Hochschule Kaiserslautern | University of Applied Sciences

BUSINESS VALUATION

UNIVERSIDAD NACIONAL DEL LITORAL – HOCHSCHULE KAISERSLAUTERN

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- Financial Consultant , specialized in Valuation of companies and banks.
- Economic Advisor at Ministerio de Agricultura de la Nación Argentina.
- 10 published books in Finance, Macroeconomics, Financial Mathematics and Fixed Income.
- Author and Reviewer of articles for indexed journals.

LEARNING TARGETS

- Understanding financial statements and the mechanics of cash flow.
- Designing assumptions based on historical performance.
- Forecasting cash flows.

What is Valuation?

Valuation, in finance, involves the determination of the economic value of a business.

The interest in Valuation has increased since the 90´s.

The objective of Finance is to maximize the shareholder value.

The concept of “shareholder value” is so important in Corporate Finance as the concepts of “arbitrage” in Financial Economics and “general equilibrium” in Macroeconomics…

VALUATION: AN INTERDISCIPLINARY TOPIC

Valuation joins and integrates concepts from different disciplines such as:

- Accounting
- Statistics and Econometrics
- Financial Mathematics
- Economics
- Corporate Finance Theory

When do we need to perform a valuation?

1. As a requirement of a willing buyer (the most common case)

2. Changes in the equity capital composition (a new partner wants to buy a share of the company or an old partner wants to sell his share)

3. Privatization or nationalization (the Government sells a state-owned company to a private company or vice-versa)

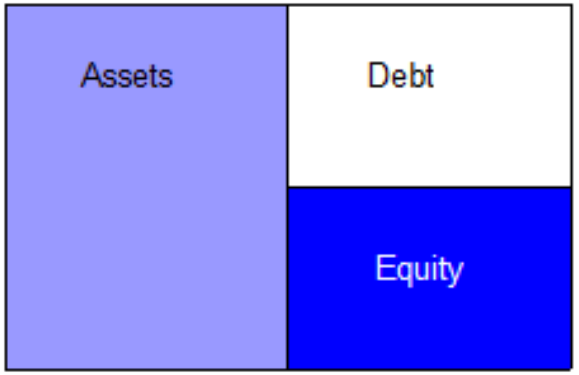
4. When a company is going public (a privately held company decides to make an IPO)

WE PAY FOR THE EQUITY VALUE

We value the assets, buy we pay for the equity…

When we value a company, we obtain first (using the free cash flow method) the fair value of its operations, represented by the letter "V":

V=Fair value of assets



But we pay for the equity value, since paying for the equity value give us rights on the assets but also responsibilities on financial debt "D"; to obtain the equity fair value we have to subtract "D" from "V":

V-D= Fair value of equity "**E**"

WHAT IS FAIR VALUE?

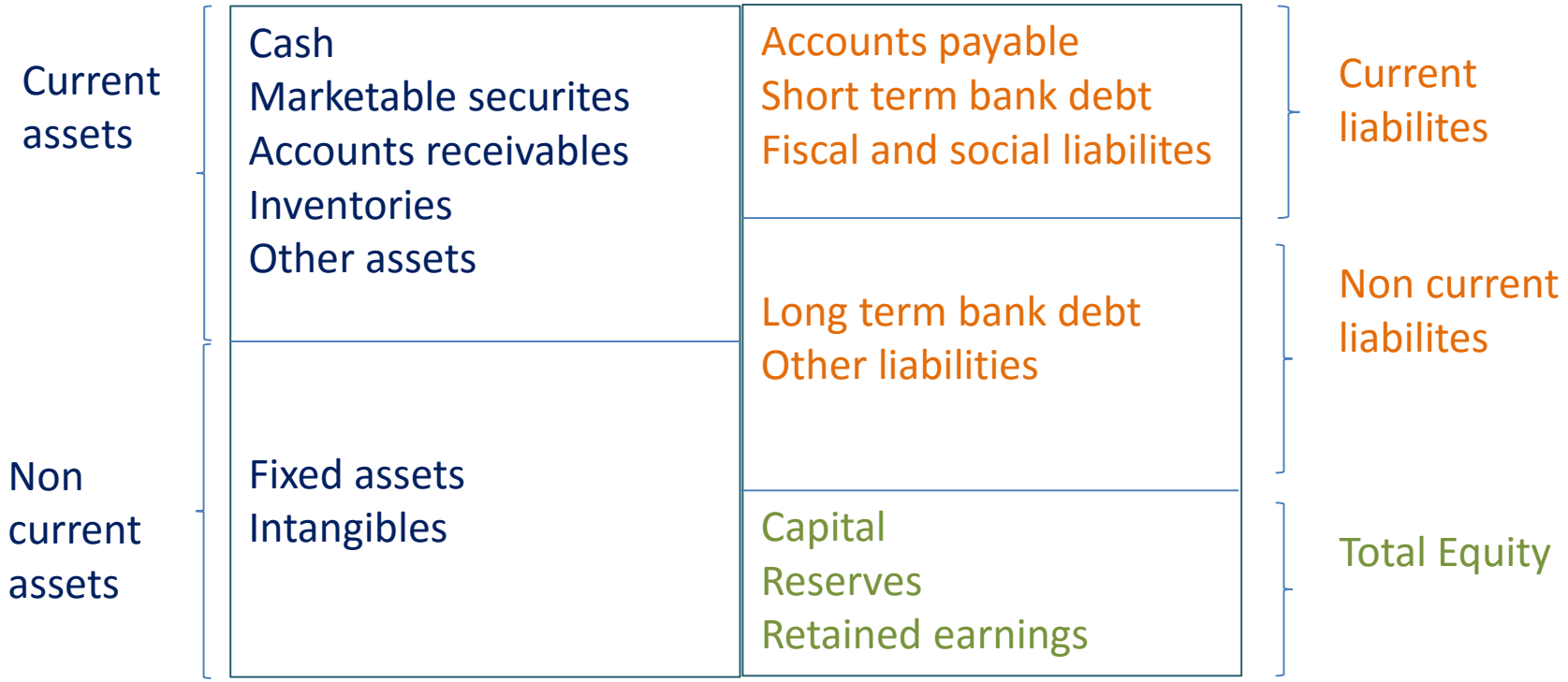
The company fair value is the price at which the property would change hands between a *willing* buyer and a *willing* seller, when the latter is not under any compulsion to sell, and the buyer has complete or at least *reasonable* information about the financial situation of the company.

So…*nobody can get a better deal than the other…*

Willing → *not forced to transact*

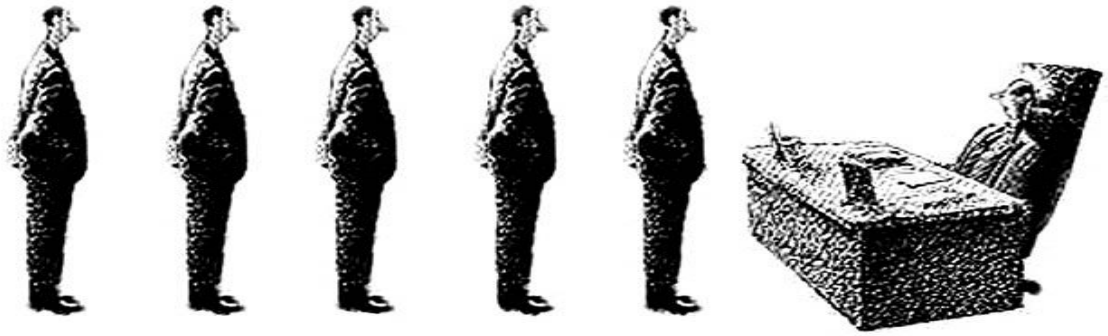
Reasonably informed → *means more than being informed about the accuracy of financial statements.*

WHAT IS A BALANCE SHEET?



What is an income statement

Sales
COGS (cost of goods sold)
Gross margin
Adm. expenses
Comm. expenses
EBIT
Interest expense
EBT
Taxes
Net Income



Shareholders Government Banks Suppliers Employees

OLD VALUATION METHODS: BALANCE SHEET METHOD

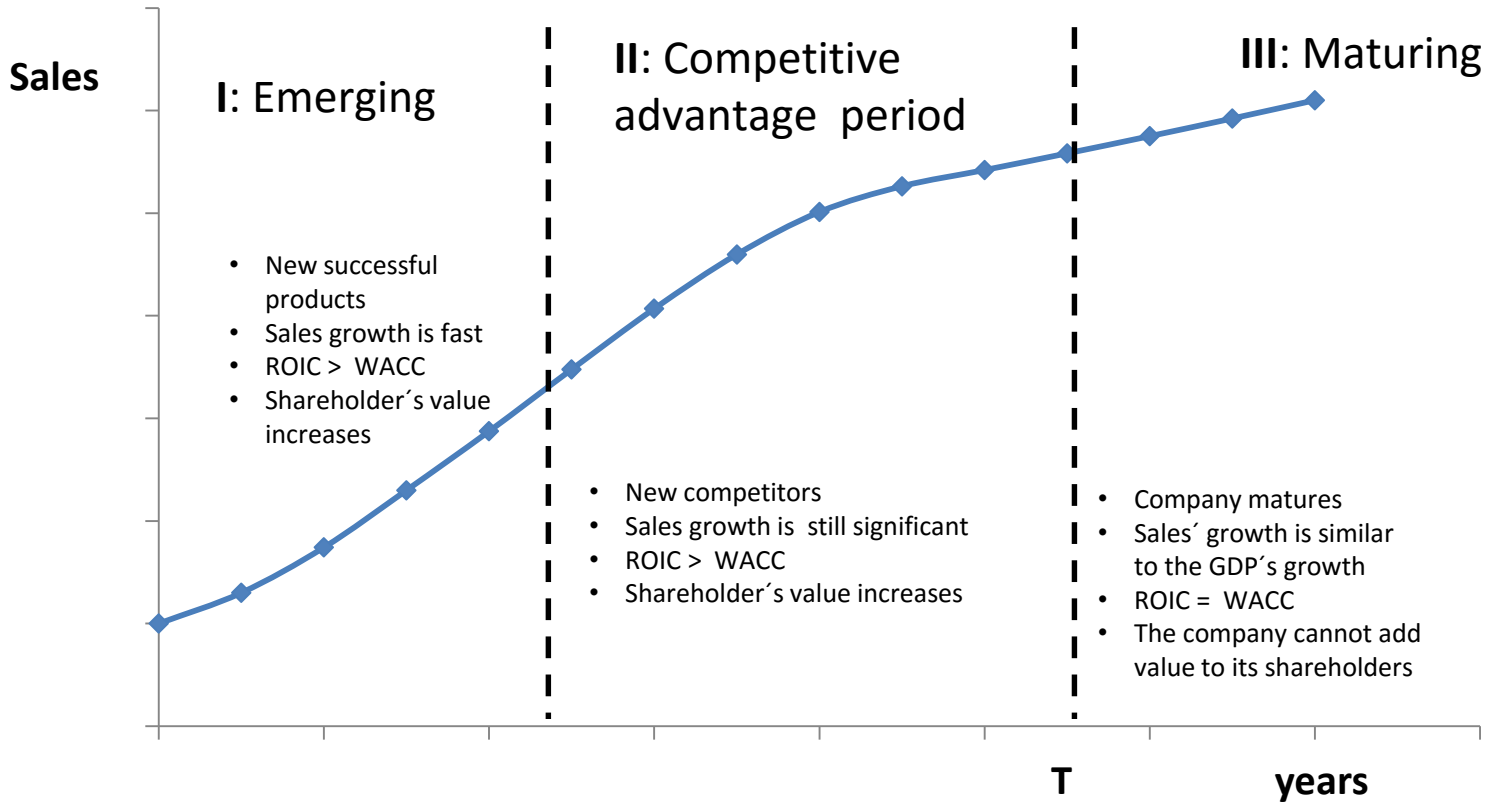
A rudimentary way of valuing a business is simply to take its balance sheet and subtract liabilities from assets to arrive at the equity value. However, this book value has little resemblance to the fair value of the company for at least three reasons:

1. Assets are recorded at historical costs, which may be much greater or much less than their present market values. The case of fixed assets is the typical example.

2. Balance sheet is vulnerable to accounting conventions. Different practices regarding inventory values and depreciation methods distort comparisons.

3. The firm´s ability to generate future profits and cash flows does not appear on the balance sheet.

INDUSTRY GROWTH PHASES



BALANCE SHEET SHORTCOMINGS: MEMORIAL COMPANY

"Memorial" is a mature company that has passed both the emerging and growth phases of industry growth. Now its growth is slower, near zero, so it does not need to invest in working capital and capex.
Because Memorial does not invest in itself, all net income is distributed as dividends...

Sales	100
Operative cost	(70)
Earning before taxes	30
Taxes (40%)	(12)
Net income	**18**

→ As all net income is distributed as dividends every year, Shareholder Equity never grows…

Assets	50	**S. Equity 50**

→ $S.\ Equity_1 = S.\ Equity_0 + Net\ income - Dividends$

Although Memorial is profitable, its equity capital remains unchanged; therefore, estimating the equity fair value using the balance sheet method is not a recommendable practice.

Main valuation methods

Discounted Cash flow

Free Cash Flow
Capital Cash Flow
Equity cash flow
Adjusted Present Value (APV)

These methods use different measures of cash flow but give identical values when cost of capital adjustments are performed.

Multiples

$$P/EBITDA = \frac{\text{Market capitalization}}{EBITDA}$$

$$EV/EBITDA = \frac{\text{Market cap. + D}}{EBITDA}$$

Comparable companies are first identified and once the EBITDA multiples of the sample were obtained, the mean of the peer group is multiplied by the current company´s EBITDA to obtain an estimation of the equity fair value.

CASE INTRODUCTION

"San Telmo" is a company that produces and sells plastic packaging products for other companies.

San Telmo is fully financed with equity capital (which means that it has no financial debt) . A company that has no financial debt is known as an "unlevered" company.

The business is settled in an emerging country, in which the average inflation rate is about 4% per year, and the average GDP growth rate is about 3% per year.

CASE INTRODUCTION

Balance sheet and income statement for the last two years are shown in the following figures:

Balance sheet	d 2010	d 2011
Cash	10	23
Accounts receivable	30	36
Inventories	20	24
Fixed Assets	45	49
Total assets	**105**	**132**
Accounts payable	20	25
Total liabilities	20	25
Shareholder´s Equity	85	107
Tot. liab. + S. Equity	**105**	**132**

Income statement	d 2010	d 2011
Sales	130	144
COGS	64	72
Gross margin	66	72
Adm. expenses	9	10
Comm. Expenses	11	12
EBIT	**46**	**50**
Income taxes	18	20
Net income	**28**	**30**

CASE INTRODUCTION

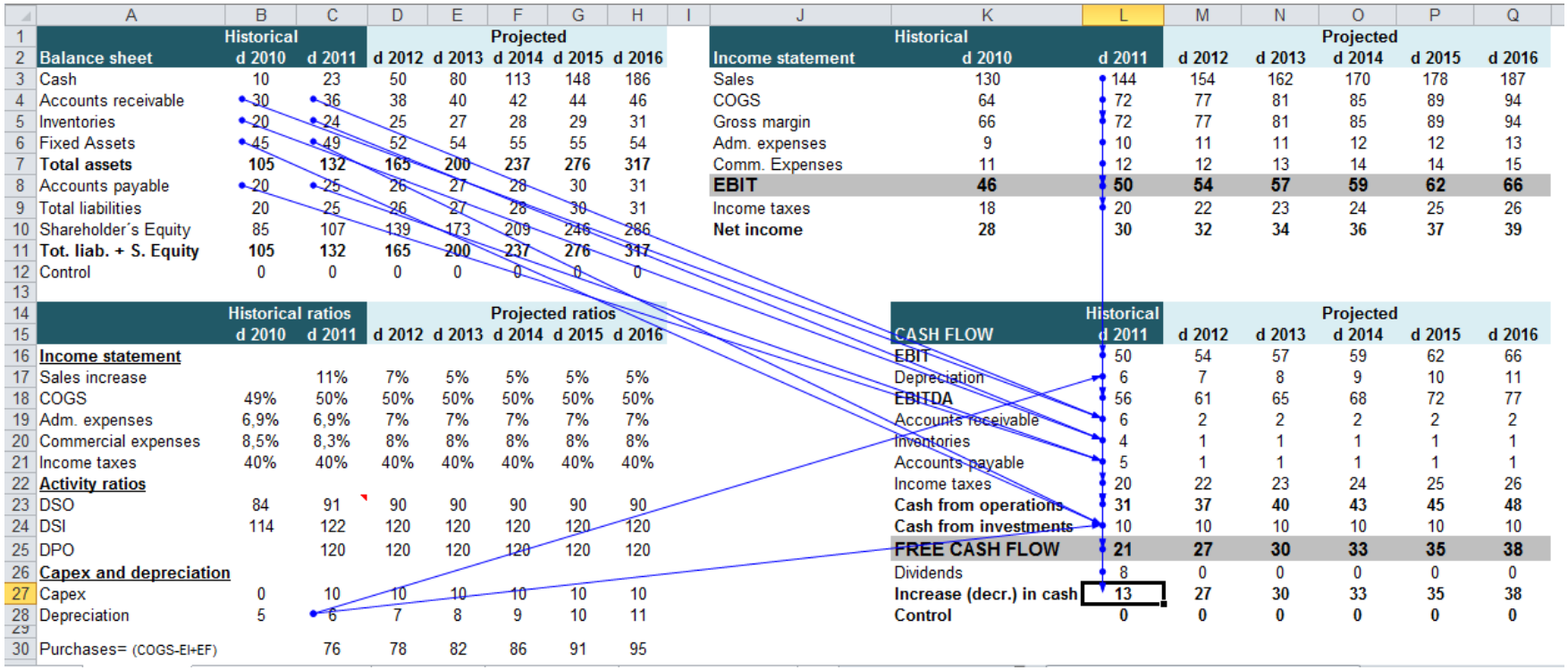
The case has two objectives:

1. To show how the cash balance changed from $10 million in 2010 to $23 million in 2011

Balance sheet	d 2010	d 2011
Cash	10 →	23
Accounts receivable	30	36
Inventories	20	24
Fixed Assets	45	49
Total assets	**105**	**132**
Accounts payable	20	25
Total liabilities	20	25
Shareholder´s Equity	85	107
Tot. liab. + Net worth	**105**	**132**

CASE INTRODUCTION

2. To forecast the free cash flow for the 2012-2016 period, taking into account the connections between Balance Sheet, Income Statement and Cash Flow Statement



	A	B	C	D	E	F	G	H
1		Historical		Projected				
2	**Balance sheet**	**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
3	Cash	10	23	50	80	113	148	186
4	Accounts receivable	30	36	38	40	42	44	46
5	Inventories	20	24	25	27	28	29	31
6	Fixed Assets	45	49	52	54	55	55	54
7	**Total assets**	**105**	**132**	**165**	**200**	**237**	**276**	**317**
8	Accounts payable	20	25	26	27	28	30	31
9	Total liabilities	20	25	26	27	28	30	31
10	Shareholder´s Equity	85	107	139	173	209	246	286
11	**Tot. liab. + S. Equity**	**105**	**132**	**165**	**200**	**237**	**276**	**317**
12	Control	0	0	0	0	0	0	0
13								
14		Historical ratios		Projected ratios				
15		**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
16	**Income statement**							
17	Sales increase		11%	7%	5%	5%	5%	5%
18	COGS	49%	50%	50%	50%	50%	50%	50%
19	Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%
20	Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%
21	Income taxes	40%	40%	40%	40%	40%	40%	40%
22	**Activity ratios**							
23	DSO	84	91	90	90	90	90	90
24	DSI	114	122	120	120	120	120	120
25	DPO		120	120	120	120	120	120
26	**Capex and depreciation**							
27	Capex	0	10	10	10	10	10	10
28	Depreciation	5	6	7	8	9	10	11
29								
30	Purchases= (COGS-EI+EF)		76	78	82	86	91	95

	J	K	L	M	N	O	P	Q
1		Historical		Projected				
2	**Income statement**	**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
3	Sales	130	144	154	162	170	178	187
4	COGS	64	72	77	81	85	89	94
5	Gross margin	66	72	77	81	85	89	94
6	Adm. expenses	9	10	11	11	12	12	13
7	Comm. Expenses	11	12	12	13	14	14	15
8	**EBIT**	**46**	**50**	**54**	**57**	**59**	**62**	**66**
9	Income taxes	18	20	22	23	24	25	26
10	**Net income**	**28**	**30**	**32**	**34**	**36**	**37**	**39**
11								
12								
13								
14		Historical		Projected				
15	**CASH FLOW**	**d 2011**		**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
16	**EBIT**	50		54	57	59	62	66
17	Depreciation	6		7	8	9	10	11
18	**EBITDA**	56		61	65	68	72	77
19	Accounts receivable	6		2	2	2	2	2
20	Inventories	4		1	1	1	1	1
21	Accounts payable	5		1	1	1	1	1
22	Income taxes	20		22	23	24	25	26
23	**Cash from operations**	**31**		**37**	**40**	**43**	**45**	**48**
24	**Cash from investments**	10		10	10	10	10	10
25	**FREE CASH FLOW**	**21**		**27**	**30**	**33**	**35**	**38**
26	Dividends	8		0	0	0	0	0
27	**Increase (decr.) in cash**	13		**27**	**30**	**33**	**35**	**38**
28	**Control**	**0**		**0**	**0**	**0**	**0**	**0**

First look at the income statement

Income statement	d 2010	d 2011
Sales	130	144
COGS	64	72
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Adm. expenses	9	10
Comm. Expenses	11	12
EBIT	**46**	**50**
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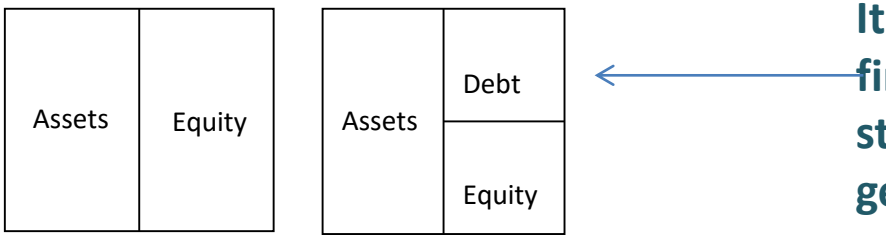
Net income	**28**	**30**

The purpose of Income Statement is to show whether the company made or lost money during a particular period.

Revenues, expenses and taxes are recognized (*) for a particular period, usually one year.

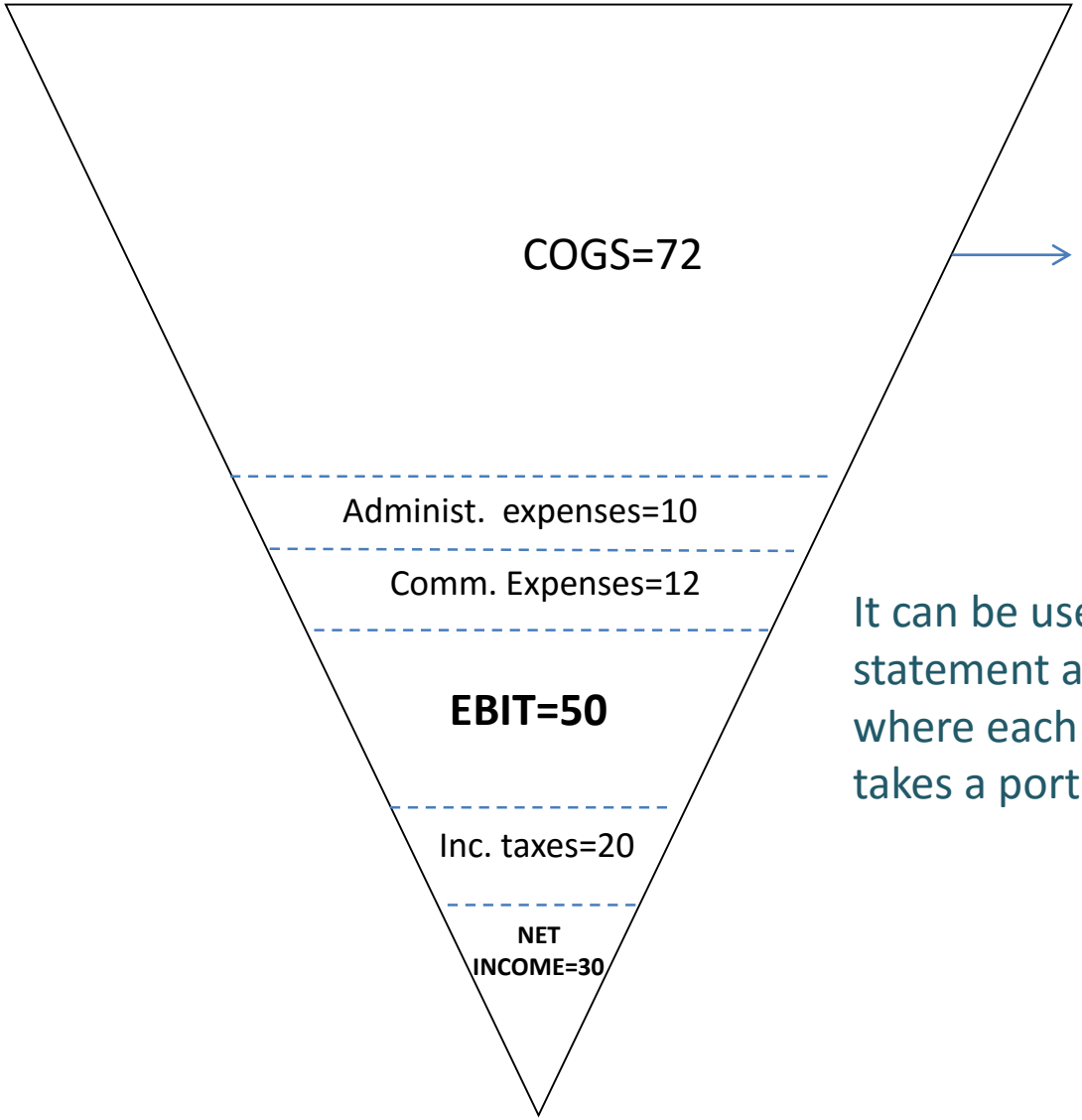
EBIT is one of the most important measures of profit, since it represents the profit generated by the business.



It does not matter how the company is financed, the EBIT does not change. Capital structure does not affect the EBIT. EBIT is generated by the company´s assets.

(*) "recognized" refers to the accrual practice convention.

First look at the income statement



Sales=144

(the sales amount represents the area of the triangle)

It can be useful to think of income statement as an inverted triangle where each operating expense takes a portion of the triangle.

WHAT IS DEPRECIATION?

Sales
COGS → Includes depreciation of fixed assets used to produce consumers goods (plant and machineries)
Gross Margin
Administrative expenses → Includes depreciation (maybe the depreciation of the desk used by the CEO)
Commercial expenses → Includes depreciation (maybe the depreciation of the truck used to deliver the company´s products)
EBIT
Income taxes
Net income

Depreciation is a non-cash expense that represents the recognition of the deterioration of the fixed assets due to the use and the course of time, but does not affect the company´s cash flow.

FIRST LOOK AT THE BALANCE SHEET

Balance sheet	d 2010	d 2011
Cash	10	23
Accounts receivable	30	36
Inventories	20	24
Fixed Assets	45	49
Total assets	**105**	**132**
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Total liabilities	20	25
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Tot. liab. + S. Equity	**105**	**132**

Additional data:

1. In 2011 San Telmo paid dividends totalling $8 million.
2. In 20011 Depreciation charge totalling 6 million.

Balance sheet summarizes a company´s assets, liabilities and shareholder´s equity at a specific point in time.

It gives us an idea about what the company owns and owes and the amount invested by the shareholders.

The balance sheet is more useful when:

1. There are some years of information
2. It is analyzed in tandem with the other financial statements (Income and Cash Flow statements

First look at the balance sheet – Fixed assets

- Fixed assets are recorded at the acquisition cost minus depreciations.
- A depreciation charge is reflected in two places: on the balance sheet and in the operative expenses, basically in the COGS.

- In 2011 fixed assets are composed by a building and a machine. The machine was acquired in 2011 for $ 10 million.
- Both are depreciated based on a straight line depreciation method.

Balance sheet	d 2010	d 2011
Cash	10	23
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Building	5
Machinery	1
Depreciation charge in 2011	6

Fixed assets balance at d 2011 is equal to the value at the beginning plus capex minus depreciation (45+10-6=49)

Since the majority of fixed assets may have been acquired several years ago, their book values would not reflect the value of these assets today. So, the value of fixed assets is usually understated relative to the value of the other assets.

ACCOUNTS RECEIVABLE, INVENTORIES AND ACCOUNTS PAYABLE

- **Usually, an increase in sales leads to an increase in inventories, accounts receivable and accounts payable.**
- A purchase of inventories means more accounts payable, since the company purchases inventories on credit.
- A sales increase usually means an increase in accounts receivable, since when the company sells its products it gives some days to their customers to pay the bills.

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THE STATEMENT OF SHAREHOLDER´S EQUITY

Shareholder´s Equity, or Equity, is usually defined as total assets minus total liabilities. Put another way, Equity is what is owned minus what is owed.

The Statement of Shareholder´s Equity details the changes within the equity section of the balance sheet during a period of time.

For example, the 2011 Equity of San Telmo is equal to the Equity at the beginning plus the net income minus dividends (plus stocks issuance, if there was any):

Shareholder´s Equity at December 2010	**85**
+ Net income December 2011	30
- Dividends paid in 2011	8
+ Stocks issuance	0
Shareholder´s Equity at December 2011	**107**

INFLOWS AND OUTFLOWS: RULES

INFLOW	OUTFLOW
Assets decrease	Assets increase
Liabilities increase	Liabilities decrease
Incomes or revenues	Expenses or losses
Stock issuance	Dividends

*"Any **decrease in assets, any increase in liabilities and income,** must be considered as an **inflow** (and vice versa)".*

Stock issuance is an inflow and dividends paid are an outflow, which are reflected directly in the statement of shareholder´s equity.

FREE CASH FLOW MODEL

CASH FLOW from OPERATIONS	EBIT (earnings before interest and taxes) + Depreciation & Amortization - Increase in accounts receivable - Increase in inventories + Increase in accounts payable - Income taxes	Changes in working capital
CASH FLOW from INVESTMENTS	- Capital expenditures (CAPEX)	
	FREE CASH FLOW	

CASH FLOW: HOW IS GENERATED

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Cash	10	23
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13

Income statement	d 2010	d 2011
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Gross margin	66	72
Adm. expenses	9	10
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EBIT	**46**	**50**
Income taxes	18	20
Net income	**28**	**30**

CASH FLOW	Dec 11
EBIT	50
Depreciation	6
EBITDA	56
Changes in accounts receivable	6
Changes in inventories	4
Changes in accounts payable	5
Income taxes	20
CASH FLOW FROM OPERATIONS	31
Capex	10
CASH FLOW FROM INVESTMENTS	10
FREE CASH FLOW	**21**
Dividends	8
Increase (decrease) in cash	13

EXERCISES

1. A purchase of inventories means (you have to choose the correct option):

a) An inflow, if the company purchases inventories on credit.

b) An inflow, if the company purchases inventories on cash.

c) An outflow, if the company pays on cash.

2. An increase in accounts payable means (you have to choose the correct option):

a) There is no cash effect, if the company pays the bill on cash.

b) A neutral effect on cash flow, if the increase in accounts payable is a consequence of an inventory´s purchase on credit.

c) An inflow, if the increase is a consequence of an inventory´s purchase on cash.

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c) An inflow, if the increase is a consequence of an inventory´s purchase on cash.

EXERCISES

1. An increase of fixed asset means (you have to choose the correct option):

a) An outflow, if the company purchases fixed assets on credit
b) There is no cash effect, if the company purchases fixed assets on cash
c) An outlow, if the company purchases fixed assets on cash

2. A decrease in accounts receivable always means (you have to choose the correct option):

a) An outlflow
b) There is no cash effect
c) An inflow, since a decrease in accounts receivable means that the company collected their sales

EXERCISES

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EXERCISES

San Temo´s sales grew 14 million in 2011. As a consequence, the company had to invest in working capital (accounts receivable, inventories and accounts payable).

a) How much was the net investment in working capital in 2011?
b) How much did the company have to invest in working capital per unit of increase in sales?

	Dec 11
Increase in sales	14
Changes in accounts receivable	6
Changes in inventories	4
Changes in accounts payable	5

SOLUTION

The net investment in working capital was of $5 million (6 million in accounts receivable, 4 million in inventories minus 5 million in account payables.

Since the company invested $5 million as a consequence of an increase in sales of $14 million, we can say that, for every dollar increase in sales, the company had to invest around 36 cents (5/14)

EXERCISES

Imagine that these operations took place on the last working day in December 2011:

a) San Telmo got a bank loan of $50 million.
b) San Telmo paid $20 million in accounts payable
c) San Temo collected $10 million in accounts receivable.

Show how these operations would modify the balance sheet and cash flow.

Balance sheet	d 2010	d 2011
Cash	10	23
Accounts receivable	30	36
Inventories	20	24
Fixed Assets	45	49
Total assets	**105**	**132**
Accounts payable	20	25
Total liabilities	20	25
Shareholder´s Equity	85	107
Tot. liab. + S. Equity	**105**	**132**

CASH FLOW: HOW IS GENERATED

Balance sheet	Historical d 2010	d 2011
Cash	10	63
Accounts receivable	30	26
Inventories	20	24
Fixed Assets	45	49
Total assets	**105**	**162**
Accounts payable	20	5
Bank debt		50
Total liabilities	20	55
Shareholder´s Equity	85	107
Tot. liab. + S. Equity	**105**	**162**
Control	0	0

Interest on debt is 0 (zero) because the company received the loan at the end of 2011 and no interests were accrued.

CASH FLOW	Dec 11
EBIT	50
Depreciation	6
EBITDA	56
Changes in accounts receivable	-4
Changes in inventories	4
Changes in accounts payable	-15
Income tax	20
CASH FLOW FROM OPERATIONS	21
Capex	-10
CASH FLOW FROM INVESTMENTS	10
FREE CASH FLOW	**11**
Bank debt	50
Interest on Bank debt	0
CASH FLOW FROM FINANCING	50
Dividends	8
Increase (decrease) in cash	53

Income vs. Cash Flow

While the historical net income is an *opinion* – among many - the *historical* cash flow is a *fact*.

It does not matter which accounting practices were used to make the financial statements, the historical cash flow is never affected by accounting practices or depreciation methods.

Suppose for an instant, that the inventory book value at the end of 2011 was distorted by an accounting convention and its value changed from 24 million to 34 million.

Does this situation modify the Free Cash Flow?

CASH FLOW: HOW IT IS GENERATED

Since COGS= $Inv._{BEG.}$ + Purchases – $Inv._{END}$, this practice leads to a lower COGS, which in turn leads to a higher EBIT.

Income statement	d 2011
Sales	144
COGS	62
Gross margin	82
Adm. expenses	10
Comm. Expenses	12
EBIT	**60**
Income taxes	20
Net income	**40**

CASH FLOW	Historical d 2011
EBIT	60
Depreciation	6
EBITDA	56
Accounts receivable	6
Inventories	14
Accounts payable	5
Income taxes	20
Cash from operations	**31**
Cash from investments	10
FREE CASH FLOW	**21**
Dividends	8
Increase (decrease) in cash	**13**

Balance sheet	d 2010	d 2011
Cash	10	23
Accounts receivable	30	36
Inventories	20	34
Fixed Assets	45	49
Total assets	**105**	**142**
Accounts payable	20	25
Total liabilities	20	25
Shareholder´s Equity	85	117
Tot. liab. + S. Equity	**105**	**142**

While EBIT increased $10 million (from 50 to 60) which means an inflow, this situation is compensated by an **increase in inventories of $10** million (from 4 to 14) which means an outflow.

Thus, the effect of the accounting convention on Free Cash Flow is null.

EXERCISES

1. Your have to organize the following items to explain the Statement of Shareolders´ Equity of Clank, a mexican company, for the year 2010.

Shareholders´ Equity 2009	93.866
Shareholders´ Equity 2010	110.571
Stock issuance	11.856
Net income	4.849

2. Using the following data, you have to demonstrate how much were the capital expenditures (capex) in 2011.

	dec-10	**dec-11**
Fixed assets	132.782	148.081
Depreciation & Amortization		13.072

SOLUTION

1.

Shareholders´Equity 2009	93.866
+ Stock issuance	11.856
+ Net income	4.849
Shareholders´Equity 2010	110.571

2.

	dec-11
Fixed assets at the end of 2011	148.081
+ Depreciation & Amortization	13.072
- Fixed assets at the end of 2010	132.782
Capital expenditures	**28.371**

EXERCISES

Suppose a company that in the year 2013 had:

- An EBITDA of $100
- An increase on accounts receivable of $30
- A decrease on inventories of $10
- A decrease on accounts payable of $20
- Income taxes were of $ 20
- Capital expenditures were of $ 50

a) How much is the cash flow from operations?
b) How much is the Free Cash Flow?

SOLUTION

a)

EBITDA	100
- Increase in accounts receivable	-30
+ Decrease in inventories	10
- Decrease in accounts payable	-20
- Income taxes	-20
Cash from operations	**40**

b)

Cash from operations	40
- CAPEX	50
Free Cash Flow	**(10)**

EXERCISES

1. You have to organize the following items to obtain the free cash flow for the year 2013:

	2012	2013
Income taxes	20	30
EBIT	80	90
Accounts payable	30	45
Inventories	32	48
Fixed assets	120	140
Depreciation	10	12
Accounts receivable	60	50
Other current assets	15	20
Other current liabilities	20	23

SOLUTION

	2013
EBIT	90
+ Depreciation	12
EBITDA	102
+ Decrease in accounts receivable	10
- Increase in inventories	16
+ Increase in accounts payable	15
- Increase in other current assets	5
+ Increase in other current liabilites	3
- Income taxes	30
Cash from operations	**79**
- Capex	32
Cash from investments	**32**
Free Cash Flow	**47**

FORECASTED FINANCIAL STATEMENTS: ASSUMPTIONS

Now that we have already understood the historical financial statements, it is time to forecast them. To do that, we need to design assumptions. The assumptions we use are critical to our cash flow forecasting.

The key rule is to base our assumptions on objective information. For example:

- Sales could be forecasted using a statistical method (for example, regression analysis)
- Operating expenses for next years could be based on past performance (either last year's performance or an average of years of performance)
- Working capital investment could be based on activity ratios (DSO, DSI, DAP observed on either last year´s performance or an average of years of performance)
- Fixed assets are related with sales volume, although this relation is not linear.

FINANCIAL STATEMENTS PROJECTION

Before designing the assumptions, it can be useful to consider the following points of reference:

Income statement

- Sales and GDP relationship
- COGS/sales
- Adm. Exp/sales
- Comm. Expenses/sales

Balance sheet

- DSO, DSI and DAP.
- Fixed assets and sales relationship: Capex/Sales ratio.

Income Statement always has to be forecasted first, since we´ll need the forecasted values of sales, COGS and purchases to project accounts receivable, inventories and accounts payable, respectively. And fixed assets also are related to sales, although this relation is not so linear as the other items.

INCOME STATEMENT PROJECTION

We can use some historical ratios as a reference point to design the assumptions.

	Historical ratios		Projected ratios				
	d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
Income statement							
Sales increase		11%	7%	5%	5%	5%	5%
COGS	49%	50%	50%	50%	50%	50%	50%
Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%
Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%
Income taxes	40%	40%	40%	40%	40%	40%	40%

To simplify the analysis, we forecast sales assuming a percentage increase for each year.

Later, we will explain a more scientific methodology known as regression analysis.

It seems reasonable to express operating expenses (COGS, administrative and commercial expenses) as a percentage of forecasted sales, since in the past they exhibited a stable relationship.

Income taxes: we will assume an effective tax rate of 40%.

FORECASTED INCOME STATEMENT: MECHANICS

The mechanics of Income Statement forecasting are quite simple.

First, we have to fill each cell of the assumption´s set with the input data.

Second, we have to write the formulas that include the input data.

Assumption´s set

		Historical ratios		Projected ratios				
		d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
	Income statement							
	Sales increase		11%	7%	5%	5%	5%	5%
	COGS	49%	50%	50%	50%	50%	50%	50%
	Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%
	Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%
	Income taxes	40%	40%	40%	40%	40%	40%	40%

+L3*(1+D17)

	J	K	L	M	N	O	P	Q
1		Historical				Projected		
2	**Income statement**	**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
3	Sales	130	144	154	162	170	178	187
4	COGS	64	72	77	81	85	89	94
5	Gross margin	66	72	77	81	85	89	94
6	Adm. expenses	9	10	11	11	12	12	13
7	Comm. Expenses	11	12	12	13	14	14	15
8	**EBIT**	**46**	**50**	**54**	**57**	**59**	**62**	**66**
9	Income taxes	18	20	22	23	24	25	26
10	**Net income**	**28**	**30**	**32**	**34**	**36**	**37**	**39**

This way gives us the posibility to modify later any input data and re-forecast the income statement (for example, if new information arrives and we want to introduce changes).

SALES FORECASTING

We assume at first glance that San Telmo´s sales will grow in 2012 at a rate around 7%, composed by the expected GDP growth rate and the expected average inflation rate:

$$Sales_{2012}=Sales_{2011}\ [(1+growth\ rate_{2012})(1+inflation\ rate_{2012})]$$

We will assume a GDP growth of 4% and an inflation rate of 3% in 2012, which leads to a growth rate around 7%:

$$144(1+0.04)(1.03)=154.25$$

SALES FORECASTING

Then we can assume that the growth will be a little lower in 2013 and beyond, about 5% per year, based on an lower expected inflation rate:

Year	**Sales**	
2012	154.25	
2013	161.78	(year 2012 x 1.05)
2014	169.87	(year 2013 x 1.05)
2015	178.37	(year x 1.05)
2016	187.29	(year x 1.05)

SALES FORECASTING: REGRESSION ANALYSIS

- A more scientific methodology to forecast sales is a statistical method known as Regression Analysis. Econometrics has become strongly identified with Regression Analysis. This relates a dependent variable to one or more independent variables.

- In Valuation, regression analysis is used mainly to establish a relationship between GDP (which takes the role of independent variable) and company´s sales (which take the role of dependent variable).

- **The hypothesis is that when the GDP grows, sales also grow, and vice-versa.**

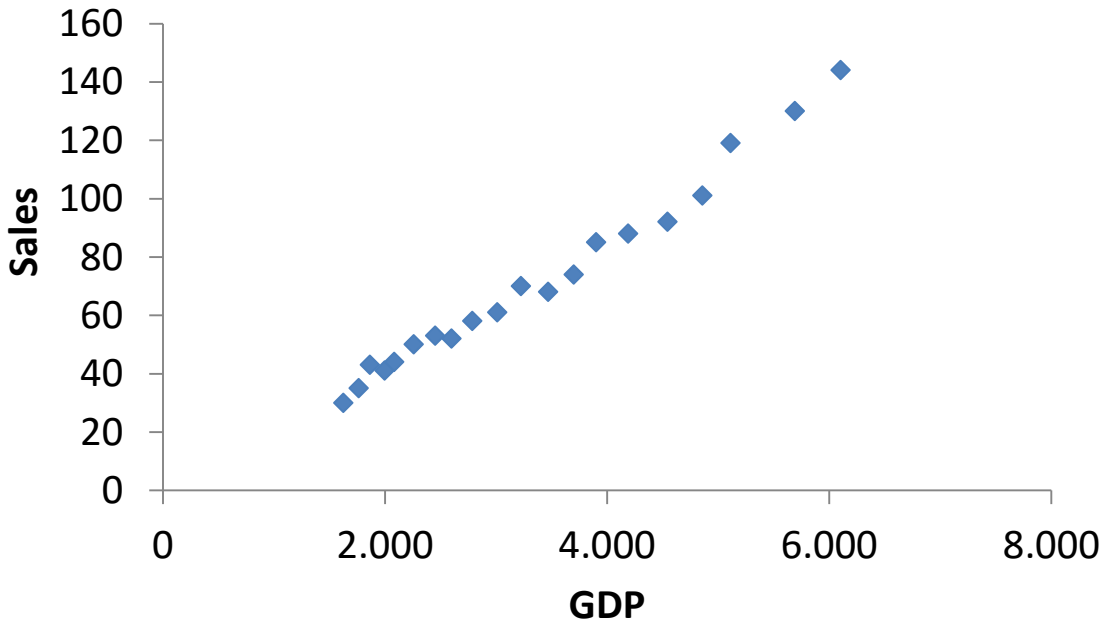
SALES FORECASTING: REGRESSION ANALYSIS

Table1. GDP and San Telmo´s sales

Year	GDP	Sales
1992	1.624	30
1993	1.760	35
1994	1.862	43
1995	1.995	41
1996	2.080	44
1997	2.256	50
1998	2.450	53
1999	2.598	52
2000	2.784	58
2001	3.010	61
2002	3.224	70
2003	3.467	68
2004	3.698	74
2005	3.900	85
2006	4.187	88
2007	4.541	92
2008	4.857	101
2009	5.111	119
2010	5.690	130
2011	6.100	144

Table 1 reports the GDP and San Telmo´s sales for the 1992-2011 period (figures in millions of dollars).

If we draw a scatter diagram, it seems that there is a linear relationship between GDP (X) and Sales (Y)...

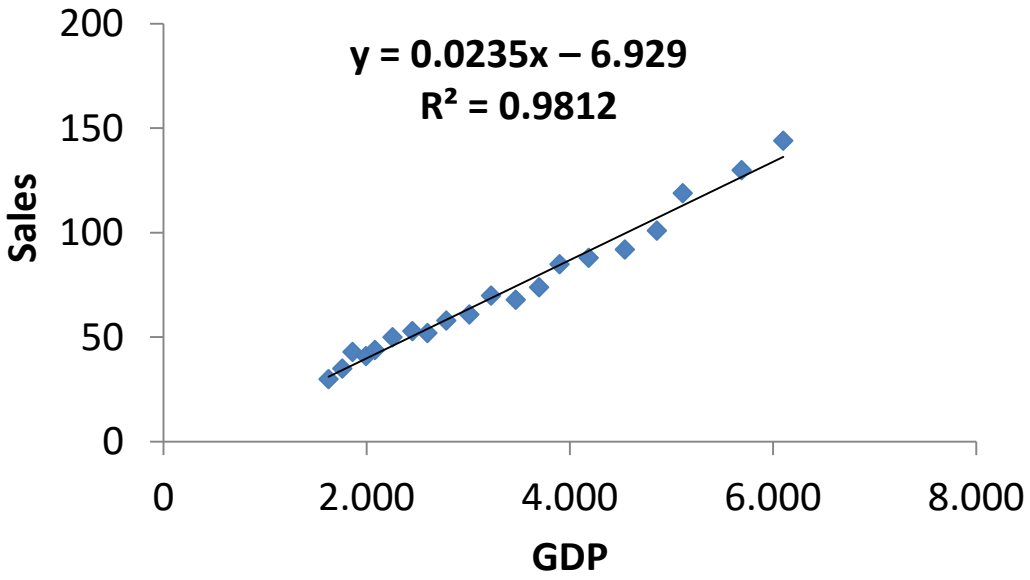


SALES FORECASTING: STEPS IN REGRESSION ANALYSIS

1. Select the sample of XY observations, then choose “dispersion” in the graph Excel menu.

2. We left-click in one point of the graph and then right-click and choose “Add Trendline”.

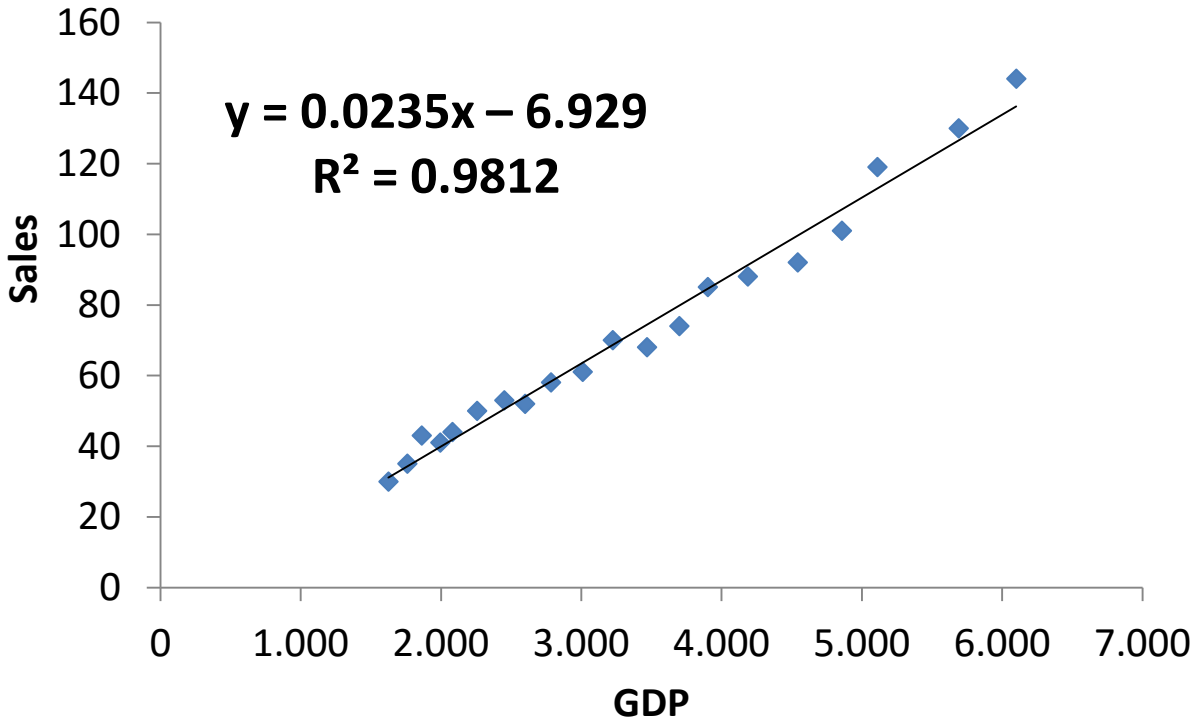
3. We must check “Linear”, “Display equation on chart” and “Display the R-squared value on chart”.



SALES FORECASTING: STEPS IN REGRESSION ANALYSIS

Excel uses the OLS method which is a technique for fitting the "best" straight line to the sample of XY observations. It involves minimizing the sum of the squared (vertical) deviations of points from the fitting value (fitting values are the values on the line).

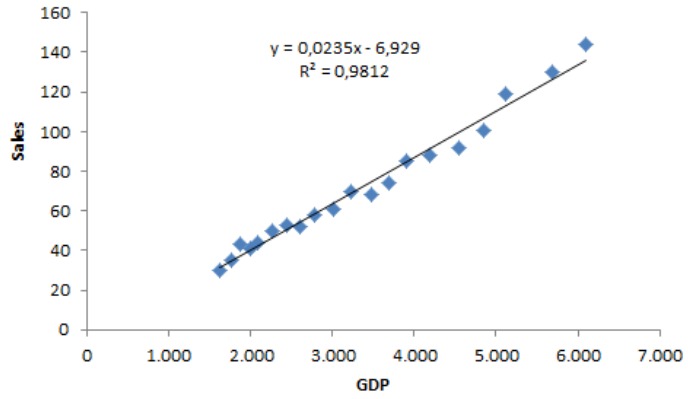
Since "x" in the equation represents the value of GDP, we need a GDP forecast first…



SALES FORECASTING: STEPS IN REGRESSION ANALYSIS

1. We can estimate the value of GDP using the forecasted growth rate estimated by the World Bank or an economic researcher.

	A	B	C	D	E	F	G
1							
2	**Year**	**GDP**	**Sales**				
3	1992	1.624	30				
4	1993	1.760	35				
5	1994	1.862	43				
6	1995	1.995	41				
7	1996	2.080	44				
8	1997	2.256	50				
9	1998	2.450	53				
10	1999	2.598	52				
11	2000	2.784	58				
12	2001	3.010	61				
13	2002	3.224	70				
14	2003	3.467	68				
15	2004	3.698	74				
16	2005	3.900	85				
17	2006	4.187	88				
18	2007	4.541	92				
19	2008	4.857	101				
20	2009	5.111	119			Expected inflation rate	4%
21	2010	5.690	130	-->	+B22*(1+$G$22)	Expected GDP growth rate	3%
22	2011	6.100	144			Expected GDP growth rate (nominal)	7,1%
23	2012	6.534	147	-->	+$G$24+B23*$G$25		
24	2013	7.000	158			Alfa (inteception)	-6,929
25	2014	7.498	169			Beta (slope)	0,0235
26	2015	8.032	182				
27	2016	8.604	195				



2. Once the GDP was forecasted in column B, the sales are forecasted using the linear regression equation **y=0,0235 x -6,929** in the range C23:C27

EXERCISES

Table2. Consumption and disposable income

X	Y
114	102
118	106
126	108
130	110
136	122
140	124
148	128
156	130
160	142
164	148
170	150
178	154

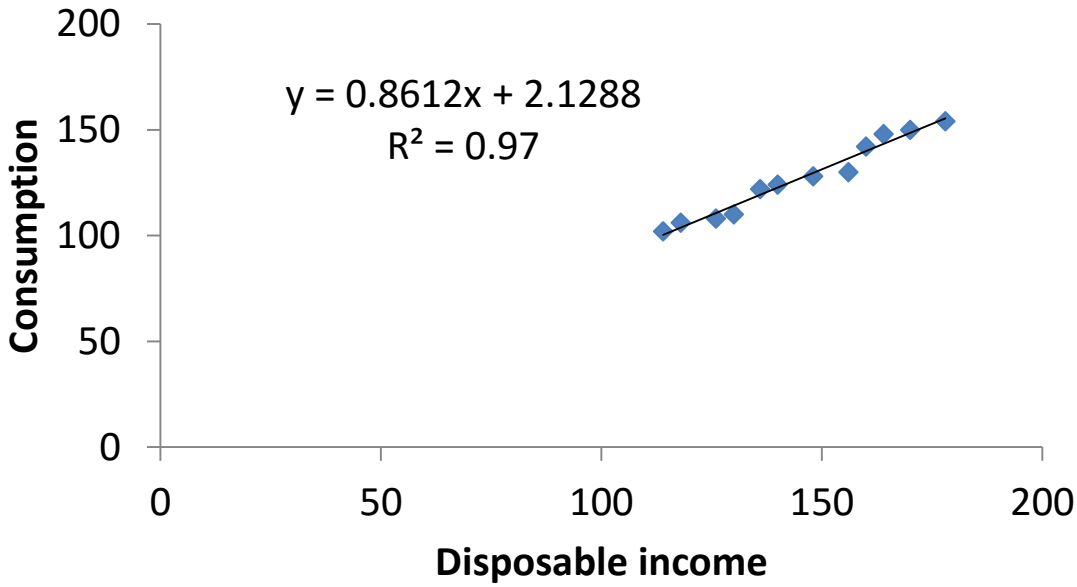
Table 2 reports the consumption (Y) and disposable income (X). Draw a scatter diagram and determine by inspection if there is an approximate linear relationship between Y and X.

Then, find the value of the interception and the slope.

With reference to the estimated OLS regression line, state the meaning of the interception and the meaning of the slope.

SOLUTION

X	Y
114	102
118	106
126	108
130	110
136	122
140	124
148	128
156	130
160	142
164	148
170	150
178	154



- The interception of 2.12 means that for a disposable income of zero, the compsumption would be of 2.12
- The slope of 0.86 means for each increment of 1 in the disposable income, the compsumption will increase 0.86
- A R^2 of 0.97 means that 97% of the change in compsumption is explained by the change in disposable income.

BALANCE SHEET FORECASTING

Once income statement has been forecasted, the following step is to forecast the balance sheet.

Again, we can use some historical ratios as a reference point to design the assumptions to forecast the balance sheet.

Although there is no precise order, it is suggested to start forecasting fixed assets and Equity, and then continue with the spontaneous assets and liabilities (accounts receivable, inventories and accounts payable).

STATEMENT OF THE SHAREHOLDERS´EQUITY

The forecasted Shareholders´equity is equal to the book value on the previous year plus the forecasted net income:

	Historical		Projected				
Income statement	**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
Net income	**28**	**30**	**32**	**34**	**36**	**37**	**39**

	Historical		Projected				
Balance sheet	**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**
Shareholder´s Equity	85	107	139	173	209	246	286
			107+32	139+34	173+36	209+37	246+39

Notice that we not include dividends in our projections. According to the corporate finance theory, is assumed that all free cash flow is distributed as dividends.

Corporate Finance Theory: Potential dividends

We assume that the forecasted free cash flow is the available cash flow that can be paid as dividends to equity holders. But they are not the actual dividends that were forecasted to be paid. Actually, only a part of net income after taxes can be paid as dividends to equity holders. But this doesn't mean that this cash flow is not property of the equity holders.

We are handling the problem considering the difference as "*marketable securities*", because investments in marketable securities have zero net present value and there is no effect on the value of the company.

Therefore, marketable securities are a part of cash flow to equity, and also disbursed to shareholders in the year it is acquired.

BALANCE SHEET PROJECTION: FIXED ASSETS

	A	B	C	D	E	F	G	H
1		Historical		Projected				
2	Balance sheet	d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
6	Fixed Assets	45	49	52	54	55	55	54
13								
14		Historical ratios		Projected ratios				
15		d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
26	Capex and depreciation							
27	Capex	0	10	10	10	10	10	10
28	Depreciation	5	6	7	8	9	10	11

The depreciation charge will increase $1 million per year, since each machine costs $10 million and it will be depreciated based on straight line depreciation method, supposing a useful life of 10 years (10/10=1)

Although plant and machines don´t change every time the sales increase, capex projections must be consistent with sales forecasting.

While a sales increase attributable to price requires no additional capacity, a sales increase attributable to volume increase does. We assume that San Telmo will need to acquire one machine per year to support the increase in volume (here we assume that for each increase of 3% in volume, an additional machine is required).

	Historical		Projected				
Income statement	d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
Sales	130	144	154	162	170	178	187

ACCOUNTS RECEIVABLE, INVENTORIES AND ACCOUNTS PAYABLE

We use the following formulas to examine the historical performance:

$$\text{DSO} = \frac{\text{Accounts receivable}}{\text{Sales}} \times 365$$

$$\text{DSI} = \frac{\text{Inventories}}{\text{COGS}} \times 365$$

$$\text{DAP} = \frac{\text{Accounts payable}}{\text{Purchases}} \times 365$$

Rearranging terms we obtain the formulas to forecast AR,Inventories and AP:

$$\text{Accounts receivable} = \frac{\text{DSO}}{365} \times \text{Sales}$$

$$\text{Inventories} = \frac{\text{DSI}}{365} \times \text{COGS}$$

$$\text{Accounts payable} = \frac{\text{DAP}}{365} \times \text{Purchases}$$

ACCOUNTS RECEIVABLES, DSO ANALYSIS AND FORECASTING

$$DSO = \frac{\text{Accounts receivable}}{\text{Sales}} \times 365$$ ← **Formula to calculate DSO**

$$DSO\ 2010 = \frac{30}{130} \times 365 = 84.2$$

$$DSO\ 2011 = \frac{36}{144} \times 365 = 91.2$$

We calculate first the DSO for 2010 and 2011…

$$\text{Accounts receivable} = \frac{DSO}{365} \times \text{Sales}$$ ← **Formula to forecast accounts receivables**

Since the historicals DSO were around 90 days, we will assume 90 days as a DSO for 2012 and beyond…

$$\text{Accounts receivable}\ 2012 = \frac{90}{365} \times 154 = 38$$

Forecasted sales 2012

INVENTORIES, DSI ANALYSIS AND FORECASTING

$$DSI = \frac{Inventories}{COGS} \times 365$$

← **Formula to calculate DSO**

$$DSI = \frac{20}{64} \times 365 = 114$$

$$DSI = \frac{24}{72} \times 365 = 121.6$$

We calculate first the DSO for 2010 and 2011…

$$Inventories = \frac{DSI}{365} \times COGS$$

← **Formula to forecast inventories**

Since the historicals DSI were around 120 days, we will assume 120 days as a DSI for 2012 and beyond…

$$Inventories = \frac{120}{365} \times 77 = 25$$

Forecasted COGS 2012

ACCOUNTS PAYABLE, DAP ANALYSIS AND FORECASTING

$$DAP = \frac{\text{Accounts payable}}{\text{Purchases}} \times 365$$

$$DAP = \frac{25}{76} \times 365 = 120$$

In order to obtain the DAP ratio we have to calculate purchases first, using the the formula of COGS and rearranging terms.

Since COGS= Inv_1 + Purchases – Inv_2
Then Purchases= COGS- Inv_1 +Inv_2

You notice that only one DAP historical ratio is calculated. This is because we need the inventory value at the beginning and we have only two fiscal years of information.

Formula to forecast accounts payables

$$\text{Accounts payable} = \frac{DAP}{365} \times \text{Purchases}$$

Since the historicals DAP was around 120 days, we will assume 120 days as a DAP for 2012 and beyond…

$$\text{Accounts payable} = \frac{120}{365} \times 78 = 26$$

Forecasted Purchases 2012

ASSUMPTIONS

After filling the cells with the data assumptions, we have to write the formulas in each cell of the balance sheet for fixed assets, accounts receivable, inventories and accounts payable.

	Historical ratios		Projected ratios				
	d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
Income statement							
Sales increase		11%	7%	5%	5%	5%	5%
COGS	49%	50%	50%	50%	50%	50%	50%
Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%
Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%
Income taxes	40%	40%	40%	40%	40%	40%	40%
Activity ratios							
DSO	84	91	90	90	90	90	90
DSI	114	122	120	120	120	120	120
DPO		120	120	120	120	120	120
Capex and depreciation							
Capex	0	10	10	10	10	10	10
Depreciation	5	6	7	8	9	10	11

FORECASTED BALANCE SHEET

	2010	2011	**2012**
Cash	10	23	¿?
Accounts receivable	30	36	38
Inventories	20	24	25
Fixed assets	45	49	52
Total assets	105	132	
Accounts payable	20	25	26
Total liabilities	70	75	26
Shareholder´s Equity	35	57	139
Total liab. + S. Equity	105	132	165

Cash 2011 + increase (decrease) in cash

$$\frac{DSO}{365} \times Sales_{2012}$$

$$\frac{DSI}{365} \times COGS_{2012}$$

$FA_{2011} + Capex_{2011} - deprec._{2011}$

$$\frac{DAP}{365} \times Purchases_{2012}$$

$Equity_{2011} + Net\ income_{2012}$

FORECASTED CASH FLOW

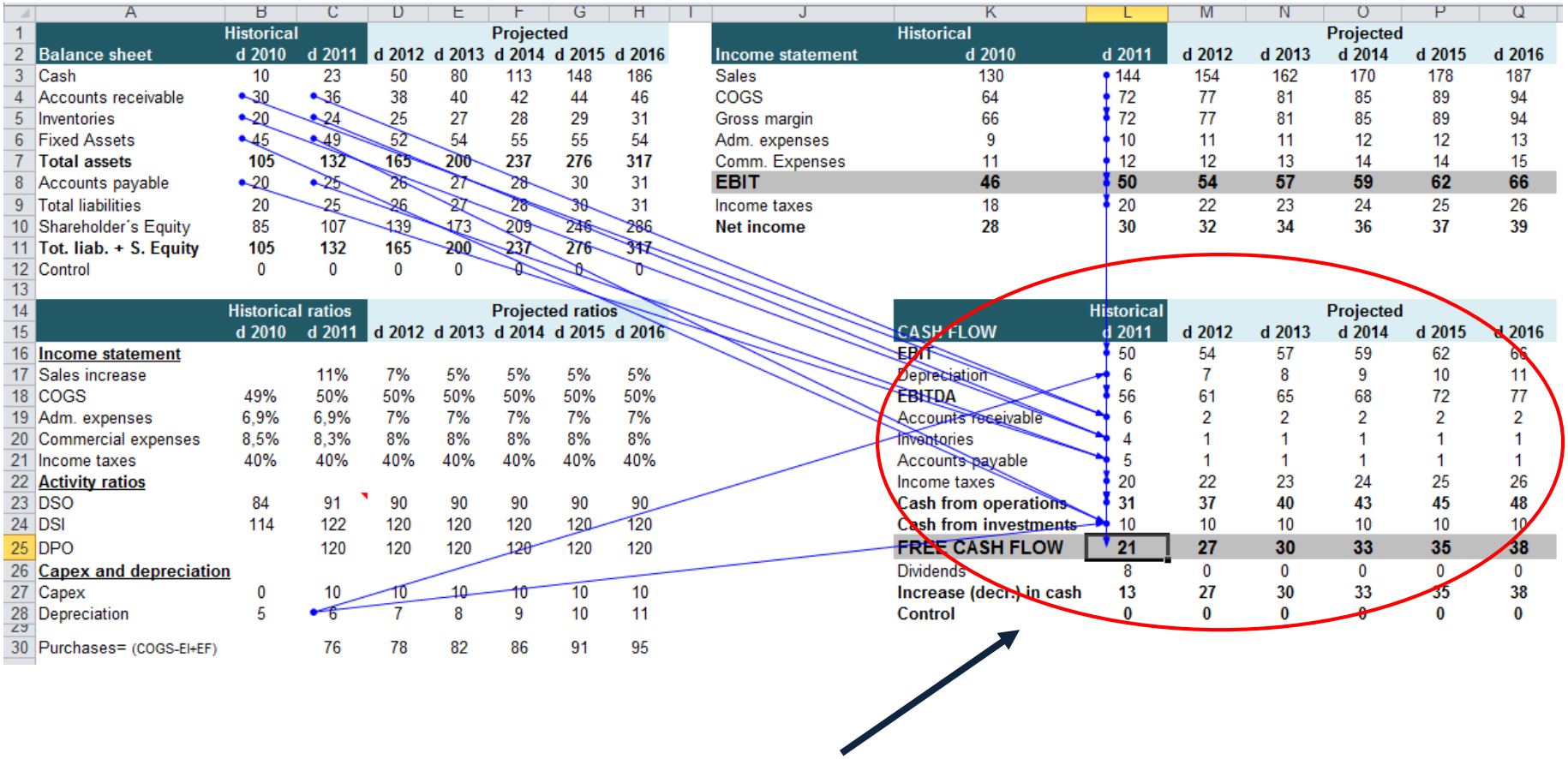
Since the historical cash flow of 2011 contains formulas in each cell, we can copy and paste these formulas for the year 2012, and adding the increase in cash of 27 million to the cash at the beginning, we have a cash balance of 50 in 2012

	A	B	C	D
1		Historical		
2	**Balance sheet**	**d 2010**	**d 2011**	**d 2012**
3	Cash	10	23	50
4	Accounts receivable	30	36	38
5	Inventories	20	24	25
6	Fixed Assets	45	49	52
7	**Total assets**	**105**	**132**	**165**
8	Accounts payable	20	25	26
9	Total liabilities	20	25	26
10	Shareholder´s Equity	85	107	139
11	**Tot. liab. + S. Equity**	**105**	**132**	**165**
12	Control	0	0	0
13				
14		Historical ratios		
15		**d 2010**	**d 2011**	**d 2012**
16	**Income statement**			
17	Sales increase		11%	7%
18	COGS	49%	50%	50%
19	Adm. expenses	6,9%	6,9%	7%
20	Commercial expenses	8,5%	8,3%	8%
21	Income taxes	40%	40%	40%
22	**Activity ratios**			
23	DSO	84	91	90
24	DSI	114	122	120
25	DPO		120	120
26	**Capex and depreciation**			
27	Capex	0	10	10
28	Depreciation	5	6	7
29				
30	Purchases= (COGS-EI+EF)		76	78

	J	K	L	M
1		Historical		
2	**Income statement**	**d 2010**	**d 2011**	**d 2012**
3	Sales	130	144	154
4	COGS	64	72	77
5	Gross margin	66	72	77
6	Adm. expenses	9	10	11
7	Comm. Expenses	11	12	12
8	**EBIT**	**46**	**50**	**54**
9	Income taxes	18	20	22
10	**Net income**	**28**	**30**	**32**

		Historical	
	CASH FLOW	**d 2011**	**d 2012**
	EBIT	50	54
	Depreciation	6	7
	EBITDA	56	61
	Accounts receivable	6	2
	Inventories	4	1
	Accounts payable	5	1
	Income taxes	20	22
	Cash from operations	**31**	**37**
	Cash from investments	10	10
	FREE CASH FLOW	**21**	**27**
	Dividends	8	0
	Increase (decr.) in cash	**13**	**27**
	Control	**0**	**0**

FORECASTED CASH FLOW



Balance sheet	Historical d 2010	Historical d 2011	Projected d 2012	Projected d 2013	Projected d 2014	Projected d 2015	Projected d 2016
Cash	10	23	50	80	113	148	186
Accounts receivable	30	36	38	40	42	44	46
Inventories	20	24	25	27	28	29	31
Fixed Assets	45	49	52	54	55	55	54
Total assets	**105**	**132**	**165**	**200**	**237**	**276**	**317**
Accounts payable	20	25	26	27	28	30	31
Total liabilities	20	25	26	27	28	30	31
Shareholder´s Equity	85	107	139	173	209	246	286
Tot. liab. + S. Equity	**105**	**132**	**165**	**200**	**237**	**276**	**317**
Control	0	0	0	0	0	0	0

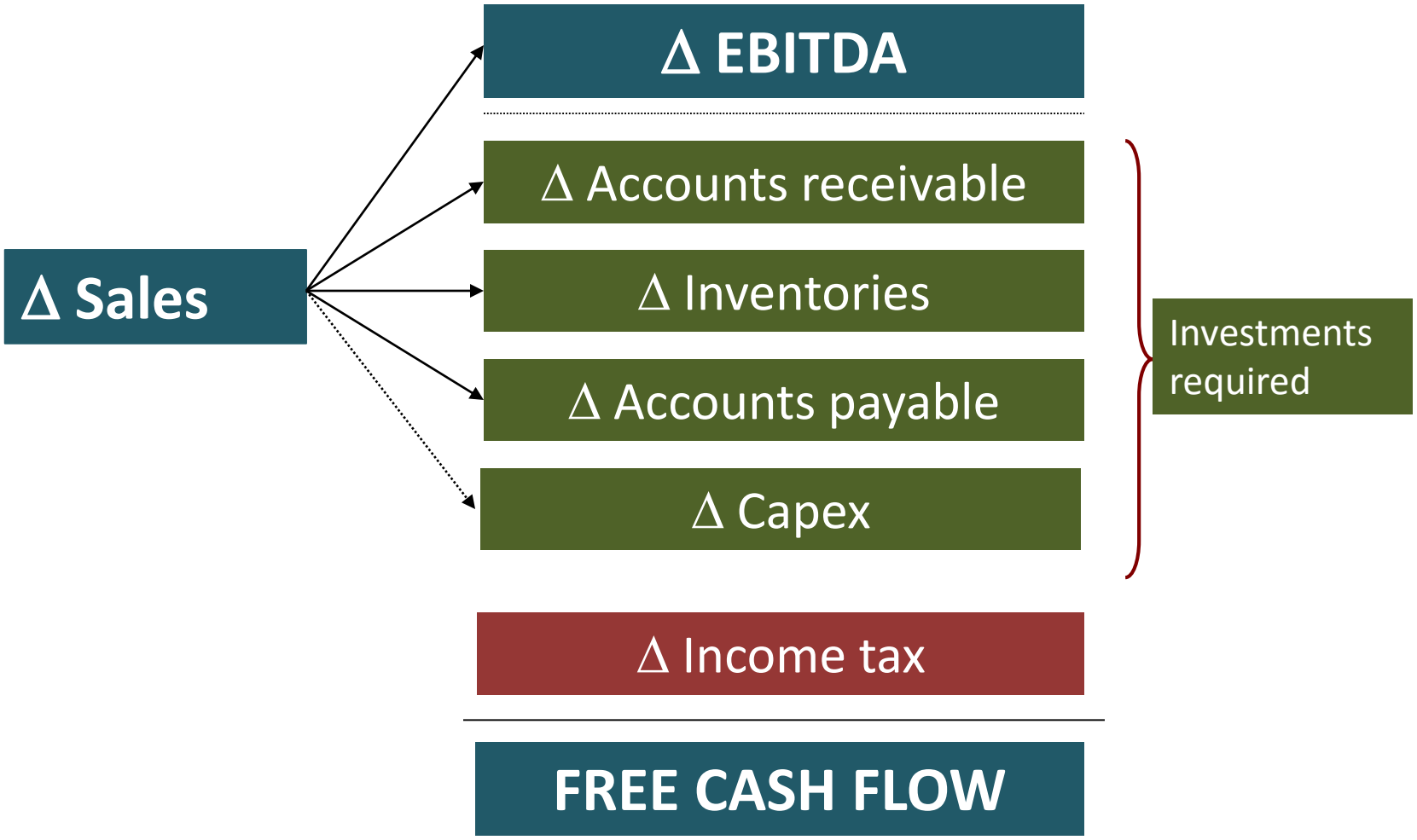
Income statement	Historical d 2010	Historical d 2011	Projected d 2012	Projected d 2013	Projected d 2014	Projected d 2015	Projected d 2016
Sales	130	144	154	162	170	178	187
COGS	64	72	77	81	85	89	94
Gross margin	66	72	77	81	85	89	94
Adm. expenses	9	10	11	11	12	12	13
Comm. Expenses	11	12	12	13	14	14	15
EBIT	**46**	**50**	**54**	**57**	**59**	**62**	**66**
Income taxes	18	20	22	23	24	25	26
Net income	**28**	**30**	**32**	**34**	**36**	**37**	**39**

	Historical ratios d 2010	Historical ratios d 2011	Projected ratios d 2012	Projected ratios d 2013	Projected ratios d 2014	Projected ratios d 2015	Projected ratios d 2016
Income statement							
Sales increase		11%	7%	5%	5%	5%	5%
COGS	49%	50%	50%	50%	50%	50%	50%
Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%
Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%
Income taxes	40%	40%	40%	40%	40%	40%	40%
Activity ratios							
DSO	84	91	90	90	90	90	90
DSI	114	122	120	120	120	120	120
DPO		120	120	120	120	120	120
Capex and depreciation							
Capex	0	10	10	10	10	10	10
Depreciation	5	6	7	8	9	10	11
Purchases= (COGS-EI+EF)		76	78	82	86	91	95

CASH FLOW	Historical d 2011	Projected d 2012	Projected d 2013	Projected d 2014	Projected d 2015	Projected d 2016
EBIT	50	54	57	59	62	66
Depreciation	6	7	8	9	10	11
EBITDA	56	61	65	68	72	77
Accounts receivable	6	2	2	2	2	2
Inventories	4	1	1	1	1	1
Accounts payable	5	1	1	1	1	1
Income taxes	20	22	23	24	25	26
Cash from operations	**31**	**37**	**40**	**43**	**45**	**48**
Cash from investments	10	10	10	10	10	10
FREE CASH FLOW	**21**	**27**	**30**	**33**	**35**	**38**
Dividends	8	0	0	0	0	0
Increase (decr.) in cash	**13**	**27**	**30**	**33**	**35**	**38**
Control	**0**	**0**	**0**	**0**	**0**	**0**

Cash flow always must be forecasted taking into account the connections between assumptions, balance sheet and income statement…

DO NO FORGET: AN INCREASE IN SALES MEANS INVESTMENTS



EXERCISES

Write one suitable word in each space:

Cash flow from operations is equal to EBIT plus……., minus an ……in accounts receivable and an ……in inventories, plus an ……in accounts payable minus……taxes.

The Company´s Free Cash Flow is equal to the Cash Flow from……minus cash from…….

Finally, the cash balance at the end is equal to the cash balance at……plus the……in cash.

EXERCISES

Write one suitable word in each space:

Cash flow from operations is equal to EBIT plus *depreciation and amortization*, minus an *increase* in accounts receivable and an *increase* in inventories, plus an *increase* in accounts payable minus *income* taxes.

The Company´s Free Cash Flow is equal to the Cash Flow from *operations* minus cash from *investments.*

Finally, the cash balance at the end is equal to the cash balance at *the beginning* plus the *increase/decrease* in cash.

EXERCISES

1. Some people believe that EBITDA is sometimes an approximate measure of the company´s cash flow.

What are the differences between EBITDA and Free Cash Flow in the case of San Telmo in 2013?

Show and explain the differences using only four concepts: EBITDA, working capital investment, capex and income taxes.

SOLUTION: EBITDA AND FREE CASH FLOW

The differences between EBITDA and the free cash flow are the net investments (working capital and CAPEX) and income taxes

CASH FLOW	Historical d 2011	d 2012
EBIT	50	54
Depreciation	6	7
EBITDA	56	61
Accounts receivable	6	2
Inventories	4	1
Accounts payable	5	1
Income taxes	20	22
Cash from operations	**31**	**37**
Cash from investments	10	10
FREE CASH FLOW	**21**	**27**
Dividends	8	0
Increase (decr.) in cash	**13**	**27**

EBITDA	61
Working capital invest.	2
Capex	10
Income taxes	22
FREE CASH FLOW	27

EXERCISES

2. Suppose an increase of 100% in San Telmo´s sales for 2013 and explain the changes in EBITDA, working capital investment and income taxes.

In addition, assume that the company will have to invest $40 in fixed assets. Compare these changes with the previous sales forecasting.

How much was the *net* investment of San Telmo in 2013?

SOLUTION

CASH FLOW	d 2012
EBIT	54
Depreciation	7
EBITDA	61
Accounts receivable	2
Inventories	1
Accounts payable	1
Income taxes	22
Cash from operations	**37**
Cash from investments	10
FREE CASH FLOW	**27**
Dividends	0
Increase (decr.) in cash	**27**

Differences:

+50
+33
+22
+29
+18
+30
25

CASH FLOW	d 2012
EBIT	101
Depreciation	10
EBITDA	111
Accounts receivable	35
Inventories	23
Accounts payable	30
Income taxes	40
Cash from operations	**42**
Cash from investments	40
FREE CASH FLOW	**2**
Dividends	0
Increase (decr.) in cash	**2**

While EBITDA increased by $50, the working capital investment increased by $26 (55-29), capex increased by $30 and income taxes increased by $18.

So, the net effect on the Free Cash Flow was -$25 in comparison with the original projection…

EXERCISES

1. Re-forecast the income statement, balance sheet and cash flow for the year 2012 (by hand) using the following assumptions:

	Historical ratios d 2010	d 2011	d 2012
Income statement			
Sales increase		11%	40%
COGS	49%	50%	52%
Adm. expenses	6,9%	6,9%	7%
Commercial expenses	8,5%	8,3%	8%
Income taxes	40%	40%	40%
Activity ratios			
DSO	84	91	90
DSI	114	122	120
DPO		120	120
Capex and depreciation			
Capex	0	10	10
Depreciation	5	6	7
Purchases= (COGS-EI+EF)		76	115

EXERCISES

Perform a sensitity analysis using the Excel function “Table” in order to determine how sensitive is the free cash flow to changes in:

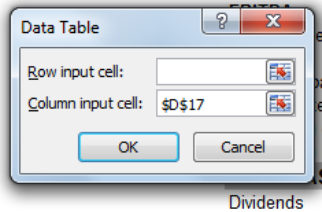
a) Sales increase of -20%, 0% and 20%

b) Sales increase of -20%, 0% and 20% and simultaneously DSO values of 30, 60 and 90 days (you have to use the function Tables considering “cell row” and “cell column”

SOLUTION

a) Free Cash Flow sensitivity to a change in sales

		Historical ratios		Projected ratios				
		d 2010	d 2011	d 2012	d 2013	d 2014	d 2015	d 2016
Income statement								
	Sales increase		11%	7%	5%	5%	5%	5%
	COGS	49%	50%	50%	50%	50%	50%	50%
	Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%
	Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%
	Income taxes	40%	40%	40%	40%	40%	40%	40%
Activity ratios								
	DSO	84	91	90	90	90	90	90
	DSI	114	122	120	120	120	120	120
	DPO		120	120	120	120	120	120
Capex and depreciation								
	Capex	0	10	10	10	10	10	10
	Depreciation	5	6	7	8	9	10	11
	Purchases= (COGS-EI+EF)		76	78	82	86	91	95



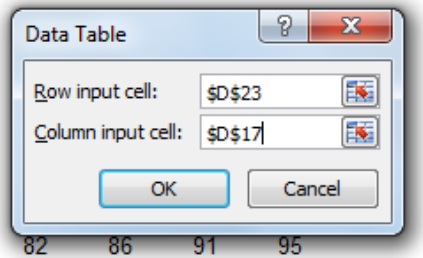
CASH FLOW	Historical d 2011	d 2012	d 2013	Proje d 2
EBIT	50	54	57	5
Depreciation	6	7	8	9
	56	61	65	6
eceivable	6	2	2	2
	4	1	1	1
ayable	5	1	1	1
es	20	22	23	2
operations	**31**	**37**	**40**	**4**
investments	10	10	10	1
SH FLOW	**21**	**27**	**30**	**3**
Dividends	8	0	0	0
Increase (decr.) in cash	**13**	**27**	**30**	**3**
Control	**0**	**0**	**0**	**0**

	26,80	--> =+M25
-20%	26,12	
0%	26,62506	
20%	27,12816	

SOLUTION

b) Free Cash Flow sensitivity to a change in sales and DSO

	A	B	C	D	E	F	G	H	I	J
10	Shareholder´s Equity	85	107	139	173	209	246	286		**Net income**
11	**Tot. liab. + S. Equity**	**105**	**132**	**165**	**200**	**237**	**276**	**317**		
12	Control	0	0	0	0	0	0	0		
13										
14		**Historical ratios**		**Projected ratios**						
15		**d 2010**	**d 2011**	**d 2012**	**d 2013**	**d 2014**	**d 2015**	**d 2016**		
16	**Income statement**									
17	Sales increase		11%	7%	5%	5%	5%	5%		
18	COGS	49%	50%	50%	50%	50%	50%	50%		
19	Adm. expenses	6,9%	6,9%	7%	7%	7%	7%	7%		
20	Commercial expenses	8,5%	8,3%	8%	8%	8%	8%	8%		
21	Income taxes	40%	40%	40%	40%	40%	40%	40%		
22	**Activity ratios**									
23	DSO	84	91	90						
24	DSI	114	122	120						
25	DPO		120	120						
26	**Capex and depreciation**									
27	Capex	0	10	10						
28	Depreciation	5	6	7						
29										
30	Purchases= (COGS-EI+EF)		76	78	82	86	91	95		
31										
32				Days on sales outstanding (DSO)						
33				27	30	60	90			
34	Change in sales			20%	55,5336	41,331	27,128			
35				0%	50,2963	38,461	26,625			
36				-20%	45,059	35,59	26,122			



EXERCISES

AMC is a small company that operates in Argentina. It produces cleaning products. You have to:

a) Explain and design the cash flow of 2011.
b) What is the difference between EBITDA and free cash flow?

Balance sheet

	dec-10	dec-11
Cash & Banks	365	1,094
Marketable securities		103
Accounts receivable	261	446
Inventories	16	19
Other ST assets	216	166
Fixed assets	2,777	2,728
Total assets	3,635	4,556
Accounts payable	40	86
Fiscal liabilities	531	974
ST Bank debt	431	658
Total liabilities	1,002	1,718
Equity	2,633	2,838
Total liabilites + Equity	3,635	4,556

Depreciation charge in 2011 is of $177 mil.

Income statement

	dec-11
Sales	7,586
COGS	5,538
Gross margin	2,048
Adm. expenses	653
Commercial expenses	548
Other income	93
EBIT	940
Interest expenses	52
EBT	888
Income taxes	277
Net income	611

Statement of Shareholders´ Equity

	dec-11
Equity 2010	2,632
Net income	611
Dividends	-405
Equity 2011	2,838

SOLUTION

Balance sheet

	dec-10	dec-11
Cash & Banks	365	1,094
Marketable securities		103
Accounts receivable	261	446
Inventories	16	19
Other ST assets	216	166
Fixed assets	2,777	2,728
Total assets	3,635	4,556
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Depreciation charge in 2011 is of $177 mil.

Income statement

	dec-11
Sales	7,586
COGS	5,538
Gross margin	2,048
Adm. expenses	653
Commercial expenses	548
Other income	93
EBIT	940
Interest expenses	52
EBT	888
Income taxes	277
Net income	611

Equity evolution

	dec-11
Equity 2010	2,632
Net income	611
Dividends	-405
Equity 2011	2,838

	dec-11
EBIT	940
Depreciation	177
EBITDA	1,117
Accounts receivable	185
Inventories	3
Accounts payable	46
Other ST assets	50
Fiscal liabilites	443
Income taxes	298
Cash from operations	**1,170**
Cash from investments	**128**
FREE CASH FLOW	**1,042**
ST Bank debt	227
Interest expenses	52
Tax shield	21
Cash flow from financing	196
Dividends	405
Marketable securities	103
Increase/decrease in cash	**729**

EXERCISE: THE CASH FLOW STATEMENT OF SIEMENS

Consolidated Financial statements of Siemens are provided in an Excel file.

Explain and design the cash flow statement of 2012.

D.1 Consolidated Statements of Income

For the fiscal years ended September 30, 2013 and 2012

(In millions of €, per share amounts in €)	Note	2013	2012[1]
Revenue		75,882	77,395
Cost of sales		(55,053)	(55,470)
Gross profit		20,829	21,925
Research and development expenses		(4,291)	(4,245)
Selling and general administrative expenses		(11,286)	(11,043)
Other operating income	5	503	523
Other operating expenses	6	(427)	(364)
Income (loss) from investments accounted for using the equity method, net	7	510	(333)
Interest income	8	948	939
Interest expenses	8	(789)	(760)
Other financial income (expenses), net	8	(154)	(5)
Income from continuing operations before income taxes		**5,843**	**6,636**
Income tax expenses	9	(1,630)	(1,994)
Income from continuing operations		**4,212**	**4,642**
Income (loss) from discontinued operations, net of income taxes	4	197	(360)
Net income		**4,409**	**4,282**
Attributable to:			
Non-controlling interests		126	132
Shareholders of Siemens AG		4,284	4,151

D.5 Consolidated Statements of Changes in Equity

For the fiscal years ended September 30, 2013 and 2012

(In millions of €)	Issued capital	Capital reserve	Retained earnings
Balance as of October 1, 2011 (as previously reported)	2,743	6,011	25,881
Effect of retrospectively adopting IAS 19R	–	–	116
Balance as of October 1, 2011[1]	2,743	6,011	25,996
Net income[1]	–	–	4,151
Other comprehensive income, net of income taxes[1]	–	–	(1,783)[2]
Dividends	–	–	(2,629)
Share-based payment	–	42	(129)
Purchase of treasury shares	–	–	–
Re-issuance of treasury shares	–	(6)	–
Cancellation of treasury shares	(100)	–	(2,410)
Transactions with non-controlling interests	–	–	(326)
Other changes in equity	–	126	7
Balance as of September 30, 2012	**2,643**	**6,173**	**22,877**

D.3 Consolidated Statements of Financial Position

As of September 30, 2013 and 2012

(In millions of €)	Note	09/30/2013	09/30/2012[1]
Assets			
Cash and cash equivalents		9,190	10,891
Available-for-sale financial assets	10	601	524
Trade and other receivables	11	14,853	15,220
Other current financial assets	12	3,250	2,901
Inventories	13	15,560	15,679
Current income tax assets		794	836
Other current assets	14	1,297	1,277
Assets classified as held for disposal	4	1,393	4,799
Total current assets		**46,937**	**52,128**
Goodwill	15	17,883	17,069
Other intangible assets	16	5,057	4,595
Property, plant and equipment	17	9,815	10,763
Investments accounted for using the equity method	18	3,022	4,436
Other financial assets	19	15,117	14,666
Deferred tax assets	9	3,234	3,748
Other assets		872	846
Total non-current assets		**54,999**	**56,123**

Appendix 1: Double entry bookkeeping

Double-entry bookkeeping is a system of bookkeeping so named because every entry to an account requires an opposite entry to a different account. If there is an increase or decrease in one account, there will be equal decrease or increase in another account.

The following rules of debit and credit in respect to the various categories are summarized below:

	Debit	**Credit**
Asset	Increase	Decrease
Liability	Decrease	Increase
Income (revenue)	Decrease	Increase
Expense	Increase	Decrease
Capital	Decrease	Increase

Assets Accounts: debit increases in assets and credit decreases in assets. Revenues or Incomes Accounts: credit increases in incomes and gains, and debit decreases in incomes and gains.
Expenses or Losses Accounts: debit increases in expenses and losses, and credit decreases in expenses and losses

Appendix 2: Accrued interest

A term used to describe an accrual accounting method when interest that is either payable or receivable has been recognized, but not yet paid or received.

Accrued interest occurs as a result of the difference in timing of cash flows and the measurement of these cash flows.

Hochschule Kaiserslautern | University of Applied Sciences

BUSINESS VALUATION

UNIVERSIDAD NACIONAL DEL LITORAL – HOCHSCHULE KAISERSLAUTERN

DR. GUILLERMO L. DUMRAUF

SANTA FE, JUNE 2016