

**THE IMPACTS OF THE UNITED STATES-CHINA TRADE WAR
ON THE TEXAS COTTON SECTOR**

by

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LIST OF ABBREVIATIONS

BRI- Belt and Road Initiative

CCP- Chinese Communist Party

CFAP- Coronavirus Food Assistance Program

EWG- Environmental Working Group

IP- Intellectual Property

IPR- Intellectual Property Rights

MFP- Market Facilitation Program

PLC- Price Loss Coverage

PRC- People's Republic of China

STAX- Stacked Income Protection Plan

U.S.-The United States

USDA- United States Department of Agriculture

WHIP+- Wildfire and Hurricane Indemnity Program Plus

WTO- World Trade Organization

1. Problem Statement

Tensions escalated between the United States (U.S.) and China during the summer of 2017. An investigation by the U.S. Trade Representative authorized the Trump administration to take action against China for trade violations. These violations included theft of American intellectual property, currency manipulation, and breaking international trade norms (Di, Luft, & Zhong, 2019). In response to these violations, President Trump added tariffs on Chinese goods worth over \$250 billion dollars (Di, Luft, & Zhong, 2019). In retaliation, the Chinese created matching value tariffs, inciting the U.S.-China trade war. With China being a major destination for U.S. agricultural exports, the tariffs were mostly focused on the U.S. agricultural sector (Di, Luft, & Zhong, 2019). Cotton has been one of the hardest hit commodities in the American agriculture sector as a result of this trade war. Especially in Texas, many rural communities rely on the cotton industry for their livelihood. With sparse rainfall typical in cotton country, there are not many other agricultural crops that farmers can produce. Although these rural communities may feel isolated from global markets,

they are, in reality, at the mercy of the international politics of trade.

The purpose of this Master of Applied Geography directed research project is to better understand how the dynamics of the U.S.-China trade war impacted the cotton market in west Texas. Furthermore, this research will attempt to understand future potential trade wars between the two countries and how they might impact U.S. agriculture and other commodities. If the U.S. government and cotton sector can understand Chinese purchasing patterns and the trends of subsidization and consolidation in the current cotton sector, they may be able to plan and take action to mitigate their negative effects. Protecting these rural agricultural markets is crucial for the future of Texas farming communities.

To meet this research objective, this directed research project asks: How has the Texas cotton market been affected by the U.S.-China trade war, and what are the long-term implications of the trade war for the Texas cotton market? Drawing on statistical analysis and in-depth interviews, I argue that the trade war has resulted in three key, interrelated dynamics. First, the trade war has increased farmer's reliance on subsidies from the U.S government to reduce the financial impacts of the trade war. Second, the trade war has increased numbers of small cotton farmers being consolidated into larger cotton farms due to their inability to turn a profit farming smaller acreage in the face of pressures brought on by the trade war. Third, the Chinese government has reduced demand for U.S. cotton, which in turn, has led to Chinese investment in other foreign agricultural markets as a strategy of the Chinese Communist Party (CCP) to gain regional and global power. In sum, I argue that these three dynamics brought about by the U.S.-China trade war have increased the speed of the American cotton industry's overall decline. The long-term impacts of the continued reliance on government subsidies are reducing the ability of farmers to operate independently. As a result, the U.S. government is allowed to exert some control over their profits and losses. The large-scale consolidation of smaller farms is leading to economies of scale, pushing more money into the hands of the top landowners. Finally, disinvestment in American cotton by the Chinese runs the risk of flooding the world market with cotton produced in other countries, thus decreasing the profits of U.S. cotton farmers. Also, Chinese import demand for American cotton has historically been a useful negotiation tool for reducing the trade deficit and furthering American foreign policy goals.

To support my argument that the trade war has been detrimental to the cotton sector I will first broadly evaluate the U.S. and Texas cotton market from the perspective of Chinese purchasing practices, U.S. government cotton subsidies, and the consolidation of cotton farms.

Next, I draw on 11 interviews with cotton sector stakeholders in west Texas, specifically Nolan County, where cotton has been farmed since the late 19th century. The interviews focus on the three different aspects of the trade war analyzed here: the increased use and reliance on subsidies to support agricultural markets in the U.S., the large-scale consolidation of cotton farms, and increasing Chinese disinvestment in American cotton. Specifically, I examined how subsidy programs offered by the United States Department of Agriculture (USDA) such as the Market Facilitation Program (the “Trump Check”), Stacked Income Protection Program (STAX), and Coronavirus Food Assistance Program (CFAP) have impacted cotton farmers in Texas since almost every single aspect of the cotton industry is subsidized by the government (U.S. Department of Agriculture, 2020). This includes but is not limited to the seed, commodity price, irrigation, and insurance. Next, I analyze whether the trade war has accelerated the large-scale consolidation of cotton farms in west Texas. This process has been occurring for the last three decades, but it seems as if subsidy programs brought about by the trade war have enabled large scale farmers to start accumulating massive amounts of land that smaller farmers can no longer hold onto. Finally, I analyze how the U.S.-China trade war is causing Chinese disinvestment in the U.S. cotton industry. China has reportedly been investing billions of dollars to build large scale agricultural infrastructure in places such as Brazil and Africa (He et al., 2019). This is part of the Belt and Road Initiative (BRI) by the Communist Party. This plan is serving as a long-term investment program to promote Chinese economic growth. The Chinese government sees becoming agriculturally self-sufficient as one of their biggest weapons in the trade war against the U.S. (He et al., 2019). I will use data from the county, USDA, state, and national databases to show the significance the trade war has had on Texas cotton and to demonstrate the dynamics listed earlier in action.

This project will contribute to the existing body of literature that shows how international policy, trade, and politics can influence resource and environmental management in the U.S. I argue that the U.S.-China trade war is just the beginning of a period of stagnation for the U.S. agricultural industry that will increase the trade deficit that the U.S. has with China as China develops agricultural markets elsewhere. I believe this will lead to an overall decrease in the price and quality of agricultural goods as more products flood the world markets. In turn, the U.S. government may have to spend more in support subsidies or reform the agricultural system all together to counter this dynamic

2. Background

2.1 Texas Cotton Farming

Texas has a long history with cotton, with the crop being cultivated in the region as early as the mid 19th century (Britton, Elliot, & Miller, 2021). The removal of Native Americans, introduction of the railroads, and the invention of barbed wire in the 1870's saw the Texas cotton industry grow rapidly. By 1900, Texas was producing approximately 3.5 million bales of cotton annually (Britton Elliot, & Miller, 2021). Today, there are six major cotton production regions in Texas (Texas AgriLife Extension Service, 2009), including the High Plains, Rolling Plains, Blackland, Coastal Bend and Upper Gulf Coast, Lower Rio Grande Valley, and Far West Texas (Figure 1). These regions farm half of the acres devoted to cotton in the U.S. and produce 40% of total U.S. production (Texas AgriLife Extension Service, 2009).

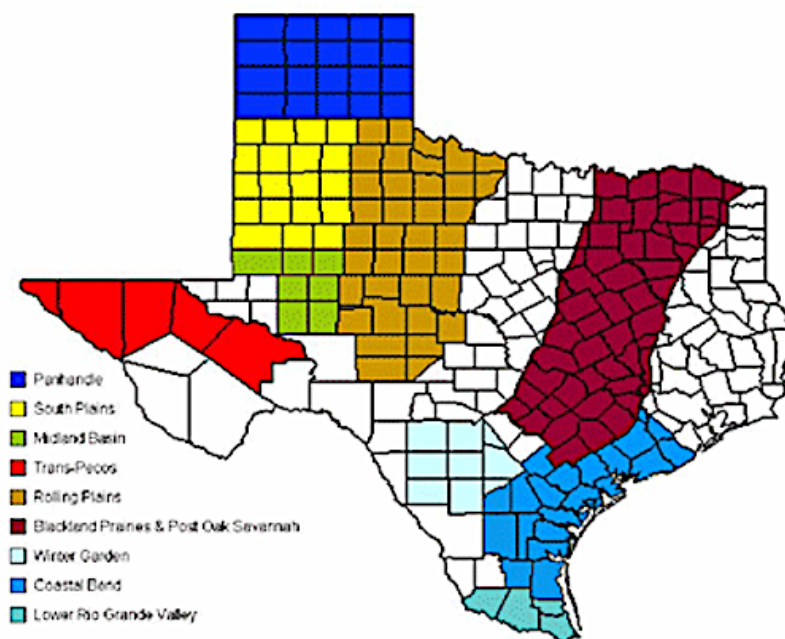


FIGURE 1. The Major Cotton Producing Regions of Texas
Source: Texas AgriLife Service (2021)



FIGURE 2. Nolan County Location in Texas
Source: Maps Open Source (2021)

The top cotton producing counties are mostly found in and around the Texas Panhandle. The Rolling Plains region, where all of the interview participants were from, produces roughly 20% of Texas cotton (Texas AgriLife Extension Service, 2009). This region is made up of 26 counties to the east of Lubbock. It has loamy and sandy soils and receives an average of 20-24 inches of rain annually (Texas AgriLife Extension Service, 2009). Although cotton is a drought tolerant crop, the loamy and sandy soils in which it grows is often susceptible to soil erosion (Britton, Elliot, & Miller, 2021). Cotton fields are usually contoured to prevent erosion and allow for the fields to retain more water. Although there is slight variance in planting time across the state, the Rolling Plains region usually plants cotton in late spring. Cotton is harvested during the fall, depending on weather conditions. Large machines known as “strippers” strip the cotton

from the stock. Then it is compressed into modules and transported to a local cotton gin. Returns on cotton vary as gins measure the quality of the crop. This is usually measured based on grade and length of the fibers which vary depending on the quality of the growing season (Britton, Elliot, & Miller, 2021).

Nolan County (Figure 2) is a major cotton producing county in the Rolling Plains Region (Nolan County Extension Service, 2021). Sparse mesquite and cedar trees are distributed throughout the county near water sources. The county's economy is mostly centered around agriculture, petroleum, natural gas, and gypsum (Nolan County Extension Service, 2021). Crops, cotton in particular, make up over half of the county's annual agricultural income (Nolan County Extension Service, 2021). Cotton has a long history of providing an economic backbone for the county. The county was not settled by Anglo-Americans until after the Civil War. In the 1870's, buffalo hunters came to the area and settlers soon followed. By 1910, cotton was being planted on 33,000 acres in the county and made up approximately 72 percent of the county's total income (Nolan County Extension Service, 2021). By 1982 more than 94 percent of the county was devoted to agricultural purposes. Cotton was and continues to be the largest cash crop. This is mainly due to its drought tolerance and existing infrastructure found in the county. Other viable crop options like pecans, tomatoes, sweet potatoes, and hay were not grown as much as cotton because they are more labor intensive, less profitable, and lack the infrastructure to get to market (Nolan County Extension Service, 2021). Today, the county's economy is made up of cotton, cattle ranching, wind turbines, gypsum, and petroleum.

2.2. Background of U.S.-China Trading Relationship

Throughout its diverse and long history, China has had some of the most complex, vast, and advanced trade routes and relationships in the world (Chang, 2015). The Chinese were

trading globally thousands of years before the colonization of North America by Europeans. With respect to a few early voyages in the 19th century, trade between the U.S. and China was virtually nonexistent until the late 1970s (Chang, 2015). Imperialism, differing fundamental political and cultural views, and previous undesirable relationships with the West had made the People's Republic of China (PRC) suspicious and wary of establishing formal trade relations (Chang, 2015). With the victory of Mao Zedong and the Communist party in 1949, the pressures of globalization began to build for the unified country. The monumental visit of President Richard Nixon to China in 1972, mainly attributed to the work of U.S. National Security Advisor Henry Kissinger and Zhou Enlai, the premier and foreign minister of China, established the beginning of normalization of political and trade relations (Warner, 2007).

After the death of Mao Zedong in 1976 and the succession of Deng Xiaoping to party Chairman, China began to open itself to the world and started to adopt capitalist practices (MacDonald, Gale, & Hansen, 2015). This process occurred through the establishment of special economic zones, bringing in foreign investment, and a push for industrialization. During the post-Mao era, this economic reformation was justified under the idea of “socialism with Chinese characteristics” (Coase & Wang, 2013). During the 1970s, China became one of the world's leading importers of agricultural goods. The majority of these goods were and continue to be cotton, soybeans, corn, and grains for animal feed. Leading agricultural suppliers include the U.S., Canada, Brazil, and Australia (Gale, Hansen, & Jewison, 2015). Along with increasing demand for Chinese textiles, the Chinese became the world's top importer of cotton by 1979 (MacDonald, Gale, & Hansen, 2015). Chinese entrance into the World Trade Organization (WTO) in 2001, backed by American support, further bolstered the Chinese manufacturing industry (MacDonald, Gale, & Hansen, 2015). Along with other U.S. agricultural goods like

soybeans, Chinese importation of cotton has continued to grow steadily with noticeable peaks in 2003 and 2011. Importing raw cotton from the U.S. allows China to grow its textile industry trade surplus (MacDonald, Gale, & Hansen, 2015). Also, by controlling a majority share of the cotton importation market the Chinese have considerable power over the price and quantity of cotton on the world market. Although beneficial strategically, this power comes from China's textile industries insatiable demand. By 2010, more than half of the world's textiles were produced in China. The cotton and textile sector of China produces more trade surplus and jobs than any other industrial sector (MacDonald, Gale & Hansen, 2015).

The U.S. is the world's largest producer and exporter of cotton (Liu, Robinson, & Shurley, 2018). Cotton exports are crucial for the U.S. agricultural sector because the U.S. produces approximately four times as much cotton as it consumes domestically (Liu, Robinson, & Shurley, 2018). Various government reserve programs and stockpiling efforts by the Chinese have created volatility within U.S. cotton exports. Within the last two decades, the Chinese have bought and stored cotton when global prices are cheap, then used their reserves when world prices went up. This has created artificial pricing frameworks for the world cotton market (Liu, Robinson, & Shurley, 2018). Market volatility can be clearly seen in the years in which China cuts back on the amount of cotton it is importing and decides to use some of the reserves stored by the government. With the Chinese buying so many raw agricultural products from the U.S. and refining them into labor intensive products on the world market, a trade imbalance is created (Liu, Robinson, & Shurley, 2018).

Cotton markets in the U.S. took a turn for the worse after the Trump administration instigated the start of the U.S.-China trade war in June of 2018 (MacDonald, 2018). Trump campaigned on rearranging past trade agreements, reversing international commitments, and

returning the U.S. manufacturing base that had moved to China. Once elected, the Trump administration argued that the Chinese had violated intellectual property rights and past trade agreements (He et al., 2019). On June 15, 2018, the U.S. implemented billions of dollars of tariffs on Chinese imports and the PRC soon followed suit with equal retaliatory tariffs of its own. Since Chinese textiles and American agricultural products are some of the largest sectors of trade between the two countries, they were targeted within the tariffs (He et al., 2019). Cotton markets, already susceptible to the volatility of global markets largely due to Chinese buying practices, crashed with the lowest commodity price seen in decades (He et al., 2019). As of early 2020, both sides have backed off substantially with threats of tariffs and a “phase one” bilateral trade agreement has been signed (Lester & Zhu, 2020). Nevertheless, the damage to the trading relationship between the two countries has been done. China was dropped as the number one trading partner of the U.S. in 2019 (He et al., 2019). Increasing Chinese agricultural imports from countries such as Brazil, India, and Australia did not bode well for U.S. agricultural markets (He et al., 2019). Various tariffs, although lowered from the high levels of September 2019, were still being applied to U.S. and Chinese goods into late 2020 (Lester & Zhu, 2020).

2.3 Cotton Subsidies

Because of massive market losses in agriculture caused by the trade war, particularly soybeans, corn, and cotton, the United States Department of Agriculture (USDA) has given out over \$23.5 billion dollars in relief payments to American farmers since 2019 (Janzen & Hendricks, 2020). This was mainly done through the Market Facilitation Program (MFP), also informally known as the “Trump check”, which was offered for both 2018 and 2019 crops (Janzen & Hendricks, 2020). Basically, it aimed to replace the money lost because of the retaliatory tariffs China had placed on U.S. cotton. Payments were based on how much revenue

cotton farmers had generated in the years before the trade war (Janzen & Hendricks, 2020).

Although this type of subsidy program is relatively new, cotton growers have been receiving government support for decades.

The U.S. has a long history with cotton subsidies that dates back to 1933 (Brown, 2011). This is when legislation, informally known as the Farm Bill, began to create policy specifically working towards improving American agriculture. Usually enacted every five to six years, the Farm Bill is created through negotiations with the USDA, House of Representatives, and Senate Agriculture Committees. It is finalized in Congress. Cotton subsidies first started as an attempt by the U.S. government to help cotton growers recover from the Great Depression. Then and now, subsidies are just a way for the U.S. government to protect domestic producers from market externalities and ensure their continuity (Peterson, 2009). “Since their inception in the early New Deal, assistance programs for cotton have varied widely, but the essential ingredient, a guaranteed floor price, remained in effect. Through the years, the machinations and intricacies of the programs became complex, often befuddling growers themselves” (Brown, 2011, p. 212). Although cotton subsidies are positive for producers, they often influence global markets in negative ways. Agricultural subsidies have always been met with both opposition and support, which is reflected in 1973 when Congress passed the Agriculture and Consumer Protection Act. This legislation allowed Congress to revisit the cotton subsidy programs every few years in order to replace old programs with new ones and determine the financial needs of producers (Brown, 2011). Cotton subsidies usually came in the form of low interest loans, loan forgiveness, target pricing, and deficiency payments. All of these schemes ensured the same end goal, that the producer turn a profit. The 1996 Farm Bill was monumental because it laid out the plan for the U.S. government to end support payments by 2002. Despite this, subsidies continued in 2002 due

to economic failures in Southeast Asia which caused a massive decrease in U.S. cotton export demand. Critics argued that the continued government support stopped cotton markets from modernizing, moved it further away from much needed liberalization, and interfered with U.S. objectives for free and fair global markets (Brown, 2011).

From 1996 on, the U.S. began facing increasing global pressure to end its market distorting cotton subsidy programs (Ridley & Devadoss, 2012). This came to a head in 2002 when Brazil, and a host of other cotton exporting countries, made a formal complaint to the WTO. By 2005, the WTO ruled against the U.S., which forced the U.S. to make changes to cotton subsidization programs (Ridley & Devadoss, 2012). Despite this, cotton producers had, at the start of the trade war, been averaging around \$2.1 billion distributed annually from varying subsidy programs (Gro Intelligence, 2018). While federally supported crop insurance was usually subsidized, the U.S. created the Direct and Counter Cyclical Payment Program in 2002. This program, on top of subsidized insurance premiums, ensured that producers were paid the target price for their cotton even if markets were down. This type of schematic went under several different programs such as the Market Loss Assistance Payment Program, Price Support Program, and Production Flexibility Contract (Gro Intelligence, 2018). Although all of these subsidy programs were slightly varied, they all protected farmers from market externalities. “Between 2009 and 2018, the average per acre cotton subsidy doubled. Between 1995 and 2016, cotton indemnity subsidies, or those paid out to protect crop loss, averaged \$365 million annually” (Gro Intelligence, 2018, p.1). Although international pressure made the U.S. change its subsidy programs, the distribution of government funds actually increased. By 2014 the U.S. government completely stopped the use of direct cotton subsidies. Instead, the Stacked Income Protection Plan (STAX), still in use today, was created as a way to protect revenues for farmers.

In summary, cotton farmers are still receiving massive government support through a myriad of programs in order to dodge international trading pressures (Gro Intelligence, 2018).

From the start of the U.S.-China trade war and onward, subsidization programs like the MFP and continued federally supported crop insurance programs offered cotton farmers a short-term shield against the repercussions of the trade war. Access to foreign markets in which to export American agricultural goods became uncertain (Jansen & Hendricks, 2020). Cotton farmers in west Texas, in particular, are at the mercy of world markets. Dry land cotton, cotton farmed on non-irrigated land, makes up the majority of acres planted. Crop production relies heavily on rainfall. For most years, the timing of the rain leaves west Texas cotton farmers with low to mid-grade crops compared to other parts of the state. As for 2020 and 2021, cotton farmers are no longer receiving payments from the MFP and instead are being offered the Coronavirus Food Assistance Program by the USDA (CFAP) and the Wildfire and Hurricane Indemnity Program Plus (WHIP+). Different regions may qualify for different subsidy programs based on the weather conditions and local markets. CFAP is basically offering farmers relief for market changes caused by the coronavirus disease 2019 (Covid-19) and trade tensions on the global market (Coronavirus Food Assistance, 2020). WHIP+ distributes aid to farmers that have suffered from adverse weather events. After seeing the consequences of the trade war, Covid-19, and inadequate subsidy programs, cotton farmers are facing many uncertainties in the future. The effects of small farm consolidation, delayed relief payments, and damaged trade relationships will influence cotton farmers long after the U.S.-China trade war and Covid-19 pandemic have concluded.

3. Literature Review

This section aims to explore the existing literature surrounding the trade war and how it impacted American agriculture, specifically the cotton industry in Texas. Because this is a recent issue, scholarship analyzing how the trade war influenced the American cotton industry is scarce. There is little to no literature concerning the immediate effects of the trade war on American farmers nor is there much information regarding the success of the protectionist subsidization programs run by the U.S. government. To examine the impacts of the U.S.-China trade war on the Texas cotton industry, I will analyze the existing scholarship on how the conflict impacted the trading of agricultural goods more broadly and how these changes have led to subsidization and consolidation within the Texas cotton industry.

To do this, I review two major topics within the field as well as the various subsets of contemporary research within those topics. U.S.-China trade relations is the first category of literature that will be analyzed. Within this body of research, I investigate U.S.-China foreign policy regarding agriculture and the recent uptick in Chinese foreign direct investment, and relevant theories on how this will impact the American agriculture sector. Next, I explore the current literature of the U.S. cotton market within the context of the trade war. Within this scholarship, I outline the current position of the cotton market in the U.S. in light of the trade war, subsidization, the recent consolidation of cotton farms, and finally theories on the future of the American cotton industry.

3.1 U.S.-China Trade Relations and Agriculture

Historically, the U.S.-China trade relationship has changed with respect to the differing positions of each presidential administration. This relationship soured quickly as Donald Trump proved to take a much harder stance on China. Trump cited China's abuse of American

intellectual property rights (IPR) and technology as the main reason for instigating the first round of tariffs (Weishi, 2020). Since much of U.S. agricultural goods are exported to China, particularly soybeans and cotton, these goods turned out to be one of the most important weapons for the Chinese in the trade war (He et al., 2019). China's lack of domestic supply of cotton but abundance of cheap labor means the country is constantly searching for raw agricultural goods to feed massive industries such as the textile industry. The U.S. benefits from this trade as it exports most of its cotton. Although this trade relationship is beneficial, it puts U.S. cotton farmers at the mercy of global politics, Chinese stockpiling practices, and high market volatility (Robledo, 2020). Robledo (2020) shows that the U.S. percentage share of cotton exports to China was reduced by approximately 11% once tariffs were applied between 2017 and 2019. China has replaced the reduction in supply of cotton from the U.S. and found other supply lines in major cotton producing countries like Brazil and India. Economic forecasts and predictions argue that this may lead to an entire reshuffling of the U.S.-China cotton trading relationship (Liu, Robinson, & Shurley, 2018).

The outbreak of Covid-19 further complicated the already tense political and economic relationship of the U.S. and China. The political and ideological differences of the two countries were spotlighted in their response to the pandemic and the economic impacts were widespread (DeLisle, 2021). With the discourse between the two countries more aggressive than any time in the recent past, China began to see its importation reliance on U.S. goods as an increasing national security concern. The U.S. cotton sector, in particular, has been seen as a target because of the complex textile relationship between the U.S and China (Zheng et al., 2018). The CCP has discussed plans to increase the amount of raw soybean and cotton produced domestically. This may lead to Chinese import demand falling even further and a decrease in global prices as more

products flood global markets (Zheng et al., 2018). Conversely, other economic models have shown that U.S. agricultural exports, cotton included, may increase as the U.S. exploits new markets. Approaching the trade war from a wider economic view, the U.S. may benefit economically from the trade war. With this being said, the political and trading relationship of the U.S. and China may become fractured and weakened as a result (Zemaityte & Urbsiene, 2020).

Next, it is necessary to understand the underlying foreign policy and trade directives of the two countries and how it relates to agriculture. The PRC had already begun to move away from American exports long before the start of the trade war. The Belt and Road Initiative (BRI) is a major foreign policy directive that was created by the CCP in 2013 (Tian et al., 2019). The BRI is a highly nationalistic strategy that was created to strengthen the economic connectivity of Asia to Europe and Africa. Trade and resource oriented, the BRI seeks to ensure China's position of power through investment in infrastructure (Tian et al., 2019). In the past, the U.S.-China trade relationship has seen China supplying the U.S. with labor and resource intensive goods and the U.S. supplying high capital and technology intensive goods. One of the key aspects of the BRI is to allow China to switch from labor intensive goods to capital and technology products. Infrastructure investments, particularly in Africa, have shown that China is developing its export and import potential. This may lead to higher efficiency and cheaper prices when China seeks to import raw cotton from its BRI participating countries (Yu et al., 2020).

China's rise to a global power position has come from its large export sector of high labor products, namely textiles which have been sold to the U.S. (Yi & Rui, 2020). This significant shift in global power has led to major congressional attention to U.S.-China trading relations. Both countries have seen surges in nationalistic trading patterns. Although the Trump

administration cited the theft of intellectual property (IP) as the main reason for the trade war, Trump ran for office on reducing the trade deficit with China, maintaining the global status quo, and bringing jobs back to America from China's manufacturing sector (Delisle, 2020). As of 2018, the U.S. had a trade deficit with China of approximately \$378 billion (Delisle, 2020). Reports have shown that for over a decade Chinese IP theft has cost the U.S. economy an estimated \$200-600 billion annually and two million American jobs (Levine, 2020). This theft is argued to be part of a broader plan by China to become the world superpower by 2050. This plan is known by the CCP as Made in China 2025. Within this plan, the CCP is sponsoring businesses in the Chinese economy that are contributing to the developmental and technological growth of China. Levine writes, "As China continues to manipulate the liberal international order in its favor by using protectionism, unfair subsidization, and theft of sensitive technology, U.S. companies stand to lose substantial wealth and technological superiority in high-end economic sectors and the military" (p. 10, 2020). Policy directives of this type can be seen in the Chinese domestic cotton industry. The creation of a massive cotton stockpiling program by the CCP in 2011 is argued to undermine global cotton markets by creating high market volatility by stockpiling large quantities of cotton when global prices are low. This type of program attempted to bolster the domestic cotton industry in China by injecting funds into the mechanization of agriculture (MacDonald, Gale, & Hansen, 2015). My research illustrates how Chinese purchasing practices of cotton may influence the American domestic cotton industry. Also, my research aims to identify whether changes in these Chinese purchasing practices are due to market influences or are actually part of one of the broader national policy strategies identified above.

3.2 The U.S. Cotton Industry and the Trade War

The Texas cotton industry is already highly volatile since much of the cotton grown in Texas is subject to semi-arid weather and all the market volatility that was described above. Naturally, since Texas is the top cotton producing state, it received a large portion of the \$23.5 billion handed out by the USDA to soften the blows of the U.S.-China trade war (Janzen & Hendricks, 2020). The Chinese strategy of targeting U.S. agricultural goods, cotton included, was to lower the quantity and value of exports in the U.S., as well as reduce the prices producers received for their finished goods (Janzen & Hendricks, 2020). Farmers also made up a highly important political and economic group that supported the Trump administration. With the support of the Trump administration, the USDA rolled out the Market Facilitation Program (MFP). In many ways this subsidy program may have actually overcompensated farmers in some regions (Janzen & Hendricks, 2020).

Scholarship on this topic focuses on the unequal distribution of MFP payments and how the MFP is a short-term solution to a long-term problem. A study conducted by Paulson, Featherstone, & Hadrich (2020) examined how the MFP influenced farms in Kansas, Minnesota, and Illinois. It showed that the MFP represented roughly 40% of the income of the farms analyzed in Illinois and Kansas and approximately 60% of the income in Minnesota (Paulson, Featherstone, & Hadrich, 2020). Without the MFP, these farms would have had a much more difficult time receiving farm loans and would be subject to higher interest rates. Although this subsidy program helped mitigate the short-term damages of the U.S.-China trade war, it will not replace the long-term commodity price drops and market volatility as the U.S. move towards a global trading environment filled with uncertainty (Paulson, Featherstone, & Hadrich, 2020). Other studies reinforce the theory that the MFP is just a short-term solution to a long-term problem. Furthermore, subsidy programs of this nature are often not applied equally to each

farm. “However, we also show that some farms received far less or far more than the true magnitude of their farm specific trade-related loss because program rules are not targeted to all farm situations” (Janzen & Hendricks, 2020, p. 224). My study seeks to analyze whether there was unequal distribution among Texas cotton farmers and if the MFP was an appropriate compensation for trade related losses. In doing so, my research addresses the need to better understand how the MFP impacted the cotton market specifically.

My project also engages with contemporary scholarship surrounding farm subsidies and the ultra-high levels of subsidization found in the American cotton industry. In theory, agricultural subsidies are a way for a government to correct a market failure in the economy (Peterson, 2009). They are often used to protect domestic markets or to raise funds in order to encourage the production of a certain kind of resource. When agricultural subsidies are used, they can have global impacts because of the global market share the U.S. holds (Peterson, 2009). Cotton subsidies in the U.S. have evolved from price support programs via farm loans in the early 20th century and then to price-based deficiency payments in the 1970s (Smith & Glauber, 2019). These types of programs were designed to increase the financial stability of cotton farmers. The 1980s saw the U.S. move toward fixed payments based on farmers' historical production trends. This strategy tried to keep cotton farmers profits at relatively equal levels year to year regardless of global commodity prices (Smith & Glauber, 2019). Counter cyclical payments and crop insurance subsidies were later introduced. Since complaints against U.S. cotton subsidies arose in the WTO, a combination of these subsidies is offered based on the need of farmers from year to year. Most parts of the cotton industry are now subsidized including seed, crop insurance, and cotton commodity prices (Smith & Glauber, 2019).

Existing debates on the subsidization of the cotton industry within the U.S. focus on how the subsidies impact other countries, especially developing ones. My research aims to focus on the domestic impacts of cotton subsidies on Texas cotton farmers. To do this, it is necessary to explore the existing scholarship on the advantages and disadvantages of farm subsidies in the U.S. It has long been known that subsidies, cotton subsidies in particular, have global impacts when applied in the U.S. (Peterson, 2009). An early study conducted by Heinisch (2006) found that cotton subsidies in the U.S. often have a direct influence on millions of cotton producers in African countries. The WTO has often become a battleground in which countries try to protect their domestic industries from U.S. subsidization programs. For example, a dispute led by Brazil and several African countries about cotton subsidies was brought before the WTO in 2002 (Ridley & Devadoss, 2012). These countries accused U.S. cotton subsidization policies to be detrimental to the rest of the world. Despite the WTO ruling in favor of Brazil, the U.S. only slightly changed its policies to meet WTO standards. With cotton being one of the most heavily subsidized goods in the American economy, this type of contention continues to appear before the WTO (Ridley & Devadoss, 2012).

With so much international pressure to curtail U.S. cotton subsidies, it is obvious that their continuation is important to U.S. policy makers. Callahan (2019) theorized that the amount of money in the cotton industry and its political supporters allows for continuation of subsidies on both state and national levels. Cotton farmers and lobbyists contribute to political campaigns in the House of Representatives and also run a sophisticated strategy to make sure local legislators keep the interests of cotton in the forefront (Callahan, 2019). This kind of research helps explain as to why the Trump administration subsidized the cotton industry so heavily during the trade war. Academic literature in support of the continuation of U.S. cotton subsidies

is scare. Special interest groups and increasing quantities of U.S. cotton exports abroad are cited to be some of the main reasons cotton farmers keep getting bailed out (Devadoss & Luckstead, 2019). More broadly, the U.S. government has tried to provide financial stability to cotton farmers because they are an important mechanism in the global trading scheme of the U.S. and provide a financial backbone for rural and local economies around the country. There is no doubt that U.S. cotton farmers would suffer if they did not receive support, but the sustainable continuation of U.S. cotton subsidies in the future is uncertain (Devadoss & Luckstead, 2019). This project explores how these subsidies have impacted cotton farmers in Texas and if their impacts have changed in light of the trade war. I also explored the unequal distribution of cotton subsidies in Texas in order to analyze whether this has sped up the consolidation of cotton farmers. Individual cotton farmers in Texas are now farming more and more acres of cotton. Despite the increasing quantity of cotton being produced in the U.S., the actual amount of cotton farmers has been steadily decreasing. Literature addressing this phenomenon is scant. Thus, I analyze whether Chinese purchasing practices, subsidization, and the future of U.S.-China relations is related to the consolidation of U.S. cotton farmers.

4. Methods

The goal of this research is to better understand the longer-term impacts of the U.S.-China trade war on the Texas and U.S. cotton industry, as well as China's cotton purchasing and investment practices. To accomplish this goal, I address the following questions: "How has the U.S. and Texas cotton markets been affected by the U.S.-China trade war in terms of: 1) China's global purchasing practices, 2) subsidization of the US cotton market, and 3) consolidation of the cotton industry? This is a mixed method study drawing on a descriptive statistical analysis of economic data collected by the United States Department of Agriculture. I also conducted qualitative research interviews with Texas cotton farmers and others who work in the industry. I used semi-structured coding methods to analyze the interview transcripts (Cope, 2016). I coded the transcripts using themes based on the three research questions: Chinese purchasing practices, subsidization, and consolidation. Each interview was approximately 45 minutes long. The majority of the interview participants were cotton producers, but I also interviewed people working in general labor, insurance, marketing, chemical sales, and lobbying efforts.

4.1 Data Collection and Analysis:

4.1.1 Quantitative Data Collection and Analysis

To understand broad patterns and dynamics of the US-China cotton trade, I drew from several databases detailing purchasing volume of global cotton markets, subsidization of cotton, and consolidation of cotton farms.

4.1.2 *Data Collection and Analysis of Chinese Purchasing Practices*

To understand changes in Chinese purchasing practices of US cotton, I analyzed data from the a) USDA cotton and wool yearbook data publications and b) reports from the USDA Foreign Agricultural Service office in Beijing. The USDA cotton and wool yearbook data

publications offer an overview of the world cotton and wool supply and demand (Meyer, 2019). I specifically looked at the datasets containing information on cotton. The data is organized to show major worldwide cotton importers and exporters, world supply of cotton and its various uses, and supply and use data from major cotton importing and exporting countries such as the U.S., China, and India. The data provided starts in 1975 and runs through 2020. This analysis focuses on data from China and the U.S from the years of 2017 through 2020 to see the impacts of the U.S.-China trade war. Limitations of this dataset include partial data for 2020. Furthermore, the data show the amount of cotton imported, exported, and produced by a specific country, but does not show where the cotton was imported from or which country it was exported to. This dataset also does not identify the specific kind of cotton that is being exported or imported. I used this data as a broad outline to better understand the global cotton market and production in various countries (Meyer, 2019).

A report titled *Cotton and Products Annual* produced by the USDA Foreign Agricultural Service at the Beijing office details data, trends, and predictions about the cotton industry in the PRC (Ward, 2020). Some of the data in this report are sourced from the Chinese government or other governments who report their trading data around the world. Although the report details Chinese domestic production of agriculture, for the purpose of this research, I examine import and export data. Table 6 from this report, “China’s Cotton Imports by Country of Origin,” gives Chinese import data dating back to 2015 through 2020. I analyze this data by doing a descriptive analysis of how China’s trading patterns have changed during the trade war and have impacted the flow of cotton around the world (Ward, 2020, p.17). A limitation is that only partial data for 2020 is included.

4.1.3 Data Collection and Analysis of Subsidization of Cotton

To understand how the trade war has impacted the subsidization practices of the U.S. government, I obtained data on U.S. subsidies, specifically from the state of Texas and the U.S., of cotton subsidies from the Environmental Working Group (EWG) for the years 1995 - 2019. EWG sources their subsidization data from the USDA. The EWG provides this data in a way that is organized, distinct, and clear as opposed to the USDA databases that do not have their data organized in a digestible way. The EWG categorizes the subsidies payments by the type of subsidy program they were paid out in. The EWG also generates different types of charts and graphs for the data. For the purpose of this research, I looked at the subsidies under the categories of price loss coverage, counter-cyclical, agricultural risk coverage, price support, market loss assistance, crop insurance, and other. The category “other” contains the MFP which was the subsidy program provided in response to the U.S.-China trade war. I analyzed how these subsidies changed during the trade war. Limitations of the dataset include only partial data for 2019. This is because many subsidies are delayed based on a number of variables.

4.1.4 Data Collection and Analysis of Consolidation of Cotton Farms

To analyze how the trade war impacted the size and number of cotton farms, I drew on USDA census data from the most recent 2017 census of agriculture (USDA, 2019). Starting in 1987 and ending with the most recent census in 2017, the data shows the number of cotton farms in the U.S. and how many bales of cotton were produced. It also shows how many acres have been planted in cotton for a given year, which is measured every 5 years. Limitations for this data set include the lack of categorization of the type of cotton farmers that are increasing or decreasing. Despite the data only encompassing census numbers from 2017, a year before the

trade war started, it will help inform this research on broader trends that were already occurring in the U.S. cotton industry (USDA, 2019).

4.2 Qualitative Data Collection and Analysis

I collected qualitative data in the form of 11 interviews. Most of the interview participants were my personal contacts. I used chain-referral sampling to recruit the rest of the interview participants.

Interviewee	Position in Cotton Industry	Years of Experience	Acres Farmed
1	Producer	26	500
2	Producer	8	1200
3	Foreman of Cotton Farm	5	4000
4	Marketing Officer	10	N/A
5	Crop Insurance Salesman	16	N/A
6	Producer	39	3000
7	Producer	37	2400
8	Producer	46	7000
9	Vice President of Lobbying Group	3	N/A
10	Producer	19	550
11	Manager of Agricultural Chemical Retailer	2	N/A

TABLE 1. Description of Interview Participants

Source: Anonymous Personal Interviews

The interviews asked farmers and others working in the Texas cotton industry about their experiences with subsidies, consolidation, and their knowledge on the influence of Chinese purchasing practices on Texas cotton. See the table above for information on the position, years of experience, and acres farmed of each interview participant (Table 1). In accordance with Institutional Review Board requirements, these interviews were conducted via ZOOM. Video and audio recordings were securely stored on a restricted Texas State University Canvas site within a restricted folder. They were deleted from my password protected computer within 24 hours of the interview. Interviews were anonymous, and pseudonyms are used for participants. The key linking participants with their pseudonym is securely stored on the Texas State server. I used ZOOM software to aid in transcription. Each interview was taped, transcribed, and approximately 45 minutes.

5. Results and Discussion

This portion of the paper reports on the results of my quantitative and qualitative analysis that I conducted on Chinese purchasing practices, the subsidization of cotton, and the consolidation of cotton farms. Each subsection integrates the quantitative and qualitative analysis. I then discuss the implications of my findings on the Texas cotton industry.

5.1 *Chinese Purchasing Practices*

Beginning in 1975, the USDA cotton and wool yearbook dataset shows annually how many 480-pound bales of cotton were imported from the U.S. to China (Meyer, 2019). To condense the numbers, the USDA provides each data entry divided by 1000. One bale in the dataset represents 1000 bales imported by China. For consistency, I follow the same practice. The data show that China imported approximately 900 bales in that year (1 bale = 480 pounds). Import numbers for China only really began to steadily rise in 2002 with 3127 bales when China began to undergo a series of economic reforms under the new leadership of Hu Jintao. The year 2011 was a record year for Chinese importation of cotton at 24,533 bales. The Chinese domestic stockpiling program implemented in 2010 was to blame for the increased demand of raw cotton (Meyer, 2019). The amount of cotton being imported from 2010 onward has generally decreased, with the Chinese importing an average of approximately 10,969 bales a year. Mill use peaked in 2009 with 50,000 bales being used in the Chinese textile industry. It is important to note that mill use of raw cotton may have decreased in recent years due to the increase of finished yarn being imported to China. Also, importation of raw cotton has decreased generally over the last 10 years due to increasing domestic production and existing cotton stocks. When the U.S.-China trade war started in 2018, the Chinese imported 9,640 bales of cotton which was the highest amount since 2013. The following two years saw 7,136 bales and 9,500 bales. The Covid-19 pandemic caused

a global decrease in textile consumption for 2019. The U.S. export quantities of cotton has increased significantly with a yearly average of 10,380 bales being exported from 1990-1999, 12,739 from 2000 to 2009, and 13,160 from 2010-2020. U.S. cotton stockpiles saw a jump from 4,200 bales and 4,850 bales in 2018 and 2019 to 7,250 bales in 2020, which may be a result of the trade war as the U.S. had to find new countries to export to (Meyer, 2019).

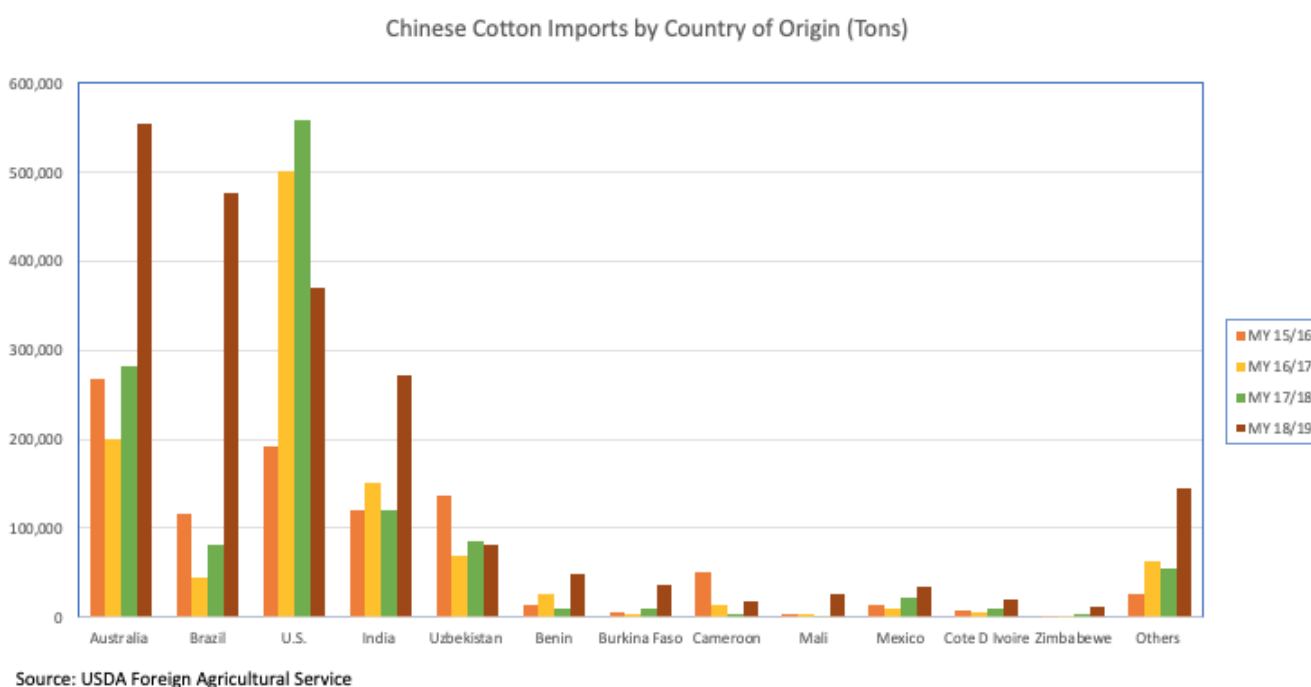


FIGURE 3. Chinese Cotton Imports by Country of Origin
Source: USDA Foreign Agriculture Service (2020)

This dataset shows that, on average, China has been increasing the amount of cotton it imports from market year (MY) to market year. Although China imported 959,323 tons of cotton in 2015 this number had more than doubled by 2018 with 2,096,262 tons (Ward, 2020). The amount of cotton that China has been importing from smaller African countries has also increased. Burkina Faso, Zimbabwe, and Côte d'Ivoire all saw a massive increase in cotton

exports to China (Figure 3). This started occurring more rapidly during the 2018-2019 years of the U.S.-China trade war. Australia, Brazil, and India all readily filled the gap of U.S. cotton and their export quantities to China increased. Data for 2020 may be heavily influenced by the pandemic as demand for textiles has slowed as a consequence of the economic shutdowns that occurred in many countries. Despite doubling the amount of cotton being imported since 2015, China is increasingly getting their cotton from countries other than the U.S. Based on the average tons imported to China in the three years leading up to the trade war (2015, 2016, 2017), for the market year 2018 and 2019, at the peak of trade tensions, Australia, Brazil, and India each respectively saw 121%, 488%, and 107% approximate increases on the amount of cotton China was importing from them (Figure 3). The U.S., on the other hand, saw an 11% decrease in export quantities of cotton going to China. Early trends from partial data available of the 2020-2021 market year show even less American cotton going to China (Ward, 2020). Although the data does seem to show that China is moving away from American cotton despite increasing the total quantity imported, there are several variables at play. The Covid-19 virus also caused a global economic slowdown as countries tried to control the spread of the virus. The pandemic saw U.S.-China ideological differences come to a head, and political confrontation saw a new peak. As mentioned earlier, China 2025 and the BRI are national policy directives to make China the global superpower. The biggest threat to China's rise is U.S. hegemony. Chinese purchasing practices of U.S. cotton may be a strategic tool used by the CCP. Trends in the data suggest that China may begin to source much of the cotton for their textile industry from BRI participating countries. As demonstrated, there are many export markets abroad that are viable options for China. This may make global prices go down as more products flood the market. For producers, especially in arid places such as Texas, the uncertainty caused by changes in Chinese purchasing

practices may make cotton farming no longer feasible. Logistically speaking, transportation costs may go up as U.S. exporters work with smaller orders and quantities. This uncertainty, which the U.S. government has attempted to reduce through subsidies, will be discussed briefly in the next section.

Although many of the people I interviewed could not speak directly to Chinese purchasing practices, they did have attitudes, experiences, and perceptions surrounding China and the cotton industry that directly or indirectly relate to them. Upon analyzing interview data, I observed three themes surrounding Chinese purchasing practices. These themes were 1) mass uncertainty, 2) negative attitudes towards China, 3) and financial loss caused by the trade war. First, the decrease in cotton being purchased by the Chinese during the trade war caused mass uncertainty throughout the Texas cotton industry. Texas cotton is already at the mercy of uncertain variables such as weather, market volatility, and overhead costs. The interviews revealed that the trade war produced even more uncertainty as farmers did not know if their cotton was going to be sold or fetch a fair price on volatile world markets. A cotton marketing officer with 10 years of experience working in the Rolling Plains region explained, “The trade war pushed the U.S. cotton industry back on its timeline. One of the biggest things of the trade war, as far as cotton goes, was the planning aspect of it. The tariffs caused uncertainty moving forward.” (Interview #4, April 6, 2021). This enabled other countries to export their cotton into the Chinese market that had previously been dominated by the U.S. With this being said, producers revealed that Chinese purchasing practices had long been influencing the Texas cotton market in negative ways. One large-scale cotton farmer from Nolan County with 2400 acres stated, “China has been impacting the U.S. cotton market for 20 years. They tend to buy none or buy a lot, then stockpile it and get out of the market. It seems like our market has always swung

with whatever China is doing more than any other factor” (Interview #7, April 28, 2021). The same pressures caused by Chinese purchasing practices in the past were exacerbated by the trade war and led to mass uncertainty.

Second, the interviews revealed that those working in the Texas cotton industry, especially producers, held a negative attitude towards China. Chinese purchasing practices left producers feeling victimized. The trade war, although financially and emotionally straining, was received as an act of American defiance and market protection by those I interviewed. A foreman of a 4000-acre cotton farm remarked, “The Trump administration was right in fighting for the American farmer. I think China has a monopoly on cotton and they can run the show however they please” (Interview #3, March 31, 2021). Those interviewed were frustrated at the fact that the U.S. had lost its manufacturing base and no longer used the vast majority of its cotton. One farmer with approximately 500 acres and 26 years of experience stated, “China bought less of our cotton during the Trump administration. Trump was trying to get on a level playing field with China by using tariffs. China has not been fair, and they take advantage of the U.S.” (Interview #1, March 27, 2021). Farmers and those working in the industry realized that China was a dominant market force and emphasized careful action in the future to reduce uncertainty and financial loss for producers. A lobbyist stated, “I had producers calling me saying they appreciated the Trump administration’s stance toward China because they had long been dominating markets, but also that we should be careful how we stepped” (Interview #9, May 5, 2021). In summary, despite the widespread harm caused by the trade war, the majority of those interviewed still supported the Trump administrations actions and held negative attitudes towards Chinese involvement in U.S. cotton markets.

Third, Chinese purchasing practices in 2018 and 2019 caused the price of cotton to drop which caused financial strain. Although producers lost money directly from selling their crop, they were also hurt in other ways. A crop insurance salesman stated, “I lost money because the price of cotton was so low. It made it unprofitable for everyone. The low price of cotton has made it harder for some farmers to get full crop insurance coverage.” (Interview #5, April 14, 2021). Inevitably, this also made it harder for producers to secure their previous lines of credit. Most cotton farmers have massive overhead costs so access to low interest farm loans is a must. Producers feared that if low prices continued, they may also lose access to crop insurance which is necessary to protect against financial ruin. Cotton farmers also lost money on chemicals. One farmer with approximately 550 acres said, “Most of the glyphosate that we use on our crops is made in China. I remember high chemical prices during the trade war” (Interview #10, May 18, 2021). While it is true that some of the financial loss was mitigated by subsidies, changes in Chinese purchasing practices were of detriment to numerous parts of the cotton industry. The producers I interviewed looked back on the trade war as a time of financial difficulty.

5.2 Subsidization of Cotton

With more than 10 subsidization programs, including insurance premiums which are also subsidized by the USDA, Texas cotton farmers have received \$14.6 billion in subsidies since 1995 (EWG, 2020). This accounts for 36.4% of the cotton subsidies distributed in the U.S. since 1995 (EWG, 2020). In 2019 alone, the Texas cotton industry received \$425,571,262 in subsidies with no other state coming even close. Georgia followed in second with \$57,174,590 in support payments. Overall, the USDA has paid \$40.1 billion to cotton farmers in the U.S. (EWG, 2020). That is approximately an average of \$2.1 billion of taxpayer dollars being distributed annually (EWG, 2020).

Starting in 1995 and continuing through 2013, most payments were in four programs. These programs are direct payments, price support, counter cyclical, and crop insurance (Figure 4). As mentioned previously, the number of subsidy programs for cotton farmers is vast. Most of them are only slightly different from one another, but all seek to protect farmers from uncertainties beyond their control and ensure the continuity of farming communities. For example, the Chinese cotton stockpiling program caused global prices to drop in 2001, this led abnormally high levels of cotton subsidies as policymakers attempted to protect producers from the low commodity price (Figure 4). Over time, U.S. and Texas cotton subsidy payments have increasingly become less diverse (EWG, 2020).

Source: (EWG, 2020)

Cotton Subsidies in Texas from 1996-2019

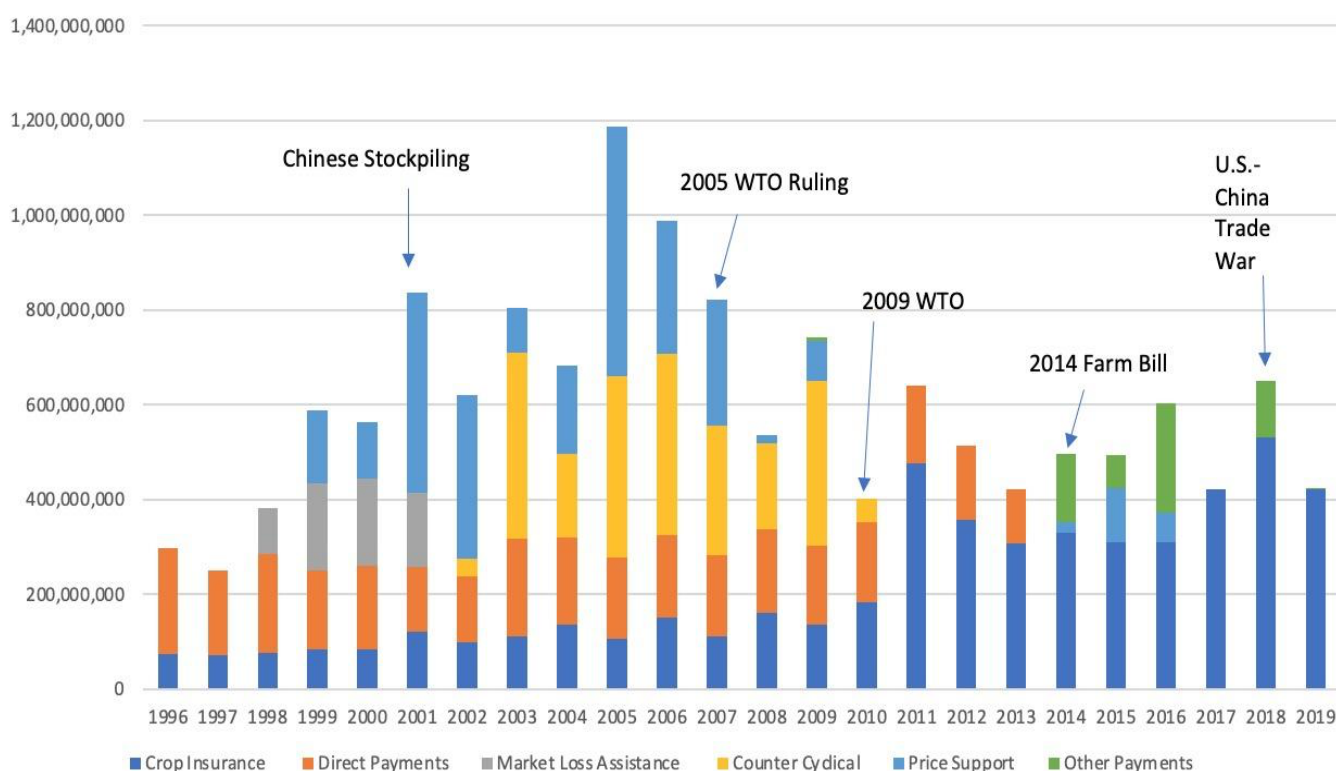


FIGURE 4. Cotton Subsidies in Texas from 1996-2019

Source: EWG (2020)

This came as a result of WTO rulings against U.S. subsidies, namely the case brought about by Brazil in 2002, and put into the 2014 farm bill. Rulings against the U.S. in 2005 and 2009 in a WTO court made subsidies drop substantially in the following years (Figure 4). These rulings put limits on certain types of subsidies and made the U.S. pay countermeasures to countries that its subsidies had impacted. The 2014 farm bill eliminated the counter cyclical and direct payment subsidy programs (Gro Intelligence, 2018) and this has limited the scope of U.S. subsidy capabilities.

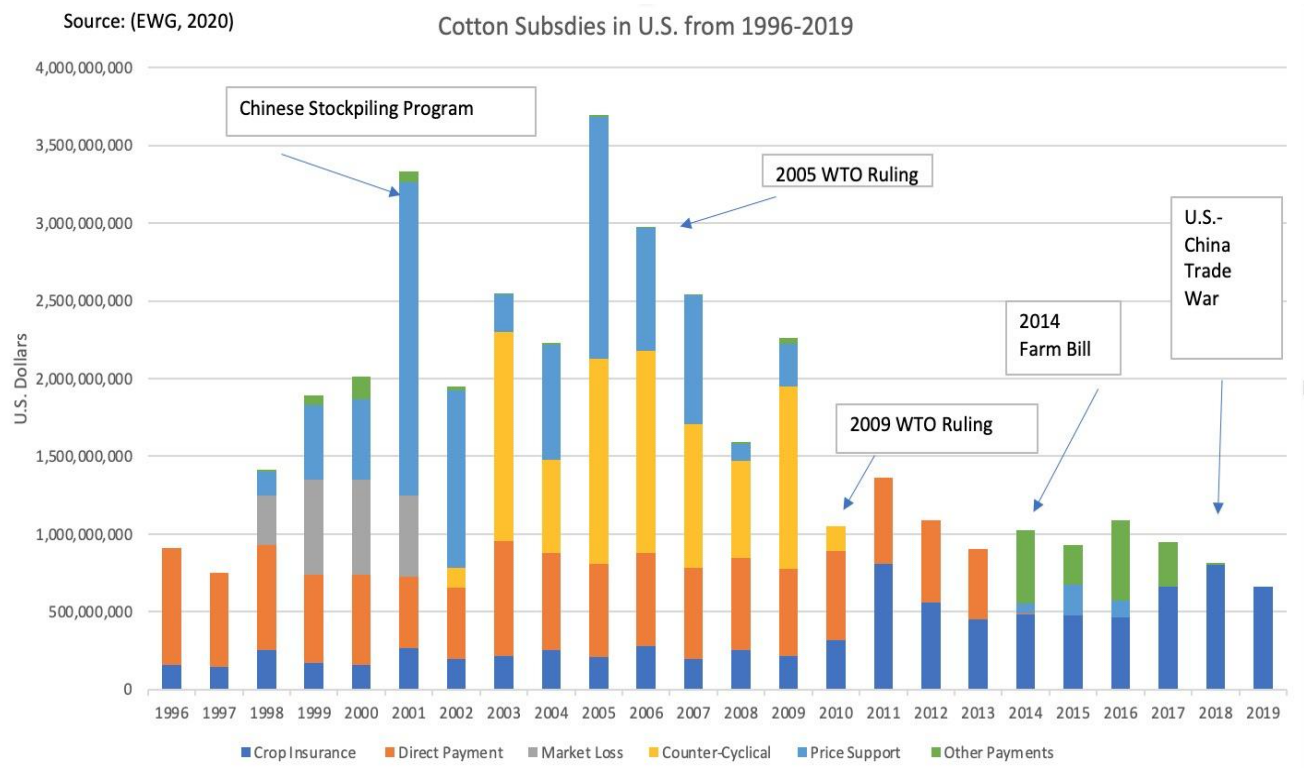


FIGURE 5. Cotton Subsidies in the U.S. from 1996-2019
SOURCE: EWG (2020)

Patterns for U.S. subsidies and Texas subsidies are similar since Texas controls a majority percentage of the cotton market (Figure 5). Basically, the USDA only slightly changes the subsidy programs internally in order to come into compliance with the WTO. The 2014 farm

bill completely changed the way in which subsidies had to be distributed (Gro Intelligence, 2018). In order to continue to support farmers, the USDA had to move away from direct cotton subsidies. Today, subsidies are applied to cotton seed, insurance, and cottonseed oil in order to comply with the higher levels of regulation on how subsidies are applied. Indeed, cotton subsidies have decreased, but funds are still being distributed via different avenues. For example, CFAP and the WHIP+ are being offered to Texas cotton farmers in 2020 and 2021 (USDA, 2021). Although they are not direct cotton subsidies, they still serve the same purpose. Regardless, subsidies of any kind move the market further away from liberalization. Disguising them under program names and subsidizing different byproducts of cotton have the same outcome on global markets.

What is notable about the U.S.-China trade war is how subsidy payments have changed since 2018. Texas saw the highest levels of cotton subsidies since 2009. The MFP began in 2018 as a direct response to losses in revenue caused by the U.S.-China trade war. This is unique because it was created specifically due to the tariffs and trade disruption caused by the conflict. It was officially ended in December of 2019. This program was not only distributed to cotton producers, but to all farmers whose commodity price was influenced by the trade war. As of 2021, the USDA paid out approximately \$23.5 billion in MFP payments (USDA, 2021). Programs like WHIP+, CFAP, and the MFP show that policymakers are still willing to subsidize cotton farmers even in the face of WTO court orders and high levels of regulation. Negative publicity surrounding the MFP has shown that the main concern of a subsidy program of this scope is that it will violate U.S. trade commitments to the WTO (Schnepf et al., 2019). In summary, cotton farmers are still getting large subsidies, both directly and indirectly. Oftentimes cotton subsidies, particularly those distributed in Texas, are a lifeline for producers. This is

because much of the cotton farmed in Texas is farmed in arid environments where no other cash crop is a viable option. Cotton farmers have powerful political lobbying groups and are involved in international trade. This may point to why cotton farmers were protected while other economic groups suffered the trade war with no support. Despite large scale subsidy reform in the 2014 farm bill, the trade war saw cotton producers getting more subsidies than they have had in 10 years. The U.S.-China trade war highlighted how subsidies are still a vital tool in keeping domestic agriculture afloat. Only time will tell if continued subsidy programs will cover the long-term impacts of the trade war inflicted on cotton farmers. Patterns in subsidization of cotton suggest that the USDA will continue to fund farmers in any way it can.

My analysis of interview data revealed three themes surrounding cotton subsidies during the trade war. These three themes were: 1) the importance of subsidies as a form of financial relief during the trade war. 2) The inability of farmers to continue without subsidies, and 3) the cotton industry's complex relationship with subsidies and the uncertainty they cause. While many of the interview participants with whom I spoke held a diverse set of opinions about subsidies, there was general consensus that subsidies help cotton farmers continue farming. First, subsidies were extremely important for mitigating financial damages caused by the trade war. The MFP, in particular, allowed many producers to continue in the face of uncertainty. One experienced producer stated, "The MFP payments were tremendously helpful. In 2019 and 2020, support payments were way above their normal levels" (Interview #7, April 28, 2021). Arguments for and against subsidies aside, they allowed farmers to endure the U.S.-China trade war. While producers are the main beneficiaries of subsidies directly, all other parts of the industry also indirectly need their support. Insurance and marketing, for example, need subsidies to maintain their profitability providing services for producers. A crop insurance salesman said,

“I would say over the last three years if we didn’t have subsidies half of the farmers would have a hard time getting refinanced this year. Without the MFP and CFAP it would be very difficult for the farmers in this area to continue operating” (Interview #5, April 14, 2021). In summary, despite all of the arguments against subsidies they did prove an effective tool for keeping the Texas cotton market financially afloat during the trade war.

Second, 6 of 11 of the people I interviewed stated they would not be able to continue doing business if subsidies were discontinued. Regardless of the trade war, producers argued that subsidies allow for stability in a venture that is inherently unstable. Especially in Texas, cotton is not naturally profitable. Decades of artificial government support has built local agricultural economies completely reliant on the injection of government funds. One cotton grower with 500 acres said, “We live and farm in a way where we are addicted to these subsidies. It’s kind of like a drug addict, if you take their drugs away it is going to hurt. We have gone so far down the road of subsidies there is no going back now” (Interview #1, March 27, 2021). Most producers agree that subsidies are good for ensuring their continuity, but do not like the reliance they have built on them over the last few decades. Farmers’ inability to continue without subsidies is worrisome as presidential administrations change. One Nolan County cotton producer commented, “I don’t think the current Biden administration is going to be very friendly to the cotton farmers. I think subsidies are on the way out” (Interview #7, April 28, 2021). While the Trump administration protected farmers from the backlash of the trade war, farmers are looking at an uncertain future.

Finally, my analysis of the interviews revealed that the Texas cotton industry has a complex relationship with cotton subsidies and the uncertainty they cause. The majority of people I interviewed commented that subsidies were both good and bad. A foreman of a large cotton farm remarked, “Subsidies can be good, especially in west Texas where both cotton prices

and yields are low compared to different parts of Texas. On the other hand, subsidies create a behavioral habit where farmers are always looking for the next handout” (Interview #3, March 31, 2021). The artificial stimulation of subsidies on local cotton economies can encourage certain types of behavior that directly contradicts the entire point of subsidies. The U.S. government may be subsidizing the Texas cotton industry because of low commodity prices while at the same time encouraging producers to plant more acres. With farmers receiving more subsidies in the trade war to combat low prices and market volatility, the reliance placed on them causes a general uneasiness among those in the industry. While they are good for producers the fear that they could suddenly go away with changing farm policy or WTO rulings increases the uncertainty of farming cotton. The vice president of a lobbying group said, “Subsidies are a basic safety net and calculated risk based on whatever administration is in charge. The Trump administration wasn’t afraid to butt heads with the WTO” (Interview #9, May 5, 2021). The involvement of politics and international trade within Texas agriculture leaves producers in limbo, as they do not know if they will be receiving funds in the coming years. Subsidy programs like the MFP were a crucial form of support during the trade war. In summary, several producers described subsidies as a ‘double-edged sword’. While their support can save a farming operation, it could also lead to behavior patterns detrimental to the industry.

5.3 Consolidation of Cotton Farms

First measured in 1987, the USDA agricultural census has been reporting the amount of cotton farms in the U.S. every 5 years. In 1987, there were 43,046 cotton farms in the U.S (Figure 6). By 2002, there were only 24,805. In the most recent 2017 census there were only 16,149 cotton farms left in the U.S. That is an approximately 62% decrease in the number of cotton farms over a period of 30 years (Figure 6).

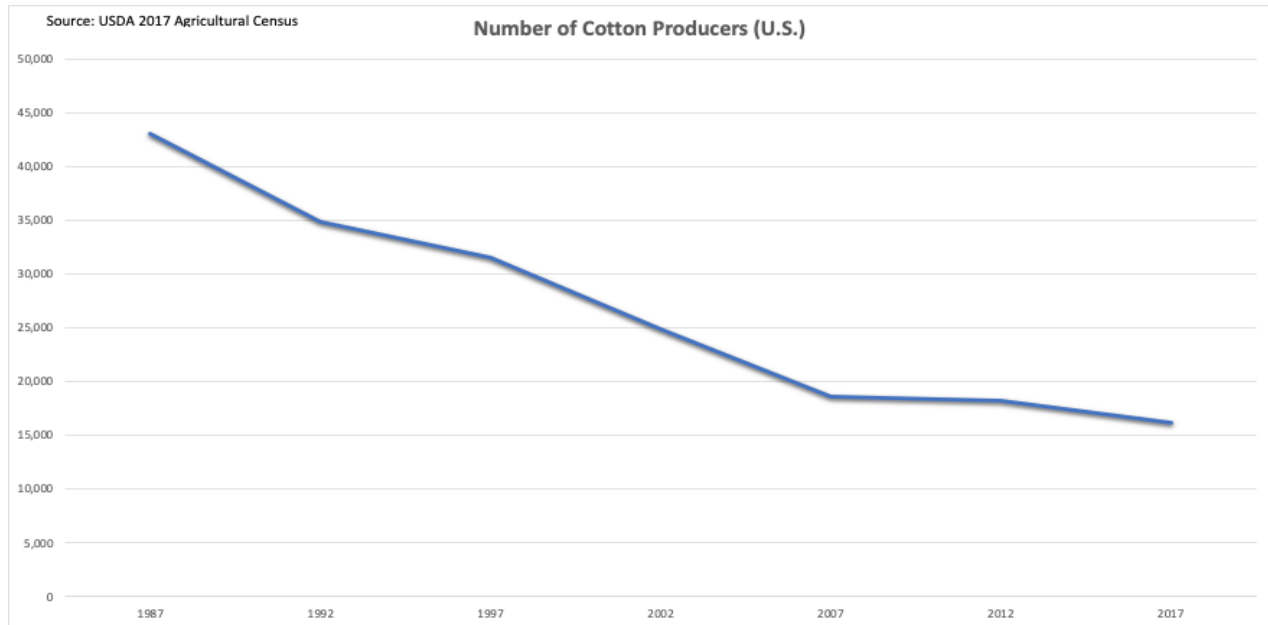


FIGURE 6. The Number of Cotton Producers in the U.S. from 1987-2017
Source: USDA Agricultural Census (2017)

Conversely, the number of bales being harvested, and acres of cotton being farmed have risen (Figure 7). In 1987, cotton farmers had an average of 228 acres per farm. By 2017 this number had risen to approximately 706 acres per farm. This same pattern is true, to a greater or lesser degree, across many different agricultural crops in the U.S. This is mostly because of the high levels of innovation and technological advancement made in the mechanization of agriculture (Johnson et al., 2021). This technology has, inevitably, increased the overhead costs to get started and maintain a cotton farm. Production costs have also gone up, which leads to U.S. cotton being less competitive on world markets. This technology has allowed farmers to produce more bales per acre. From 1987 to 2017, there has been an approximate 53% increase in the number of bales harvested in the U.S. However, the 2020/2021 market year saw a 24.9% reduction in production of cotton in the U.S. Most of this loss in production was in Texas (Johnson et al., 2021). This drop in production may be attributable to the trade war and the

Covid-19 pandemic, but it also suggests that fewer producers are planting their farms in cotton because of its uncertainty as a crop.

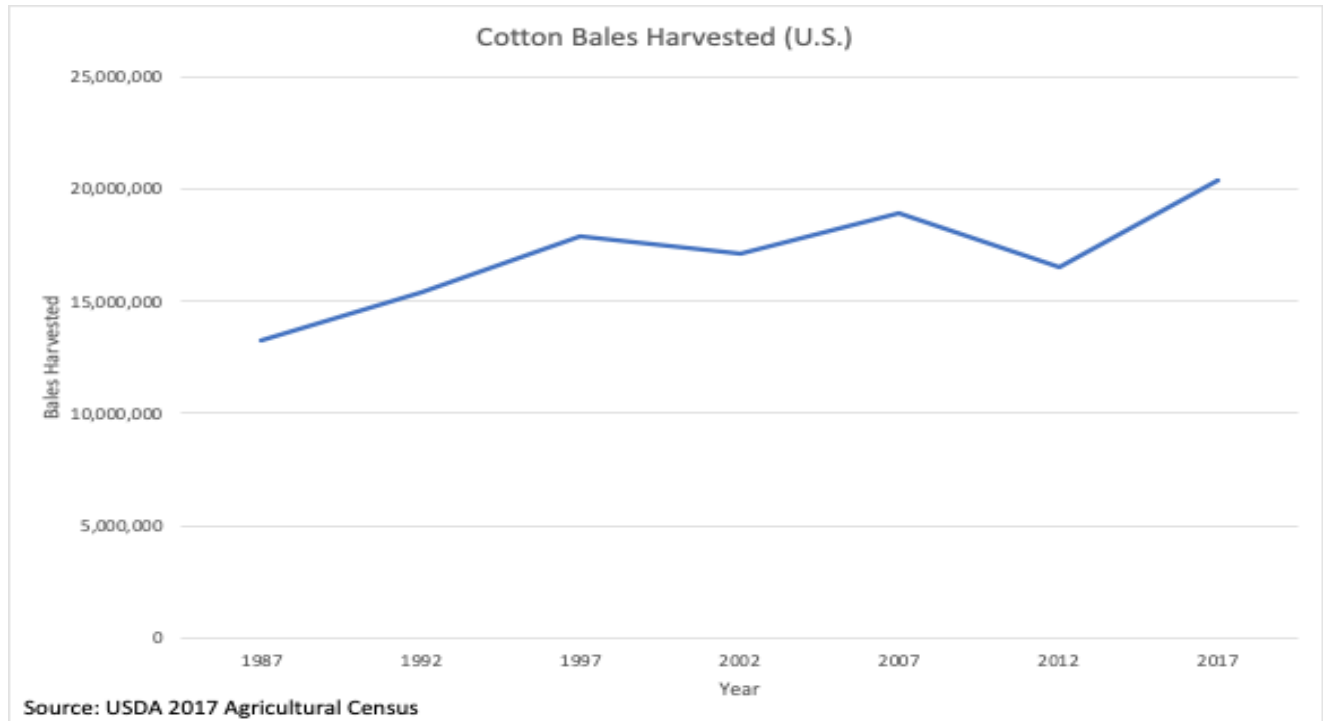


FIGURE 7. The Number of Cotton Bales Harvested in the U.S. from 1987-2017
Source: USDA Agricultural Census (2017)

Despite large decreases in the number of farmers, production capabilities bolstered by technology have allowed cotton growers to produce more with less. The trends in Chinese purchasing practices and cotton subsidies suggest that the consolidation process for cotton farms may have been exacerbated by the trade war. Subsidies and uncertainty tend to favor larger producers who can weather economic and financial strain. Literature suggests that subsidization practices also favor producers who generate higher quantities of product. The small rural cotton communities scattered around Texas may suffer and eventually collapse due to this consolidation

process. Although my qualitative research touched on this topic, more research needs to be conducted on how consolidation will impact the cotton sector

While there is a lack of scholarship and data on cotton farm consolidation, the interviews I conducted revealed that consolidation is a regularly occurring phenomenon in the Texas cotton industry. Although I found no evidence from my interviews that the burden of the trade war directly caused consolidation, I did find several themes exacerbated by the trade war that are related to consolidation. These themes are 1) the increasing overhead cost to operate a cotton farm, 2) the flight of young people from Texas cotton communities to urban areas, and 3) the financial inability of the industry to allow new cotton farmers to start a farm. First, analysis of the interviews revealed that almost everyone in the industry had experienced some form of consolidation. In fact, most of the producers still operating today are able to do so because they made land grabs throughout the 1990s and early 2000s. One mid-sized producer commented, “I’ve noticed a lot of farmers getting out for financial reasons. The same farmers keep getting bigger and bigger” (Interview #2, March 27, 2021). There was a consensus among participants that the main reason for the consolidation was increasing overhead costs. These costs have risen because of the mechanization of agriculture. The main problem with this is that while the market price of cotton has stayed relatively the same, production costs have skyrocketed. That is one of the main reasons for implementing cotton subsidies. An individual working in cotton marketing said, “It’s not only the producers that have been consolidated. It’s been producers, marketers, warehouses, and even gins. Technology has played a huge role in this” (Interview #4, April 6, 2021). The decreasing profitability combined with rising overhead costs made it even more difficult to continue farming in the trade war.

Second, many producers commented that their main concern for the industry was the lack of young people willing to stay and work. “I don’t like consolidation because it makes it impossible for younger people to get involved without family help. You have to have family help to get started” (Interview #7, April 28, 2021). Producers’ perceptions of the younger demographic seemed to suggest that the rural lifestyle and uncertainty of farming had made the prospect of returning to home to farm cotton unattractive. Many producers referenced this phenomenon as the ‘brain drain’. One large-scale cotton producer stated, “I hope we have a reversal of that trend because we need to keep more young people out in rural West Texas. We have the brain drain of everyone raising their kids and shipping them off to California, Austin, and everywhere else but here” (Interview #7, April 28, 2021). Producers seemed more than willing to sponsor younger farmers and help them out. This is mainly because they are worried about mass consolidation within the industry and the collapse of rural agriculture economies. One Nolan County producer with 39 years of experience stated, “The profitability of cotton farming has been difficult recently and the overhead is just outrageous. Younger people aren’t going to want to come back and farm” (Interview #6 April 26, 2021). Many of those interviewed thought that the only way to encourage the return of younger demographics to cotton farming would be to make it more profitable and less volatile of an industry.

Third, while younger people may find a career in the cotton industry unattractive, producers did realize that cotton farming is an exclusive occupation. There was a general consensus among those interviewed that it was impossible to get into cotton farming without inheriting the land, equipment, and knowledge necessary to be profitable. A lobbyist stated, “Basically, young people or college graduates wanting to get into production agriculture with no inheritance or family help would be near impossible. You need to marry into an agricultural

family or come from one” (Interview #9, May 5, 2021). Producers who are fortunate enough to expand their operation pay higher than market prices to purchase viable farming land. This leaves potentially younger growers or those wanting to get into the industry with no chance of obtaining affordable land. One cotton grower with 8 years of experience stated, “The only reason I haven’t felt consolidation pressures is because I inherited equipment. I won’t be able to afford new equipment in the future” (Interview #2, March 27, 2021). Despite billions in support subsidies, the uncertainty and rising overhead costs caused by the trade war suggests many smaller scale cotton growers will have to consolidate due to financial pressures.

6. Conclusion

Although the U.S.-China trade war has caused economic harm to both countries (Di, Luft, & Zhong, 2019; He et al., 2019; Janzen & Hendricks, 2020), research on how it impacted the Texas and U.S. cotton sector is scarce. To understand how the conflict impacted the cotton sector this Master of Applied Geography directed research project analyzed three dynamics within the industry: the increased use of cotton subsidies; the large-scale consolidation of cotton farms; and changes in Chinese purchasing practices of American cotton. I conducted a mixed methods study to test how the U.S.-China trade impacted these three dynamics.

First, I used descriptive statistics to illustrate changes in Chinese purchasing practices. I found that despite China increasing the amount of cotton it is importing, it is importing less cotton from the U.S. after the start of the trade war in 2018. During the years of the trade war the amount of U.S. cotton going to China decreased by 11%. Furthermore, China has been buying more cotton from other competitive export markets like Australia, Brazil, and India. Each country respectively saw 121%, 488%, and 107% increases on the amount of cotton going to China. The BRI is a strategic plan created by the CCP in order to increase the economic connectivity and growth of China and bolster its projection of power abroad. The BRI participating countries in Africa have also seen significant increases (Ward, 2020). Second, the dataset on USDA cotton subsidies over time shows cotton subsidies have decreased in recent years due to the U.S. abiding by WTO commitments. However, subsidies programs like the MFP that were created during the trade war were a specifically targeted attempt to mitigate the damages of trade disruptions and retaliatory tariffs. Subsidies distributed in Texas during the trade war were the highest since the 2009 WTO ruling against U.S. subsidy policies (EWG, 2020). Third, data from the USDA census from 1987 to 2017 shows that the number of cotton farms in the U.S. have been decreasing steadily over time despite farming more acres and

producing more bales of cotton per acre (USDA, 2019). The number of cotton farms have decreased by 62% over a 30-year period. This is largely due to technological innovation. Uncertainty caused by the trade war and unfair distribution of subsidies to larger producers may have exacerbated this phenomenon.

My qualitative interview analysis provided an in-depth view of the experiences, perceptions, and opinions of Texas cotton producers and industry stakeholders surrounding the U.S.-China trade war and its relation to the three dynamics described above. First, analysis of the interviews revealed that in the Texas cotton industry Chinese purchasing practices caused mass uncertainty, negative attitudes towards China, and financial loss. The U.S.-China trade war caused mass uncertainty because China usually bought the majority of American cotton. The search for new export markets caused uncertainty. 7 of 11 total interviewees held negative attitudes towards Chinese interference in the U.S. cotton market. This is attributable to the financial loss and uncertainty caused by Chinese market actions in the past and the U.S.-China trade war. Second, the interviews revealed three themes related to cotton subsidies. These were: the importance of subsidies as a form of financial relief during the trade war; the inability of farmers to continue without subsidies, and the cotton industry's complex relationship with subsidies and the uncertainty they cause. In general, relief payments like the MFP and CFAP did help ensure producers continuity in the face of uncertainty. While the payments went directly to producers, they also supported all other parts of the industry indirectly. Despite the benefit of the payments these programs also revealed that most producers were entirely reliant on subsidies to turn a profit and would not be able to continue if they went away. The Texas cotton industry has a complex relationship with subsidies. Producers appreciate and need the support they provide but dislike their loss of autonomy and reliance on the U.S. government. Third, the interview

analysis revealed three themes on consolidation. These were: the increasing overhead cost to operate a cotton farm; the flight of young people from Texas cotton communities to urban areas; and the inability of the industry to allow new cotton farmers to start a farm. The trade war exacerbated the already increasing overhead cost of farming cotton. In turn, this has made it less attractive to the younger demographic. Producers realized the flight of their kids was caused by the financial instability and uncertainty of cotton farming. The interviews revealed that because of the rising cost of equipment, land, and market volatility it would be impossible for someone to get into farming without inheriting the land and equipment. All of these phenomena were exacerbated by the trade war.

Despite the substantial efforts by the U.S. government to protect domestic industries from international affairs, I argue that three dynamics of subsidization, Chinese purchasing practices, and consolidation have pushed both the Texas and U.S. cotton sector away from market liberalization. The short-term implications of the trade war have been somewhat mitigated by government support, but the long-term implications of the trade war are vast. Cotton producers in Texas could become unprofitable if they do not have the necessary large-scale acreage to bear market uncertainties caused by global trade relations. Changes in Chinese purchasing practices and FDI could flood global cotton markets and drive down the commodity prices. Disappearance of subsidies could cause lines of credit to disappear, thus leading to even more consolidation. Future measures to protect the cotton sector should be aimed at mitigating the long-term damages of the trade war and its reshuffling of the global cotton market.

7. Works Cited

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