HARNESSING QUALITY FOR GLOBAL COMPETITIVENESS

Upgrading Eastern Europe and Central Asia’s Quality and Standards

Overview
Conference Edition
Knowledge Economy Forum IX, Berlin

Edited by
Jean-Louis Racine

May 2010

THE WORLD BANK
Washington, D.C.
Contents

Acknowledgements ............................................................................................................... ii
Contributing Authors .......................................................................................................... iii

Quality and standards play a crucial role in trade and competitiveness ......................... 1
Eastern Europe and Central Asia lag behind on export quality—but to highly varying degrees ................................................................. 2
National quality infrastructure provides a basic framework for supporting quality—but is not fulfilling this function in many ECA countries ..................................................... 3
Standards and quality regulations may not be promoting sustainable economic growth in ECA ........................................................................................................ 6
When conformity assessments are available, in much of ECA they are used as tools of regulatory control than enablers of quality ..................................................... 8
ECA countries are struggling to have their measurements recognized abroad .................. 10
The independence, impartiality, and credibility of accreditation bodies are questionable in many ECA countries ................................................................. 12
The road to an internationally recognized national quality infrastructure is long, but new EU members show that no obstacle is too large ........................................... 14
References ........................................................................................................................... 17
Acknowledgements

This book benefited from the valuable inputs, contributions and support of people in many countries. Policy-makers throughout ECA provided critical advice on their needs for a book covering policy options for reform and modernization of quality systems. Quality infrastructure development practitioners provided unique insight from their experience working throughout the region. We are in particular very thankful of PTB for their collaboration on this book and in other World Bank activities. We are also indebted to the many firms, business associations and consumer groups that volunteered their time during the case studies developed for this book.

At the World Bank, we are most grateful to Fernando Montes-Negret for his continued support and encouragement from the start, to Paulo Correa, Donato De Rosa and George Clarke for their advice and comments of the various drafts. Additional research and contributions were provided by Doina Cebotari, Donato De Rosa, Evgeny Evgeniev, Lorenzo Costantino, Gordana Popovik, Victor Burunsus and Andrej Popovic. We would like to thank Paul Holtz for his valuable editing support and Romain Falloux from El Vikingo Design, Inc. for the graphic design of the report.

The team is grateful for comments received from peer reviewers, including John Wilson, José Guilherme Reis and Philip Schuler. Comments on the concept note were given by John Wilson, Seven Jaffee, Suzanne Troje and Vinod Goel. The team expresses its appreciation to Pradeep Mitra, Marianne Fay, Willem Van Eegehn, Indermit Gil, Gerardo Corrochano, Sophie Sirtaine, Lalit Raina, and Sylvie Bossoutrot for their support and guidance. Finally, we would like to acknowledge Zenaida Kalinger who generously supported us during the production of the book.

The authors alone take responsibility for the content of the book and the views expressed here, which do not necessarily reflect the views of our colleagues in the World Bank Group.
Contributing Authors

Maurício Nogueira Frota is the head of the postgraduate metrology programme of the Catholic University of Rio de Janeiro, Brazil. He serves as a consultant for the World Bank, USAID and European agencies in quality infrastructure-related projects. He is the founder and first president of the Brazilian Metrology Society, a former Director of Scientific and Industrial metrology of Brazil, the former President of the Inter-American Metrology System (SIM) and the former vice-President of the International Measurement Confederation (IMEKO). He has a PhD from Stanford University.

John Gabriel Goddard is an Economist in the Europe and Central Asia region for the World Bank, where he focuses on lending operations and analytic studies that can contribute to improving competitiveness, innovative capacity and access to finance. He has also worked in the Africa region’s Energy Group in projects to develop power generation and promote energy efficiency. Prior to joining the World Bank, he worked as a researcher at Dauphine University and the Cournot Centre in Paris and as a consultant for UN-ECLAC and UK-based firms. He has a BA in Economics from CIDE in Mexico and earned the MPhil and DPhil in Economics from the University of Oxford.

Martin Kellermann is an international consultant in standardization and technical regulation with a decade of experience primarily in Africa and Central Asia, where he advises governments on optimizing their national quality infrastructure and establishing effective technical regulation frameworks compliant with the WTO TBT Agreement. Previously he was the Vice President of the South African Bureau of Standards and represented his country amongst others in the ISO Technical Management Board and the WTO TBT Agreement Technical Committee.

Manfred Kindler is a former head of the German Accreditation System of Testing (DAP) and a member and Peer Evaluator of European co-operation of Accreditation (EA). For the past fifteen years he has been active in multiple projects of TRANSFORM, PRAQ III, PHARE, TACIS, MEDA and German projects in Eastern Europe, Central-, South-East and East- Asia, Latin- and Centro-America, Caribbean Region and Africa. His specialities include ILAC and IAF MRA recognitions, proficiency testing schemes, accreditation of conformity assessment bodies including medical laboratories, as well as quality and risk management.

Jean-Louis Racine is an Innovation Specialist in the in the Europe and Central Asia region for the World Bank. At the World Bank, his work focuses on policies and programs to support industrial upgrading, technology diffusion and innovation. Prior to his current position, he worked in a private consulting practice where he advised regional governments and businesses on technology-based competitiveness strategies. He draws from a combined background in engineering and policy, with a PhD in Mechanical Engineering from the University of California at Berkeley, an MIA in Technology Policy for Economic Development from Columbia University and an MSc in Mechanical Engineering from Stanford University.
Prathima Rodrigues has been in the World Bank for four years working on policy issues in both the private development and education sectors. She is graduate of Columbia University, where she specialized in economic development. Her global experience includes working with UNICEF, the United National Industrial Development Organization (UNIDO) in Vietnam and the International Institute of Rural Reconstruction (IIRR) in the Philippines. Prathima is also the founder of Skills for Kids — an initiative that teaches entrepreneurial skills to middle school children (www.skillsforkids.org). She is a native of Mangalore, India.

Clemens Sanetra is a consultant on the different components of national quality infrastructure systems, with a main focus on metrology. He works in technical cooperation projects all over the world, mainly in Asia and Latin America. He has a PhD from the Institute for Fatigue Analysis and Plant Engineering at the Technical University of Clausthal in Germany and professional experience in various areas, among others material testing, environmental management, metrology in chemistry, and quality assurance in value chains.

Alexandra Schleier works for an industry association in the field of technical regulation and standardization. She is an expert in quality infrastructure and has a background in development cooperation where she collected extensive regional experience in the ECA countries.

María Teresa Silva Porto Díaz — a graduate from Universidad de las Américas Puebla — worked at the time of writing the chapter at the Austrian Institute of Economic Research (WIFO). After additional work experience at the European Commission she joined the Centro de Estudios Económicos del Sector Privado in México City. Her research fields are various, including foreign trade, international trade relations, industrial economics, industrial policy, public finance and public policy.

Susanne Sieber is an economist at the Austrian Institute of Economic Research (WIFO) in the department Industrial Economics, Innovation and International Competition. Her research interests focus on international trade and foreign direct investment. Furthermore she teaches industrial policy at the Vienna University of Technology. Prior to joining WIFO she worked at the Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR).

Hüseyin Ugur, Ph.D in Physics at the University of Chicago, has been an independent consultant since 2004, after working in UME, Turkish Metrology Institute as the Founding Director for 12 years. He is involved in the preparation and supervision of World Bank quality infrastructure projects in Europe and Central Asia. His areas of specialty are metrology, accreditation, conformity assessment, quality infrastructure, innovation, R&D policy and management.
Overview

Standards are everywhere—yet invisible to most. Standards define how products, processes, and people interact with each other and their environments. This book defines standards as models or examples established by authority, custom, or general consent. Standards define features or performance, convey information, or provide means of communication.

Standards allow the large-scale use and sale of mobile phones across countries, increasing demand for innovation. They allow automotive engineers to select standardized parts from a wide range of global suppliers, knowing that the parts will withstand required mechanical loads without having to measure and test each one. They allow hospitals to diagnose diseases and governments to monitor drinking water with confidence when using equipment with known characteristics.

Quality and standards are inherently linked. Quality is the degree to which the innate characteristics of a product, process, or person fulfills stated and unstated customer requirements and expectations, complies with stated norms, regulations, and laws, or both. Standards and quality are inherently connected because standards are often used to codify technical requirements expected by customers or governments. Moreover, standards are an essential element of efforts to upgrade quality.

Quality and standards play a crucial role in trade and competitiveness

Chapter 1 of this book summarizes the role that quality and standards play in economic growth. The chapter examines the role of standards in society and industry as well as their role internationally—either as technical barriers or facilitators.

Under the right conditions, standards have important benefits for trade, productivity, and technological progress. The most common economic benefits of adopting standards include increased productive and innovative efficiency. Standards lead to economies of scale and allow suppliers to achieve lower costs per unit by producing large homogeneous batches of products. They spur and disseminate innovation by providing information on new technologies and methods.

Standards also solve coordination failures. They facilitate the development of profitable networks by allowing network participants to benefit from interactions. Global buyers increasingly demand products and services that meet rigorous standards—to ensure that the products and services integrate flawlessly with other components of the supply chain, satisfy customer requirements, and comply with the maze of technical regulations in importing countries.
Standards, and the quality infrastructure that supports them, also play an important role in trade. They can promote or impede trade depending on how they are established. Standards can facilitate trade because they define what can or cannot be exchanged and the procedures that must be followed for exchange to occur (Brenton, 2004). So, complying with standards requirements and developing an internationally harmonized national quality infrastructure are critical in determining access to global markets.

Conformance to shared standards promotes trade (Swann, Temple, and Shurmer, 1996; Blind and Jungmittag, 2005; Moenius 2004). Moreover, competing on quality, as supported by standards and quality infrastructure, allows firms to forge the types of long-term relationships that maximize knowledge transfer with global buyers and lead to sustainable development (Kaplin-sky and Readman, 2001). This is essential to many countries in Eastern Europe and Central Asia (ECA), where high or rising labor costs often make it difficult for firms to compete on cost alone. Moreover, many ECA countries have limited trade because they have few high-quality goods to export.

**Eastern Europe and Central Asia lag behind on export quality—but to highly varying degrees**

As ECA governments decide on policy priorities, they should consider how the quality of their exports compares with those from other countries. A country’s openness to imports, diffusion of standards, trade partner incomes, and economic size and structure are all correlated with its export product quality.

Measuring quality in ECA matters because the few proxies for quality collected from opinion surveys, albeit imperfect, show that most ECA countries lag behind high-income countries, middle-income competitors such as China, and the world average (Figure 1). Improving the quality of goods and ser-

---

**Figure 1: ECA countries vary widely on quality in opinion survey**

Note: Scores are based on responses to the question, “How numerous are local suppliers in your country?” (1 = largely nonexistent; 7 = very numerous); 2008–09 weighted average.
vices is a sustainable source of international competitiveness and a driver of economic growth. Chapter 2 benchmarks ECA countries using novel indicators of quality.

There are few reliable, publicly available indicators for measuring quality. Some policymakers use international standards as measured, for example, by ISO 9001 certification rates. But this flawed methodology reflects a lack of understanding of the relationship between ISO 9001 and quality. As an illustration, the number of ISO 9001 certificates, as standardized by GDP, suggests that Bulgaria performs nearly 10 times better than Germany on quality.

If quality is defined as features of a product valued by buyers, quality should be reflected in buyers’ willingness to pay more for a product with such features. To some extent a higher price for a product in a given market should reflect the product’s higher quality. Thus it should be possible to construct indicators that measure quality based on the relative price fetched by a globally traded product. It should also be possible to identify industries where quality plays an important role by contributing to a trade surplus.

Although ECA countries tend to export lower-quality products than do high-income EU comparator countries, ECA countries are fairly heterogeneous. New EU members are quickly catching up on various quality indicators. They export higher-quality products than other ECA countries, their quality is improving, and they are engaged in sectors with high potential for upgrading quality. The picture is more mixed in the Balkans, but the region generally lags behind the new member states—except for a few high performers such as Turkey.

Meanwhile, members of the Commonwealth of Independent States (CIS) lag far behind. They mostly export lower-quality products than do other ECA countries, product quality has not improved over time, and most CIS countries do not export in sectors with many opportunities for upgrading quality. The quality gap between CIS and EU countries is widening (see Table 3 and its related discussion at the end of this summary for definitions of country groupings).

In sum, CIS countries have opportunities to upgrade quality by diversifying into sectors that compete on quality, and EU and Balkan countries have opportunities to upgrade quality by diffusing quality practices within their economies.

National quality infrastructure provides a basic framework for supporting quality—but is not fulfilling this function in many ECA countries.

Firms’ ability to fully exploit the benefits of standards depends on a supportive national quality infrastructure. The term national quality infrastructure denotes the complete public and private infrastructure required to establish and implement the standardization, metrology (scientific, industrial, legal), inspection, testing, certification (product and system), and accreditation services needed to prove that products and services meet defined requirements, whether demanded by authorities or the market (Box 1). Chapter 3 examines the functions and components of a national quality infrastructure and the relationship between them. It then summarizes national quality infrastructure systems in ECA, their levels of international harmonization, and incentives for reform.
Box 1: Components of national quality infrastructure

Testing laboratories and inspection bodies

Testing and inspection help show that a product or process satisfies technical requirements—determining its features and performance. A firm can contract independent testing laboratories or inspection bodies to prove that a product or process conforms to certain characteristics. In some cases testing and inspection are required for firms to implement a quality control system, such as ISO 9001.

Certification bodies

Third-party certification is the assurance by an independent certification body that a product, service, system, process, or material conforms to standards or specifications. Manufacturers and service providers can have their products or management systems certified to certain standards to distinguish themselves from less reputable suppliers. Some government regulators require certification by third-party organizations, and such certification is increasingly included in trade contracts. Certification bodies are usually commercial for-profit or non-profit entities, but in undeveloped markets they are sometimes public sector organizations.

Calibration laboratories

Calibration involves determining the relationship between an instrument’s input and the magnitude or response of its output. Calibration laboratories can be internal, serving only the needs of the firm, or commercial. In commercial cases, calibration serves industrial producers, testing laboratories, inspection bodies, research laboratories, universities, and other final users. Many conformity assessment bodies require that equipment and measurement reference systems be calibrated to widely accepted metrological references before they issue product or system certificates.

National standards bodies

Standards provide the basis for evaluating conformity assessment bodies and define the requirements for such assessments. National standards bodies bring together public and private stakeholders to develop official national standards. Standards bodies usually adopt standards through consensus and publish them to make them available to industry, public institutions, and consumers.

National accreditation bodies

Accreditation is the procedure by which an authoritative body (the accreditation body) gives formal recognition that an organization or person is competent to conduct specific tasks. Conformity assessment bodies—such as certification bodies, inspection bodies, and testing and calibration laboratories—can seek accreditation on a voluntary basis as proof of competence in a given area. The accreditation body evaluates the personnel and supporting management system of the candidates for accreditation and can request practical tests for laboratories when relevant. Most countries have a single national accreditation body responsible for all areas of accreditation.

National metrology institute

A national metrology institute establishes the national measurement system used to maintain, develop, and diffuse measurement standards for basic units and to diffuse metrological expertise to the economy. These institutes operate in the primary calibration market: they disseminate measurement standards by providing calibration services to independent calibration laboratories and other organizations responsible for regulations and standards. When their industrial measurements are traceable to the national metrology institute through an unbroken chain of comparisons, firms are able to guarantee the accuracy and precision of their calibration instruments, process control instruments, and quality control instruments. Countries often have a single national metrology institute—but when there are several, each is responsible for distinct measurement areas.
OECD countries—including advanced EU countries—have mostly harmonized their approaches to and basic building blocks for their national quality infrastructure to reflect best practices of transparency, openness, consensus, impartiality, technical credibility, and the voluntary nature of standards. In addition, a system of international organizations has been established to help countries harmonize their national quality infrastructure.

But ECA’s systems for national quality infrastructure remain underdeveloped and unharmonized with those of its trade partners. As a result, standards remain important contributors to trade costs in ECA and play a critical role in the region’s export performance (Broadman, 2005). As ECA countries implement or upgrade their national quality infrastructure, they must decide how to cater to technological needs, minimize negative environmental, health, and safety externalities, and avoid unnecessary technical barriers to trade.

All ECA transition economies had some type of national quality infrastructure before the transition began. But the systems were designed based on the logic of a planned economy. Accordingly, three features inherited from central planning still distinguish the national quality infrastructure of most ECA countries:

- While standards are voluntary in OECD countries, this concept remains foreign to many ECA countries that have inherited systems in which standards are mostly mandatory. These mandatory standards and technical regulations are imposed from the top down, and ECA institutions do not have a strong history of involving industry and other stakeholders in developing standards.

- Many ECA governments still require testing and certification by state-owned entities. The integrity of these institutions is often suspect—reasons include conflicts of interest, lack of technical capability, and unofficial payments—which prevents ECA firms from efficiently obtaining services that will enable them to sell their products and services in domestic or foreign markets.

- ECA countries have only recently started reforming their national quality infrastructure, and most of those systems remain isolated or unrecognized abroad. Before the transition, while many EU and OECD countries were aggressively integrating and harmonizing their national quality infrastructure to lower technical barriers to trade, ECA countries developed their own models for national quality infrastructure—many following the logic of the Soviet system for mandatory standards. Today institutions and policies for national quality infrastructure in OECD countries are based on strict rules that allow for mutual recognition of test reports and product certificates, facilitating trade.

While Turkey was never a centrally planned economy, its national quality infrastructure also suffered from many of the same challenges as other ECA countries, with an emphasis on technical regulations and closed, top-down standardization and certification systems.

ECA policymakers now face decisions about what type of national quality infrastruc-
ture will best enable their countries’ further entrance to a globally integrated market economy, as well challenges of how and how quickly to transform the systems they have inherited. In describing their achievements and the challenges they face in upgrading their national quality infrastructure, important distinctions need to be made based on the varying economic, political, and historical contexts of ECA countries.

Some ECA countries are in various stages of accession as EU members (such as Romania), EU candidate members (such as FYR Macedonia), or aspiring candidate members (such as Albania), and have taken steps to integrate their national quality infrastructure with the EU model and international norms. Others (such as Kazakhstan) remain torn between maintaining Soviet systems of standards and technical regulations and adopting international models that conform to international treaties such as the World Trade Organization’s Technical Barriers to Trade Agreement.

While some ECA countries started to build technical expertise and capacity in their national quality institutions in the mid-20th century (such as Bulgaria), others did not inherit any such institutions after their recent independence and must build them from the ground up (such as Croatia). Though some larger or better-off ECA countries can use economies of scale to invest in a national quality infrastructure to support the needs of a broad range of economic sectors (such as the Russian Federation), smaller or lower-income ECA countries remain bound by tight fiscal constraints (such as Armenia).

Standards and quality regulations may not be promoting sustainable economic growth in ECA

Standards lie at the heart of national quality infrastructure, providing the basis for evaluating conformity assessment bodies and defining the requirements for conducting conformity assessments. They help solve coordination failures, create economies of scale, and provide information on technology—and their impact on economic growth has been well documented. National standards bodies bring together public and private stakeholders to develop official national standards. Chapter 4 explores the economic roles of standards and technical regulations and provides insights on best practices that best support economic and social needs. The chapter also assesses standards and standardization bodies in ECA.

Standards bodies usually adopt standards through consensus and publish them to make them available to industry, public institutions, and consumers. But there is a growing global trend to adopt regional and international standards instead of idiosyncratic domestic standards. Shared standards facilitate international trade and transfers of technology and market information.

Countries use three closely linked strategies to harmonize their standards:

- The first is to adopt international standards—preferably those used by actual or potential trade partners or those recognized with a high knowledge content, such as ISO 9001, as instruments for technology adoption.
The second is to influence international standardization activities, to ensure that the international standards eventually adopted by a country’s trade partners will also meet that country’s needs.

The third is to coordinate with trade partners to develop regional standards appropriate to the region’s needs. Most countries are now members of regional standardization organizations.

As noted, standards remain mandatory and are imposed by the state on a top-down basis in many ECA countries, especially in the CIS. In such cases standards and technical regulations are unlikely to promote sustainable economic growth. Instead of supporting industry and trade, they impede entrepreneurship and innovation (Box 2). This contrasts with OECD countries (including established EU economies), where independent national standards bodies develop voluntary standards through interaction with stakeholders.

Moreover, technical regulations in the CIS remain numerous, overlapping, and overly prescriptive. And while ECA’s EU members have replaced domestic with regional and international standards, a number of Balkan and CIS countries still rely on national standards or GOST (a regional standards

---

**Box 2: Technical regulations threaten modernization in Ukraine**

In Ukraine nearly all goods and many services must comply with state standards—posing a serious obstacle to technology adoption and innovation. New equipment cannot be imported or implemented, and new products cannot be put on the market unless they satisfy state standards or register technical specifications with the national standards body. And existing technical regulations are extremely prescriptive and complex, far beyond what is needed to ensure safety. Instead of focusing on the end result—safety—technical regulations prescribe the precise characteristics that technologies need to adopt.

Moreover, many of these technical regulations are outdated and incompatible with modern technological processes, so they actually prevent firms from introducing new, safer technologies. In Ukraine mandatory standards include almost 17,000 GOST standards developed before 1992. Almost half of these were developed before 1980. As a result, small and medium-size enterprises in Ukraine spent more than $127 million in 2006 on procedures associated with technical regulations, including standardization, certification, and inspections.

organization operation), both mostly dating from the Soviet era (Figure 2).

All ECA countries also face the challenge of adopting standards over which they have little influence. Whether EU members or not, ECA countries barely participate in international standardization activities—so they do not benefit from international knowledge spillovers and run the risk of adopting standards that do not reflect their national conditions.

When conformity assessments are available, in much of ECA they are used as tools of regulatory control rather than enablers of quality.

Testing, inspection, and certification lower information and search costs, enabling buyers to quickly assess whether products and services meet needed standards or requirements (Table 1). Third-party testing and certification allow buyers on one side of the globe to trust the quality of suppliers on the other side, making it easier for firms to compete based on quality, creating transparency in the market, and promoting quality. Such conformity assessments also facilitate innovation, enabling firms to test new products before launching them in the market and to obtain rapid feedback if the products do not meet customer requirements. Conformity assessments show that specified requirements for a product, process, system, person, or body have been—or not been—fulfilled.

Chapter 5 describes the functions of conformity assessment and market surveillance.
in OECD economies. It also assesses conformity assessment in ECA, summarizing different situations in EU and Balkan countries—which are converging toward international best practices—and in the CIS—where the boundary between quality and technical regulations is blurry and both are enforced by inefficient structures inherited from the central planning era.

Certification to international standards is growing quickly in ECA, and a number of the region’s countries have or will soon surpass the world’s manufacturing powerhouse—China—based on the size of their economies (Figure 3). Moreover, conformity assessment is no longer a burden for firms in ECA’s EU and Balkan countries, where compulsory product certification is mostly a relic of the past. These countries have restructured their conformity assessment organizations and liberalized their certification and testing markets. Investments by foreign conformity assessment bodies have led to

### Table 1: What are testing, inspection, and certification?

<table>
<thead>
<tr>
<th></th>
<th>Testing</th>
<th>Inspection</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What does it do?</strong></td>
<td>Determines one or more characteristics of an object of conformity assessment, according to a procedure.</td>
<td>Examines a product design, product, process, or installation and determines whether it conforms with specific requirements or, based on professional judgment, with general requirements.</td>
<td>Issues a statement, following a review, a product, process, system, person, or body has fulfilled specified requirements.</td>
</tr>
<tr>
<td><strong>How is it done?</strong></td>
<td>Examines one piece or sample, typically with specialized equipment.</td>
<td>Examines one piece or sample, typically without specialized equipment (or with very simple equipment).</td>
<td>Ensures that, in the future, a producer is able to or will correctly produce according to specified requirements. Certification is granted based on audits, usually supplemented by testing, calibration, or inspection.</td>
</tr>
</tbody>
</table>

dynamic, competitive markets in most of these countries.

But the picture is completely different in other ECA countries. Certification to international standards still lags far behind in the Caucasus and Central Asia. Mandatory certification continues to thrive in the CIS, imposing unnecessary costs on firms and creating opportunities for corruption and rent seeking. State conformity assessment bodies have yet to be restructured in the CIS. They are often part of bodies developing mandatory standards, leading to conflicts of interest and weak testing and certification.

Except in Russia and Ukraine, multinational certification bodies have had a limited impact on fostering a market for quality in the CIS. Moreover, modern conformity assessments that can help firms comply with the requirements of import markets in high-income countries are often missing or not recognized by trade partners. Weak certification and testing infrastructure can result in costly reliance on foreign countries.

ECA countries are struggling to have their measurements recognized abroad

Metrology ensures that measurements are reliable throughout an economy. It confers credibility to measurements, allowing industry to control product quality, protecting consumers and the environment from unscrupulous producers, and boosting international competitiveness by, for example, ensuring that manufactured parts are interchangeable (Box 3).
When countries recognize the equivalence of each others’ measurements—be it of oil flowing through transcontinental pipelines, grain shipped through seaways, or pesticide content in apples—it reduces transaction costs and makes trade disputes less likely. Chapter 6 examines the role of metrology in OECD countries (including advanced EU countries), then addresses issues of technical capacity, international traceability, and transition to best practices to support economic competitiveness.

An internationally recognized metrology system relies on modern equipment and sound technical skills, but these are only part of the story. To be recognized abroad, measurements must be conducted using similar procedures across borders. Countries must also participate in international comparisons of their measurement equipment. A national metrology institute’s measurement accuracy and precision must reach commercial laboratories and industry through an unbroken chain of measurement traceability.

This concept of measurement traceability has been implemented in ECA’s EU and some Balkan countries. But it is not widespread in many CIS countries—particularly in the Caucasus and Central Asia—so there is no way of knowing whether a measurement taken by one economic actor is equivalent to that taken by another, with obvious negative impacts on product quality. Moreover, metrology in CIS countries largely follows the same guiding principle as conformity assessment.

Metrology is expensive, and CIS countries have struggled to build, equip, and staff their national metrology institutes. As a result, they often rely on obsolete, uncalibrated equipment. In the Caucasus and Central Asia the state dictates measurement errors for a lot of equipment, and national metrology institutes operate mainly as regulatory control agencies, adding little value to industrial competitiveness. In OECD countries measurement errors are mainly determined by end users, and metrology institutes help them meet their needs by providing reliable calibration services.

In contrast, two of the larger ECA economies—Russia and Turkey—have invested heavily in world-class scientific metrology institutes to foster their economic competi-
tiveness. So, while ECA’s new EU member states and its larger economies are well integrated with the international metrology system, countries in the Balkans, the Caucasus, and Central Asia remain isolated. None of their measurements—or the tests and certifications that depend on them—are recognized abroad, posing obvious barriers to trade (Figure 4).

The independence, impartiality, and credibility of accreditation bodies are questionable in many ECA countries.

Accreditation is the last level of quality control in the conformity assessment services delivered by both voluntary and mandatory systems. It is the procedure under which an authoritative body gives formal recognition that another body or person is competent to conduct specific tasks. Accreditation can provide credibility to certification, testing, inspection, and calibration bodies, so that their services are recognized and respected throughout the economy and abroad. Accreditation minimizes transaction costs and facilitates exports because it instills confidence in a country’s quality system.

For full recognition, national accreditation bodies must establish agreements with one another based on mutual evaluation and acceptance of each other’s accreditation systems. Membership in a mutual recognition arrangement (also referred to as a multilateral recognition arrangement) is required to guarantee the credibility of domestic certificates and test reports in importing coun-

Figure 4: The Balkans, the Caucasus, and Central Asia lag behind on internationally recognized calibration and measurement capabilities

Note: * denotes countries that are not members of the International Committee of Weight And Measures’ Mutual Recognition Agreement (CIPM MRA) and so cannot have calibration and measurement capabilities.
tries. These issues are discussed in Chapter 7, which first summarizes the role of a modern accreditation body, then examines the institutional framework for accreditation in ECA and constraints to building international recognized accreditation systems in ECA countries.

After a late start in the 1990s, accreditation is now thriving in many ECA countries—if only because it plays a central role in EU accession. Every one of these countries has an accreditation body with nominal missions similar to those in OECD countries. ECA’s EU and Balkan countries have mostly aligned the institutional structures of their accreditation systems with international best practices. Political independence and impartiality provide credibility to their accreditation bodies.

The situation differs in the CIS, where accreditation bodies are often subject to conflicts of interests (Table 2). Political independence and impartiality provide credibility to accreditation bodies, but accreditation systems in those countries lack transparency. So, though all of ECA’s EU and Balkan countries have adopted international accreditation standards, the quality of accreditation in CIS countries is questionable. Many CIS accreditation bodies, lacking properly trained staff, offer accreditation based on idiosyncratic national standards or on international standards that they are unlikely to meet. And while all ECA countries have achieved or are moving toward mutual recognition of their accreditation systems, CIS countries still have some way to go—meaning that products need to be retested and recertified when they cross borders, creating unnecessary barriers to trade.

A first step toward achieving mutual recognition of accreditation is to establish a national accreditation system that conforms to international standards and guidelines. But most national markets are too small to make accreditation an attractive investment opportunity for the private sector. Thus financing is a challenge for small ECA economies that do not have critical mass in their markets to sustain self-funded accreditation bodies.

In many countries, governments subsidize the setup of national accreditation systems, but these bodies are expected to become self-financing in the medium to long term. But with the exception of countries with large markets, such as the United States, accreditation is usually not financially self-sufficient and depends on government subsidies. An estimate of costs and revenues for

<table>
<thead>
<tr>
<th>Region</th>
<th>Countries where accreditation bodies are involved in standardization, metrology, or conformity assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU and OECD</td>
<td>None</td>
</tr>
<tr>
<td>Balkans</td>
<td>None</td>
</tr>
<tr>
<td>CIS</td>
<td>Azerbaijan, Belarus, Russia, Tajikistan, Turkmenistan, Uzbekistan</td>
</tr>
</tbody>
</table>

Source: ISO Members 2006 and websites of the national standards bodies.
accreditation bodies in Europe shows that to achieve cost recovery, accredited bodies must have 100–250 clients—which requires that a country have roughly 1,600–4,000 ISO 9001 certificates. As a second step, national accreditation bodies can join regional and international accreditation organizations.

The road to an internationally recognized national quality infrastructure is long, but new EU members show that no obstacle is too large.

The first step toward establishing an internationally recognized national quality infrastructure that supports industrial competitiveness is ensuring good governance and creating institutions that lack conflicts of interest. To achieve this, some ECA countries will need to restructure their national quality infrastructure and create independent, transparent institutions that hear the voices of all stakeholders in the system. A national quality infrastructure cannot exist without government support. ECA countries can take several approaches to enhance their products, processes, and services and ease technical barriers to trade by upgrading their national quality infrastructure.

A national coordination framework can help all ECA countries develop their quality infrastructure. Many ECA countries have developed or reformed their national quality infrastructure in an unplanned, uncoordinated fashion—resulting in imbalances in the system. Although coordination could be left to government, most ECA countries could also benefit from formal structures to receive inputs from stakeholders.

A second condition for a national quality infrastructure that serves economic growth and provides useful services is to abolish mandatory standards and reduce technical regulations. Once mandatory standards have been abolished and technical regulations minimized, quality infrastructure institutions can support business competitiveness in ECA. Harmonizing national standards with regional and international trade partners is the next step to supporting global market integration, though such efforts are usually highly technical and do not happen overnight. Still, improving trade opportunities and knowledge inflows requires adopting regional and international standards over national standards.

Many CIS countries are in particular need of restructuring their national quality infrastructure. Removing political interference and conflicts of interests requires providing more autonomy to institutions that support this infrastructure. At the very least:

- Accreditation bodies must be independent from all other national quality infrastructure institutions.
• Metrology, accreditation, and standardization bodies should not be involved in the development of technical regulations, mandatory standards, or other regulatory activities.

• Metrology, accreditation, and standardization bodies should be free of political interference and able to respond to market needs and represent their countries in relevant international organizations.

To strengthen metrology, equipment and infrastructure will be need to be upgraded. But such efforts will be fruitless unless human resources are improved, quality systems are implemented, and international traceability is achieved. An incremental approach, working with one laboratory at a time in the national metrology institute, avoids repeating mistakes. Accreditation bodies can also be modernized, particularly if Caucasus and Central Asian countries cooperate.

A survey of market needs is an essential but often ignored first step toward developing a metrology plan. As they broaden their measurement capabilities, ECA’s national metrology institutes will need to invest in upgrading human capacity, equipment, and infrastructure. Any upgrading should be done in the context of harmonization with international norms for national quality infrastructure, including the adoption of relevant management processes.

For example, most ECA countries can only build solid accreditation systems through regional cooperation. But CIS countries must address their lack of a regional accreditation body. To reduce operating costs, small ECA economies can join forces to develop Measurement on the bazaar in Yerevan, Armenia.
and share complementary calibration capabilities. ECA’s EU member states also need to continue strengthening their national accreditation systems while supporting regional collaboration.

Still, across ECA countries, expensive equipment operated by the most scientifically advanced personnel is useless unless it is operated using international quality assurance guidelines. Once institutions have been reformed based on international norms, capacity building and technological upgrading can be targeted to individual aspects of the national quality infrastructure to achieve “quick wins” and exhibit demonstration effects. The end goal should be to have an internationally harmonized national quality infrastructure that responds to the needs of society without duplicating the role of the private sector.

But in many ECA countries a supply-side approach alone is insufficient to developing a market for quality services. Many firms in the region are unaware of their quality needs, face financial barriers, and are reluctant to approach national quality infrastructure institutions because for decades they have associated them with state control, rent seeking, and corruption for decades. So, for systems to be sustainable, governments can support the demand for quality services by small and medium-size enterprises by providing financial and technical assistance—though this will require carefully designed delivery mechanisms.

ECA countries can reform their national quality infrastructure by moving from:

- Systems based on technical regulations to systems based on voluntary standards.
- Systems based on state ownership of national quality infrastructure to systems based on public and private ownership.
- Systems operating in isolation to regionally and internationally integrated systems.

ECA countries can leverage support for these efforts from a number of international institutions, including the World Bank. But these goals are best achieved when they are part of national quality strategies that put stakeholders in the driver’s seat.

The book also identifies strategies for strengthening the technical capacity of national quality infrastructure and offers recommendations for state support in adopting standards and quality guidelines in the private sector. It also discusses the role of ECA governments in kick-starting the establishment of conformity assessment infrastructure and the ways in which it can be restructured.
References


