Accounting and shipbuilding

EKMOA presentation

28 Nov 2020

Dr Paul Ahn

University of Glasgow

Contents

- What is accounting?
- Key misunderstanding
- Financial statements
- Accounting in British shipbuilding in the 19th century and early 20th century

What is accounting?

회계 vs Accounting

- What comes to your mind when you hear “accounting”?
- Bookkeeping
- Debits and credits
- Money
- Math
- Profit and loss statement
- Balance sheet
- Cashflow statement
- Boring

회계 (Mainstream accounting)

- 회계의 정의

- 나가고 들어오는 돈을 따져서 셈을 함 (cash flow calculation)
- 빚이나 물건값, 월급 따위를 치러 줌 (settle financial obligation)
- 개인이나 기업 따위의 경제 활동 상황을 일정한 계산 방법으로 기록하고 정보화함.

- Accounting defined by AAA: Process of identifying, measuring and communicating economic information to permit informed judgements and decisions by users of the information

Definitions of Account

- Accounting: Doing account
- Account [noun] : A **report** of an event or experience
- Account for [verb]:

- Give a satisfactory **record** of something, typically money, that one is **responsible** for
- Provide a satisfactory **explanation** or reason for

Accounting = Accountability

- Account for = Be (held) accountable for
- A is (held) accountable to B for C
- Accountability
- Required or expected to **justify actions or decisions**; **responsible**
- Able to be **explained** or understood.
- Demanding and giving reasons for a conduct
- Accounting/accountability involves recording, reporting, explaining, responsibility, answerability, stewardship and etc.

Accounting/accountability history

- Ac(counting): ancient practice
- Sumerian cuneiform + clay beads
- Religious (Judeo-Christian) and ethical practice
- Man is accountable to God
- Children are accountable to parents
- Husbands/wives are accountable to spouses
- Servants are accountable to masters

→ Resulting in reward or punishment depending on evaluation

Jesus' parable in Matthew 25

- Servants are accountable to masters

- A: 5 bags of gold (investment) → 5 bags of gold (profit)

→→ RoI =5/5=100% →→→ Reward

- B: 2 bags of gold (investment) → 2 bags of gold (profit)

→→ RoI =2/2=100% →→→ Reward

- C: 1 bag of gold (investment) → No attempt

→→ RoI =0/1=0% →→→ Punishment

Double-entry bookkeeping

- Invented or popularised by Franciscan Friar Luca Pacioli (aks the Father of Accounting and Bookkeeping)
- Balance between Good and Evil
- "And forgive us our debts, as we also have forgiven our debtors" (Lord's prayer)
- Debit and credit
- Accounting equation 1: Assets = Liabilities + Owners' equity

→ Assets – Liabilities = Net assets = Owners' equity

- Accounting equation 2: Expenses + Profit/loss = Revenue

→ Profit/loss = Revenue – expenses

2 Key purposes of accounting

- Providing information for decision making
- Financial accounting for owner (shareholders) and other stakeholders
- Management accounting for managers
- Control, accountability, and governance
- Control costs
- Performance measurement to control employees and directors/managers
- Auditing

Misunderstanding

Vignette1: 사장과 회계사의 대화

- 사장님: “회계사님, 금년 우리회사 순이익이 얼마인가요?”
- 회계사: “사장님, 금년 순이익을 얼마로 맞춰드릴까요?”

→Accounting creates reality while identifying, measuring and communicating reality

Asset valuation

- What is the value of an oil tanker?

- Purchase price (Historic cost): $80 million
- Realisable value: $50 million
- Replacement cost: $60 million
- Present value of the benefits from the use of the tanker: $100 million

Depreciation

- Does not involve cash flow
- Many methods to depreciate assets: straight-line method, reducing-balance method and etc.
- Estimated economic life: 10 years, residual value: $0

- Depreciation 80/10= $8 million

- Estimated economic life: 14 years, residual value: $10 million

- Depreciation (80-10)/14= $5 million

Vignette2: 권리금

- A: 10년 계약 점포 임대, 김밥가게 개업, 대박
- B: 임대 계약기간 2년 남은 시점에서 권리금 1억 (단골 손님 + 목좋은 상권 + 믿을만한 식재료 공급업자)주고 김밥가게인수

- Goodwill = Cash payment – Net assets

- 2년 후 건물 재개발

- What will happen to the goodwill?

Financial statements

Balance sheet (statement of financial position)

As at 31 December 20xx

- Assets A
- Liabilities B
- Owner's equity C

Liabilities + owners' equity (B+C)

A=B+C

As at 31 December 20xx

- Assets A
- Liabilities B

Assets – Liabilities= Net assets

- Owners' equity C

A-B=C

Income statement (profit/loss statement, statement of financial performance)

For the year ended 31 December 20xx

Revenue	A
- Cost of goods sold (Prime cost = direct material + direct labour)	B
Gross profit	C(=A-B)
- Operating expenses (overhead costs)	D
Operating profit (EBIT: Earnings before interest and tax)	E(=C-D)
- Finance cost	F
- Profit before tax	G(=E-F)
- Taxation	H
- Net profit (Profit after tax)	I(G-H)

Cashflow statement

- For the year ended 31 December 20xx

- Cashflows from operating activities A
- Cashflows from investing activities B
- Cashflows from financing activities C
- Net cashflow D=A+B+C
- Cash at the start of the year E
- Cash at the end of the year F=(D+E)

Accounting in British shipbuilding in the 19th century and early 20th century

Shipbuilding in the UK

- UK had established her hegemony by 1900
- By the early 1900s UK output averaged over 1 million tons a year
- 3 top areas
- The Clyde
- Belfast
- North East Coast

Early 19th century

- Need for ships to carry coal 'exports' to London
- Small-scale wooden shipbuilding
- Iron shipbuilding tonnage exceeded that of wood in 1862

Practices of shipbuilders and owners

- Swings within the industry's business cycle
- Ship builders’ practices:
  - Speculative building
  - Joint ventures
  - Sale of fractional shares in ships
  - Insurance against bad debts
- Ship owners’ practices:
  - Progress payments during construction (instalment payments)
  - Bills of exchange

Shipbuilders’ practices (cont.)

- Not to take profit on work-in-progress
- When shipowners paid several instalments of the purchase price to the builder during construction, then reasonably accurate calculation of profit on work in progress was made

Contract cost accounting

- Widespread throughout British shipbuilding
- Ship-by-ship accounting
- A contract account is maintained for each individual contract
- Direct costs (and a proportion of company overheads) are debited
- Selling price is credited
- Contract profit or loss calculated and then transferred to the company profit and loss account

Direct material

- Workmen require materials

→Apply to their foreman for a written order

- This order gives the particulars with numbers and names of vessels intended to be used on

→ Storekeeper then prepared cost summaries, which were passed to accountants

→Accountants make entries into the accounting system

Direct labour costs

- Whether piecework-based or time-based
- Metalworkers: Piece-work basis
- Woodworkers: Time-work basis

- Wages analysis book:
- Weekly wages costs by Hull, Boilers and Engine
- Class of workmen

Overheads

- Written off *en bloc* to the profit and loss account
- Charged to individual ships (Absorption costing) based on:
- Prime cost (direct material and direct labour): a rate of approximately 4 per cent
- Direct labour
- In Glasgow
- John Brown of Clydebank: Direct labour-based rate
- Fairfields of Govan: Annual sales turnover

Ship cost

- Costs prepared by estimators

- Hull
- Boilers
- Engine

- Each of the three elements has its own cost book
- Cost book: monthly costs for direct wages and materials for all ships in progress

Key discussed issues according to boards' minutes

- Cash receipts
- Cash payments
- Cash forecast
- Bank position

Internal control

- Comparison between actual and estimated cost
- No budgetary control

- Standard costing and budgeting and variance analysis

Engineering bias of boards

- Engineering culture among management have inhibited the development of costing.

- Growth of the Institution of Engineers and Shipbuilders of Scotland from 1858

- BSc degrees in Scottish universities from the 1860s and 1870s

- UK-wide Institution of Mechanical Engineers

→engineering predilections of senior management

→→ Standard costing was not introduced in shipbuilding