Keynote Paper:
The Role of Standards in the One Belt One Road (OBOR) Initiative

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ABSTRACT
Standards play a crucial role in the cooperation and connectivity of countries and economic zones. The One Road One Belt (OBOR) Initiative is in need to implement a "standards strategy" – key part of which has been described in the "Action Plan to connect OBOR through standardization". This paper aims to link the learnings from the broad literature on ISO management systems standards with the strategies that are discussed in the Action Plan. The empirical evidence is drawn from the most credible studies in the field (summarized in the research monograph by the author; Castka and Corbett, 2015) and this is supported by the data on standards adoption, standards development participation and GDP data from the OBOR countries. This empirical basis serves as a platform for a discussion on standards development, adoption of standards and the development of accreditation and certification infrastructure for the OBOR initiative.

Keywords: ISO Standards, the One Belt One Road Initiative, cooperation, connectivity

1. Introduction

International standards form an important backbone of international trade (ISO, 2015) and assist in providing a common platform for harmonizing transactions between partners. The development of international standards has been globally facilitated by the International Organization for Standardization (ISO), which developed 22,063 standards (ISO, 2018) - inclusive of technical standards and management systems standards. Management systems standards such as ISO 9001 for quality management systems and ISO 14001 for environmental management systems became widely adopted across the world (latest count in 2016 indicates 1,105,938 certificates being issued for ISO 9001 across 194 countries). Academic literature on management systems standards is similarly vast and numerous studies appear in leading scientific journals (Castka and Corbett, 2015). This paper scrutinizes this literature and links it to the One Road One Belt (OBOR) Initiative and draws learnings for the OBOR Initiative.

The paper is structured in the following way. First, the paper discusses the OBOR Initiative from the standards perspective. An overview of the "Action Plan to connect OBOR through standardization" as well as key aims of the plan are presented. This section also contains an account of OBOR countries and an example of standards development in the maritime industry (Li and Ouyang, 2017). Second, the paper provides key findings from the literature on management systems standards – focusing specifically on standards development, adoption and governance (e.g. accreditation and certification infrastructure). This section of the paper links the empirical findings from the ISO research with the OBOR Initiative and also includes an overview of the key OBOR countries and their current level of adoption of international standards (taking ISO 9000 as a proxy and corrected by GDP data from the World Bank) as well as their involvement in international standards setting initiatives (taking ISO 26000 as a proxy and the data on each countries activism in the development of ISO 26000). In the conclusion section, the paper discusses the main findings and proposes further steps in the development of a sound strategy for harmonization of standards as part of the OBOR Initiative.

2. The OBOR Initiative and Standards

The role of standards within OBOR is of critical importance and was formally recognized by the Office for the Advancement of the OBOR in the "Action Plan to connect OBOR through standardization"

(further referred to as "Action Plan"). The Action Plan aims at "deepening of bilateral and multilateral standardization cooperation and connectivity through cooperative development and adoption of standards". The plan portraits in particular the need for the development of standards in infrastructure (electric power, railway, maritime and aerospace industries; IT, high teach equipment manufacturing, biotech, new materials, etc.), in areas of Chinese strengths (such as traditional medicine, fireworks, tea, textile, footwear, etc.) as well as the need to translate Chinese domestic standards and making them available to partners. The main issues from the Action Plan are summarized in Table 1.

Table 1 Action Plan to connect OBOR through standardization

Item	Description
Key Objectives	• Boost international cooperation in production capacity and equipment manufacturing • Chinese standards to go out (500 urgently needed national and industry standards to get translated – Action Plan (2015) • Conduct research on standards on bulk commodities • Establish ASEAN Agricultural Standardization Demonstration Zones – to promote Chinese standards and management experience in agriculture
Key Industries and Types of Standards	• Development of standards in infrastructure (electric power, railway, maritime and aerospace industries; IT, high teach equipment manufacturing, biotech, new materials, etc.) • Development of standards in areas of Chinese strengths (such as traditional medicine, fireworks, tea, textile, footwear, etc.)
OBOR Countries	• Mongolia, Russia, Kazakhstan, Tajikistan, Uzbekistan, Vietnam, Cambodia, Thailand, Malaysia, Singapore, Indonesia, India, Armenia, the GCC Standardization Organization, Saudi Arabia, Egypt and Sudan; other GCC countries, Azerbaijan
Potential institutional partners	• ISO • GCC • International Maritime Organization • ISEAL

NOTE: The Table was developed by the author based on the OBOR Action Plan (OBOR, 2015) and other materials.

The importance of the linkage between ISO and the OBOR Initiative only starts to emerge in the literature. Yet it is evident that the linkage is vastly important and will become so in the near future. For instance, Li and Ouyang (2017) in ISO Focus Magazine describe the role of ISO standards in relation to maritime activities with the OBOR (details are summarized on Table 2. ISO Focus Magazine has not paid attention to other industry sectors and ISO's standards role in the OBOR but it is clear from the article by Li and Ouyang (2017) that the existing ISO standards can significantly assist in the development of the OBOR initiative.

Table 2 Maritime Cooperation – ISO standards and the OBOR Initiative

Objective	Scope of standards	Key institutions	Initiatives
To provide a platform for collaboration and cooperation in engineering equipment for shipping and high-tech ships	Technical, operational, management, safety and environmental management	ISO – about 400 standards in place (Stewardships under ISO/TC 8 Ships and Marine Technology; TC/TC188 Small craft; ISO/TC35/SC12 Preparation of steel substrates before application of paints and related products. IMO (International Marine Organization (IMO)	Smart "green ship" standards to drive cooperation

Note: The Table was developed based on Li and Ouyang (2017)

3. ISO Standards and the OBOR Initiative – a discussion

The literature on ISO management systems standards provides evidence that the standards play an important role in the international trade and that they serve as a valuable platform for cooperation and connectivity amongst international partners. It is therefore an appropriate strategy to purse connectivity and cooperation within the OBOR Initiative through the development and adoption of standards. In the sections that follow, the paper discusses the main findings from the literature on management systems standards, namely for standards development, adoption of standards as well as governance and certification infrastructure development and links the findings to the OBOR Initiative and the suggestions from the Action Plan.

3.1 Standards Development

ISO is the most dominant player in the global standards arena (Brunsson and Jacobsson, 2000). However, ISO is not the only player on the global scene. Numerous standards were developed by various NGOs; for instance standards in forestry (Bowler et al., 2017) or fishing (Oosterveer, 2008). Collectively, these standards are referred to as "eco-labels" (Castka and Corbett, 2016a, b). Standards are also being created in economic regions – such as by the GCC Standardization Organization in the Gulf Region. There are several other trends in the standards development area that are worth pointing at.

The world of standards seem to be embracing multistakeholder standard development much more closely in the recent years (Balzarova and Castka, 2012; Castka and Balzarova, 2008a; Helms et al., 2012). The ecolabelling schemes (eco-labels), for instance, are mostly developed through a multistakeholder standards development process and ISO itself is embracing the mechanism as well. ISO 26000 – a guidance standard for social responsibility – is the best example of such process. Developing standards in a multistakehodler setting is a challenging undertaking and even ISO has experienced delays with such mode of development (the standard took over 5 years to develop – excluding the build up toward the development process). ISO 26000 is also reminiscent of another trend: development of national standards in cases when a multistakeholder platform disagrees on an international standard. ISO 26000 was issued as a guidance – rather than a certifiable standard (Castka and Balzarova, 2008a; Castka and Balzarova, 2008b). However, many countries have been keen on certification and disagreed with the guidance nature of the standard. This later led to the development of national standards, which are based on ISO 26000 (for instance in Denmark) and which offered certification.

The empirical literature on the development of standards is relatively scarce. The most covered standards development process is the development of ISO 26000 (Castka and Balzarova, 2008a; Helms et al., 2012; Schwartz and Tilling, 2009). These studies scrutinize the standards development from a participation perspective and draw mostly critical conclusions about the process. The important finding for the OBOR Initiative is that the studies unravel the disparity of standards development competence amongst participating countries. ISO standards are developed by nominated experts (who are nominated by national standards bodies). However, the research shows that some countries are mere observers in the process, which raises questions about their competence and/or resource availability to participate in international standards development. Table 3 provides data on the activism of the OBOR countries in the development of ISO 26000. The data shows that only 29% of OBOR countries participated in the development and 58% participated in the voting. Even though it can be argued that the social responsibility is not a main stream standard (and may not be of strategic importance to OBOR countries), from a standards development perspective, it is worrying that such a limiting number of countries have participated (and voted) the standard. Such low participation might mean a lack of ability and /or resources of some OBOR countries, which presents a risk to the development of standards for the OBOR Initiative.

Table 3 OBOR Countries' activism in ISO 26000 standards development

Country	Participation[1]	Voting[2]	Comments submitted[3]	Tenor of Acceptance[4]
ARMENIA	0	0		
AZERBAIJAN	0	0		
CAMBODIA	0	0		
EGYPT	0	1		
INDIA	1	1	24	0.036
INDONESIA	1	1	85	-0.005
KAZAKHSTAN	0	0		
MALAYSIA	1	1	16	0
MONGOLIA	0	1		
RUSSIAN FEDERATION	0	1		
SAUDI ARABIA	0	1		
SINGAPORE	1	1	8	0.047
SUDAN	0	0		
TAJIKISTAN	0	0		
THAILAND	1	1	30	0
UZBEKISTAN	0	0		
VIET NAM	0	1		
TOTAL OBOR Countries	5	10	163	

NOTES The data was sourced from publicly available data on ISO 26000. Number of comments and the tenor of acceptance is sourced from Balzarova and Castka (2012).
[1] Participation: 0= the country did not participate; 1=the country participated
[2] Voting: 0= country did not vote; 1= country voted (note that countries had an option to vote without participation in the development process.
[3] Comments submitted: number of comments that a country submitted (commenting is a proxy for activism in participation)
[4] Tenor of Acceptance: access whether the comments were accepted; average tenor (across all participating countries = 0.013)

The other aspects of standards development is the lengths of the development (ISO refers to three years, even though ISO 26000 has taken over 5 years to develop). From the perspective of the OBOR Initiative, this means that the decision to develop new standards (as opposed to adopt or translate existing standards) will be critical. Especially in terms of management systems standards, adoption of existing standards might be more effective (please note that the paper does not discuss the technical standards in which the best practice might be different). Management Systems standards are already widely adopted (see the discussion in the next section) even within the OBOR countries. The policy makers might also explore other standards. (Castka and Corbett, 2016a, b) provide an extensive discussion of environmental and social labelling schemes (so called "eco-labels"). Adoption of eco-labelling standards presents another area of opportunity especially when the focus is on environmental and social issues.

3.2 Adoption of standards

The literature provides evidence that economic cooperation and adoption of standards are largely interlinked. Numerous studies have shown that standards assist in economic development and trading partners are more likely to adopt international standards. This is in particular the case in the developing countries. Clougherty and Grajek (2008) for instance report that "ISO diffusion to have no effect in developed nations, but to positively pull FDI (i.e., enhancing inward FDI) and positively push trade (i.e., enhancing exports) in developing nations". The country-of-origin argument is another important aspect of standardization and harmonization. Prakash and Potoski (2007) argue that "inward FDI stocks are associated with higher levels of ISO 14001 adoption in host countries only when FDI originates from home countries that themselves have high levels of ISO 14001 adoption." This finding shows that the home countries can successfully harmonize internationally by providing leadership through investments – even through a decentralized institutional instrument such as ISO 14001.

The macro diffusion patterns of ISO 9001 and ISO 14001 are likely to be present in the OBOR Initiate and the policy makers can draw conclusions from this body of the literature. However, the importance of firm level preparedness is similarly important. The research demonstrates that firms have different levels of operational maturity and that maturity levels also determined firms' preparedness to embrace the standards (Castka and Corbett, 2015). This finding would suggest that the competence (at a firm level) needs to be addressed in the OBOR countries so that the diffusion and adoption process speeds up. To assess the likely preparedness of firms in any given country, adoption levels of standards and their penetration in the economy is being used (Corbett and Kirsch, 2001). Table 4 presents data on adoption levels of ISO 9001 and ISO 14001 in the OBOR countries. The penetration of ISO standards is measured against the economic strength (e.g. number of certificates divided by GDP). The results show that there is a disparity in the penetration of standards practice across the OBOR countries. Countries with low level of penetration of standards (e.g. Tajikistan, Uzbekistan, and Sudan) are likely to present a challenge and working strategically with these countries on their "standards ability" will be crucial for success of the OBOR Initiative.

Table 4 Number of ISO 9001 and ISO 14001 certificates and their penetration in OBOR Countries

Country	Certificates (ISO 9001)	Certificates (ISO 14001)	GDP (in millions)	Certificates/GDP ISO 9000	Certificates/GDP ISO 14001
ARMENIA	28	7	10,572	2.65	0.66
AZERBAIJAN	220	68	37,848	5.81	1.80
CAMBODIA	45	22	20,017	2.25	1.10
EGYPT	2687	982	332,791	8.07	2.95
INDIA	37052	7725	2,263,792	16.37	3.41
INDONESIA	7512	2001	932,259	8.06	2.15
KAZAKHSTAN	533	148	137,278	3.88	1.08
MALAYSIA	10380	2325	296,536	35.00	7.84
MONGOLIA	18	4	11,183	1.61	0.36
RUSSIAN FEDERATION	5083	1037	1,283,163	3.96	0.81
SAUDI ARABIA	2353	399	646,438	3.64	0.62
SINGAPORE	4737	1305	296,976	15.95	4.39
SUDAN	70	17	95,584	0.73	0.18
TAJIKISTAN	4	2	6,952	0.58	0.29
THAILAND	9660	3458	407,026	23.73	8.50
UZBEKISTAN	80	17	67,220	1.19	0.25
VIET NAM	5160	1371	205,276	25.14	6.68
TOTAL OBOR Countries	85622	20888	7,050,913	158.62	43.06
TOTAL GLOBALLY	1,105,938	346,148	75,845,109	2,272.26	681.92
Percentage of OBOR Countries	8%	6%	9%	7%	6%

Notes: Data obtained from 2016 annual survey of ISO adoption and GDP data obtained from the World Bank database.

To facilitate the adoption, the policy makers should also communicate the impact of adoption of standards. In terms of management systems standards, Castka and Corbett (2015) summarize the impact of ISO 9001 and ISO 14001 standards as positive (the positive impact is not enough communicated – in the author's view). Castka and Corbett (2018) provide an overview of the most important studies in the field and conclude that "The evidence, on balance, points to a positive effect of ISO 9000 on various measures of operational performance (such as inventory days, accounts receivable, operating cycle time, or waste) and financial performance. The evidence on ISO 14000 is weaker but does imply a positive effect on environmental performance and perhaps on financial performance" (Castka and Corbett, 2018, p.35). Communicating the positive impact of standard on firms and national economies should be the

cornerstone of the standards strategy and the findings from Castka and Corbett (2015) should be used to communicate the beneficial nature of adoption of management systems standards.

3.3 Governance of standards – accreditation and certification infrastructure

ISO standards (and many of the eco-labels) are organized as two tier governance system: accreditation bodies approve certifiers and certifiers audit individual firms (or sites) to establish compliance with any given standard. Such oversight will be also crucial in the OBOR Initiative and a sound accreditation and certification infrastructure will need to be in place. Without the infrastructure, the Initiative might struggle to enforce the standards and to monitor whether the standards are being consistently adhered to.

The benefit of using existing standards is that of existing infrastructure – especially in relation to ISO standards. The data in Table 4 – penetration of ISO standards in OBOR countries - serve as indicators of a country's certification infrastructure as well: countries with low penetration are likely to have poor accreditation and certification infrastructure. The strategy and the action plan should also embrace the infrastructural challenges of accreditation and certification.

Even though the two tier governance system has been in place for decades, the more recent research has pointed out at the increasing inconsistency of accreditation and certification (Castka et al., 2015; UNIDO, 2012). No evidence exists to determine if the inconsistencies are related to particular countries. The recent establishment of ISO/TC176 TG02 on brand integrity is however a clear signal that the problem became significant. The research also shows that in some countries – e.g. China – foreign certifiers and foreign owned firms require stricter conformance with standards in comparison to domestic certifiers and domestic firms (Fryxell et al., 2004). Findings such as this further sparkled discussions about the role of accreditation bodies in their oversight (Prajogo et al., 2018). Again, these discussions might prove valuable in the formulation of the Action Plan.

4. Conclusions and Future Research

The academic research into ISO management systems presents an important source of insight for the OBOR Initiative and policy makers in charge of formulation the action plan for standardization. This paper highlighted the main issues in terms of standards development, adoption and development of certification infrastructure. The paper discussed the critical decision making points and presented statistics to indicate, which countries in the OBOR Initiative might have less preparedness to develop and adopt standards.

The paper focuses solely on ISO Management Systems Standards and the future work needs to broaden the focus and provide the analysis of the current status quo of technical standards. It is advisable to develop a research project and map the current standards competence across the countries and further disaggregate the analysis by key industries. The paper provided an example from maritime industry and this can serve as a platform for future studies. It is a hope of the author that the paper paves the way for future research in the role of standards and that – ultimately – it will contribute to successful cooperation and connectivity through standards in the OBOR Initiative.

References

Balzarova, M.A., Castka, P., 2012. Stakeholders' Influence and Contribution to Social Standards Development: The Case of Multiple Stakeholder Approach to ISO 26000 Development. J. Bus. Ethics 111 (2), 265-279

Bowler, K., Castka, P., Balzarova, M., 2017. Understanding firms' approaches to voluntary certification - evidence from multiple case studies in FSC certification. J. Bus. Ethics 145 (2), 441-456.

Brunsson, N., Jacobsson, B., 2000. The Contemporary Expansion of Standardization", in: A World of Standards, in: al., B.e. (Ed.), A World of Standards. Oxford University Press, Oxford, pp. 1-17.

Castka, P., Balzarova, M.A., 2008a. The impact of ISO 9000 and ISO 14000 on standardisation of social responsibility—an inside perspective. Int. Journal of Production Economics 113 (1), 74-87.

Castka, P., Balzarova, M.A., 2008b. Social responsibility standardization: Guidance or reinforcement through certification? Human Systems Management 27 (3), 231-242.
Castka, P., Corbett, C.J., 2015. Management Systems Standards. Diffusion, Impact and Governance of ISO 9000, ISO 14000, and Other Management Systems Standards. Foundations and Trends in Technology and Operations Management 7 (3-4), 223.
Castka, P., Corbett, C.J., 2016a. Adoption and Diffusion of Environmental and Social Standards: The effect of Stringency, Governance, and Media Coverage. International Journal of Operations and Production Management 36 (11), 1509-1524.
Castka, P., Corbett, C.J., 2016b. Governance of eco-labels: expert opinion and media coverage. J. Bus. Ethics 135 (2), 309-326.
Castka, P., Corbett, C.J., 2018. No Joking Matter. Quality Progress (January), 32-37.
Castka, P., Prajogo, D., Young, A.C.L., Sohal, A., 2015. Understanding firms' selection of their ISO 9000 third-party certifiers. International Journal of Production Economics 162 125-133.
Clougherty, J.A., Grajek, M., 2008. The impact of ISO 9000 diffusion on trade and FDI: A new institutional analysis. Journal of International Business Studies 39 (4), 613-633.
Corbett, C.J., Kirsch, D.A., 2001. International Diffusion of ISO 14000 Certification. Production and Operations Management 10 (3), 327-342.
Fryxell, G.E., Chung, S.S., Lo, C.W.H., 2004. Does the selection of ISO 14001 registrars matter? Registrar reputation and environmental policy statements in China. Journal of Environmental Management
71 (1), 45-57.
Helms, W.S., Oliver, C., Webb, K., 2012. Antecedents of Settlement on a New Institutional Practice: Negoations of the ISO 26000 Standard on Social Responsibility. Academy of Management Journal 55 (5), 1120-1145.
ISO, 2015. Reaping the benefits of ISO 9001. International Organization for Standardization, Geneva.
ISO, 2018. We're ISO: we develop and publish International Standards. International Organization for Standardization, Geneve p. https://www.iso.org/standards.html.
Li, Q., Ouyang, T., 2017. Building China's Silk Road. ISO Focus (Sep-Oct), 17-21.
Oosterveer, P., 2008. Governing global fish provisioning: Ownership and management of marine resources. Ocean & Coastal Management 51 (12), 797-805.
Prajogo, D., Castka, P., Sohal, A., 2018. Selection, Experience and Satisfaction with ISO 9001 Certification Bodies and Auditors. Joint Accreditation System of Australia and New Zealand., Canberra.
Prakash, A., Potoski, M., 2007. Investing up: FDI and the cross-country diffusion of ISO 14001 management systems. International Studies Quarterly 51 (3), 723-744.
Schwartz, B., Tilling, K., 2009. 'ISO-lating' Corporate Social Responsibility in the Organizational Context: A Dissenting Interpretation of ISO 26000. Corporate Social Responsibility and Environmental Management 16 (5), 289-299.
UNIDO, 2012. ISO 9001 - Its relevance and impact in Asian Developing Economies. Based on Project TE/RAS/09/003 A survey covering quality management system development, certification, accreditation and economic benefits. International Organization for Standardization, International Accreditation Forum, Norwegian Agency for Development Cooperation.

Author's Background

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