Quality Management & Job Quality:
How ISO 9001 affects employees & employers

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About me

• Industry experience
  – Operations management
  – EHS consulting
  – Corporate EHS Director
    • Internal policies, procedures, training, auditing
    • ISO 14001 and Responsible Care

• Harvard Business School
  – Teach MBAs and PhDs
  – Case studies
  – Large-N data analysis
ISO 9001 is popular

900,000 adopters in 170 countries by 2006

Number of ISO 9000 Certificates, US & California 1993-2003

Why study the impacts of ISO 9001?

• Half a million adopters.
• Diffusion based largely on faith, not on large-scale empirical results.
• Prior analyses have some drawbacks:
  – Subjective measures
    “Did ISO 9001 help your sales?” None, A bit, A lot
  – Subjective survey respondents
    Typically, Quality Manager

Source: ISO 9000 Registered Company Directory

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Our empirical approach

We compare ISO 9001 adopters to similar set of non-adopters

- In California
- Single-plant firms
- Purchase worker’s compensation insurance (not self-insured)
- Match on size, industry, etc.
- Exhibit similar performance pre-trends

Number of single-plant firms

- Overall: 1,418 adopters + 20,777 non-adopters
- Matched: 550 adopters to 550 non-adopters

Empirical approach: differences in differences
What was already known and
What we learned

What’s the impact of ISO 9001?

Signal to (potential) buyers that quality management approach meets international standards
- \(\uparrow\) production \(\checkmark\)
- \(\uparrow\) financial returns \(\checkmark\)
- \(\uparrow\) sales ?
- \(\uparrow\) employment ?
- \(\uparrow\) company survival ?

Improve management practices
- \(\uparrow\) quality outcomes (e.g., \(\downarrow\) defects)
- \(\uparrow\) or \(\downarrow\) required skill set ? (wages)
Possible spillovers to...
- \(\uparrow\) or \(\downarrow\) occupational safety ?
- \(\downarrow\) pollution \(\checkmark\)

Our study examines these potential outcomes
ISO 9001 → survival & sales

ISO 9001 may lead to higher rates of firm survival and higher sales if adopting ISO 9001...

1. Promotes learning
   ...teaches how to reduce costs or improve quality  → lowers cost (↑Π)

2. Signals
   ...signals unobservable high-quality to buyers  → increases price (↑Π)

3. Screens
   ...qualifies suppliers  → increases sales

We found that, compared to matched non-adopters, ISO 9001 adopters subsequently...

- Had higher survival (fewer firm deaths)
  Proportion of firms that disappeared from our dataset between adoption year and 2003: 0.5% of adopters vs. 7.1% of non-adopters

- Had higher sales
  Adopters subsequently had 9% higher sales than non-adopters

ISO 9001 → worker skills

ISO 9001 requires new tasks:
- standardizing procedures  • training
- documenting procedures  • auditing
- root-cause analysis  • continuous improvement

➢ If require more effort, skill, or specialized knowledge, higher wages

ISO 9001 may erode skill requirements by codifying routines, which can reduce worker discretion and devalue tacit expertise.

➢ Enables lower skill operators, at lower wages

We found that, compared to matched non-adopters, ISO 9001 adopters subsequently...

- Had higher wages
  Adopters subsequently had 7.5% higher wages than non-adopters
ISO 9001 → employment

If ISO 9001 increases sales, do companies increase productivity, hire workers, or both?

We found that, compared to matched non-adopters, ISO 9001 adopters subsequently...
  - Increased employment
    Adopts subsequently had 10% more employees than non-adopters.
    This is the same as sales growth, so no evidence of increased productivity

ISO 9001 → health & safety

If standardized procedures, training, and routine auditing include:
  - Adherence to safety procedures
  - Mitigating hazards / work-arounds
  - Root cause analysis and corrective action applied to safety incidents and accidents
  ➢ ISO 9001 may improve worker safety

But, if standardized procedures:
  - Reduce flexibility and job rotation
    — Cumulative trauma disorders from repeated tasks
  - Reduce worker innovation to develop safer work methods
    — More difficult to change procedures
  ➢ ISO 9001 may worsen worker safety
ISO 9001 → health & safety

We found that, compared to matched non-adopters, ISO 9001 adopters subsequently...
- Had slightly increased odds of zero injuries
  Adopters were subsequently 5 percentage points more likely to report zero Worker’s Comp claims than controls (beyond overall mean of 28%)

But no evidence that adopters subsequently differed from controls in annual injury costs or rate

What’s the impact of ISO 9001?

Signal to (potential) buyers that quality management approach meets international standards
- ↑ production ✓
- ↑ financial returns ✓
- ↑ sales ? ⇔ ✓
- ↑ employment ? ⇔ ✓
- ↑ company survival ? ⇔ ✓

Improve management practices
- ↑ quality outcomes (e.g., ↓ defects) – still unknown
- ↑ or ↓ required skill set ? ⇔ ↑ ✓
Possible spillovers to...
- ↑ or ↓ occupational safety ? ⇔ ?
- ↓ pollution ✓
Caveats

Generalizability

- Single-plant firms
- California only
  - California has strong H&S regulations

For more details, see the article...


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Questions?