

CIMA VISITING PROFESSOR LECTURE

MANAGEMENT ACCOUNTING CHANGE:
ORGANIZATIONAL CAUSES AND
INDIVIDUAL EFFECTS

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THE ONLY CONSTANT IS CHANGE

- Organizations are constantly experiencing change
- Strategy, structure, processes, products, employees, customers, locations
- Organizational changes are frequently in response to environmental changes
- Competition, customers, regulations, technology, uncertainty
- Most organizational changes are continuous, with change focused within departments — TQM
- Some organizational changes are discontinuous, with change focused across departments — Re-engineering

MANAGEMENT ACCOUNTING CHANGE

- Responsibility accounting — pseudo-profit centers
- Budgeting — and beyond, links to strategy
- Costing — ABC, life cycle, environmental/health/safety
- Performance measurement — financial (EVA), quantitative nonfinancial, subjective measures
- Performance reporting — Balanced Scorecard, real time
- Incentives — pay for performance, gain sharing, teams
- What causes change in management accounting?

ORGANIZATIONAL CHANGE → MANAGEMENT ACCOUNTING CHANGE

- Since organizational change is frequently a response to environmental change, many management accounting changes are indirectly caused by environmental change
- Environmental change →
organizational change →
management accounting change

CHANGE IN COMPETITION → CHANGE IN STRATEGY

- How does a strategic business unit compete in an industry?
- Low cost and/or differentiation strategies
- Industry structure → competitive strategy
 - Structure-Conduct-Performance Model: # buyers and sellers, product differentiation, barriers to entry, cost structures, vertical integration
 - Five Forces Model of Environmental Threats: Threat of entry, threat of suppliers, threat of substitutes, threat of buyers, threat of rivalry
 - Example: Threat is entry of new competitors → deter entry by
 - low cost strategy (economies of scale, learning curve)
 - differentiation (strong brands, R&D, custom products, service)

CHANGE IN STRATEGY → CHANGE IN MANAGEMENT ACCOUNTING

- Traditional costing systems allocate overhead to products proportional to products' direct labor content
- Assumes all products consume overhead resources at same (average) rates
- Firms are changing their competitive strategy towards product differentiation
- Differentiation strategy → product customization → products consume different overhead resources
 - Design, development, logistics, production, marketing, distribution, service
- Product differentiation strategy increases benefit from using activity-based costing

EXAMPLE: RESPONSIBILITY ACCOUNTING

- Rowe, Birnberg, and Shields. 2007. Effects of organizational process change on responsibility accounting and managers' revelations of private knowledge. *Accounting, Organizations and Society*
- A division of a Fortune-100 firm experienced significant change in competition
- Its major customer changed from having two suppliers each with a cost-plus contract to one supplier with a fixed-price contract

CONTINUOUS-IMPROVEMENT STRATEGY

- Division's continuous organizational process improvement strategy focuses on incremental change within functional departments
 - Engineering, procurement, logistics, production, testing
- Strategy is effective when organizational success is based on improving performance by, say, 3% per year
- Managers could improve organizational performance 3% each year by making incremental improvements within their own departments
 - Improvement did not require multiple departments to coordinate their actions

COMPETITIVE RESPONSIBILITY-CENTER BOUNDARIES

- Each department is a responsibility center with its own budget and accounting reports, and accounting information is not shared with other departments
- Accounting reports refer to particular managers using different titles or social categories
- Accounting reports have technical jargon that inhibit inter-department communication about economic implications of competing improvement proposals
- Managers are physically distanced or separated (walls)
- Each manager communicates separately with superiors about budgets and analysis of competing improvement proposals

ACCOUNTING MOTIVATED COMPETITIVE BEHAVIOR

- Accounting system designates each department as a separate responsibility center with separate budgets and accounting reports with jargon, and incentives
- Motivates department managers to have competitive behavior — **compete for budget, resources, rewards**
- Competitive managerial behavior is effective because it results in each department incrementally improving performance

DISCONTINUOUS-IMPROVEMENT STRATEGY

- Change in competition resulted in continuous organizational process improvement strategy not being effective
 - Division needed immediate 25% cost reduction, not 3% per year
- Changed strategy to discontinuous organizational process improvement using re-engineering
 - Identify opportunities for massive immediate cost reduction by changing processes that cut across the entire organization
- Requires department managers to communicate with other managers about how to revise processes to reduce costs
- Important for managers to know how they impose costs on other managers and how they can reduce those costs
- Change managers' behavior from competitive to cooperative

HOW CAN ACCOUNTING PROMOTE COOPERATION?

- Each department being a separate responsibility center creates boundaries between managers
→ **competitive behavior**
- **Accounting can motivate cooperative behavior** by changing responsibility-center boundaries to group together department managers involved with common organizational process
- Relationally frame managers as “We”, not “I”, to encourage them to cooperate and share private knowledge

COOPERATIVE RESPONSIBILITY-CENTER BOUNDARIES

- Group department managers together with consolidated budgets and shared accounting reports
- Eliminate individual names and titles from reports and replace with no or single title or social category ("Team A")
- Use language in accounting reports that all managers understand to facilitate inter-department communication about economic implications of competing improvement proposals
 - ABC dictionary, no accounting or functional area technical jargon
- Managers are physically together in face-to-face proximity
- Groups of managers communicate simultaneously with superiors about budgets and analysis of competing improvement proposals

EFFECT OF CHANGE IN RESPONSIBILITY ACCOUNTING

- With competitive responsibility-center boundaries, managers did not reveal much, if any, private knowledge about how to reduce process costs across departments
- When changed to cooperative responsibility-center boundaries, managers did reveal private knowledge
- Revelations estimated to reduce the Division's total cost by ~ 21% per year (close to the needed 25% / year)
- Change management accounting → change individuals' communication

RELEVANCE OF STORY

- **Change in competition** (as demanded by key customer)
 - **change in competitive strategy** (from continuous to discontinuous organizational process improvement)
 - **change in management accounting** (from competitive to cooperative responsibility-center boundaries)
- Organizational-level changes in competition and strategy
 - organizational-level change in management accounting
- Organizational-level change in management accounting **may or may not cause** individual managers to change their behavior
 - Communication, decisions, motivation
- **If no or incorrect change in individual managers' behavior, then no change or decrease in organizational performance**

MANAGEMENT ACCOUNTING CHANGE

- Organizational change → change organizational management accounting → change individual-level behavior
- Management accounting change only indirectly affects organizations through its affects on individuals
- Management accounting change → change individual behavior → change organizational behavior → change organizational performance

EFFECTS OF MANAGEMENT ACCOUNTING CHANGE ON INDIVIDUALS

- Individuals, not organizations, respond to management accounting change
- Management accounting and its change may or may not influence individual behavior
- Communication, decisions, motivation
- Explaining and predicting how management accounting change affects organizations requires understanding how management accounting affects individuals' behavior
- 2 examples of how management accounting change **may or may not** change individuals' decisions and motivation

BACK TO ABC

- Firms are increasing product customization → increases diversity of products' resource consumption
- Low-volume custom products consume more overhead resources per unit than do high-volume standard products
- Cost allocations based on volume assume all products consume overhead resources at same (average) rates
- Result is relatively small over-costing of high-volume standard products and large under-costing of low-volume custom products

INDIVIDUAL'S COGNITIVE ADAPTATION TO CHANGE IN COSTING METHOD

- Firms change competitive strategy towards differentiation
→ firms implement ABC to measure economics of differentiation
- Cost drivers to capture effects of product customization and resulting process (activity) complexity
 - Activity cost drivers and pools
- Will managers change their decision process in response to a change in cost accounting?

COGNITIVE ADAPTATION TO CHANGE IN MANAGEMENT ACCOUNTING

- Dearman and Shields. 2005. Reducing accounting fixation: Determinants of cognitive adaptation to variation in accounting method. *Contemporary Accounting Research*
- Do individuals using unit product cost information to make product pricing decisions change their decision model when there is a change in how overhead costs are allocated to products?
 - From volume to ABC or vice versa?

BIASED UNIT PRODUCT COSTS

- Unit product cost with volume allocation is biased
 - Low-volume custom products are under-costed by a relatively large amount
 - High-volume standard products are over-costed by a smaller amount
- With volume-based overhead cost allocation, debias unit product costs by using production volume
 - Small decreases to reported costs of high-volume products
 - Large increases to reported costs of low-volume products
- Unit product cost with well-design ABC system is not biased

PRODUCT PRICING DECISIONS AND DEBIASING PRODUCT COSTS

- Product price = $a + b_1 \times \text{unit product cost} + b_2 \times \text{market competition} + b_3 \times \text{production volume}$
- Unit product cost measured by allocating overhead costs by volume or ABC
- When change cost allocations from volume to ABC or vice versa, should change product pricing decision model for how production volume should influence pricing decision
 - For ABC, production volume should not influence price: $b_3 = 0$
 - For volume allocation, use production volume to adjust for biased reported unit product costs
 - Bigger increases in prices of lower volume products and smaller decreases in prices of higher volume products
 - Thus, negative relation between price and volume: $b_3 < 0$

CHARACTERISTICS OF MANAGERS WHOSE DECISION MODELS CHANGE: CHANGE INFLUENCE OF PRODUCTION VOLUME

- 78% of managers did not change their decision model
- 20% of managers changed their decision model in right direction
- 2% of managers changed their decision model in wrong direction

- Consistent with prediction based on **cognitive psychology**, only managers who had **high levels of cognitive ability**, **cost-accounting knowledge**, *and* **intrinsic motivation** changed their decision model in the right direction

IMPLICATION

- Do not automatically assume that management accounting change will always result in a change in organizational performance
- Depends on how individuals respond to the change in management accounting
 - No change, change in right direction, change in wrong direction
 - Degree or optimality of change
- How individuals' decisions respond to change in cost accounting depends on their ability, knowledge, motivation

MOTIVATION, COST ACCOUNTING, AND INCENTIVES LINKED TO PERFORMANCE MEASURES

- Krishnan, Luft, and Shields. 2005. Effects of accounting-method choices on subjective performance-measure weighting decisions: Experimental evidence on precision and error covariance. *The Accounting Review*
- Many managers' compensation is based on incentives linked to accounting performance measures, such as product cost
- Whether managers are properly motivated depends on how these incentives are linked to performance measures

MOTIVATION AND COST ALLOCATION

- ABC has increased attention to cost pools (activity cost pools) and cost drivers (e.g., unit, batch, product, facility)
- Another design decision is choice of denominator level in cost allocation formula
 - Cost allocation rate = overhead cost / activity level
- Alternatives include actual or budgeted volume, theoretical capacity, and practical capacity
- Actual or budgeted volume is most common, but practical capacity is recommended
 - to avoid allocating unused capacity costs to products and having allocation rates vary inversely with volume
 - to have more informative cost measures about managers' actions

COST ALLOCATION ACTIVITY LEVEL

- When use actual (or budgeted) activity volume to determine overhead cost allocation rate, unit product cost varies inversely with actual activity level
- Production managers can influence production costs by the efficiency of resource use, but have little control over production volume (depends on market conditions, product desirability, sales effort)
- Practical capacity results in no variation in overhead cost allocation rate due to changes in actual (or budgeted) production volume
 - Unit product cost measure is more controllable by production managers and informative about their actions

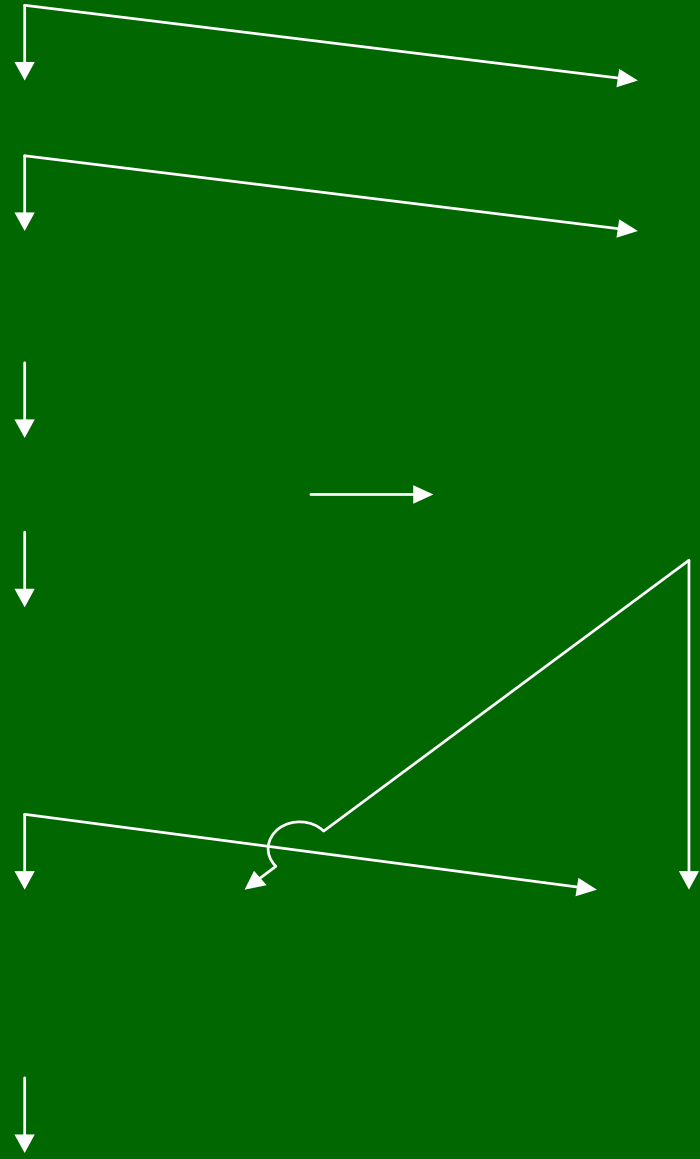
HOW LINK INCENTIVES TO COST MEASURE?

- Incentive bonus = $b_1 \times PM_1 + b_2 \times PM_2 + \dots$
 - b_i = incentive weight = £ bonus per unit of PM
- As precision of performance measure decreases, decrease incentive weight on measure
- Less precise measure is more influenced by uncontrollable events and less by the manager's actions
- Incentive weight on an imprecise measure results in variable (risky) compensation to the manager because the measure is influenced by uncontrollable events

APPROPRIATE LINKING IS COMPLICATED

- Risk-averse manager does not like uncontrollable variation in pay
- Manager will require higher expected payoff in return for a given amount of effort when compensation risk is higher
- Motivating manager is more costly because of risk premium
- When price of manager effort is higher, effort is a more costly input and firm acquires less of it in equilibrium
- Optimal response to decrease in precision of cost measure is to decrease its incentive weight
- When change from allocating costs by actual volume to practical capacity, incentive weight on the cost measure should increase because its precision increases

DIRECTIONAL
EFFECT OF
CHANGE IN
COST
MEASURE'S
PRECISION
ON
INCENTIVE
WEIGHTS



OPTIMAL INCENTIVE WEIGHTS ON MEASURES

- $\mathbf{v}_+ = [\boldsymbol{\mu}\boldsymbol{\mu}^t + r \boldsymbol{\Sigma}]^{-1} \boldsymbol{\mu}\mathbf{b}$
- where:
- \mathbf{v}_+ = vector of incentive weights for measures
- $\boldsymbol{\mu}$ = matrix of sensitivity coefficients (expected change in cost and other measures associated with a one-unit change in cost-reducing and other effort)
- r = manager's absolute risk aversion
- $\boldsymbol{\Sigma}$ = variance-covariance matrix representing precision in cost and other measures and error covariance of the cost and other measures
- \mathbf{b} = vector of coefficients indicating the effects of the manager's cost-reducing and other effort on firm's profit
 - Feltham and Xie. 1994. Performance measure congruity and diversity in multi-task principal/agent relations. *The Accounting Review*

REACTION TO CHANGE IN COST ALLOCATION METHOD

- Variety of types of people in many firms design incentive compensation, and most have no formal training in how to make these design decisions
- Do individuals decrease or increase the incentive weight on a cost measure when its precision decreases or increases due to a change in how overhead costs are allocated to products?
- 47% of individuals' decisions are directionally correct
- 38% of individuals' decisions are directionally incorrect
- 16% of individuals' decisions did not change
- **Why do people make incorrect incentive weighting decisions?**

DIFFERENT MENTAL MODELS

- Mental models are subjective internal representations of systems of causal relations that can support decisions, explanations, and predictions
- They differ from formal scientific models, and these differences can affect the quality of decisions, such as performance-measure incentive-weighting decisions
- They typically are **qualitative**, **incomplete** versions of scientific models that **replace** variables in scientific models with variables that are cognitively accessible or easier to use
 - Exclude indirect effects and complex causal chains
 - Replace conditional probability and covariance with similarity, familiarity, or causal propensity

MENTAL MODELS → DECISION PERFORMANCE

- Individuals who believe that measurement error (precision) is not relevant to incentive-weighting decisions did not change their decisions in response to a change in the cost measure's precision
 - Incomplete mental model because it excludes precision
- Individuals who have incomplete mental models of agency theory reasoning make directionally incorrect decisions
 - Mental models are consistent with risk-return reasoning
 - Precision decreases → pay risk increases → increase weight to increase expected pay to compensate for increased risk
- Individuals who have mental models that are consistent with reasoning based on agency theory make directionally correct decisions
 - Precision decreases → pay risk increases → decrease weight

DIFFICULT TO MAKE CORRECT WEIGHTING DECISIONS IN RESPONSE TO CHANGES IN PERFORMANCE MEASUREMENT

- Not surprising so many individuals made directionally incorrect changes in incentive weights when precision of cost measure changed
- Difficult decision that requires a complicated mental model
- Developing and using complicated mental models requires appropriate ability, knowledge and motivation
- Knowledge of accounting, economics, mathematics, operations management, strategy, ...

SUMMARY

- Environmental change → Organizational change → Management accounting change → Individual change (communication, decisions, motivation) → Change organizational performance
- If employees lack enough:
 1. cognitive ability
 2. knowledge (accounting, economics, math, operations mgt, strategy, ...)
 3. mental models (of how variables should be related in causal models of firms' operations and profit drivers)
 4. motivation: extrinsic, intrinsic

SUMMARY

- then they are *not* likely to change their behavior (appropriately) in response to change in management accounting
- Because employees often lack enough of at least one of these 4 attributes, many firms are *not* likely to realize benefits from change in management accounting
- *Unless* firms hire talented people and provide them with appropriate knowledge and motivation