IT'S HARD TO PREDICT, ESPECIALLY ABOUT THE FUTURE
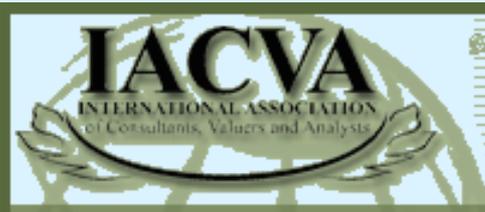
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INTRODUCTION

- Reasons for trying to predict the future
  - Determining future people and plant needs
  - Negotiating bank loans
- It is impossible, by definition, to be accurate, but one must strive to be effective
- "Good numbers don't make a bad deal good. Bad numbers make a good deal bad."

INTRODUCTION

- Financial forecasts and projections have specific meanings

- Financial Forecasts: "Prospective financial statements that present, to the best of the responsible party's knowledge and belief, an entity's expected financial position, results of operations and cash flows. It is based on the responsible party's assumptions reflecting conditions it expects to exist and the course of action it expects to take."

INTRODUCTION

- Financial Projections: "Prospective financial statements that present, to the best of the responsible party's knowledge and belief, given one or more hypothetical assumptions, an entity's expected financial position, results of operations and cash flows. A financial projection is sometimes prepared to present one or more hypothetical courses of action for evaluation, as in response to a question such as 'what would happen if'. A financial projection is based on the responsible party's assumptions reflecting conditions it expects would exist and the course of action it expects would be taken, given one or more hypothetical assumptions."

INTRODUCTION

- In a Forecast, all assumptions are those considered most likely to occur, usually by Management

- In a Projection, a number of assumptions are not those most likely to occur, but ones that have reasonable chances of happening

- As things change over time, Management and valuators should consider at least three scenarios in assessing future activities

We recommend:

- ■ Success (Management's most likely view)
- ■ Survival (rather poorer performance)
- ■ Status-Quo (no change from the current year)

- ■ As the main objective of preparing a set of Financial Projection scenarios is to identify the full range of possible futures of a business, not just a single set with an illusory certainty

INTRODUCTION

- Whether a specific projection actually turns out to be accurate is only part of the picture

"Even a broken clock is right twice a day"

- Our task is to map probable outcomes and their related uncertainties. For in a world where actions in the present influence the future, uncertainties can give rise to opportunities

INTRODUCTION

- All Financial Projections must be supported by an articulated and defensible logic

- The user must understand enough of the process and logic involved to make an independent assessment of their output's quality and to properly understand the opportunities and risks involved

- The wise consumer is not a trusting bystander but a participant and, above all, a critic.

INTRODUCTION

- Every decision maker has ultimately to rely on his intuition and judgment

- Effective Financial Projections can help narrow the areas within which she needs to act
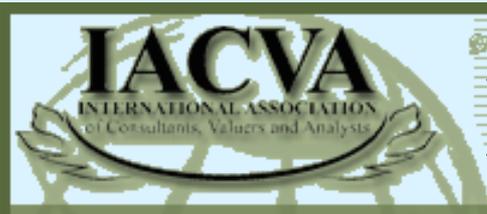
They:

- Provide an essential context

- Reveal overlooked possibilities

- Expose unexamined implicit assumptions

INTRODUCTION

- The *cone of uncertainty* delineates possibilities

- Many factors go into such a zone

- The most important are defining:
    - Its breadth
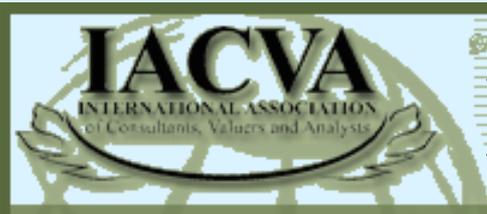   - Relationships among elements
    - Ranking of possible outcomes

Oil

$200

a barrel

House prices

Down

30%

INTRODUCTION

- Making effective Financial Projections is always an iterative process

- Involves generating hypotheses about outcomes and eventual responses

- Finding avoidable unpleasant surprises

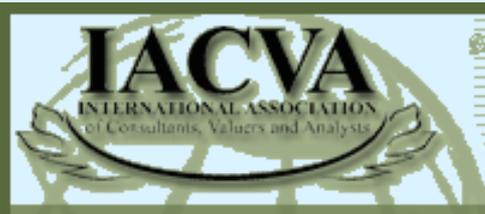- Identifying otherwise missed opportunities

INTRODUCTION

- Who assumes responsibility for the reasonableness of:
    - The underlying assumptions
    - Their context and structure
    - The logic and integrity of the model
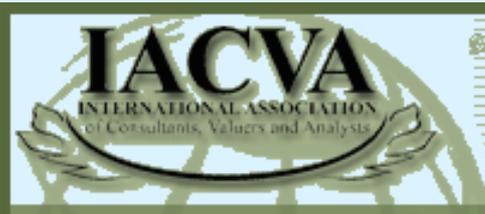   - The resulting amounts
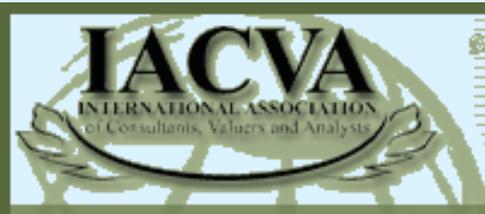
Assuming responsibility always involves problems

INTRODUCTION

- This paper covers the major problems with respect to:
  - Context - BASE THE FUTURE ON THE PAST
  - Structure – THE TRUTH IS IN THE PARTS
  - Model – UNNECESSARY RISKS
  - Assumptions – GARBAGE IN, GARBAGE OUT
  - Results – BELIEVABLE CONCLUSIONS

■ **COVER YOUR ARSE with words such as:**

"In preparing these Financial Projections, we have relied upon historical financial information provided to us by management and derived from (refer to the appropriate sources such as tax returns, audited reports and so on). This financial information has not been audited, reviewed or compiled by us and accordingly, we do not express an opinion or any form of assurance on any of this material. By their nature it is impossible to accurately predict the future results of operations and financial positions of an entity. While theses Financial Projections have been prepared [in conjunction with] [by] Management based on their views of the most probable assumptions as to future events and courses of actions, the actual results will differ from those projected and the variances may be material."
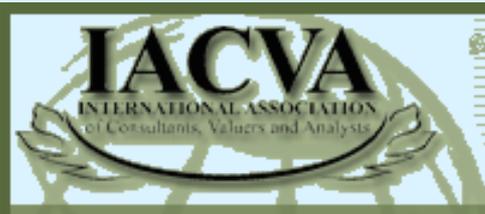
- It is essential to understand the context, especially the economic outlook of a Financial Projection

"Too often people steer their way into the future while staring into the rear view mirror because the past is so much more comforting than the present"

- *Marshall McLuhan, Canadian Philosopher 1911-1980)*

- Used properly, a rear view is an extraordinarily powerful forecasting tool
- Past events can help connect the dots of present indicators
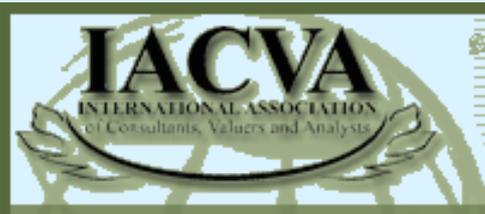
BASE THE FUTURE ON THE PAST

- Consider the post 2000 uncertainty

- Google, Yahoo, Vodaphone and Facebook emerged triumphant

- Traditional telco's, TV and print media declined

- The change hard to categorize, much less predict

- Until one looked back to the early 1950s when TV took-off catalysing a new mass-media structure; the late 1990s had eerie parallels to that era
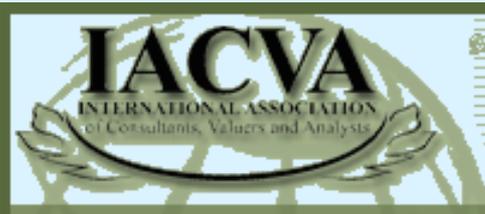
- We are now in a moment when an old (mass-media) order is being replaced
  - By a new (personal-media) one
  - Everyone involved is struggling to understand and adjust
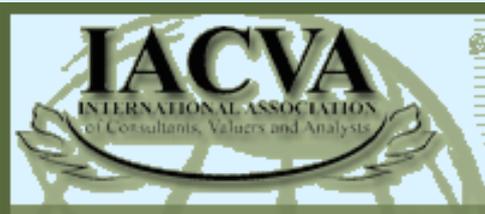
- One problem with relying on history is that a love of certainty and continuity often causes us to draw the wrong conclusions

"The most recent past is rarely a reliable indicator of the future", if it were, one could successfully predict the stock market

- Markets do not behave that way
- Neither does any other trend
- It is essential to look for the turns, not the straightaways
- However a valuator must peer far enough back to identify any patterns
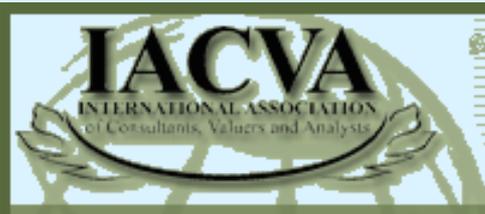
BASE THE FUTURE ON THE PAST

- When looking for parallels, always go back at least twice as far as you plan to project
- Normally 10 years in the past to five of the future
- Search for similar patterns such as recessions

"History doesn't repeat itself,
but sometimes it rhymes."

- Avoid the temptation to use it the way a drunk uses a lamppost

"Support rather than illumination"

- Another part of the context of a Financial Projection is continuity

- To be meaningful, they must be based on actual historical results

- Make detailed analysis of past financial statements after any necessary adjustments
  - Trends over time
  - Revenues
  - Costs
  - Assets
  - Liabilities
  - As well as selected ratios

- They present a useful picture of Management's reactions to outside developments and events

BASE THE FUTURE ON THE PAST

- Analytical procedures are designed to identify relationships and pinpoint unusual items
- Those may indicate changes in the business
- The most common techniques consist of comparing:
  - current financial information with those of previous periods;
  - actual past results with the comparable budgets or forecasts;
  - amounts or ratios with expectations developed by management, and;
  - projected ratios with industry averages or those of similar, publicly traded companies.

- Determining patterns in the key ratios for the complete period for which information is available
    - Current
    - Quick
    - Days Sales Outstanding
    - Inventory Turnover
    - Depreciation of each Asset Class to Carrying Amounts
    - Debt/Equity
    - EBITDA Margin
    - Pre-tax Margin
    - Tax Rate
    - Net Margin
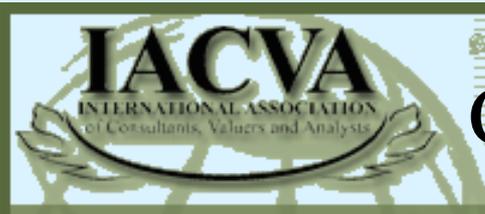
CHANGE IS NOT LINEAR

- Part of context, is variation in the rate of change
- Nothing unfolds in a straight line
- Important developments typically follow an "S-curve"
- They start slowly and incrementally
- Putter along quietly
- Suddenly explode, before eventually tapering off

CHANGE IS NOT LINEAR

- One famous "S-curve" is "Moore's Law"
- "The density of circuits on a silicon wafer double every 18 months"
- We are all still benefiting from it
- The top of the "S" is nowhere in sight
- It will flatten eventually
- Certainly with regard to silicon
- In a broader form (density regardless of the material)
- This "law" is likely to stay in effect
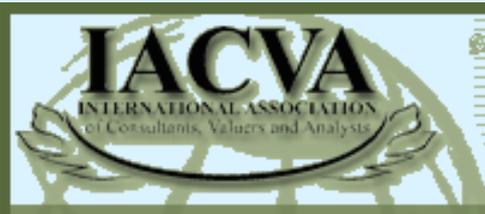
- S-curves are fractal in nature

- Large, broadly defined curves are usually composed of several smaller, more precisely defined ones

- A valuator discovering an emergent S curve should suspect a larger, more important one lurking in the background

- Miss that and the firm's strategy may amount to standing on a whale, fishing for minnows

CHANGE IS NOT LINEAR

- A significant part of forecasting is to identify emerging S-curves well ahead of the inflection points

- These dramatic moments of take-off

- Professionals often do worse than the public when it comes to anticipating them

- Observers who glimpse the beginnings of the S curve often miscalculate when it will arrive

- There is a tendency to overestimate the short-term and under-estimate the long-term effects

- Hope causes us to conclude that the revolution will arrive tomorrow
  - (a) When reality fails to conform,
  - (b) Disappointment leads to the conclusion that it will never occur,
 - (c) Right before it does
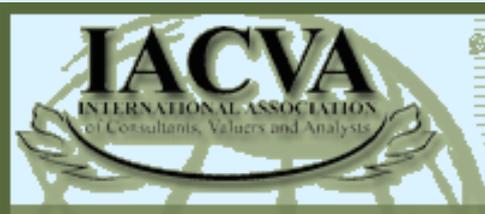
CHANGE IS NOT LINEAR

- Don't underestimate the speed of the changes
- We are all by nature linear thinkers
- Phenomena governed by exponential growth catch us by surprise
- Some of us instinctively draw a straight line through the S curve
  - Missing the lag at the start
  - Explosive growth
  - Even though we arrive at the same end

CHANGE IS NOT LINEAR

- "The future's already arrived. It's just not evenly distributed yet."

  - William Gibson (British Author, 1948-)

- Opportunities for a business are likely to be very different from those the majority predict

- Even the most anticipated futures tend to arrive in utterly unexpected ways

  In the early 1980s, PC makers predicted that every home would soon have one

  When that event finally came about for word processing and spreadsheets,

  It was driven by entertainment, not work

- The best way to spot an emerging S curve is to become attuned to things that don't fit

- Find the thing that's going to come whistling in, out of the blue, in the near future

- Look for smart ideas that seem to have gone nowhere

THE TRUTH is in the PARTS

- Normally, we look at the whole of a business
- It is essential also to look at the parts
- All entities carry on more than one function
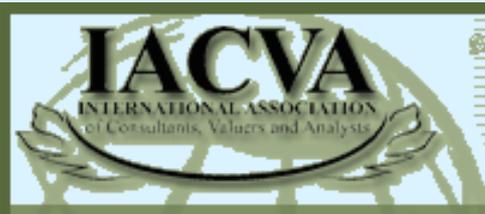
THE TRUTH is in the PARTS

- Every successful business has at least two, and preferably all of the following segments:
  - Existing Operations
  - Emerging Activities
  - Future Opportunities
- The latter are the future of the entity
- Emerging Activities either are, or are about to be, providing revenues
- Future Opportunities are R & D projects

- In many cases, Existing Operations covers more than one activity with different sales cycles and profitability

- Some even have losses locked away beyond the outsider's gaze

- The importance of disaggregation is demonstrated by Anaconda Enterprises, supplying the telephone industry:

IACVA — INTERNATIONAL ASSOCIATION of Consultants, Valuers and Analysts

	Anaconda			$'000		
INCOME STATEMENT	**2,003**	**2,004**	**2,005**	**2,006**	**2,007**	**2,008** projection
Reveue						
Services	127,824	130,378	127,581	127,198	133,826	142,341
Equipment	81,262	72,868	77,473	52,198	0	0
	209,086	203,245	127,581	127,198	133,826	142,341
Services Growth	0	0	(0)	(0)	0	0
Gross Profit						
Services	30,544	31,152	32,439	32,273	29,220	32,039
Equipment	18,995	16,087	0	0	0	0
	49,539	47,239	32,439	32,273	29,220	32,039
Services Gross Margin	0	0	0	0	0	0
Expenses						
Administration	23,975	22,339	20,756	17,321	13,125	11,777
Selling & Engineering	18,258	19,089	7,317	5,496	5,257	6,190
Corporate Charges	2,539	3,588	1,917	1,903	4,841	2,160
	44,772	45,016	29,990	24,720	23,223	20,127
Pre-Tax Profit	4,767	2,223	2,449	7,553	5,997	11,912
Income Tax	(834)	(889)	(723)	(2,900)	(1,792)	(4,765)
Reported Net Income	3,933	1,333	868	400	4,205	7,147
Tax Rate	0	0	0	0	0	0
Continuing Business	4,779	4,473	1,727	4,653	4,141	7,147
Discontinued	(846)	(3,139)	(858)	(4,254)	64	0

2006 INCOME STATEMENT	Total	Defense	Commercial	Services	Instruments
$'000					
Revenue	127,198	36,832	76,989	113,821	13,377
Gross Profit	32,273	(1,903)	27,515	25,612	6,661
Gross Margin	0	(0)	0	0	0
Expenses					
Administration	17,321	5,633	10,689	16,322	999
Selling & Engineering	5,496	291	4,428	4,719	778
Management Fees	1,903	626	1,336	1,962	(59)
	24,720	6,550	16,453	23,003	1,717
Pre-Tax Profit	7,553	(8,453)	11,063	2,609	4,944
Income Tax	(2,900)	3,245	(4,247)	(1,002)	(1,898)
Net Income	4,653	(5,208)	6,815	1,608	3,046

THE TRUTH is in the PARTS

2007 INCOME STATEMENT	Total	Defense	Commercial	Services	Instruments
$'000					
Revenue	133826	42938	80951	123889	9937
Gross Profit	29220	(2428)	28608	26179	3041
Gross Margin	0	(0)	0	0	0
Expenses					
Administration	13125	5025	6440	11464	1661
Selling & Engineering	5257	0	2383	2383	2875
Management Fees	4841	2176	2790	4966	(126)
	23223	7201	11612	18813	4410
Pre-Tax Profit	5997	(9629)	16995	7366	(1369)
Income Tax	(1792)	2878	(5079)	(2201)	409
Reported Net Income	4205	(6752)	11916	5165	(960)
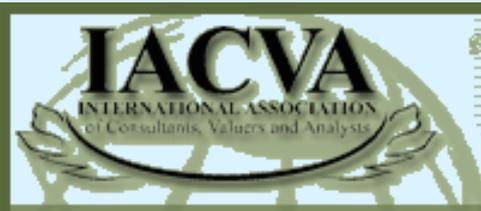
THE TRUTH is in the PARTS

2008 INCOME STATEMENT (projection) ($'000)	Total	Defense	Commercial	Services	Instruments
Revenue	142341	39641	90460	130101	12240
Gross Profit	32039	(4901)	32642	27741	4298
Gross Margin	0	(0)	0	0	0
Expenses					
Administration	11777	5130	5107	10237	1540
Selling & Engineering	6190	0	3751	3751	2439
Management Fees	2160	845	1135	1980	180
	20127	5975	9993	15968	4159
Pre-Tax Profit	11912	(10875)	22649	11773	139
Income Tax	(4765)	4350	(9059)	(4709)	(55)
Reported Net Income	7147	(6525)	13589	7064	83
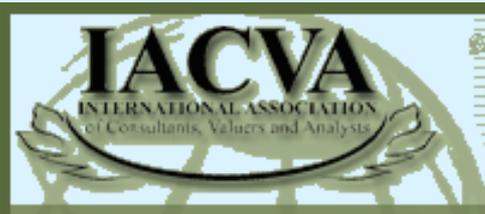
THE TRUTH is in the PARTS

- From 2003 to its sale in 2006 Anaconda lost $9,097,000 on its equipment business

- Thereafter the firm was wholly devoted to services

- Disaggregating shows that their defence contract was over zealously bid in 2005

- Resulting in continuing losses until it expires in mid 2010

- For Financial Projections to be meaningful

- Each segment should be projected independently as well as valued separately

UNNECESSARY RISKS

- Financial Projections are normally prepared through a model of the firm

- Generally prepared using a commercial spreadsheet program

- Every spreadsheet has at least a few errors

- They may be small and initially appear insignificant

- The tiniest slip can grow into a totally erroneous financial picture as the program performs more and more calculations

- All spreadsheets should be frequently audited for errors

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in the order form at

www.SpreadsheetDetective.com

- The Spreadsheet Detective helps ensure model correctness in Microsoft® Excel® by providing automated documentation that highlights mistakes.
  - Shows how formulas have been copied throughout a workbook
  - Clarifies cryptic "A1" references using English AutoNames
  - Easily follows complex Precedent/Dependent relationships
  - Compares different versions of a spreadsheet
  - Performs advanced inter-worksheet data flow analysis for complex models
  - Highlights bad sensitivity relationships
  - Assist with the understanding and manipulation of Named Ranges
- In combination they go well beyond Excel's in-built auditing feature to clarify the structure of complex models

	Code	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Capital	35000	4,000	4,000	5,000	6,000	4,750
Sales (Gross)	35100	600	1,700	1,900	1,400	5,600
Cost of Goods Sold	35200	400	1,500	1,400	1,100	4,400
Gross Profit	39200	200	200	550	300	1,250
Gross Profitability	39300	2.0%	2.3%	1.9%	0.5%	6.2%
Fixed Costs	35300	79	94	94	28	295
Net Profit	39900	121	106	456	272	955

= E33 `Sales# - E34 `CosOfGooSol#=.

Shading Overview

The cross hashed shading shows that cell E35 contains a new formula, namely "= E33 - E34".

The horizontal stripes indicates that cell F35 has an equivalent formula to E35, ie. "= F33 - F34". (or range if multi-cell array formula.)

Formulas and named ranges are further documented with AutoNames in cell comments as described below.
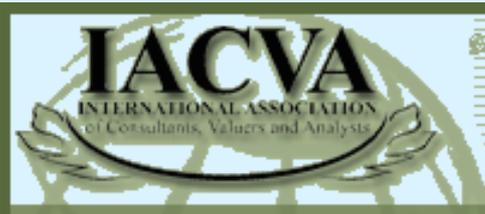
Inconsistent shading makes the errors in these two cells obvious.

This speckled shading shows that this formula is a copy of a non-adjacent formula (I35). (But neither this nor the cell above are incorrect.)

- Many cost figures are established as percentages of revenues
- Projecting them is one of the most important functions
- Two basic methods
- "Bottom Up", starting with major customers and building volumes and related prices for them and the various sales channels
- "Top Down", fitting trends to historic data, preferably by business segments

BOTTOM UP

- Product and services organizations are structured and managed differently

- Make separate projections of value and prices

- In some industries (computer) prices go down all the time

- All services, products, and customers have lifecycles

BOTTOM and TOP

- A lifecycle is something that has a beginning (birth) and end (death); includes stages of maturity, which impact revenue; to effectively plan for growth, a business must analyse these for market, organization, product and adopters

- Remember revenue and profit projections are dependent upon lifecycle stages and must factor, their influencers when creating growth strategies

BOTTOM and TOP

- Both have unique revenue recognition, utilization, profit and lifecycle nuances

- Find the "right" revenue and profit balance-supporting growth

- Avoid struggling with cyclical cash flow issues

TOP DOWN

- Sales are normally developed using statistical tools to project trends in historic data

- Excel can calculate six types of trend lines: linear, logarithmic, polynomial, geometric, exponential and moving average

- For the first five, it will project the curve out into the future and display the relevant mathematical formulas. At least five years of historic data is needed for trend line analyses, but adding more will provide increasingly better results

- Assess the quality of the "fit" (high R^2), between the data plotted against time and a trend line drawn through it
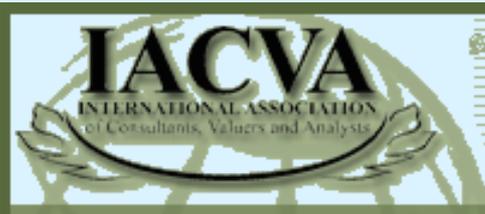
■ <u>A linear trend</u> is simply a straight line, calculated so that the sum of the squares of the differences between the trend and the data is as small as possible (least squares fit). Such a line is represented by the equation: $y = mx + b$, with m being the slope of the line and b the intercept on the x-axis. Linear trends, which can be up, down or level, are most useful when an entity's past results have been relatively consistent and are expected to continue in a similar fashion

- <u>A logarithmic trend line</u> calculates the least squares fit, using the following equation: $y = cLn\ x + b$, where c and b are constants and Ln is the natural logarithm of the data. A logarithmic trend line will usually give the best fit when the rate of change in the data increases or decreases quickly and then levels out
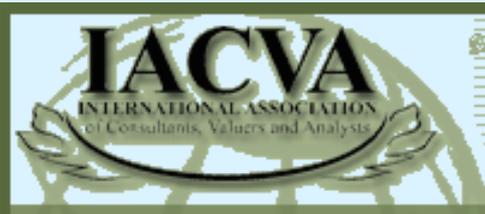
- <u>A geometric trend line</u> calculates the least squares fit using the following equation: $y = cx$, with c a constant. This is most applicable to data that increases at a regular rate. However, it is dangerous to expect such a trend to continue for long as eventually a "reversion to the mean" will occur. It cannot be used if the data includes zero or negative numbers

- <u>An exponential trend line</u> calculates the least squares fit through point using the following equation: $y = ce^x$, where c is a constant and e is the base of the natural logarithm. It is very similar to a geometric trend, but with the rate of growth accelerating. This is useful when the data rises or falls at increasing rates. Again, it cannot be used if the data includes zeros or negative numbers

- A polynomial trend line calculates a least squares fit, using the following equation: $y = b + cs_1 + cx_2 + cx_3$ up to cx_y, where b and c_1 to c_y, are constants, known as an S-curve.

- These trend lines are best applied when data fluctuates. The number of hills and valleys determines the order of the polynomial. An order two polynomial trend line normally has one hill and one valley, an order three trend, two of each and so forth.
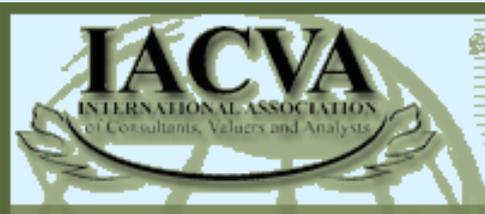
- Even if the regression line has an excellent statistical fit, the resulting projections may not be reasonable. In many cases, a second order polynomial regression can have an excellent fit with the last 10 years' sales, but can result in implausible projections showing revenues rising or falling rapidly. Therefore caution is recommended in using trends.

- An analysis of historic Income Statements will give a range of percentages of sales for every category of expenses, such as Labour, Material and Overhead as part of Cost of Sales. In general the most plausible methods are to use 3-year moving averages of such percentages or to apply a Monte Carlos simulation using random amounts in the delineated range

- Assumptions materially affect any Financial Projection. With any model, the quality of the conclusions totally depends on that of the assumptions. We must ensure that they are reasonable, reliable and consistent with existing market information, the current economic climate and past experience. Key external and internal non-financial performance indicators such as market share and customer satisfaction must be taken into account

- Management spends a great deal of time in developing the most likely financial forecasts

- In some cases they look like a hockey stick, with revenues, margins and net incomes all increasing rapidly

- Valuators should work with Management to generate at least three future scenarios

- Management's most likely situation is Success, some lesser level of improvement, in line with market participants as Survival

- A continuation of the past year as Status-Quo

- Everything will not go as management expects

- Distinguish between the possible and various degrees of probable
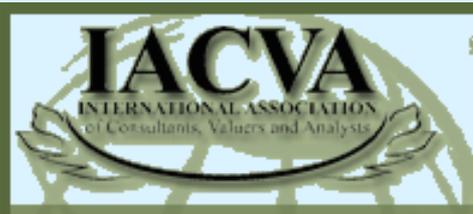
- In a Business Combination the assumptions should take into account:

  the various known and possible costs

  amounts and timings of anticipated synergies

- Differentiate those that market participants (financial buyers) can achieve by introducing industry best practices from those obtainable by the specific acquirer (usually a strategic buyer)

- Two major forms of synergies:

  cost reductions that often can be realized relatively quickly

  revenue enhancements that result from strategic factors which often take a substantial time to reach

- Synergies nearly always take longer to achieve than expected and usually involve unforeseen costs
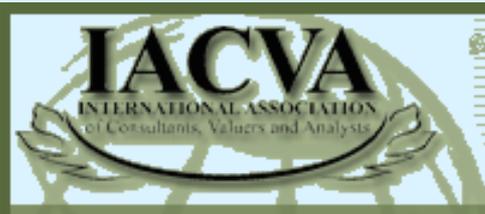
- Synergies expected by the acquirer can be used in the cash flow forecasts used for the purchase price allocation

- Only those obtainable by a market participant may be applied in the goodwill impairment tests
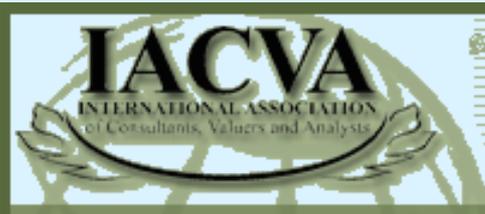
- examine the forecasting procedures adopted
- consider the following traditional questions
  - Who?
  - Why?
  - How?
  - Where
  - When?
  - What happened before?

- Focus on the key assumptions, which are not always self-evident

- May be implicit in the model, rather than being explicitly disclosed

- Don't concentrate on the largest numbers, look at the most important or those with the greatest risks

- Confirming the reasonableness of the assumptions is an art, not a science
- It requires:
  - Industry knowledge
  - Experience
  - Understanding why the transaction took place
  - Maintaining a healthy does of scepticism
  - Enquire as to what management expects to achieve

- Many Financial Projections are subject to audit
- Since they involve uncertainties and subjectivities, the auditor will normally assess to what degree the conclusions could be misstated
- In particular he will consider:
  - The number, significance and complexity of the assumptions
  - Evidence to support hem and their degree of subjectivity
  - To what extent they depend on the outcome of future events
  - The availability of objective data to support them
  - The projected period