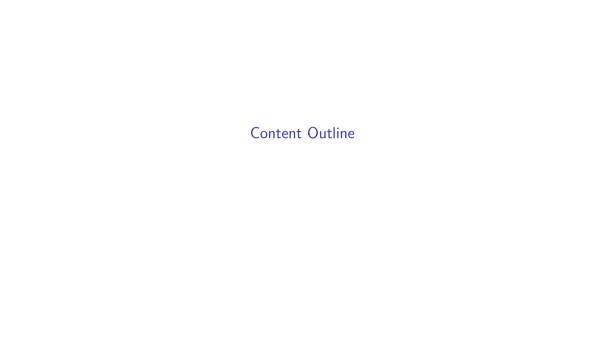Review Session

Overview

- Comprehensive
  - The questions from the mid-term will be included, but slightly edited.
- 3 hours
  - You can expect the exam to be about three times as long as the midterm.
- The exam is closed book and notes.

Content Outline

Content Outline

- **Section 1: Tools** Covered in Midterm. Final Exam questions will be *very* similar.
- **Section 2:** Theory.
  - Part 1: Time Value of Money and Taxes. Covered in Midterm. Final Exam questions will be *very* similar.
  - Part 2: Economics of Agency. Not Covered in Midterm. Will be on Final Exam.
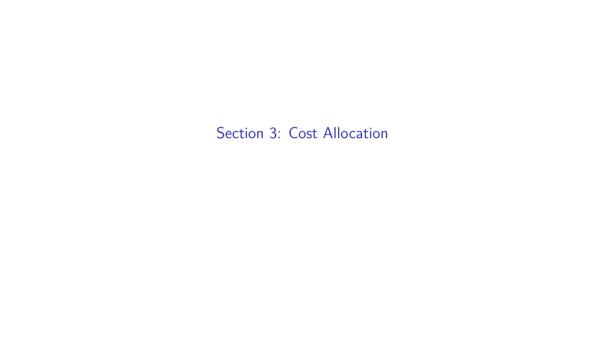- **Section 3:** Cost Allocation. Not Covered in Midterm. Will be on Final Exam.

Section 2 Part 2: The Economics of Agency

Economics of agency

- The following issues will be covered:
  - Separation of ownership and control
  - The nature of the principal agent problem.
  - Risk aversion and incentives

Economics of agency

- These will be questions about the concepts from:
  - Incentives and Compensation
  - Examples
    - Risk Aversion
    - Controlability/Informativeness

Section 3: Cost Allocation

Lectures 13 & 14: Transfer Pricing

- ▶ Vik-Giger
- ▶ Why do we need transfer prices?
  - ▶ Overconsumption of common resources.
  - ▶ Transmit information and incentives within a decentralized firm.
- ▶ Do you understand why the transfer price is useful for decentralized decisions in questions 1 & 2? **(Starting on Slide 6)**
- ▶ Do you understand why the transfer price is not useful for decentralized decisions in question 3? **(Starting on Slide 18)**

Lectures 13 & 14: Cost Allocation

- The key concept here is that cost allocations (including transfer prices) function as 'Pigouvian' taxes.
  - Taxes reduce the taxed activity.
  - Negative taxes are subsidies, and increase the subsidised activity.

Lecture 16: Cost Allocation

- ▶ **Step-down method:** I will not ask you about the step-down method. Beyond asking you what is wrong with it.
  - ▶ This method is 'unstable', 'indeterminate' or 'inaccurate', because the same underlying economics can produce very different numbers depending on the order in which you allocate the costs. There is no theoretical reason to prefer one order over the other.
  - ▶ Inaccurate, if the interdepartmental support consumption is large and unbalanced (i.e. consumption varies widely across all departments), then this method can missallocate costs by a large amount.

Lecture 18: Cost Allocation

▶ **Reciprocal Method:** I won't ask you to calculate the allocations, but I may ask you about how to set it up and interpret it.
  ▶ If given a table of costs, you should be able to set up the equations and describe how to solve them.

Review the slides (**Posted here**) starting with the "reciprocal method" slide. Focus on how to assemble the information and the steps, rather than the calculation. (*If you need a calculator, you will not need to do it!*)

Lectures 19 & 20: Absorption Costing

- ▶ I will not ask you about the examples in lecture 19. I will focus on the examples from lecture 20.
- ▶ Navisky, Aspen, Kothari problems (don't worry, I won't ask all of them)

Navisky notes

- ▶ Several students have asked about this problem.
- ▶ Please keep in mind that I will not ask you to calculate this on the final exam.
- ▶ The most common question is "Where does the Fixed Manufacturing Overhead in question 1 come from?"
  - ▶ We'll look at this on the next slide.
- ▶ The second is where are the production numbers coming from?
  - ▶ These are various scenarios, chosen to illustrate the range of options available to the manager in each question. You **will not** need to calculate these. I will give them to you and ask you to interpret them.

▶ Manufacturing overhead: 2.7 million

Production	1200	1300	1350	1360
Revenue (assuming sales of 1200 units)	€6,600,000	€6,600,000	€6,600,000	€6,600,000
Cost of goods sold:				
Variable mfg cost	(456,000)	(456,000)	(456,000)	(456,000)
Fixed mfg overhead	**(2,700,000)**	**(2,492,308)**	**(2,400,000)**	**(2,382,353)**

Where did the last row come from?

Navisky notes: Overhead application

If we produce and sell 1200 units (the first column):

- ▶ MO allocation rate:
- ▶ $2,700,000/1200 = 2,250$
- ▶ MO allocation to COGS:
- ▶ $1,200 \times 2,250 = 2,700,000$

If we produce 1200 and sell 1300 (the second column):

- ▶ MO allocation rate:
- ▶ $2,700,000/1300 = 2,076.923$
- ▶ MO allocation to COGS:
- ▶ $1,200 \times 2,076.923 = 2,492,307.6$

Navisky notes: General approach

- ▶ Application of fixed overhead
- ▶ You can think of the formula for fixed manufacturing overhead applied to cost of goods sold as:

$$FMO = OHR \times Q_{sold}$$

- ▶ OHR is the overhead rate: $OHR = TOH/Q_{made}$
- ▶ OH is the total overhead, 2.7 million in this case
- ▶ Q_{made} is the number of units produced, and Q_{sold} is the number of units sold.

Navisky notes

- The cost per unit of inventory is the sum of the overhead applied to the inventory and the variable manufacturing costs

- $VC/unit = 380$

- The fixed overhead applied to each unit of inventory is just the overhead rate:
  $OHR = TOH/Q_{made}$

Navisky: Think about the structure of the incentives

- ▶ What roles in determining incentives could the size of the factory play?
  - ▶ Limits overproduction to 1500 units. If we assume that the manager does not have the ability to unilaterally expand the factory, if they do then we do not have enough information to determine the costs and benefits from the company and manager perspectives.
- ▶ What roles in determining incentives is the bonus cap playing?
  - ▶ Limiting the bonus to €27,000
- ▶ What role is the bonus itself playing?
  - ▶ In general, an incentive to increase net income.
  - ▶ So, first: produce and sell 1200 units.
  - ▶ Then, second: overproduce until the bonus cap, or factory limit, is reached.

Navisky: Think about the structure of the incentives

- ▶ What role is the accounting method playing?
  - ▶ Absorption costing allows managers to increase income by reducing cost of goods sold.
- ▶ How do these things interact and what would happen if they were relaxed (one at a time or all together)?
  - ▶ Think about each of the answers, and choices that the manager makes and think about how the optimal choice would change if the parameters were to change.

Activity Based Costing

Conceptual understanding of how activity based costing improves on simple absorption costing.

1. More granular information leads to more accurate cost allocations.
2. More accurate allocations provide better information via transfer prices.
3. More accurate allocations connect incentives (a la Pigou) to the actual costs that the firm incurs.

Budgets/Standard Costs/Variances

There will be a section of multiple choice question based on these.

- ▶ A few students asked for the who test to be MC, I'm not allowed to do that. I'm sorry. Also, writing MC questions is so absolutely apocalyptically stultifyingly soul crushingly boring that I can't possibly write any more of these than I have. But there will be a bunch of them and they will be easy.

Variance

Total Variance = Actual Cost - Standard Cost

Disaggregation of direct cost variances

Direct cost (labor and materials) can be disaggregated into Price and Quantity variances using the flexible budget.

Disaggregation of direct cost variances

Total Variance	Actual DM Cost	Flexible Budget	Standard DM Cost
$(Q_a \times P_a) - (P_s \times Q_s)$	$P_a \times Q_a$	$P_s \times Q_a$	$P_s \times Q_s$

Total Variance	Price Variance	Quantity Variance
$(Q_a \times P_a) - (P_s \times Q_s)$	$P_a \times Q_a - P_s \times Q_a$	$P_s \times Q_a - P_s \times Q_s$
$[Q_a(P_a - P_s)] + [P_s(Q_a - Q_s)]$	$Q_a(P_a - P_s)$	$P_s(Q_a - Q_s)$

Disaggregation of overhead cost variances

Total Overhead Variance = Actual Overhead Costs - Overhead Absorbed

$$AOH - (OHR \times SV) = AOH - (OHR \times SV)$$

$2,300,000 - $2,291,600 = $8,400

Interpretation:

- ▶ Overhead is 'Underabsorbed', if actual > absorbed
- ▶ Overhead is 'Overabsorbed', if actual < absorbed

Disaggregation Overhead Variance

Total Overhead Variance = Actual Overhead - Overhead Absorbed

- ▶ Overhead spending variance = Actual overhead - Flexible budget at actual volume
- ▶ OSV = AOH - FB@AV
- ▶ Overhead efficiency variance = Flexible budget at actual volume - Flexible budget at standard volume
- ▶ OEV = FB@AV - FB@SV
- ▶ Overhead volume variance = Flexible budget at standard volume - Overhead Absorbed
- ▶ OVV = FB@SV - OA

Disaggregation Overhead Variance

TOV	=	AOH				-		OA
OSV	=	AOH	-	FB@AV				
OEV	=			FB@AV	-	FB@SV		
OVV	=					FB@SV	-	OA

More detailed definitions:

TOV	=	AOH	-		$OHR \times SV$
OSV	=	AOH -	FOH+(VOH×AV)		
OEV	=		FOH+(VOH×AV) -	FOH+(VOH×SV)	
OVV	=			FOH+(VOH×SV) -	$OHR \times SV$

Disaggregation Overhead Variance

- Overhead spending variance: OSV = AOH - FB@AV
  - This is the variance due to change in the cost of the overhead itself.
- Overhead efficiency variance: OEV = FB@AV - FB@SV
  - This is the variance due to differences in how efficiently we used the overhead.
- Overhead volume variance: OVV = FB@SV - OA
  - This is the variance due to the effect of volume on the overhead allocation.