**Slide Show Notes**

**Harmonization of Standards**

Specialization and increasing returns to scale are important to the gains from trade, to productivity, and to living standards.

But specialization itself would be hard, in an engineering sense, if the inputs that you bought from other firms didn't fit together when you tried to assemble them. That's the way it is when production is "artisanal": individual artisans make parts fit together with one another, one by one. A nut that screws onto one bolt might not fit on another bolt, because the two bolts aren't standardized to be the same.

To achieve mass production, parts need to be identical and available in large quantities from competitive suppliers. For distant suppliers to provide identical items in large quantities, the specifications need to be precise and agreed upon between the parts suppliers and the parts buyers. In other words, they need to conform to a standard.

But what if each consumer product has its own standards for its parts? Do parts suppliers have to re-tool for every different customer?

Yes, to some extent they do — at least for the aspects of the final products that are the unique selling points of a given brand.

But for any number of "invisible" internal parts, components, or ingredients, the supplying industry is going to be a lot more efficient if there is just one standard for the part. That may require that initially differing standards be harmonized into a common standard.

In particular, if industry wants to source parts globally, starting from a context where different standards were traditionally used in different countries, then international harmonization of traditional national standards is going to be worth considering.

The institutionalization of that effort for global harmonization of national standards is the topic of this module.

This is something that I hadn't known about until it came to my attention in my work as a USAID economist in Peru, as I'll describe later. It seems important to me, as a practical matter. Since the subject doesn't appear in the economists' textbook that I was initially using for this course (KOM), I was strengthened in my conclusion that I should re-design the course and move it away from economists' textbooks.

U.S. schools usually include in their lessons about U.S. history the story of Eli Whitney. He's mostly famous for the cotton gin, a machine that quickly removed cotton seeds from large quantities of raw cotton. But we're also taught that he championed the use of "interchangeable parts" in manufacturing.

This technique was initially applied to assembling large numbers of muskets (primitive rifles) for large orders by the U.S. military. Apparently, the technique of interchangeable parts was initially used more in the U.S. than in Europe, and so was called "the American system."

Key words in this subject area also include "interoperable systems," which is relevant both to different chunks of computer software and to services in general.

In speaking of standardization, let's distinguish between "meeting a standard of acceptable quality" and "conforming exactly to standard specifications." It's the latter that's "standardization."

To illustrate the difference: One standard that I wish existed is for airline seats. In terms of quality, I don't expect to get a huge, first-class type seat for a discount fare. But in terms of uniformity, I wish there were standard seat designations so that I don't have a surprise when I board the aircraft. I know that there are some private services that try to inform travelers, but it still doesn't seem transparent to me.

"Network externalities" can lead to standardization and are one example of external returns to scale. The idea is that, once enough people are using your standard, then new producers will adopt that standard because of the large market that demands it.

Other standards will lose traction, not because they are technically inferior, but because they can't get enough volume to benefit from returns to scale, so they lose cost competitiveness. The victorious product standard becomes a better value, in that, even if its intrinsic quality isn't better, its "quality for the price" becomes better as volume production brings its unit costs down.

Another distinction is between standards and regulations. Standards are often voluntary agreements, while regulations are usually legal enforcement mechanisms. Of course, it's possible that a standard might be enforced by a legal regulation, but (especially thanks to network externalities) that may not be necessary. Some standards are widely adopted on a purely voluntary basis.

From the WTO's perspective — which focusses on reducing discrimination at the borders between sovereigns — there is a risk that a local standard can become a discriminatory barrier, especially if it's legally required by the government. Outside producers who have achieved low costs by networking around a different standard may be deterred by high costs of re-tooling for the standards of just one market.

This sort of local standard can be a "technical" barrier to trade, or TBT, but only if it is applied in a discriminatory fashion to outside sources and not to inside sources.

Application of the standard is done in two steps. First, the standard is established. Second, a test is performed to see if a product conforms to the standard.

Discrimination can occur at either step.

1. The standard can be "idiosyncratic," so that outside producers are at a disadvantage in meeting it (compared to inside producers).
2. The test of conformity can be applied in a biased way.

The WTO's solution, as embodied in the agreement on TBT (which is one of the annexes to the WTO agreement), is twofold.

First, the WTO's TBT agreement makes it explicit that national standards and tests of conformity should not impose discriminatory burdens on outside producers as a trade barrier.

One famous example of a technical trade barrier was when the USG, to discourage young people from smoking, banned some flavoring for cigarettes but didn't ban other flavoring. In particular, clove flavoring, a specialty of Indonesia, was banned while menthol flavoring, common in the U.S., was not. When in 2010 Indonesia filed a complaint, the WTO panel agreed that, since the distinction had no public-health function, the U.S. rule was a technical barrier to trade, violating the U.S. commitment to the TBT agreement.

Second, the WTO encourages all members to help create international standards and to adopt international standards for use in their own countries.

International (global) standards not only prevent discrimination, but by making the standards more transparent to producers around the world, they facilitate development of new industries, particularly in emerging-market countries. South Korean producers didn't need to "discover" German standards when Germany adopted global standards.

Along with adopting global standards, another short-cut is "mutual recognition." In a mutual recognition agreement (MRA), each of two countries says to the other, "I agree with your standards and I trust your conformity testing. If your producer passes your conformity tests of your standards, then the product can be sold in my country, just as if my own testers had certified that it conformed to my standards."

These four slides list the WTO's principles applying to product standards.

You should recognize these principles, given our previous discussion of the WTO. For example, you already know about transparency mechanisms like inquiry points, notifications, and the Trade Policy Reviews.

In the "Files" folder in Canvas, you can find the text of the TBT agreement with my highlighting. I think you'll find it quite clear on all these issues, even though it is careful in its wording.

The folder also has a "WTO Briefer" document, which has an excellent explanation of the various aspects of the TBT agreement and a summary of TBT disputes brought to the WTO, including the decisions of the WTO's TBT committee.

The TBT agreement refers to ISO a couple times. You've probably heard "ISO" before, in phrases like "ISO 9000" (which refers to standards for quality control), but maybe without any real idea of what "ISO" referred to.

So, let's have an ISO Awareness poll.

ISO turns out to be a real thing that is important to international trade and to the economy in general.

The International Organization for Standardization keeps the initials "ISO" from an earlier name it was known under: "iso" from classical Greek for "equal," as in "isovalue line."

Organizationally, ISO is the culmination of a long history of mainly private initiatives by engineers from various countries. The required reading by Yates and Murphy has several interesting tidbits going back to the mid-1800s. Famous brand names, Siemens and Toshiba, come up as their founders were involved as electrical engineers in the predecessor of ISO that "pioneered many of the techniques and institutional mechanisms" that are still in use today.

Yates and Murphy mention the special problem for standardization posed by "the inch countries," the U.S. and the UK, vs. the metric countries. I was reminded of this recently by a news article about how "the U.S. has two feet" (that is, two different standards for how long "a foot" is). This article is in Canvas, in case you're interested.

ISO is an international organization whose members are national standards bodies, coming from over 160 countries. ISO has relatively small staff of just over 150 (full-time) people, located in Geneva (like the WTO).

The bulk of ISO's standards development is done by technical committees composed and driven mainly by the needs of industry and by representatives from industry.

The way this works is somewhat analogous to a dispute at the WTO (except in a positive way). Industry takes the initiative by deciding that international action on a standard is desirable. Industry then approaches their national standards organization to take action to the international level. In response, industry and the national standards organizations work together within an ISO technical committee to draft a new standard.

Creating a new international standard is a high-stakes endeavor because it will shape industry around the world. ISO says it typically takes three years to develop a new standard.

Many of ISO's case studies note that companies economize on their procurements by using standardized specs. This allows them to compete their sourcing from various companies with confidence that the input will fit their needs. For suppliers, it obviously means they want to offer products that hit the standardized specs!

This slide summarizes an example from ISO's website (filed in Canvas's Files folder) of how standards are used.

The example describes a company, Mapei, that produces adhesives for floor coverings. Standards have been set for how well they work physically as adhesives. From the company's point of view, standards "streamline" the design process for new products.

In addition, the company must be sensitive to the possible impacts on health of some of the ingredients in the adhesives, when they're applied on the job site.

Mapei built a global business, based on the confidence that diverse clients in many countries can have in the quality of its products, given that the products conform to known, international standards. Specific ISO-approved standards (and their European versions) assure buyers of both function and safety (for indoor air).

A big company like Mapei also participates in setting standards.

An example of ISO's members is ANSI, the American National Standards Institute, which is the U.S. member. ANSI is an NGO that serves as the apex organization for hundreds of U.S. "standards development organizations" (SDOs) in different lines of industry.

Thousands of standards have been adopted for U.S. use through the work of these SDOs. These are U.S. national standards that should, in principle, meet the WTO's tests of being objective and of treating U.S. and non-U.S. producers equally. U.S. standards development should also meet WTO standards of transparency and should preferably adopt global ISO standards where relevant.

As shown by the example of Mapei (a company originally based in Italy), it's good for multinationals operating in the U.S. if U.S. standards are consistent with global ISO standards, as this will help the companies sell the same standardized products in many countries' markets.

While working in Lima with USAID/Peru, I was briefly acquainted in 2014 with ANSI's program to develop and harmonize standard-setting in emerging-market countries. USAID was assisting ANSI and developing countries to get together through what was called the "Standards Alliance" program.

Emerging-market economies like Peru's are constantly seeking to diversify from their traditional products to a wider range of value-added products that they can export successfully to the immense markets of the industrial economies. (We alluded to this previously when we described complexity theory as a way of approaching diversification.) Meeting the specifications of buyers in global markets is obviously essential, and those buyers' specs include standards of the kind developed through the processes supported by ANSI in the U.S. and by ISO globally.

Peru's industry would be helped by having national standards to prepare them for global markets. In addition, Peru has committed itself, within the WTO, to not use technical standards as devices for discriminating against outside sources.

On ANSI's side, U.S. industry is helped by having emerging-market economies adopt global standards. U.S. industry can more easily export to countries with global standards and can also site production in countries where the ability to meet global standards is strong, providing marketing channels in world markets for products from countries like Peru.

What will you do to benefit from this module?