

## **POLICY-DRIVEN CAUSES FOR COTTON'S DECREASING MARKET SHARE OF FIBRES**

### **D. Ethridge**

*Fiber & Biopolymer Research Institute*

*Texas Tech University*

*Lubbock, Texas USA*

### **ABSTRACT**

Cotton's losses in market share of fibres have accelerated since the early 1990s, and especially since the mid-2000s. This acceleration has been caused largely by the mix of governmental policies that have evolved along with the emergence of and developments paralleling the World Trade Organization (WTO). These developments were the primary cause for the following realities:

- Between 1990 and 2013, cotton's share of the global fibre market decreased from about 50% to about 28%.
- During the decade of the 2000s, global textile manufacturing capacity has grown about 4 times faster than global population.
- China alone accounted for about 97% of this global growth in textile manufacturing capacity.
- The Asian subcontinent now accounts for about 86% of global textile manufacturing capacity.
- Four countries – China, India, USA, and Pakistan - account for about over 70% of world cotton production, with China and India each accounting for about one-fourth of world cotton production.
- The USA, world's largest cotton exporter and the only one of the 'big 4' producers that is a reliable exporter, has a decreased share of world cotton production.
- China is withholding about 27% of the total world supply of cotton from the market.
- Growth in global polyester production has resulted in it being the only fibre to gain market share since 1990.
- As a share of total man-made fibre production worldwide, polyester has increased from about 45% in 1990 to about 77% in 2015.
- World production of polyester is 44% larger than world cotton production.
- Growth in global polyester production capacity has far outpaced growth in polyester consumption, resulting in unutilized capacity exceeding 30%.
- China is overwhelmingly responsible for the excess polyester capacity; its share of global capacity has grown from less than 13% to more than 71%.
- China is producing more than three-fourths of world polyester production.
- China alone is producing almost one-third more polyester than the entire world production of cotton.
- Using average prices over the last 5 years:
  - China's domestic price of cotton is about 59% above the world price of cotton.
  - China's domestic price of cotton is about 83% above its domestic price of polyester.
  - Other Asian countries pay a premium of about 11% for cotton over polyester.

These are primarily policy-driven, rather than market-driven, realities. The policies that have developed over the last two decades were made possible by actualization of the World Trade

Organization (WTO) – and especially by China’s accession in 2001 to full membership in the WTO. China’s subsequent dominance in both fibre and textile production was driven by central government policies, which gave it hegemonic leverage over global competition between cotton and polyester, and which it used in a manner to effectively increase polyester’s share of the market. While the results enumerated above have distorted trade in both fibres and textiles, the policies producing these have not been treated as actionable by the WTO.

Other policies that have functioned to decrease cotton’s market share include U.S. ethanol policy, U.S. cotton policy, India’s cotton prices and cotton export regulations, etc. But the effects of these have been minor in comparison to the effects of the policy developments since China joined the WTO.

## Introduction

The story of cotton’s decreasing global market share parallels the history of the World Trade Organization (WTO), which was expected to become reality during the early 1990s, was actualized in 1995, and which saw the accession of China to full membership in 2001. The global volume of cotton consumption reached its apex in 2007 and has trended down since. Figure 1 shows the volumes of the major textile fibres consumed since 1990. Total fibre consumption has increased every year except the global recession year of 2008, growing from 37.9 million tonnes in 1990 to 89.7 million tonnes in 2015, an average increase of 2.1 million tonnes per year. Over this same period, cotton consumption has increased from 18.6 million tonnes to 24.7 million tonnes, for an average increase of 244 thousand tonnes per year. However, cotton consumption peaked at 26.6 million tonnes in 2007 and has since exhibited an average decrease of 238 thousand tonnes per year.

Figure 2 expresses the fibre consumption as shares, which makes obvious the downtrend in cotton’s share. Figure 3 compares the shares in 1990 with those in 2015. Cotton’s global market share decreased from 49.1% to 27.6%. Furthermore, all categories of fibres other than synthetics lost market share, as the synthetics’ share increased from 39.3% to 65.4%. Cotton is the only category of natural fibres that remains a bona fide mass-market fibre; however, this status is threatened by the precipitous loss of market share in recent years.

The premise of this paper is that the dominant cause of cotton’s market-share losses is the combination of government policies around the world – and especially in China and the Asian subcontinent – following China’s accession to the WTO. To examine the evidence for this, the cumulative and interactive effects of policy impacts on four market dimensions will be examined. These are the Following:

- Impacts on global textile manufacturing capacity
- Impacts on global cotton supply
- Impacts on global polyester supply
- Impacts on pricing competition between cotton and polyester

The developments in each of these dimensions separately are remarkable. But the outsized impact on cotton’s market share is explained by the synergy generated from the cumulative and interactive effects among China’s policies regarding each one. Before considering each

one of these dimensions, a brief explanation of the cause-and-effect of China's policies is useful.

### China's Methods for Pursuing Its Policy Choices

China's approach regarding manufacturing capacity, cotton supply and polyester supply has been primarily at the structural level.<sup>1</sup> The central government has manipulated the financial and legal levers of power to enable an unprecedented 'explosion' of infrastructure.<sup>2,3</sup> The processes have been unimpeded by considerations of return on investment, cost of capital, opportunity costs, etc. Much of the manufacturing capacity consists of state-owned enterprises. Metrics that have normally been used to manage such processes in open-market economies were generally irrelevant in China. Policies such as zero-cost capital, forgiveness of debt, repeated infusions of government-controlled funds to cover operational costs, restriction of currency outflows, etc. have been very effective in making China extraordinarily dominant in both fibres and textiles since the early 2000s.

Additionally, excesses enabled by the central government policies were magnified by added excesses of provincial governments that were not sanctioned by national authorities. Governments at all levels in China are preoccupied with avoiding any sense of instability, which has made them resistant to adjustments in policies that appear to risk bursting economic 'bubbles'.<sup>4</sup>

Regarding cotton infrastructure, China's government has financed and overseen the development of large-scale, government-controlled cotton production in the western province of Xinjiang, which now produces over two-thirds of China's cotton. In a correlated initiative, additional textile manufacturing capacity is being added in Xinjiang and labourers are being

---

<sup>1</sup> Policy aspects of economic cause-and-effect may be analysed within a structure-conduct-performance paradigm. Thus, the structural realities determine how economic agents conduct their activities, which in turn determines how a firm/sector/market/economy performs. It follows that government intervention at the structural level is the most durable way to control the conduct of people, and this conduct will ultimately determine the performance (outcomes) of an economic unit or system. For example, government intervention to provide zero-cost capital to an industry will accelerate the proliferation of capital. The wisdom of such a policy notwithstanding, the conduct of affected industries (over-investment in capital equipment) and the performance (excess production) is not in doubt. Furthermore, leveraging into existence durable capital structures, machinery and equipment tends to leverage the conduct and performance for long periods of time into the future. A major treatment of the Structure-Conduct-Performance paradigm is given in *Industrial Organization: A Treatise*, Joe S. Bain, 1959, 2<sup>nd</sup> ed., 1968, John Wiley. A simple primer is available at "Structure, conduct, performance paradigm," *Policonomics*, <http://www.policonomics.com/structure-conduct-performance-paradigm/>.

<sup>2</sup> This is China's modus operandi for virtually all the industries targeted by the government, from steel to textiles to semiconductors. See, for example, "Chips on their Shoulders," *The Economist*, January 23, 2016.

<sup>3</sup> Information on the extent of financial leverage that has been used to expand infrastructure is provided in "The Great China Ponzi—An Economic and Financial Train Wreck Which Will Rattle the World," David Stockman, August 16, 2015. <http://davidstockmanscontracorner.com/>.

<sup>4</sup> See the following at <https://www.stratfor.com/>:

"China: No Easy Cure for Local Governments' Addiction to Real Estate Revenue." *Stratfor*. October 16, 2015.

"China's Crisis: The Price of Change," Roger Baker, *Stratfor*, August 18, 2015.

"The State of the World: Assessing China's Strategy," George Friedman, *Stratfor*, March 6, 2012.

"China Political Memo: A Crisis over Private Lending?" *Stratfor*, September 25, 2011.

"China's Struggle to Reform the Steel Industry," *Stratfor*, June 20, 2012.

relocated from eastern provinces to work in the industry there. These developments are to be understood in part as a method of pacification of a recalcitrant region of the country.<sup>5</sup>

Policies affecting the last dimension listed above – pricing competition between cotton and polyester – have included both leveraged infrastructure and domestic price controls. Thus, data show that the Chinese government has made over-capacity of polyester production a de facto policy. Regarding cotton, the Chinese government has promulgated an extended suspension of global prices within its borders – an obvious subversion of the price system that disrupts orderly, open-market commerce. Other countries also engage in price interventions, but the distortions of market prices have generally been relatively small compared to China.<sup>6</sup>

No doubt China's government would insist that all of its interventions in the fibres and textiles sectors are not a legitimate concern of other governments. But China's accession to full membership in the World Trade Organization (WTO) in 2001 made it inevitable that these interventions would greatly distort global cotton and textile markets. To date, other governments have not pressed these issues within the WTO.

This study does not delve deeply into the details of China's government policies; the lack of transparency would make this a very substantial study – and undertaking it would inevitably involve much guesswork. The extent of the accumulated distortions is so great that, to a significant degree, the results 'speak for themselves'. The focus of this report is on results of enabling these distortions over the past twenty years.

## Manufacturing Capacity

Using data from the International Textile Manufacturers Federation (ITMF), Figure 4 shows the installed capacities of ring spindles around the world at decade intervals since 1960, along with the most recent available data for 2013.<sup>7,8</sup> It shows a 'rupture' in the growth of spinning capacities during the decade of the 2000s. Capacity growth increased at an average annual rate of 1.1 million tonnes between 1960 and 2000, but then averaged an increase of 7.6 tonnes per year during the decade of the 2000s. This is a nominal 7-fold increase in the growth of capacity. In reality, however, it is even larger than this, because of the increase in output per spinning position that occurred during the decade. Spinning technologies reached new plateaus of productivity by the late 1990s, and these more productive machines were shipped and installed during the 2000s.

Implications for excess capacity are made clear in Figure 5. It shows that, while the population increased 12.6% during the decade, the spindle capacity increased 45.1% – before accounting for the increased output per spindle. This magnitude of excess capacity generation is unprecedented in modern history. It is far larger than can be explained by increases in global population or income levels. It obviously occurred without an economic basis; rather,

---

<sup>5</sup> See "China's Ambitions in Xinjiang and Central Asia (Parts 1, 2 & 3)," *Stratfor*, September 30, October 1, October 2, 2013. <https://www.stratfor.com/>. See also "Chinese Gov't to Invest \$1.6 Billion in Xinjiang's Textile Industry," Ivan Kenneally, *Sourcing Journal*, April 1, 2014. <https://sourcingjournalonline.com/>.

<sup>6</sup> For information on market interventions by governments of cotton producing countries, see "Update to Foreign Crop Subsidy Database, 2014-2015," Darren Hudson, November 12, 2015. <http://www.depts.ttu.edu/cei/assets/pdf/database.pdf>.

<sup>7</sup> From data provided by Brian Mandt, ITMF.

<sup>8</sup> See "International Textile Machinery Shipment Statistics," ITMF, Volume 37 / 2014.

it was made possible by government policies that enabled financing and other incentives for such an explosion of new production capacity.

Examination of Figure 4 reveals that this excess capacity is concentrated in China and other Asian countries. China increased its capacity by 158% during the 2000s and the rest of Asia (India, Pakistan, and ‘Other Asia’) increased capacity by 22.6%. The non-Asian sectors of the world taken together actually decreased capacity by 28.1%. During the decade of the 2000s, China alone accounted for 96.5% of the global increase in textile manufacturing capacity. This overwhelming dominance of global capacity positioned China to exercise significant oligopolistic power when the Multi-Fibre Agreement was ended in 2004.<sup>9</sup> It exercised this power in a manner to further increase its share of the global textile market.

Between 2010 and 2013, China’s capacity decreased slightly (Figure 4), but the rest of Asia offset China’s decrease, so that the Asian subcontinent maintained an 86% share of global spinning capacity in both 2010 and 2013 (Figure 6).

All of Asia accounted for 91% of global shipments of new ring spindles in 2014.<sup>10</sup> Therefore, the pace of growth in the Asian sector relative to the rest of the world is not yet slowing. Many of the new shipments outside of China were to Vietnam, Indonesia, and Bangladesh. Figure 7 shows the shares of shipments of ring spindles in 2014 among these three countries versus all Asian countries except China. Vietnam accounted for 38.2% of new shipments and Bangladesh for 17.8%. These two countries are the latest ‘hot spots’ for new textile manufacturing. It is safe to assume that the shipments to these two countries represent a corresponding increase in capacity, because few if any of the existing spindles will be replaced. Some replacements are likely occurring in Indonesia, where the industry is older and is struggling to become more efficient.

Ring spinning is the dominant spinning technology around the world, but open-end rotor spinning is also significant. A rule-of-thumb is that each rotor position produces about ten times the amount of yarn that each ring spindle produces. Using this approximation, Figure 8 shows global spinning capacities in 2013 in terms of spindle-equivalents. Adding in the open-end rotor capacities does not alter conclusions regarding the distributions of global capacities. The estimated global capacities in 2013 are as follows:

Ring spindles:	244,338,356
Rotor spindle-equivalents:	83,391,520
Total capacity:	<u>327,729,876</u>

The implication of these data is that the global spinning capacity divides into approximately 75% ring spinning and 25% rotor spinning. These shares have changed little in recent years.

Installed production capacities are the most rigid and uncompromising of structural factors that determine the conduct and performance of an industry. The overwhelming dominance of

<sup>9</sup> An oligopoly market structure exists when the market is dominated by a small number of sellers. It is applied here in the context of countries rather than firms. The Multi-Fibre Agreement (MFA) divided import quotas among countries, so that every country with a quota had a guaranteed share of markets in the developed countries. The termination of the MFA removed these guarantees.

<sup>10</sup> See “International Textile Machinery Shipment Statistics,” ITMF, Volume 37 / 2014.

China and the Asian subcontinent in yarn spinning capacities ensures that these industries have outsized leverage on decisions about which fibres are used to make yarns.

Consumer preferences in the developed markets of the world can ‘pull’ cotton fibres through the marketing chain to a limited extent. But this capability applies primarily for the developed markets and only if consumers in these markets are willing to actively discriminate in favour of the preferred fibres. In the less developed markets throughout Asia and the rest of the world, consumers will be much more price sensitive and for a variety of reasons cannot exert much pressure on the textile manufacturers to choose a fibre that is not the most advantageous in their production cost budgets.

It follows that when a few countries control the world’s production capacity, their policies regarding the competing fibres in these countries have substantial leverage to determine which fibres gain in market share over time.

### **Cotton Supply**

It must be emphasized that production is not necessarily the same as supply; this is certainly true for cotton. With regard to cotton production, Figure 9 shows data covering the 25 marketing years of 1990/91 through 2014/15.<sup>11</sup> Data is provided for the top 8 cotton producing countries in the world and for all the remaining countries as a group. Over the entire period, the top 8 countries averaged producing 83% of the total world crop. Over the past decade, these 8 countries have averaged producing 87% of the world crop.

Figure 10 shows how production shares among these top 8 countries have changed over the 25-year period. India’s share increased dramatically, going from 13.3% in 1990/91 to 28.8% in 2014-15. The greatest decreases occurred in the United States and in Uzbekistan, but of the other 6 countries only Brazil exhibited a small increase in share. Furthermore, the trend in Brazil’s share has been flat for the past 8 years.

India’s cotton yield put its production on a higher yield trajectory during the mid-2000s, based significantly on the adoption of genetic engineering technology that alleviated yield losses from insect damage. Combined with the largest amount of land devoted to cotton production among all cotton producing countries, the result has been to bring India’s production to approximately the same level as China’s in 2014/15.

The 4 largest cotton producing countries are China, India, USA, and Pakistan; just these countries accounted for about 72% of the world’s cotton production in 2014/15. Among these countries, only the USA contributes consistently towards global exports of cotton. Figure 11 shows these export shares in 1990/91 versus 2014/15. The USA remains the world’s largest cotton exporter; it has generally held a 30-35% share of the total. China and Pakistan have never exported large amounts of cotton and the negligible amounts in 2014/15 are typical. Neither has India historically exported large amounts of cotton, but these have increased since the larger crops have enabled India to reliably produce an exportable surplus of cotton.

Primarily as a result of agricultural policies, India’s textile industry is encouraged to focus on cotton consumption. However, the Indian government has a perverse tendency to disallow cotton exports whenever world cotton prices are high, due to pressure to keep abundant

---

<sup>11</sup> See “Cotton: World Statistics,” ICAC, December 2015.

supplies available to the domestic manufacturing industry. Thus, instead of selling into rising prices, India tends to withhold export sales, thereby exacerbating price volatility. Over time, volatility in prices damages cotton's market share versus competing fibres.

Obviously, developments that further reduce U.S. cotton production would restrict the availability of cotton to those textile sectors that lack a domestic supply of cotton, thereby contributing to the loss in cotton's market share. U.S. policy that heavily subsidizes ethanol production and mandates the use of ethanol in gasoline emerged in the 2000s. This resulted in substantial land area previously devoted to cotton being shifted to the production of oilseeds and grains. Recently passed legislation has removed 'safety net' provisions in farm policy that continue to be available to the oilseeds and grains; this will further suppress the land area devoted to cotton in the years ahead. Therefore, U.S. policies have contributed toward reductions in the global supply of cotton. Over time, reduced supply by the world's largest exporter guarantees reduced consumption.

The global supply situation is best understood by dividing the total supply into the part that is sold into the market and the part that is held off the market. By definition, total cotton supply in a given year consists of beginning stocks plus production, while cotton held off the market is the ending stocks. This is illustrated in Figure 12 for the world excluding China (rest of world, or ROW), over the marketing years 1990/91 through 2014/15. The quantity of cotton withheld from the market is fairly well behaved; it averaged 30.9% of the total supply over the 25-year period and it has averaged 33.6% over the most recent 5 years.

The situation is quite different for China. Cotton withheld from the market averaged 44.2% of China's supply between 1990/91 and 2010/11, but has averaged 55.2% since 2011/12. As shown in Figure 13, the quantity withheld from the market increased drastically in marketing year 2011/12. This occurred as the rest of the world sold stocks down to low levels and cotton prices spiked to historically high levels; it was the year in which the industry was traumatized by '2-dollar cotton' (meaning some cotton was sold for \$2.00 per pound).<sup>12</sup> The quantity of cotton withheld from the market by China ballooned from 2.1 million tonnes in 2010/11 to 6.1 million tonnes in 2011/12. This has continued each year since, going to 9.6 million tonnes in 2012/13, 12.1 million tonnes in 2013/14, and 12.7 million tonnes in 2014/15.

This behaviour is due to Chinese government policy that is unrelated to market signals and it has disconnected the global market for cotton from the existing supply of cotton. It has reduced the global supply of cotton available to the market (i.e., shifted the global supply curve to the left), which has reduced the equilibrium quantity consumed of cotton. This reduced equilibrium will persist until China reverses these policies.

## **Polyester Supply**

Polyester dominates man-made fibre production to such an extraordinary extent that an evaluation of competition between synthetics and cotton devolves into an evaluation of competition between polyester and cotton. Figure 14 uses data from PCI Fibres to separate total man-made fibre production (which includes both synthetic and cellulosic fibres) between polyester and 'all other man-made fibres'. Between 1990 and 2015, global polyester production increased from 8.7 to 48.0 million tonnes. Meanwhile, all other man-made fibres

---

<sup>12</sup> India also contributed to the restriction of the cotton supply by disallowing cotton exports during the highest-price months of the marketing year.

increased from about 10.5 to about 14.7 million tonnes. As a result, polyester's share of the total increased from about 45% to about 77% (Figure 15).

Polyester is the only textile fibre that has gained market share; i.e., every other fibre's share of global fibre consumption decreased over the period analysed. Furthermore, polyester gained market share in all major categories of end uses; i.e., apparel, home furnishings, and technical textiles.<sup>13</sup> The competition between polyester and cotton is where the impacts from China's policies become critically important.

Global production capacity for polyester has increased more drastically than has production, with most of the growth occurring in China. Between 1990 and 2015, global production capacity for polyester fibres increased from 10.4 to 69.4 million tonnes. Figure 16 divides this growth between China and the rest of the world. It shows that China's production capacity increased from 1.3 to 49.6 million tonnes, while capacity in the rest of the world increased from 9.1 to 19.8 million tonnes. The result is that China's share of the world production capacity for polyester fibres increased from 14.5% to 72.3% (Figure 17).

That China's capacity increases have not been driven by market-based conditions is indicated in Figure 18, which divides the world capacity for polyester into actual production and the unutilized capacity.<sup>14</sup> It shows that, while actual production has increased from 8.7 to 48.0 million tonnes, the unutilized capacity has increased from 1.7 to 21.4 million tonnes. As a result, global unutilized capacity has increased from 16.7% to 30.8% (Figure 19). This should be understood as a lower bound of the excess capacity, because of production at levels where revenues do not cover the total costs of production.

China's actual production of polyester in 2015 is estimated by PCI Fibres at 33.3 million tonnes. Using this estimate, the fibre production situation in 2015 may be summarized approximately as follows:

World polyester production = 48.0 million tonnes  
 China polyester production = 33.3 million tonnes  
 World cotton production = 26.1 million tonnes  
 China cotton production = 6.5 million tonnes

The situation is such that:

- World production of polyester is 44% larger than world cotton production.
- China is producing almost 70% of world polyester production.
- China alone is producing almost one-third more polyester than the entire world production of cotton.
- China is producing about one-fourth of world cotton production.
- China is withholding that country's cotton production from the market, greatly reducing the global supply of cotton.

---

<sup>13</sup> Explaining the outsized growth in polyester requires accounting for its use in technical textiles. According to PCI Fibres, only 50-60% of polyester staple is used in spinning, with the rest of it going into technical textiles using other processing technologies. Furthermore, about two-thirds of polyester production is currently in the form of filament yarns, rather than staple fibres, and a large portion of these filaments goes into technical textiles. However, these realities do not negate the fact that cotton has lost market share to polyester in those textiles that have long been served by cotton.

<sup>14</sup> From data provided by PCI Fibres.



Since the first four realities reflect great structural imbalances in the global fibre industry – and since fibres are the raw input into all the subsequent textile manufacturing processes – they predetermine to a significant extent which fibres are used in making textiles. China’s withholding of its cotton supply from global markets is not structural in nature; rather, it is a policy directly regulating market conduct. This issue is explicitly treated in the next section.

## Price Competition

The foregoing dimensions of policy-caused distortions are inevitably manifested in market prices, even if no additional policy measures were focused directly on these prices. Thus, policy intervention to create sunk-cost, durable production facilities may distort market prices over decades regardless of market signals. But governments also may intervene directly to distort market prices as the method of achieving policy objectives. The most egregious example of direct intervention in recent years has been China’s regulation of domestic cotton prices.

Figure 20 shows annual cotton prices in the top 4 producing countries (China, India, USA, and Pakistan) from 2007/08 to 2014/15.<sup>15</sup> It shows that prices in India, Pakistan, and USA are grouped closely together, so that these prices have moved based on global market-based factors. India’s domestic pricing policies have generally kept these at a small premium to the world prices, but not by much. But China’s administered cotton prices have been far above global market prices. Since 2010/11, the cotton prices in China have averaged \$3.06 per kilogram (\$3.06/kg), while prices in the other three countries have averaged \$1.93/kg. The difference is \$1.13/kg, which means that domestic cotton has cost the textile manufacturing sector about 59% more in China.

In contrast to China’s directly administered, inflated prices for cotton, the large excess capacity in polyester production has put great downward pressure on these prices. Figure 21 compares the domestic cotton prices with domestic polyester prices in China. Since 2010/11, the average cotton price of \$3.06/kg compares with an average polyester price of \$1.67/kg, a premium for cotton of 83%.

In an industry that functions on razor-thin margins, this gives an overwhelming cost incentive to substitute polyester for cotton. Unless global textile buyers absolutely require that cotton fibres be included in the textile products they want, it is probable that Chinese textile manufacturers would stop using any cotton that must be sourced domestically. This explains the large imports by China of cotton yarns in recent years, because these cotton yarns cannot be produced competitively in China and the industry is using the yarns to fulfil contracts requiring cotton fibre content. It also explains efforts by some Chinese manufacturers to establish production capacities in other countries.<sup>16</sup> The Chinese firms that remain in country are likely to increasingly focus on the domestic market,<sup>17</sup> which means these will also likely focus on the use of polyester fibres.

<sup>15</sup> Prices from “Emerging Textiles.com.”

<sup>16</sup> See, for example, “Stung by Local Cotton Prices, Chinese Yarn Makers Go Global,” Dominique Patton and Lewa Pardomuan, *Reuters*, January 14, 2014. See also “Chinese Textile Companies Set Up Shop on US Shores,” *Sourcing Journal*, August 4, 2015. <https://sourcingjournalonline.com/>.

<sup>17</sup> See “Chinese Manufacturers’ Alleged Relocations: A Wild Goose Chase?” Michael Flanagan, *Sourcing Journal*, April 20, 2015. <https://sourcingjournalonline.com/>.

The price incentive to substitute polyester for cotton extends to the other Asian countries. On average cotton prices in these countries have been at about an 11% premium to the polyester prices. The fact that much of China's cotton yarn imports have come from India, Pakistan, and even the U.S. is because these countries have large domestic supplies of cotton and do not use policy to discriminate against cotton. Also, the new global 'hot spots' of textile manufacturing – Vietnam and Bangladesh – have emphasized cotton in order to compete with China and become established global suppliers.

There is also a significant discrepancy between polyester prices in the USA relative to those in Asia.<sup>18</sup> Figure 22 shows these prices for China, India, Pakistan, and USA. The textile mills in India and Pakistan are buying at approximately the same price level as in China, but textile mills in the USA are paying more. Since 2010/11, U.S. mills have averaged paying \$2.45/kg, while these three Asian countries have averaged \$1.72/kg. The U.S. has averaged paying a premium of \$0.73/kg (a 42% premium).

### Costs Do Not Determine Production

In free and open markets, it is comparative advantage<sup>19</sup>, rather than the absolute level of production costs, that is the determinative factor in the location of textile manufacturing. In reality, however, production costs have been largely irrelevant for determining where textile manufacturing is located.

Figure 23 illustrates the fact that the U.S. share of world cotton mill consumption collapsed from 13.9% in 1994/95 to 3.3% in 2014/15. But this does not imply that the production costs in the U.S. are greater than those in countries where the production has relocated.

For many years, the ITMF has been taking periodic surveys to estimate production costs. The countries included in these surveys are the USA, China, India, Korea, Italy, Turkey, Egypt, Indonesia, and Brazil. The data provided by these surveys are a widely accepted benchmark for relative production cost levels around the world. The latest survey results apply to the year 2012 and these results were consistent with previous surveys.<sup>20</sup>

Figure 24 illustrates the cumulative cost components for ring spinning of Ne 30 cotton yarns for the 9 countries. The low-cost country was India and the high-cost country was China.<sup>21</sup> Figure 25 indexes these costs to the U.S.; i.e., sets the U.S. cost at 100% and expresses the others as relative percentages. The implication is that the U.S. is cost-competitive in ring spinning, being well below those for four countries and well above only two countries.

Figure 26 illustrates the same cumulative cost components for open-end rotor spinning of Ne 20 cotton yarns for these countries. Here, the U.S. is the low-cost country, with China again as the high-cost country, as is emphasized by the indexing of the costs in Figure 27. These

<sup>18</sup> USA prices from Agricultural Marketing Service of the U.S. Department of Agriculture.

<sup>19</sup> A country has a comparative advantage over another in producing a particular good when it can be produced at a lower opportunity cost. The opportunity cost is the value of the best alternative that is foregone in order to produce the good.

<sup>20</sup> See "International Production Cost Comparison 2012," ITMF.

<sup>21</sup> Obviously China is the high-cost country based primarily on the artificially high cost of fibres – which is a testament to the policy-based distortion. If China were to allow its domestic cotton prices to follow world prices, its cost-competitiveness would greatly improve.

data help explain why the remaining yarn spinning industry in the U.S. is dominated by open-end rotor spinning.

Figures 28 and 29 summarize the indexed total costs (spinning plus fabric formation) for making woven fabrics from ring and rotor yarns. Figures 30 and 31 do the same for making knitted fabrics. These show that, based on total manufacturing costs, the U.S. textile industry is globally competitive on a per-unit cost basis. Therefore, the precipitous decline in U.S. textile manufacturing shown in Figure 23 is not explained by relative costs in the U.S. versus the rest of the world.

## Conclusion

The acceleration in losses of cotton's global market share among textile fibres during the last 20 years has not been driven primarily by open-market forces, but by the mixture of government policies. It has been driven primarily by Chinese policies regarding production capacities and prices for fibres and textiles, secondarily by policies in the rest of the Asian subcontinent, with tertiary policy influences by other countries. The policies that have developed over the last two decades were made possible by actualization of the World Trade Organization (WTO) in 1995 – and especially by China's accession in 2001 to full membership in the WTO. China's subsequent dominance in both fibre and textile production was driven by central government policies, which gave it hegemonic leverage over global competition between cotton and polyester, and which it used in a manner to effectively increase polyester's share of the market.

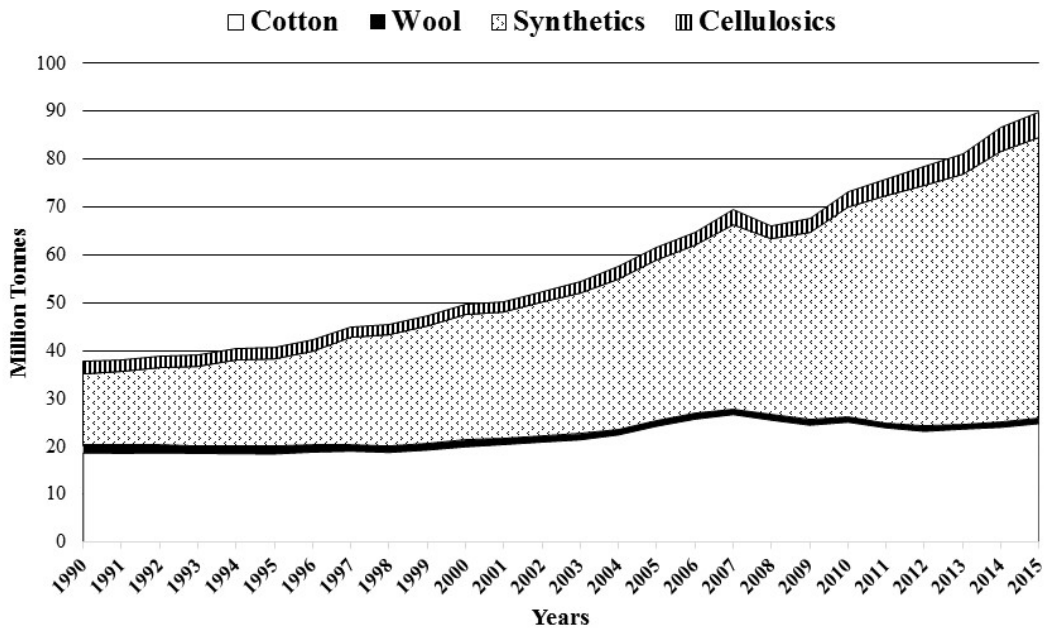
Offsetting forces are now coming into play that may somewhat dilute these policy distortions; e.g., the emergence of textile industries in countries like Vietnam and Bangladesh,<sup>22,23</sup> along with growth in India's textile industry, all of which have a comparative advantage vis à vis China in the production of cotton textiles and all of which will use this advantage to satisfy consumer preferences for cotton content in textiles. However, China's overwhelming expansion of production capacities in both textiles and polyester fibres, its price-depressing oversupply of polyester, its commanding presence in government-controlled cotton production, all in combination with administered prices that make cotton uncompetitive, will continue to depress consumption of cotton.<sup>24</sup> The policies that have caused this have not been treated as actionable by the WTO; yet, a reversal in cotton's share losses cannot be expected unless and until the policies are changed.

---

<sup>22</sup> See "Vietnam, Bangladesh Enjoy Biggest Share Gains of US Apparel Imports," Judith Russell, *Sourcing Journal*, January 12, 2016. <https://sourcingjournalonline.com/>.

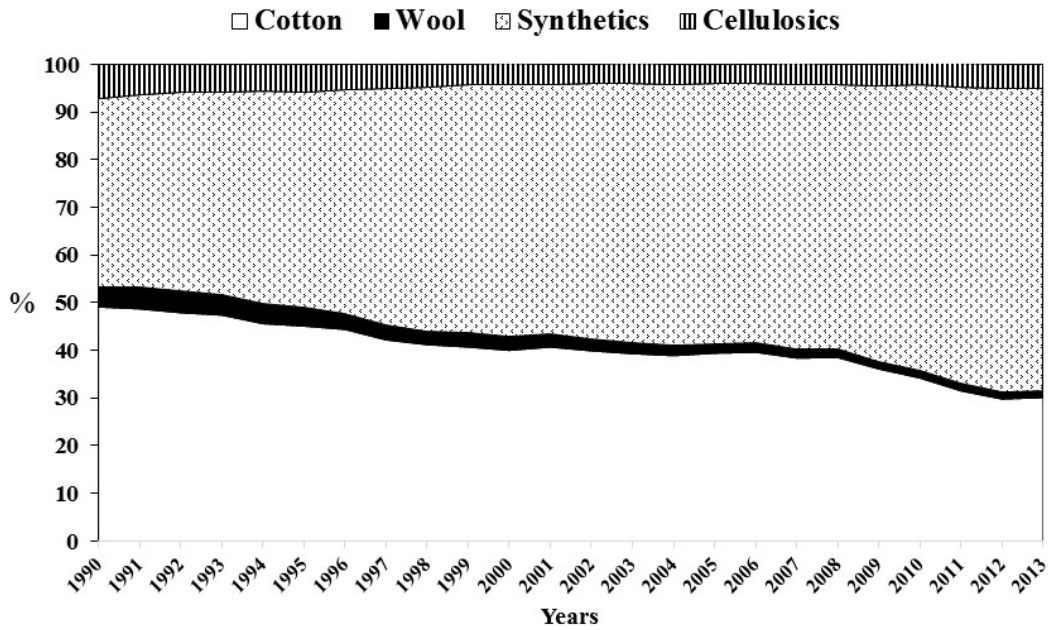
<sup>23</sup> See "Changes in Chinese Cotton Are Pushing Vietnam to Record Output," Matt Vitone, *Sourcing Journal*, January 19, 2016. <https://sourcingjournalonline.com/>.

<sup>24</sup> See "China's Noncompetitive Cotton Prices Slow Spinning Sector Growth," Tara Donaldson, *Sourcing Journal*, September 8, 2015. <https://sourcingjournalonline.com/>.



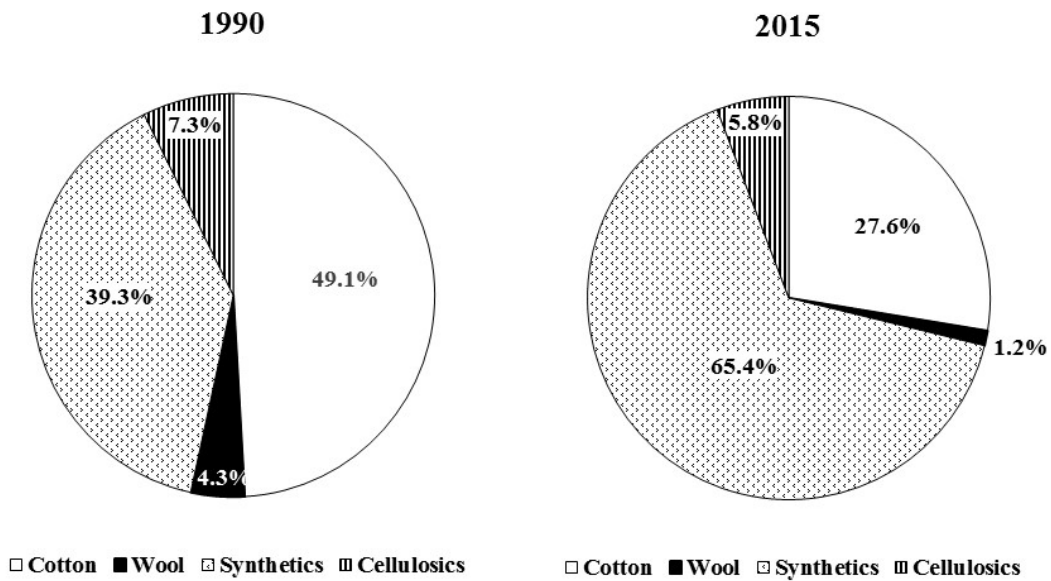
Source: International Cotton Advisory Committee, Commonwealth Secretariat, Wool Secretariat, Fiber Economics Bureau

**Figure 1. World Consumption of Major Textile Fibres**



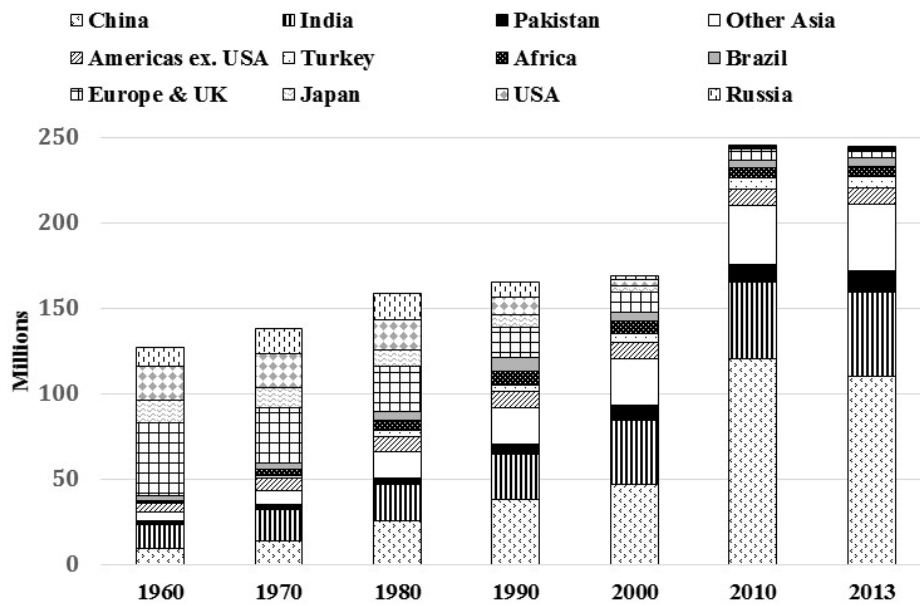
Source: International Cotton Advisory Committee, Commonwealth Secretariat, Wool Secretariat, Fiber Economics Bureau

**Figure 2. World Consumption Shares of Major Textile Fibres**



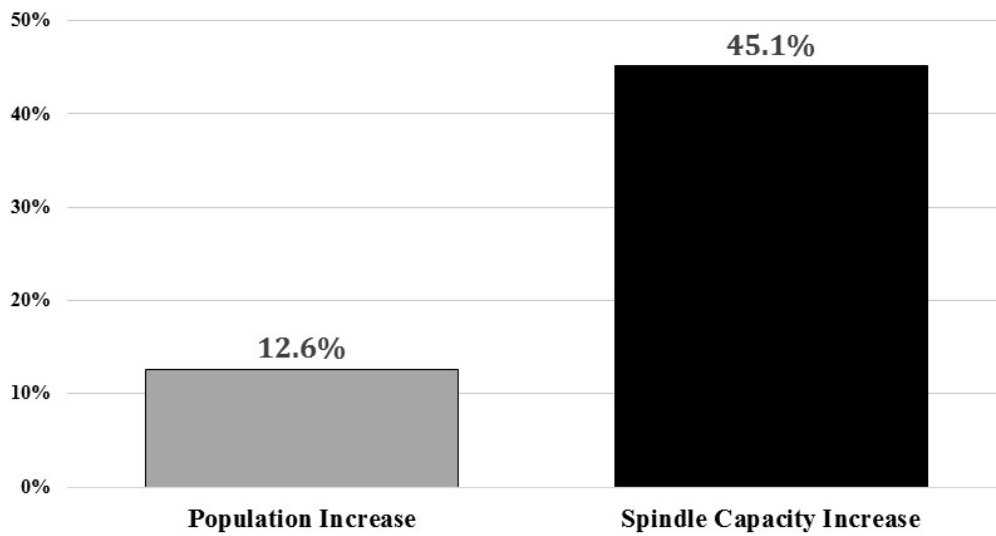
Source: International Cotton Advisory Committee, Commonwealth Secretariat, Wool Secretariat, Fiber Economics Bureau

**Figure 3. World Consumption Shares of Major Textile Fibres, 1990 versus 2015**



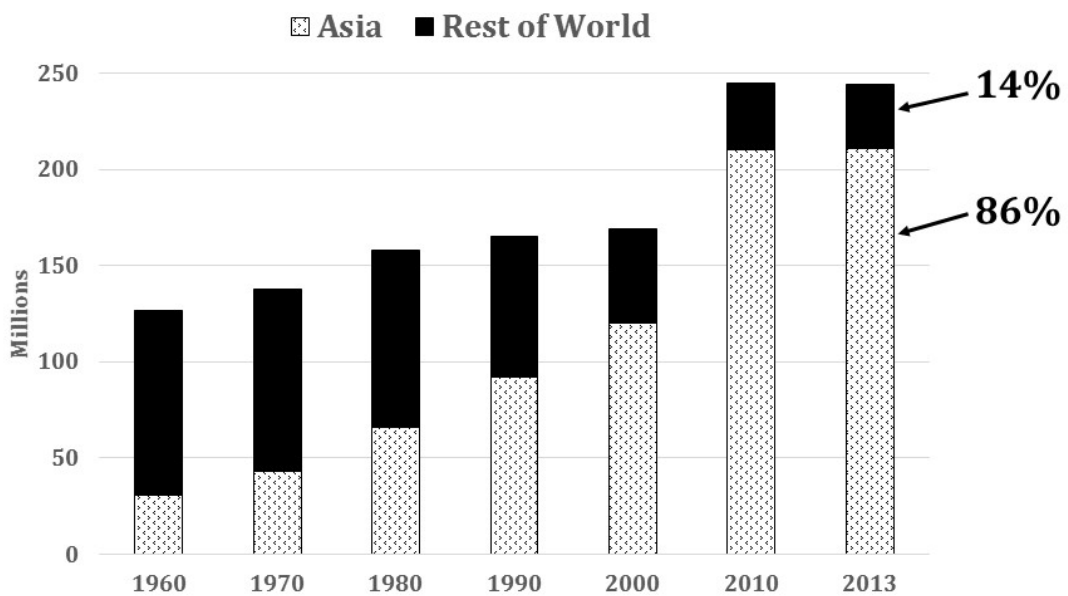
Source: ITMF

**Figure 4. Installed Capacities of Ring Spindles around the World**



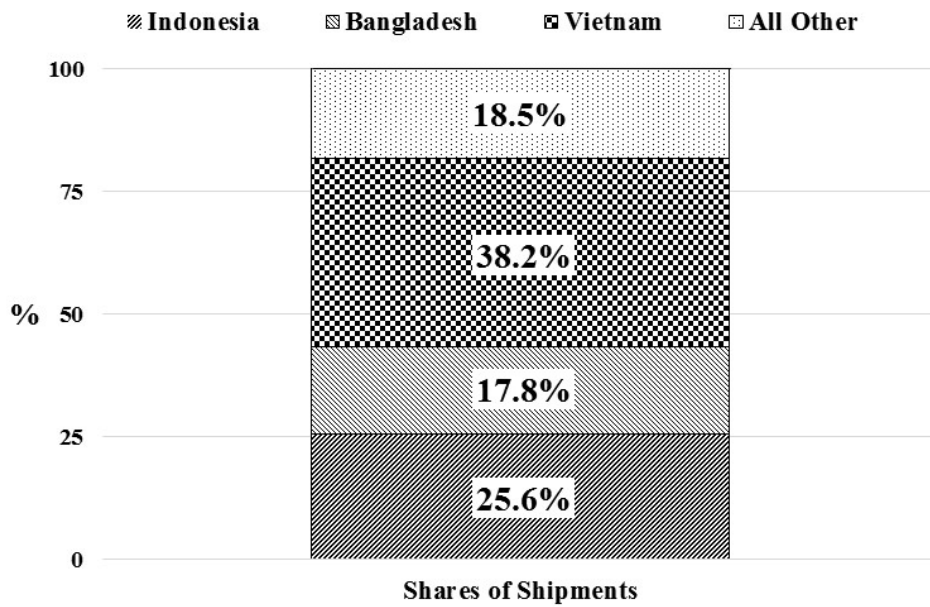
Source: ICAC and ITMF

**Figure 5. Growth in world population versus spindle capacity, 2000 versus 2010**



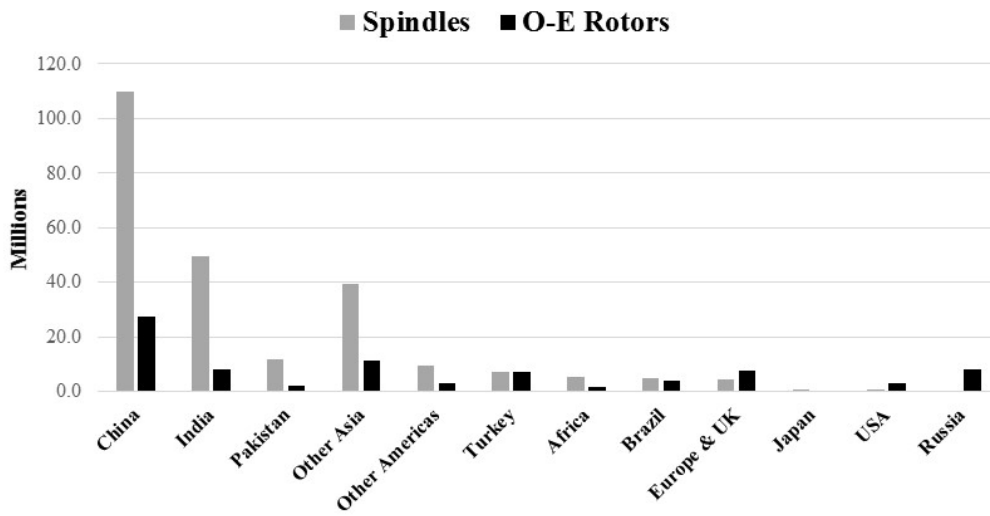
Source: ITMF

**Figure 6. Installed Capacities of Ring Spindles, Asia versus Rest of World**



Source: ITMF

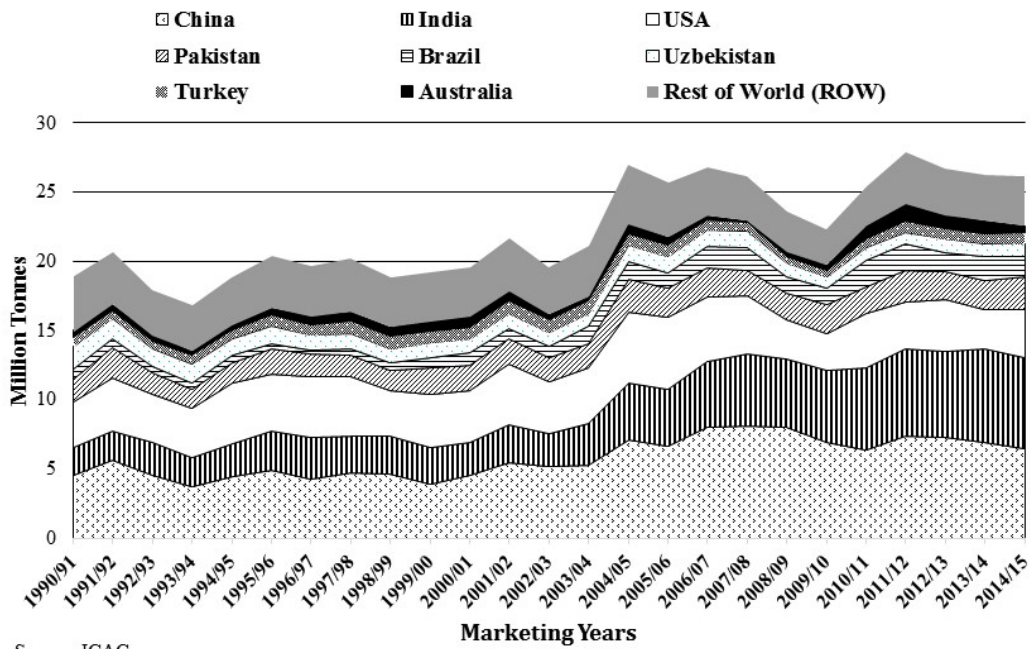
**Figure 7. Shares of Ring Spindle Shipments in 2014, Asia excluding China**



Note: 1 rotor = 10 Spindles

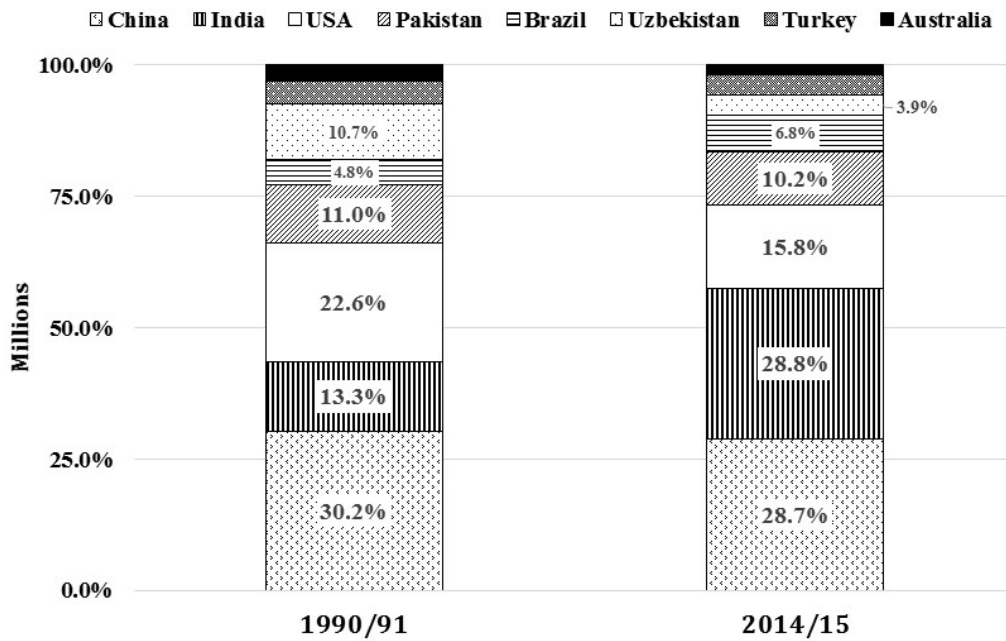
Source: ITMF

**Figure 8. Global Spinning Capacities in 2013, Expressed in Spindle-Equivalents**



Source: ICAC

**Figure 9. World Cotton Production, 1990/91 to 2014/15 Marketing Years**



Source: ITMF

**Figure 10. Cotton Production Shares among Top 8 Countries, 1990/91 versus 2014/15**



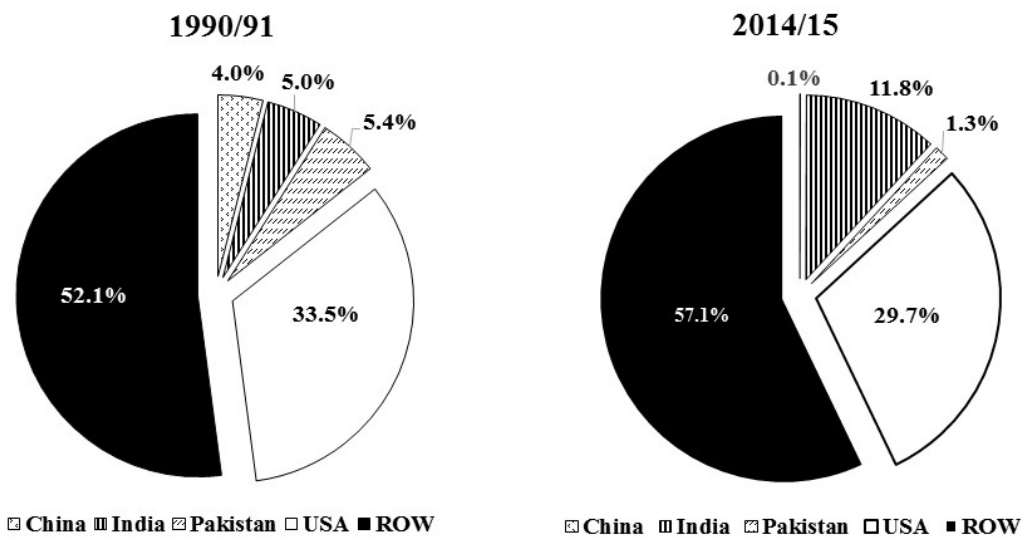


Figure 11. Cotton Export Shares of Top 4 Countries, 1990/91 versus 2014/15

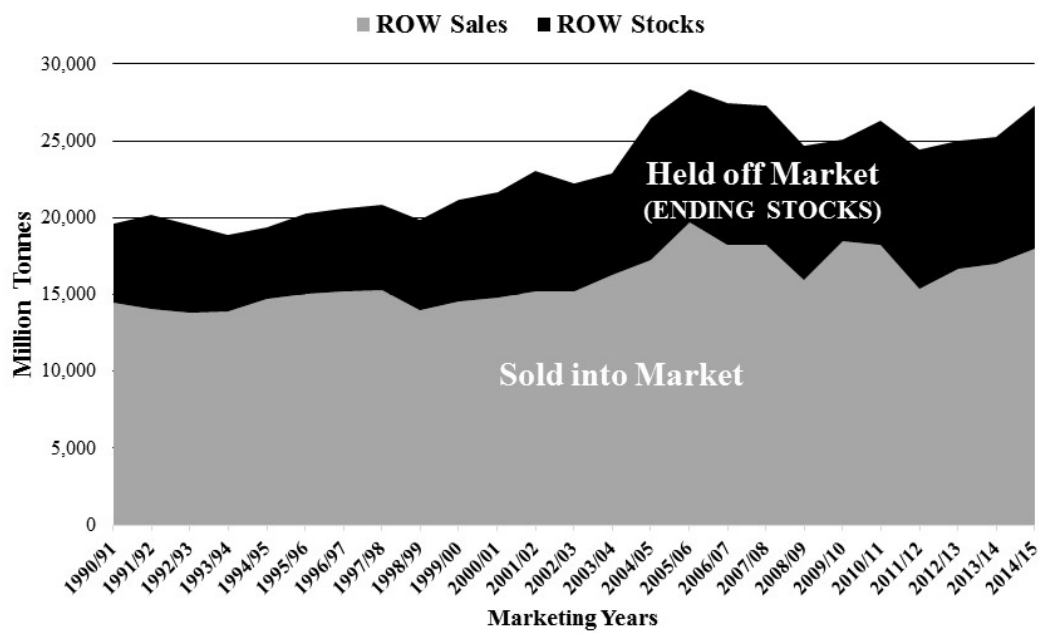


Figure 12. Cotton Supply in World less China (ROW): Sales versus Stocks

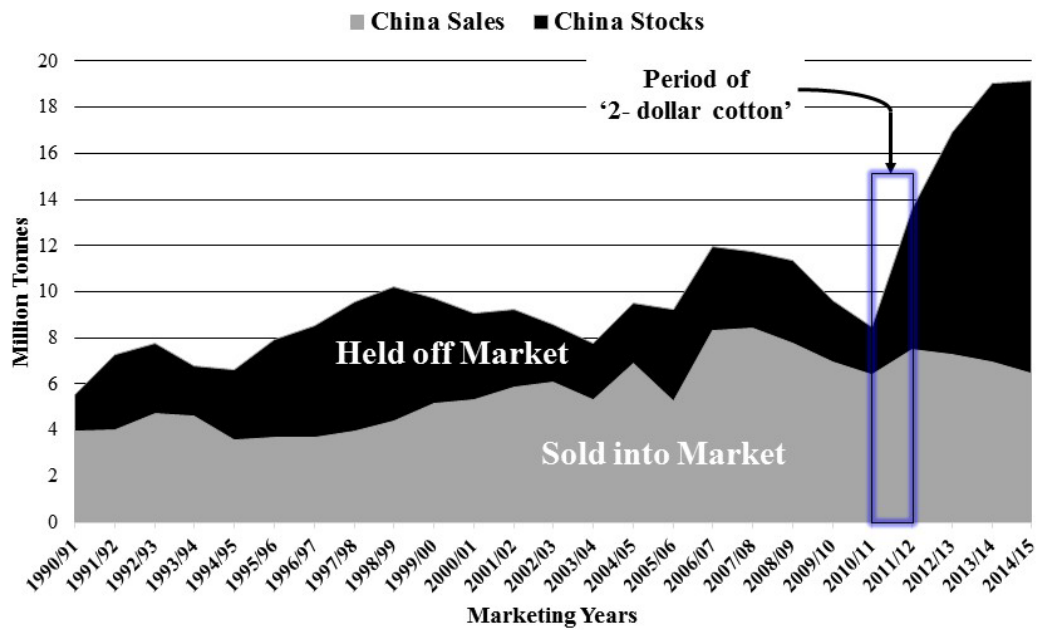
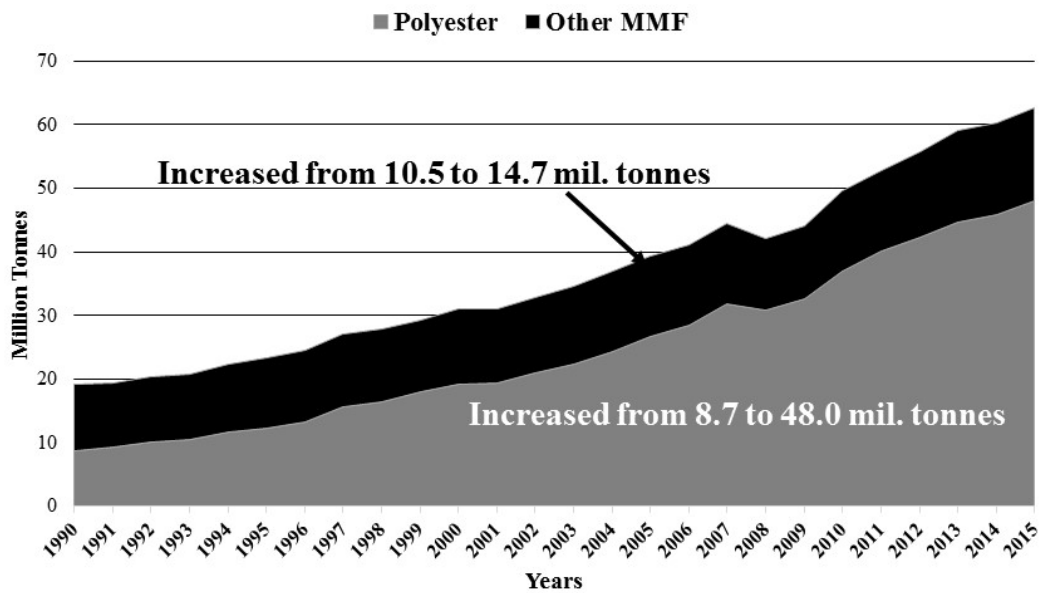
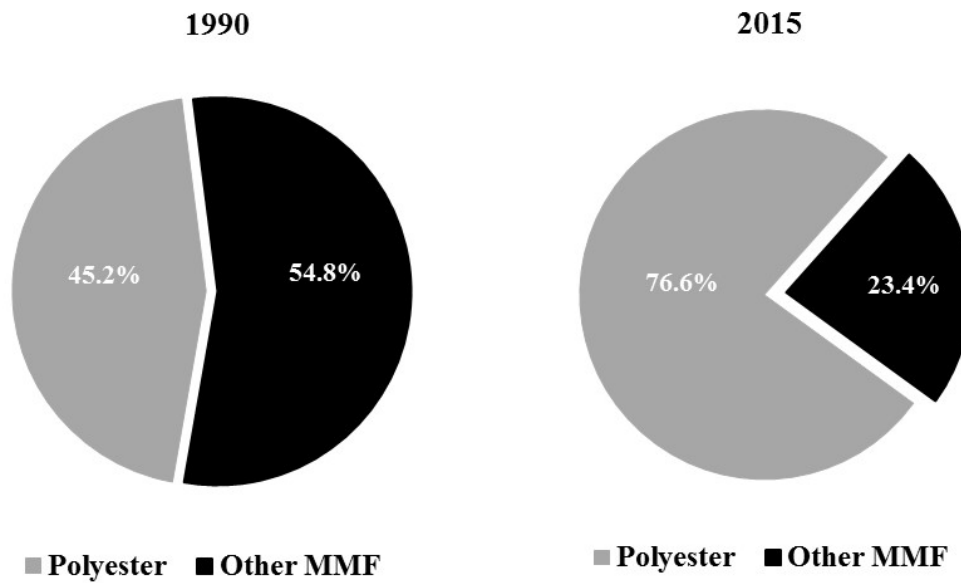


Figure 13. Cotton Supply in China: Sales versus Stocks, 1990/91-2014/15



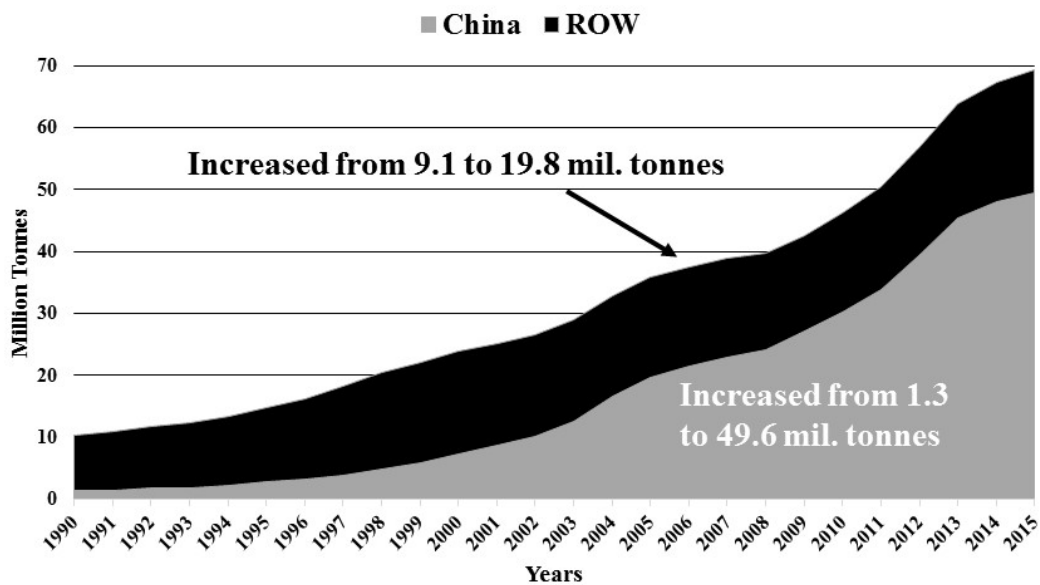
Source: PCI Fibres

Figure 14. World Production of Polyester versus All Other MMFs, 1990-2015



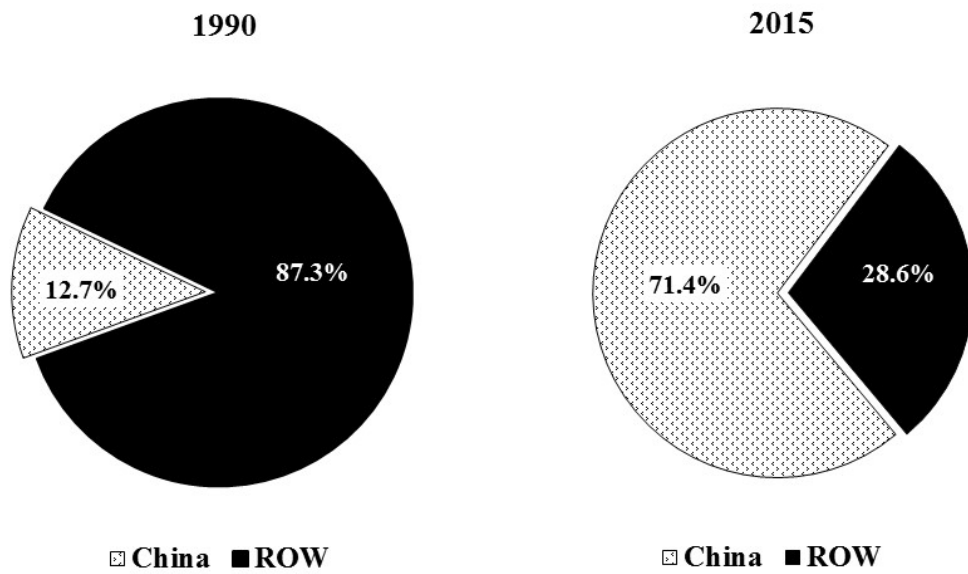
Source: PCI Fibres

**Figure 15. Global Shares of Polyester versus All Other MMFs, 1990 versus 2015**



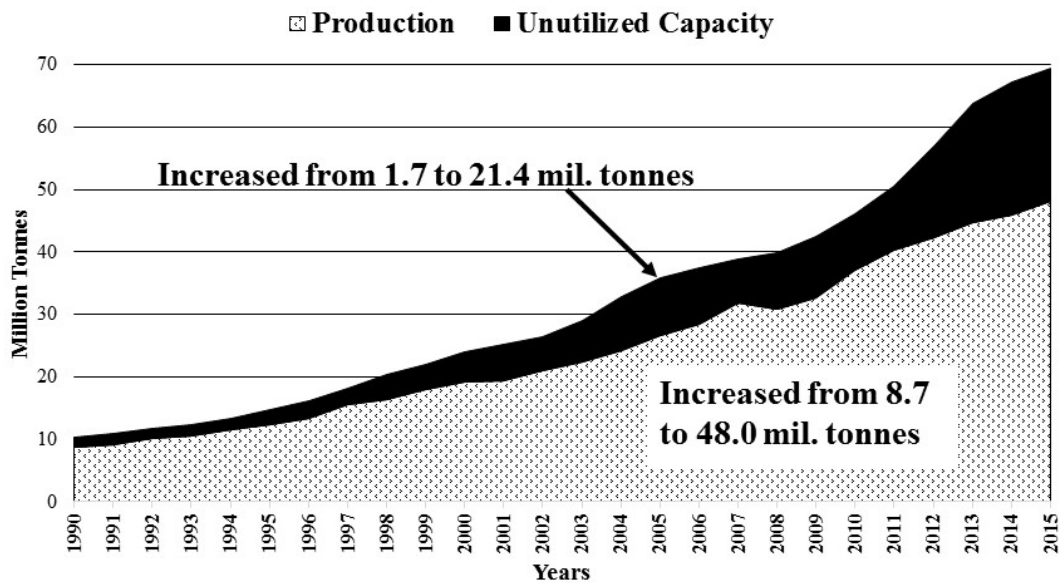
Source: PCI Fibres

**Figure 16. Polyester Production Capacity, China versus ROW, 1990-2015**



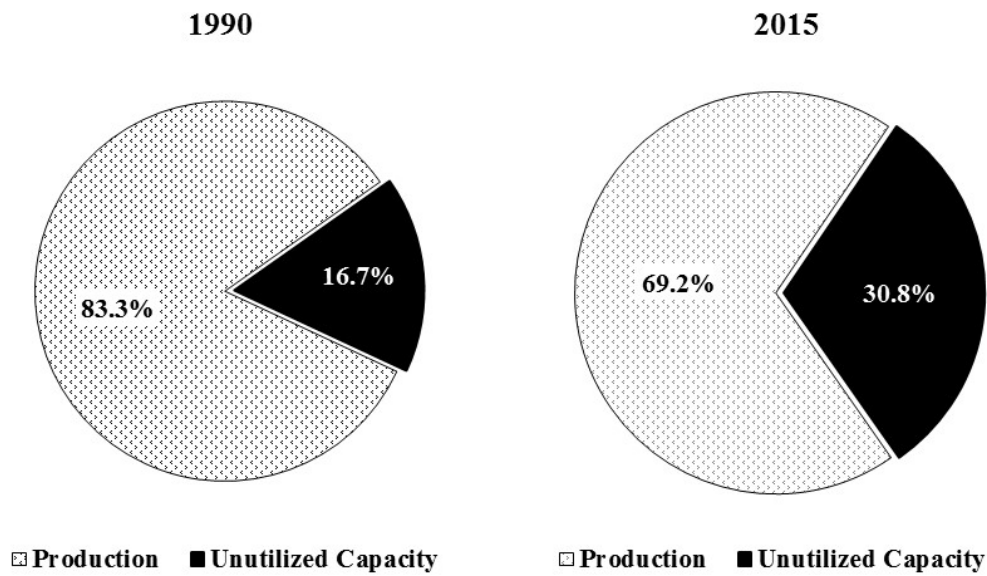
Source: PCI Fibres

**Figure 17. Polyester Production Capacity, China versus ROW, 1990 versus 2015**



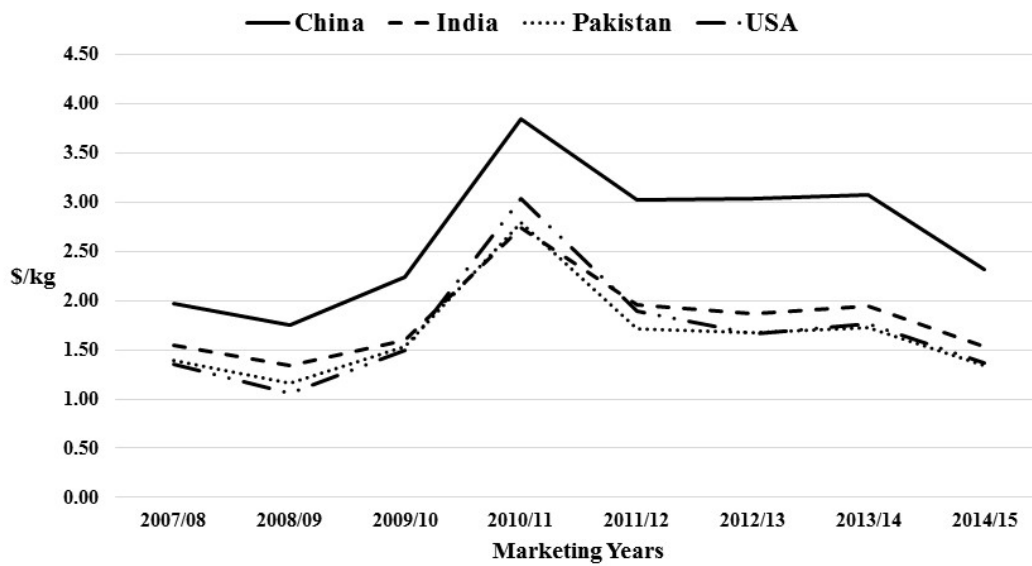
Source: PCI Fibres

**Figure 18. World Polyester Production versus Unutilized Capacity, 1990-2015**



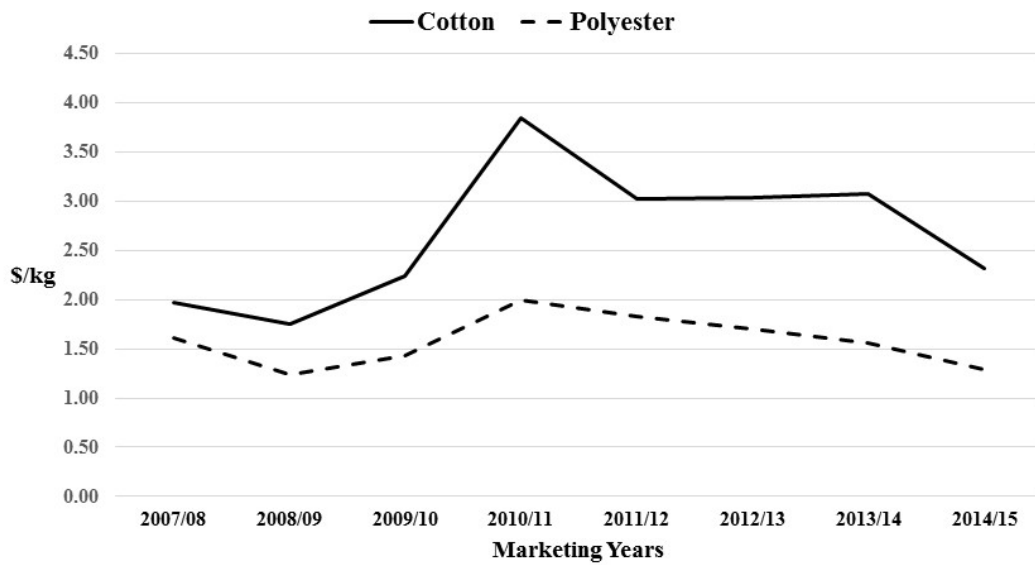
Source: PCI Fibres

**Figure 19. World Polyester Production versus Unutilized Capacity, 1990 versus 2015**

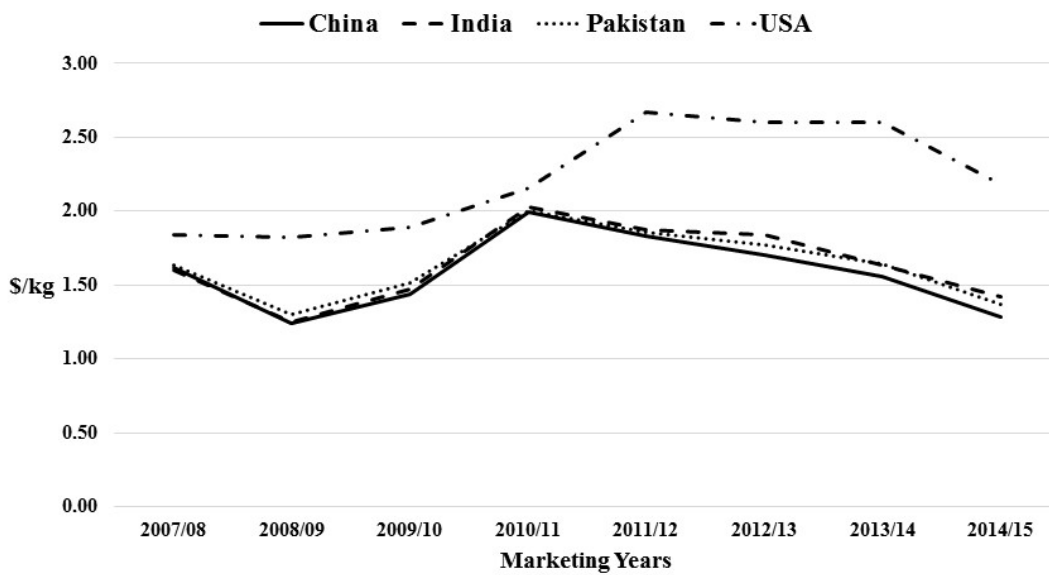


Source: Emerging Textiles for China, India and Pakistan. USDA, AMS for USA.

**Figure 20. Cotton Fibre Prices, by Countries, 2007/08-2014/15**



**Figure 21. Prices of Cotton versus Polyester in China, 2007/08-2014/15**



**Figure 22. Polyester Fibre Prices, by Countries, 2007/08-2014/15**

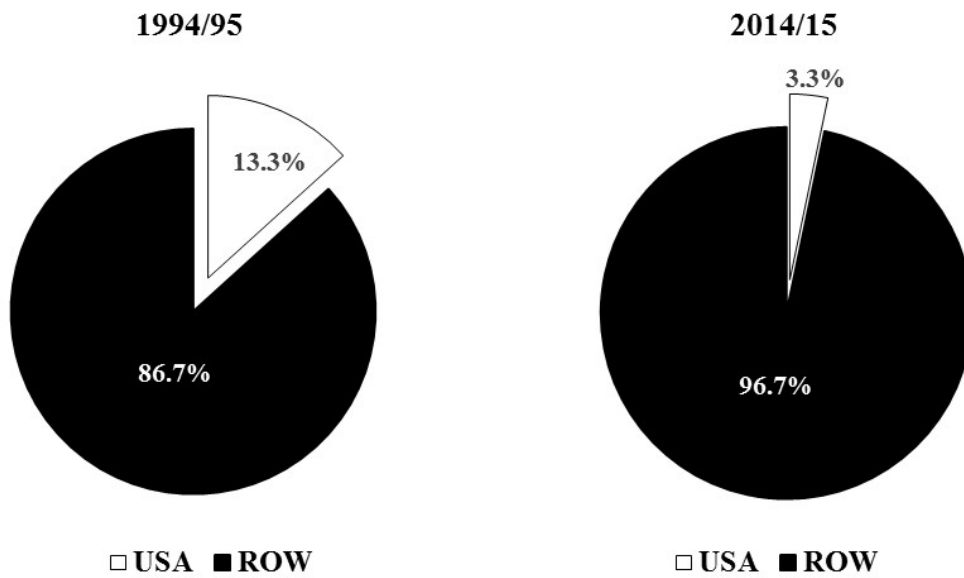
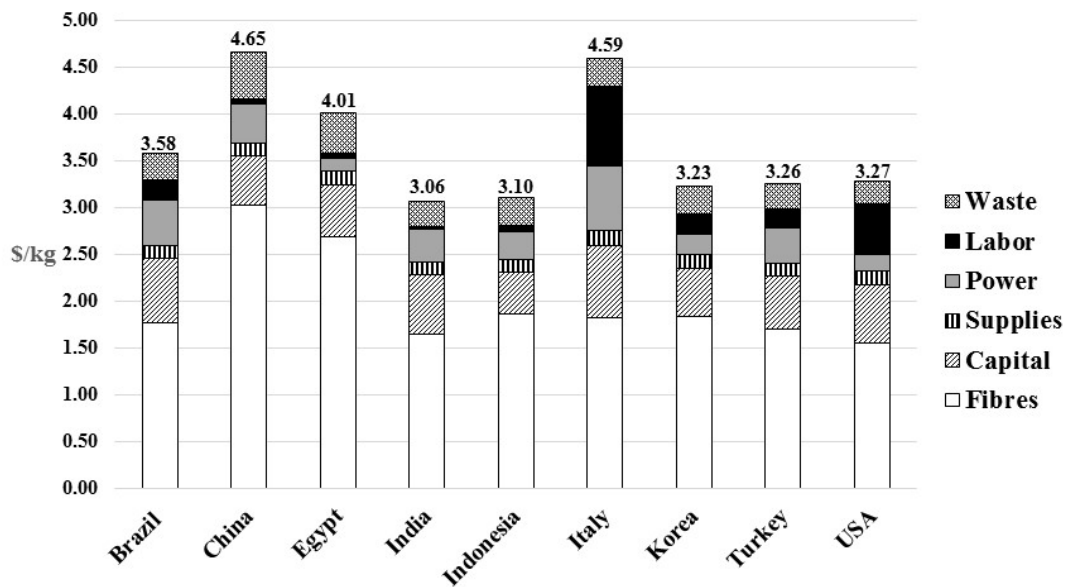


Figure 23. USA Shares of World Mill Consumption of Cotton, 1994/95 versus 2014/15



Source: ITMF

Figure 24. Ring Spinning Costs by Countries in 2012, Ne 30 Yarns

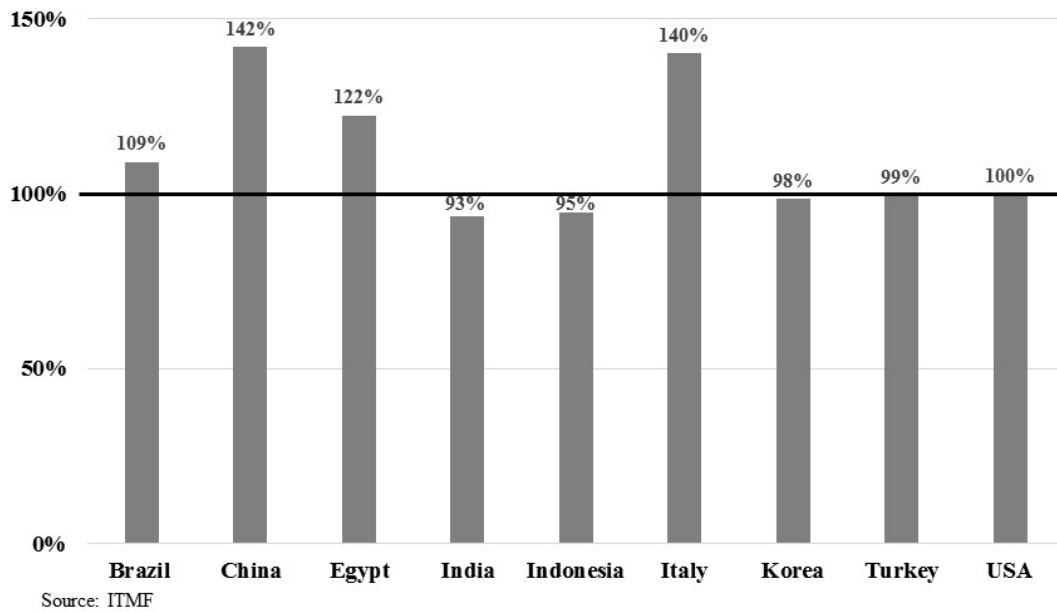


Figure 25. Ring Spinning Cost Indexes by Countries in 2012, Ne 30 Yarns, USA = 100%

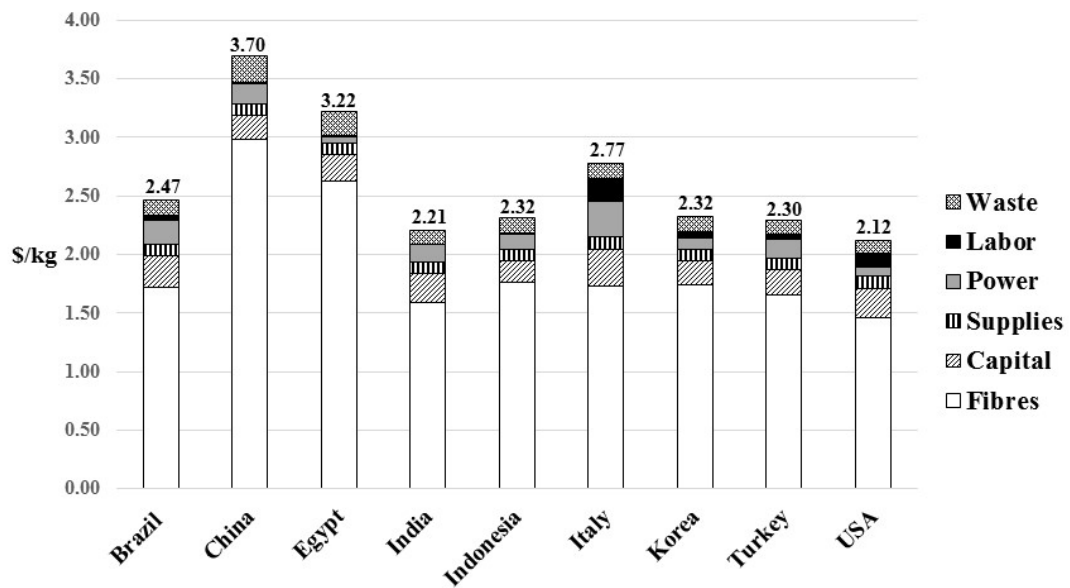
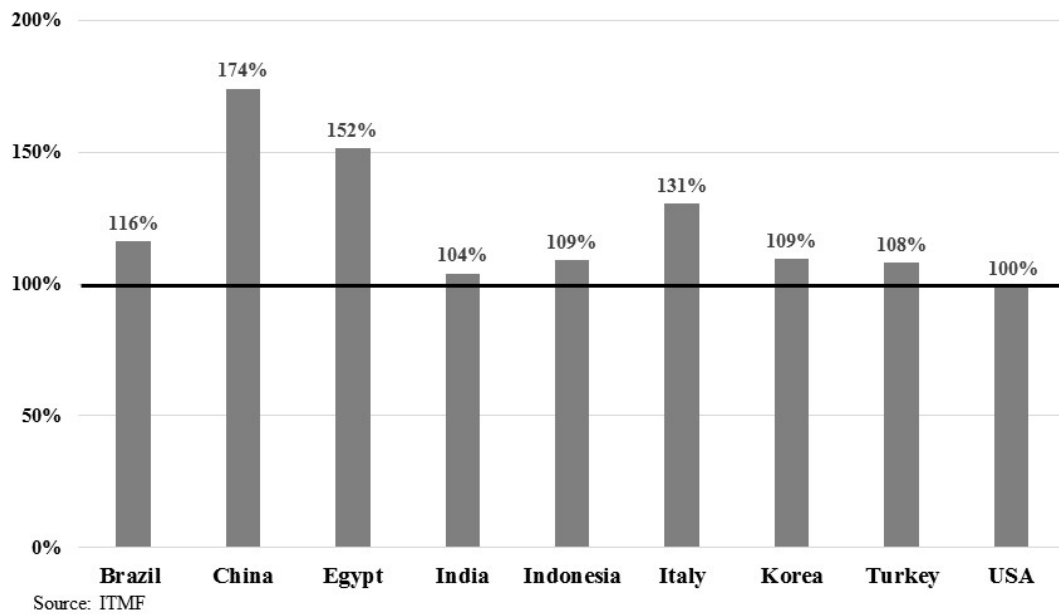
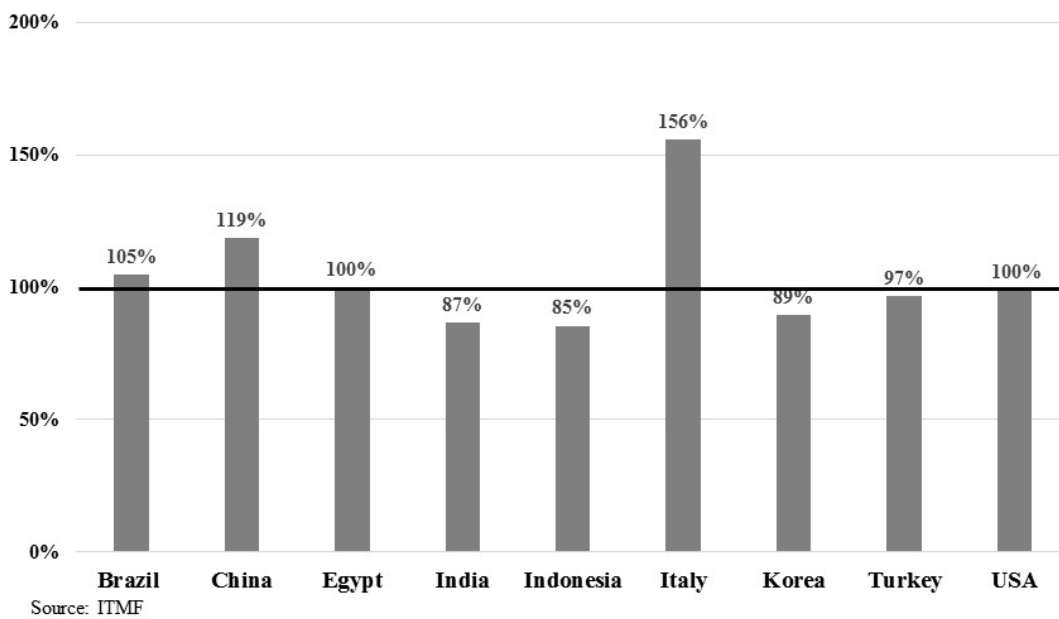


Figure 26. Open-End Rotor Spinning Costs by Countries in 2012, Ne 20 Yarns

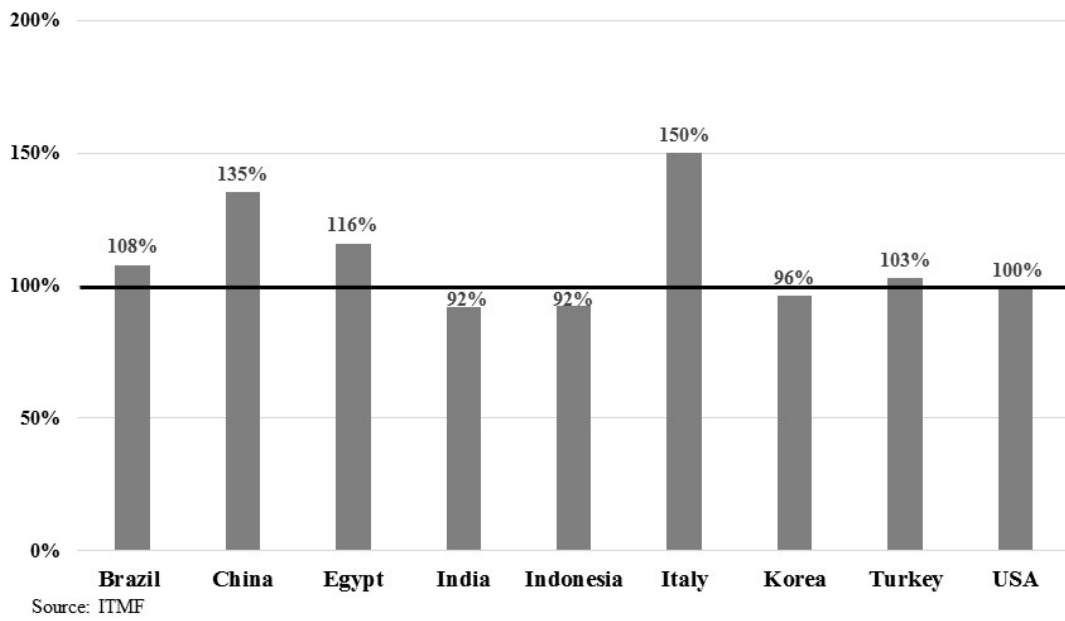




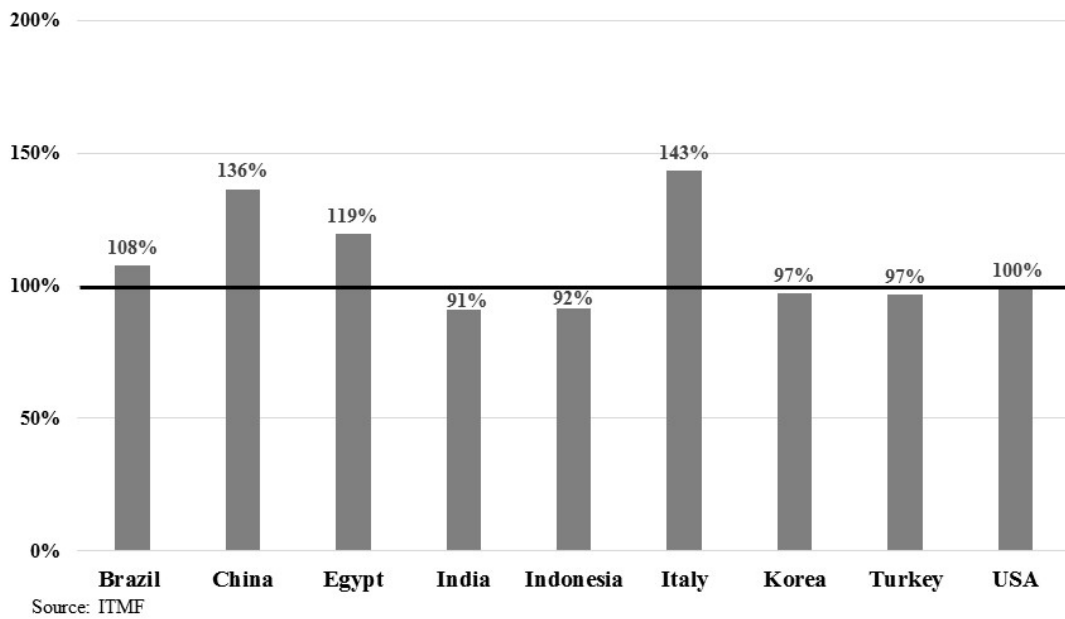
**Figure 27. Open-End Rotor Cost Indexes by Countries in 2012, Ne 20 Yarns, USA = 100%**



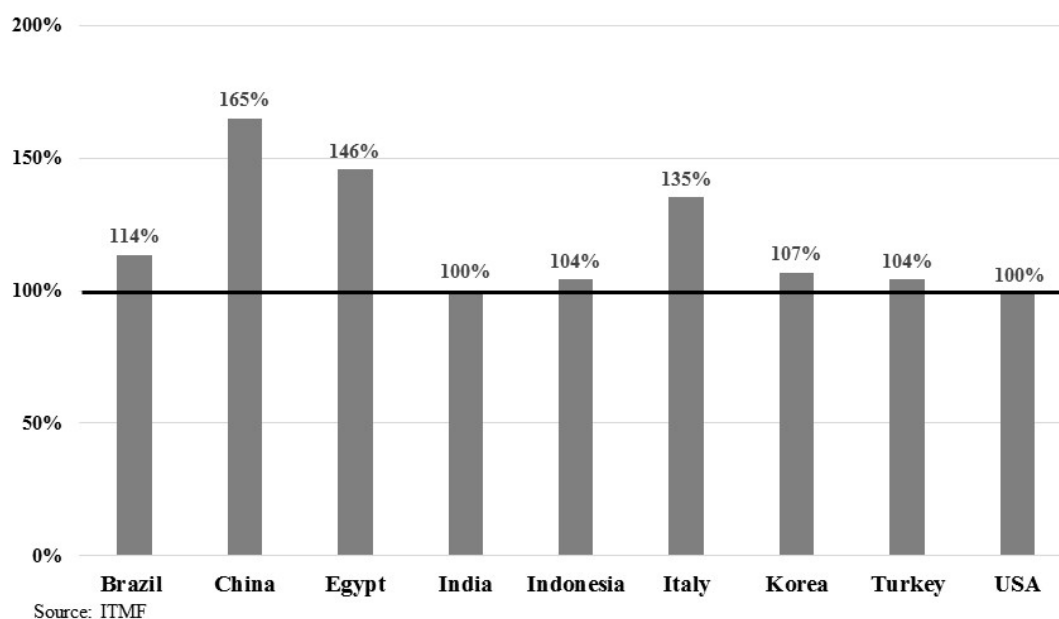
**Figure 28. Total Cost Indexes for Woven Ring Yarn Fabric by Countries in 2012, USA = 100%**



**Figure 29. Total Cost Indexes for Woven Rotor Yarn Fabric by Countries in 2012, USA = 100%**



**Figure 30. Total Cost Indexes for Knitted Ring Yarn Fabric by Countries in 2012, USA = 100%**



**Figure 31. Total Cost Indexes for Knitted Rotor Yarn Fabric by Countries in 2012, USA = 100%**

## References

Cotton Market News Division. January 5, 2016. Cotton Price Statistics. *Agricultural Marketing Service, U.S. Department of Agriculture*. Volume 96, Number 13.

Bain, J. 1968. *Industrial Organization: A Treatise*, 2<sup>nd</sup> Ed. John Wiley.

Baker, R. August 18, 2015. "China's Crisis: The Price of Change." *Stratfor*.

Donaldson, T. September 8, 2015. "China's Noncompetitive Cotton Prices Slow Spinning Sector Growth." *Sourcing Journal*. <https://sourcingjournalonline.com/>.

Emerging Textiles. [www.EmergingTextiles.com](http://www.EmergingTextiles.com).

Flanagan, M. April 20, 2015. "Chinese Manufacturers' Alleged Relocations: A Wild Goose Chase?" *Sourcing Journal*. <https://sourcingjournalonline.com/>.

Friedman, G. March 6, 2012. "The State of the World: Assessing China's Strategy." *Stratfor*.

Hudson, D. November 12, 2014. Update to Foreign Crop Subsidy Database, 2014-2015. <http://www.depts.ttu.edu/cei/assets/pdf/database.pdf>.

International Cotton Advisory Committee. December 2015. World Textile Demand.

International Cotton Advisory Committee. December 2015. Cotton: World Statistics.

International Textile Manufacturers Federation. 2014. International Textile Machinery Shipment Statistics. Vol. 37.

International Textile Manufacturers Federation. 2014. International Textile Machinery Shipment Statistics. Vol. 37.

International Textile Manufacturers Federation. 2012. International Production Cost Comparison 2012.

Kenneally, I. April 1, 2014. "Chinese Gov't to Invest \$1.6 Billion in Xinjiang's Textile Industry." *Sourcing Journal*. <https://sourcingjournalonline.com/>.

Patton D. and L. Pardomuan. January 14, 2014. "Stung by Local Cotton Prices, Chinese Yarn Makers Go Global." *Reuters*.

*PCI Fibres*. [www.PCIFibres.com](http://www.PCIFibres.com).

*Policonomics*. "Structure, conduct, performance paradigm." <http://www.policonomics.com/structure-conduct-performance-paradigm/>.

Russell, J. January 12, 2016. "Vietnam, Bangladesh Enjoy Biggest Share Gains of US Apparel Imports." *Sourcing Journal*. <https://sourcingjournalonline.com/>.

Stockman, D. August 16, 2015. "The Great China Ponzi—An Economic and Financial Train Wreck Which Will Rattle the World." <http://davidstockmanscontracorner.com/>.

*Sourcing Journal*. August 4, 2015. "Chinese Textile Companies Set Up Shop on US Shores," <https://sourcingjournalonline.com/>.

*Stratfor*. "China: No Easy Cure for Local Governments' Addiction to Real Estate Revenue." October 16, 2015. <https://www.stratfor.com/>.

*Stratfor*. September 30, October 1, October 2, 2013. "China's Ambitions in Xinjiang and Central Asia" (Parts 1, 2 & 3). <https://www.stratfor.com/>.

*Stratfor*. June 20, 2012. China's Struggle to Reform the Steel Industry. <https://www.stratfor.com/>.

*Stratfor*. September 25, 2011. "China Political Memo: A Crisis over Private Lending?" <https://www.stratfor.com/>.

*The Economist*. January 23, 2016. "Chips on their Shoulders."

Vitone, Matt. January 19, 2016. "Changes in Chinese Cotton Are Pushing Vietnam to Record Output." *Sourcing Journal*. <https://sourcingjournalonline.com/>.