



SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving
SFSA steel casting industry members

780 McArdle Drive Unit G, Crystal Lake IL 60014
Tel: 815-455-8240 Fax: 815-455-8241
<http://www.sfsa.org>

November — 2019

Casteel Commentary

The Casteel Commentary this month is long and deals with trade. The shift in U.S. trade policy was not merely a preference of the Trump administration, it is an inevitable recognition of the changes in the trading system. Nationalism is the consequence of the changes in trading practices in part facilitated by containerization and IT communication. The commentary looks at these issues.

Cast in Steel

The Cast in Steel Competition for SY 2019-20 is to cast a Bowie knife. Colleges and universities have started forming teams. Similar to last year's competition, each team will work with a foundry partner. We plan to hold the testing and evaluation of the Bowie Knives in Cleveland, OH on April 20, 2020 prior to the AFS MetalCasting Congress on April 21-23. If your foundry is interested in partnering with a university, contact Diana David ddavid@sfsa.org. More information is available here:

<https://www.sfsa.org/castinsteel>

National Technical & Operating Conference

The SFSA National Technical & Operating Conference committee has worked hard preparing the 2019 T&O program. Supported by the steel foundry members that make up the Steel Founders' Society of America, the T&O conference is the premiere steel casting event in the world. The 73rd conference, will continue the legacy of technical and operating topics of today that will provide value to the industry for many years to come. This year's workshop will feature two fundamental pouring & gating presentations by University of Iowa and University of Northern Iowa; one on filling effects based on rigging changes, and one on applying naturally pressurized gating practices. In addition, University of Alabama at Birmingham will provide a hands-on casting analysis activity that will help foundries perform their own lab assessment, and Tom Stevens will review the fundamentals of understanding manganese steel. The conference includes sessions related to Next Generation Manufacturing, pouring & gating, and lessons learned in ceramic sand, and many more papers covering everything from melting to foundry engineering to molding to finishing to management to EHS to quality to technical & featured research. The T&O is only a month away! Register now here: <https://sfsa.site-ym.com/event/to2019>. We look forward to seeing you on December 11-14 at the Loews Hotel in Chicago (please note that the hotel room block is ending soon – don't wait any longer to book your room).

Specifications

If you are interested in getting involved with the SFSA Specifications Committee, please contact David Poweleit poweleit@sfsa.org.

ASTM: A01.13 is planning to ballot a revision to A370 early next year that will require that testing to E10 and E18 be limited to stationary tester; thus, excluding portable testers. Further incorporation of "production" welding in A488 and other standards is being pursued. Section size effect on properties of grades in A494 was confirmed based on SFSA datasets as possible. Duplex Stainless Steel grades are being added to A800 for ferrite estimation. John Griffin, UAB, drafted a test procedure for CPIT or portable hardness testing with the NewAge tester, and is planning to do an ILS. E10 and E18 have tabled requiring the load for Brinell (including the standard load - HBW 10/3000) be reported and what ball is used. UAB is supporting an A370 duplex hardness conversion ILS for lean to rich long product with multiple hardness test methods. A01.18 is looking at replacing "yield point" with "yield strength".

Working on adding product analysis tolerance for nickel-base alloys to the general requirement standards.

ISO: ISO TC17/SC11 met in June and agree to prepare FDIS for 4986 - Magnetic particle inspection, 4987 - Liquid penetrant inspection, 4992 (Part 1 and 2) - Ultrasonic examination, 19959 - Visual examination of the surface condition of investment castings, and 11971 - Visual examination of surface quality. 10679 - Cast tool steel, was submitted for publication new edition has been published.

BPVC: CA6NM per SA352 and SA487 has two different design allowables, but they are different standards. Need to update SA703 and adopt A1067. The foundry is responsible for SA351 Grade CF3M requirements not IID Table U are for allowables. Adopt A1091 and consider removal of SA217 C12A. Update 5A "cool to minimum" and adopt revision to SA 995. There is also a need to update and add additional ASTM standards to the code.

API: SFSA with the support of Paul Rudd and POK are pursuing involvement with API 6D, 7K, 8C, 16A, 20A, and RP 6HT. 20A TG is reviewing weld repair table 3 and 8 for possible revision, and possible issues with clause 4.5.8.3 on chemical analysis conforming to ASTM A703 (applicability to nickel-base alloys in material group E). SFSA is also working to address the use of major weld restrictions under 6D. 6D SS defines a major weld as over 20% of the wall thickness, or 10 square inches and over, or 1" depth. Adoption of this in 6D would be prohibitive for many low-pressure valves having relatively small wall thicknesses.

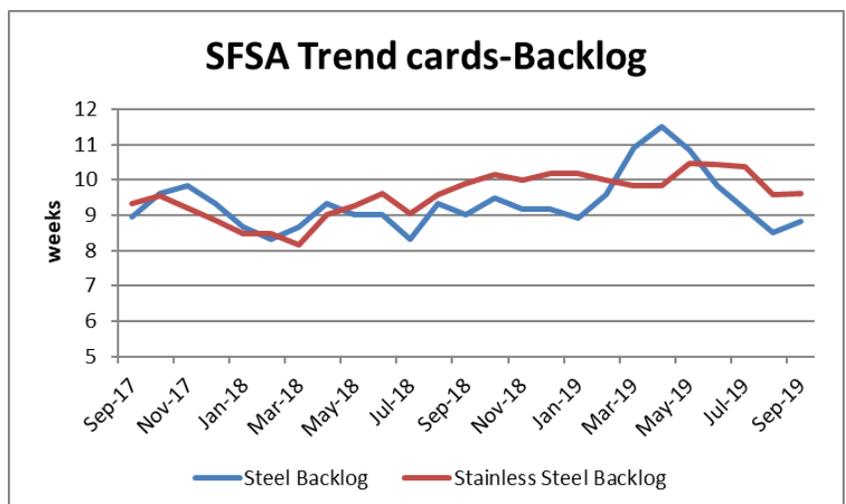
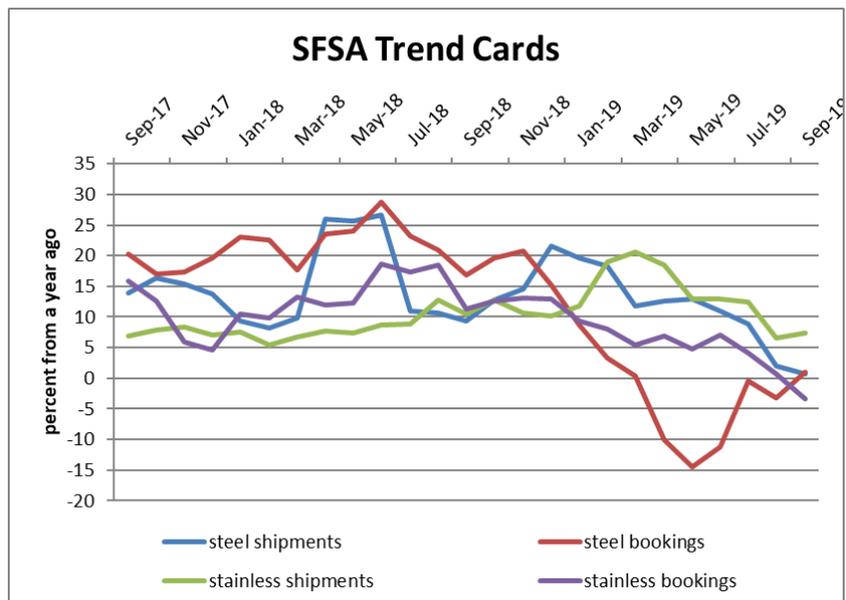
Market News

As seen in the weekly updates on the SFSA Facebook page and the blog, steel production and prices for steel mill products have been declining since early in 2019.

Compared to a year ago, steel casting and stainless steel castings have continued to grow except in the area of bookings for steel castings. Booking for stainless castings remain positive but bookings for both are below shipments suggesting a softening of the steel casting market.

This softening is seen in the backlog reported for our industry. Stainless backlogs remained high through July but steel casting backlogs have fallen back to 9 weeks consistent with the active level of business last year. All of this is consistent with the SFSA forecast to see relatively strong but softening markets through the beginning of next year.

Another factor to track in watching the current trends in steel casting production is the change in pricing reported as changes to the producer price index for steel castings. The volume of steel mills is less volatile than steel castings but the pricing is more volatile. This is likely due to the fact that steel mill product costs are 2/3 purchased materials while in



steel castings it is less than half. No details are publicly published for high alloy steel castings. To make this graph readable the PPI for steel castings is multiplied by 5 and for high alloy steel castings by 2. Through the last report in July, steel casting prices and high alloy steel prices reflected in the PPI numbers increased with an indication of flattening or even decline in the latest numbers.

The production of steel mill products has declined and so has the shipments of combined iron and steel

castings in the DoC reports seen in the Business report attached. Capital Goods New Orders that are correlated and supportive of steel casting demand has flattened out this year, supporting current activity but not showing growth. Oil and copper prices as reported weekly show declines suggesting a future market slowdown.

While the forecast reflects the best estimate we could make of the trends for future activity, there is a significant instability potential in the financial and geopolitical markets that could affect the markets in either direction for steel castings. A re-valuation of equities based on the political or economic mood could lead to a dramatic re-valuation of equities and affect steel casting demand. Alternatively, a disruption of supply for basic industrial components or supplies could stimulate demand to develop alternatives. It is important to monitor and plan for the possibility of dramatic shifts in market conditions in this environment.

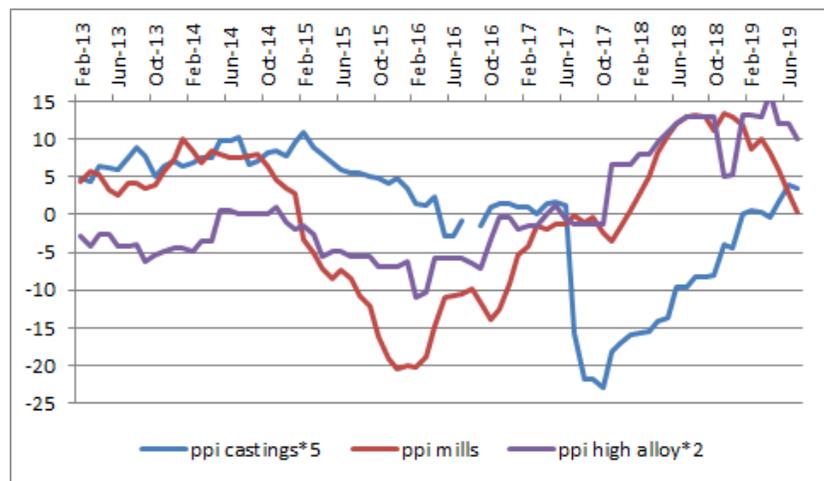
Casteel Commentary

Market transactions in functioning economic regions allows producers to maximize value using scarce resources of material, labor and capital. Multiple purchasers with diverse needs for products and multiple producers with unique processes and businesses compete and their bidding and executed transactions identify both the best final use of resources, the highest bidder, and the most productive supplier of products, the best market value. Free trade of purchasers and producers across national boundaries allows these market forces to create value by allowing markets to function in maximizing value.

This only works if market forces determine the outcome in trade. Traditionally when governments were smaller players in the marketplace and currencies were valued against a universal standard, the value of gold, tariffs and subsidies were the primary market distorting forces in trade. International trade was labor intensive and uncertain. This made most of the economic impact of trade depend on commodities like steel and oil. Even today steel and oil are the most traded materials and products internationally.

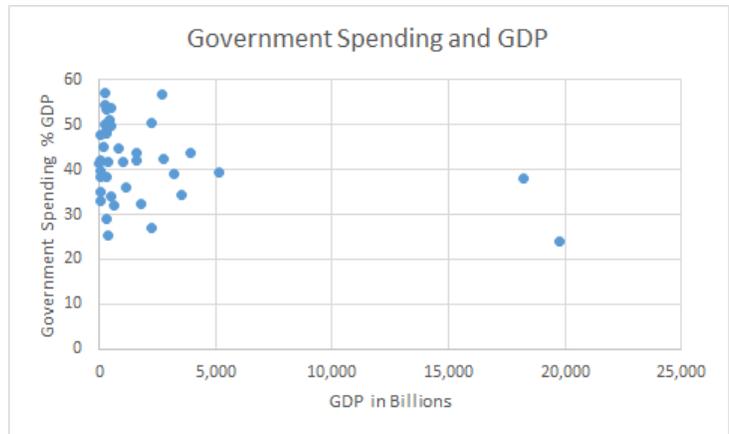
The challenge of trade today is radically different than when the trade rules were written. Containerization and information technology has fundamentally reshaped trade. The system to regulate "unfair" trade practices is not suited to this new environment. Trade is no longer done by shipping large quantities of commodities by ship. Containerization allows small highly valuable lots of advanced manufactured products to be traded. It allows nations to target vulnerable industry segments with subsidized monopolistic practices that would be illegal if done domestically. The traditional trade remedies for subsidies and dumping are ill suited to the new reality. In addition, developed economies are dominated by services including financial, transportation, insurance, etc. The current tariffs and trade re-negotiations initiated by the U.S. are trying to grapple with these new realities.

Mercantilism is the term used to describe trade practices designed to protect domestic industries from competition and for subsidies to promote the domestic industry in trade. These particular market distorting practices are recognized as unfair in trade and remedies for these practices by nations is allowed by the WTO. However, in our current environment, national policies are more important in determining the product value in trade than manufacturing efficiency or product performance. This is



seen in the re-location of production to low cost countries with favorable tax treatment and in the use of national economic policies that subsidize exports.

National policies dominate the competitiveness in trade because the growth of governments as a portion of the total economic activity makes their footprint a market distorting force that determines the ability of domestic sources to compete. The graph on government spending as a percent of the GDP shows clearly that manufacturing efficiency advantage is trivial compared to the effect of government market distorting activity. The U.S. footprint of government spending is 38% of the GDP. China's public information that is clearly misleading is that they are 22% of the economy. Other countries vary from 20 to near 60% of the GDP. So nationalism is not the result of the abandoned manufacturing class but a recognition that by the current financial structure of the global economy.



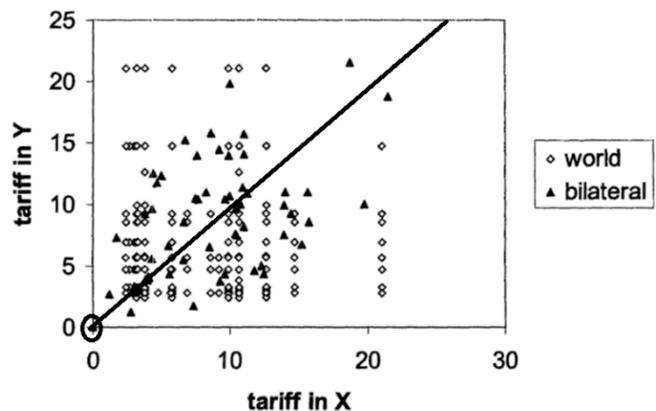
We can see this easily in our domestic markets. Whether it is cigarettes or gas or liquor taxes across statelines, different state government tax policies affect trade. Purchasers travel to get the economic benefit of different government policies when those policies create a significant price differential. That differential is not a market force rewarding value of suppliers but a market distorting force from policy.

Economists and political leaders continue to argue for "free" trade and concede that we must also have "fair" trade. The reality as shown in the graph of tariff differentials in world and bilateral trade agreements is that these trade agreements are neither free nor fair. Free trade would mean reducing the tariffs to near zero so the agreements should put the tariffs in the circle at the origin.

Fair trade has two approaches or definitions.

The expected definition is reciprocity, we treat the imports from our trading partners in other nations the way their nation treats of export to them. This would mean that trade agreements would all fall on the line so that tariffs in Y would match tariffs in X.

Current policy makers do not conform to this definition and use the alternative formulation. They argue that fair trade is when we treat all importers and exporters equally, regardless of how they treat trade. So having differential tariffs is okay as long as we treat all importers of a



product the same. This allows policymakers the flexibility to negotiate complex agreements perceived to be in their national interest. So the commitment to “fair” trade is a cover for mercantilism in trade.

The FRED graph shows for the U.S. trade balance in manufacturing and services. The blue line is our



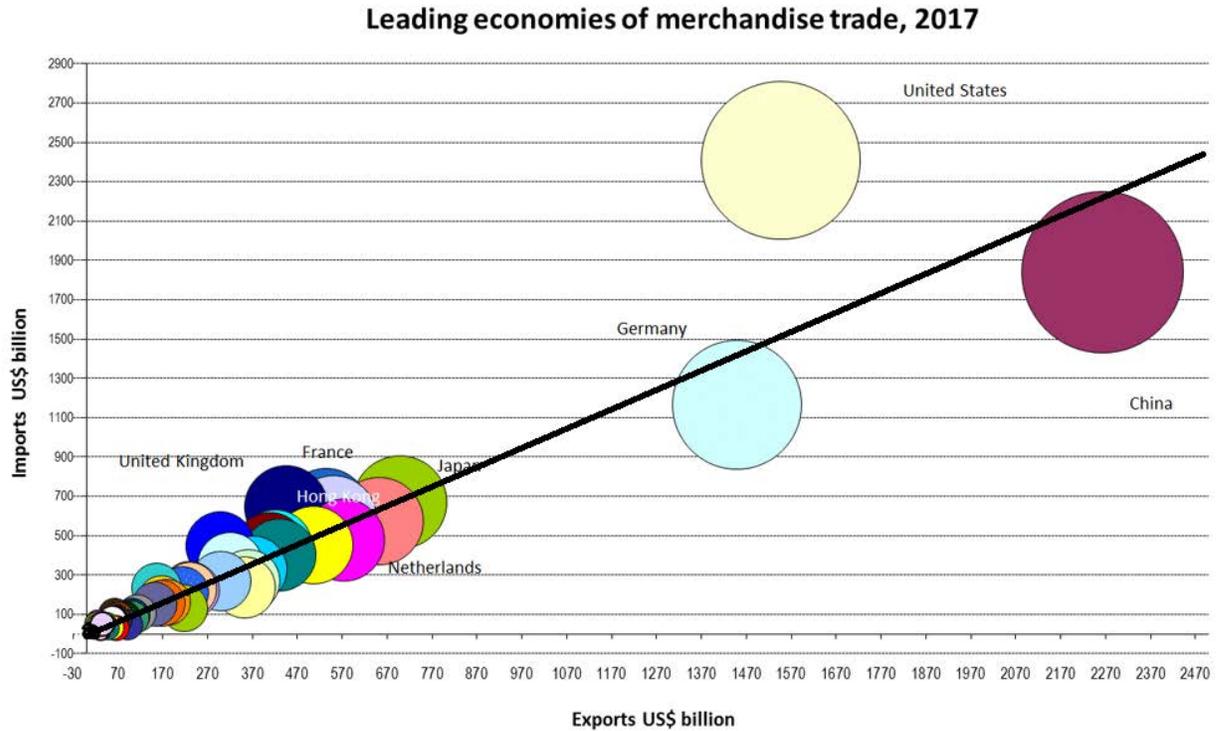
trade surplus in services and the red line is our trade deficit in manufactured goods. Policymakers and trade negotiators are driven to make agreements protecting the service industries and opening trading economies more for services by being flexible and allowing our partners to gain the advantage in traded manufactured goods.

While we are in this situation with all nations with existing agreements overseen by international trade agencies like the WTO, trade imbalances are most severe in only three countries. As seen below, Germany and China have large trade surpluses and the U.S. has a large trade deficit. The U.S. is able to run this deficit since the dollar is the de facto global currency.

If trade was driven by competitiveness then the value of currencies would have no effect. Prices in trade would adjust rapidly to currency values. This is not what happens, exchange rates are a bigger factor in international sourcing than domestic efficiency. Government policies, national tax and regulatory policies determine the competitiveness of industries in trade.

Because of this reality, trade is not a market determination of value but a competition between nations. Nationalism is not fundamentally a populist political movement but the structural reality of the modern economy. Globalization was only really advantageous after the Cold War when the U.S. dominated a uni-polar global economy. With the subsequent rise and competition from Germany/Europe and China, the nationalism structure of global trade becomes obvious.

So in our industry we need to recognize the realities of trade and adjust our business approaches to prosper in the national and global environment we are living in. There are no obvious solutions from a policy approach that would change the unbalanced and national character of trade. Tariffs are a blunt crude unwieldy instrument but may be the only tool to deal with predatory monopolistic practices of our global national competitors. Global corporations have exploited the national character of production to take advantage of poor workers and rich financial institutions to gain minimum taxation and maximum profitability. This is not clearly in the interest of the participating nations, their economies or their citizens.



The only factors that cause developed economies like the U.S. from abandoning the manufacturing and the displaced workers are the federal political system that is still sensitive to local economic health and from a policy standpoint the need to maintain a military that can dominate the battle space. Globally supplied technologies means that all military organizations will have the same advanced weaponry and the controller of the critical suppliers and equipment will dominate.

So we live in uncertain times of structural changes with a real struggle for global dominance with other regions of the world. We need to understand the nature of trade and not be simplistic thinking the current internal debate is between protectionists that want uncompetitive local industries to survive and free traders that believe global suppliers dominate because they are more efficient manufacturers making products with more value.

Raymond

**STEEL FOUNDERS' SOCIETY OF AMERICA
BUSINESS REPORT**

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	September	August	July
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Carbon & Low Alloy

Shipments	11.3	0.7	0.0	-8.0	10.0
Bookings	0.0	-4.3	-15.0	-10.0	12.0
Backlog (wks)	9.7	8.8	10.0	8.0	8.5

High Alloy

Shipments	12.8	7.4	12.5	-2.4	12.1
Bookings	5.6	-3.3	-2.0	-7.5	-0.5
Backlog (wks)	10.0	9.6	10.0	9.1	9.8

Department of Commerce

Census Data

Iron & Steel Foundries (million \$)

Shipments	1,478.6	1,473.7	1,461	1,469	1,491
New Orders	1,476.3	1,462.7	1,410	1,519	1,459
Inventories	2,122.3	2,121.0	2,122	2,133	2,108

Nondefense Capital Goods (billion \$)

Shipments	77.0	74.3	74.2	74.3	74.5
New Orders	74.7	73.7	71.4	73.6	76.0
Inventories	186.4	192.6	194.4	192.7	190.9

**Nondefense Capital Goods
less Aircraft (billion \$)**

Shipments	69.4	69.2	68.9	69.4	69.4
New Orders	69.0	68.9	68.5	68.9	69.4
Inventories	128.6	130.0	130.1	129.9	130.0

Inventory/Orders	1.9	1.9	1.90	1.89	1.87
Inventory/Shipments	0.0	1.9	1.89	1.87	1.87
Orders/Shipments	0.0	1.0	0.99	0.99	1.00

American Iron and Steel Institute

Raw Steel Shipments (million net tons)	8.1	5.5	0.0	8.5	8.1
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