

Economic Impacts of U.S. Ballast Water Regulations

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U.S. Coast Guard (USCG) and U.S. Environmental Protection Agency (USEPA) ballast water (BW) regulations are ready to be implemented, with phased in deadlines requiring new-builds to comply by December, 2013 and existing ships, depending on their BW capacity, to comply by the date of their first dry docking after 2014 or 2016. Let's consider what this could mean in terms of costs to shipping companies, and potential impacts on shipping costs, import prices, and world trade.

These new U.S. BW regulations give ship owners the following five compliance options:

- Install a USCG-approved Ballast Water Management System (BWMS)
- Use potable water from a Public Water Supply
- Retain ballast water on board while in waters of the United States
- Discharge to a port-based ballast water reception facility
- Use a USCG approved Alternate Management System (AMS), which is a BWMS certified by some other nation for a maximum of five years during which that AMS must receive USCG type approval or be replaced with a BWMS that does.

The first option, installing a USCG certified BWMS, is not possible at this time because the USCG has not certified any BWMS. Currently, using potable water and discharging to a port-based BW water reception facility are also not viable options for commercial vessels, and retaining BW on board usually means not taking on cargo, which is also not a viable option for most merchant ships.

So, of the five compliance options, purchasing and installing a USCG approved AMS, and facing the prospect of needing to upgrade it or replace it to have a USCG-certified BWMS within 5 years, is the only way most ship owners will be able to comply with these new U.S. BW regulations.

That poses implementation problems, because global AMS production and installation capacity does not exist to allow many vessels to exercise this option in time to comply on schedule with U.S. BW regulations.

The regulations have provisions that allow "compliance extensions" and "modification in deadlines" if compliance is not "practicable." Under the circumstances, it is a good bet that these provisions will be exercised, resulting in delays in U.S. BW regulations being enforced. However, as a mental exercise, assume these BW regulations will be implemented on schedule, and that to comply, a ship will

need to install an AMS at a cost of roughly \$1.5 million to \$2 million, and then spend about the same amount within five years to upgrade to a USCG approved BWMS.

This would put the cost of complying with U.S. BW regulations at about \$4 million per ship or, amortized over 20 years, at about \$200,000 per ship per year. Of course, many existing ships have a useful life of less than 20 years, and owners of those ships, especially if they own more than one of them, may not have access to financing to spread these AMS/BWMS purchase and installation costs over multiple years. This could cause significant economic hardships for some already struggling shipping businesses, and increase the rate at which older marginal ships will be scrapped.

Some of these compliance hardships may be severe enough to deserve leniency in the form of conditional compliance extensions. It may also be worthwhile establishing some private/public partnerships to facilitate the financing of BWMS purchases and installations, or the leasing of BWMS for a fixed number of years under installation/maintenance agreements, or within-year leasing of BWMS to be used on specific routes. And, there may be time to institute policies that encourage BWMS designs and installations that maximize the salvage and reuse value of BWMS, which would make it easier for some innovative short-term financing and leasing options to develop.

However, as significant as some specific cases of economic hardships will be, it is not reasonable to expect or assert that the overall economic impacts of U.S. or IMO BW regulations on the global shipping industry, or on the world's importers and exporters or households and businesses will be significant. In fact, in terms of handling

environmental compliance costs, the global shipping industry has four big advantages over other industries that will dilute the cost of BW regulations to the point where they are miniscule.

First, despite some rhetoric to the contrary, merchant ships compete very little with other modes of transport, such as trucks, trains, and planes. Most customers of the global shipping industry—overseas exporters of merchandise—must use ships to deliver their products, which is why industry-wide demand for shipping is extremely “price inelastic.” The shipping industry has more potential than any other industry in the world to pass environmental compliance costs on to customers.

Second, shipping costs contribute very little to the overall cost of internationally traded goods. This means shippers/exporters need to make very slight increases in the prices they charge their customers—importers—to recoup shipping industry compliance costs that will be passed back from shipping companies to them.

Third, the prices importers pay for imported goods are only a fraction of the prices that will be paid for those goods by households and businesses around the world. Importers will find it very easy to pass along slightly higher prices of imported goods to their customers.

Fourth, because the diffusion of compliance costs in import markets will be widespread and diluted, it will result in domestically produced goods gaining very little market advantage over imported goods, or give any particular exporters or importers any special market advantages.

To support the above arguments, consider a worst case scenario where a global merchant

fleet of around 60,000 ships needs to comply with U.S. ballast water regulations by first installing an AMS and then replacing it within five years. Based on the cost figures described above this would result in industry-wide compliance costs of about \$12 billion annually (60,000 ships at \$200,000 per year each), or about \$240 billion over twenty years.

Based on the most recent OECD statistics, earnings by the world shipping industry in 2009 were \$380 billion. So, if \$12 billion in fleet-wide annual BW compliance costs were absorbed fully by the shipping industry, it would reduce annual shipping industry earnings by 3.2%.

However, assume instead that extremely “inelastic” demand for global shipping will allow the shipping industry to pass all of its BW compliance costs back to shippers in the form of higher freight rates, who will then pass it forward to importers in the form of higher import product prices.

The dollar value of international trade in 2011, measured as the total value of exports or imports, was \$18.255 trillion. About 85% of this, or \$15.516 trillion, involved goods (as opposed to services) that were carried by ships (as opposed to air freight or other modes of transport). This means that if all of the \$12 billion in annual ballast water compliance costs incurred by the shipping industry was passed back to exporters, who then added it to the prices of the goods they export, the prices of imported goods at ports of entry around the world would increase by an average of 0.08%; that is, by eight hundredths of 1%.

However, the prices paid for imported goods by households and businesses reflect the import prices paid by importer at the port of entry, plus the importer’s profits, plus the

cost of value-added processing and packaging, transport and marketing and wholesale and retail markups, etc. This post-shipping value-added dilutes the impacts of pass through BW compliance costs even further.

During 2009, for example, the U.S. Federal Reserve Board estimated that the difference between “border prices” of imported goods at the point of entry and “market prices” paid for those imported goods by U.S. households and businesses averaged 50% to 70%. Using the bottom end of that range, the market value of imported goods worldwide is roughly 50% higher than its imported value at ports of entry.

This means the \$18.255 trillion in imported goods carried by ship measured at ports of entry in 2011 had a wholesale/retail market value of \$27.383 trillion. So, in that year, a \$12 billion increase in shipping industry costs that was passed back to exporters, and then forward to importers, and then on to the world’s businesses and consumers would result in wholesale/retail prices of imported goods increasing by only 0.04 %, that is four hundredths of 1%.

And finally, consider the fact that in the U.S. imported goods account for only about 11.5% of annual business and household purchases; the rest involves spending on domestically produced goods and services, housing, medical care, etc. This means that if U.S. businesses and households paid this 0.04% increase in import prices because of the shipping industry’s BW compliance costs the average price they pay for goods and services would increase by around 0.005%, that is five thousandths of 1%.

Numbers for other nations will differ, but the basic point here is that the economic value of global trade is so huge that the

overall economic impacts of BW regulations on world trade, international markets, and global economic welfare are probably not statistically distinguishable from zero.

It is possible that the shipping industry may not pass BW compliance costs along uniformly to all buyers of imported goods, and that higher priced imports could have significant adverse economic impacts on populations that are particularly vulnerable (e.g. poor people who rely on imported grain).

Like the special hardships BW regulations will impose on specific shipping companies, especially some small short haul shippers, these specific product market impacts need to be tracked, taken seriously, and addressed somehow. As a general rule, however, it is more likely that BW compliance costs will be passed along as higher prices disproportionately in markets where buyers can afford them, and may not even be able to detect them.