

The Big Idea

Natural Rubber in the 21st Century

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Let's spoil the surprise and get to the end right here at the beginning. Natural rubber supply will rise to meet demand, and we will have what we need. Period. This market always finds a way to get back to equilibrium. Tappers seem to find new trees in times of high prices and will leave large swathes of trees unused during periods of low prices. Unfortunately, the devil is in the details, and they can get out of whack and cause headaches for everyone along the way.

Those who have spent time in the industry know that natural rubber is a "special" ingredient in our recipes. While the tendency is to refer to natural rubber as a commodity, there is hardly a company out there that does not demand the specifications of a manufactured raw material of its natural rubber suppliers. Rubber from one factory IS NOT deliverable against a contract of rubber from a second factory and vice versa. At this point alone, natural rubber ceases to be a commodity. Yet buyers expect commodity pricing day in and day out. For several reasons, this cannot continue.

Rubber 101

There are several requirements for growing and processing natural rubber that limit our global supply. These include:

- Climactic: Natural rubber can only grow in tropical rain forests.
- Geographic: These rain forests must be within 10 degrees of the equator to provide the proper seasonality for the heavea brasiliensis trees.
- Growing culture: Rubber trees take 7 years to mature and require sustainable agronomic practices to flourish.
- Test Lab Availability: Most consumers demand ISO certifications and that international laboratory standards be enforced in the middle of the jungle, far removed from major population centers.
- Labor: A skilled labor force is required to tap trees, in large numbers, at 3AM in the morning. Unskilled tapping of trees can kill them by either tapping the trees too frequently or cutting too far in to the bark of the tree.
- Infrastructure: A transportation infrastructure must be in place not only to take the raw material to the processing factory, but also to take the finished goods to a port for export to the United States.
- Financing: Banks must believe in, and be willing to finance the planting of trees and the building of factories in the producing countries.
- Export Facilities and Vessels: Producing countries must have sufficient ports and security infrastructure that will allow shipping companies to include their ports regularly in vessel rotations.
- Insurability: Insurance companies must be willing to insure vessels and cargoes from the ports of origin.

Any one of these factors can become THE item that limits the growth of natural rubber production areas.

In theory, West Africa could produce much more rubber, but the relative instability of many nation-states there immediately reduces the industry's access to financing, insurance, means of transportation and even a stable work force to tap the trees.

In the Americas, the single greatest hurdle to increasing production of natural rubber is the relatively very high cost of labor. Beyond that, the Americas also have issues surrounding the cost of land and the existence of leaf blight in Brazil, the ancestral home of today's rubber trees.

When all is said and done, the economic advantages to the world's production of natural rubber, a product we could not do without, is decidedly slanted towards Southeast Asia.



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Another interesting facet of global natural rubber production is the predominate religion in the production areas.

- Muslim dominated areas produce over 62% of global natural rubber.
- 90% of the natural rubber consumed in the United States comes from predominately Muslim producing regions including: Indonesia, Malaysia and Thailand. Note: while many of us think of Thailand as a Buddhist nation, over 75% of Thailand's rubber is produced in the south and, per the Thai embassy, "Muslims comprise Thailand's largest religious minority and are concentrated main in the southernmost provinces of Narathiwat, Pattani, Yala and Satun."² These are precisely the origins of most of Thailand's natural rubber production.

¹ Source: IRSG (International Rubber Study Group) Data

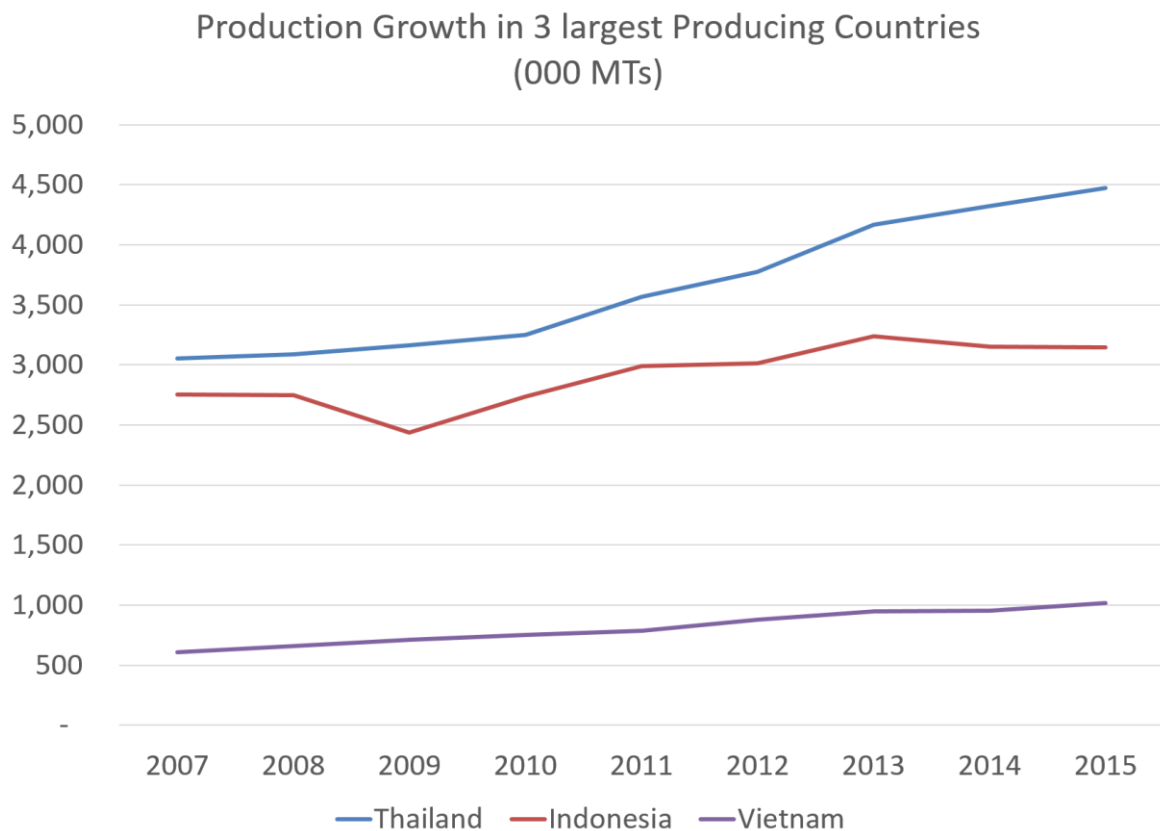
² <http://www.thaiembassy.org/riyadh/th/organize/29025-Muslim-in-Thailand.html>

Key Natural Rubber Price Leading Indicators

Managing the risk of any market starts with understanding the factors that affect production and consumption. Separated into production and consumption factors, we see the market as follows.

Production

- **Total Area Planted:** Vietnam increased plantings 7-10 years ago so we are seeing quite a bit of new production coming in to the market. In fact, roughly 35% of their current production areas are just starting to mature. Thailand also planted new acreage between 2005-2008 in northeast Thailand and those plantings, too, are just starting to produce latex. The higher prices in 2011-13 also spurred replanting in southern Thailand and this rubber will enter the market between 2018 – 2020.
- **Governmental Support:** Especially in very poor countries, government support of an industry can make or break that industry in the long run. Governments in Thailand, Malaysia and Vietnam assess an export tax on all exports and that money is reinvested in the industry. In the case of Vietnam, the government actively participates in much of the replanting of natural rubber. Indonesia has no governmental support of the rubber industry and the difference in production growth is substantial. Over the last 9 years, natural rubber production growth in Thailand is up 46%, Vietnam is up 68% and Indonesia is up only 14%.



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³ Source: IRSG (International Rubber Study Group) Data

- Labor Issues: As mentioned earlier, the cost of labor in Mexico and Guatemala is too high to increase natural rubber production. Likewise, in Indonesia we see rural workers leaving the countryside to take up more lucrative positions in construction in more densely populated regions. In Thailand, much of the rubber industry now relies on imported labor. This brings with it many challenges, one of which is that tapping trees requires a very distinct set of skills. Unskilled tappers can reduce yields and even destroy trees, which would take 7 years to replace.
- Agronomic Practices: The country with the soundest agronomic practices is likely Vietnam, where the government takes an active role in the planting of natural rubber and much of the country's production relies on raw material from plantations as opposed to smallholders. Indonesian smallholders supply over 83% of the industry's raw materials and there is very little information made available to the small farmers about best practices. Thailand has similar issues with information dissemination.
- Yields: Yields, generally expressed in terms of MTs per hectare, can be affected by many things. We saw prices shoot up in January of this year because of extreme monsoon rains in Thailand which decreased the overall production in the affected areas by 25%. Luckily the government of Thailand sold from their stockpiles to ensure that the market had the rubber it needed during the wintering period. Due mainly to its inexperienced labor pool, Thailand's natural rubber yields have dropped to 1.35 MTs per hectare from 1.6 MT per hectare. Vietnam leads productivity with 1.6 MTs per hectare and Indonesia weighs in at 0.84 MTs per hectare.
- Corporate Social Responsibility - The International Rubber Study Group (IRSG) is spearheading a Sustainable Natural Rubber Initiative (www.SNR-i.org). The objectives of this initiative include the following:
 - Promoting the development of best sustainability practices in the natural rubber sector globally.
 - Supporting the improvement of natural rubber plantations' productivity.
 - Enhancing natural rubber quality.
 - Supporting forest sustainability through the protection/conservation of protected areas.
 - Demonstrating appropriate water management
 - Demonstrating the highest respect for human and labour rights.

Consumption

It is much easier for this audience to understand the demand side of the natural rubber equation because over 75% of natural rubber is consumed by the automotive industry. We regularly hear updates on auto sales in the daily news. Experts in the industry agree that overall natural rubber demand will grow between 3 and 3.2% over the next 18 months.

At the end of 2016 China surprised the market with a higher annual consumption number than expected and that strong demand has continued into the first quarter of 2017. China's population is roughly 4.24 times that of the United States and their overall automobile ownership level is much lower than that of the United States, so the overall potential for growth in China is higher than in the US.

The US automotive industry had a good year in 2016 and as of the end of February, they expected similar numbers to continue through 2017 and maybe in to early 2018. We do see demand topping out

in 2018 as driving habits shift and we see more reliance on ride sharing models such as Uber, Lyft, etc. We see General Motors entrance in to the ride sharing market as Lyft as confirmation that ride sharing is expected to grow in the USA.

External Factors

Several “non-rubber” factors come to play in the natural rubber price arena on a regular basis. We need to keep our eyes on the following.

- **Climate Change:** The extended monsoon season in Thailand this year cost the market roughly 25% of the annual production. This caused a price disruption of 34% in 47 days. The heavy rains not only prevented collection of the latex for production, but also damaged the transportation infrastructure of the producing areas.
- **Oil and Copper Prices:** Although there is not an established relationship between natural rubber prices and those of crude oil and copper, what happens in those markets does affect natural rubber prices. In general, a bullish oil market will raise natural rubber prices and vice versa. On the copper side, the movements in copper and natural rubber often mirror each other because they are both components of building or repairing the infrastructures of countries.
- **Non-Market Inventories:** In natural rubber we see governmental entities building and selling inventories to try and regulate prices. As result, it is sometimes difficult to calculate the true amount of rubber inventories available. A miscalculation of this number can result in erratic price swings.

Risk Management

As the supply and demand scenarios are roughly in balance, responsible risk management centers around different aspects of the market including:

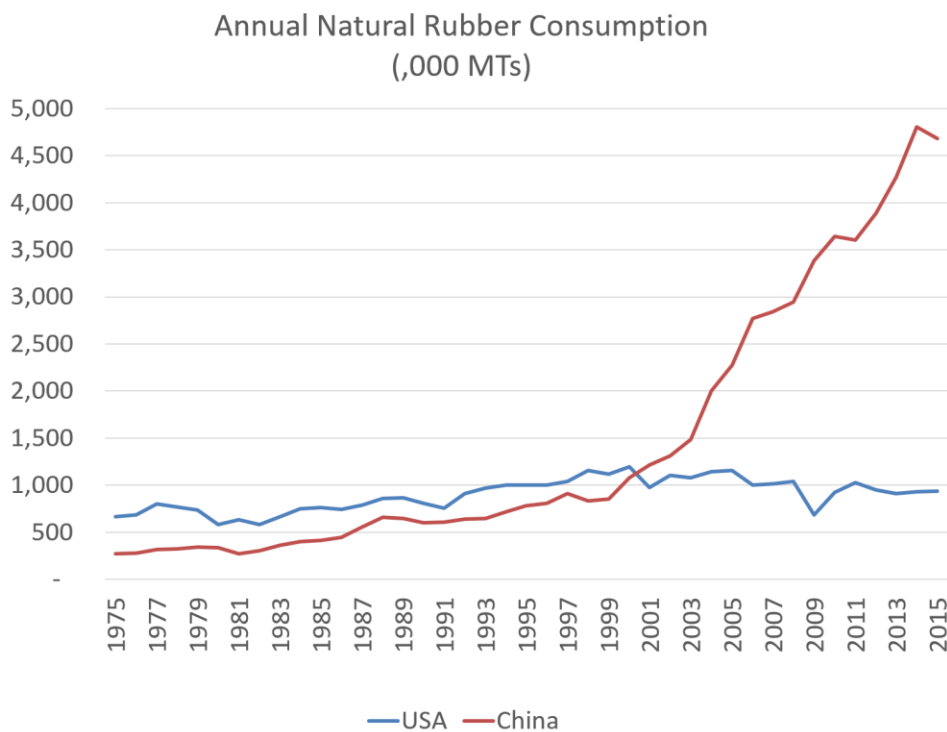
- Assuring inventories are warehoused in North America to provide continuity of supply in the face of:
 - Shipping delays in the 15,000 mile supply chain, and
 - Production disruptions at origin,
 - Changes in plant raw material demand,
 - Any other unforeseen supply chain issues
- Diversification of supply chain logistics, and
- Properly timing purchases with respect to end consumer sales. Producers have the ability to sell customers on a forward basis that completely hedges the consumers risk on forward sales to their customers.

Conclusion

In closing, over the last 10 years, I have come away from the proceedings of the Pressure Sensitive Tape Council with the impression that this is an intelligent group of individuals. A group that looks past the limitations of today and dreams about what the future will look like. A group that values innovation and progress. I want to leave you today with a big question to think about.

First, it is important that the United States of America not cede our position as the leader of free trade in the world. I took care not to mention politics in our overview of natural rubber, because commerce has traditionally overcome political debates. The only time that politics disrupted the natural rubber market was during WWII when the Axis blockaded southeast Asian waters. The resulting shortages of natural rubber stunned and slowed the US economy. In response, the US government declared natural rubber a strategic commodity and we built stockpiles in the 1950's. After decades of global peace, these stockpiles were sold off in the 1990's. No big inventories of natural rubber exist in the USA today.

For about 50 years, the USA consumed more natural rubber than any other economy in the world. This changed dramatically in 2001 and China realized their aggressive 5-year development plans and their consumption of natural rubber is today more than four times that of the United States.



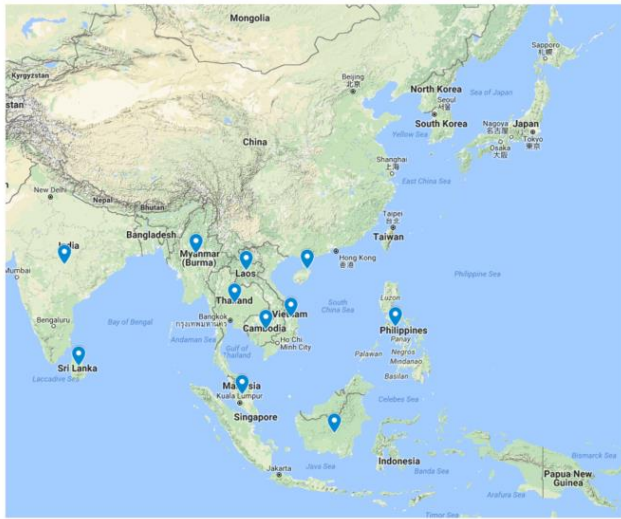
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Recent headlines across the globe paint a picture in which China is the defender of free trade and global markets while the US turns itself inward, away from the rest of the world. In January, The Guardian of London posted a story with the following headline: “China’s president, Xi Jinping, has delivered a strong defence of globalisation, serving notice to Donald Trump that Beijing will seek to usurp America’s traditional role as the champion of free trade and open markets.” (Wearden, 2017)⁵

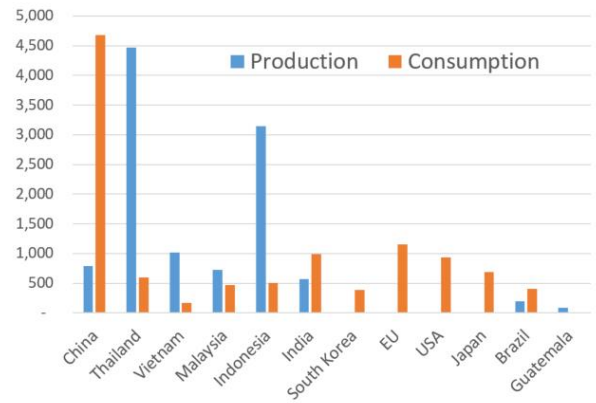
Consider the following graphic display of natural rubber supply and demand.

⁴ Source: IRSG (International Rubber Study Group) Data

⁵ <https://www.theguardian.com/business/2017/jan/17/china-xi-jinping-china-free-trade-trump-globalisation-wef-davos>



Natural Rubber S&D Key Countries (1,000 MTs)



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Ceding hegemony in SE Asia to China and potentially starting a trade war would not be a good idea for any country in need of natural rubber. Cars, trucks, trains and planes cannot be made with synthetic rubber alone. Such a country, would pay more for everything.

By the same token, China is not our enemy in the sense that it seeks to destroy us: their economy relies on US exports too heavily for that. However, if 92% of the world's natural rubber production falls under China's sphere of influence, US industries that rely on natural rubber for their products will struggle to maintain a reliable and consistent supply, and the ramifications of that could be serious indeed.

⁶ Source: IRSG (International Rubber Study Group) Data