Conformity Assessment as a Business Tool

Tadako Yamamoto, Wanji Yang and Marcus Long
Financial Performance
2001 five year study of companies in the Basque region of Spain showed companies certified to ISO 9000 had return on assets employed between 24% and 48% higher than non-certified companies after the five years.

Rate of return

2000 study of Danish companies, 734 certified and 644 of similar size but not certified.

In the year prior to certification, the firms who would become certified had a 20% higher rate of return than those who would not be certified.

Two years after certification, the rate of return of the certified companies had risen to 35% above those not certified.

Operating cycle and inventory management

2007 study of 695 publicly listed US manufacturing companies certified to ISO 9001.

With operating cycle, this was reduced on average by 5.28 days one year after certification, falling to 11 days three years after certification.

On inventory days, these were 3.68 days less one year after registration, falling to 8.75 days three years after certification.

Average Economic Profitability

2001 study of 800 Spanish companies between 1994 & 1998, 400 certified to ISO 9000, 400 not

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<tbody>
<tr>
<td>ISO 9000 certified</td>
<td>7.90%</td>
<td>9.41%</td>
<td>6.62%</td>
<td>11.79%</td>
<td>17.30%</td>
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<tr>
<td>Non-certified</td>
<td>6.33%</td>
<td>6.61%</td>
<td>6.10%</td>
<td>6.11%</td>
<td>7.35%</td>
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Cost savings from ISO 50001 implementation

Since an ISO 50001-based Energy Management System was implemented in 2014, LG Chem’s Ochang plant set a goal to reduce energy cost by 10% each year. The Ochang (South Korea) plant pursues energy savings by conducting self-assessments to seek more cost-saving opportunities. As result of monthly report assessments of its energy use and GHG, the Ochang plant achieved an energy cost reduction of 13% ($9.5 million) in 2014 and 11% ($7.0 million) in 2015.

Source: LG Chem
Insurance: Italy

Up to 28% insurance premium reduction with Health & Safety certification

• Italy’s Italian Workers' Compensation Authority, INAIL, the National governmental Institute for insurance against Accidents at Work, offers businesses up to 28% on the cost of insurance premiums for businesses who are certified to the Health & Safety standard OHSAS 18001

Further details
2005 study of 3700 US facilities regulated under the Clean Air Act, compared those certified to ISO 14001 against those not.

On average, the certified companies spent 7% less days on regulatory compliance than those not certified.

Overall Company Performance
Company benefits

BSI’s customer research (BSI voice of the customer survey 2012 to 2015) shows that as a result of implementing and gaining certification:

• 50.6% of businesses attract new customers
• 50.6% report improvements in products or services
• 60.8% report an increase in trust in their business
• 61.8% of businesses have seen a reduction in the likelihood of mistakes

Source: BSI - The benefits of adopting the Quality Management Standard, ISO 9001:2015 as a small or micro business owner
Innovation

‘Certification increases the probability to be innovative of about 25% for small firms and of 15% for the largest firms’.

Company value

From Feb 1990 to Jan 2000, $100,000 invested in the S&P500 would have yielded $423,795.

If the same $100,000 had been invested in a sample of 212 ISO 9000 certified companies, the yield would have been $814,335.

Quality Performance
‘Figure 1 shows the performance improvement achieved in each of the eight basic TQM categories in the ISO 9000 certified Greek companies’

ISO 9001’s contribution to the five enablers of the European Foundation for Quality Management excellence model

## Benefits achieved from ISO 9001 implementation

1. Improved the efficiency of the quality system 4.93 0.74
2. Better documentation procedures 4.89 0.88
3. Increased quality awareness in the firms 4.76 0.91
4. Improved quality of products and customers service 4.36 0.96
5. Clearing working instructions or procedures 4.33 0.97
6. Effective communication among employees 4.23 0.97
7. Improved the quality of incoming materials 4.11 0.98
8. Reduced defective rate and waste 4.09 0.99
9. Helped in continual improvement 4.04 1.03
10. Expansion to international market 3.95 1.07
11. Greater opportunity for export 3.87 1.11
12. Improved productivity 3.66 1.15
13. Reduced customer complaints 3.61 1.17
14. Increased market share 3.54 1.19
15. Improved process design 3.43 1.21
16. Greater competitive advantage 3.33 1.23
17. Decline in business costs 3.12 1.24
18. Improved profitability 3.08 1.27
19. Better corporate image 2.87 1.29
20. Increased sales 2.65 1.32
21. Improved supplier relations 2.61 1.39
22. Clear job responsibilities 2.45 1.41
23. Improved staff motivation 2.40 1.45
24. Positive culture change 2.39 1.47

Operational performance & ISO 9001

Figure 9 Impact of ISO 9001 Implementation on Operational Performance

Source: JAS-ANZ research into the impact of ISO 9001

- Reduced inspections from customers
- Reduced customers’ complaints and warranty costs
- Improved efficiency and productivity
- Reduced defects or reworks
- Improved product performance
- Improved conformance to specification
- Improved mechanisms for identifying and handling problems in processes
- Improved effectiveness and consistency of the operating procedures
- Improved documentation of key processes in our operations
Business performance & ISO 9001

Figure 10 Impact of ISO 9000 on business performance

Source: JAS-ANZ research into the impact of ISO 9001
The value of ISO 9001 for businesses in China

To gain insight into the impact of ISO 9001 certification on organisations, CNCA and UNIDO conducted a survey of the effectiveness of ISO 9001 quality management system certification in China from September 2012 to September 2013.

• 43% said the most important reason was to gain market access or to respond to customer pressure or tender requirements
• 98% said that regardless of the overall cost, the implementation of ISO 9001 had been a good or a very good investment.
• 9% estimated that it brought a benefit of up to RMB 100,000, either in cost savings and/or increased profits. 39% believed it to be between RMB 100,000 to 1,000,000. (c.US$ 15,000 – US$ 150,000)
• 37% estimated that it could bring more than RMB 1,000,000 of benefits (either cost savings or increased profits).

Source: UNIDO
Productivity improvements

‘All positively agreed in favour (72% strong agree/28% agree), using ISO 9001 would deliver enhancements to enterprise quality procedures and consequently productivity’.

Environmental Performance
Reducing regulatory violation

2002 study of 166 Korean companies comparing rate of environmental regulatory violation between 28 companies certified to ISO 14001 and 138 companies with no certification.

In 1998, rates of regulatory violation were 3.5% & 11.6% for certified & non-certified companies.

In 1999, rates of regulatory violation were 1% & 8.5% for certified & non-certified companies.

Reducing regulatory burden

2005 study of 3700 US facilities regulated under the Clean Air Act, compared those certified to ISO 14001 against those not.

On average, the certified companies spent 7% less days on regulatory compliance than those not certified.

Resource reduction

U.S. adopters of ISO 14001 are 25.9% more likely to reduce their natural resource usage than non-adopters, while Japanese adopters of ISO 14001 are 35.1% more likely to do the same.

Pollution reduction

The analyses of pollution levels for a panel of 138 countries for the 1991–2005 period suggest that a 1 percent increase in aggregate levels of ISO 14001 adoption is associated with about a 0.064 percent reduction in SO$_2$ emissions, all else equal.

The average (unlogged) number of ISO 14001 certifications in our sample is about 265, which corresponds to the number of ISO 14001 certifications in Belgium in 2002. In that year, Belgium’s SO$_2$ emissions were 205 gigagrams. Holding constant other variables in our model, increasing in 2002 Belgian ISO 14001 certifications by 10 percent (26.5) would reduce that country’s pollution emissions by about 1.25 SO$_2$ gigagrams.

Environmental benefits of ISO 14001

Source: JAS-ANZ research into the impact of ISO 14001
Strategic benefits of ISO 14001

Figure 10 Impact of ISO 14001 on strategic benefits

Source: JAS-ANZ research into the impact of ISO 14001
Case Studies from Japan

Tadako Yamamoto
International Accreditation Japan
Construction
Local Government & Urban Renaissance Agency

Accredited testing laboratory according to ISO/IEC 17025 are one of the tender criterions for public facilities by local government such as Osaka, Niigata and Urban Renaissance Agency (for seismic diagnosis survey).

IAJapan accredits testing laboratories that performs concrete strength testing and other building materials based on JIS standards such as:

- JIS A 1107 Method of sampling and testing for compressive strength of drilled cores of concrete
- JIS A 1108 Method of test for compressive strength of concrete
- JIS Z 2241 Metallic materials - Tensile testing - Method of test at room temperature


Concrete mixer vehicle image: [http://www.ricora.net/photo/133.html](http://www.ricora.net/photo/133.html)
Example: Concrete compressive strength test

Compressive force is loaded to the concrete sample based on JIS A 1108 Method of test for compressive strength of concrete

Uniaxial testing machine
Kansaikiki: http://kansaikiki-s.co.jp/
Products & Services
Variation in quality in widespread use of LED lamps became an issue as there were products with discrepancies between public value and actual value of total luminous flux of LED lamp.

Notification by METI enforced on 2014-11-01 revised Energy Conservation Law for LED lamps which mandates JNLA testing laboratory to conduct measurement of luminous flux and power consumption as well as indication of JNLA testing laboratory number on product package.

F further details

www.meti.go.jp/committee/summary/0004296/pdf/001_s01_00.pdf
Example: JNLA testing laboratory number & statement on product package

Rated power consumption and total luminous flux of LED lamp is indicated along with JNLA laboratory number and statement.
Society of International sustaining growth for Antimicrobial Articles (SIAA)

SIAA developed voluntary product certification scheme which requires applicant’s product to be tested by JNLA testing laboratories based on JIS Z 2801 “Antibacterial products -- Test for antibacterial activity and efficacy” (Test method described in ISO 22196 “Measurement of antibacterial activity on plastics and other non-porous surfaces”).

Market label for SIAA ISO 22196 for KOHKIN

https://youtu.be/z_4UsrzSFG0?t=2m17s
KE’KEN Textile Testing & Certification Center
Product Certification Division

KE’KEN provides the voluntary certification system for cashmere 100% in the textile products. IAJapan extended accreditation scope in order to accredit KE’KEN as a Product Certification Body. The test data is provided by Chubu Laboratory, Japan Wool Products Inspection Institute Foundation accredited by IAJapan. Cashmere 100% tags issued as at 2017-03-18: 697,161

http://www.jwif.org/tag_system/
Food Safety & Agriculture
For the measurement and analysis of radioactive materials in food, the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) issued the notification that laboratories accredited under ISO/IEC 17025 are reliable analysis organizations for the analysis and presentation of this data as announced in May, 2012.

The MAFF in Japan have also used accreditation as part of the process to validate the safety of meat and eggs exported to Hong Kong, helping to deliver safe food across international borders.

Source: Certificate of exportation for Hong Kong (in Japanese language)
http://www.maff.go.jp/j/export/e_shoumei/hk_shoumei.html
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Case Studies from Taiwan
Wanji Yang
Taiwan Accreditation Foundation
Driven by market needs

• Trade volume (2014)
  • Export : 313,800 Million USD
  • Import : 274,220 Million USD
Acceptance by foreign regulators/professional groups

Swedish Confederation of Professional Employees (TCO)
**Shorten “Time-to-Market”**

- **Benefits - Help industries**
  - To save testing fees
  - To shorten lead time (time-to-market)

- BSMI (Bureau of Standards, Metrology and Inspection)
- NCC (National Communication Council)
- APEC TEL MRA (US, Canada, Singapore, HK, NZ, AU)
- Bluetooth SIG. Co.
- CTIA (The Wireless Association)
- SWCC (Small Wind Certification Council)
- US EPA – ENERGY STAR Program
Study: Economic Benefits of Accreditation

• *Contributions made by MRA/MLA of accreditation on Taiwan’s Industries*
  • TAF-sponsored study conducted in 2013 in cooperation with the National Sun Yat-sen University
  • APEC TEL MRA, USEPA Energy Star Programme
  • Trade volume of mobile phone, digital set-top box, navigation equipment, router, notebook between Taiwan and APEC economies in 2009~2012
  • Gravity model of trade
    • Surveys: 112
    • Interviews: 19 with accredited labs/CBs and 1 with mobile phone manufacturer
Study: Economic Benefits of Accreditation

• Conclusion
  • For manufacturers:
    • Notable reduction of time to market on mobile phone and notebook products
    • cost reduction of conformity assessment services by 2%
  • For conformity assessment bodies
    • increase of services by 6%
  • For Taiwan’s ICT industries
    • More competitiveness
DNA Paternity Testing

- Request from forensic science related professional groups due to increasing disputes on inheritance of cross-straight marriages, 2005
- MoU:
  - ASCLD/LAB: 2005
  - Technical Taiwan Academy of Forensic Sciences, 2007
- Technical criteria for DNA paternity testing labs
- DNA paternity testing reports issued by TAF accredited labs are required for household registration and most lawsuit cases
- Market: 40,000 per year (+100%)
TAP – Market Differentiation

- Traceable Agricultural Product (TAP) Scheme: TGAP + Traceability
- CBs to be accredited a Signatory to IAF MLA
- Data:
  - No. of petty farmers: +300%
  - No. of TAP restaurants: +190%

![Graphs showing data growth](image-url)
• **No. of labels printed per month:** +550%  

• **Sales Volume (USD):** +11.8 times  

• **Price premium:** +20% ~ 60%  

• **7-11 stores:** 12 (2012) → 400 (2016)
TAP – Market Differentiation

• Other benefits:
  – Proof of origin
  – Competitiveness and price premium
  – Better risk management
  – Transparent and reliable information
  – Lower risks on liability

Source: Council of Agriculture
https://www.taft.coa.gov.tw
IKEA Risk Management

- Risk assessment and product testing
  IKEA has a third-party accredited test laboratory that is certified each year by external auditors and third-party accredited test laboratories perform random tests. IKEA requires suppliers to order certified products testing by third party auditors.

Further details
Chunghua Post On-line Mall

• Merchants requirements
  • For food and cosmetics products, test reports must be issued by FDA-recognised accredited labs
  • For other goods, test reports must be issued by government labs or TAF-accredited labs.

Further details
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Reducing customer audits

Leading food manufacturing business producing own-brand and white label branded fresh pasta products for major supermarkets

• Accredited certification to the BRC Global Standard for food safety

• Use of accredited laboratories to test ingredient, environment, and measurements
Reducing customer audits

- Accredited certification and accredited test reports provide confidence - ‘earned recognition’.
- Company has reduced routine customer audits from 17 to 2 per year.
- This saves 240 man-days ~ £40k per year
Cost of sales reductions

A manufacturer of wireless fire detection systems.

- Implementation of accredited certification to ISO 14001 in order to adopt sustainable and environmentally sound practices.

- It involved a methodical and systematic review of existing processes and a number of new initiatives.
Cost of sales reductions

Outcomes:

• The re-examination of waste produced and how this was removed lead to 74% of all waste generated being recycled, generating savings of over £7,000 per year in removal fees.

• 40% saving of water use per year.

• 30% reduction of energy consumption achieved by reviewing EMS’ own use and that of its suppliers.
Winning public sector contracts

Affiniti - A large web hosting company

- Implementation of accredited certification to ISMS to assure data management and integrity.
- Key to winning local authority contracts and private sector such as Virgin.
- Key to winning place on public framework
Reducing the cost for associations

Trade association representing businesses that carry out pre-use and in-service inspections of fairground park equipment.

- ADIPS members are very small businesses, the majority of which are sole traders.
- Accreditation costs are prohibitive.
- UKAS project underway to develop a range of accreditation products for assessment and accreditation of small businesses and to consider the feasibility of applying different terms of business / price structure.
Trade figures

- 80% of world trade involves some element of conformity assessment (World Bank)
- 30% of Specific Trade Concerns attributed to inappropriate use of standards (WTO/TBT)
- 12% of Specific Trade Concerns attributed to inappropriate use of conformity assessment (WTO/TBT)