Management Accounting in Supply Chains and Alliances

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Agenda

Overview

• Alliances: what and why?
• Trends in alliance formation: motivation and substance
• Alliance risk and risk management

What are the management accounting issues?

Examples from research:

• risk and the use of management controls in alliances
• performance measurement and management of alliances.
Theory: What Coase, Williamson and Porter taught us about firm boundaries the ‘middle ground’

MAKE
Vertically integrate

Production costs + Transaction costs

BUY
Arm’s-length market exchange

HYBRID
Collaboration

Different types

A transient state on the path to vertical integration?
Types of inter-firm relationships

Formal collaborative arrangements align the interests of partners through a shared profit opportunity and formal profit sharing rules.

Examples:
- franchises
- licensing arrangements
- joint ventures
- minority equity shares

Informal arrangements use fewer mechanisms from contract law to structure interactions or allocate gains from trade.

Examples:
- strategic alliances
- consortia
- networks
- supply chains
From 1997-2000, the typical large U.S. firm formed 177 alliances that accounted for 25%+ of firm revenues.

Source: Anderson & Sedatole (2003)
Why form an alliance?

Alliances are formed to exploit unique resources, the ‘resource based view’ of alliance formation (Das and Teng 1998)

- Technological
- Physical
- Managerial
- Financial

Alliances are used to achieve specific outcomes (Glaister and Brickley 1996)

- Technology development
- Risk reduction and speed of execution of large projects
- Market development
- Market power consolidation
- Resource specialisation
The motivation has changed

Source: Anderson & Sedatole (2003)
The **substance** of alliance activity changed

- Less technology licensing… more meaningful collaboration
  - Joint R&D
  - Joint marketing
  - Joint manufacturing
- More than 55% of alliances are between *competitors*
- A shift from dyad relationships to *networks* of collaborators
Less vertical integration means more ‘inter-firm’ transactions

- Over the past 50 years the **value of purchased materials and services has grown** from 20% to 56% of the selling price of finished goods
- The global market for **supply chain management software** topped $6B in 2006 and is growing at a annual rate of 8.6% per year
- The typical U.S. manufacturer manages over 30 contract relationships. **Complex supply chains** typically include a mix of:
  - global material and service suppliers,
  - contract manufacturers,
  - company-owned plants and shared service centers, and
  - third party logistics and transportation providers

[AMR Research 2007]
The participants have changed

Alliances by Industry Category

Data: Thomson Financial Services

Source: Anderson & Sedatole (2003)
The participants have changed

Changes in technology and global trade policy enable firms to revisit vertical integration of non-manufacturing activities (i.e., back office operations, customer service functions).

Offshore vendors are shifting from a low cost strategy to a strategy of expanding their service offerings and building operational and strategic relationships with clients.
What hasn’t changed?

Over 60% fail

Risk vs. Management controls

Performance risk

Relational risk

[Anderson et al. 2009]
Risk in strategic alliances

Das and Teng 1996; Ring and Van de Ven 1992

- Performance risk
- Relationship risk

COSO 2004: Enterprise risk management framework

- Strategic risk
- Operational risk
- Reporting risk
- Compliance risk

Anderson et al. (2009) 19 distinct alliance-specific risks identified in the research literature
Risk in strategic alliances

1. Quality performance risk  
2. Price renegotiation risk  
3. Innovation risk  
4. Co-ordination risk  
5. Intellectual property risk  
6. Product/service failure risk  
7. Misalignment of incentives  
8. Input supply risk  
9. Surge capacity risk  
10. Verification and evaluation risk  
11. Compliance and regulatory risk  
12. Partnering lock-in risk  
13. Financial viability risk  
14. Contribution valuation risk  
15. Financial commitment risk  
16. Outside scope risk  
17. Output demand risk  
18. Surge demand risk  
19. Channel effectiveness risk
Risk in supply chains

In a survey of supply chain managers, top three risks:

- Supply interruption/business continuity is by far the biggest risk:
  - supplier failure
  - logistics failure
  - natural disaster
  - geopolitical event.
- Absence of senior management leadership of supply chain
- Absence of accurate, timely supplier performance measures and spend analysis for use in strategic sourcing

APICS & Protiviti 2004
‘With the shift to global sourcing and the pressure for low inventory levels and faster order fulfilment cycles, supply chains are more fragile, more extended and more time-sensitive than ever before… Supplier failures ripple through the supply chain.’

Supply chain leaders reduce this liability by changing the way they measure and control their suppliers, and by rethinking the way they identify and resolve supply disruptions.

[AberdeenGroup, Sept 2004]
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[AberdeenGroup, Sept 2004]
Risk management in supply chains
[APICS & Protiviti 2004]

Top risk management solutions

Organisational design:
Integrate procurement and supply chain management

Management processes:
Supply chain risk assessment
Supplier selection processes
Supplier evaluation processes

Opportunities to employ management accounting expertise
What are the management accounting issues?
## Management accounting topics: Intra- vs. Inter-firm

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<thead>
<tr>
<th>Topic</th>
<th>Intra-firm</th>
<th>Inter-firm</th>
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<tbody>
<tr>
<td><strong>Costing practices</strong></td>
<td>product/service cost, cost of quality lifecycle cost</td>
<td>total cost of ownership reverse supply chain costs</td>
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<tr>
<td><strong>Cost management</strong></td>
<td>C-V-P analysis activity-based management (ABM) process re-engineering</td>
<td>make-buy analysis spend analysis open book accounting and value chain re-engineering</td>
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<td><strong>Planning and co-ordination</strong></td>
<td>cost estimation budgeting</td>
<td>joint target costing EDI /VMI/collaborative forecasting</td>
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<tr>
<td><strong>Control practices</strong></td>
<td>decision delegation reward systems transfer pricing policy</td>
<td>allocation of business profit sharing arrangements inventory ownership rules risk management</td>
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<tr>
<td><strong>Performance assessment</strong></td>
<td>variance analysis scorecard analysis</td>
<td>supplier/buyer scorecards supplier management system</td>
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</table>
Research examples

1. Control practices: mitigating alliance risk with management controls
   • Formal controls: contract design (Anderson and Dekker 2005)
   • A portfolio of formal and informal controls (Anderson, Christ, Dekker and Sedatole 2009)

2. Performance measurement in alliances

3. Cost management in alliances
Organisational form and management accounting

When hybrid organisational forms emerge, intra-firm relationships are replaced with inter-firm relationships.

Make

Intra-firm cost accounting and management control

Hybrid

Inter-firm cost accounting and management controls

Buy

Market price and competition

What form does management control take in alliances?
Risks and formal controls

Anderson and Dekker (2005)

Map of research questions

Transaction characteristics:
- Uncertainty (+)
- Size (+)
- Asset specificity (+)
- Task complexity (+)

Transaction partner characteristics
- Competition (-)
- Power (+)

Contract design
- Contract extensiveness (+)
- Contract structure (+)

Costs of contracting

Ex post transaction problems

Misalignment (+) between transaction hazards and control structure
Common intra-firm management control frameworks

- **COSO (1992)**
  - Preventive controls
  - Detection controls

- **Simons (1995)**
  - Belief systems
  - Boundary systems
  - Interactive systems
  - Diagnostic systems

- **Merchant and Van der Stede (2003)**
  - Culture controls
  - Personnel controls
  - Action controls
  - Outcome controls

- **Jensen and Meckling (1992)**
  - Decision rights allocation
  - Rewards and punishments
  - Performance measures
**RESEARCH QUESTION:**
Do intra-firm management control frameworks fit alliances?

Why might they NOT fit?

- Separate (but overlapping) profit functions of partners.
- Absence of one central figure who provides conscious governance through fiat.
- The potential role of courts and third party arbitrators in settling disputes.
Research design: exploratory field studies

Three large, U.S.-headquartered firms with significant, varied alliance activity:

- **BIOTECH** international R&D, sales and production that combines biological, chemical and manufacturing expertise
- **TECHNOLOGY** international R&D, sales and production that sells consumer and business software, hardware and related support services
- **RETAIL** general merchandising firm that sells products in the U.S. through stores, catalog and internet
Focal risks and controls

**BIOTECH**

‘We have had a number of situations where the joint ventures have actually gone out and operated outside the scope of… [how] they were supposed to operate.’

‘…make sure you have enough board representation… I think that’s an important way to really influence how the strategic alliance performs and operates. To keep people that you have in those key positions, especially if they’re your people, makes a big difference.’
Focal risks and controls

TECHNOLOGY

‘One of the biggest issues that we face is piracy/counterfeiting of our products in distribution channels. Another risk that we have is under-reporting by our channel partners, specifically, by our [OEM] partners, who may or may not do it intentionally.’

‘You always negotiate in audit rights in order to go through... you want to make sure that the software is getting deployed properly and in the right numbers’.
Focal risks and controls

RETAIL

‘… Of course, you can pick up the newspaper on any given day and there are challenges that are ethical. …But we want to assure [that] our vendors understand our ethical standards.’

‘The way we wrote the contract was with an ‘escape clause,’ where after a period of time, we both agreed to discuss whether or not sales were meeting expectations and our process was meeting expectations.’
## Evidence on risk exposure

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<th>Risk frameworks:</th>
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75% perf. risk

80%

Relational risk with property rights concerns

80%

Sparsely represented but important to accounting and finance managers

All risks classifiable in both frameworks
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The risk frameworks ‘fit’ with the alliance risks that were discussed. The field research sites demonstrate significant risk exposure and ample variation in the type of risk associated with different types of alliances.

- All risks classifiable in both frameworks
- 75% perf. risk
- 80%
- Sparsely represented but important to accounting and finance managers

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### Evidence on the Portfolio of Controls

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<td><strong>Framework fit</strong></td>
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<td><strong>Prevention of relational risks/intellectual property loss</strong></td>
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| **Simons (1995)** |         |      |        |       |
| Belief systems    | 8        | 5    | 8      | 22    |
| Boundary systems  | 62       | 46   | 25     | 133   |
| Diagnostic controls | 15      | 43   | 28     | 86    |
| Interactive controls | 9       |      |        |       |
| N/A               | 0        |      |        | 0     |
| **Total**         | 95       | 112  | 88     | 272   |
| **Framework fit** |         | 77%  |        |       |
| **Greater reliance on ‘negative’ boundaries vs diagnostic than other firms** | | | | |

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- **Framework fit**: 47%
- **Greater reliance on decision rights, similar to ‘negative’ boundaries**
- **Low reliance, like beliefs**
- **greater reliance, unlike beliefs**
- **Framework (mis)fit**
Supplier performance management (SPM) includes the processes of:

- measuring and analysing supplier performance
- managing the supplier relationship

to enhance efficiency (cost) and efficacy (profit and revenue) of the full value chain.
Trends in SPM

- Firms employ a variety of measures in SPM. However, nearly half of firms have no formal practices of measuring supplier performance.

- Among firms with formal SPM, better performance is found for those:
  - that have measured suppliers for more than 18 months
  - that standardise measurement practices at the SBU (versus the firm)
  - that measure performance for more than 25% of the total supply base
  - no performance differences are associated with different technological (e.g. ERP, e-sourcing, VMI, spreadsheets) approaches.

[Aberdeen Group Sept 2005]
What aspects of supplier performance are measured?

- On time delivery
- Quality of goods/services
- Service capability/performance
- Price Competitiveness
- Compliance with Contract Terms
- Leadtime
- Response
- Technical Capability
- Environmental, health and safety performance
- Innovation
- Compliance with Contract Terms
- Price Competitiveness
- Service capability/performance
- Quality of goods/services
- On time delivery

Source: AberdeenGroup, Sept 2005
How do firms use supplier performance data?

- Segment supply base
- Predict supplier performance
- Consolidate supply base
- Drive supplier development
- Identify supply risks
- Improve supplier selection
- Improve supplier performance

Source: AberdeenGroup, Sept 2005
How do advanced users plan to extend their SPM practices in the future?

- Add performance metrics (65%)
- Include more suppliers
- Shift focus to supplier development/improvement
- Add corrective action planning and monitoring
- Include more spend categories (i.e. indirect)
- Add dispute resolution mechanisms
- Include more business units (24%)

Source: AberdeenGroup, Sept 2005
Putting it all together

An illustrative example with many unanswered questions:

`Supplier Management at Sun Microsystems (A)`

Stanford University Case, OIT-16A. Available through Harvard Case Services
SPM at Sun Microsystems

Cost management

• **Boundary of the firm**: not a simply make-versus-buy. Different combinations of design, make and buy
  
  • What alternatives are considered and why?
  • What costs and values are assigned to each (real) option?
  • Is uncertainty incorporated in the decision? Whose uncertainty?

• **Total cost of ownership**: not a cost allocation. Assigned based on performance-to-goal for several non-financial metrics
  
  • Does the method of calculation matter? Why - information properties vs cognitive processing?
  • Does the link to subsequent sourcing decisions and individual compensation support/ undermine performance?
SPM at Sun Microsystems

Management control and governance

• **Supplier selection:** not simple cost minimisation
  - How are non-financial factors weighed in the decision?
  - How does the make/buy/design decision interact with subsequent monitoring?

• **Contracting:** thoughtfully constructed, rarely consulted later
  - Can we reconcile economic models of the role of the contract with the reality that it is rarely consulted or ‘enforced’? Are our negotiation models/ experiments premised on this ‘disuse’?

• **Compensation design:** supplier scorecard is an input to future supplier selection, scorecard results are used by some suppliers to compensate their managers
  - Do issues of distributive and procedural justice affect supplier relations when competitive conditions cause suppliers with lower scorecard performance to receive bigger awards than those with higher performance?
SPM at Sun Microsystems

Performance measurement and evaluation

• **Measurement Scorecard**: designed and administered by Sun. Used interactively with suppliers. An input to future sourcing decisions
  - Is Sun’s scorecard fully aligned with supplier strategies?
  - Will it maximize performance of the full value chain?

• **Setting Performance Goals**
  - Do different goal-setting processes between buyer-supplier (i.e. participation, information sharing, ratcheting) produce different results?
  - Does goal-setting interact with contract terms (i.e. take or pay contracts)
Other issues for consideration

Sun Microsystems is a large, U.S. firm. The case focuses on their processes for organising suppliers. How would a change of perspective alter things?

Current research tends to focus on large, Western firms

• How will the research questions, theory and/or results differ:
  • if the ‘central’ firm is not Western
  • if the ‘supplier’ sells to several large firms that have different SPM practices
  • if the relations are not ‘hub and spoke’, but rather, fully networked (e.g. interactions among suppliers)
  • with varying bilateral power in the buyer-supplier dyad.

Current research focuses on ‘forward’ supply chains - moving product/service to end customers. How will research questions, theory and/or results differ for ‘reverse’ supply chains --- recycling, reusing and disposing of goods?
Conclusions

• Inter-firm relationships account for an increasing share of firms’ costs and are associated with exposure to new risks (and returns).

• Although they are often initiated to reduce cost; they are increasingly a source of strategic advantage for firms pursuing both low cost and differentiation strategies.

• Management control systems, cost accounting systems and performance management systems are adapting to address:
  • Alliance risk and decision-making under uncertainty
  • Performance of the value chain
  • Aligned incentives of all partners
Questions and comments