

## **Distinguished Keynote Paper:** **Standards and Diversity: A Binomial to be considered in the OBOR**

Dr. Palmira López-Fresno

*President, Spanish QFD Association, **SPAIN***

*Senior Expert in International Cooperation, European Union*

[correo@palmiralopezfresno.com](mailto:correo@palmiralopezfresno.com)

Dr. Fernando Fernández-González

*Senior Expert, QmB International; Ex-Head of Neurology, Hospital Central de Asturias, SPAIN.*

[fgfernando@msn.com](mailto:fgfernando@msn.com)

### **ABSTRACT**

*The debate on standards and diversity has caught the interest of managers and researchers in the past few years. Many are the benefits of standardization, but when taken to the extreme, creativity and innovation could be limited, so does competitiveness. On the other side, international trade is based in harmonization of standards. International standards have brought both areas closer together, as by essence they incorporate diversity as a principle for their development. The OBOR project opens great opportunities, while involves challenges. At which levels and fields diversity should be promoted, and in which others standardization is appropriate? The answer will be one of the keys to its success. Through content and graph analysis of the official speeches on OBOR delivered by President of the People's Republic of China, Xi Jinping, in international organisations we shall go through the challenges the OBOR faces, the principles to make it a reality and the role standards should play for OBOR implementation.*

**Keywords:** Corporate Governance, Diversity, OBOR, Standards, Standardization, Sustainable Development.

### **1. The OBOR strategy**

President of the People's Republic of China, Xi Jinping unveiled his vision of the Silk Road Economic Belt on September 2013, and the concept of New Maritime Silk Road on October, 2013. These two concepts are combined as the One Belt One Road (OBOR), a massive infrastructure-led economic integration plan that encompasses more than 60 emerging market economies and a total population of over 4 billion (Du & Zhang, 2018) and it will span more than 50 years. The OBOR strategy is expected to help China to tackle the imbalances in socio-economic development between the country's flourishing coastal provinces and the less developed western and central provinces and to reduce income inequalities (European Parliament, 2016), but no doubt that it is an ambitious project that will redistribute the maps of international trade and investment (Chaisse & Matsushita, 2018). The five pillars of OBOR announced by President Xi Jinping are policy communication, road connectivity, unimpeded trade, money circulation, and cultural understanding.

The Silk Road is a story of connectivity, one that enables countries and cities to strategically respond to the shifting geopolitics of the region and use the past as a means for building competitive advantage in an increasingly networked economy (Winter, 2016). The OBOR fosters valuable institutional and interpersonal connections. With routes, hubs, and corridors, countries will continue to find points of cultural connection though the language of shared heritage, in order to gain regional influence and loyalty. Culture is in essence diversity. The challenge will be how to manage, at the organisational and country-macro level, to face the challenges of globalisation, not only respecting diversity but also promoting it, while harmonisation and standardisation are clue to develop areas such as international trade. So, standards and diversity become a binomial to be considered in the OBOR project.

### **2. Challenges of OBOR – Analysis of President Xi Jinping's speeches**

The OBOR strategy and project proposed by President of the People's Republic of China, Xi Jinping, readily won international support. Through content analysis of the official speeches on OBOR he delivered in international organisations, we shall go through the challenges the OBOR faces, to later analyse the role standards should play for a successful OBOR implementation.

## 2.1 Research objectives

The objective of the research conducted was to identify the conceptual articulation of sustainable development from the Chinese criterion, as inputs to analyse the role standards should play in OBOR implementation.

## 2.2 Data

As data for the analysis we took the official translation into English of the speeches on OBOR President Xi Jinping delivered in international organisations, from 2013 to 2017.

## 2.3 Research methodology

Mixed methods were applied, based on content analysis supported by graph/visual analysis, as follows:

- *Content analysis*: it currently focuses on the presence, meanings and relationships of words and concepts, to make inferences about the messages (Busch et al., 2005), rather than in counting the number of times specific words and terms appeared, as historically it was viewed (Berelson, 1952; Krippendorff, 1980; Marshall & Rossman, 2016).
- *Graph analysis*: it aims at identifying interconnections between entities in abstract structures named graphs. Quantitative data can be converted into narrative data and analysed qualitatively, and vice versa, qualitative data can be converted into numerical codes and analysed quantitatively (Herrero, 2000, Saunders, Lewis & Thornhill, 2009; Kuz, Falco and Giandini, 2016). A network graph is formed by connections or links (also named *edges*) between data, sets, elements, objects or entities, which in turn are labelled as vertices or *nodes* (Tufte, 2001; Saunders, et al., 2009). Therefore, a graph is a structure with "n" dimensions constituted by nodes that represent the generic entities that form the system or network. The connections between the nodes indicate how the corresponding entities interact or are related to each other. A graph has a set of origins or *sources*, and *targets* connected to each other, whose connections or links (*edges*) can be uni or bidirectional.

## 2.4 Data analysis

We introduced the content of the speeches in EXCEL<sup>®</sup>, a word per file. Through an algorithm programmed in EXCEL<sup>®</sup>, we discarded the *stop words*, to later identify the frequency of each word and the concatenation between words, as concepts. That is, the *sources* (words that go before) and *targets* (the subsequent words) for the purposes of the graph analysis. To convert words into concepts we used the algorithm based on synonyms available in NVIVO<sup>®</sup>. The narrative data were coded numerically, *ad hoc* for their algebraic processing as a source for the graph analysis.

Among the numerous tools available for the visualization of graphs, for this research we used GEPHI<sup>®</sup>, a free-download software which allows to visualize, explore and analyse networks and complex systems, hierarchical and dynamic graphs (Rayón, 2015). It is a complementary tool to traditional statistics, aimed at making the thought triggered by visual perception function, as an iterative "interface" that facilitates reasoning. This statement is a paradigm in the field of research through visual analysis (Ursyn, 2014) and had, in this case, application to the study of nodal interrelations.

A first step in analysing a network is to discern if the objects, elements or data belong to the same group, module or community. That is, to identify similarities and inequalities between the nodes and their links. For that purpose, algorithms are used to identify or know the "modularity" of the graph (Blondel et al., 2008) and the "centrality". Centrality measures the importance of each node within the network (for the purpose of this study, a node is a "concept"); it answers the question about which are the most important or central nodes (Newman, 2010). Or, in a similar sense, it expresses an activity index of the main nodes of a network (Freeman, 1978/79), which would have both access to resources, and greater potential to create new relational nodes (Daly et al., 2010). To measure centrality specific algorithms are used (Scott, 1994; Newman et al., 2002;), as follows:

- *Degree centrality (Degree)*: an indicator of the communication activity or connections of a node (Rusinowska et al., 2011).
- *Intermediation centrality (Betweenness)*: an indicator aimed at identifying those nodes that exert a bridging function within the chains of links, roads or routes, that are key within the network.

- *Closeness centrality (Closseness)*: an indicator that measures the degree of proximity with respect to all other nodes. It indicates how close the influencing nodes are to reach contact with others. So, how important they are within the network of influences for possible communications or relationships with other nodes.
- *Prestige centrality (Eigenvector)*: a more elaborate version of the grade centrality metric. It assumes that not all connections or links have the same importance, so it does not take into account the number of connections, but the quality of them.

## 2.5 Results

Five communities of conceptual elements were identified in President Xi Jinping’s speeches (Figure 2).

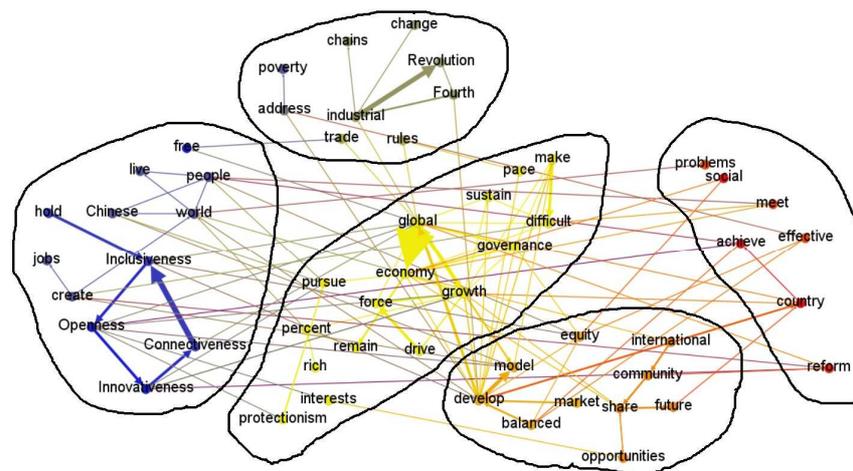


Figure 2: Communities of concepts identified in the graph analysis

The five communities are the following:

- *A first one related to the principles that guide OBOR strategy*: inclusiveness, openness, innovativeness, connectiveness.
- *A second one referred to the pillars for economic development*: industry 4.0 (fourth industrial revolution) is proposed to reduce (address) poverty.
- *A third one associated to the challenges of sustainable growth in the global economy*: how to reduce the gap between rich and poor; good governance.
- *A fourth one linked to how the development model should be*: the model should drive balanced and equitable development, where market is an axe for development.
- *A fifth one related to how countries should address effective reforms*: under the principles of inclusiveness, openness, connectiveness and innovativeness (first community).

To identify the functional structure of the network – spatial/functional arrangement of nodes and edges – we used the Force-atlas 2 algorithm. Figure 3 illustrates the centralities of degree, intermediation and prestige, as well as the edges, where the colour of each edge corresponds to the colour of the source node.

The study of centrality hierarchies the functional relations of the conceptual nodes. Development (develop) is the most important concept (node), and it should be global, equitable and influence the world (edges in red colour). Development requires a model (the thicker edge, red colour), that entails openness, and carries the concepts of make, create, Chinese and growth (edges in green colour). In the same way all the interrelations can be analysed, in an interactive way.

From the analysis the graph it is inferred that the concept of OBOR is not linear and deterministic, but rather it is an initiative of radial and global development.



work, compatibility and interchangeability of components and products, reduction of variability, and an unusual increase in the efficiency of resources (López-Fresno, 2014). During the last twenty years, standardization also hinged the development of international trade. In 2016 more than 21000 standards have been harmonised internationally (ISO, 2016), and the number of national and international voluntary standards continues to grow rapidly, as the world economy becomes more complex.

Standardization function includes technical regulations and technical standards (Czubalaa et al, 2009), the latter usually named as standards. Both standards and technical regulations set out specific characteristics of products, such as size, shape, design, functions, and performance; the way they are labelled or packaged; and the related process and production methods. Although both terms are often used interchangeably, they basically differ with respect to compliance and issuing responsibilities. Thus, technical regulations are developed by governments to fulfil particular objectives, generally safety, health, or environmental protection, and their compliance is mandatory, enforced by the government. Standards are developed by coordinated work through standardizations bodies, and their compliance is not mandatory; only market can enforce it. Standards can also arise through a "de facto" process that is uncoordinated by commercial guidelines (Hufbauer, Kotschwar & Wilson, 2001). Thus, if a product does not meet the requirement of a technical regulation in an importing country, it will not be allowed to enter market; but if a product does not meet a voluntary standard, it is free to enter the country, although it may not find much of a market (Kotschwar, 2001).

Standards and technical regulations are interrelated spheres. According to Good Regulation Practices, standards should be used as basis for technical regulations, when appropriate. World Trade Organisation (WTO) – Technical Barriers to Trade (TBT) Agreement encourages the use of international standards, creating a rebuttable presumption that technical regulations aligned with international standards do not constitute “unnecessary” obstacles to international trade (Czubalaa et al, 2009).

ISO/IEC Guide 2 (2004) defines standards as *documents established by consensus and approved by a recognized body, that provide, for common and repeated use, rules, guidelines or characteristics for activities or their results, in order to achieve an optimum degree of order in a given context*. The same document defines standardization in the volunteer ambit as *the activity aimed at establishing, with regard to present or potential problems, provisions for use common and repeated, in order to achieve an optimum of order in a given context*. Standardization can be done at an individual, organizational, associational, national, regional or international level (UNIDO, 2006). Standards issued at the international level are a determinant factor to facilitate international trade.

Standards are drawn up by consensus through Technical Committees, integrated by a balanced representation of interested parties. Key principles on international standards development are the following (ISO, 2018):

- *ISO standards respond to a need in the market*: ISO does not decide when to develop a new standard, but responds to a request from industry or other stakeholders such as consumer groups. Typically, an industry sector or group communicates the need for a standard to its national member who then contacts ISO. Contact details for national members can be found in the list of members.
- *ISO standards are based on global expert opinion*: ISO standards are developed by groups of experts from all over the world, that are part of larger groups called technical committees. These experts negotiate all aspects of the standard, including its scope, key definitions and content. Details can be found in the list of technical committees.
- *ISO standards are developed through a multi-stakeholder process*: the technical committees are made up of experts from the relevant industry, but also from consumer associations, academia, NGOs and government. Read more about who develops ISO standards.
- *ISO standards are based on a consensus*: developing ISO standards is a consensus-based approach. Comments from all stakeholders are taken into account, and each country has a vote. The participation of more than 160 countries in ISO standards development ensures that diversity in its broader sense is considered as a basis for standard development, and the voting process (one vote per country member) is the key to consensus.

### **3.2 Standards and trade - Harmonization as facilitator of global trade**

Global trade has been possible due to requirements and specifications (standards and technical regulations) and their progressive harmonisation. Specially after the 1990s, international standardization

played a pivotal role for the development of global trade (Moenius, 2004; Shintaku et al, 2006; Swann et al, 1996). The more than 21,000 international standards published by the International Organization for Standardization (ISO) are an example of this. As a consequence, other pillars of the QI also evolved worldwide: certification, as a guarantee of compliance with the requirements; metrology, as a means to provide reliability in measurements and testing; accreditation, as a guarantee of the technical competence of conformity assessment bodies; and the mutual recognition agreements, such as mutual recognition of conformity assessment results. Trade literature on integration (eg. Venables, 1990; Flam, 1992) evidenced that common standards in two countries facilitate trade between them.

There is growing concern about the adverse consequences that proliferation of requirements has potentially in international trade, mainly through protectionist technical regulations, both in the field of Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT). The potential of standards and technical regulations to act as barriers to trade was first formally recognized at the multilateral level during the Tokyo Round, with the negotiation of the Agreement on Technical Barriers to Trade (the Standards Code), which came into effect in 1980 to members who chose to sign on (Kotschwar, 2001). With the Uruguay Round, Agreement on Technical Barriers to Trade (the TBT Agreement), standards issues were brought into the mainstream of international trade negotiations and was made obligatory for all WTO members. The TBT Agreement expands and strengthens the scope and coverage of international disciplines on standards and technical regulations and provides a comprehensive set of guidelines for the regulation of technical barriers to international trade.

Regulatory protectionism determines a reduction in exports and the competitiveness of the country and, unfortunately, this effect is particularly strong and evident in developing countries (Shepherd, 2007). Standards and regulations take part of the TBT, but with different impact, within the framework of the non-tariff measures (NTM). They are, among NTM, the category with the highest incidence in notifications to the WTO: 530 entries, almost half of the total, followed by those relating to administrative and customs processes, 380 entries, and SPS, 137 entries (Staiger, 2012). Costs associated to NTM are relevant, and according to Maskus et al. (2005), in the case of technical regulations they can represent 2.7% of the sales of a company. Therefore, TBT, and especially technical regulations, are of international growing concern. Harmonization of standards and mutual recognition of conformity assessment results are two ways to reduce the negative effects of divergent regulations.

Harmonization is the process of adjusting differences or existing inconsistencies between two or more standards and technical regulations, adopting a single legislative instrument (López-Fresno, 2014). Its objective is to promote economies of scale in designing and manufacturing, and reduce costs of conformity assessment, information and others, thereby improving productivity and competitiveness of enterprises and countries as a whole.

Research conducted in the area of standardization was mainly centred in the impact of mandatory standards in international trade (Swann et al., 1996; Moenius, 2004; Baller, 2007; Shepherd, 2007; Chen & Mattoo, 2008; Disdier et al, 2008; Czubalaa et al, 2009; Mangelsdorf, 2011; Bao and Qiu, 2012; Xiong and Beghin, 2012; Bao, 2014). These studies generally found some evidence that product standards impact negatively on trade with those countries outside the harmonisation zone, affecting the both the probability of other countries' exporting and their export volumes. The effect is not uniform, however, and tends to vary from one sector to another (Moenius, 2004).

Yet with limitations of scope, research show a significant and proportional relationship between harmonization, volume and variety of exported products, and variety of destination countries. This relationship is variable, according to the type of measure (standard or technical regulation), scope, sector and characteristics of the enterprises.

International harmonized standards: i) improve the quality and safety of products (Swann et al, 1996) and services, thereby improving their acceptance in the market and the quality of life of consumers and society; ii) eliminate technical barriers to trade (ISO, 2004), so facilitating the free movement of products; iii) facilitate interoperability and compatibility between products (Swann et al, 1996); iv) allow further economies of scale, so reducing costs (ISO, 2004; Swann et al, 1996); v) improve efficiency (Kotschwar, 2001) and efficacy of processes and systems, and overall productivity (SCC, 2007); vi) transfer technology from developed to developing countries (El Araby, 2015; WTO, 2005); vii) foster the diffusion of technological and process best practices (Tippmann, 2013); viii) improves communication between the different stakeholders (Lopez-Fresno, 2014), reducing transnational costs (Kotschwar, 2001);

ix) contribute to the socialization of technology and technological cooperation (ISO, 2004); x) promote a culture of quality; xi) protect environmental and social aspects; xii) promote transparency and ethics; and xiii) contribute to the improvement of industrial and global competitiveness of a country, among other benefits (Lopez-Fresno, 2014). It is estimated that the contribution of the standardization to the annual growth of the economy lies between 0.8% and 1% (AFNOR, 2009; BSI, 2005; SCNZ, 2011).

Harmonization of standards contributes to facilitate trade, as makes more better substitute products (WTO, 2005), increases the compatibility between complementary products, ensures the interchangeability of components, reduces costs of information, improves the confidence of consumers regarding imported products (Dissanayaka et al, 2001), and promotes the effectiveness of the communication (Grajek, 2004). But harmonization of standards does not mean to limit the variety of products, their diversity in the broadest sense, that should be promoted, although no doubt that globalisation on one hand bring countries and regions closer, but on the other has affected in reducing variety.

As identified in the analysis of President Xi Jinping's speeches, openness, innovativeness, connectiveness and inclusiveness should lead the implementation of the OBOR strategy. These four principles characterise how international trade should be. Harmonised international standards, such as ISO standards are pivotal to facilitate international trade, and they carry the principles of innovativeness and inclusiveness in their essence.

### 3.3 Standards at the organizational level

The interdependencies between organisations, communities, countries and economies (connectiveness) are strengthening and increasing in complexity. In order to be competitive in this complex environment, organisations need to be able to identify and manage their competitive advantages from a global holistic and systemic view (openness), considering continuous improvement and innovation (innovativeness) in the core of their organizational culture.

There are several areas of organizational management where standards and diversity should be considered: i) *Innovation*: managing improvement and innovation requires the ability to work with different people and promoting diversity (Pamfilie, 2008) as a base to foster creativity, a necessary precondition for successful innovation (Bassett-Jones, 2005). People with different backgrounds, skills and behaviours (inclusiveness) are prolific for idea generation and for maintaining a creative work environment that would result in a high rate of successful innovations. Innovativeness requires openness and connectiveness, as capacity to innovate not only relies in internal resources; ii) *process management*: regardless of sector, size, structure or maturity, organisations need to establish an appropriate management framework to achieve competitiveness. The advantages of using internationally standards are out of doubt. In a highly competitive environment, managers need proven valid management models, that help them to drive the organisation within a robust, and at the same time flexible, frameworks. Harmonized ISO standards play a critical role in helping organisations worldwide to be competitive, providing them global management models such as ISO 9001, thematic standards such as ISO 140001, ISO 10001, ISO 27001 and many other sectoral, thematic standards, or specific standards for product/service design and manufacturing, definitions, etc. ISO standards promote effectiveness while respecting cultural diversity, at the country and local level.

## 4. Conclusions

OBOR is an ambitious infrastructure-led economic integration plan that encompasses more than 60 emerging market economies and a total population of over 4 billion. But overall, it is a story of connectivity on the basis of cultural diversity. Diversity cannot be limited by rigid standards; on the contrary, it should be respected and promoted, under the principles of openness and inclusiveness. At the international country level, harmonisation of standards should be promoted to foster trade. At the corporate level, harmonised international standards should be considered for process management and as basis for management framework, while widening promoting diversity that will lead to continuous improvement and innovation. Inclusiveness, openness, innovativeness and connectiveness should guide sustainable development in OBOR implementation.

## References

- AFNOR (2009), *The economic impact of standardization, technological change, growth in France standards*, Paris, AFNOR.
- Bassett-Jones, N. (2005), "The paradox of diversity management, creativity and innovation", *Creativity and Innovation Management*, Vol.14, No.2, pp.169-175
- Baller, S. (2007), "Trade Effects of Regional Standards Liberalization: a Heterogeneous Firms Approach", *The World Bank - Policy Research Working Paper*, Series #4124.
- Bao, X. & Qiu, L.D. (2012), "How Do Technical Barriers Influence Trade Flows?", *Review of Internacional Economics*, Vol.20, pp.691-706.
- Bao, X. (2014), "How Do Technical Barriers to Trade Affect China's Imports?", *Review of Development Economics*, Vol.18, No.2, pp.286-299.
- Berelson, B. (1952), *Content Analysis in communication research*, Glencoe, Free Press.
- BSI - British Standards Institution (2005), *The empirical economics of standards*. London, BSI and UK Department of Trade.
- Chaisse, J. & Matsushita, M. (2018), "China's 'belt and road' initiative: Mapping the world trade normative and strategic implications", *Journal of World Trade*, Vol.52, No.2, pp.163-185.
- Chen, M.; Mattoo, A. (2007) "Regionalism in standards: good or bad for trade?", *The World Bank - Policy Research Working Paper*, Series #3458.
- Clougherty, J.A. & Grajek, M. (2014), "International standards and international trade: Empirical evidence from ISO 9000 diffusion", *International Journal of Industrial Organization*, Vol.36, pp.70-82.
- Corporate Governance (s.f.), *Business dictionary*. Available from: <<http://www.businessdictionary.com/definition/corporate-governance.html>> [Accessed 16 March 2018].
- Cortina, A. (2007), *Ética de la razón cordial*, Oviedo, Ed. Jovellanos.
- Czubalaa, W., Shepherd, B. & Wilson, J.S. (2009), "Help or Hindrance? The Impact of Harmonised Standards on African Exports", *Journal of African Economies*, Vol.18, No.5, pp.711-714.
- Daly A.J., Nienke M.M., Bolivar, J. M. & Burke. P. (2010), "Relationships in reform: the role of teachers' social networks", *Journal of Educational Administration*, Vol.58, pp.359-391.
- Dissanayaka, S.M.; Kumaraswamy, M.M.; Karim, K.; Marosszeky, M. (2001), "Evaluating outcomes from ISO 9000-certified quality systems of Hong Kong constructors", *Total Quality Management*, 12 (1), pp. 29-40.
- Du, J. & Zhang, Y. (2018), "Does One Belt One Road initiative promote Chinese overseas direct investment?" *China Economic Review*, Vol.47, pp.189-205.
- European Parliament (2016), *One Belt, One Road (OBOR): China's Regional integration initiative, briefing, July 2016*. Available from: <[http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS\\_BRI\(2016\)586608](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2016)586608)> [Accessed 08 March 2018].
- El Araby, S. (2015), Quality Infrastructure: The road towards Nation's competitiveness, Available from: <[http://www.researchgate.net/publication/265006161\\_Quality\\_Infrastructure\\_The\\_road\\_towards\\_Nation's\\_competitiveness](http://www.researchgate.net/publication/265006161_Quality_Infrastructure_The_road_towards_Nation's_competitiveness)> [Accessed 10 March 2018].
- Freeman L.C. (1978/1979), "Centrality in social Networks conceptual clarification", *Social Networks*, pp.215-239.
- Grajek, M. (2004), "Diffusion of ISO 9000 standards and international trade", *Wissenschaftszentrum (Discussion Paper SP II)*.
- Herrero, R. (2000), "La terminología del análisis de redes: problemas de definición y de traducción", *Política y Sociedad*, Vol.33, pp.199-206.
- Hufbauer, G.C., Kotschwar, B. & Wilson, J.S. (2001), "Trade Policy, Standards, and Development in Central America", *The World Bank - Policy Research Working Paper*, Series #2576.
- ISO - International Standardization Organization (2005), *ISO 9000 quality management systems - fundamentals and vocabulary*, Geneva, ISO.
- ISO (2004), *Conformity assessment - Vocabulary and general principles*, Geneva, ISO.
- ISO (2015), ISO in figures, Available from: <<http://www.iso.org/iso/home/about/iso-in-figures.htm>> [Accessed 16 September 2015].
- Kotschwar, B. (2001), "Standards and Technical Barriers to Trade", Chapter 7 in José M. Salazar and Maryse Robert, eds. *Towards Free Trade in the Americas*, pp.141-162. The Brookings Institution. Available from:

- <<http://www.sedi.oas.org/dttc/belizecourse/textbooks/TFT/chap7.pdf> cap 7> [Accessed 16 September 2015].
- Krippendorff, K. (1980), *Content analysis. An Introduction to its Methodology*, Beverly Hills, Sage.
- Kuz, A., Falco, M. & Giandini, R. (2016), "Análisis de redes sociales: un caso práctico", *Computación y Sistemas*, Vol.20, No.1, pp.89–106.
- López-Fresno, P. (2014), "La normalización como factor para la calidad y el comercio internacional", *Dossier Programa Regional de Apoyo a la Calidad y a la Aplicación de Medidas Sanitarias y Fitosanitarias en Centroamérica (PRACAMS)*, Vol.1, pp.18-29.
- Mangelsdorf, A. (2011), "The role of technical standards for trade between China and the European Union", *Technology Analysis & Strategic Management*, Vol.23, No.7, pp.725-743.
- Marshall, C. & Rossman, G. B. (2016), *Designing qualitative research*, Thousand Oaks, Sage.
- Maskus, K.E. & Wilson, J.S. (2001), "Quantifying the Impact of TBT: A Review of Past Attempts and the New Policy Context", in K.E. Maskus and J.S. Wilson (eds), *Quantifying the Impact of Technical Barriers to Trade*. Ann Arbor, University of Michigan Press.
- Maskus, K.E., Tsunehiro, O. & Wilson, J.S. (2005), "The cost of Compliance with Product Standards for Firms in Developing Countries: An Econometric Study", *The World Bank - Policy Research Working Paper*, Series #3590.
- Moenius, J. (2004), "Information versus product adaptation: the role of standards in trade", *International Business and Markets Research Center Working Paper*. USA: Northwestern University.
- Newman, M.E.J., Watts, D.J. & Strogatz, S.H. (2002), "Random graph models of social networks", *Proceedings of the National Academy of Science of the United States*, PNAS, Vol.99, suppl. 1, pp.2566–2572.
- Pamfilie, A. (2008), "Diversity management driver of creativity leading to innovation as a competitive advantage", *Amfiteatru Economic*, Vol.10, No.2, pp.140-145.
- Rayón, A. (2015). Análisis de redes sociales: el poder de la teoría de grafos. Available at <<https://blogs.deusto.es/bigdata/analisis-de-redes-sociales-el-poder-de-la-teoria-de-grafos/>> [Accessed 28 December 2017].
- Rusinowska, A, Berghammer, R., de Stewart H., y Grabisch M. (2011), "Social networks: Prestige, centrality, and influence (Invited paper)", *RAMICS 2011, Springer, Lecture Notes in Computer Science (LNCS) 6663*, pp.22-39.
- Saunders, M., Lewis, P. & Thornhill A. (2009), *Research methods for business students*, Harlow, Oearson Education.
- Shepherd, B. (2007), "Product Standards, Harmonization, and Trade: Evidence from the Extensive Margin", *The World Bank - Policy Research Working Paper*, Series #4390.
- Shintaku, J., Ogawa, K. & Yoshimoto, T. (2006), "Architecture-based approaches to international standardization and evolution of business models". *90 International Standardization as a Strategic Tool: Commended papers from the IEC Centenary*. Geneva: IEC.
- Swann, P., Temple, P. & Shurmer, M. (1996), "Standards and Trade Performance: the UK Experience" *The Economic Journal*, Vol. 106, No.438, pp.1297-1313.
- Staiger, R.W. (2012), "Non-tariff Measures and the WTO". *The World Bank - Policy Research Working Paper*.
- Standards Council of Canada - SCC (2007), *Economic Value of Standardization*, Toronto, SCC.
- Standards Council of New Zealand (2011), *The Economic Benefits of Standards to New Zealand*, New Zealand, SCNZ.
- Tippmann, C. (2013), "The National Quality Infrastructure", *Policy Brief*. National Policies to attract R&D-intensive FDI in developing countries. World Bank. Available from: <[https://www.innovationpolicyplatform.org/sites/default/files/rdf\\_imported\\_documents/TheNationalQualityInfrastructure.pdf](https://www.innovationpolicyplatform.org/sites/default/files/rdf_imported_documents/TheNationalQualityInfrastructure.pdf)>. [Accessed 16 September 2015].
- Tufte, E. R. (2001), *The Visual Display of Quantitative Information*, Cheshire, Graphics Press.
- Ursyn, A. (2014), *Computational Solutions for Knowledge, Art, and Entertainment: Information Exchange Beyond Text*, Hershey, Information Science Reference.
- UNIDO (2015), "Competitiveness and Trade". Available from: <[http://www.unido.org/fileadmin/user\\_media\\_upgrade/What we do/Topics/Competitive and trade/5\\_QI\\_highres.pdf](http://www.unido.org/fileadmin/user_media_upgrade/What_we_do/Topics/Competitive_and_trade/5_QI_highres.pdf)> [Accessed 12 March 2018].
- United Nations Industrial Development Organization (2006), "Role of Standards. A guide for small and medium-sized enterprises", *Working Paper, UNIDO*.
- Winter, T. (2016), *One Belt, One Road, One Heritage: Cultural Diplomacy and the Silk Road*, Diplomat. Available from: <<https://thediplomat.com/2016/03/one-belt-one-road-one-heritage-cultural-diplomacy-and-the-silk-road/>> [Accessed 16 March 2018].

Yiu, E. (s.f.), *One Belt, One Road' Infrastructure seen as Catalyst for New Trade Growth*. Available from: <http://www.scmp.com/business/global-economy/article/2051138/one-belt-one-road-infrastructure-seen-catalyst-new-trade> [Accessed 16 March 2018].

Watson, p. (2012), *The Great Divergence: How and Why it Came to be Different to the Old World and the New*, Barcelona, CRITICS.

WTO - World Trade Organization (2005), *World Trade Report 2005: Trade, Standards and the WTO*, Geneva: WTO.

Xiong, B. & Beguin, J.C. (2012), "Does European Aflatoxin Regulation Hurt Groundnut Exporters from Africa" *European Review of Agricultural Economics*, Vol.39, pp.589-609.

**Authors' Background**

	<p><b>Dr. Palmira López-Fresno</b> works as Senior Expert in International Cooperation. She has more than 20 years of international experience in management and assessment, with extensive knowledge of the economic and social reality of Latin America, Europe and Asia-Pacific. Her activity has been developed in more than 40 countries in all continents, in different projects and top management positions, covering areas of assessment, quality management (Quality Director, Vice-president for Corporate Quality, consultant and auditor) and business management (Project Director; Production Director; Executive Director).</p> <ul style="list-style-type: none"> <li>-- Author of several books on leadership abilities and service quality. International speaker, trainer and consultant.</li> <li>-- Distinguished member of Spanish Association for Quality (AEC), Senior member of ASQ, member of BAM and other quality organizations.</li> <li>-- Former President of the Service Quality Committee (AEC) - 2001 to 2014.</li> <li>-- Former Vice President of AEC, 2008 to 2014.</li> <li>-- EFQM lead assessor, APBEST Chief Examiner, Spanish Quality Award Lead Assessor.</li> </ul>
	<p><b>Dr. Fernando Fernández-González</b> is Medical Doctor specialized in Neurophysiology and Neurology, with more than 46 years of experience in health care and in management. He also received specific training in Biological Engineering. From 1982-1992 he worked with the Spanish Health Ministry as assessor for New Health Care Technologies, being Director responsible of assessment and implementation of new medical devices as innovative technologies for health care at the National Health Authority, and Advisor of the NATO for healthcare technologies. He has an extensive background in Health Care Management and in Medical Technology Assessment.</p>