

CHANGES IN GLOBAL COTTON MARKETS: CAUSES AND EFFECTS

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Abstract

This paper presents a summary of the changes that have occurred in the global cotton market over the past two decades and offers interpretations on their causes and effects. Changes and effects differ substantially by country, and dominant countries in the various market changes are thus emphasized. Causes of changes are addressed under two categories, global factors affecting markets for goods in general and factors specific to cotton and textile markets. Overall, China has emerged as the country with the most prominent changes in both the cotton and textile sectors and an influential source of changes in many other countries. Some of the factors that will likely impact future changes in the global situation are briefly discussed.

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The structure, conduct, and performance of the global cotton market have changed dramatically over the past two decades. During that period, global cotton fiber production has increased by 44%, global consumption has increased by 54%, and trade in cotton has increased by about 35% (U.S. Department of Agriculture, Foreign Agricultural Service). In some respects, the changes are more dramatic when we consider inter- and intra-country shifts that have occurred, and some of those changes will be examined. What forces, or combinations of forces, have caused or driven these changes and what are the ramifications of them? To address these questions, at least two related markets must be considered in conjunction with the cotton fiber market. One of these is the market for textiles, since cotton's primary use is as a raw material in the production of textiles; that is, cotton is primarily an industrial raw material. The other market is that for man-made fibers, since they are the primary competition for cotton for producing textiles. In textiles markets, total textile production has increased by 97% (All Pakistan Textile Mills Association) and man-made fibers use has increased by 125% in the past two decades (Fiber Economics Bureau).

To better prepare for the future, there is value in examining the forces changing the cotton and textiles markets/sectors. The objective of this paper is to provide an overview perspective of the major forces that have driven the changes in the global cotton market during the last 20 years and provide evidence on how they have impacted the market and the major participants in it. As with any effort of this type, many specifics must be omitted, else we become hopelessly lost in details. In this regard, I am not marginalizing events, concerns, or problems in individual countries or individual events, but I do hope to capture the major forces and the main events as they impact the situation on a global scale.

To address the topic, I have chosen to first provide a summary of the major changes that have occurred in the industry in the last two decades, how the changes have accelerated in recent years, and examine some major causes of the changes. In evaluating the causes, I separate them into two general categories. The first is the set of forces that cover the entire set of countries and all goods/commodities; we may think of these as global macroeconomic forces, and they fall mostly within the general descriptor of “Globalization.” The other category of forces I consider is those at the industry level, or those specific to cotton and textiles; on a global scale, we may view these as being in the microeconomic realm.

Overview of Changes

First, consider the changes that have occurred in global cotton fiber production, use, and trade (Figure 1). Cotton fiber production and consumption have moved together, as expected, except for short-term imbalances that take time for the market to alleviate through adjustments in production, use, and/or inventories. In the 20 marketing years between 1986/87 and 2006/07, global production and mill use rose from about 16.3 million metric tons to about 25 million metric tons. Global demand has increased largely from growth in population and incomes. Global supply has increased primarily from technology and expanded cultivated areas. *Note that while global cotton fiber production and use increased relatively slowly, and trade declined slightly prior to 2000/01 (Figure 1), all three have been increasing rapidly since.* From our current knowledge of the elasticities of demand for cotton, the primary chain of causation has been for the increases in production (supply) to result in lower (market clearing) cotton prices, which have resulted in increases in cotton use (movement along the demand curve).

Next, consider these changes disaggregated by major countries. Disaggregation of cotton fiber production (Figure 2) reveals that only one group, the Former Soviet Union

countries, had a decline in total cotton fiber production since 1986, and they appear to be recovering in more recent years. While most countries/groups have had moderate increases in production, increases have been large in China, the United States (U.S.), and India, with less dramatic increases in Pakistan and Brazil. Of these five countries, Brazil and China have substantially increased land area in cotton production while production increases in the U.S., India, and Pakistan have resulted primarily from yield increases.

China accounts for most of the growth in cotton consumption of raw cotton fiber (Figure 3) by textile mills since the 21st century began, and India and Pakistan account for most of the remaining increase. Textile consumption of cotton fiber has decreased most in the U.S., followed by the European Union (E.U.) and Japan.

The counterparts of changes in cotton fiber production, use, and trade are the changes in textiles markets. Figure 4 shows global fibers used in textile production, which is also an indicator of textile production. Note that while consumption of all fibers has doubled in the last 20 years, the composition of fiber use has changed. In 1986, cotton comprised 53% of all fibers used; seven years later, in 1993, the group of man-made (MM) fibers had gained so that cotton's share had declined to 50%, then another seven years later, by 2005, cotton had declined further to 37% of the total market. Note that both total fiber use and MM fiber use accelerated starting in the mid-1990s. This followed the rapid expansion of MM fiber production capacity starting in the early 1990s. Most of the increased capacity was in China. Between 1990 and 2004, China's share of global production capacity increased from 10% to 43% (Fiber Economics Bureau).

Fiber consumption has shifted dramatically among countries, particularly during the last 10 years. While all of the major textile manufacturing countries have either maintained or

moderately increased total fiber use over the past two decades, most of the world's growth in fiber use has been captured by China. In fact, China is the only country whose market share of fiber use has increased (Figure 5); market shares for all other countries have declined in recent years. Moreover, the substitution of MM fibers for cotton has been the greatest within China (Figure 6). These factors taken together indicate that China's increasingly dominant role in the global textiles markets has been to the disadvantage of cotton.

One means of evaluating some of the combined effects of cotton fiber markets and textile markets on the cotton industry is to examine patterns in both raw fibers and the cotton content of textiles. Data are available for only two countries, the U.S. and China, but examination of patterns in these two countries is useful. When we consider raw cotton fiber alone (Figure 7), the U.S. is clearly the dominant exporter of cotton fiber, particularly during the last decade. However, when the cotton embodied in the exports and imports of cotton textiles is combined with the raw fiber exports and imports, the U.S. is a net importer of cotton in most years; that is, the U.S. is consuming more cotton than it produces (Figure 8), although the trend in net imports has been declining because of increasing cotton fiber exports. On the other hand, while China is the largest importer of raw cotton fiber (Figure 9), after factoring in the cotton content of textile imports and exports (Figure 10) China is a net exporter of cotton, almost certainly the largest in the world. China's net cotton exports have reached about 3.3 million metric tons and the trend is increasing.

The global changes in the cotton industry may be summarized as follows:

- Global cotton fiber production increased rapidly, particularly in the last five years, with most of the increases coming from the largest producing countries, China, the U.S., and India, and the primary cause being an increase in yields.

- Global mill consumption of cotton increased in line with global production, with the most dramatic increases in China, India, and Pakistan, and the largest decreases in the U.S. and the E.U.
- While mill use of all fibers has increased, cotton has lost market share to man-made fibers, with cotton's largest market share losses occurring in China, Taiwan, and Brazil.
- Raw cotton export increases have been the largest in the U.S. (associated with the large decline in textile manufacturing), but net cotton export increases (raw cotton plus cotton embodied within textiles) have been the largest in China.

These points suggest that understanding reasons for these patterns lies at least in part in events in these countries/regions—China, the U.S., the E.U., India, Pakistan, Taiwan, and Brazil—as well as some events on a global scale.

Drivers of Change

There is no doubt that China has emerged as the dominant force of change in global cotton markets. In conjunction with those forces, however, have been other major forces at work, affecting many more industries than just cotton and textiles. I will address those forces first and will group them under the label of “globalization.” For purposes of this paper, we will define globalization as the process of countries’ economies, markets, cultures, and government policies becoming more interdependent or integrated on a global scale (Knutson et al., 2007, p. 3).

Globalization

There has been a process of intermittent reductions in trade barriers since the end of World War II, particularly among developed countries and in manufactured goods. The Breton Woods Conference in 1944 led to the formation of the World Bank and the International

Monetary Fund and to the General Agreement on Tariffs and Trade (GATT), with its Most Favored Nations clause. Influenced by GATT, average tariffs on manufactured goods by developed nations fell dramatically between 1947, and particularly after the mid-1960s, and the Tokyo round in 1979. This allowed more trade and fostered more integration of economies and set the stage for the formation of the World Trade Organization (WTO).

A concerted effort has been made to lower trade barriers for agricultural goods since 1985, with limited success. These efforts resulted in the formation of the WTO, which is having a more direct influence on trade matters and influencing the nature of countries' commodity programs, including cotton. The WTO was established with three primary objectives: to increase market access (lower trade barriers), to reduce trade-distorting domestic commodity supports, and to reduce export subsidies (Knutson et al., 2007). Subsequent to WTO formation, coalitions of developing countries have found it feasible to band together to wield increased bargaining power within the political structure of WTO (Wolfe, 2006), and by the Doha Round of negotiations, an "economic development" objective was explicitly included, which became the primary focus of the developing countries. The developed countries continued to focus on market access and trade-distorting domestic policies, and the result has been a stalemate in the Doha Round.

Another force, albeit difficult to quantify, has been the creation and spread of electronic communication via the internet. This technology has not only made the conduct of business on an international level faster, easier, and lower cost, it has also greatly facilitated the global spread of information and more rapid spread and adoption of technology (Cox and Alm, 2006). This spread of information has undoubtedly fostered this process of globalization.

An important macroeconomic force, particularly as trade becomes more prominent, is exchange rates and individual countries' capacities to affect them. Many, national currencies are traded in international financial markets and currency rates affect trade flows. Perhaps the most prominent exception to flexible exchange rates in today global markets is in China, whose central government manages its exchange rates.¹ China's managed exchange rates, which many believe to be substantially undervalued (e.g., Goldstein, 2003), makes China's trade goods cost less with other countries' currencies. This fosters that country's trade advantage in all goods exported, including textiles.

These forces have served to make national economies more interdependent and more politically aware of that interdependence. Thus, major drivers of general (not commodity specific) changes over the past two decades may be summarized under the categories of:

- A concerted, long-term effort toward freer trade, initially addressing trade in manufactured goods, but with more recent attempts to include agricultural commodities.
- Technological innovations in communication and information flows that have facilitated the spread of production and marketing technology.
- Management of currency values/ exchange rates.

Industry Changes

I will characterize the major causes of change in the global cotton industry over the past two decades into five categories—restructuring of the global textile industry, biotechnology, synthetic fiber production capacity, the WTO, and market structure changes. These are each discussed below.

¹ Many governments manage currency values through economic policy. Those efforts are more successful when government has more direct control, such as in China.

Textile Industry Restructuring. With respect to cotton, the interface with textile manufacturing has direct implications for strategies for economic development for a number of countries at different stages of development. Many international groups, including WTO, appear to assume cotton fiber trade issues to be independent of textile products trade issues. However, from the perspectives of both economic impact and policy, this assumption is invalid. As textile manufacturing has shifted among countries (e.g., away from the U.S. and Europe toward Asian countries) (Organisation for Economic Cooperation and Development, 2004), the competitive advantage among cotton producing countries/regions is altered, other things equal. The advantage, other things equal, results from transportation costs associated with getting cotton to textile manufacturers, frequently augmented by government policies aimed at self-sufficiency in fiber production.² Of course, quality attributes of the cotton and other aspects of marketing can mitigate transportation cost advantages, but the movement of textile manufacturing away from the U.S. and Europe toward Asian countries has shifted some production and export advantage toward Australia, India, China, Former Soviet Union countries, and West African countries.

Textile manufacturing has shifted because of two overriding reasons (for some historical perspective, see Rivoli, 2006). On the one hand, economics of textile manufacturing moved toward developing countries with abundant, low-cost labor, particularly for those textile operations that are inherently more labor intensive³ and particularly in those countries that

² In China, for example, one of the stated policy objectives is to increase domestic cotton production as a means to decrease imports (Reinhart, 2007).

³It should be noted that textile manufacturing may be cost efficient as both labor-intensive and capital-intensive, depending on the relative cost of labor and the specific nature of the manufacturing operation. This explains why, for example, yarn manufacturing may be efficient in countries with high labor costs when automated, high-technology machinery is used in combination with very little labor and also be efficient in countries with low labor costs when less automated equipment is used in combination with larger amounts of low-wage labor.

allowed or facilitated capital investment (domestic and/or foreign capital) in those enterprises. In recent years, these conditions have been prevalent in China, India, Pakistan, South Korea, Taiwan, and Turkey. On the other hand, the phasing out of the Multi Fiber Agreement (MFA) between 1995 and 2005, starting with the formation of the WTO, has enabled those economic shifts. The lower trade barriers on textile imports, particularly in the U.S. and the E.U., have had major impacts. Many developing countries have maintained more of their protectionist policies of domestic textile industries (Ethridge et al., 2007). Consequently, international markets are still not working in line with free market principles. A corresponding shift, difficult to separate from the MFA effect, was the admission of China into the WTO.

Biotechnology. With notable exceptions of new-land development in Brazil and China, the primary reasons for the increased cotton production (Figures 1 and 2) has been from yield increases, and, while there have been efficiency gains from management, input use, etc., an important driver for those has been the development and adoption of biotechnology. Insertion of insect and herbicide resistance genes into cotton plants, in combination with conventional cotton breeding, has removed yield barriers and/or reduced the variable costs of cotton production. Figure 11 shows cotton lint yield patterns in selected countries over the past 10 years. Cotton yields have increased everywhere except in the West African Countries, where the biotech seed varieties have yet to be widely adopted (Ismael, Bennett, and Morse, 2001; Toenniessen, 2003). Yield increases have been particularly dramatic in Brazil for over a decade, and impressive in the U.S., China, and India during the last 5 years.

In developed countries, where intellectual property laws are enforced more aggressively, the fixed costs of the seed technology have increased, but average cost per unit of lint cotton produced has likely declined (although the financial risk of the fixed-cost technology may have

increased). In some developing countries where intellectual property rights are not well enforced, the licensing fees may be avoided, giving cotton producers in those countries a substantial competitive advantage in the global market,⁴ at least in the short run. Longer-run impacts on the investment in the development of such technological innovations are less clear.

Synthetic Fiber Capacity. The different fibers compete for shares of the market with textile manufacturers, who in turn respond to consumer markets for textile products. Cotton's primary fiber competitor is MM fibers, of which polyester is the major component of that group. Most MM fiber production has a high proportion of fixed costs, so that once that capacity is built, pricing of that fiber is a function of only the variable costs up to point where production and utilization approach full industry plant capacity. In price-competitive fiber markets where fibers readily substitute in production, large or rapid expansion of MM fibers capacity usually result in downward pressure on cotton prices. In these instances, the results may be adjustments in the amount of cotton produced by cotton producers or cotton producing countries whose markets are not insulated from these forces.

On a global scale, MM fibers production capacity during the past two decades grew by 237%, from 19,145 million metric tons in 1986 to 45,442 million metric tons in 2005, while production grew by 218% (Fiber Economics Bureau). Figure 12 shows the increase in global MM fibers production and for selected major producing countries over that period. It shows that the growth has occurred largely in Asia and is dominated by growth in China (Figure 13). In 2005, China had 38% of global MM fibers production capacity, up from less than 7% in 1986, and 44% of global MM fibers production.

⁴ Documentation of the extent of these violations is weak, but contentions hold that they are not uncommon in countries such as Brazil, China, and India (see, e.g., Kerr et al., 1999; Fannakas, 2003; Cook and Campbell, 2007).

Impacts of WTO. At the September, 2003 meeting of the WTO, Brazil, supported by Australia and the West and Central African nations, filed a petition challenging that U.S. cotton subsidies depress world prices and are injurious to farmers in those countries. The Cotton Economics Research Institute 2004 analysis of the impacts of the U.S. cotton program indicated that their elimination would produce little impact on world prices, but would impact the location of production (Pan et al., 2006). Several subsequent studies supported that general finding (Goreux, 2004; Poonyth et al., 2004; Shepherd, 2005), although others (Alston, Sumner, and Brunke, undated; Baffes, 2004) found larger world price effects. The WTO subsequently ruled that two aspects of the U.S. cotton program were non-compliant under the WTO rules—the “Step 2” subsidy payments and the “counter-cyclical” aspects of the program--on the basis that they are trade distorting. The U.S. has discontinued Step 2 aspects of the program. The U.S., the E.U., and Japan in particular are moving away from commodity supports toward direct income supports, at least in part to avoid such rulings.

All countries, both developed and developing, support/subsidize/protect their agricultural sectors, including cotton (Ethridge et al., 2007). They use different policy tools to accomplish their goals, but no country has shown willingness to subject its citizens, economies, and security interests to unrestrained agriculture market forces, particularly when those markets are inherently unstable.⁵ A comparison across countries of approaches to protecting their farmers from market forces reveals at least two prominent differences between developed and developing countries: (1) developing countries tend to use tariffs and other forms of trade protection more than developed countries and (2) developed countries are more likely to use income supports while developing countries are more likely to use input subsidies. Hoekman,

Ng, and Olarreaga (2003) found that “tariffs matter significantly more than subsidy policies” in welfare gains for developing countries, and in the case of cotton, Pan et al. (2005) found that China’s tariff-rate-quota (TRQ) on cotton had about twice the impact on world cotton prices than does the U.S. cotton program. While the WTO ruling on the U.S. cotton program is seen by some cotton producing countries as a gain for them, what will be the net gain if/when rulings come disallowing import protections on cotton? In the same vein, just as any form of output subsidy that tends to increase production in a given country places downward pressure on global market prices, input subsidies also have that effect. Yet, to date WTO has ignored input subsidies in its Aggregate Measure of Support (AMS), i.e. subsidy support, estimates; but how long will that be the case? This is only to suggest that if WTO survives and is serious about addressing the trade-distorting aspects of the domestic policies of different countries, we may have yet seen only the leading edge of these impacts.

Thus, WTO is playing a role in the dynamic shaping the global cotton industry, but its effects in the future are far from certain. WTO actions, and their effects, are clearly influenced by political coalitions (Wolfe, 2006), and it remains to be seen how and the extent to which domestic country policies will be influenced by the WTO.

Market Structure Changes. When we look at the previously discussed shifts in cotton production, consumption, and trade flows, the emergence of China as the single most dominant force in that global market becomes clear. Between 1986 and 2006,

- China’s share of global cotton fiber production increased from 23% to 27%,
- China share of global mill consumption of cotton fiber increased from 24% to 39%, and

⁵ See Panagariya (2005) for an overview of effects of developed countries’ commodity programs on developing countries.

- China's share of global cotton fiber imports increased from .05% to 35% (U.S. Dept. of Agriculture, Foreign Agricultural Service).

Also, in 2005, China exported 24% of the global value of clothing and textiles exports (World Trade Organization, 2006).

Thus, China is approaching 40% of the global market in cotton fibers, making it a dominant force in both the cotton market as an input and the market for its products (clothing and textiles). Add to that China's practice of state trading, i.e., market buyers and sellers must bargain with an agency of China's government rather than other market participants with less market power (Ethridge et al., 2007), and an emerging global market structure of oligopsony is feasible, if not likely. The oligopsony (a few firms, or in this case, countries, buying a product or commodity, in this case cotton, potentially with one dominant country) may have evolved through the various changes that is sufficiently concentrated that there is enough market power to influence cotton prices. With China purchasing 35% of all raw cotton traded, and the proportion growing, and given its "single desk" trading practices, it is logically consistent that China holds a "dominant country" oligopsony power in the world cotton fiber market, which gives it sufficient market power to suppress global cotton prices. This would help explain the failure of the International Cotton Advisory Committee (ICAC) price prediction model (Kaltsas, 2000; Goreux et al., 2007), which has performed well historically, to make accurate price forecasts in recent years. If such a structural market shift has occurred, then the old paradigms for "doing business" in cotton, textiles, and clothing may no longer be reliable. Note that this does not suggest that large increases in production and additional competition from man-made fibers have not exerted downward pressure on world cotton prices; rather, it suggests that the

structural shift toward more market concentration may have exerted *additional* downward pressure.

With 24% of the international clothing and textiles (C&T) market, China may also have oligopoly power in that market. However, since that market share is lower than for cotton fiber imports and C&T exports are less centrally controlled, its oligopoly power in C&T is likely less than its oligopsony power in the cotton market.

Summary and Conclusions

In summary, data have been presented supporting that:

- Global cotton production has been increasing over the past two decades, but especially rapidly in the last half-dozen years. The recent rapid increases have come largely from yields, in which biotechnology R&D have been the major factor. The production and yield increases have been most prominent in several of the dominant producing countries—Australia, Brazil, China, India, and the U.S.
- Global consumption of cotton by textile mills has increased commensurate with production, showing similar rapid growth in recent years. The rapid growth corresponded with trade liberalization, particularly the phase-out of the MFA, and mill use has shifted away from developed countries, especially the E.U. and the U.S., and toward developing countries, particularly in Asia, and dominated by China.
- While cotton consumption has been increasing, man-made fibers use has been increasing at a faster rate, fed by expanded production capacity for MM fibers and resulting lower prices. MM fibers capacity growth has concentrated in Asia, and particularly in China.
- Trade in cotton fiber has increased as textile manufacturing has shifted and cotton use has grown. China has become the dominant cotton fiber importer, driven by its rapid

expansion of textile manufacturing, and the U.S. has become the dominant cotton fiber exporter, driven by its rapid loss of textile manufacturing.

- Substantial concentration of global market power has occurred in China. The combination of China's potential market power in the global textiles market and market power in the cotton fibers market may have added to the downward pressure on global cotton prices (that was already there from global increases in supply).

So what do these changes suggest for the future? Let me first say that I do not know. Secondly, there are several major factors or forces that will undoubtedly impact how the future evolves. The most readily recognizable of these include:

- The extent to which production increases, through combinations of new lands development and yield increases, spread to other, primarily developing, countries. Available land for development is concentrated in Africa, Asia, and South America. Will the economic/political systems evolve to facilitate that outcome? Will the economic systems in the countries yet to utilize yield-enhancing and quality-enhancing technologies achieve the economic incentive structures to achieve the grower conduct and economic performance those countries need and want to be globally competitive? Will the current policy incentives toward bio-fuels in both developed and developing countries stay in place, and, if so, what will be the net effect on land area in cotton?
- Correspondingly, will the developing countries be successful in developing the marketing infrastructures—transportation, communication, storage and delivery systems, and cotton quality evaluation structures—needed to be competitive in a global cotton market?

- Will the WTO continue as an organization and, if so, what will be its agenda(s)? Can it successfully manage the various political agendas of member countries so as to move forward on the original objective of more open trade and economic efficiency? Can the dual objectives of free trade and economic development of developing countries be reconciled? Are the economic development goals better left to the international organizations originally formed for that purpose?
- Will the competition for cotton from man-made fibers continue, weaken, or intensify? This likely depends largely on how much global excess capacity in production capacity exists over time.

The rapid changes in global cotton markets and market structures over the past two decades have been very rapid compared to historical norms. Overriding causes have been from technological developments, increased trade in both cotton and textiles, and a greater level of integration of markets on a global scale. Will the rate of change increase or decrease in the years ahead? I obviously do not know, but I think it is more likely to increase. What do you think?

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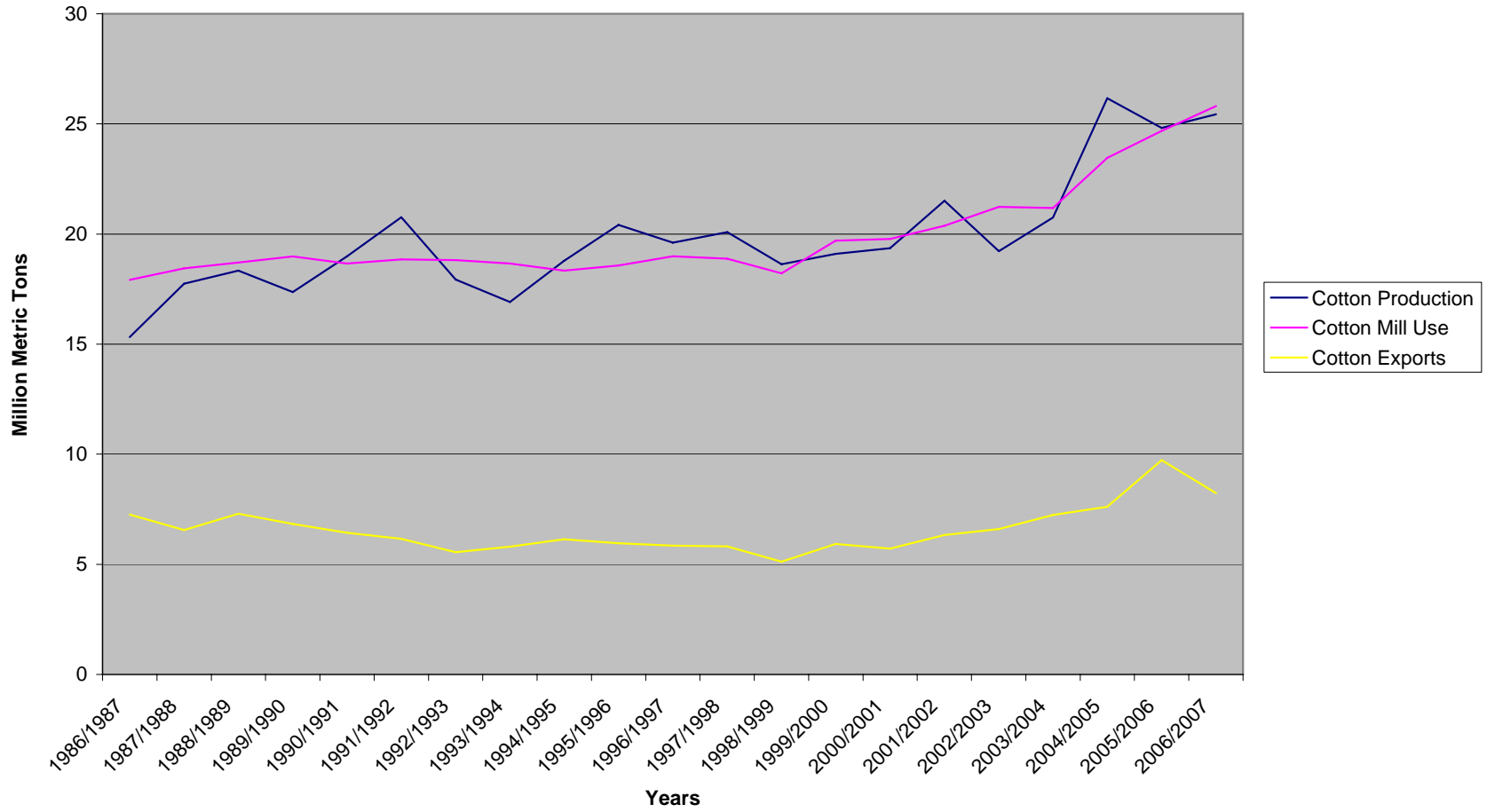
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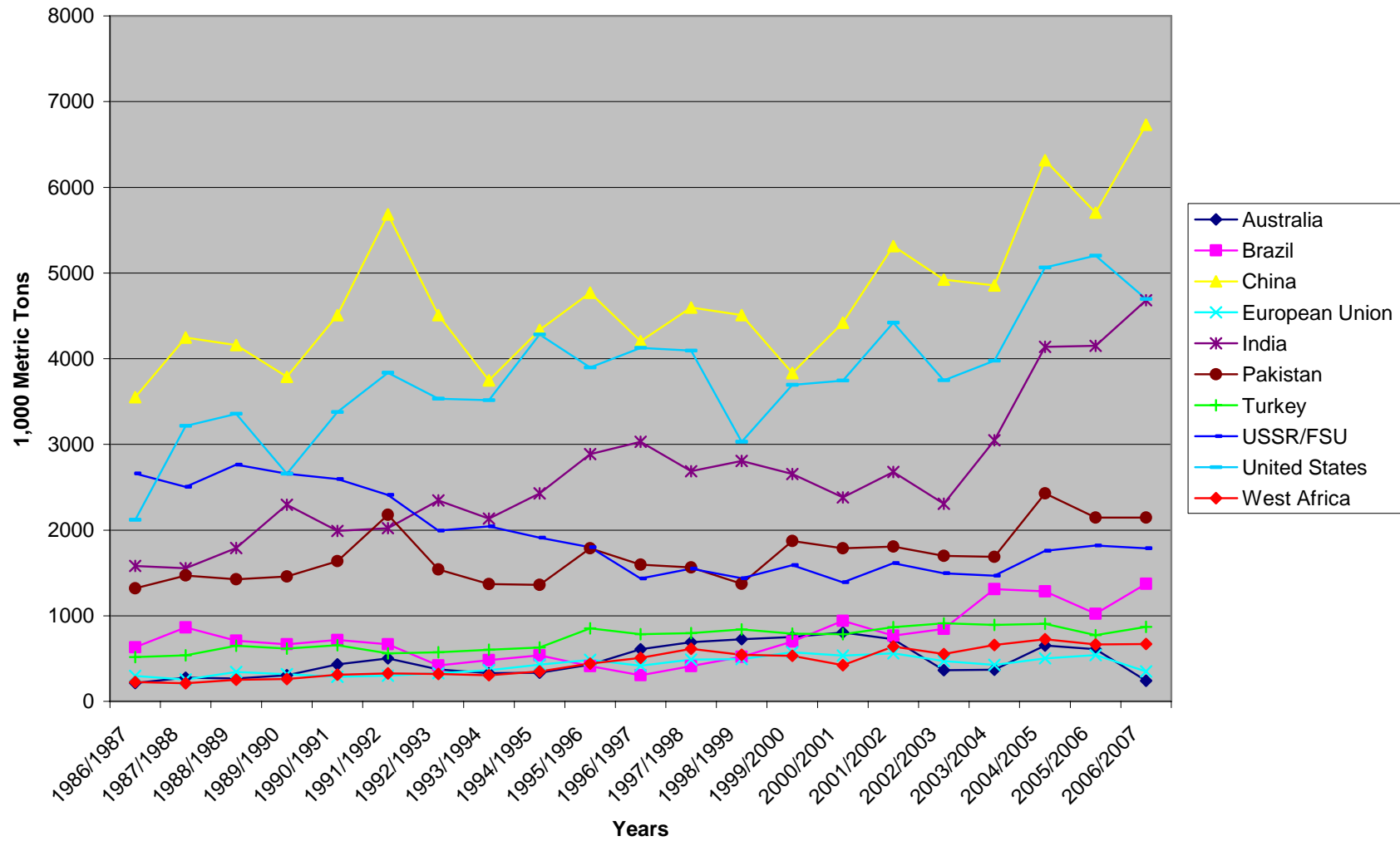
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Figure 1. Global Cotton Fiber Production, Mill Use, and Trade, 1986-2006



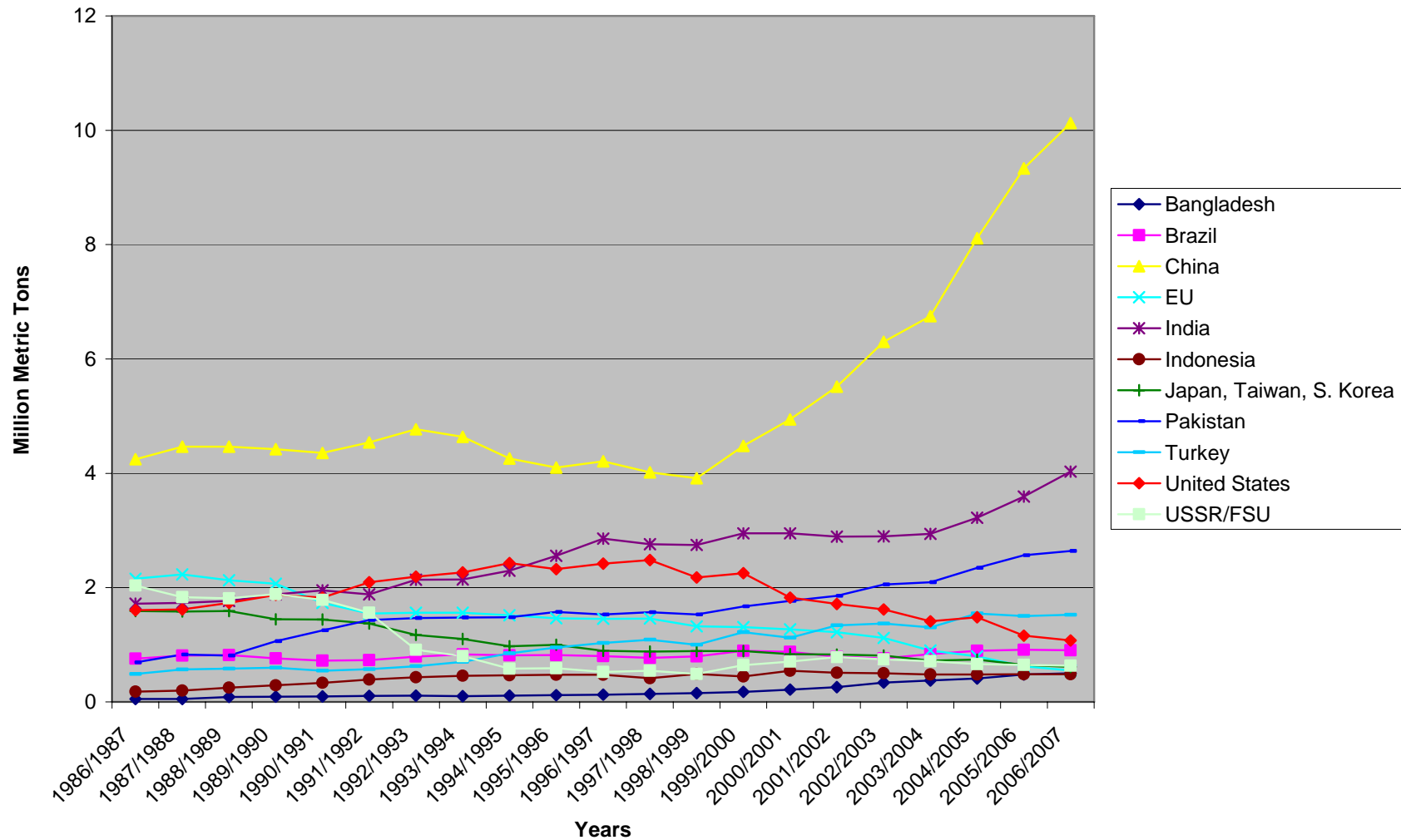
Source: U.S. Dept of Agriculture

Figure 2. Cotton Fiber Production, Selected Countries/Regions, 1986-2006



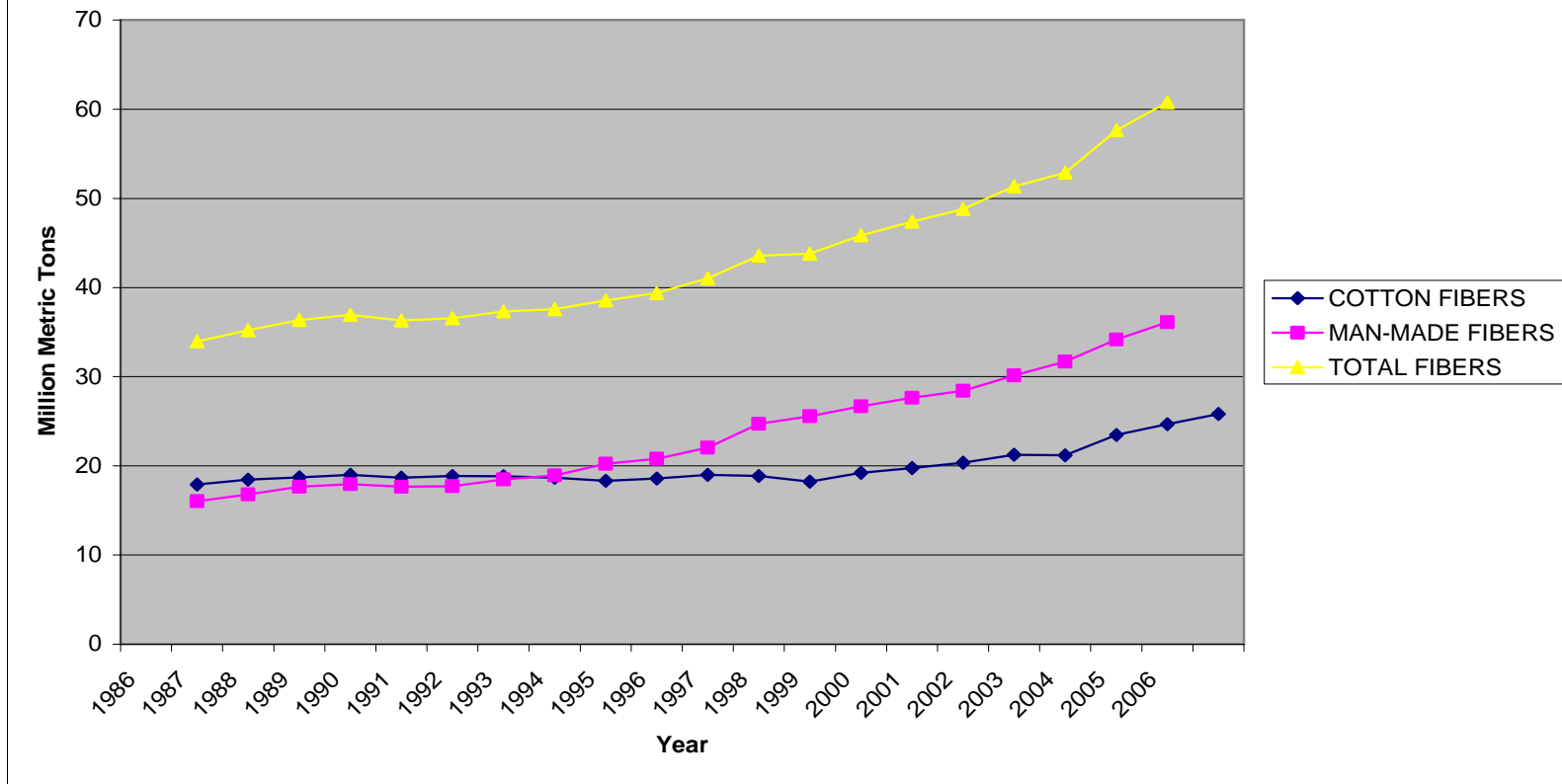
Source: U.S. Dept of Agriculture

Figure 3. Cotton Fiber Mill Use, Selected Countries/Regions, 1986-2006



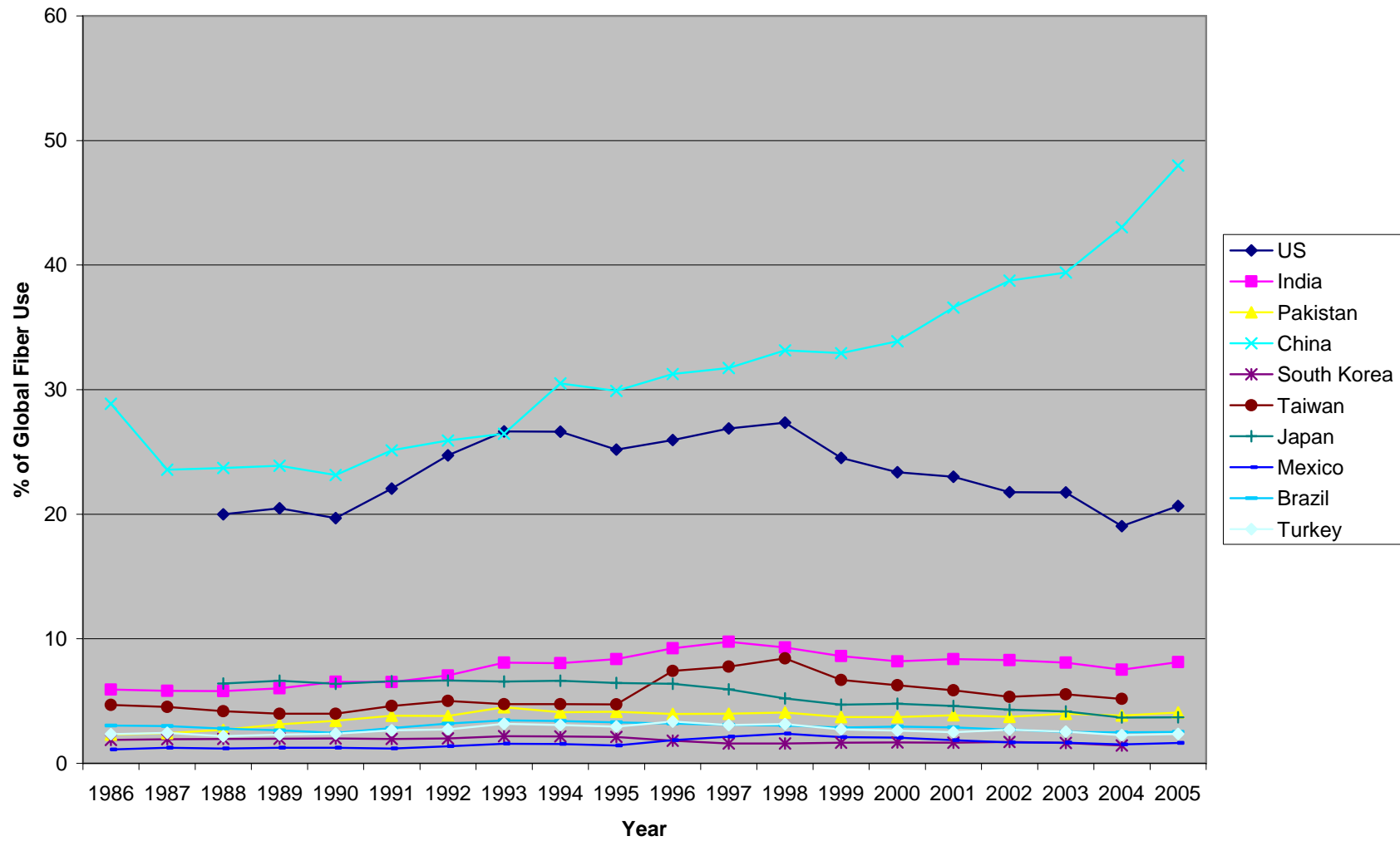
Source: U.S. Dept of Agriculture

Figure 4. Global Fibers Mill Use by Type, 1986-2006



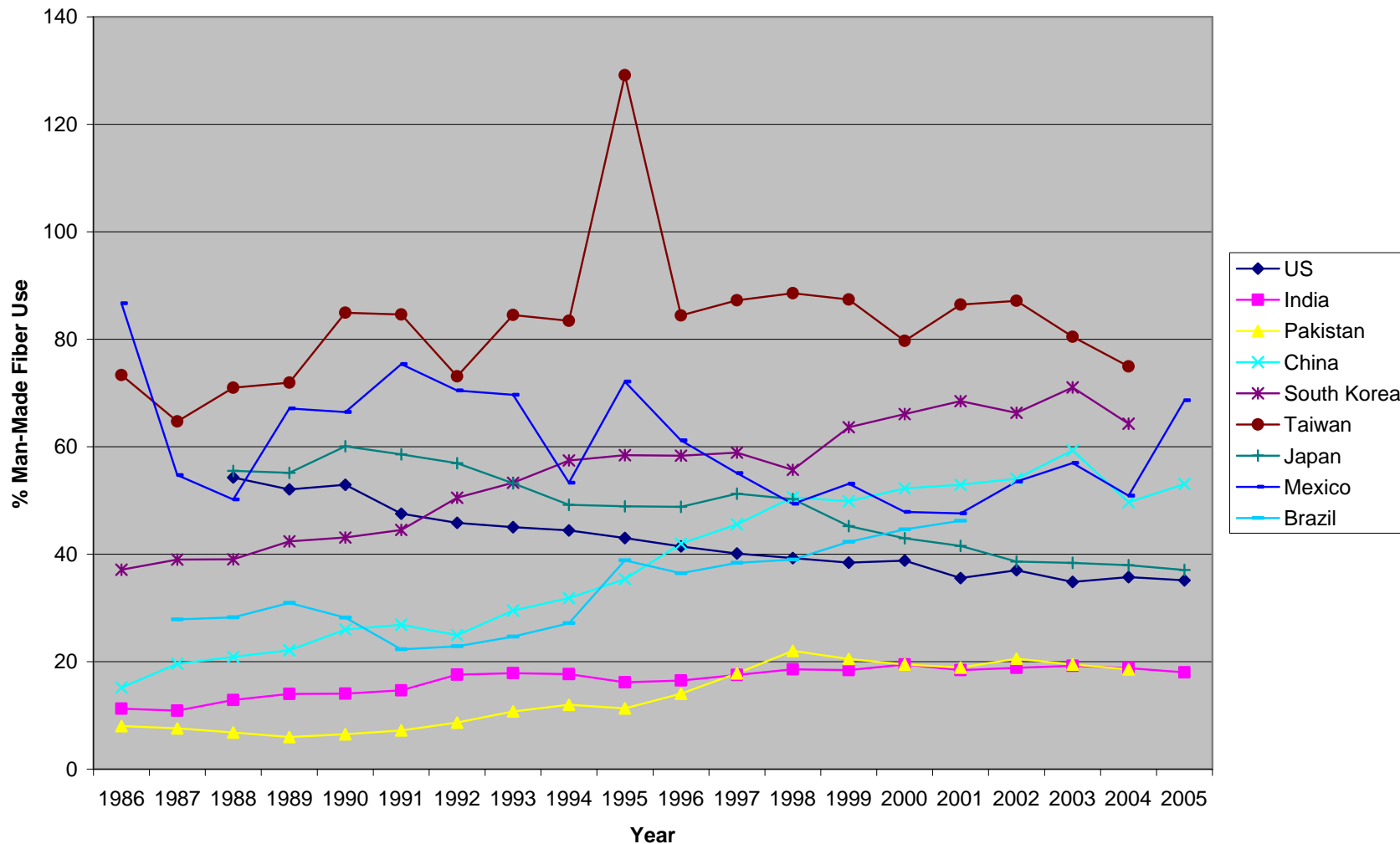
Sources: Fiber Economics Bureau
U. S. Dept. of Agriculture

Figure 5. Countries Market Shares of Total Fiber Use



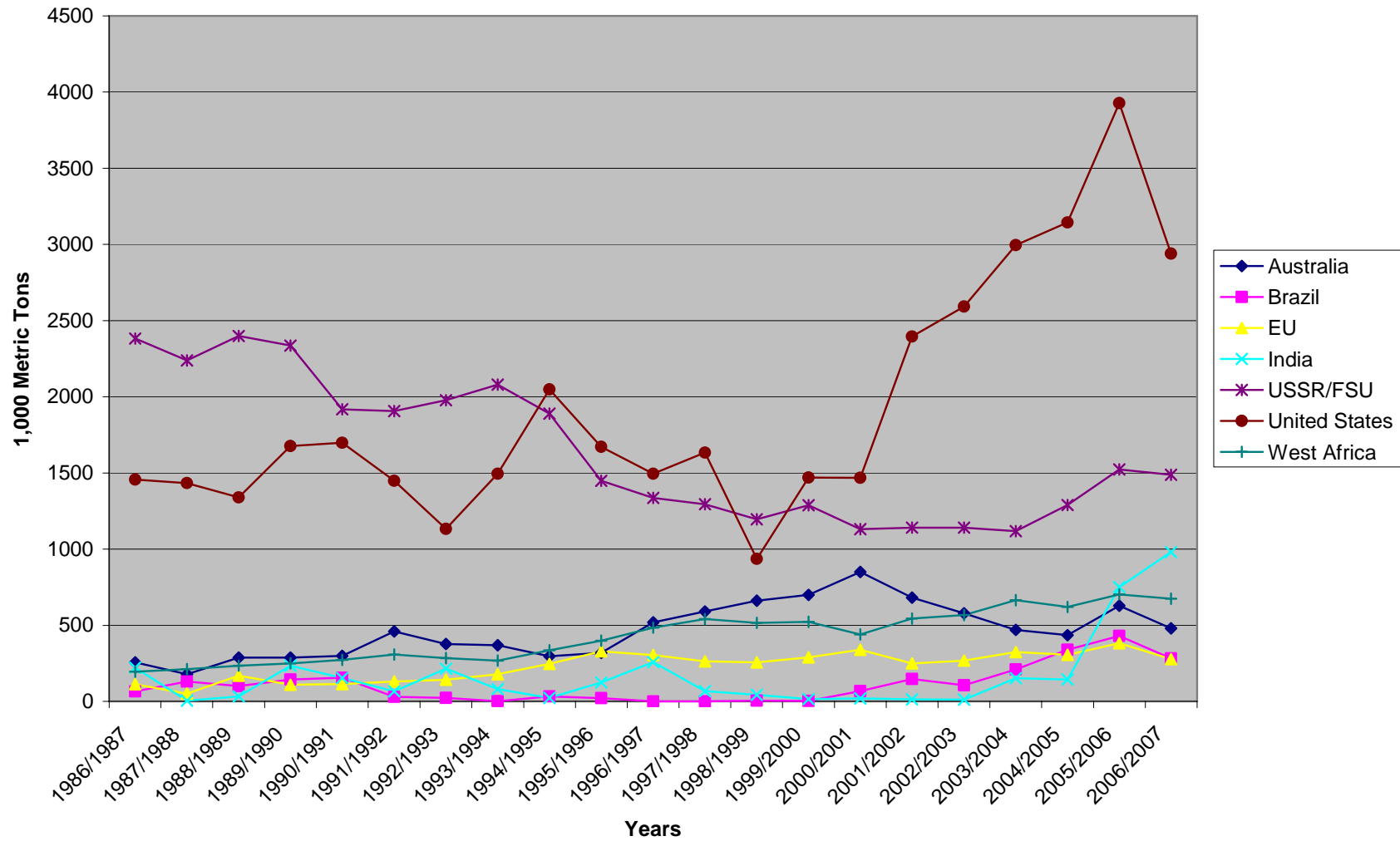
Sources: Fiber Economics Bureau

Figure 6. Man-Made Fibers Market Shares, Major Textile Manufacturing Countries, 1986-2006



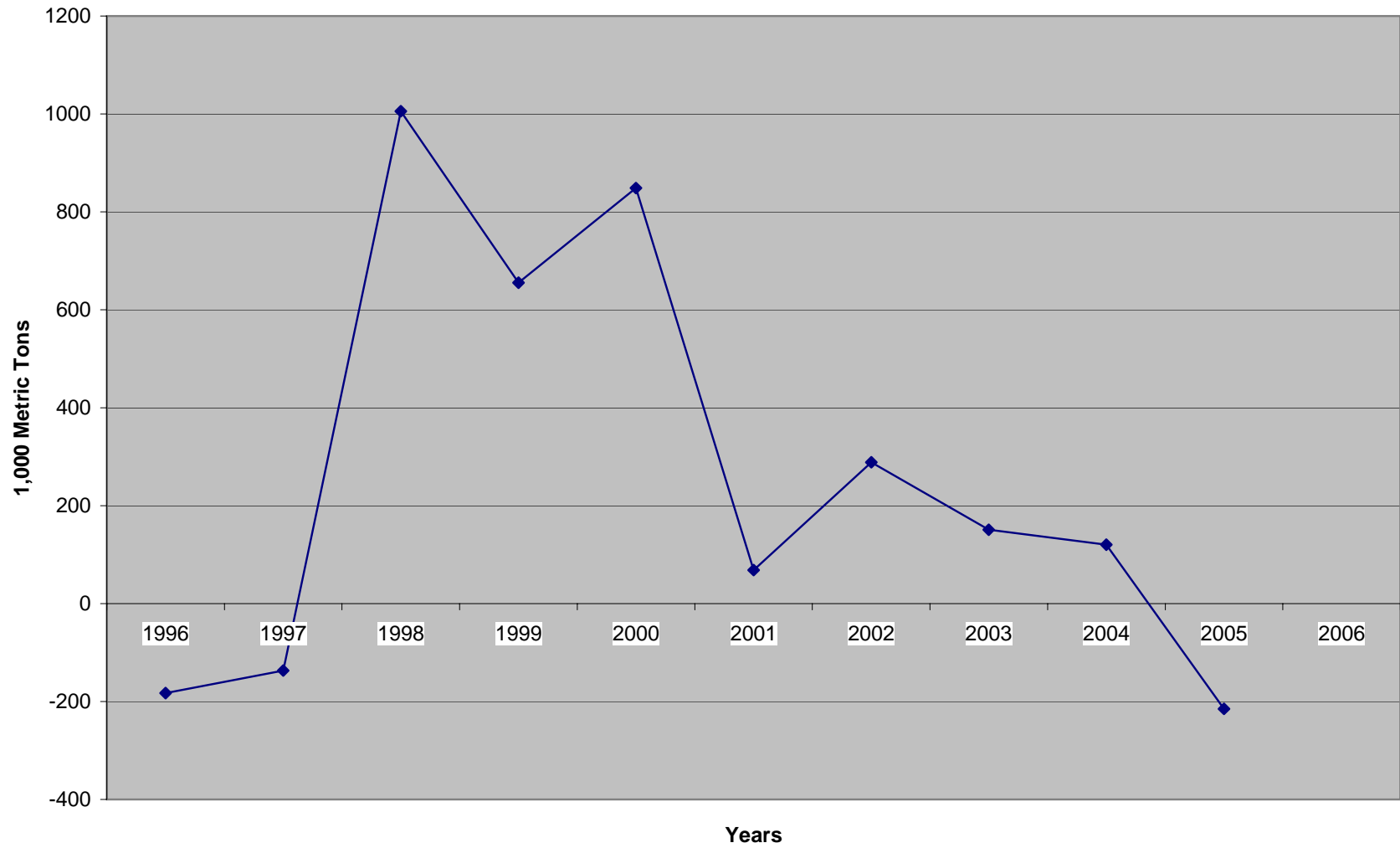
Sources: Fiber Economics Bureau

Figure 7. Cotton Exports, Selected Countries/Regions, 1986-2006



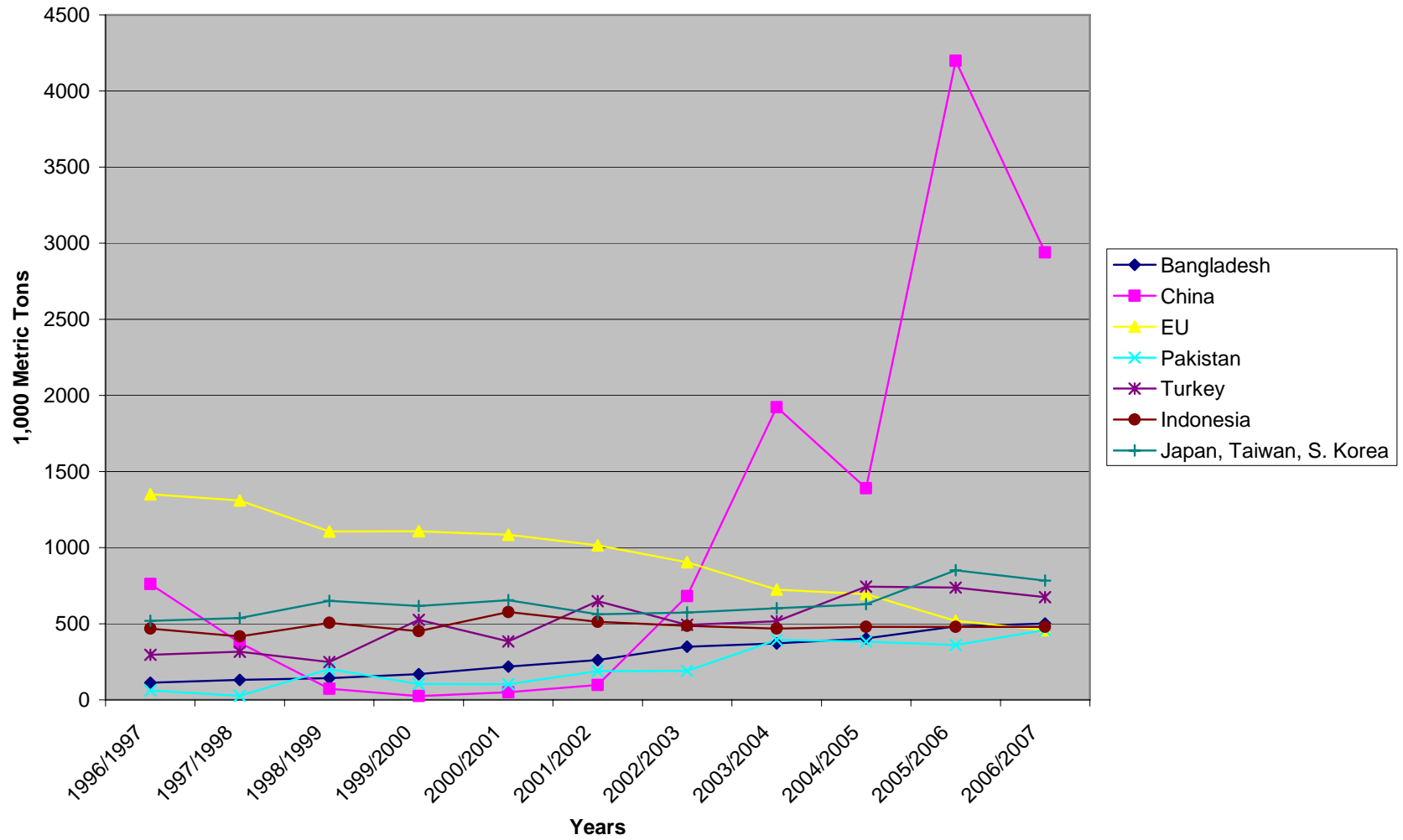
Source: U.S. Dept. of Agriculture

Figure 8. U.S. Net Imports of Cotton, Including Cotton Embodied in Textiles



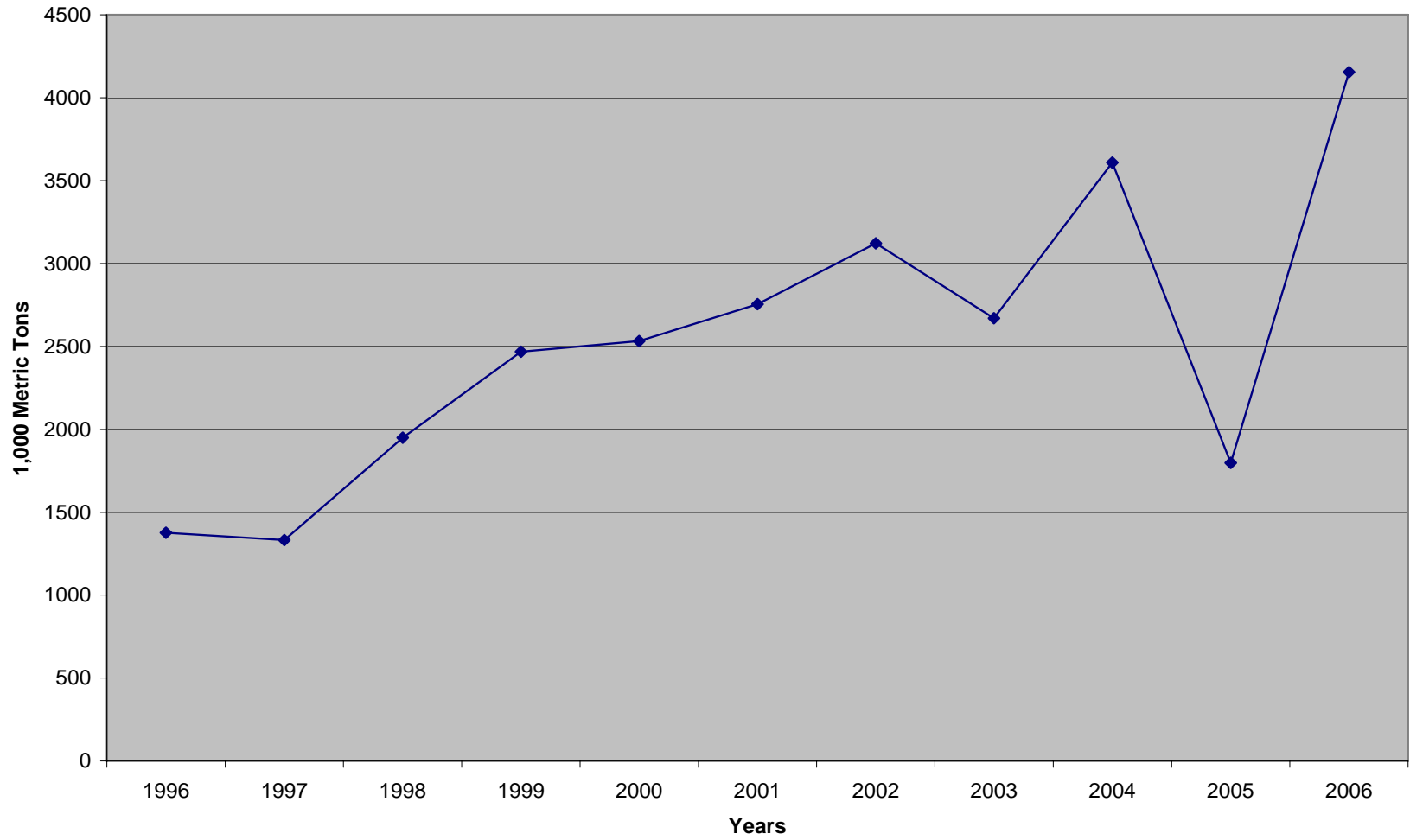
Source: U.S. Dept. of Agriculture

Figure 9. Cotton Imports, Selected Countries, 1996-2006



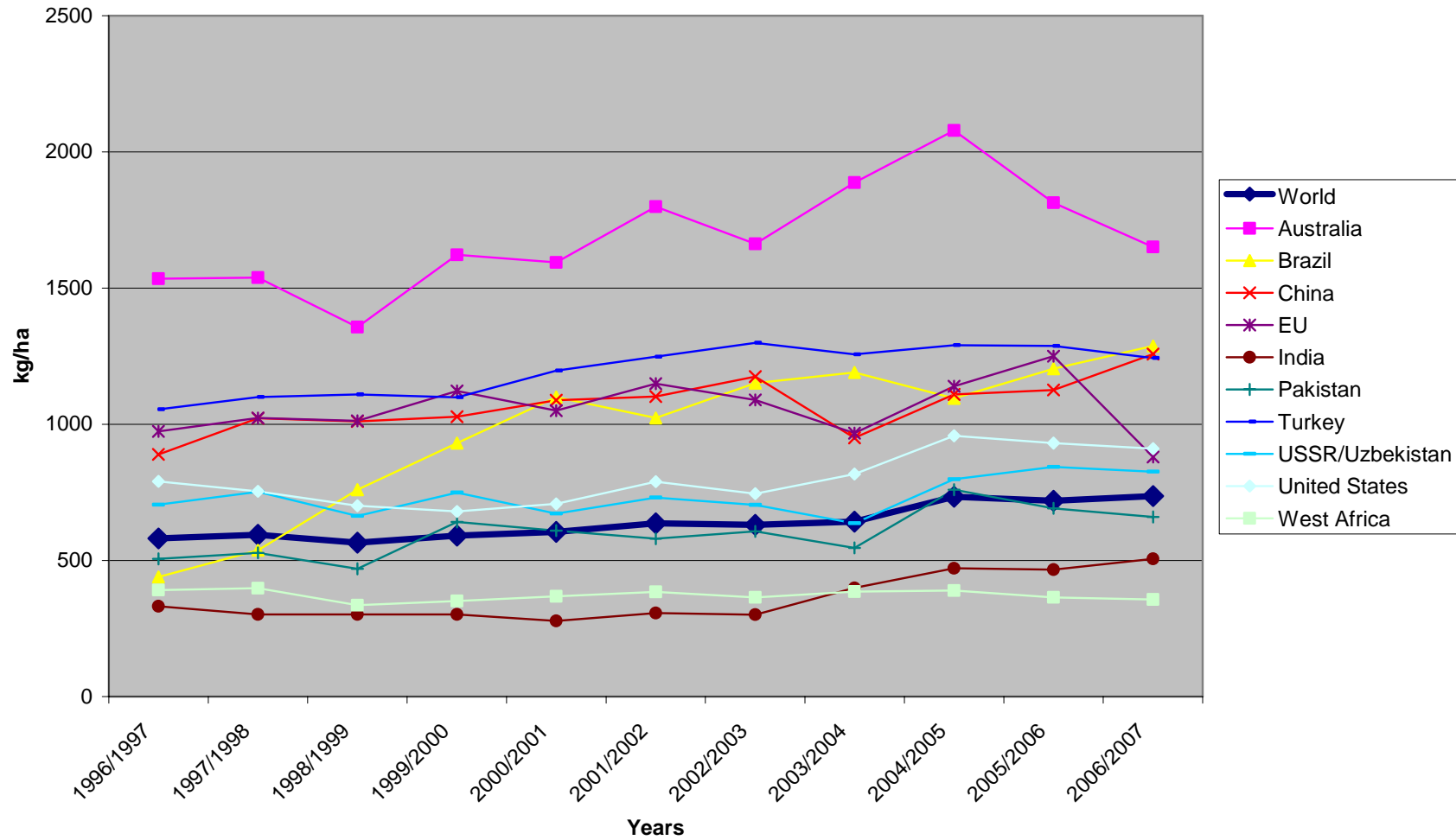
Source: U.S. Dept. of Agriculture

Figure 10. China Net Exports of Cotton, Including Cotton Embodied in Textiles



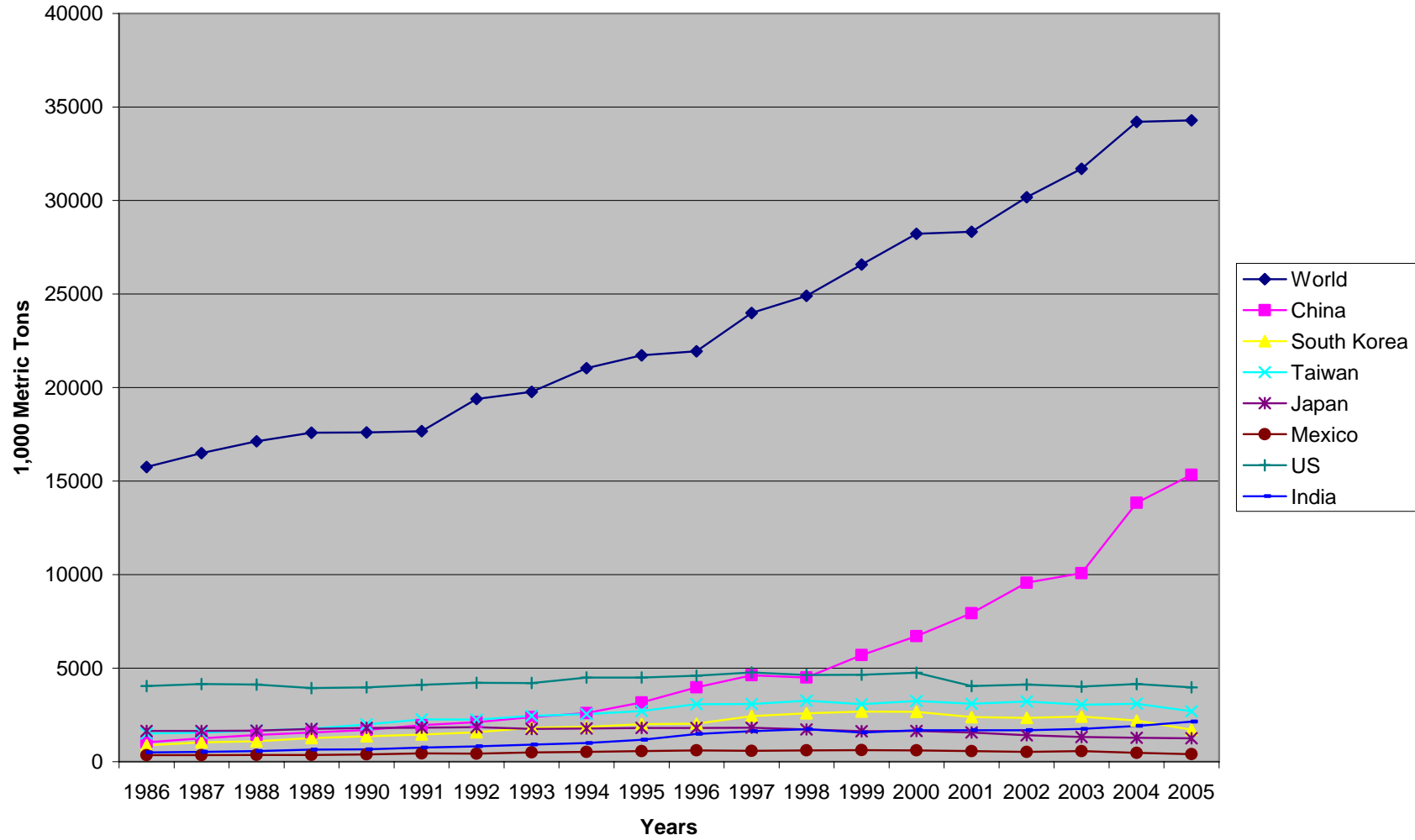
Source: MacDonald
U.S. Dept. of Agriculture

Figure 11. Cotton Fiber Yields, Global and Selected Countries/Regions, 1996-2006



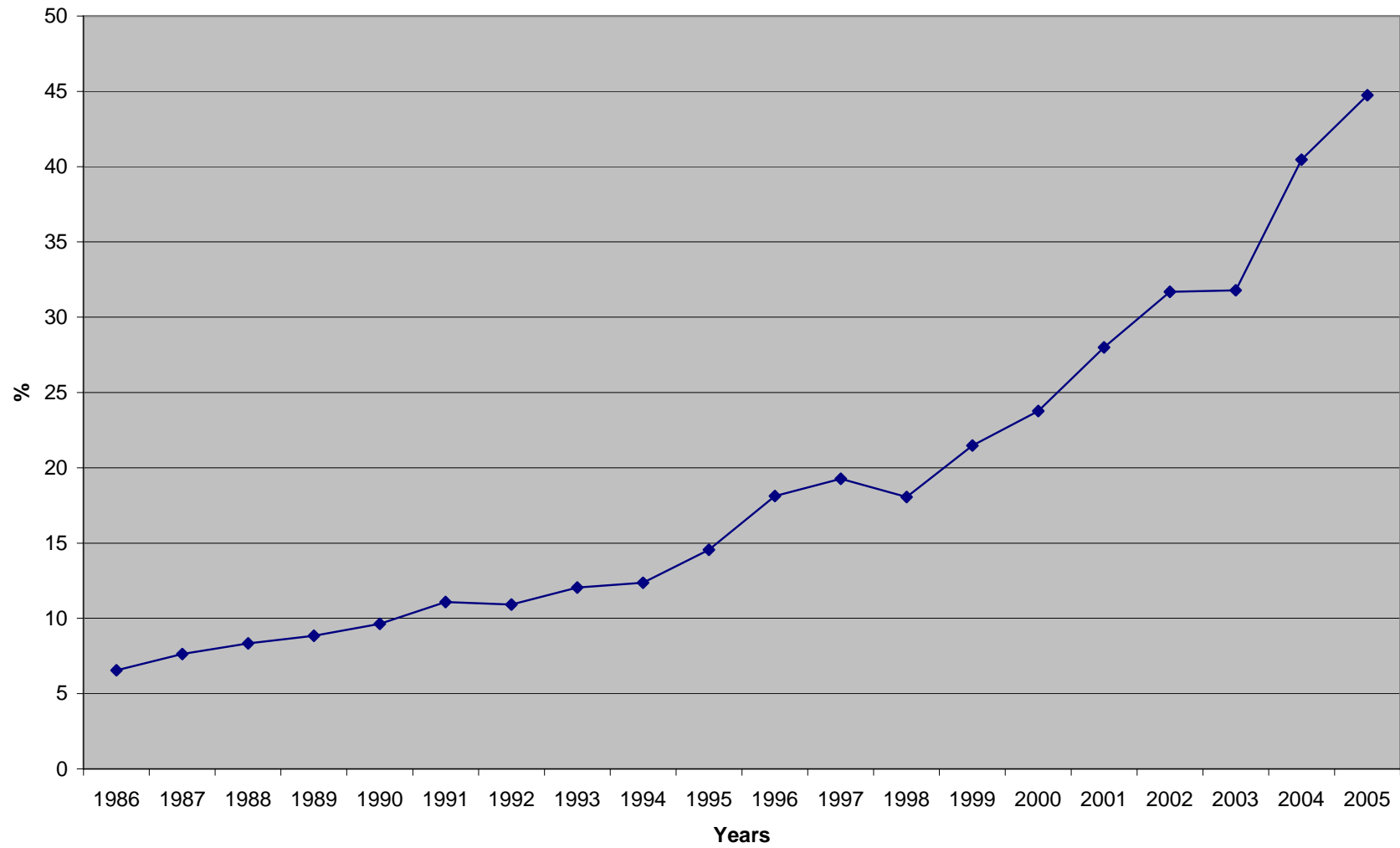
Source: U.S. Dept. of Agriculture

Figure 12. Man-Made Fiber Production, Global and Selected Countries, 1986-2006



Sources: Fiber Economics Bureau

Figure 13. China Share of Global Man-Made Fiber Production, 1986-2006



Sources: Fiber Economics Bureau