

The Economics of Standards: Theory, Evidence, Policy - a Review Article

by
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Knut Blind's book is divided in three main parts. The division seems obvious from the table of contents: parts A and B outline the theory of standardization, including regulation and the institutional framework, as a necessary background for understanding the other two main parts: an account of the author's empirical studies of 2000-2003 concerning the demand for (part C) and the impacts of (part D) formal standards, including some suggestions for policy-makers. In addition, Blind considers standardization from the microeconomic (company), the sectoral (industry) and the macroeconomic (national and international) perspective. Furthermore throughout the book the diverse relations between standardization and (i) technological change, (ii) trade and (iii) growth are analyzed. Unfortunately, this convincing structure is difficult to discover before reading the last chapters.

Blind begins the theoretical part A in chapter 4 with a classification of standards by their economic effects: while compatibility (or interface) standards often are informal (or de-facto) standards,¹ quality (i.e. minimum quality or safety) standards are mostly formal and aimed at overcoming problems of information asymmetries, such as adverse selection and moral hazard.² Variety-reduction standards enhance or inhibit innovation by providing the possibility to reach a critical mass for new markets or technologies. Information (measurement) standards often are a hybrid of the first three categories, increasing compatibility and reducing transaction costs.

In Chapter 5 Blind describes the economic impacts of standardization on technical change (innovation), competition, trade, and growth. Concerning standardization and innovation the positive impacts of concentration (of e.g. research

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¹They influence suppliers and consumers via direct and indirect network effects and thus problems of switching costs with the risk of (technological) lock-in into inferior standards arise.

²They are more effective than signaling or screening, since public goods reduce transaction and search costs without additional costs.

and development [R&D]) and of formal standards (and informal ties at standardization development organizations [SDOs]) via knowledge transfers and reduced innovation costs is explained, including a short summary of the well-known theories of standardization.³ It seems that the more open and less proprietary standards are, the more beneficial they are from a welfare perspective. "The positive implications of international standards on foreign trade [via competitive advantages and disadvantages and trade deterrence] are certainly stronger than those of the idiosyncratic national standards", which are "preferable to a situation without any standard" (p.49). The impact of standardization on growth can be assumed to be positive, especially if standardization processes are transparent and open to all interested groups and the standards are not proprietary.

Part B begins with a classification in private and governmental standards as a result of economic, social, competitive, and industrial policy regulations. The definitions of the DIN for standards (norms) and formal standards are stated and the implications of laws for standards and *vice versa* are discussed: on a European level, due to their obligatory character, formal standards are (become) in effect legal guidelines and legal requirements. Standardization institutions and processes in Germany (DIN), in Europe (CEN, CENELEC, ETSI) and on an international level (ISO, IEC) are described as well as the processes of mandatory and voluntary adoption and the adoption of international standards on the EU level, which lead to a decreasing significance of the voluntary character of formal standards. Blind restricts the analysis in the remainder of the book to legal guidelines and formal standards due to the better database compared to other (e.g. de-facto) standards.

The first empirical analysis in part C, chapter 11, is concerned with the driving forces of standardization activities in general and yields similar results for some variables on a sectoral and on a firm level:⁴ R&D intensities, the propensity to patent, export intensity, and, to a more limited extent, market concentration respective relative company size are the main driving forces for standardization activities. Blind therefore concludes that innovative areas and export-intensive sectors should be the focus of standardization, standards have to

³Network effects, externalities, excess momentum (lemmings effect) and excess inertia (penguin effect), and the bandwagon effect, as well as sponsored technologies and the coordination problems leading to over- or under-standardization in markets, committees (SDOs) and governmental institutions.

⁴With German and OECD data (on some EU countries, Japan, and the USA) on the sectoral level and (the number of) standards (a sector-specific output) replaced by patents on a firm level. Similarity may result from assuming OECD concentration indices (that were not available) to be identical to German indices.

keep up to scientific and technological state-of-the-art and the standardization process, in which small and medium sized enterprises have to be integrated better, has to get closer to the R&D process.

In order to enrich the above analysis by company motivations, Blind conducts in chapter 13 a test, based on data resulting from questionnaires sent to German respective European (including German) companies, first on a general and then on a regional level. On the general level companies are differentiated based on whether they participate in standardization activities, while on a regional level they are differentiated based on participation in national, European or international standardization. For single companies reasons for participation are to exert influence and to prevent certain specifications in standards. For big companies legal security is a reason for participation, while small companies rather participate in order to facilitate compatibility with suppliers of complementary goods. According to the European data, R&D intensive companies with sufficient protection of IPR or know-how of low value for competitors are more likely to participate in standardization. Companies with low R&D- (and patent-) intensity participate for technology transfers from R&D-intensive companies. Standardizers are generally big companies, endowed with more personnel and financial resources, that are R&D-, export- and patent-intensive.⁵ Labor productivity also has a negative influence on the propensity to standardize.

In chapter 12 Blind focuses on the relation between intellectual property rights (IPR) and the propensity to standardize. On a sectoral and company level, based on the sectoral data from chapter 11 and European company data resulting from a questionnaire concerning problems with IPR in standardization processes, individual and social rationality lead to dichotomous results: while it is reasonable to patent own innovations this (too) high patenting behavior can hamper the growth of a sector. To overcome the disadvantages of (over) protection of IPR, if market solutions fail and the overall benefits of society outweigh the costs, it might be useful, to require governments to buy patents from companies for appropriate use in the standardization process, or to use obligatory licensing and incentives for innovative companies to release their innovations.

⁵Due to a high possibility for technological innovations (including preceding basic research), R&D has a positive influence on a sectoral level and a negative from a company's perspective (in the regional models R&D intensity is insignificant). This is not necessarily a contradiction. Export intensity is not significant on a general level although it has a positive influence for a low or medium range and a negative influence for a higher range. IPR does not lead to knowledge spillovers.

In chapter 14 Blind conducts a case study (probit analysis) about ISO 9000ff quality standards in the service sector⁶ and finds sector- and size-specific differences.⁷ He also shows that ‘risky’ technologies have a positive influence on the probability to introduce ISO 9000ff as a quality seal for customers and an internal process enhancement, increasing management flexibility and pressure on employees.

In part D Blind enhances the search for explanatory variables by a more in-depth analysis of the impacts of standardization.

First, the ambivalent relationship between technological change and standardization is analyzed more thoroughly, since significantly more standards are produced in R&D and patent intensive sectors. The analysis is based on cross-sectional data and a time-series approach. The finding of Part C, that R&D intensity of companies is exogenous and influenced neither by participation in standardization processes nor by the stock of standards, is confirmed. Companies’ decisions to join standardization processes are (negatively) dependent on their R&D activities. There seems to be a positive impact of technical change and innovation on standardization, while on the other hand standardization still has a slightly positive impact on innovation (measured in patent applications). The extension of the earlier approach, using company survey data, suggests even smaller impacts of standardization on innovation.

Second, the sometimes contradicting theoretical models about foreign trade and its relationship with standardization are analyzed, with patents instead of standards as an indicator for innovation, based again on cross-sectional analysis and longitudinal data. Blind analyses the bilateral trade relations between Germany, Austria, and Switzerland, first in general and then with focus on intra-industry trade, finding a positive effect of standards on exports, stronger for national than for international standards.⁸ A time-series analysis of German trade with the United Kingdom and France reveals that the impact of standards on trade flows is often ambiguous and depends on the country under consideration. Differentiating for trading partners and sectors Blind finds that country size is very important for the impacts of national and international standards, respectively. In order to further analyze the rather ambiguous results on the sectoral level, Blind conducts another empirical test, based as before on company data. This test reveals that neither participation in the standardization processes nor

⁶With 60% of the EU workforce employed (1996) and only few standards, the service sector is an emerging field for standardization.

⁷The size-effect in the service sector is due to high cost of standardization and smaller information asymmetries in small businesses.

⁸International standards facilitate trade in general by creating identical compatibility, safety and quality standards, thus breaking down barriers to trade.

the stock of standards utilized by the company affect a company's export success. There are substantial differences concerning the impact of standards across sectors and according to company size as well as between the impacts of national and adopted international standards.⁹

Thirdly, the macroeconomic impact of standardization on growth, based on endogenous growth theory, is tested for Germany by examining growth rates in time-series analysis. Here technological progress is not modeled in the usual way as an endogenous (time-dependent) constant, but with reference to the stock of German patents (for domestic technical progress), international licensing fees (for imported progress), and the stock of standards (for technology diffusion) as indicator variables (for R&D output). The three variables can account for a substantial part of growth. The importance of technology diffusion through standardization is affirmed, although the role of official standardization by SDOs is decreasing, replaced by de-facto standards, including industry consortia standardization. Concerning domestic and imported technical progress the impact of the former kept relatively constant, while the impact of the latter increased significantly since the 1980s. A following comparison with micro-based results affirms the earlier conclusion that standardization has a significant positive effect on economic growth. The benefits of standardization amount to about 1 per cent of the gross national product.

Blind's book concludes with a summary of the main results, future research recommendations, and some policy recommendations concerning standards and technological change, R&D, foreign trade, and micro- and macroeconomic benefits.

The book is more than only a good summary and overview of Blind's (2000-2003) studies. It is an empirical test of well-known theories, providing insights into a broad variety of aspects of the impacts of standardization and a brief statement of the well established relevant theoretical background for the empirical studies. While this neglects many dimensions that are interesting and challenging from a theoretical perspective (e.g. the interrelations of standardization and market structure or the impacts of standardization on health, safety and environment), a sound and thorough empirical analysis based on rich data is more beneficial than an empirical analysis of interesting aspects based on poor data, which would, in the best case, lead to affirmation or rejection of hypothesis based on guesswork.

Concerning the policy recommendations I feel obliged to state that the few recommendations are not very original and in some cases straightforward beggar-thy-neighbor policy is recommended (e.g. to support export-intensive

⁹Due to database restrictions, these were impossible to discover on a macroeconomic or sectoral level.

sectors in standardization). However, this is made up for by very thorough recommendations for future research.

Concerning the empirical analysis it becomes apparent that analysis on a macroeconomic level is in many cases much too aggregated and should be enhanced by analysis on a microeconomic or at least on a sectoral level, as Blind himself states (p.301). There are further shortcomings that restrict the information value of empirical analysis, especially sample selection (which can often be used for international comparison, but might not be balanced enough for general conclusions) and self-selection within the sample. But although one could be quite hesitant concerning the benefits of empirical analysis in general, I think Knut Blind's analysis is rather convincing and inspiring.

References:

- Blind, K. (2004), *The Economics of Standards: Theory, Evidence, Policy*, Cheltenham, Northampton: Edward Elgar.