



## ABSTRACT

As we are approaching ten years since the global financial crash of 2008, sufficient time has lapsed for a perspective on how this affected the market in years to follow. During the period 1990 to 2002, global GDP increased at a CAGR of 3.62 % whilst during that same period the global transformer market was lagging behind with an increase at 0.59 %. This situation changed dramatically between 2002 and 2008, when the global economy experienced a period of growth averaging 10.62 % CAGR, while transformer markets exceeded all expectations achieving a growth rate of 18.37 % CAGR. Following the 2008/2009 “correction”, global GDP has recovered substantially with a growth of 2.94 % CAGR between 2009 and 2017, whilst transformer markets have virtually flat-lined at 0.94 % CAGR over the same period. What can be learned from this with a view to predicting the future? This contribution is exploring an answer to this question.

## KEYWORDS

GDP, CAGR, market, steel

# Long-term market trends

## 1. Introduction

We are approaching 10 years since the global financial crash of 2008 which is perhaps sufficient lapsed time for a perspective to be reached. In 2008, the world economy faced the worst crisis since the great depression of the 1930s. The events which began in 2007 as a “correction” in the property sector in the United States of America quickly spread throughout the entire U.S. financial sector and then virtually globally. So, a crisis which started in the U.S. financial sector quickly spread to affect the wider business, manufacturing and consumer

sectors throughout the world. By the end of 2007, not only the U.S. but many other countries, especially in Europe, were also technically in recession. Parts of Asia, South America and the Former Soviet Union (FSU) were not directly affected, but nevertheless became victims of the global downturn in investment and demand that followed.

The first major institution to go under was Countrywide Financial Corp., the largest American mortgage lender. The next victim, in March 2008, was the Wall Street investment house Bear Stearns, which had a portfolio of mortgage-based securities; this was followed in the

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coming months by Lehman Brothers and Merrill Lynch. The latter was sold to the Bank of America and Lehman declared bankruptcy the day after Merrill's sale. Other independent U.S. investment banks and insurance companies either failed, became absorbed into other initiatives, or totally restructured. Banks

stopped lending – even to each other, and “normal business” ground to a halt only to be relieved by the interventional of national banks.

The U.K. government provided nearly \$90 billion to buy banks completely or partially, and to guarantee \$500 billion in bank loans. Some banking institutions

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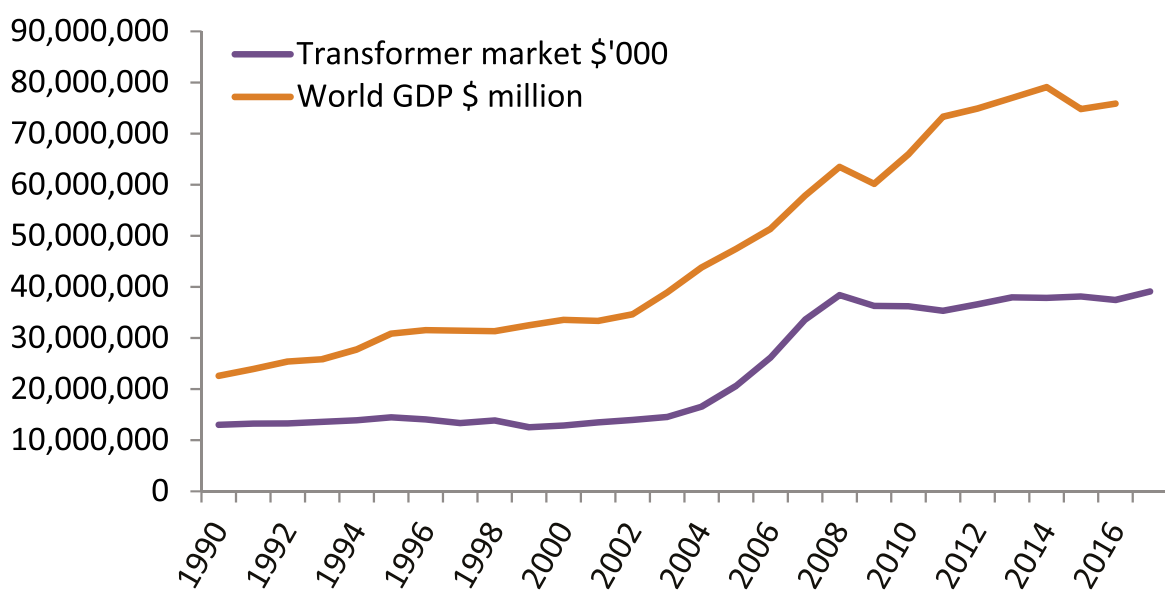


Figure 1. GDP and transformer market trends

## The World Bank is predicting short-term real global GDP growth of 3.1 % in 2018, 3.0 % in 2019 and 2.9 % in 2020

were effectively nationalised and others bailed out. Similar events were occurring across Europe with governments introducing policies aimed at keeping the recession short and shallow. Asia's major economies were swept up by the financial crisis, and by the end of 2008 all of the world's major economies were either in recession or struggling to stay out of one.

### 2. Trends in transformer markets

This 2008 “correction” can be clearly seen in Figure 1, which shows Global GDP from 1990 to 2017 and transformer markets over the same period.

Both global GDP and global transformer

markets fell by 5.5 % in 2009, but that is the only similarity between the two curves. During the period 1990 to 2002, global GDP increased at a CAGR (compound annual growth rate) of 3.62 % whilst during that same period the global transformer market increased at 0.59 % – clearly lagging far behind the global economy. This situation changed dramatically during the period between 2002 and 2008. The global economy did experience an almost unprecedented period of growth – averaging 10.62 % CAGR during that period. It may be expected that global transformer markets would at best mirror that

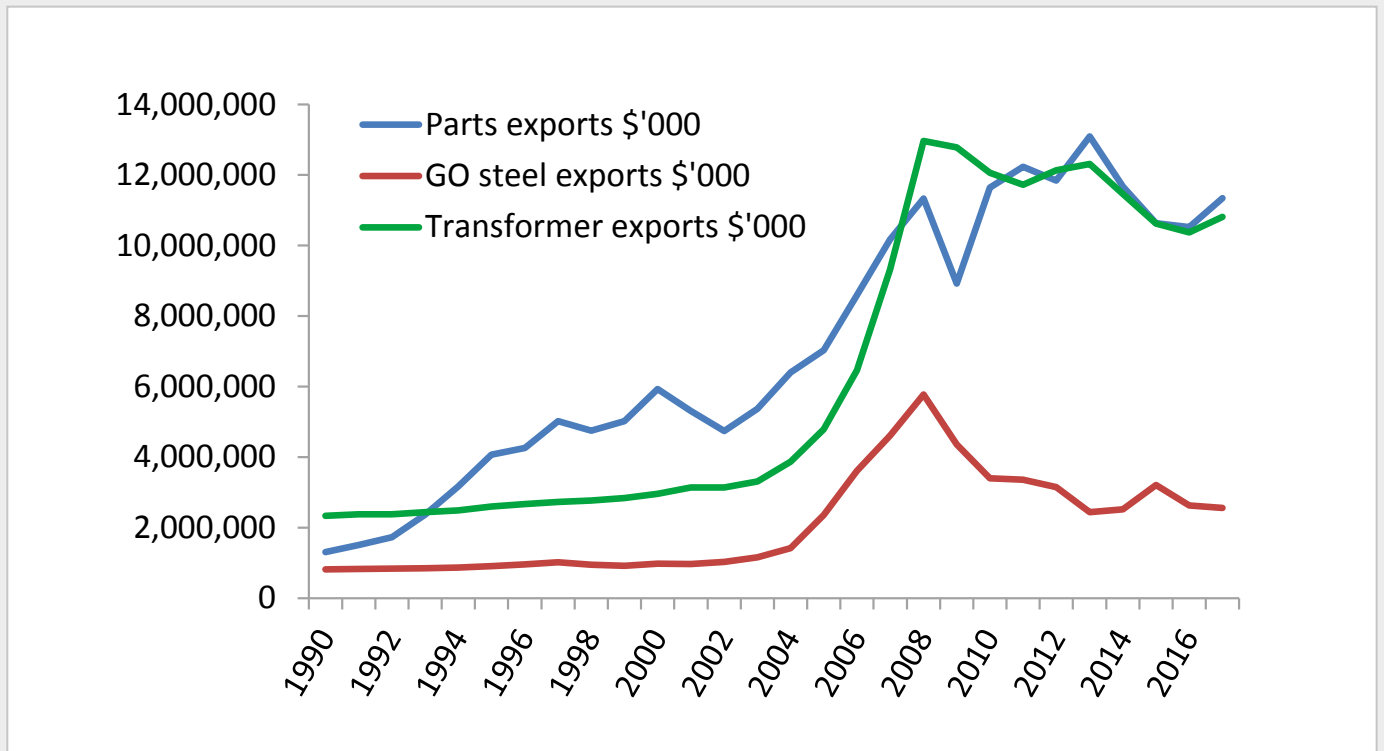


Figure 2. Transformer trade compared with component trade

Table 1. Growth rates over time

Metric	2002 to 2008	2009 to 2017
Global GDP growth	10.62 %	2.94 %
Global transformer market growth	18.37 %	0.39 %
Transformer trade growth	26.66 %	-1.84 %
Global parts trade growth	15.61 %	11.33 %
GO steel trade growth	33.31 %	1.92 %

growth, although based on the previous decade this would appear ambitious. In reality transformer markets exceeded most pundits' expectations and achieved a growth rate of 18.37 % CAGR over the same period.

In a return to what might depressingly be called normality, the comparison between the two sets of figures does not make such edifying reading. Following the 2008/2009 "correction", global GDP has recovered substantially and growth of 2.94 % CAGR has been recorded between 2009 and 2017 whilst transformer markets have virtually flat-lined at 0.94 % CAGR over the same period.

So what, if anything, can be learned from this with a view to predicting the future? There were two previous dips or recessions in the global GDP curve; in 1998 and again in 2001. This appears to be reflected rather than mirrored in the transformer markets. Transformer markets displayed a two-year dip from 1995 to 1997, and then a one-year dip in 1999, but no corresponding dip in 2001. This dysphasia may be the result of long order to delivery cycles in transformer markets which offset one GDP recession and bridged the second; in any event, it has to be noted that in percentage terms these recessions were not long or deep.

The more pertinent question is, looking

forward over the next decade, a) what are the prospects for the global economy, and b) will these trends be predictive for transformer markets? The World Bank is predicting short-term real global GDP growth of 3.1 % in 2018, 3.0 % in 2019 and 2.9 % in 2020. Other economic institutions predicting over a longer period tend to agree and predictions of 3 % real growth through to 2030 are not uncommon. Whether this will be reflected in transformer market growth remains to be seen, but a period of market growth exceeding GDP growth does not seem unrealistic.

### 3. 2008 effects on transformer trade

During the period 2002 to 2008 when transformer markets were growing at 18.37 % CAGR, the market was becoming, by definition, more and more internationalised. Trade in transformers was recorded to have grown at a rate of 26.66 % over the same period.

The market for transformers in value terms, as described earlier, has stabilised since 2008 (a growth rate of 0.39 % CAGR); however, it appears that there has been a large degree of retrenchment within the industry. Global trade in transformers decreased substantially since that time and has fallen by a rate of -2.07 % CAGR during the period 2009 to 2017.

It is interesting to note that the trade value in parts at 15.61 % CAGR growth during the period 2002 to 2008 was more nearly aligned with the transformer market (18.37 % CAGR) than with transformer trade at 26.66 % CAGR. Also during the period 2009 to 2017 trade in parts is the only segment to retain a double-digit growth rate of 17.47 % CAGR.

The trade in grain-oriented (GO) steel shows the most extreme variation in growth rates prior to and after the 2008 watershed. The trade value recorded growth during the period 2002 to 2008 was 33.31 % CAGR and from 2009 to 2017 the rate was -6.43 %. It is far from straightforward to interpret the reasons

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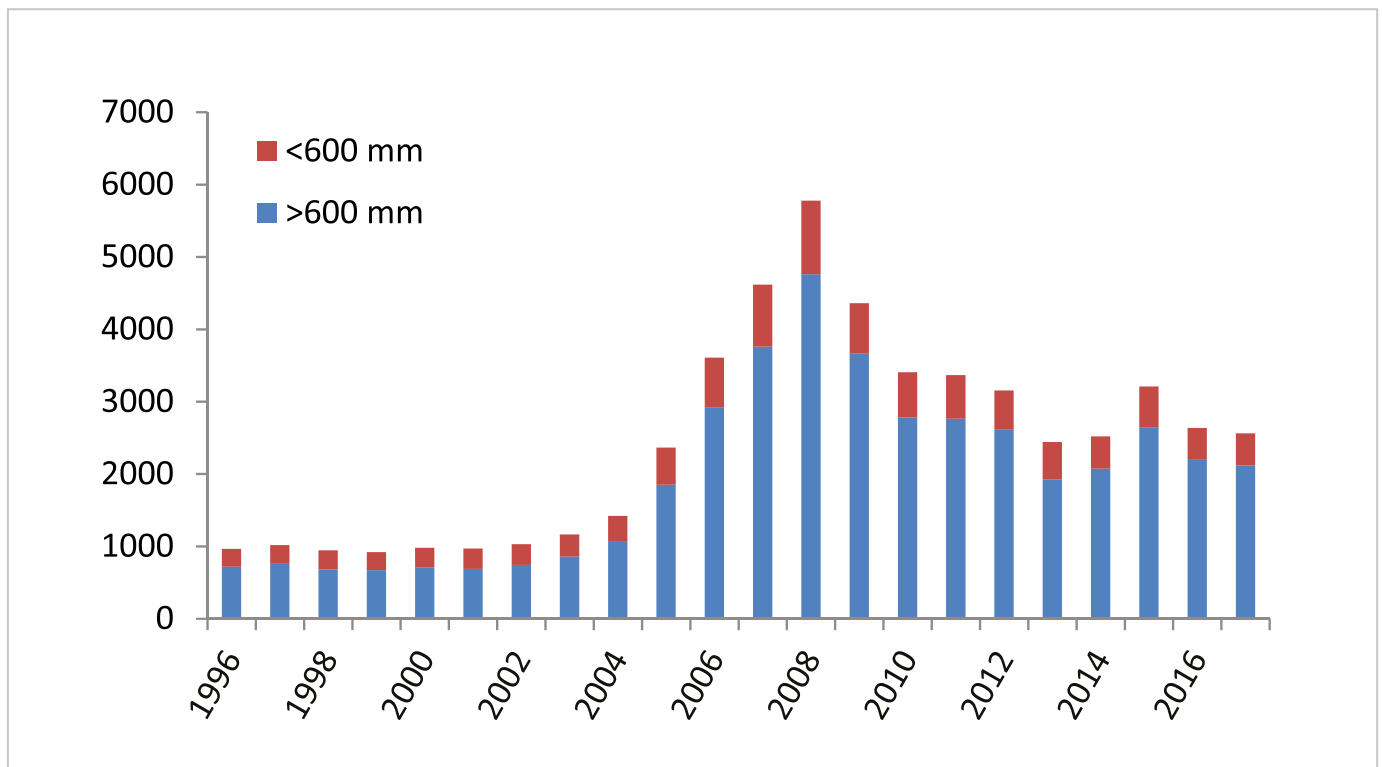


Figure 3. GO trade value 1996 to 2017 - US\$ Million

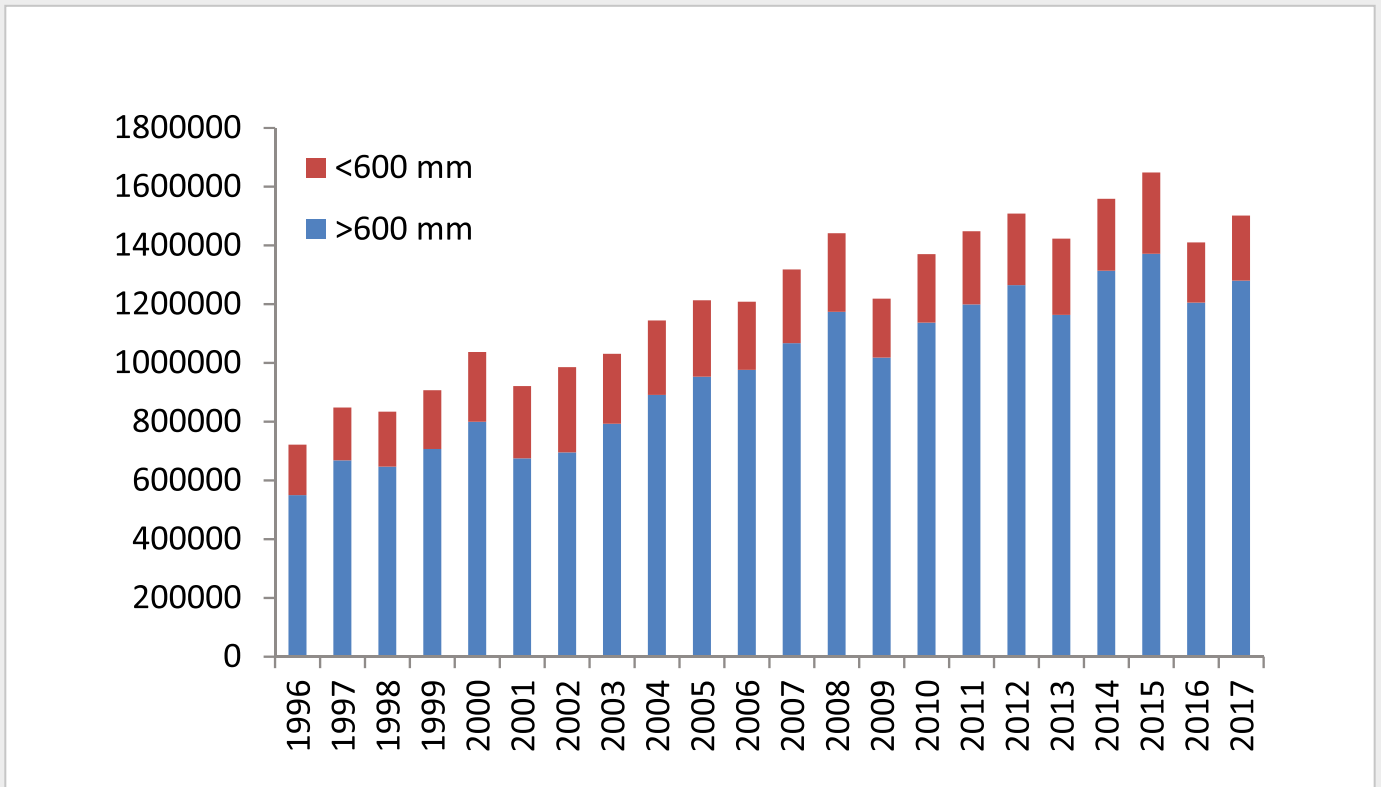


Figure 4. GO trade volume 1996 to 2017 - Tonnes

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behind these variations and the causal relationships that are at play. Pricing levels, manufacturing consolidation, changing standards and shifts in demand patterns may all impact on these statistics; however, the overall pattern is quite clear.

### 4. Real growth and inflation related growth

All of the statistics so far cited in this article are current U.S. dollar values and as such include inflation and are measures of market value rather than market volume – or real growth. Therefore, within the high growth rates experienced during the period 2002 to 2008 there is a volume and a value element.

The major constituent raw materials used in transformers are sheet steel, electrical steel, oil and copper, and it is worthwhile briefly looking at the pricing trends of these commodities during the period 2002 to 2008.

Flat-rolled steel was priced at about \$410 per tonne in 2002 and increased to \$780

per tonne in 2008. Copper price was in the order of \$1,600 per tonne in 2002, actually peaked at about \$6,000 per tonne in 2006, but was still in the order of \$5,000 per tonne in 2008 before falling to \$2,500 per tonne by the end of 2008. From the mid-1980s to September 2003, the inflation-adjusted price of a barrel of crude oil was generally under \$25/barrel. During 2003, the price rose above \$30, and peaked at \$147.30 in July 2008.

Therefore, oil price increased at 30.33 % CAGR, steel at 11.31 % and copper at 20.9 % CAGR over the period. These commodity price increases albeit offset by hedging, long-term supply contracts, etc. all contribute significantly to the large market VALUE increases noted above. And furthermore, all of these products are used in many application by many differing industry sectors.

As a case study, we can examine an easily identifiable commodity that is virtually exclusive to transformer production – GO steel. It is not necessary to go into any lengthy explanation as to the

product definition and an explanation of why it is used principally for transformer core laminations – no doubt these are well known to the readers of this publication. GO steel is a product with a fairly well-defined production base and a well-known market demand. Pricing levels are a completely different matter with commercial relationships and competitive factors pressures meaning that these are cards rightly played close to the chest.

We can, however, gain an insight into these issues by examining the global trade data where often export values are provided together with comparable volume data. This analysis is probably meaningless at a micro level, but aggregated to a macro level, it is highly indicative and comparable year on year.

### 5. Grain-oriented steel trade and price levels

Figures 3-5 illustrate the total global trade of GO steel from 1996 through to 2017 – firstly by value, then by volume, and finally in terms of dollars per tonne.

These figures clearly show the recorded value/volume comparison and the resulting price per tonne. The resulting cost per tonne in 2002 was \$1,044.00 and this

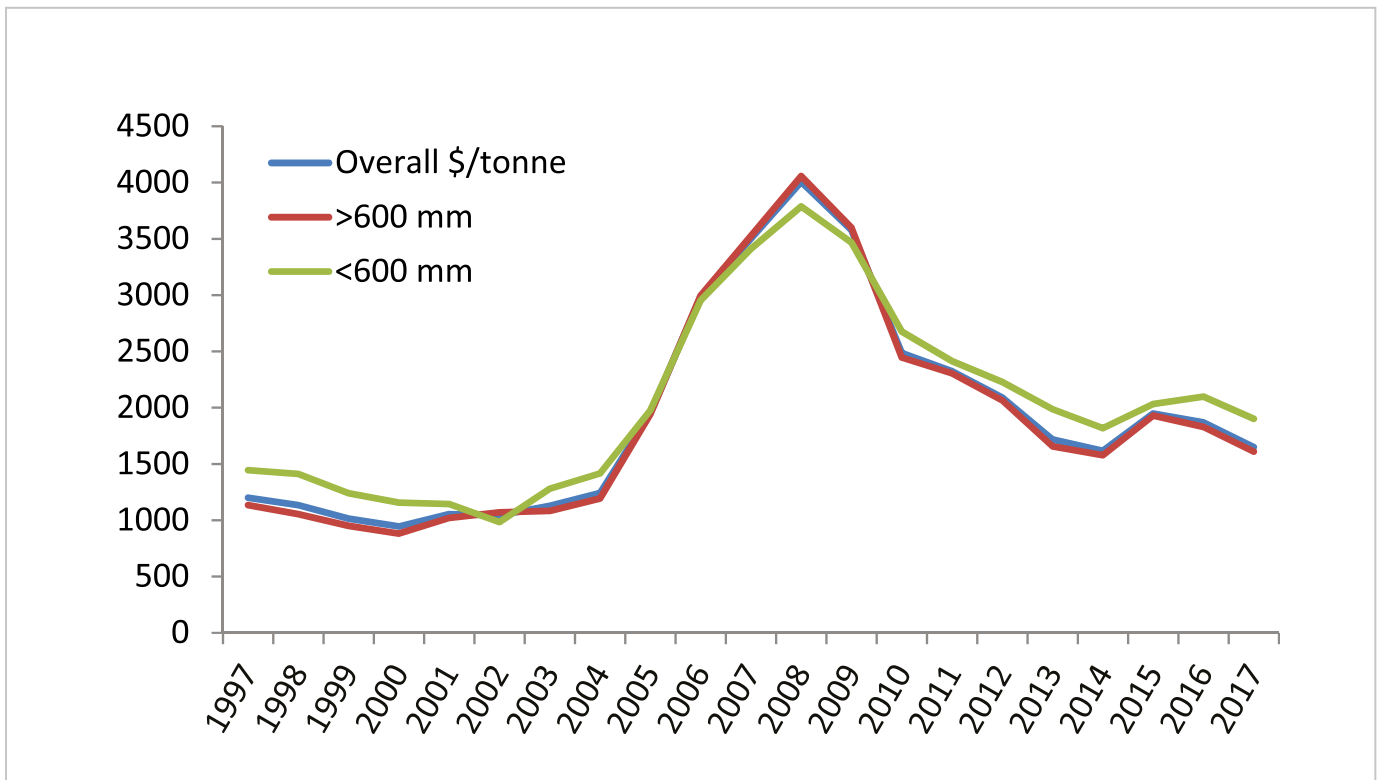


Figure 5. GO trade price levels 1996 to 2017 - \$/Tonne

increased to \$4,058 in 2008. This equates to a 25.1 % CAGR over the period, which illustrates the distorting affects of price variation on the volume to value equation. It is interesting to note that pricing levels are now trending back down to the levels that appertained 15 to 20 years ago despite a 50 % increase in the volumes traded.

Many reasons are put forward for the peaking in global commodity prices up to 2008, the principal of which is the extraordinarily high demand caused by economic growth in Asia. The markets in China and India are still running at rates that are envied by the rest of the world, but have eased back from those experienced in the 2000s and commodity prices have softened as a result. As this article is being compiled, the status quo has been jeopardised by the implementation of steel tariffs in the U.S., which has been greeted almost universally with horror outside of the U.S. Fears that this action may lead to a protectionist based trade war have unsettled governments around the world.

As a single action, the effects of a 25 % import tariff on steel imports into the USA may not be too damaging to the transformer industry worldwide. The current trade price is in the order of \$1,600 per tonne and if this is

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increased by 25 %, the resulting \$2,000 per tonne is still less than half of the rate pertaining in 2008, which should be easily containable. The U.S. demand for GO steel is in the order of 300,000 p.a.; imports and exports are roughly equal at about 30 % of that level, making the U.S. numerically self-sufficient. The major countries supplying U.S. imports of GO steel are Japan, Korea, Canada, Mexico and Russia – none of which supply more than 50,000 tonnes,

which indicates that this will be little more than an inconvenience for those suppliers. If the increase in steel price is passed on entirely in the sales price of U.S. manufactured transformers, this would push up the factory gate price by about 4 %, all of which tend to indicate that the pundits stating that countries implementing trade barriers tend to be the losers may prove to be correct. No doubt more will be written on this topic in the years to come.

### Author



**Steve Aubertin** is the Managing Director of Goulden Reports and following a first career in electrical engineering has spent the last 30 years researching and reporting on the global market for electrical products in both published and in the form of tailored research for specific clients.