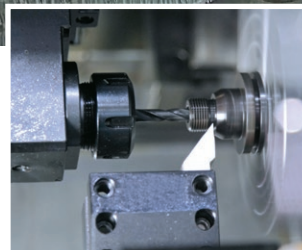
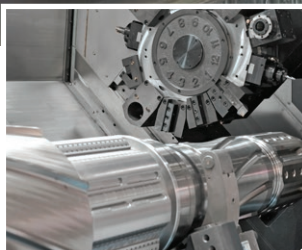




GARDNER
RESEARCH

2015 World Machine-Tool Output & Consumption Survey





THE WORLD SURVEY AT A GLANCE

In a competitive global manufacturing marketplace, increasing productivity is the name of the game. One way to increase productivity is via a more skilled work force. Another way to improve productivity is through more efficient equipment, like machine tools. It's very easy to look at these two means of achieving higher productivity as strictly competitive, for example when labor bemoans the introduction of robots or other more efficient capital equipment. But, in reality, higher skilled labor and more efficient machine tools are complementary. Higher skilled labor is necessary to make the most of more efficient machine tools and vice versa. Therefore, it's the appropriate combination of the two that lead to higher standards of living.

How these two factors of production are combined is governed by their relative costs. In recent years, the skill set of manufacturing laborers around the world has been on the rise. This is evident in the improved quality of machined parts around the world. But, a higher skilled workforce demands higher wages and other benefits. At the same time, interest rates around the globe are hitting all-time lows, which has significantly lowered the cost of capital equipment. The dynamic of rising wage rates and declining interest rates means that it is now relatively cheaper to increase productivity through capital equipment investment. Because machine tools have a hand in virtually everything that is manufactured, the level of investment in machine tools is a sign of which countries are investing with an eye to the future of a more highly skilled workforce. Current machine tool purchasing trends show that the strongest manu-

facturing countries are making greater investments in the latest machine tool technology.

Global machine tool consumption was \$75.3 billion, an increase of just 0.3 percent in 2014. But, among the 10 largest machine tool consuming countries, which generally corresponds with the 10 largest global economies, machine tool consumption increased 1.7 percent in 2014. In the other 15 countries used to estimate the global total, machine tool consumption contracted 7.9 percent in 2014. So, the countries with a stronger manufacturing base made a much larger relative investment to enhance the productivity gap between them and everyone else.

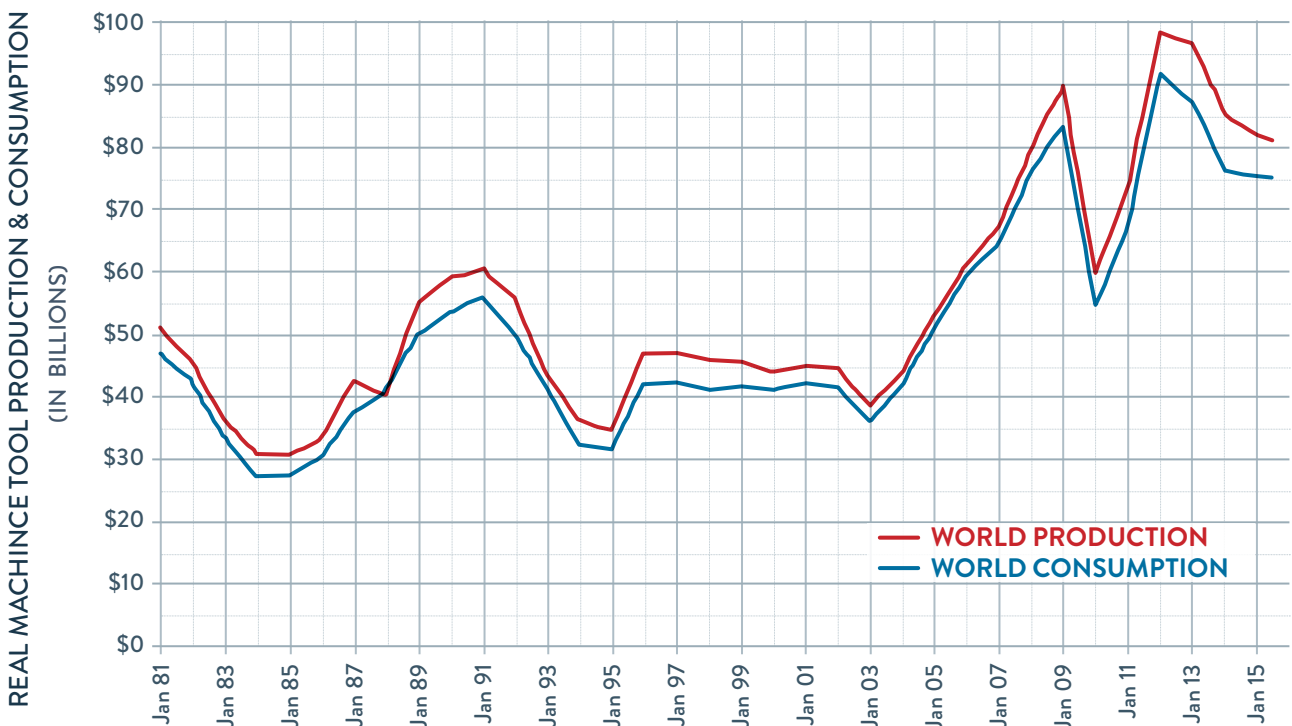
World machine tool production fell for the third year in a row to \$81.2 billion. In 2014, world production fell by 3.1 percent. The rate of contraction in production moderated in 2014 as machine tool builders brought inventory levels down, bringing supply into a better balance with demand. This is an indication that machine tool prices around the world should be firming up.

Looking ahead to 2015, Gardner Research is forecasting world machine tool consumption will fall 0.4 percent to \$75.0 billion. However, the ten largest machine tool consumers will see a decline of 1.1 percent while the remaining 15 countries will see consumption increase 3.7 percent.

For detailed charts on world consumption and production and forecasts for the top 25 consuming countries, please visit the international page of Gardner's corporate web site:

www.gardnerweb.com/forecast/international.htm

WORLD MACHINE TOOL PRODUCTION & CONSUMPTION





CONSUMERS OF MACHINE TOOLS

China remained the world's largest consumer of machine tools by a wide margin. However, China's consumption of machine tools has dropped to \$31.8 billion in 2014 from \$40.8 billion in 2011 – a 22 percent decline over three years. Because China's money supply is growing at nearly its slowest rate in more than two decades and its industrial production has grown at a continually slower rate since January 2012, we think China's machine tool consumption will decline again in 2015. We are forecasting \$28.6 billion of machine tool consumption in China.

At \$8.1 billion, machine tool consumption was essentially unchanged in the U.S., which is the world's second largest machine tool consumer. We expect machine tool consumption to increase to \$10.4 billion in 2015. You can read our rationale for why that is likely to happen in the December 2014 feature article in *Modern Machine Shop* magazine.

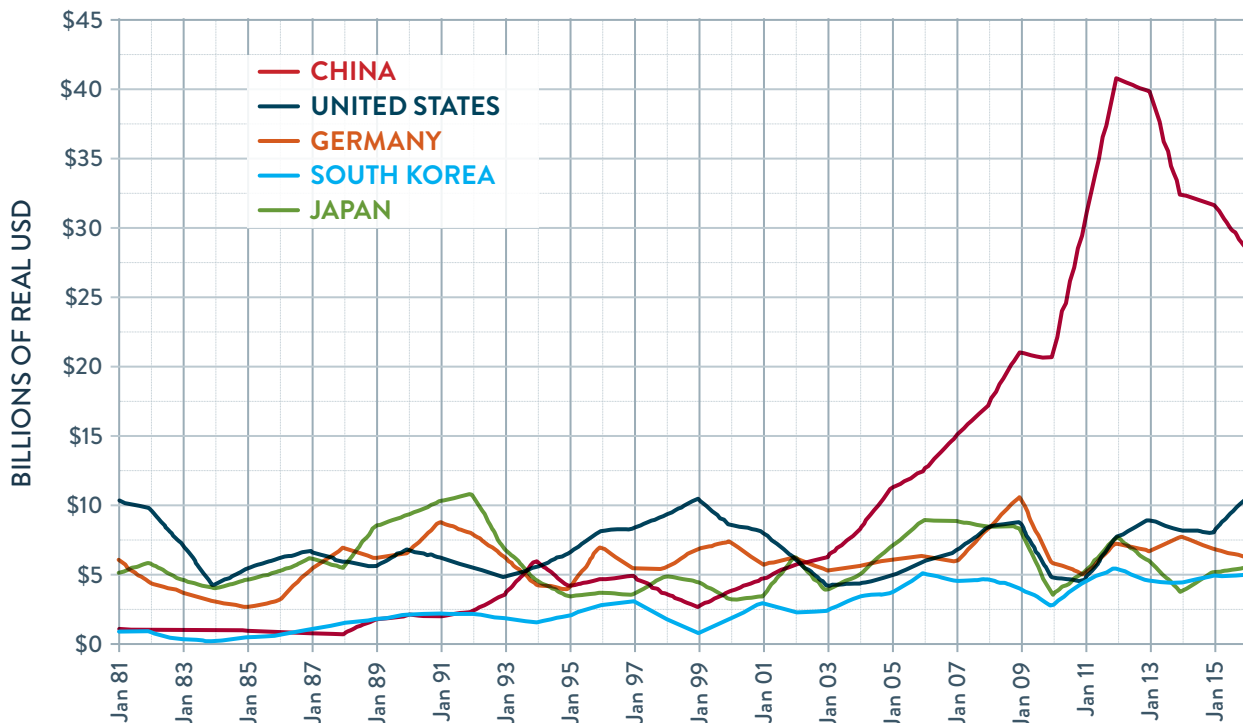
Germany remained the third largest machine tool consumer in the world. However, Germany's consumption dropped by 10.8 percent, which was the second largest percent decline of any country in the top 10 consumers. Germany's money supply, industrial production, and capacity utilization are all growing at decelerating rates. There-

fore, we think machine tool consumption in Germany is likely to fall by another 8 percent in 2015.

Japan and South Korea remained in the top five consuming countries. But, they flip flopped places with Japan moving up to number four and South Korea falling to number five. In 2014, Japan's machine tool consumption increased 39.4 percent, which was the largest increase of any country. Japan should see an increase in consumption in 2015 as well, albeit a much smaller one. Consumption increased by 13.2 percent in South Korea in 2014. Like Japan, it should see a smaller increase in 2015.

Two countries that have seen significant declines in machine tool consumption are India and Brazil. In 2011, both countries consumed close to \$2.5 billion and were ranked numbers six and seven in the world, respectively. But, in 2014 India consumed just \$1.4 billion of machine tools and Brazil just \$1.0 billion. However, India seems to be turning around as we think consumption will increase in 2015 for the second year in a row. Brazil looks to be a different story. We think consumption will drop to \$0.7 billion in 2015 as both its industrial production and capacity utilization are contracting at rapidly accelerating rates.

MACHINE TOOL CONSUMPTION – TOP 5 COUNTRIES





PRODUCERS OF MACHINE TOOLS

China has been the world's largest producer of machine tools since 2009. But, its production has fallen to \$23.8 billion from its peak of \$29.5 billion in 2011. Given the nature of China's machine tool market and the cooling off of its economy, production is likely to decline further in 2015.

For the second year in a row, Germany was the second largest producer of machine tools. However, production declined roughly 20 percent in 2014. It's also the world's largest exporter of machine tools.

In Japan, machine tool production dropped nearly 50 percent

from 2011 to 2013. But, production rebounded in 2014, increasing to \$12.8 billion. This put Japan in third place in the world, just \$0.1 billion behind Germany.

South Korea moved up one spot to number four while Italy fell one spot to number five. Both countries produced more than \$5 billion of machine tools.

Since 2011, really even as far back as 2007, Brazil's machine tool production has taken a dramatic hit. Since 2011, machine tool production in Brazil has dropped nearly 70 percent to \$0.3 billion from \$0.9 billion.

ABOUT THE SURVEY

This is the 50th edition of an independent annual survey that collects statistics from machine tool consuming and producing countries and compares them in real U.S. dollars. It is conducted through the research department of Gardner Business Media, Inc., Cincinnati, Ohio USA, by Steve Kline, director of market intelligence, and Nancy Eigel-Miller, research manager.

This year's data on production, exports and imports was collected from official sources, including trade associations and government ministries, in 27 countries which consume and produce virtually all of the world's machine tools. Consumption is calculated by adding imports to and subtracting exports from production. The data typically is reported in local currencies then converted to U.S. dollars. After converting to U.S. dollars, all of the data in the 2014 survey also was inflation-adjusted using the Bureau of Labor Statistics' Producer Price Index for capital equipment to provide a better historical comparison.

When calculating these world totals, we use the top 25 consuming or producing countries from that year. So, for example, total world consumption in 2002 is from a different set of countries than the total world consumption in 2010. Since the number of reporting countries changes from year to year, this provides a reasonable approximation because the top 25 consuming or producing countries account for roughly 95% of all consumption and production.

SOURCES. The revised data for 2013 and estimated data for 2014 are sourced at government agencies or trade associations. Also, special assistance came from the fifteen-member CECIMO consortium (Brussels, Belgium) and the Association for Manufacturing Technology (McLean, VA).

DEFINITIONS. A machine tool is usually defined as a power-driven machine, not portable by hand, and powered by an external source of energy. It is designed specifically for metalworking either by cutting, forming, physico-chemical processing, or a combination of these techniques.

Machine tools are traditionally broken down into two categories: metalcutting and metal forming. Metalcutting machines typically cut

away chips or swarf and include (but are not limited to) broaching machines, drilling machines, electrical-discharge machines, lasers, gearcutting machines, grinders, machining centers, milling machines, transfer machines, and turning machines such as lathes. Metal forming machines typically squeeze metal into shape and include (but are not limited to) bending machines, cold-heading machines, presses, shears, coil slitters, and stamping machines.

Data presented in the WMTS are solicited for metalcutting machines (codes 8456-8461 under the Harmonized Tariff System) and for metal forming machines (8462-8463) and are solicited for complete machines only, not including parts or rebuilt machines.

EXCHANGE RATES. All data reported in domestic currencies are translated into U.S. dollars using the average daily exchange rate for the year (not the end-of-year rate) as reported at www.oanda.com in the historical section. All analysis is done in real U.S. dollars.

SCOPE. Information from the 27 countries represented in the survey does not include all machine tool production and trade activity in the world but is thought to encompass more than 95% of all activity. In some cases, like South Africa and some Southeast Asian or Eastern European countries, a measurable machine tool market exists, but data is not supplied by the local market or is difficult to estimate.

"SHIPMENTS" VS. "ORDERS." Many countries, in addition to contributing statistics to this Survey, also track orders for new machine tools. These are, by their nature, different sets of numbers, and they may or may not be related.

This Survey is based on actual shipments of new machine tools from the factories in which they are produced. In contrast, the various order compilations in individual countries around the world are based on bookings for machines that will be shipped in the future. The time lag between these two events can vary greatly. An in-stock lathe might be shipped one day after the order is placed; whereas a complex engine-machining line might take a year to be delivered after the order has been received. On average in the U.S., orders lead shipments by four to five months. That is likely a common lead time for other countries.



CONSUMERS OF MACHINE TOOLS

MILLIONS OF U.S. DOLLARS

COUNTRY	2013	2014	2015*
1. China, P. Rep.	\$31,900.0	\$31,700.0	\$28,600.2
2. United States	8,048.5	8,056.3	10,412.4
3. Germany	7,573.4	6,758.2	6,232.8
4. Japan	3,695.8	5,150.2	5,427.5
5. South Korea	4,320.0	4,891.0	4,959.9
6. Italy	2,098.4	2,266.9	2,340.6
7. Russia	2,054.5	2,030.2	1,729.9
8. Mexico	1,924.2	1,708.9	1,884.4
9. Taiwan	1,629.0	1,687.0	1,877.2
10. India	1,337.7	1,416.5	1,506.9
11. Canada	1,342.0	1,235.0	1,361.8
12. Turkey	1,261.0	1,227.0	1,266.9
13. United Kingdom	1,077.5	1,087.2	1,362.1
14. Switzerland	1,126.1	1,081.8	1,030.4
15. Brazil	1,464.9	1,014.6	661.1
16. France	1,113.8	977.3	1,018.6
17. Austria	734.0	663.7	665.3
18. Spain	426.1	534.8	605.8
19. Czech Republic	435.5	464.3	567.8
20. Australia	374.7	333.0	357.2
21. Netherlands	342.5	303.9	310.8
22. Belgium	190.4	221.2	230.4
23. Argentina	210.0	195.7	137.3
24. Portugal	209.6	166.5	209.3
25. Sweden	194.2	161.3	242.1
26. Finland	121.9	115.5	132.6
27. Denmark	63.0	59.6	66.2
TOTAL	\$ 75,268.7	\$ 75,507.6	\$ 75,197.5

PRODUCERS OF MACHINE TOOLS

MILLIONS OF U.S. DOLLARS

COUNTRY	% CUTTING MACHINES	2013	2014
1. China, P. Rep.	59%	\$24,700.0	\$23,800.0
2. Germany	71%	15,268.7	12,957.2
3. Japan	83%	11,333.6	12,831.6
4. South Korea	74%	5,150.0	5,631.0
5. Italy	51%	5,475.9	5,074.7
6. United States	75%	4,956.1	4,900.4
7. Taiwan	82%	4,537.0	4,700.0
8. Switzerland	84%	3,242.8	3,111.7
9. Austria	51%	1,217.0	1,101.2
10. Spain	60%	1,285.1	1,083.0
11. United Kingdom	77%	1,007.1	931.9
12. Turkey	27%	719.0	722.0
13. France	61%	797.3	698.9
14. India	83%	576.0	645.3
15. Czech Republic	82%	697.2	625.9
16. Canada	-	685.0	571.0
17. Netherlands	-	428.8	380.5
18. Brazil	81%	417.5	280.0
19. Belgium	-	317.8	254.0
20. Russia	-	210.9	234.4
21. Finland	-	191.8	170.2
22. Mexico	-	140.6	144.0
23. Australia	-	160.0	143.4
24. Sweden	9%	163.4	135.7
25. Portugal	75%	119.2	102.1
26. Denmark	-	49.3	45.0
27. Argentina	59%	36.2	37.5
TOTAL	-	\$83,883.3	\$ 81,312.6

— * 2015 VALUES ARE FORECASTED —



IMPORTERS OF MACHINE TOOLS

MILLIONS OF U.S. DOLLARS

	COUNTRY	2013	2014	2014 Imports* as % of Consumption
1.	China, P. Rep.	\$10,100.0	\$11,200.0	35%
2.	United States	5,268.4	5,241.5	65%
3.	Germany	3,012.6	2,783.5	41%
4.	Russia	1,922.4	1,869.1	92%
5.	Mexico	1,907.6	1,655.3	97%
6.	South Korea	1,386.0	1,496.0	31%
7.	Italy	992.2	1,021.0	45%
8.	Turkey	1,037.0	989.0	81%
9.	Belgium	857.6	911.6	412%
10.	Canada	900.0	902.0	73%
11.	Brazil	1,263.8	901.2	89%
12.	United Kingdom	902.9	893.1	82%
13.	France	982.3	876.4	90%
14.	India	797.0	811.1	57%
15.	Taiwan	640.0	740.0	44%
16.	Japan	745.1	715.7	14%
17.	Switzerland	683.6	583.4	54%
18.	Czech Republic	477.0	507.7	109%
19.	Austria	461.3	416.9	63%
20.	Spain	324.7	404.8	76%
21.	Netherlands	452.1	401.1	132%
22.	Australia	286.0	264.9	80%
23.	Sweden	288.1	239.2	148%
24.	Argentina	194.6	166.4	85%
25.	Portugal	154.8	121.6	73%
26.	Denmark	119.2	108.2	182%
27.	Finland	109.6	97.2	84%

– * INCLUDES MACHINES IMPORTED FOR RE-EXPORT –

EXPORTERS OF MACHINE TOOLS

MILLIONS OF U.S. DOLLARS

	COUNTRY	2013	2013	2014 Exports* as % of Consumption
1.	Germany	\$ 10,707.9	\$ 8,982.5	69%
2.	Japan	8,382.9	8,397.1	65%
3.	Italy	4,369.6	3,828.8	75%
4.	Taiwan	3,548.0	3,753.0	80%
5.	China, P. Rep.	2,900.0	3,300.0	14%
6.	Switzerland	2,800.3	2,613.3	84%
7.	South Korea	2,216.0	2,236.0	40%
8.	United States	2,176.0	2,085.6	43%
9.	Spain	1,183.7	953.0	88%
10.	Belgium	985.0	944.4	372%
11.	Austria	944.2	854.5	78%
12.	United Kingdom	832.5	737.8	79%
13.	Czech Republic	738.7	669.3	107%
14.	France	665.8	598.0	86%
15.	Turkey	495.0	484.0	67%
16.	Netherlands	538.4	477.7	126%
17.	Canada	243.0	238.0	42%
18.	Sweden	257.3	213.6	157%
19.	Brazil	216.4	166.5	59%
20.	Finland	179.5	151.9	89%
21.	Denmark	105.5	93.6	208%
22.	Mexico	124.1	90.4	63%
23.	Australia	71.3	75.3	53%
24.	Russia	78.8	73.3	31%
25.	Portugal	64.4	57.1	56%
26.	India	35.3	39.9	6%
27.	Argentina	20.8	8.2	22%

– * INCLUDES RE-EXPORT MACHINES –



TRADE BALANCE

MILLIONS OF U.S. DOLLARS

COUNTRY	2013	2014
1. Japan	\$ 7,637.8	\$ 7,681.4
2. Germany	7,695.3	6,199.0
3. Taiwan	2,908.0	3,013.0
4. Italy	3,377.4	2,807.8
5. Switzerland	2,116.7	2,029.9
6. South Korea	830.0	740.0
7. Spain	859.0	548.2
8. Austria	482.9	437.6
9. Czech Republic	261.7	161.6
10. Netherlands	86.3	76.6
11. Finland	69.9	54.7
12. Belgium	127.4	32.8
13. Denmark	-13.7	-14.6
14. Sweden	-30.8	-25.6
15. Portugal	-90.4	-64.5
16. United Kingdom	-70.4	-155.3
17. Argentina	-173.8	-158.2
18. Australia	-214.7	-189.6
19. France	-316.5	-278.4
20. Turkey	-542.0	-505.0
21. Canada	-657.0	-664.0
22. Brazil	-1,047.4	-734.7
23. India	-761.7	-771.2
24. Mexico	-1,783.5	-1,564.9
25. Russia	-1,843.6	-1,795.8
26. United States	-3,092.4	-3,155.9
27. China, P. Rep.	-7,200.0	-7,900.0

– TRADE BALANCE = EXPORTS MINUS IMPORTS –

PER-CAPITA CONSUMPTION

MILLIONS OF U.S. DOLLARS

COUNTRY	CONSUMPTION USD (Millions)	POPULATION (Millions)	CONSUMPTION (USD per Capita)
1. Switzerland	\$ 1,081.8	8.13	\$ 133.06
2. South Korea	4,891.0	50.22	97.39
3. Germany	6,758.2	80.82	83.62
4. Austria	663.7	8.51	77.99
5. Taiwan	1,687.0	23.37	72.19
6. Czech Republic	464.3	10.53	44.09
7. Japan	5,150.2	127.02	40.55
8. Italy	2,266.9	60.78	37.30
9. Canada	1,235.0	35.67	34.62
10. United States	8,056.3	318.86	25.27
11. China, P. Rep.	31,700.0	1,360.72	23.30
12. Finland	115.5	5.47	21.12
13. Belgium	221.2	11.20	19.75
14. Netherlands	303.9	16.82	18.07
15. United Kingdom	1,087.2	64.31	16.91
16. Sweden	161.3	9.64	16.73
17. Portugal	166.5	10.43	15.96
18. Turkey	1,227.0	77.70	15.79
19. France	977.3	66.02	14.80
20. Australia	333.0	23.13	14.40
21. Russia	2,030.2	143.70	14.13
22. Mexico	1,708.9	122.33	13.97
23. Spain	534.8	46.50	11.50
24. Denmark	59.6	5.66	10.53
25. Brazil	1,014.6	202.77	5.00
26. Argentina	195.7	41.45	4.72
27. India	1,416.5	1,238.89	1.14



USD TO REPORTING CURRENCY

	COUNTRY	REPORTING CURRENCY	2013	2014	CHANGE
1.	Argentina	USD	1.000	1.000	0%
2.	Australia	USD	1.000	1.000	0%
3.	Austria	EUR	1.370	1.216	-11%
4.	Belgium	EUR	1.370	1.216	-11%
5.	Brazil	USD	1.000	1.000	0%
6.	Canada	USD	1.000	1.000	0%
7.	China, P. Rep.	USD	1.000	1.000	0%
8.	Czech Republic	CZK	0.050	0.044	-13%
9.	Denmark	EUR	1.370	1.216	-11%
10.	Finland	EUR	1.370	1.216	-11%
11.	France	EUR	1.370	1.216	-11%
12.	Germany	EUR	1.370	1.216	-11%
13.	India	USD	1.000	1.000	0%
14.	Italy	EUR	1.370	1.216	-11%
15.	Japan	JPY	0.010	0.008	-14%
16.	Mexico	USD	1.000	1.000	0%
17.	Netherlands	EUR	1.370	1.216	-11%
18.	Portugal	EUR	1.370	1.216	-11%
19.	Russia	USD	1.000	1.000	0%
20.	Spain	EUR	1.370	1.216	-11%
21.	South Korea	USD	1.000	1.000	0%
22.	Sweden	EUR	1.370	1.216	-11%
23.	Switzerland	EUR	1.370	1.216	-11%
24.	Taiwan	USD	1.000	1.000	0%
25.	Turkey	EUR	1.370	1.216	-11%
26.	United Kingdom	GBP	1.649	1.553	-6%
27.	United States	USD	1.000	1.000	0%

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