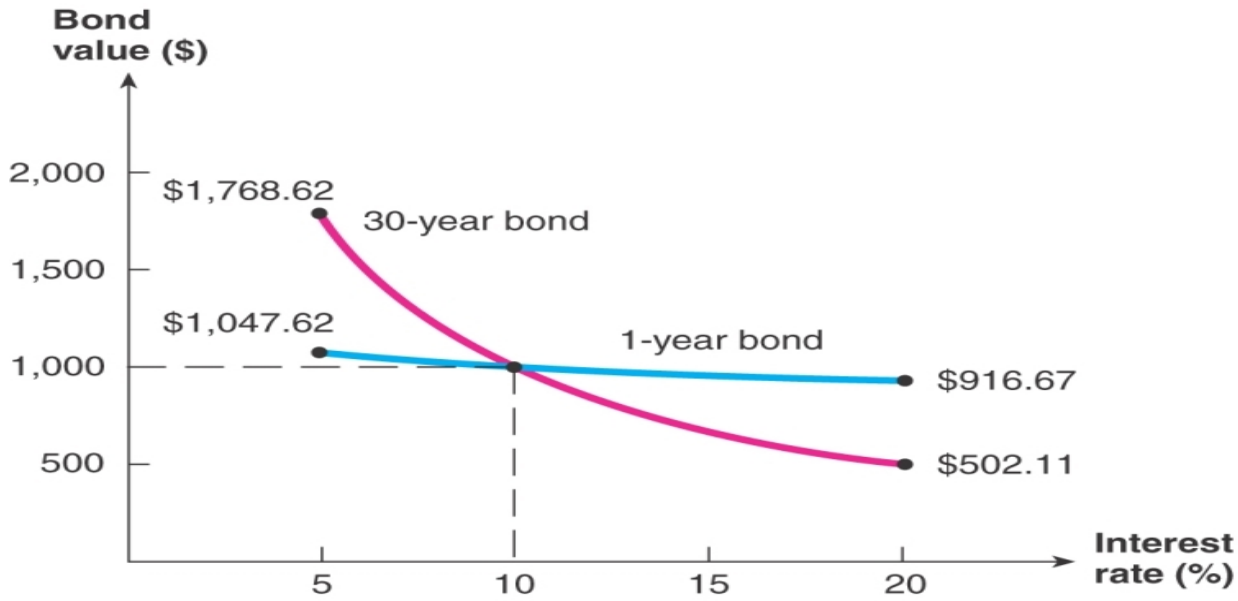
Example 6.1

- Find present values based on the payment period
  - How many coupon payments are there?
  - What is the semiannual coupon payment?
  - What is the semiannual yield?
  - B = $70[1 – 1/(1.08)^{14}] / .08 + $1,000 / (1.08)^{14} = $917.56
  - Or PMT = 70; N = 14; I/Y = 8; FV = 1,000; CPT PV = -917.56

Interest Rate Risk

- Change in price due to changes in interest rates
  - Interest rates up, bond price down!
  - Long-term bonds have more interest rate risk than short-term bonds
    - More-distant cash flows are more adversely affected by an increase in interest rates
  - Lower coupon rate bonds have more interest rate risk than higher coupon rate bonds
    - More of the bond's value is deferred to maturity (thus, for a longer time) if the coupons are small

Figure 6.2



Value of a Bond with a 10 Percent Coupon Rate for Different Interest Rates and Maturities

	Time to Maturity	
Interest Rate	1 Year	30 Years
5%	$1,047.62	$1,768.62
10	1,000.00	1,000.00
15	956.52	671.70
20	916.67	502.11

Computing YTM

- Yield to maturity is the rate implied by the current bond price
- Finding the YTM requires trial and error if you do not have a financial calculator, and is similar to the process for finding r with an annuity
- If you have a financial calculator, enter N, PV, PMT and FV, remembering the sign convention (PMT and FV need to have the same sign; PV the opposite sign)

YTM with Annual Coupons

- Consider a bond with a 10% annual coupon rate, 15 years to maturity, and a par value of $1,000. The current price is $928.09.
  - § Will the yield be more or less than 10%?
  - § N = 15; PV = -928.09; FV = 1,000; PMT = 100
  - § CPT I/Y = 11%

YTM with Semiannual Coupons

- Suppose a bond with a 10% coupon rate and semiannual coupons, has a face value of $1,000, 20 years to maturity and is selling for $1,197.93.
  - Is the YTM more or less than 10%?
  - What is the semiannual coupon payment?
  - How many periods are there?
  - N = 40; PV = -1,197.93; PMT = 50; FV = 1,000; CPT I/Y = 4% (Is this the YTM?)
  - YTM = 4%*2 = 8%

Table 6.1

I. Finding the value of a bond

Bond value $= C \times [1 - 1/(1 + r)^t]/r + F/(1 + r)^t$

where

C = Coupon paid each period
r = Rate per period
t = Number of periods
F = Bond s face value

II. Finding the yield on a bond

Given a bond value, coupon, time to maturity, and face value, it is possible to find the implicit discount rate, or yield to maturity, by trial and error only. To do this, try different discount rates in the formula above until the calculated bond value equals the given bond value. Remember that increasing the rate *decreases* the bond value.

Spreadsheet Strategies

- There is a specific formula for finding bond prices on a spreadsheet
  - PRICE(Settlement,Maturity,Rate,Yld,Redemption,Frequency,Basis)
  - YIELD(Settlement,Maturity,Rate,Pr,Redemption, Frequency,Basis)
  - Settlement and maturity need to be actual dates
  - The redemption and Pr need to given as % of par value
- Click on the Excel icon for an example

Differences Between Debt and Equity

- Debt
  - Not an ownership interest
  - Creditors do not have voting rights
  - Interest is considered a cost of doing business and is tax-deductible
  - Creditors have legal recourse if interest or principal payments are missed
  - Excess debt can lead to financial distress and bankruptcy
- Equity
  - Ownership interest
  - Common stockholders vote to elect the board of directors and on other issues
  - Dividends are not considered a cost of doing business and are not tax deductible
  - Dividends are not a liability of the firm until declared. Stockholders have no legal recourse if no dividends are declared
  - An all-equity firm cannot go bankrupt

The Bond Indenture

- Contract between the company and the bondholders and includes
  - The basic terms of the bonds
  - The total amount of bonds issued
  - A description of property used as security, if applicable
  - Sinking fund provisions
  - Call provisions
  - Details of protective covenants

Bond Classifications

- Registered vs. Bearer Forms
- Security
  - Collateral – secured by financial securities
  - Mortgage – secured by real property, normally land or buildings
  - Debentures – unsecured
  - Notes – unsecured debt with original maturity less than 10 years
- Seniority

Bond Characteristics and Required Returns

- The coupon rate is usually set close to the yield, which depends on the risk characteristics of the bond when issued
- Which bonds will have the higher yield, all else equal?
  - Secured debt versus a debenture
  - Subordinated debenture versus senior debt
  - A bond with a sinking fund versus one without
  - A callable bond versus a non-callable bond

Bond Ratings – Investment Quality

- High Grade
  - Moody's Aaa and S&P AAA – capacity to pay is extremely strong
  - Moody's Aa and S&P AA – capacity to pay is very strong
- Medium Grade
  - Moody's A and S&P A – capacity to pay is strong, but more susceptible to changes in circumstances
  - Moody's Baa and S&P BBB – capacity to pay is adequate, but adverse conditions will have more impact on the firm's ability to pay

Bond Ratings - Speculative

- Low Grade
  - Moody's Ba, B, Caa, and Ca
  - S&P BB, B, CCC, CC
  - Considered speculative with respect to capacity to pay. The "B" ratings are the lowest degree of speculation.
- Very Low Grade
  - Moody's C and S&P C – income bonds with no interest being paid
  - Moody's D and S&P D – in default with principal and interest in arrears

Government Bonds

- Treasury Securities
  - Federal government debt
  - T-bills – pure discount bonds with original maturity of one year or less
  - T-notes – coupon debt with original maturity between one and ten years
  - T-bonds – coupon debt with original maturity greater than ten years
- Municipal Securities
  - Debt of state and local governments
  - Varying degrees of default risk, rated similar to corporate debt
  - Interest received is tax-exempt at the federal level

Example 6.4

- A taxable bond has a yield of 8% and a municipal bond has a yield of 6%
  - If you are in a 40% tax bracket, which bond do you prefer?
    - 8%(1 - .4) = 4.8%
    - The after-tax return on the corporate bond is 4.8%, compared to a 6% return on the municipal
  - At what tax rate would you be indifferent between the two bonds?
    - 8%(1 – T) = 6%
    - T = 25%

Zero Coupon Bonds

- Make no periodic interest payments (coupon rate = 0%)
- The entire yield to maturity comes from the difference between the purchase price and the par value
- Cannot sell for more than par value
- Sometimes called zeroes, or deep discount bonds
- Treasury Bills and principal-only Treasury strips are good examples of zeroes

Floating-Rate Bonds

- Coupon rate floats depending on some index value
- Examples – adjustable rate mortgages and inflation-linked Treasuries
- There is less price risk with floating-rate bonds
  - The coupon floats, so it is less likely to differ substantially from the yield to maturity
- Coupons may have a “collar” – the rate cannot go above a specified “ceiling” or below a specified “floor”

Other Bond Types

- Disaster bonds
- Income bonds
- Convertible bonds
- Put bond
- There are many other types of provisions that can be added to a bond and many bonds have several provisions – it is important to recognize how these provisions affect required returns

Bond Markets

- Primarily over-the-counter transactions with dealers connected electronically
- Extremely large number of bond issues, but generally low daily volume in single issues
- Makes getting up-to-date prices difficult, particularly on small company or municipal issues
- Treasury securities are an exception

Example: Work the Web

- Bond yield information is available online
- One good site is Bonds Online
- Click on the Web surfer to go to the site
  - Follow the “bond search,” “search/quote center,” “corporate/agency bonds,” and “composite bond yields” links
  - Observe the yields for various bond types, and the shape of the yield curve.

Bond Quotations

- Consider the following bond quotation:
  - GM 8.375 Jul 15, 2033 100.641 8.316 362 30 763,528
  - Interpret the information above
- Consider the last Treasury quotation in Figure 6.3:
  - 4½ Feb 36 92:21 92:22 -8 4.98
  - What was the previous day's asked price?

Inflation and Interest Rates

- Real rate of interest – change in purchasing power
- Nominal rate of interest - quoted rate of interest; Reflects change in purchasing power and inflation
- The ex ante nominal rate of interest includes our desired real rate of return plus an adjustment for expected inflation

The Fisher Effect

- The Fisher Effect defines the relationship between real rates, nominal rates, and inflation
- $(1 + R) = (1 + r)(1 + h)$, where
  - R = nominal rate
  - r = real rate
  - h = expected inflation rate
- Approximation
  - § $R = r + h$

Example 6.6

- If we require a 10% real return and we expect inflation to be 8%, what is the nominal rate?
- R = (1.1)(1.08) – 1 = .188 = 18.8%
- Approximation: R = 10% + 8% = 18%
- Because the real return and expected inflation are relatively high, there is a significant difference between the actual Fisher Effect and the approximation.

Term Structure of Interest Rates

- Term structure is the relationship between time to maturity and yields, all else equal
- It is important to recognize that we pull out the effect of default risk, different coupons, etc.
- Yield curve – graphical representation of the term structure
  - Normal – upward-sloping; long-term yields are higher than short-term yields
  - Inverted – downward-sloping; long-term yields are lower than short-term yields

Figure 6.5 – Upward-Sloping Yield Curve

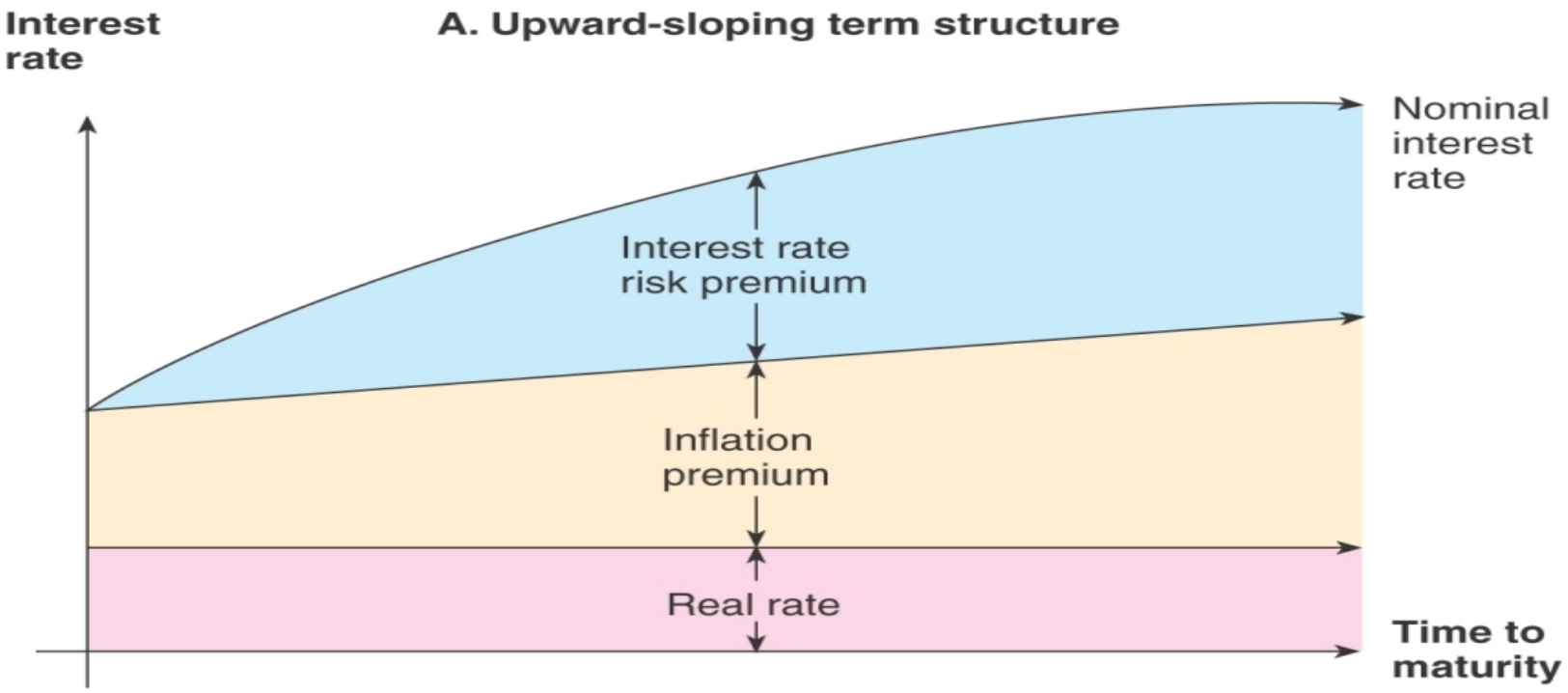


Figure 6.5 – Downward-Sloping Yield Curve

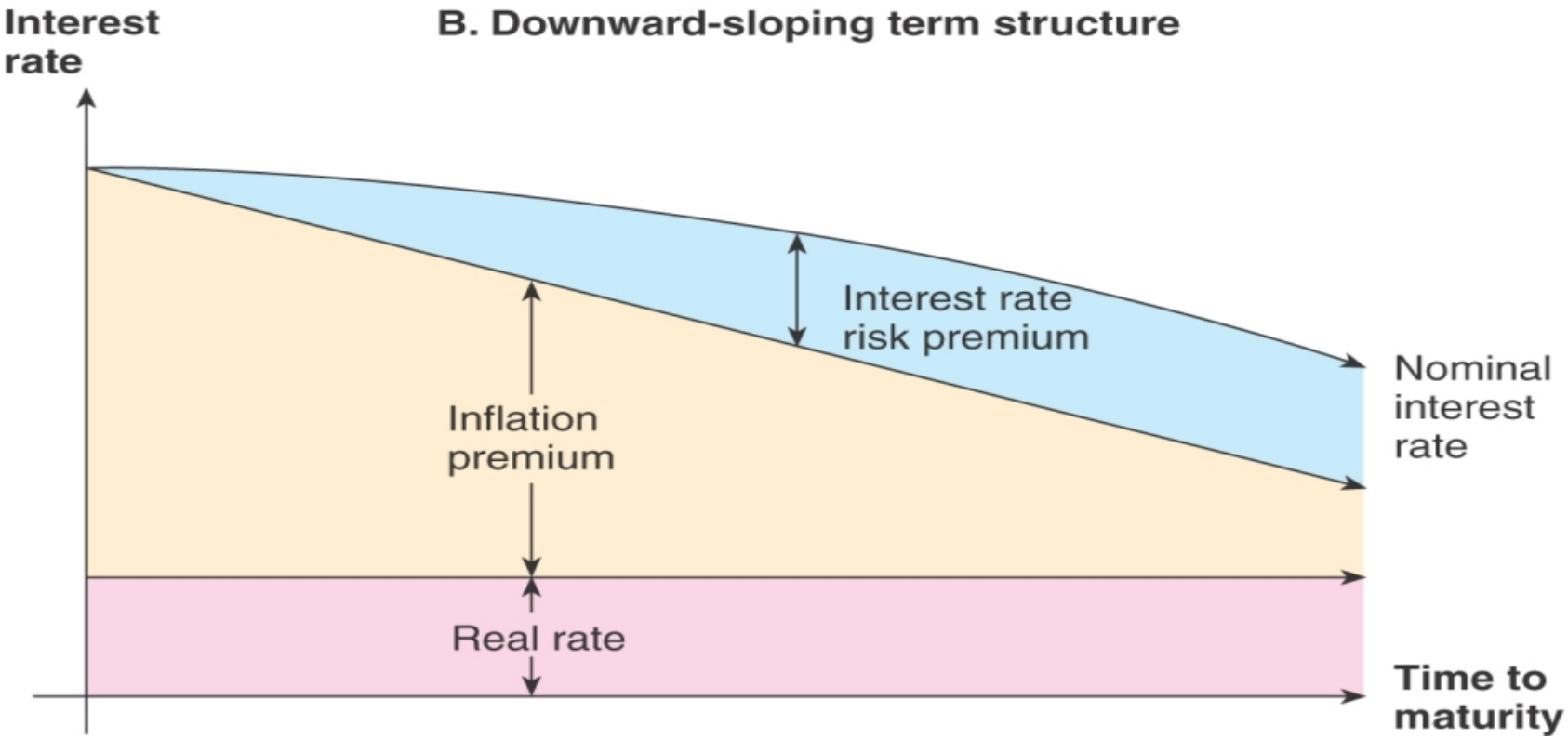
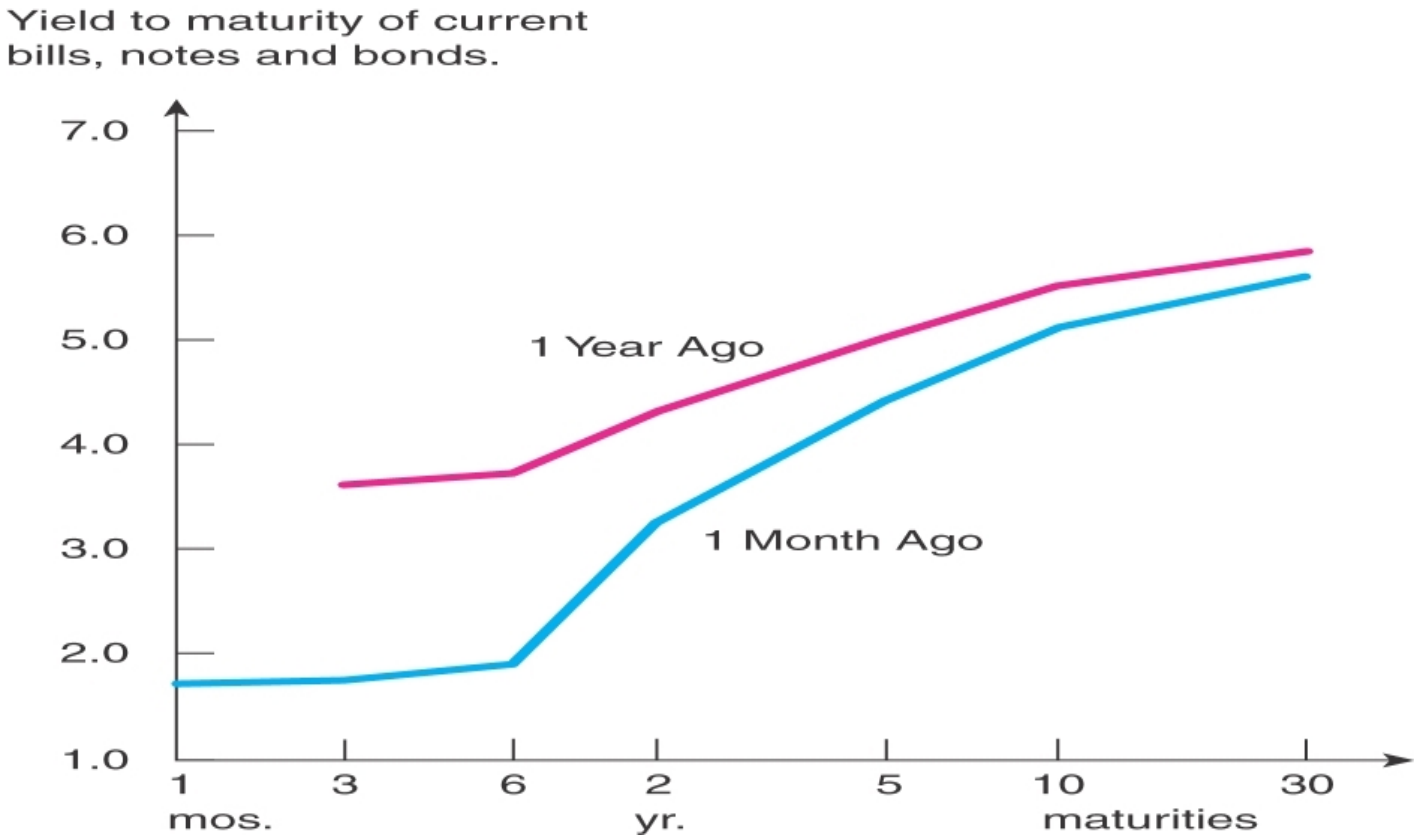


Figure 6.6 – Treasury Yield Curve



Factors Affecting Required Return

- Default risk premium – remember bond ratings
- Taxability premium – remember municipal versus taxable
- Liquidity premium – bonds that have more frequent trading will generally have lower required returns
- Anything else that affects the risk of the cash flows to the bondholders will affect the required returns

Quick Quiz

- How do you find the value of a bond and why do bond prices change?
- What is a bond indenture and what are some of the important features?
- What are bond ratings and why are they important?
- How does inflation affect interest rates?
- What is the term structure of interest rates?
- What factors determine the required return on bonds?

Comprehensive Problem

- What is the price of a $1,000 par value bond with a 6% coupon rate paid semiannually, if the bond is priced to yield 5% YTM, and it has 9 years to maturity?
- What would be the price of the bond if the yield rose to 7%.
- What is the current yield on the bond if the YTM is 7%?

Chapter 9

Stocks and Their Valuation

- Features of Common Stock
- Determining Common Stock Values
- Preferred Stock

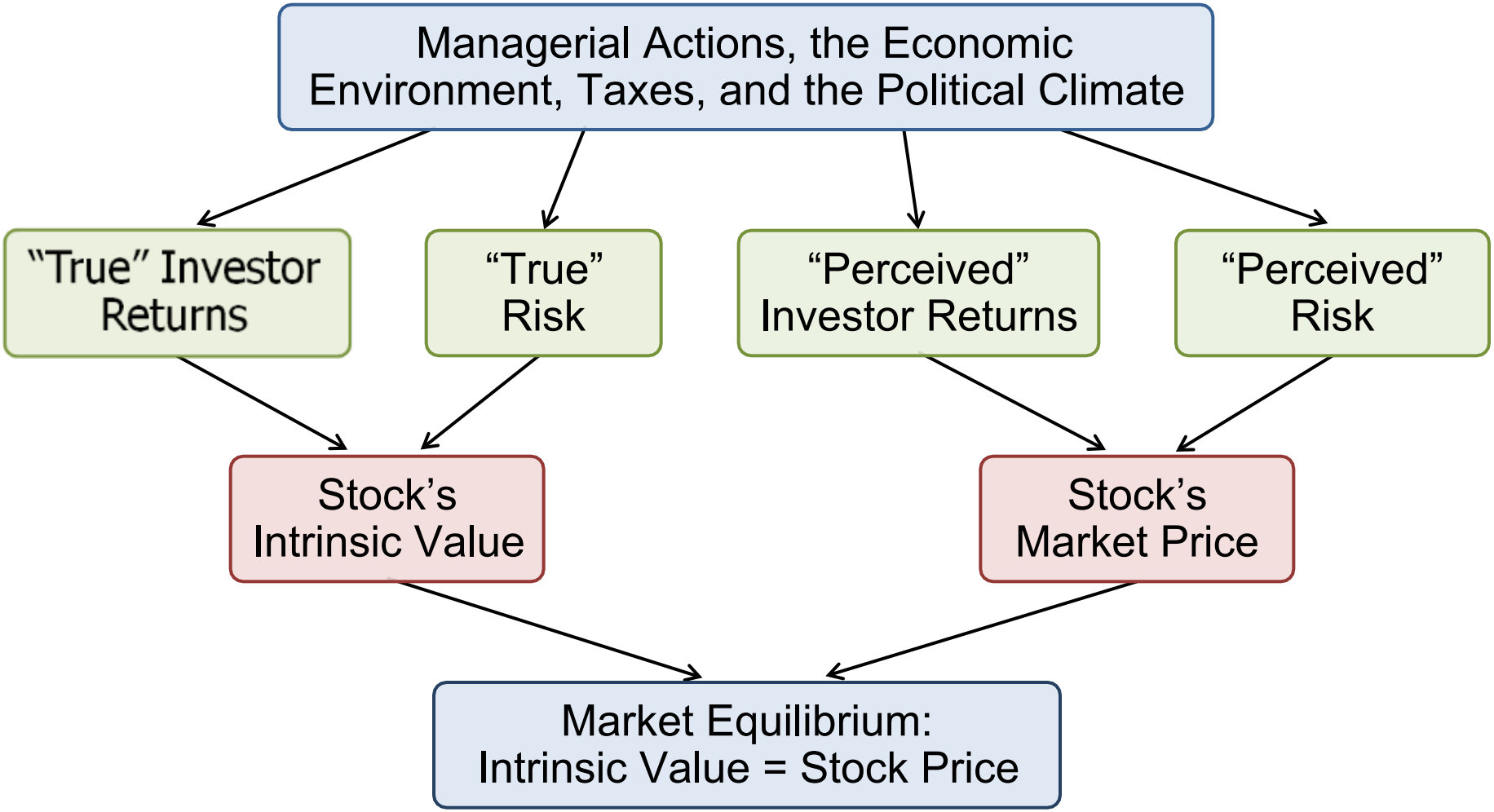
Facts about Common Stock

- Represents ownership
- Ownership implies control
- Stockholders elect directors
- Directors elect management
- Management's goal: Maximize the stock price

Intrinsic Value and Stock Price

- Outside investors, corporate insiders, and analysts use a variety of approaches to estimate a stock's intrinsic value (P_0).
- In equilibrium we assume that a stock's price equals its intrinsic value.
  - Outsiders estimate intrinsic value to help determine which stocks are attractive to buy and/or sell.
  - Stocks with a price below (above) its intrinsic value are *undervalued* (*overvalued*).

Determinants of Intrinsic Value and Stock Prices



Different Approaches for Estimating the Intrinsic Value of a Common Stock

- Discounted dividend model
- Corporate valuation model
- Using the multiples of comparable firms

Discounted Dividend Model

- Value of a stock is the present value of the future dividends expected to be generated by the stock.

$$\hat{P}_0 = \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + \frac{D_3}{(1+r_s)^3} + \ldots + \frac{D_\infty}{(1+r_s)^\infty}$$

Constant Growth Stock

- A stock whose dividends are expected to grow forever at a constant rate, g.

$$D_1 = D_0(1 + g)^1$$

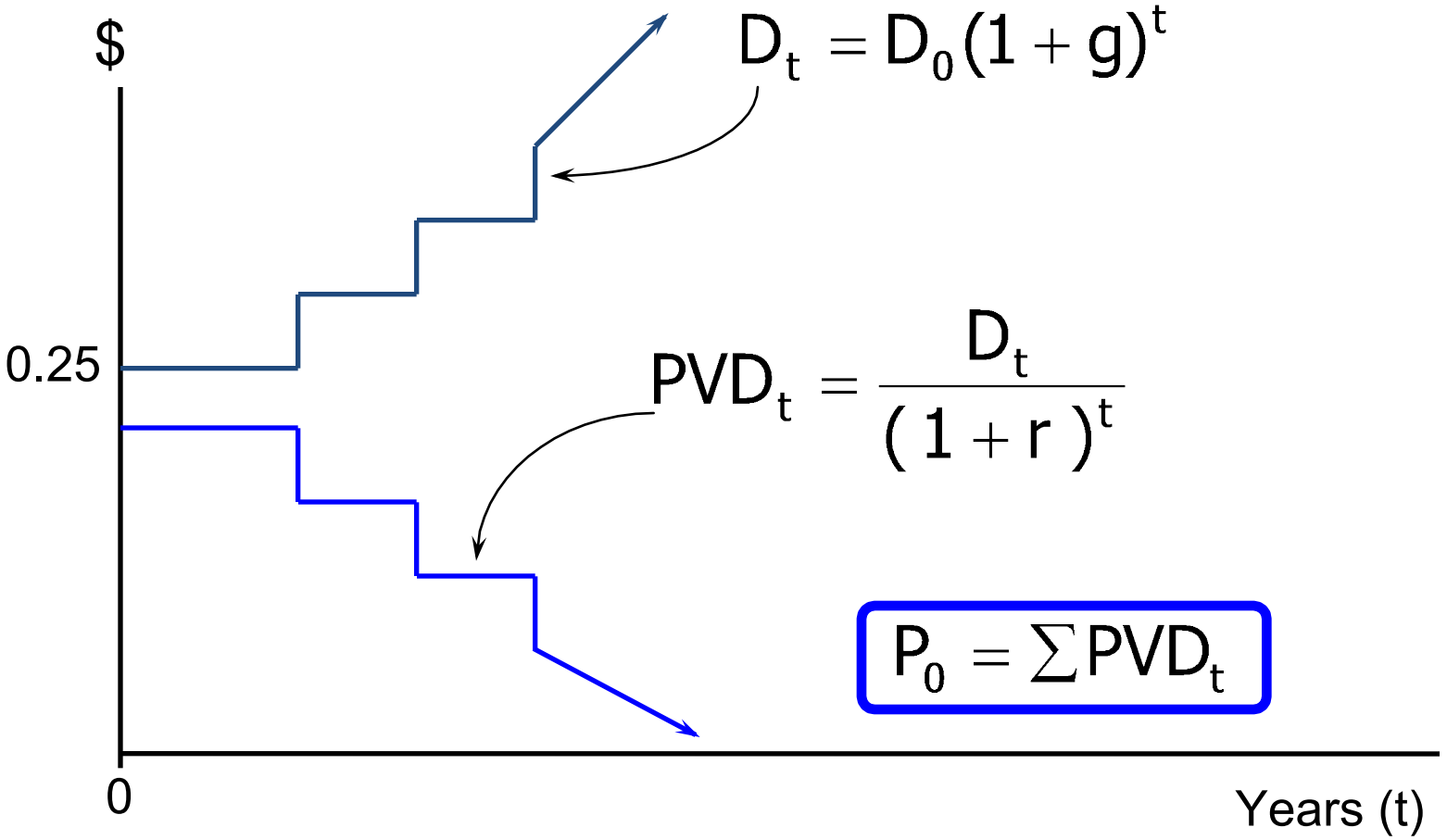
$$D_2 = D_0(1 + g)^2$$

$$D_t = D_0(1 + g)^t$$

- If g is constant, the discounted dividend formula converges to:

$$\hat{P}_0 = \frac{D_0(1+g)}{r_s - g} = \frac{D_1}{r_s - g}$$

Future Dividends and Their Present Values



What happens if $g > r_s$?

- If $g > r_s$, the constant growth formula leads to a negative stock price, which does not make sense.
- The constant growth model can only be used if:
  - $r_s > g$.
  - g is expected to be constant forever.

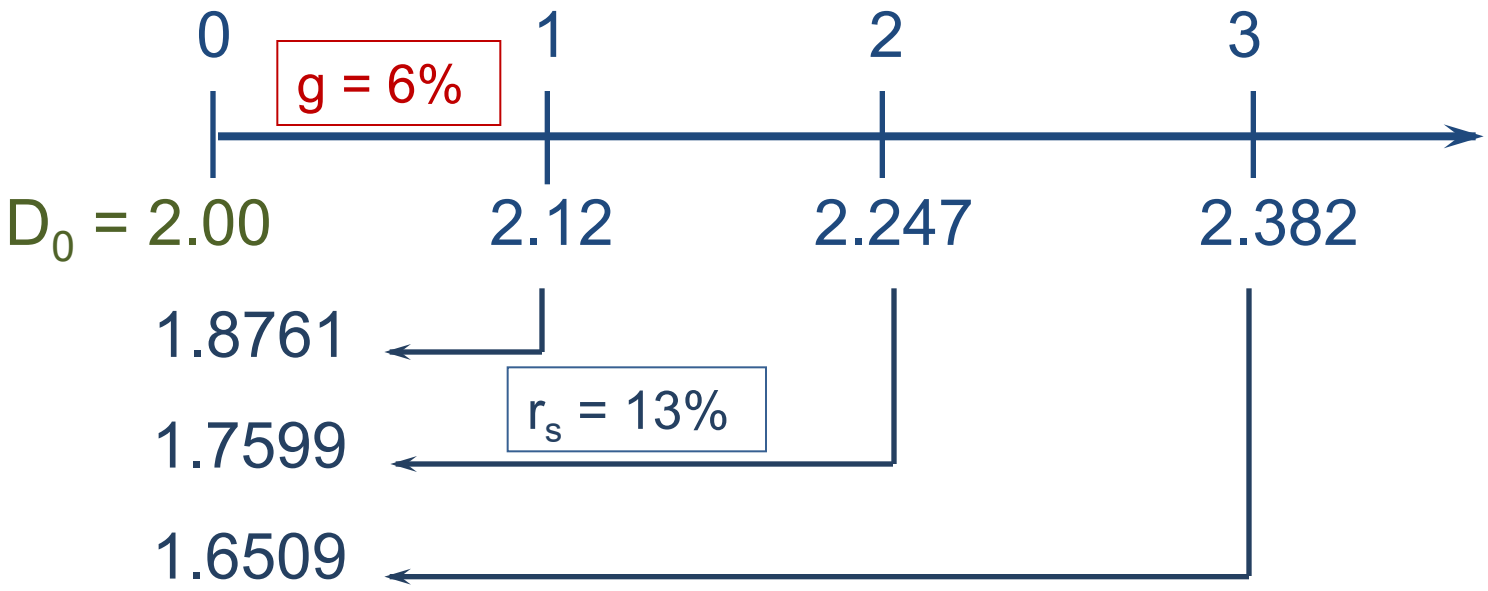
Use the SML to Calculate the Required Rate of Return (r_s)

- If r_{RF} = 7%, r_M = 12%, and b = 1.2, what is the required rate of return on the firm's stock?

$$r_s = r_{RF} + (r_M - r_{RF})b$$
$$= 7\% + (12\% - 7\%)1.2$$
$$= 13\%$$

Find the Expected Dividend Stream for the Next 3 Years and Their PVs

D_0 = \$2 and g is a constant 6%.



What is the stock's intrinsic value?

Using the constant growth model:

$$\hat{P}_0 = \frac{D_1}{r_s - g} = \frac{\$2.12}{0.13 - 0.06}$$

$$= \frac{\$2.12}{0.07}$$

$$= \$30.29$$

What is the expected market price of the stock, one year from now?

- D_1 will have been paid out already. So, P_1 is the present value (as of Year 1) of D_2, D_3, D_4, etc.

$$\hat{P}_1 = \frac{D_2}{r_s - g} = \frac{\$2.247}{0.13 - 0.06}$$

$$= \$32.10$$

- Could also find expected P_1 as:

$$\hat{P}_1 = P_0(1.06) = \$32.10$$

Find Expected Dividend Yield, Capital Gains Yield, and Total Return During First Year

- Dividend yield

  $= D_1/P_0 = \$2.12/\$30.29 = 7.0\%$

- Capital gains yield

  $= (P_1 - P_0)/P_0$

  $= (\$32.10 - \$30.29)/\$30.29 = 6.0\%$

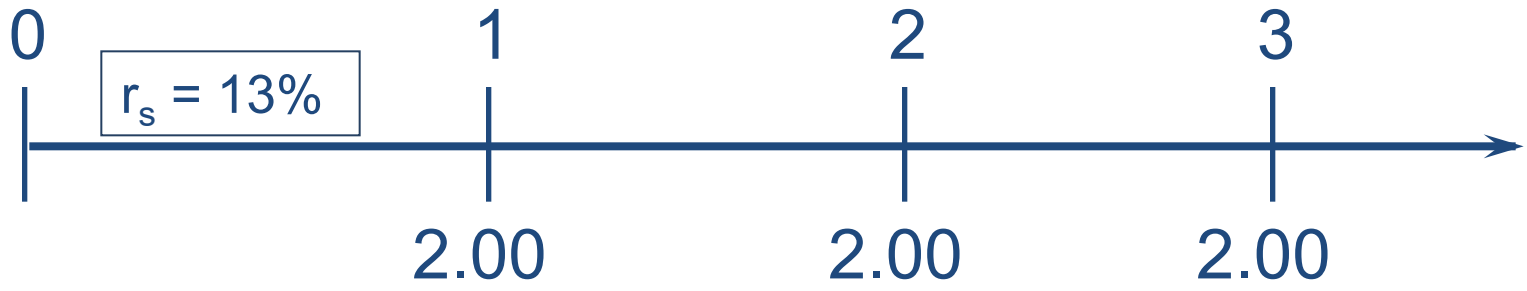
- Total return (r_s)

  = Dividend yield + Capital gains yield

  = 7.0% + 6.0% = 13.0%

What would the expected price today be, if g = 0?

The dividend stream would be a perpetuity.

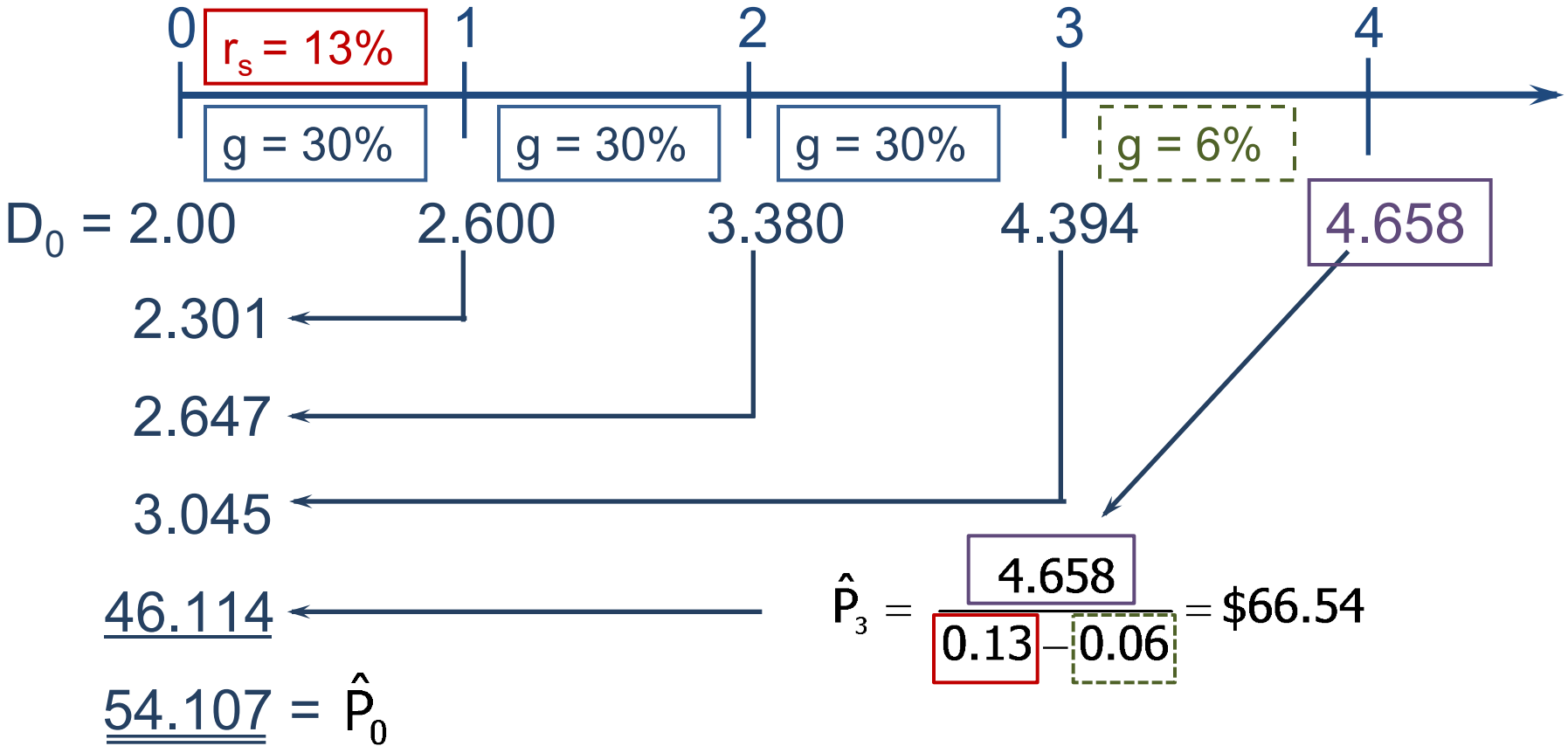


$$\hat{P}_0 = \frac{PMT}{r} = \frac{\$2.00}{0.13} = \$15.38$$

Supernormal Growth: What if g = 30% for 3 years before achieving long-run growth of 6%?

- Can no longer use just the constant growth model to find stock value.
- However, the growth does become constant after 3 years.

Valuing Common Stock with Nonconstant Growth



Find Expected Dividend and Capital Gains Yields during the First and Fourth Years

- Dividend yield (first year)

  = $2.60/$54.11 = 4.81%

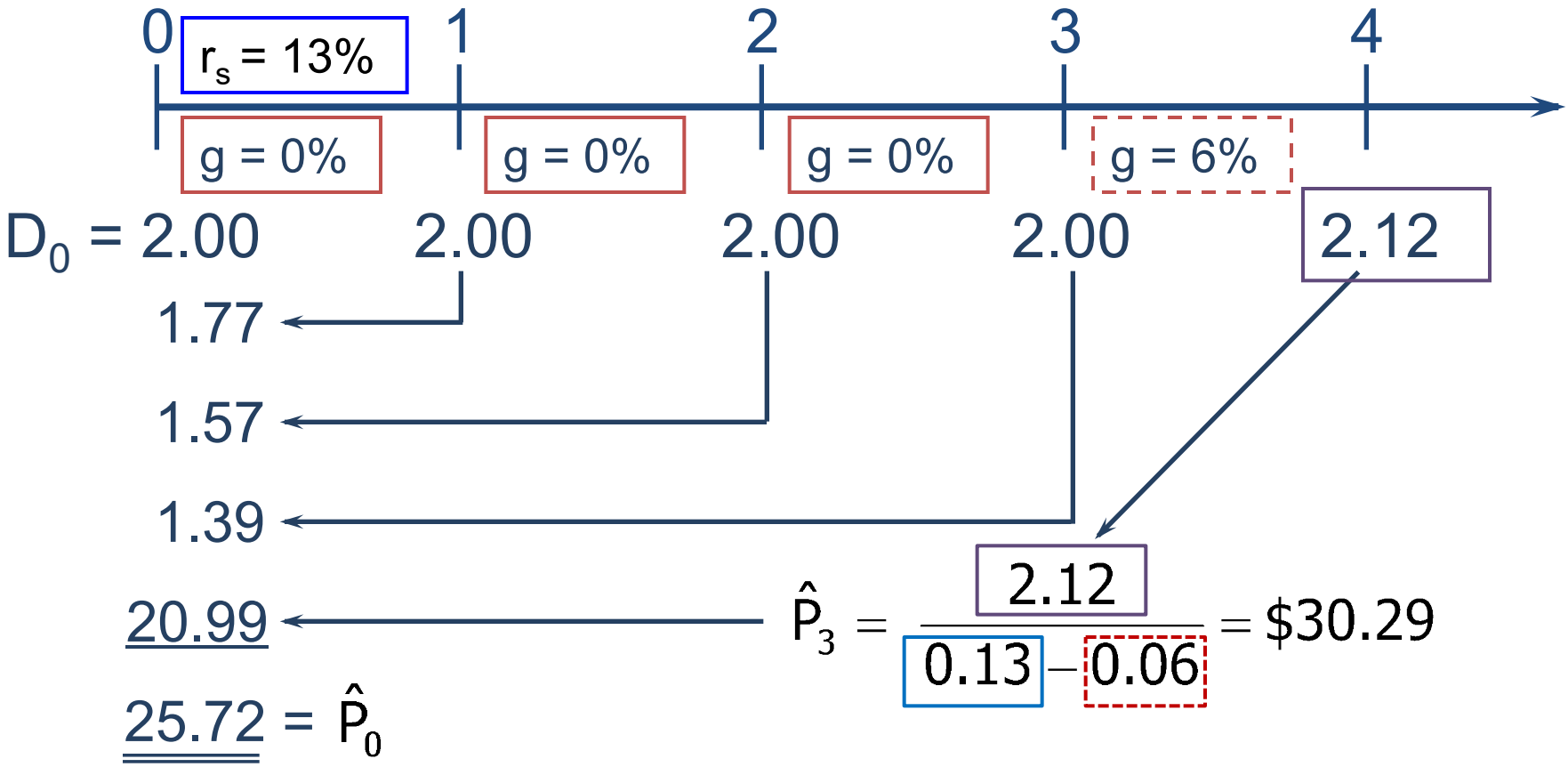
- Capital gains yield (first year)

  = 13.00% – 4.81% = 8.19%

- During nonconstant growth, dividend yield and capital gains yield are not constant, and capital gains yield ≠ g.

- After t = 3, the stock has constant growth and dividend yield = 7%, while capital gains yield = 6%.

Nonconstant Growth: What if g = 0% for 3 years before long-run growth of 6%?



Find Expected Dividend and Capital Gains Yields During the First and Fourth Years

- Dividend yield (first year)

  = $2.00/$25.72 = 7.78%

- Capital gains yield (first year)

  = 13.00% – 7.78% = 5.22%

- After t = 3, the stock has constant growth and dividend yield = 7%, while capital gains yield = 6%.

If the stock was expected to have negative growth (g = -6%), would anyone buy the stock, and what is its value?

- Yes. Even though the dividends are declining, the stock is still producing cash flows and therefore has positive value.

$$\hat{P}_0 = \frac{D_1}{r_s - g} = \frac{D_0(1+g)}{r_s - g}$$

$$= \frac{\$2.00\,(0.94)}{0.13 - (-0.06)} = \frac{\$1.88}{0.19} = \$9.89$$

Find Expected Annual Dividend and Capital Gains Yields

- Capital gains yield

  = g = -6.00%

- Dividend yield

  = 13.00% – (-6.00%) = 19.00%

- Since the stock is experiencing constant growth, dividend yield and capital gains yield are constant. Dividend yield is sufficiently large (19%) to offset a negative capital gains.

Corporate Valuation Model

- Also called the free cash flow method. Suggests the value of the entire firm equals the present value of the firm's free cash flows.
- Remember, free cash flow is the firm's after-tax operating income less the net capital investment.

  FCF = EBIT(1 – T) – Net capital investment

Applying the Corporate Valuation Model

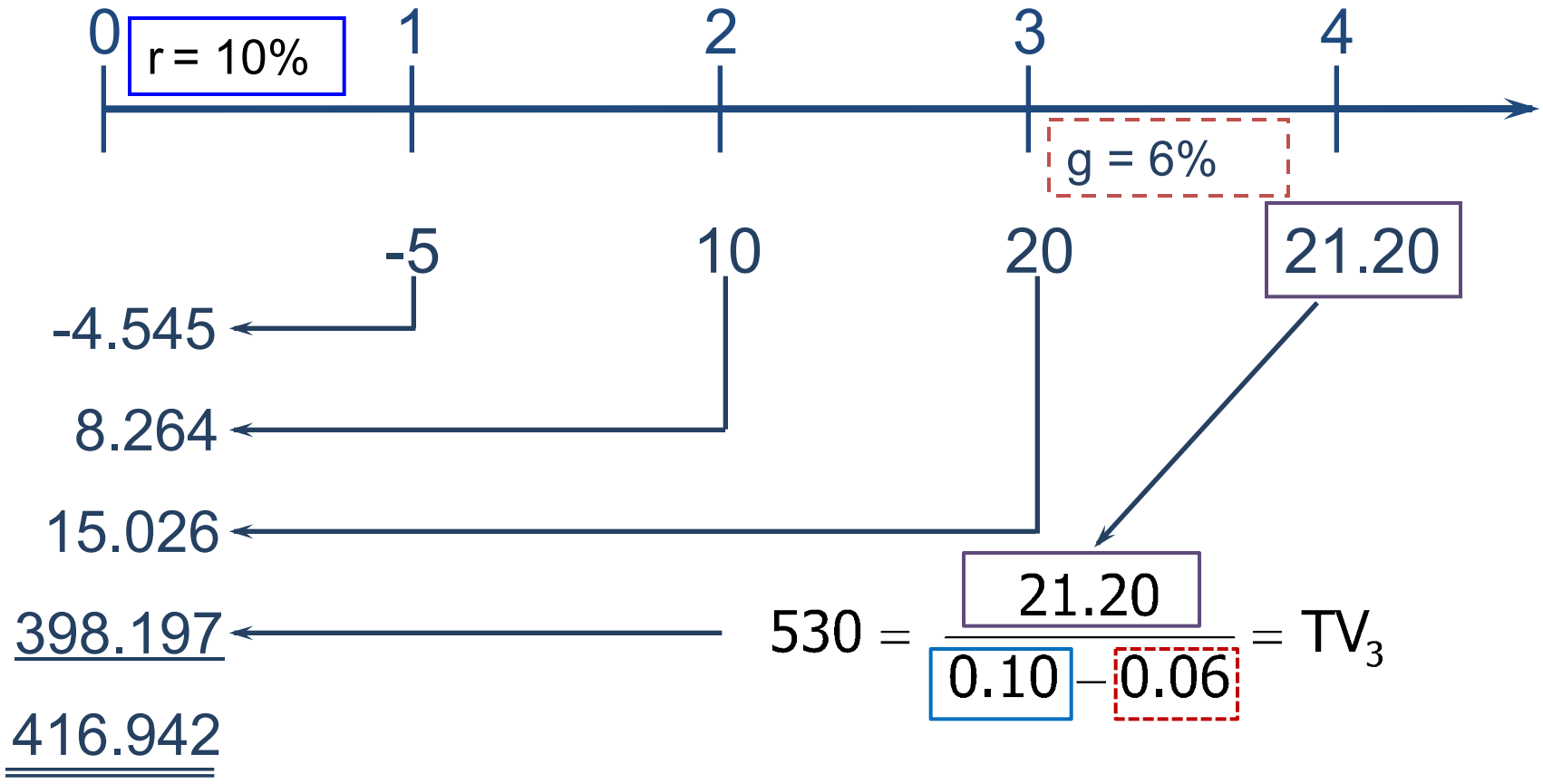
- Find the market value (MV) of the firm, by finding the PV of the firm's future FCFs.
- Subtract MV of firm's debt and preferred stock to get MV of common stock.
- Divide MV of common stock by the number of shares outstanding to get intrinsic stock price (value).

Issues Regarding the Corporate Valuation Model

- Often preferred to the discounted dividend model, especially when considering number of firms that don't pay dividends or when dividends are hard to forecast.
- Similar to discounted dividend model, assumes at some point free cash flow will grow at a constant rate.
- Terminal value (TV_N) represents value of firm at the point that growth becomes constant.

Use the Corporate Valuation Model to Find the Firm's Intrinsic Value

Given: Long-Run g_{FCF} = 6% and WACC = 10%



What is the firm's intrinsic value per share?

The firm has $40 million total in debt and preferred stock and has 10 million shares of stock.

$$\begin{aligned}\text{MV of equity} &= \text{MV of firm} - \text{MV of debt} \\ &= \$416.94 - \$40 \\ &= \$376.94 \text{ million}\end{aligned}$$

$$\begin{aligned}\text{Value per share} &= \text{MV of equity}/\#\text{ of shares} \\ &= \$376.94/10 \\ &= \$37.69\end{aligned}$$

Firm Multiples Method

- Analysts often use the following multiples to value stocks.
  - P/E
  - P/CF
  - P/Sales
- EXAMPLE: Based on comparable firms, estimate the appropriate P/E. Multiply this by expected earnings to back out an estimate of the stock price.

Preferred Stock

- Hybrid security.
- Like bonds, preferred stockholders receive a fixed dividend that must be paid before dividends are paid to common stockholders.
- However, companies can omit preferred dividend payments without fear of pushing the firm into bankruptcy.

If preferred stock with an annual dividend of $5 sells for $50, what is the preferred stock's expected return?

$$V_p = \frac{D}{r_p}$$

$$\$50 = \frac{\$5}{r_p}$$

$$\hat{r}_p = \frac{\$5}{\$50}$$

$$= 0.10 = 10\%$$

STOCK VALUATION

1. Hearth enterprise membayarkan dividendnya (Do) sebesar $1.25. Perusahaan diperkirakan mengalami pertumbuhan non konstan sebesar 20% selama 5 tahun, diikuti seterusnya oleh tingkat konstan 5%. Tingkat pengembalian perusahaan yang diminta adalah 10%.
   a. Hitunglah nilai saham hari ini
   b. Hitunglah P1 dan P2!
   c. Hitunglah imbal hasil dividend dan keuntungan modal untuk tahun ke 1. 2. Sampai 5

2. Give the following data, what should the price of the stock be?
   Required return: 10%, present dividend: $1, dividend growth rate: 5%. Use the dividend growth model!

3. Jika diketahui risk free adalah 7%, dan investor mempercayai bahwa interest rate pasar akan mengalami kenaikan menuju titik 13%. Jika nilai koefisien beta perusahaan adalah 1.3 dan dividend yang dibayarkan adalah $1, berapakah nilai return saham tersebut?
   Berapakah nilai saham seharusnya jika nilai pertumbuhan dividendnya 5%?

1. Garraty Corporation mengeluarkan dua obligasi pada tahun 2000 dengan face value
$1,000 dan harga jual $950 serta coupon rate 10% bagi masing- masing obligasi tersebut
dan dibayarkan 2 kali dalam setahun. Jika keduanya memiliki masa jatuh tempo yang
berbeda yaitu 10 tahun dan 15 tahun sejak dikeluarkannya, berapakah nilai yield to
maturity dari masing-masing bonds tersebut?

2. a. Jika diketahui bahwa required return on asset dari sebuah perusahaan adalah 22%, cost
of debt 9% dan percent of debt 25%, berapakah cost of equity?
b. Apabila cost of equity adalah 38%, berapakah debt to equity ratio?
c. Berdasarkan informasi yang sudah didapatkan pada point b, berapakah nilai persentase
equity di perusahaan?

3. Kerro Corporation mengeluarkan surat berharga untuk hutang jangka panjangnya dengan
nilai coupon 8% dan face value $1,000 yang akan dibayarkan 2 kali dalam setahun.
Obligasi tersebut akan jatuh tempo dalam masa 5 tahun dengan yield to maturity 7%.
Berapakah harga jual dari bonds tersebut?