

BUDGETING & FORECASTING IN EXCEL

Danielle Stein Fairhurst
Plum Solutions

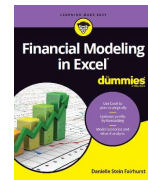
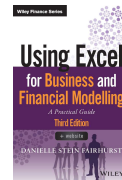
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Meet your Facilitator, Excel modelling specialist **DANIELLE STEIN FAIRHURST**



- Founded Modellers' Meetups (now virtual)
- Author of "Using Excel for Business & Financial Modelling" and "Financial Modeling for Dummies"
- Judge for the 2020 Financial Modelling Innovation Awards
- ATP & Advisory Board Member for Financial Modeling Institute (FMI)



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INTERACTION

POLL

POLL QUIZ

GROUP
BREAKOUT

SOLO
EXERCISE

3

GETTING TO KNOW YOU & YOUR OBJECTIVES

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BUDGETING AND FORECASTING IN EXCEL

1. Using Excel for the budgeting process
2. Applying phasing and seasonality to model drivers
3. Budgeting Techniques
4. Critique of the budget process
5. Capital expenditure budgeting
6. Using management reporting to promote accountability

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PART 1: BUDGETING AND FORECASTING IN EXCEL

1. Using Excel for the budgeting process

- How we use Excel for budgeting & forecasting
- Overview of commonly used Excel tools and techniques
- Visualising budget outputs with charts

2. Applying phasing and seasonality to model drivers

- Using time series and linear regression
- Calculating seasonality
- Creating a “rolling” forecast with live data

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LET'S DO IT

SOLO EXERCISE

- ❖ Open the file B&F Practical Exercises.xlsx, tab “Cell Ref 1”
- ❖ Complete the calculation as quickly as you can
without using the mouse!

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“CHAT” QUESTION:

What do you love/like about Excel?



Image source: Debra Dalgleish

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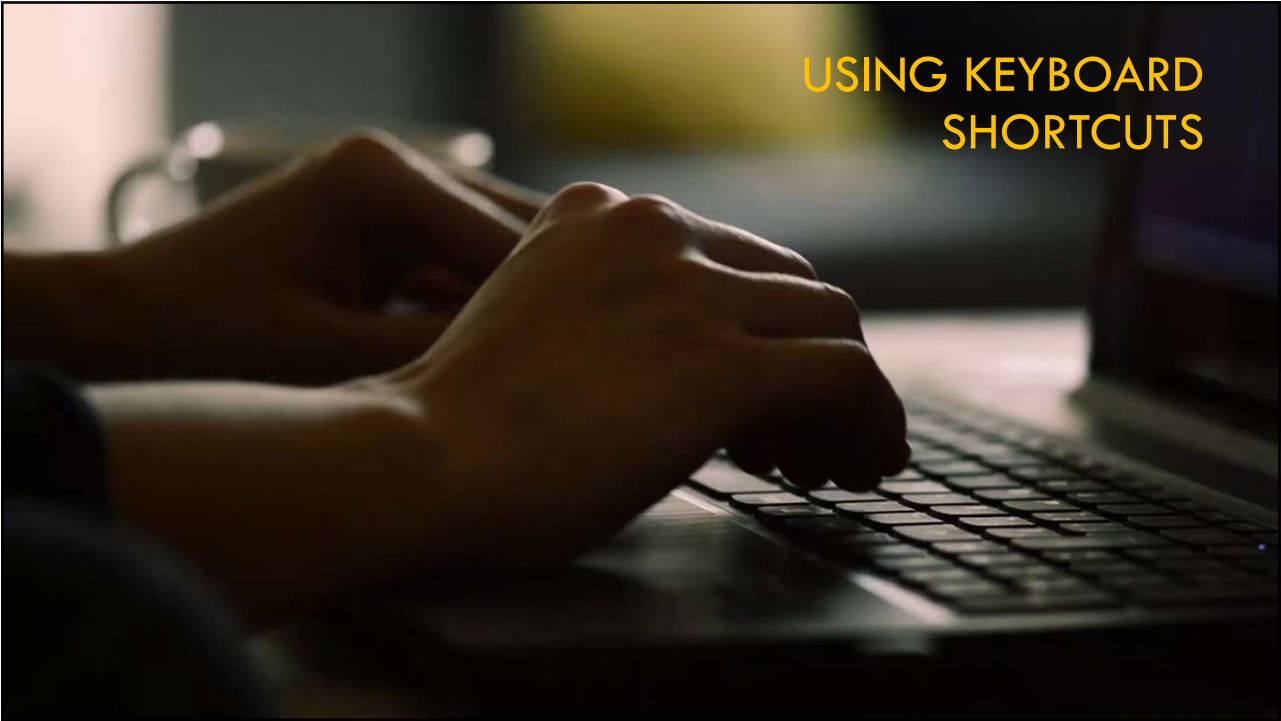
“CHAT” QUESTION:

What **frustrates** you about Excel?



Image source: Debra Dalgleish

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MODELLING FOR “STEPPED COSTS”

- Go to the tab “Stepped”
- Let’s say you are building a five year plan for a financial planning office.
- Each paraplanner can handle 30 customers.
- In year 1 you have 120 customers, and you expect that to increase by 10% per year
- How many paraplanners will you need each year? Hint: don’t forget to ROUNDUP!

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MODELLING FOR “STEPPED COSTS”

- What is your excess capacity?
- At \$50k pa (ignore inflation) what is the cost to serve each customer?
- Create a formula that tells us automatically which year has the highest cost to serve.
- (hint: you’ll want the MAXimum value in the row!)

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Averages			ANSWER IN THE “CHAT	
AVERAGE	Distribution & Tests of Probability		Discussion: How many Statistical Excel Functions have you ever used?	
AVERAGEA	BETADIST	GAUSS		
AVERAGEIF	BETAINV	HYPGEOMDIST		
AVERAGEIFS	BETA.INV	HYPGEOM.DIST		
MEDIAN	BINOMDIST	KURT		
MODE	BINOM.DIST	LOGNORMDIST		
MODE.SNGL	BINOM.DIST.RANGE	LOGNORM.DIST		
MODE.MULT	NEGBINOMDIST	LOGINV		
GEOMEAN	NEGBINOM.DIST	LOGNORM.INV		
HARMEAN	CRITBINOM	NORMDIST		
TRIMMEAN	BINOM.INV	NORM.DIST		
Count & Frequency	CHIDIST	NORM.INV	Deviation & Variance	Trend Line Functions
COUNT	CHISQ.DIST.RT	NORM.S.DIST		
COUNTA	CHISQ.DIST	NORM.S.DIST		
COUNTBLANK	CHIINV	NORM.S.INV		
COUNTIF	CHISQ.INV.RT	PEARSON		
COUNTIFS	CHISQ.INV	RSQ		
FREQUENCY	CHITEST	PHI		
PERMUT	CHISQ.TEST	POISSON		
PERMUTATIONA	CORREL	POISSON.DIST		
CONFIDENCE	EXPONDIST	PROB		
CONFIDENCE.NORM	EXPON.DIST	SKEW		
CONFIDENCE.T	FDIST	SKEW.P		
	F.DIST.RT	STANDARDIZE		
	F.DIST	TDIST		
	FINV	T.DIST.2T		
	F.INV.RT	T.DIST.RT		
	F.INV	T.DIST		
	FISHER	TINV		
	FISHERINV	T.INV.2T		
	FTTEST	T.INV		
	F.TEST	TTEST		
	GAMMADIST	T.TEST		
	GAMMA.DIST	WEIBULL		
	GAMMAINV	WEIBULL.DIST		
	GAMMA.INV	ZTEST		
	GAMMA	Z.TEST		
	GAMMALN			
	GAMMALN.PRECISE			

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BUDGETING VS. FORECASTING

- A budget, is set for a 12-month period usually, and should not be changed
- Forecasts are updated continually to reflect changes throughout the year based on the latest information.
- Budgets are static, and forecasts are flexible
- Budgets are less accurate because they are set months in advance whereas forecasts are updated frequently and should therefore reflect a more accurate picture

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PHASING AND FORECASTING IN BUDGET MODELS



- ❖ Open the file “Phasing & Seasonality.xlsx”
- ❖ Go to the tab “Phasing”
- ❖ Complete the calculation
with one single formula

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TIME SERIES

- 1. Trend:** General upward or downward movement over time
- 2. Seasonality:** a pattern of fluctuation above or below the trend line every season
- 3. Cycles:** patterns in the data that occur every several years
- 4. Random Variations:** “blips” caused by chance and unusual situations with no discernable patterns

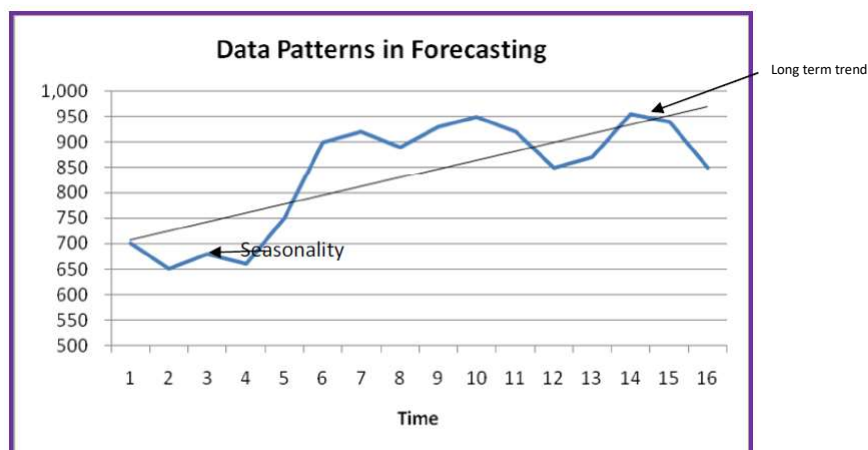
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“Quantitative Analysis for Management” Render & Stair, Pearson Prentice Hall, 2008

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Modelling for Seasonality



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LINEAR REGRESSION

- Useful for predicting future number based on historical data, or filling in gaps for missing data
- Check for outliers
- Cannot be used to calculate causation; i.e. X **predicts** Y, not X **causes** Y!
- The FORECAST function doesn't stop at zero. Use a MAX function to stop negative values if necessary.

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Stopping a Linear Forecast at Zero

1. Open the file "Phasing and Seasonality.xlsx". Go to the tab "FORECAST Neg"
2. Create a forecast function in cell C8 and copy it down (don't forget your \$)
3. Create a line chart
4. Link lines up by adding actual in cell C7
5. Stop the forecast at zero using a MAX function

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Creating a Linear Forecast

1. Go to the tab "FORECAST"
2. Create a forecast function in cell C8 and copy it down (don't forget your \$)
3. Create a line chart
4. Link lines up by adding actual in cell C7

SOLO EXERCISE

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Forecasting for Seasonality

1. Go to the tab "Fcst for Seasonality"
2. Calculate the average using an AVERAGE function in row 6
3. Calculate the Seasonality in row 7 by dividing the average of the quarter by the average of the entire dataset
4. Add the future dates using an EDATE or EOMONTH function starting from cell A12, until Dec 2023
5. Add the raw data in column B using three separate TRANSPOSE array functions, or use Paste Special > Transpose
6. Add the linear forecast from cell C23 using a FORECAST function
7. Add the seasonality index to column D
8. Multiply it out in column E
9. Create a line chart
10. Link lines up by adding actuals in row 22

BREAK OUT GROUPS
(5 min demo + 5 min on
your own + 10 min
discussion)

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WHICH DO YOU PREFER?

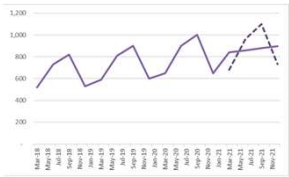
- Would you use Forecast Sheet, or calculate it manually?
- What are the pros and cons of each method?

DISCUSSION

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PHASING AND FORECASTING IN BUDGET MODELS



See "Using Excel for Business and Financial Modelling", Chap6, p158

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SEASONALITY EXERCISE

YEAR	Q1	Q2	Q3	Q4
2020	520	730	820	530
2021	590	810	900	600
2022	650	900	1000	650

Create a budget for the four quarters of 2023.

Remove the quarter-related seasonality, and forecast for 2021 using the FORECAST function, and then reapply seasonality.

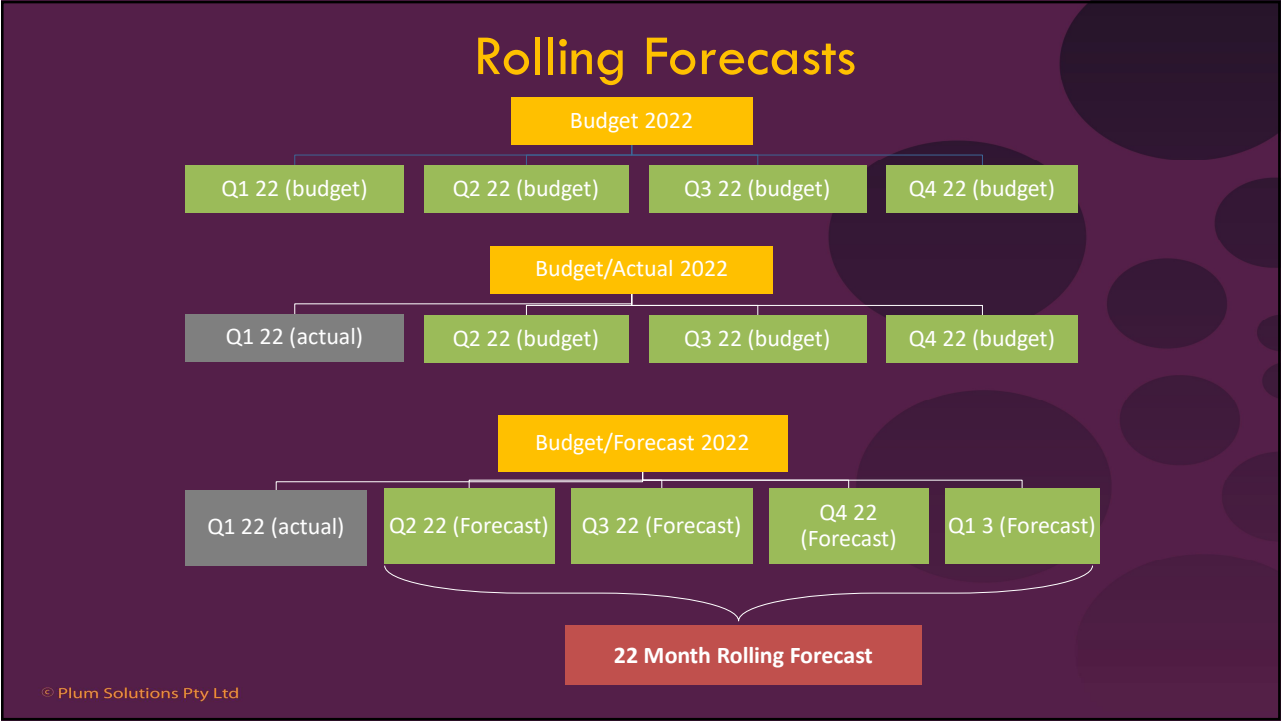
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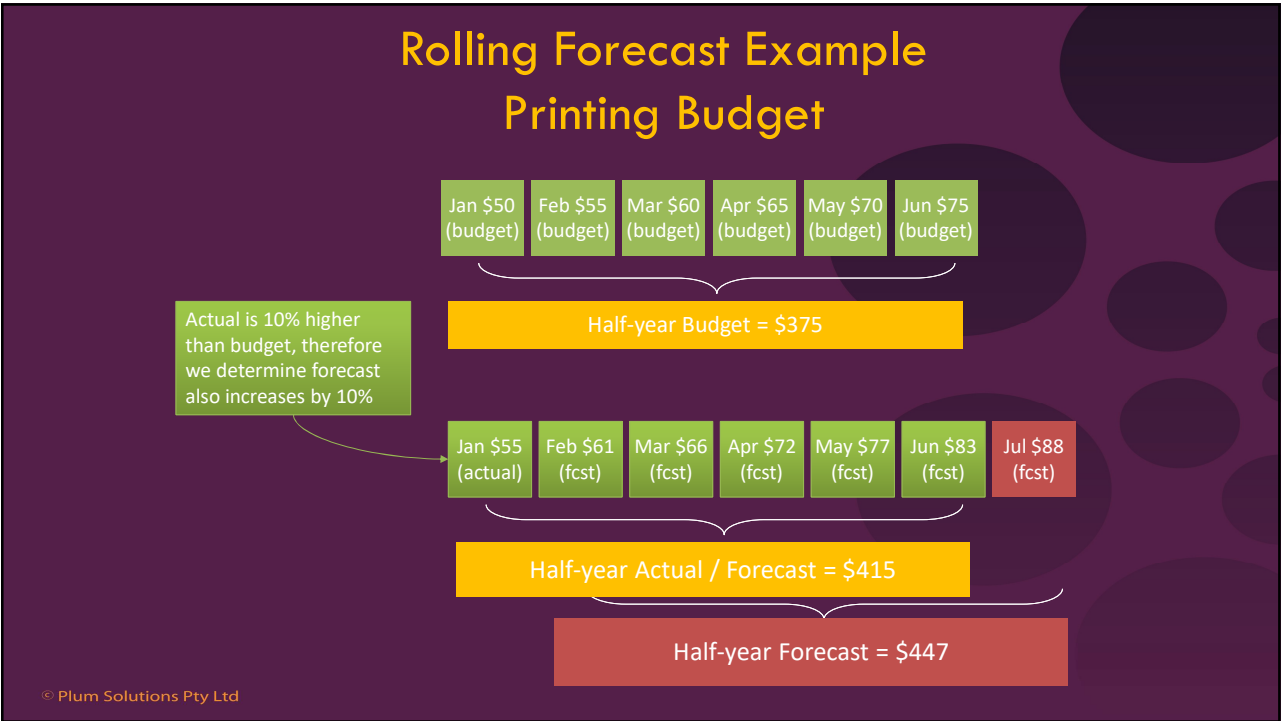
ADVANTAGES OF ROLLING FORECASTS

- Continuous review
- Encourages driver-based thinking
- Quick to respond and adapt
- We have the capability (now)

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BREAK OUT GROUPS
(5 min on your own + 10 min discussion)

ROLLING FORECAST

- ❖ Open the file “Rolling Forecast.xlsx”
- ❖ Create ACTUAL/BUDGET starting in E32 (use an IF)
- ❖ Create a forecast starting in G32 (use a FORECAST.ETS and a MAX)
- ❖ Add some sparklines in column D

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Q&A

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PART 2: BUDGETING AND FORECASTING IN EXCEL

3. Budgeting Techniques

- How budgeting fits into the strategic planning process
- Building flex budgets
- Top down versus bottom up
- Zero based budgeting

4. Critique of the budget process

- Behavioural impact of budgeting
- Budgeting “soft” skills

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FLEX BUDGETS



Companies can revise, or “flex” their budgets, depending on the changes in volume

Shows what the budget **would have looked like** at actual volume.

Hence this strips out variance relating to volume changes so that underlying performance can be examined

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BOTTOM UP BUDGETING

- Each line manager is asked to complete their budget at a granular level.
- This is then consolidated and compared with the Strategic Plan, prior years, and other forecasts.
- Each department is then asked to cut back their budget in order to gain the targeted total company amount.

Problems with this method?

If each manager is asked to complete their own budget without targets it becomes a “wishlist” of expenditure. Each manager is likely to “pad” or “sandbag” their numbers so that if they are asked to cut their budgets by 40%, for example, their budget is still within their originally desired amount!

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TOP DOWN BUDGETING

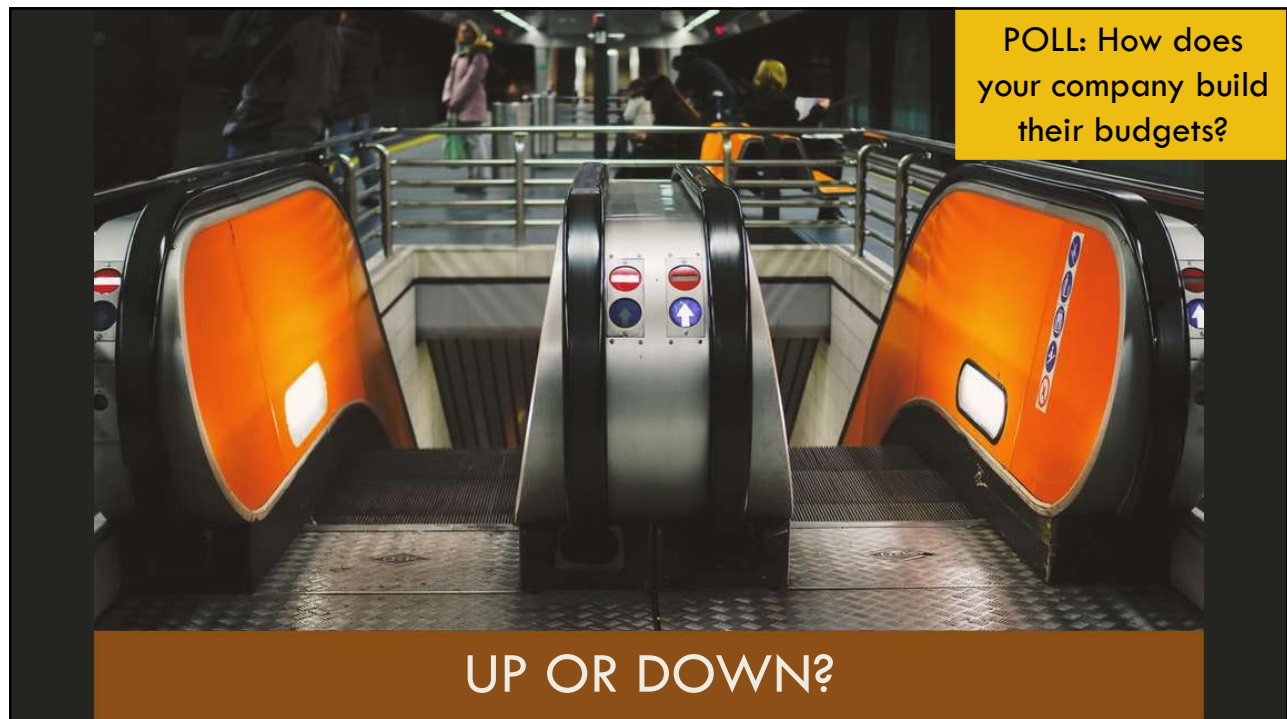
- The organisation takes the Strategic Plan, or Five Year Forecast, and splits it to department level according to historical data or strategic direction.
- Each department is then asked to complete their budget at a granular level

Problems with this method?

There is no ownership of the budget for each manager. Without ownership or “buy-in” from the managers responsible for the budget it will have no credibility, and will not be an effective performance management tool.

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THE SOLUTION?

- Usually it's practical to do a combination of both, incorporating several "cuts" of the budget.
- The Strategic plan gives an approximate indication of the total budget figures, and each area is given a target amount
- The first cut is done bottom up, and this is compared to the Strategic Plan and adjusted as necessary

Note – this method requires strict project planning and time management!

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ZERO-BASED BUDGETING

What is wrong with using last year's actuals to set this year's budget?

There is no reason to believe that what happened last year is going to happen again. It may help in the formulation of the plans, but **past events should not be automatically seen as a target.**

- In Zero-based Budgeting, the budget for every cost item is initially set to zero.
- In order to obtain funding, each item or activity needs to be justified in terms of its continued usefulness.
- There are no "givens"!
- It forces management to rethink each phase of operations before allocating resources.

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WHO USES ZERO-BASED BUDGETING?

According to a 2019 Accenture survey;

- There was a 57% increase in the use of ZBB in 2017
- More than 90% of surveyed firms used it to reduce costs
- Firms on average saved \$280m per year

Source: FP&A Board

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POLL: Have you ever used ZBB?

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DISADVANTAGES OF ZERO-BASED BUDGETING

- It is time-consuming and expensive to undertake
- Managers can feel threatened or insecure having to justify their budgets every year.
- Zero-based Budgeting is most relevant for discretionary areas of expenditure such as travel, training or research & development
- It should be undertaken with sensitivity

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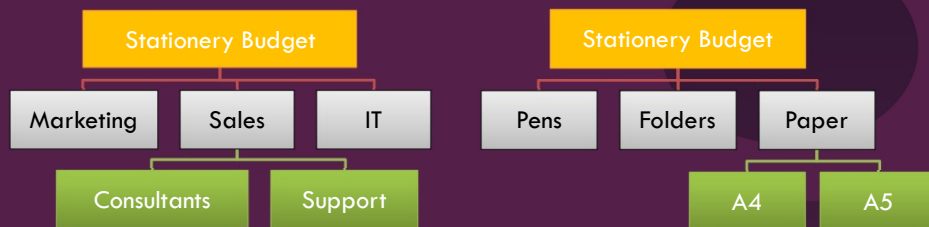
BENEFITS OF ZERO-BASED BUDGETING

- It removes “fat” from the budget
- It helps with the flexible planning process
- It helps move away from traditional budgeting culture
- Useful for a post-COVID budget

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GRANULARITY – HOW LOW TO GO?



Generally, the more detail the better, however, going into too much detail can create unnecessary work. In this case, “Stationery” will probably suffice, as reporting budget vs actual at the lower levels is impractical.

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Problems with the Traditional Budget Process

1. Budgets are time-consuming to put together
2. Considering the time required to prepare them, budgets do not add sufficient value
3. Budgets constrain responsiveness and are often perceived to be a barrier to change
4. Budgets concentrate on cost reduction and not value creation
5. Budgets can strengthen vertical command-and-control
6. Budgets do not reflect the emerging network structures that organisations are adopting
7. Budgets reinforce departmental barriers rather than encourage knowledge sharing
8. Budgets encourage gaming and perverse behaviours
9. Budgets are developed and updated too infrequently, usually annually

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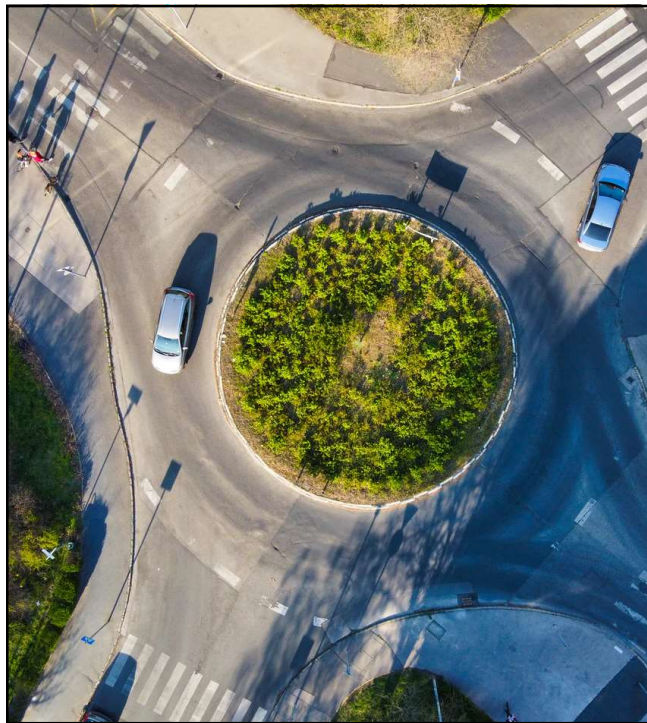


At a set of traffic lights,
the decisions are made by
the traffic controller, not
the driver

(rules-based management)

Source: <https://fpa-trends.com>

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Business decisions should be based on a roundabout, not a set of traffic lights

(values-based management)

Rules-based management versus
VALUES based management
MANAGING performance versus
ENABLING performance.

Source: <https://fpa-trends.com>

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One source of the truth?

- One source of the data, many sources of truth, depending on your function or your focus.
- Strategy, tactical or operational focus; data is translated in different ways depending on the focus.

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WHY BUDGETS HAVE AN IMAGE PROBLEM

- “It’s not in the budget”
- Just because it’s in the budget **doesn’t mean we should do it**
- And just because it’s NOT in the budget doesn’t mean we **SHOULDN’T** do it

Andy Shambrook, The Finance Business Partner

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WHEN THE NEW BUDGET YEAR STARTS



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Dysfunctional Budgeting Behaviour: Games People Play

- The June spending spree
- Use it or lose it
- Spend it early – then the cuts come from somewhere else
- Padding
- Budget early, spend late in the year

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EXECUTIVE TENURE

Company	Tenure
Uber	1.8
Dropbox	2.1
Square	2.3
Facebook	2.5
Airbnb	2.6
Netflix	3.1
Alphabet	3.2

Business Insider: Kaylee Fagan, Apr 2018

With tenure of around two years in large multinationals, the budget of many organisations is a tool of the game in **office politics**.

Source: FP&A Board

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SO WHY DO WE BUDGET?

- They promote **forward thinking and may identify short-term problems**. For example, there may be a shortage of a particular material due to seasonality of demand at one time of the year. Knowing this in advance means that managers can plan for it, and avoid potential problems. Similarly, **cashflow forecasting** is extremely important. Knowing when cash is likely to be short, and planning an overdraft could literally save a business.
- **Co-ordination in various sections of the business**. Activities of different areas can be complementary to another. E.g., areas purchasing from the same supplier should liaise and bundle their orders and potentially gain a bulk discount and save on shipping.

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- **Allocation of resources.** Budgets help to allocate limited resources between departments. For example, Govt and Councils must allocate their revenue between competing services such as maintenance of property and equipment eg. streets, parks etc. and other community services.
- They can **motivate managers to better performance.** It is well known that if managers are given a specific target, they are more likely to achieve that target than if they are told to “do their best”. It also motivates managers if they can relate their own targets to the overall objectives of the business.
“what gets measured gets done”!
- They provide a **basis for a system of control.** A budget provides benchmark, goals, KPIs and targets against which performance can be measured.

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Dysfunctional Budgeting Behaviour: Games People Play

- The June spending spree
- Use it or lose it
- Spend it early – then the cuts come from somewhere else
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- Budget early, spend late in the year

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Behavioural Impacts of Budgeting

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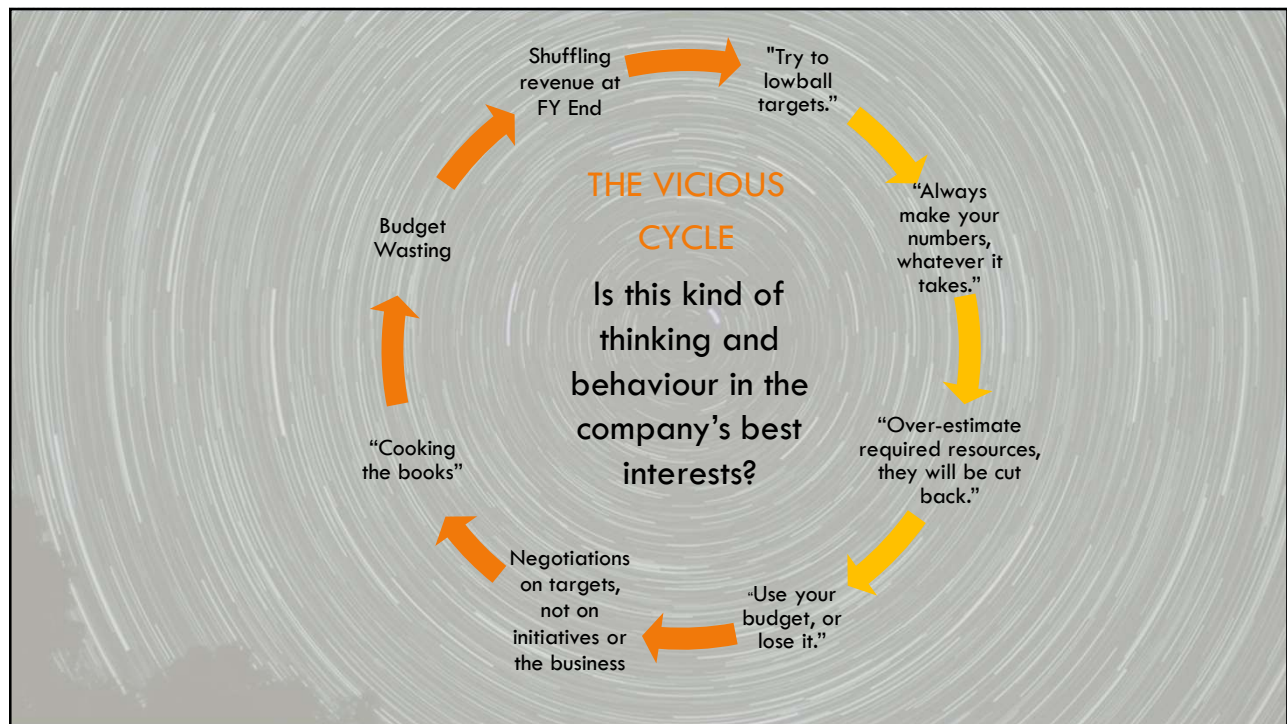
Building in Slack (“Padding” or “Sandbagging”)

Why do managers do it?

- So that they can perform well against the budget
- Dealing with uncertainty – if an unforeseen event occurs, the manager can use the slack and still meet the budget.
- The vicious cycle. Budget will be cut because they have been padded, and managers will pad their budget because they know it will be cut!

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How do we avoid the Sandbag Problem?

- Stop using the budget as a negative evaluation tool.
- Managers are allowed to exceed the budget without consequence if there is a good reason, or a matching revenue increase.
- Reward managers for **accurate** projections, not for "beating the budget".
- Create an "aspirational" budget in which managers are encouraged to be optimistic without being held to it

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SOFT SKILLS - How to get “buy-in” from your Stakeholders

- Involve them in the process early on
- Get them to take ownership by filling in their own budgets. Walk through it together if necessary in person or by phone
- Provide key budgeting assumptions with the budget but make detailed documentation available if necessary.

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Who motivates staff to better performance?

“We need to achieve another \$50k in sales by the end of the month!”

- Angela

“Just do the best you can”

- James



POLL:
Angela or James?

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Setting Timelines

- Create a project plan for your budget process.
- Work backwards from your deadlines allowing plenty of time for each activity
- Communicate with each stakeholder, letting them know what input you expect from them and when to provide it.
- Stick to it!

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A Sample Project Plan

Activity	Who	W1	W2	W3	W4	W5	W6	W7	W8
Strategic plan approved	Board of Directors								
Department targets set	Executive Team								
Build templates	Budget Manager (you)								
Distribute to managers to complete	Managers								
Collate & report first draft	Budget Manager (you)								
Executive review	Executive Team								
Adjustments	Managers								
Collate & report final draft	Budget Manager (you)								
Load into General Ledger	Systems Acc								

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Linking Rewards to Budgets

Research evidence shows that:

1. The existence of budgets tends to improve performance
2. Demanding but achievable budget targets tend to motivate better than less demanding targets
3. Unrealistically demanding targets have an adverse effect on performance
4. Participation of managers in setting their own targets improves motivation and performance

"Management Accounting for Non-Specialists" Peter Atrill, Eddie McLaney, Prentice Hall 1995

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PART 3: BUDGETING AND FORECASTING IN EXCEL

5. Capital expenditure budgeting

- Building capex and opex into the budget model
- Calculating depreciation

6. Using management reporting to promote accountability

- Building dynamic variance analysis reports
- Scenarios - Stress-testing, break-even and sensitivity analysis

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“Corkscrew” Cash Flow Forecast

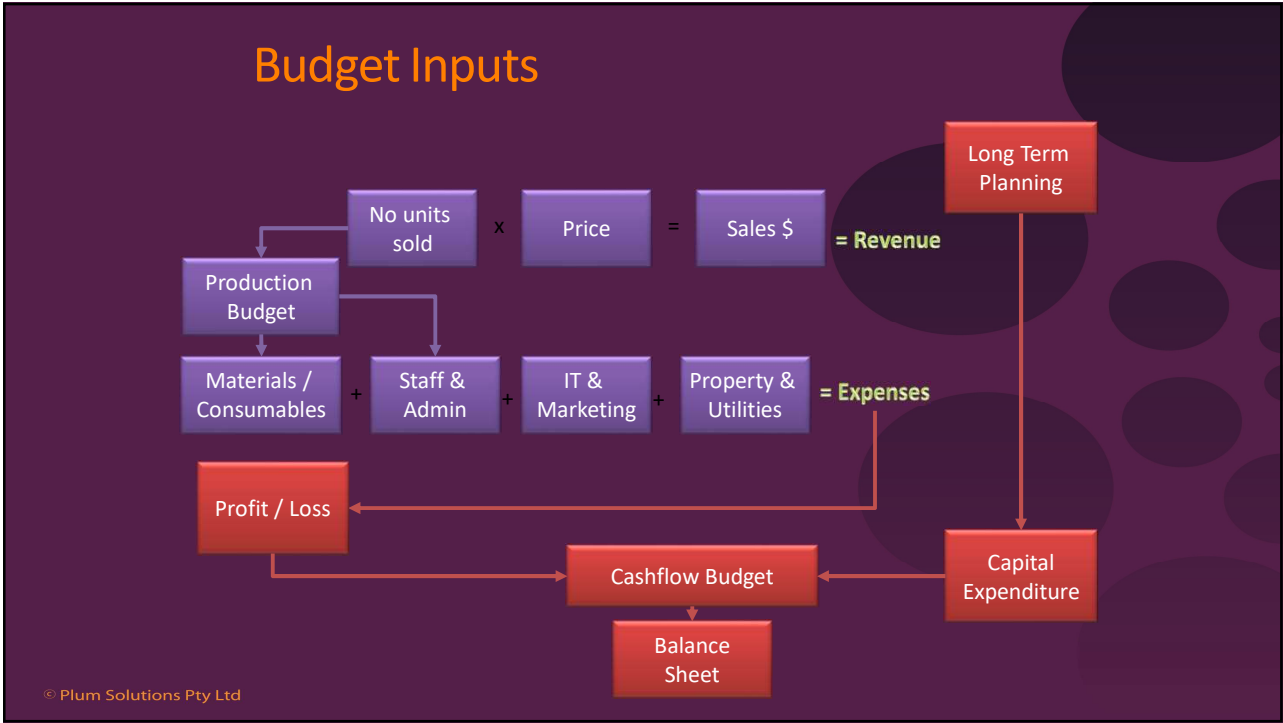
	July	August	September	October	November
Opening Cash	\$1,000	\$2,000	\$1,000	\$1,990	\$3,490
Add: Inflow from receipts	\$10,000	\$9,000	\$11,000	\$8,000	
Less: Outflow from payments	(\$9,000)	(\$12,000)	(\$8,000)	(\$6,500)	
Surplus / Deficit	\$2,000	(\$1,000)	\$4,000	\$3,490	
Add: Financing or repayments		\$2,000	(\$2,010)		
Cash at end	\$2,000	\$1,000	\$1,990	\$3,490	

Image: “Financial Modeling in Excel for Dummies”, Chapter 12

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Depreciation: Accounting for Capex

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	\$80,000	\$100,000	\$120,000	\$150,000	\$180,000
Machinery	(\$100,000)	-	-	-	-
Net Income	(\$20,000)	\$100,000	\$120,000	\$150,000	\$180,000

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	\$80,000	\$100,000	\$120,000	\$150,000	\$180,000
Depn on Machinery	(\$20,000)	(\$20,000)	(\$20,000)	(\$20,000)	(\$20,000)
Net Income	\$60,000	\$80,000	\$100,000	\$130,000	\$160,000

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What is the Difference between CAPEX and OPEX?

Capital Expenditure (CAPEX)	Operating Expenditure (OPEX)
For the purchase of physical assets	For the purpose of keeping the business running
Long term	Short term
Can be capitalised and therefore affects cashflow, but not necessarily stated profit	Expensed as incurred

Gets capitalised and depreciated

Gets expensed

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What is the Difference between Capex and Opex?

Examples of CAPEX	Examples of OPEX
• Motor Vehicles • Factory Equipment or Machinery • Computers • Furniture	• Electricity • Staff costs • Rent • Software Licenses

Gets capitalised and depreciated

Gets expensed

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CAPEX GETS DEPRECIATED OPEX GETS EXPENSED

What about Amortisation?
It's for non-tangible items

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VARIANCE FORMULAS

	Budget	Actual	Variance	B/W	Formula
Revenue	\$100	\$120	\$20	B	A-B
Expenses	<u>\$80</u>	<u>\$90</u>	<u>(\$10)</u>	W	B-A
Profit	\$20	\$30	\$10	B	A-B

- Beware the variance formula in Budget Modelling
- Note Better / Worse (B/W) may also be called Favourable / Unfavourable (F/U or FAV/UNF)

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Variance Analysis

Consider the following Actual vs Budget report for May:

	Budget	Actual
Units produced	1,000	900
Sales	\$100,000	\$90,000
Raw Materials	\$40,000	\$70,000
Labour	\$20,000	\$18,000
Fixed Overheads	\$20,000	\$20,000
Operating Profit	\$20,000	(\$18,000)

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After discussions with the production manager, it became clear that because of an offered bulk discount, twice as much material was purchased in May, and therefore June's variance report will be as follows:

	Budget	Actual
Units produced	1,000	950
Sales	\$100,000	\$95,000
Raw Materials	\$40,000	\$5,000
Labour	\$20,000	\$20,000
Fixed Overheads	\$20,000	\$20,000
Operating Profit	\$20,000	\$50,000

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Dealing with Variances

Options for dealing with this variance:

- We could move \$35k worth of materials to June's report
- Leave it as is and document the variance.

What should the production manager have done? Was he right to buy now and get the discount? Or should he have waited so that his budget remained accurate?

The rigidity of budgets can lead to dysfunctional behaviour

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Variances & Accountability

Imagine that you are the Production Manager of this company and your entire bonus relies on sticking to your budget. How would you feel?

	Budget	Actual	\$ Variance	% Variance
Raw Materials	\$40,000	\$60,000	(\$20,000)	(50%)
Labour	\$20,000	\$30,000	(\$10,000)	(50%)

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Now, let's see the whole picture...

	Budget	Actual	\$ Variance	% Variance
Units produced	1,000	1,500	500	50%
Sales	\$100,000	\$150,000	\$50,000	50%
Raw Materials	\$40,000	\$60,000	(\$20,000)	(50%)
Labour	\$20,000	\$30,000	(\$10,000)	(50%)
Fixed Overheads	\$20,000	\$20,000	-	-
Operating Profit	\$20,000	\$40,000	\$20,000	50%

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- *The company was actually doing very well...*

- If the Production Manager had tried to stick to his budget, there would have been supply problems!

- Budgets should either have some degree of flexibility or else a variance analysis needs to be taken into account when measuring performance against targets.

Reporting budgets vs actuals promotes accountability

However, variance analysis needs to be undertaken correctly so that dysfunctional budgeting behaviour is not encouraged

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Excel Scenario Tools

1. Manual Scenario selection
 - Data validation dropdown
 - Combo box dropdown
2. Data Tables
3. Scenario Manager
4. Goal Seek (What-if Analysis)
5. Monte Carlo (Stochastic Simulations)

See *"Using Excel for Business and Financial Modelling", Chapter 11*

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Scenarios, Sensitivities & What-if Analysis

- Each term has slightly different meanings
- Uncertainty is not risk
- Different to a forecast because a scenario does not rely on historical information, rather it tries to predict what **drivers** will change in the future and how this will affect outcomes
- Typically best case, base case, worst case but can be much more detailed

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The Problem with Scenario Analysis

- How useful are best/base/worst cases really?
Obviously it's worth a lot if everything goes well, less if it goes badly.
- But it's helpful to see if under the worst case scenario, will it push us into default?
- Can help prepare for the worst (if we go ahead)

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Walk through of Property Development Scenario Analysis Model

	A	B	C	D	E	F
1	Scenario:	Best Case				
2						
3		Building cost per sq mtr	Sale Price per sq mtr	Total no sq mtrs	Sales commission	
4	Best Case	\$1,250	\$3,300			
5	Base Case	\$1,500	\$3,000			
6	Worst Case	\$1,750	\$2,700			
7						
8	Assumptions	\$1,250	\$3,300	5,000	2.50%	
9						
10	Profitability of Land Development					
11	Income - Sale of Properties		\$16,500,000			
12	Expenses					
13	Land Costs		\$4,300,000			
14	Building Costs		\$6,250,000			
15	Council Contributions		\$750,000			
16	Sales Commission		\$412,500			
17	Total Expenses		\$11,712,500			
18						
19	Net Profit		\$4,787,500			
20	Profit Margin		29%			
21						

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Manual Scenario Analysis

- Use numbers, data validations, or form controls to drive scenarios
- Advantages:
 - Easy to build, easy to understand
 - Can handle a large number of inputs and outputs
- Disadvantages:
 - Can only look at one scenario at a time
 - Difficult to compare scenarios side by side

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MANUAL SCENARIO ANALYSIS

Use numbers, data validations, or form controls to drive scenarios

Advantages:

- Easy to build, easy to understand
- Can handle a large number of inputs and outputs

Disadvantages:

- Can only look at one scenario at a time
- Difficult to compare scenarios side by side

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DATA TABLES

Advantages:

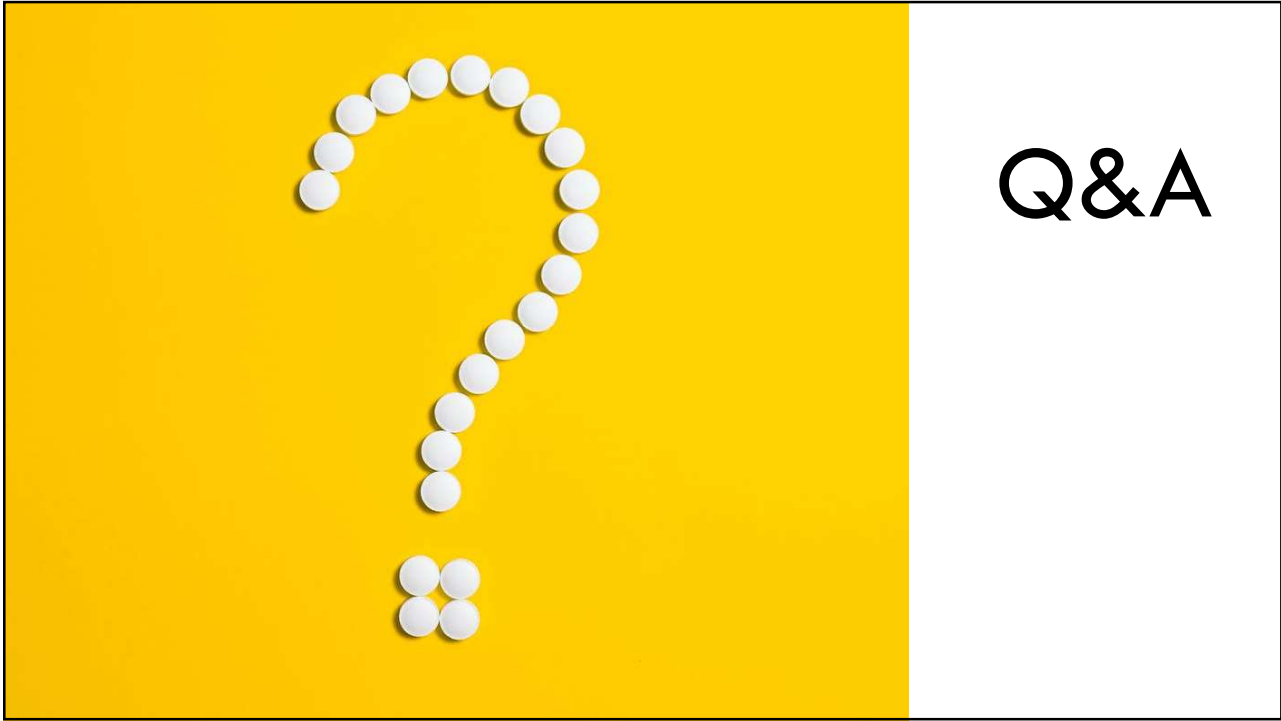
- Can look at multiple outcomes simultaneously
- Perfect for sensitivity analysis

Disadvantages:

- Uses array formulas, so tricky for beginners to build
- Inputs and outputs need to be on the same page
- Can only show one or two variables and only one output
- Slows down calculation

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VIRTUAL MEETUPS

26th Apr WOMEN IN FINANCIAL MODELLING: “Using Power Query for Financial Model Data Collection” Gabriela Strój

12th May VIRTUAL MEETUP: “Excel Dynamic Arrays in Financial models; Possibilities and Pitfalls” David Taylor

18th May LIVE WORKSHOP: “Introduction to Dashboard Reporting in Modern Excel” Danielle Stein Fairhurst

2nd Jun VIRTUAL MEETUP: “To Err is Human but to ISERR is Never OK!” Andrew Berg

23rd Jun VIRTUAL MEETUP: “I didn’t know Excel could do THAT” Bob Umlas

14th Jul VIRTUAL MEETUP: “Advancing into Analytics; from Excel to Python and R” George Mount

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