CONVERGENCE ISSUES IN THE INTERCONTINENTAL EXCHANGE COTTON FUTURES CONTRACT: ALTERNATIVES AND POTENTIAL REMEDIES

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Introduction

Product markets serve to allocate resources in the production and consumption of those products. For a market to function *efficiently*,[1] it must be *structurally competitive*; i.e., it must have a sufficient number of both buyers and sellers of the product so that no individual or group can manipulate the price and all participants must have access to reliable information relevant to that market. Within the many different types of markets, futures markets, which are organized markets for the purpose of trading contracts for future delivery of a specified product in a specified location of a specified quality at a specified price, have evolved to serve a critical function—price risk management; this explains why futures markets are common in commodities where cash prices are typically, perhaps inherently, more volatile.

While commodity futures markets allow for risk transfer, they are also inherently tied to their corresponding cash commodity markets and thus also play a role in facilitating price discovery (Witherspoon, 1993). The provision of prices for future delivery provides owners of a commodity a basis for expectations about potential cash prices, and, in many cases, allows them to secure prices for future delivery that enhances production and consumption planning. The futures markets matches speculators who are willing to assume the risk for price movements in the

[1] In a market context, efficiency refers to the ability of the freely-functioning competitive (many buyers and sellers; no outside interference) market to establish a price that is simultaneously the highest that sellers can get for that market-clearing quantity and the lowest that buyers can pay for that quantity.

future (for the potential financial gains) with owners of cash goods wishing to shift that price risk. Whereas well-functioning futures markets enhance the overall pricing efficiency of the larger cash market, ill-functioning futures markets can also detract from pricing efficiency and cash market operation by increasing uncertainty about future prices and/or contributing to volatility in underlying cash market prices.

A key indicator of an efficiently functioning futures market is the convergence of the futures and cash prices at the time of delivery against the futures contract. That is, the difference between the cash price of a good and its futures price (the basis) at the time of futures contract expiration is the cost of transfer of the commodity from its current location to a delivery point specified in the futures contract. Figure 1 shows the annual pattern of behavior of the cotton basis in recent years. The upward trend in the basis, not necessarily symptomatic of a problem, may be the result of increasing transportation costs. However, an increase in the average basis over time may also mean that the futures and cash markets are exhibiting less congruence. When cash and futures prices move toward each other in this manner, "convergence" is achieved.

Convergence fails to occur when the difference between the futures and cash price, at the time of delivery, exceeds the cost of delivery, so that it is profitable for the owner of the commodity to deliver against the contract or the buyer to demand delivery against the contract. In an efficient futures market, the prices differ by the amount of the transfer cost, and buyers and sellers settle the gains/losses in cancelling the futures contracts and make offsetting transactions in the cash market.

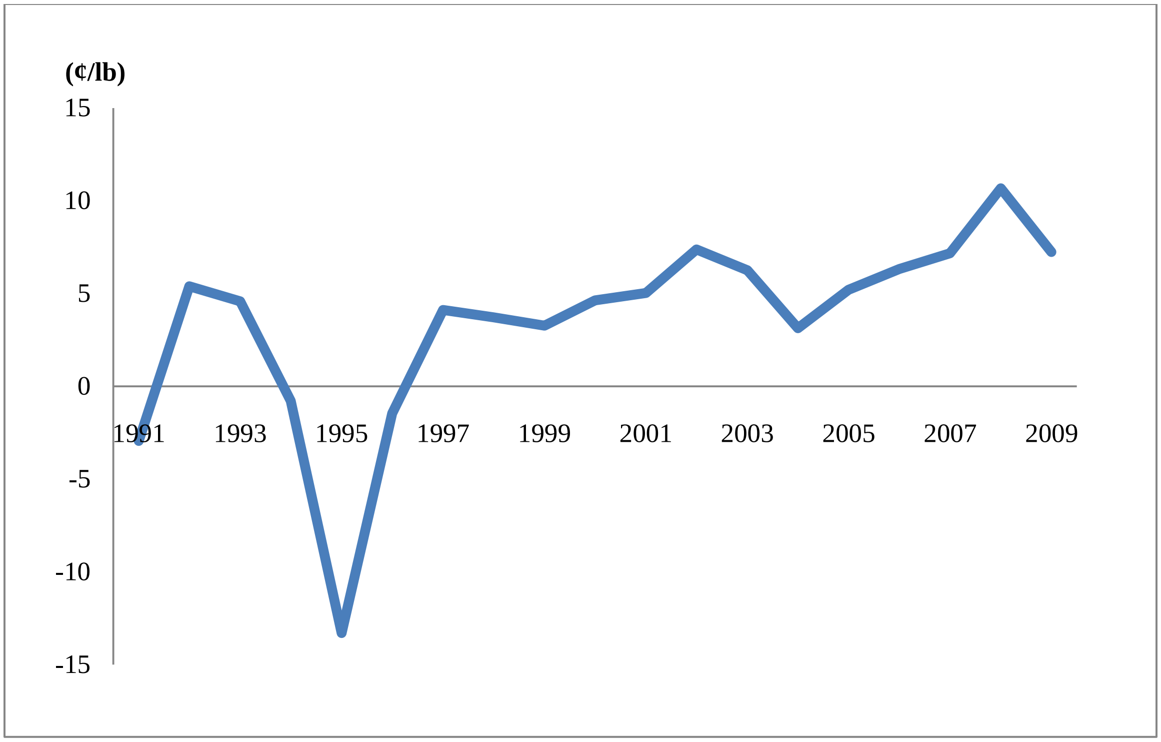


Figure 1. Annual Average Basis (Dec. Futures Price – West Texas Cash Price), 1991-2009.

It is the *threat* of delivery in an efficient market that induces convergence and keeps the cash and futures prices from deviating from the difference in delivery costs for extended periods of time. But the threat of delivery is only credible when there is sufficient *deliverable* supply of the cash commodity to provide speculators with a reasonable risk of delivery against the contract.

The cotton market is not immune from periods of lack of convergence (Carlton, 1984). In 2008, the InterContinental Exchange (ICE, 2012a)[2] cotton contract experienced rapid increases and decreases in prices (Figure 2) that had no apparent basis in market fundamentals (real forces operating in the cash

[2] Formerly the New York Cotton Exchange (NYCE) and the New York Board of Trade (NYBOT).

commodity market) and caused the failure of several prominent cotton merchants because of inability to secure sufficient financing to meet margin calls. Figure 2 suggests that convergence at contract delivery has not been a problem even in 2008, but the large interim divergence in 2008 suggests some underlying structural problem that puts into question the long-term relevance of the U.S. cotton contract (Farley, 2010). In the 2010/11 marketing year, the contract experienced record lengths of time during which prices moved beyond the daily price movement limits, thereby effectively halting trade. The analysis that follows is premised on an existing, and perhaps growing, problem of divergence in the cotton futures market. The objective of this paper is to present purported alternatives for addressing the problem and evaluate these alternatives against existing empirical evidence. To facilitate the discussion, a brief description of the ICE futures contract follows.

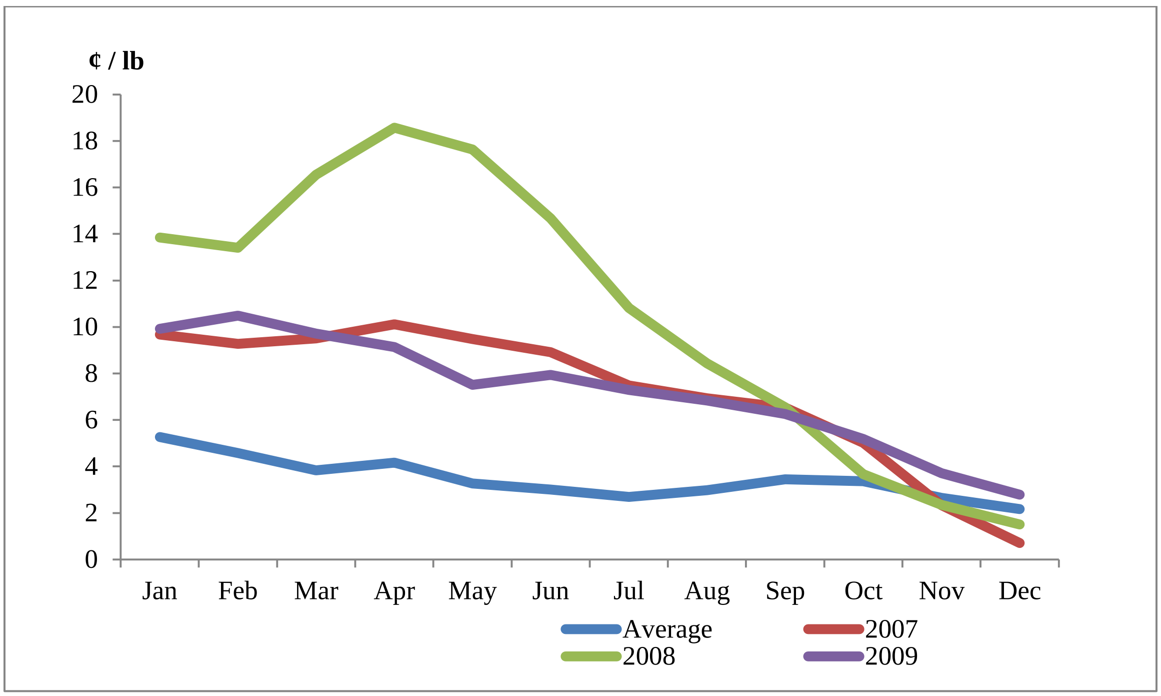


Figure 2. Monthly Basis (Dec. Futures Price – West Texas Cash Price), 2007-2009.

Background on ICE Contract and Deliverable Supply

The ICE cotton futures contract, established in 1870, is the exchange's oldest-traded commodity contract and is the world's dominant cotton futures contract (Akayama et al., 2000). The contract itself is for U.S. origin cotton of specified quality delivered at specified dates and locations (delivery points). The base grade is strict low middling (color grade 41, leaf grade 4), base staple length is 1 1/16 inch (staple 34), base micronaire is 3.5-4.7, and minimum fiber strength is 25 grams/tex.[3] A relatively narrow range of other qualities are also deliverable: white color grades within the range of good middling to low middling (color grades 11-51) and also light spot grades of middling variety and better (color grades 12-32) are deliverable, with price premiums/discounts determined by USDA's Daily Spot Cotton Quotations (DSCQ) (USDA, 2012a). Delivery of staple length above 34 is permitted, with DSCQ premiums allowed only through staple 35 (staple length longer than 35 does not carry a premium). Delivery of cotton with strength above 25 is allowed, but without premiums. Note that while the amount of deliverable cotton against the futures contract is *technically* considerably larger than the base quality specified in the contract, the premium restrictions on longer staple lengths and strengths provide a disincentive to actually deliver a large volume of the technically deliverable cotton in the U.S. In other words, the actual likely deliverable falls short of what is technically deliverable.

The ICE cotton no. 2 futures contract offers five contract delivery months that can be traded: March, May, July, October and December, and these can be traded as

[3] See USDA (2012b) for a description of the USDA quality standards and ICE (2012a) for complete specifications on the ICE cotton no. 2 futures contract.

far as 33 months in advance. One contract is for 50,000 lbs. (approximately 100 bales of lint cotton). There are five different delivery locations within the U.S.--Galveston, TX, Houston, TX, New Orleans, LA, Memphis TN and Greenville/Spartanburg, SC. On August 2, 2010, the ICE cotton board approved the addition of Dallas/Ft. Worth, TX, as a delivery point and the removal of New Orleans beginning with the Dec., 2013 contract.

Market Dynamics

The volume of trading on the ICE has grown in relation to production [from about two times global production in 1999 to over four times global production in 2010, with a spike in activity to roughly seven times production in 2008, which corresponds with the 2008 event noted by Farley (2010)].[4] While this is not necessarily indicative of a convergence issue, the increasing use of futures must also be viewed in conjunction with the amount of cotton potentially available for delivery. Because the ICE contract is based in the U.S., only U.S. cotton that meets quality specifications is relevant for delivery. Figure 3 shows the pattern of tenderable (deliverable) cotton that meets the quality specifications of the contract. But some of the cotton that is technically deliverable is unlikely to be considered deliverable by owners of the actual commodity (hedgers) because no premiums, that are otherwise paid in the cash market, are allowed in the futures contract—i.e., the premiums for longer staples, higher fiber strength, and lower leaf content that are not allowed. If we adjust the technically deliverable cotton by subtracting cotton

[4] It is not unusual for futures traded volume to be several times annual production because contracts are potentially turned over several times during the year. However, when volumes get abnormally high, it raises concerns of whether the futures market is accurately reflecting the underlying cash market fundamentals.

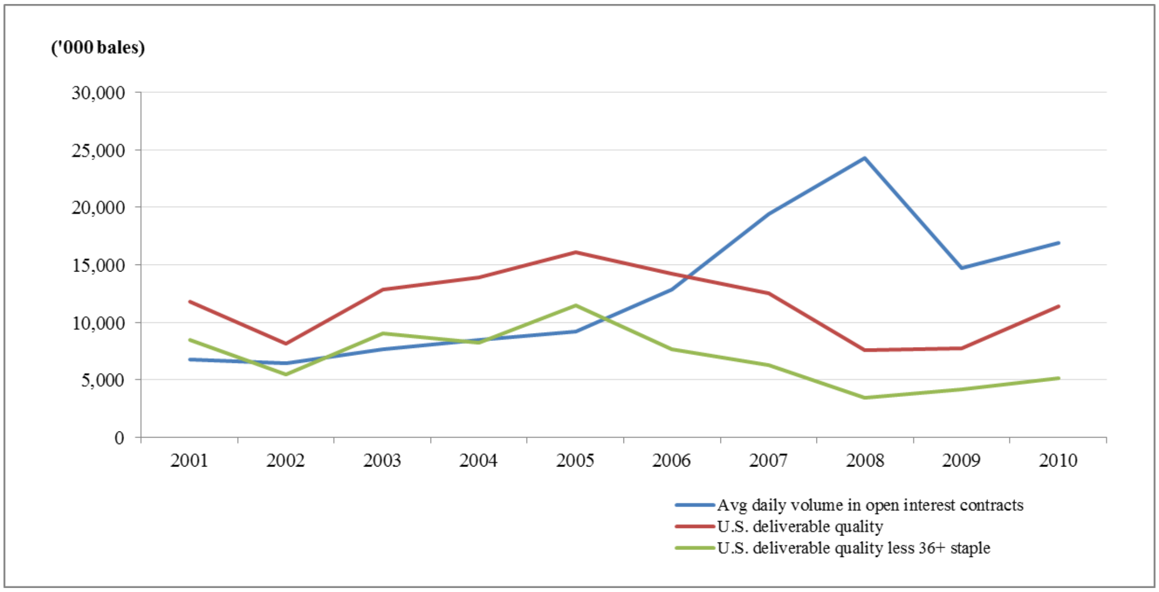


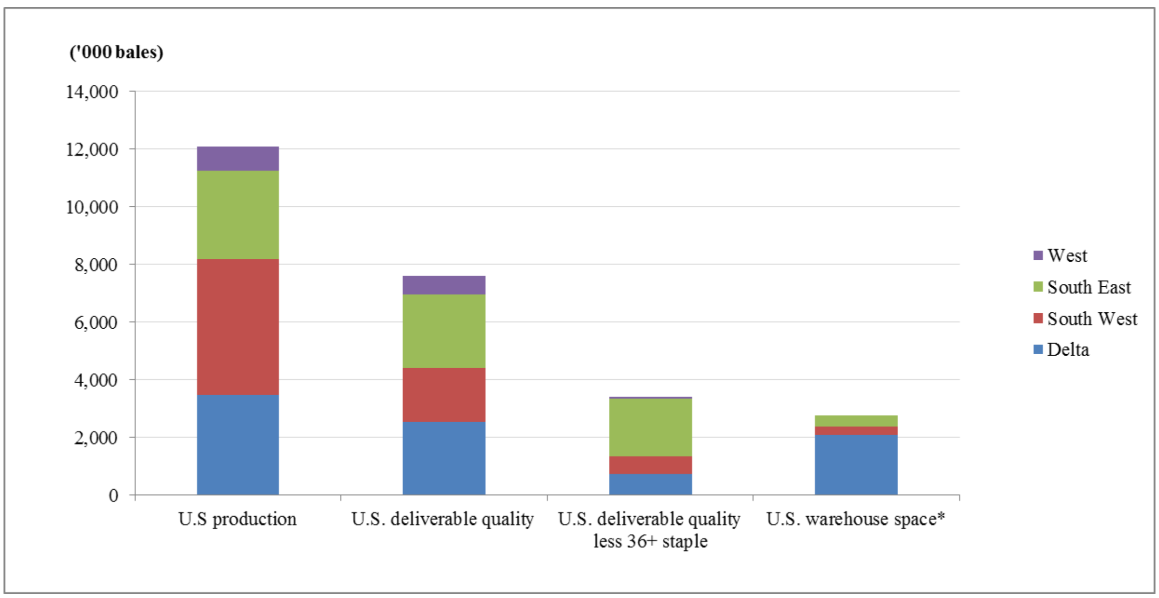
Figure 3. U.S. Deliverable Supply and Futures Contract Volume, 2001-2010.

with staple longer than staple 35, we arrive at an estimate of "likely deliverable" cotton[5] that is less than the technically deliverable, shown in Figure 3 as deliverable less staple > 35.[6] These gaps emphasize the "deliverability problem" that ensued in the 2008 period along with the entry of investment funds into the market. If the data existed to further adjust "likely deliverable" (deliverable without penalty) for fiber strength and leaf content, the divergence would be wider. Over the period 2001-2010, a declining trend in the cotton available for delivery against futures contracts relative to the number of futures contracts emerges.

[5] This estimation ignores adjustments for cotton that is *both* longer staple and high strength (above 25 grams per tex), but the data available on quality from USDA would not allow the joint adjustment. Thus, the adjustment remains an overestimate of the "likely deliverable" cotton, but the magnitude is uncertain.

[6] The ICE announced in April, 2012, that trading rules were amended, effective with the Dec. 2014 delivery month, so that cotton with staple 36 (but not longer than 36), as well as 35, delivered against the contract would draw the price premium (ICE, 2012b).

Also important to deliverability is where cotton is produced relative to where it can be delivered. ICE has a number of “delivery points” that represent bonded warehouses that are licensed to accept cotton for delivery against futures contracts. These delivery points were originally set considering where cotton production and consumption were concentrated in the U.S. some 140 years ago. But U.S. cotton production has shifted westward and consumption has shifted to foreign, predominantly Asian, markets. When cotton is located far from a registered delivery point, transport costs for delivery rise, leading to greater divergence between futures and cash prices. Figure 4 shows where cotton certified delivery warehouse capacity is located relative to cotton production that is deliverable considering quality constraints alone as of 2010. Given that production has shifted



*Note: U.S. warehouse space data are for 2010.

Figure 4. U.S. Cotton Production, Deliverable Supply, and Futures Contract Volume, 2008.

from a Southeast and Delta centered production to a Southwest centered production, but the preponderance of certified warehouse space remains in the Delta region, some quantity of cotton produced in the Southwest would have to be delivered to a warehouse in the Delta region (typically Memphis, TN) to be delivered against a futures contract. The added transport cost creates a larger wedge between cash and futures price (basis) for Southwestern, and, hence, a large portion of the deliverable cotton. The recent addition of Dallas, TX as a delivery point can partially offset this high transport cost , but there is currently no evidence of the impact of this addition on the cotton basis.

Thus, if we take the 2008 crop year as the case in point, and use the data shown in Figures 3 and 4 and the Appendix, it becomes apparent that of the total U.S. production of 12.1 million bales (not a large crop), 7.6 million bales was technically deliverable. However. if we adjust for the portion that was technically deliverable by the amount that would have been deliverable only with a staple "penalty", the "likely deliverable" shrinks to 3.4 million bales, and if we adjust also for that which would have been deliverable only with a location "penalty" (i.e., outside its region of production), the "likely deliverable" shrinks further to 1.8 million bales (15% of total production). Note that this example does not further adjust for leaf grade and fiber strength "penalties, for which the data are not available.

On the other (speculator) side of the market, "index funds" traders—investors operating large financial funds for investment companies—started buying commodities contracts, including cotton, and became particularly active in early

2008. This was a new phenomenon for the futures markets because investment funds had traditionally avoided them because of the historic (inherent?) volatility in the commodity markets. The effect was to dramatically increase the amount of "speculative money" in the commodities futures markets. Concurrent with this increase in activity, we see the number of futures contracts in cotton increase in 2008 (Figure 3) and the rapid rise in cotton futures prices (Figure 1). This led many to conclude that it was the entry of index funds into the market that drove the futures market prices to diverge from the cash market prices. However, as is discussed in the next section, it is likely more accurate to say that there were underlying conditions in terms of delivery that amplified the effects of index funds and other external shocks to the market.

Purported Solutions to Foster Convergence

Ban Index Funds? The hypothesis that the recent divergence problem was caused by the entry and speculative influence of index fund traders into the market has intuitive appeal; they occurred almost simultaneously. If that were the case, then barring index fund trading would solve the problem. However, existing empirical evidence suggest otherwise. Sanders et al. (2008) and Irwin, Sanders, and Merrin (2009) did not find empirical evidence to support the contention that large speculators were responsible for the increased volatility *per se* in the oil, grain, and soybean futures in periods of heightened volatility between 2000 and 2008.   In a similar vein, Power and Robinson (2009), using a Kalman filter-based approach for convenience yield and seasonal price volatility, in addition to a model that accounts for index trader impact and changes in cotton market fundamentals, maintained that index traders likely had no *direct* effect on cotton prices or price volatility, but that market fundamentals explained less of the price volatility during the bull cycle after the index traders entered the market. At the same time, they observed that the established relationship between price volatility and inventories did not hold during that cycle. None of these studies addressed deliverable conditions of the contract within their analysis directly, although the finding of the breakdown between inventories and price relationships could suggest that the available inventories were not likely for delivery and therefore did not serve their traditional role to force convergence. Thus, the question of whether entry of index traders, perhaps constituting a rapid shift of speculative traders on one side of the market, *in conjunction with* a diminishing deliverable supply, has not been addressed. Aside from the empirical evidence, barring *any* market participants from a market has rarely, if ever, proved to be a workable solution, although the financial market power of the index funds relative to the "traditional " market participants may still need to be addressed.

Price Limits? Daily price movement limits are intended to reduce the total cost on market participants by acting as a price stabilization mechanism (Chou et al., 2006). In cotton, the daily price limit is currently set at seven cents per pound; if prices move beyond this limit, the futures market ceases trading for the day, although the options market can remain open. Proponents of the regulation argue that limits merely prevent extreme price movements and provide a cooling-off period during moments of overreaction (Ma et al., 1989) and serve to reduce the potential for default risk on futures contracts (Brennan, 1986). However, opponents of the regulation argue that limits merely slows accurate price discovery by impeding the pace at which prices can reach their equilibrium level (Miller, 1989; Lehman, 1989; Khim and Rhee, 1997) and imposing additional risks on market participants by prohibiting mutually beneficial trades at prices outside the limits (Ackert and Hunter, 1984). Also, price limits can cause a "magnet effect" if traders, for fear of losing liquidity and being locked into their position, act to protect themselves when a price limit is close by increasing trading volume and pulling prices even closer to the imposed price limit (Lee et al., 1991).

This approach to the divergence problem is generally viewed as non-optimal. Commercial firms holding basis positions have margin money exposure; when futures move the limit, they risk being "locked in," with larger margin calls, and there is a greater risk of futures default as price limits are expanded. Additionally, when commercial firms are forced out of futures contracts, it exacerbates volatility. It may also reduce hedgers' cash-futures arbitrage capital and reduce their market participation. More fundamentally, price limits do not address the root cause of divergent margins. Rather, price limits focus on intraday price movements, and not on the longer term co-movement of cash and futures prices.

<u>Speculative Position Limits?</u> The Commodity Futures Trading Commission (CFTC) has the regulatory authority to establish limits on trading positions. It has been proposed that position limits be introduced that would cap the proportion of estimated deliverable supply that any speculator could hold in futures contracts. The rationale for such regulation is that large concentrated positions can potentially facilitate price distortions and that trading under such conditions can result in sudden changes to contract prices that would not have occurred if positions were more evenly distributed among market participants. However, no reliable evidence has yet been presented to show causality between speculative activity, or concentration of it, and the divergence anomaly in recent futures commodity markets (Murphy and Purcell, 2005), although plausible arguments exist. Pirrong (2010) argued that position limits would cause inefficient pricing and induce choppier and more volatile commodity futures markets. He notes that since speculators are informed market participants, restricting their participation slows down the price discovery process. Fortenbery (2009) concluded that regulation of speculative activity does not address underlying market price/volatility issues and if liquidity is reduced by position limits, the result would be even less availability of the market to discover prices. These arguments aside, no studies have been found that directly address the potential for very large (dominant) trading firms to manipulate the cotton futures market.

Increasing Deliverable Supply? While each of the above approaches addresses the *symptoms* of non-convergence, largely through imposing restraints on the functioning of the market as it is now, none of them tackled the issue of deliverable supply. Concerns involving deliverable supply are more likely to address *causes* of the divergence, rather than the symptoms, particularly when juxtaposed against the surge of speculators in the market.

When the deliverable supply of cotton becomes too thin, futures price volatility increases because the mechanism that ties futures prices to cash prices (i.e., the threat of delivery) is weakened, thereby allowing traders to ignore market fundamentals. In other words, the market operates with traders betting against the odds of prices moving up or down on a day-to-day basis.

Addressing this issue would entail modifying cotton futures contract specifications, altering particularly: (a) the quality specifications of what cotton is deliverable and/or (b) the location of delivery points (where cotton delivered against a contract may be delivered). Quality and location delivery options are particularly relevant in agricultural futures markets (Chance and Hemler, 1993)[7] and quality delivery options may be especially important in cotton futures due to the substantially more complex quality evaluation (grading) system for cotton than for the other agricultural commodities.

There are potentially multiple ways of adjusting the quality dimensions of the contract and the delivery locations options within the contract. As such, these alternatives are discussed, in turn, in what follows.

Changing Contract Quality Specifications.

There is a trade-off between increasing the certainty of what might be delivered on a futures contract and decreasing the likelihood of price squeezes (price pressures from inadequate supplies of a specific quality in the contract). Allowing sellers to deliver some range of qualities (beyond the specific quality identified in the contract) with specific premiums or discounts for the qualities delivered increases the deliverable quantity available and fosters convergence, but there may be some residual, unhedgeable risk by buyers and/or sellers that is unavoidable. Garbade and Silber (1983) is the only study that empirically

[7] Chance and Hemler also provide a good theoretical summary of *how* deliverable quality and location conditions work through and affect the futures markets.

addressed this issue for corn, wheat, and soybean futures (commodities with only two main attribute characteristics). They offered two main conclusions: (1) if the commodity quality differences relate directly to a technical extraction process (such as with soybeans), price differentials are easily determined and the broadening of delivery options can reduce the likelihood of squeezes without creating residual, unhedgeable risk, but (2) if the quality price differentials are more complex than a straightforward technical relationship (such as with wheat and corn), there will be some level of unmanageable risk. In both cases, the likelihood of squeezes is reduced but with added unmanaged risk for commodities with more complex attributes. Extending their results to cotton, they inferred that including more deliverable qualities of cotton, with its much more complex grading system, would probably lessen the divergence problem when deliverable supply became tight relative to the speculative demand, but it would likely reduce the speculative demand at all times (regardless of the level of speculative demand), and could be a hindrance to the functioning of the contract at other times. If they inferred correctly, it raises questions regarding the advisability of expanding the deliverable quality specifications of the ICE contract.

A variation of this approach in the cotton contract is to add premiums for longer staples and higher strength cottons that are allowed to be delivered, rather than expand the technically deliverable qualities, thereby increasing the "likely deliverable" (without affecting the "technically deliverable"). This could be done using the same premium/discount schedule provided by the Daily Spot Cotton

Quotations as is currently done in the ICE cotton contract.[8] This would have the effect of increasing the effective deliverable supply, but would also increase the unhedgeable risk, although probably not to the same extent as increasing the deliverable range of quality.

Another approach to adjusting the quality specifications would be to change the quality specifications in the futures contract to more closely reflect the quality attributes that consumers of cotton are buying and producers of cotton are selling from the set of qualities that were set in 1924. Compared to the ICE contract specifications, the quality of cotton produced today is significantly higher; while there has been a gradual increase in cotton quality over many years, the rise in quality attributes produced has been especially dramatic in the last 20 years (being fostered and/or enabled by the development of High Volume Instrument (HVI) grading of cotton and the application of biotechnology in genetic improvement). As a result, in today's market cotton producers are producing more desirable quality attributes and cotton consumers (textile mills) are buying/requiring more quality in the cotton they use. Table 1 illustrates the magnitude of that shift. The commodity market is currently producing, consuming, and trading cotton of generally higher quality than the commodity futures market is trading.

Changing cotton quality specifications in the contract to reflect the predominant qualities in the cotton market, even keeping the variation in quality that might be delivered approximately the same, would have the effect of increasing

[8] The use of the DSCQ within the contract assumes that it is a reliable proxy of the premiums and discounts in the cash market. A body of research evidence disputes this assumption (e.g., Hudson et al., 1996; Ethridge and Hudson, 1998; Hudson et al., 1998), but the DSCQ is the only *national* set of price differential indicators available.

Table 1. Comparison of U.S. Cotton Quality Produced and Allowed in the ICE Cotton Contract.[1]

Quality Attribute	ICE Contract: Specified	ICE Contract: Deliverable	Predominant Quality Produced
Color grade	41	11-51 & 12-32, w/prem.	31 (33%)
Leaf grade	4	≤4, w/o prem.	3 (41%)
Staple	34	34+, w/prem. For 35 only	35 (26%)
Micronaire	3.5-4.7	3.5-4.7	3.5-4.7 (76%)
Strength	25 min.	25+, w/o prem.	30-31 (38%)

[1]Quality produced is for the 2010 crop.

Sources: ICE (2012a) and USDA (2012c).

the deliverable supply, and especially the *effective* deliverable supply. It would appeal to hedgers on both sides of the market—those wishing to shift price risk for a reliable procurement supply and those wishing to shift price risk for a future sale. Speculators would be exposed to more deliverable risk than they presently face, but that deliverable risk would be more consistent with an optimal mix of hedgers and speculators in the market for price discovery and price risk management purposes (but not necessarily speculative profits).

Changing Contract Delivery Locations

As with deliverable quality specifications, there is a trade-off for location delivery options as well (Hranajova et al., 2005). Additional delivery points and adjusting delivery differentials can affect pricing and hedging performance. Pirrong et al. (1994) analyzed impacts of delivery locations on pricing behavior in corn and soybean futures markets and found that changes in delivery specifications can have a significant effect on the value of contracts as risk management tools. Permitting delivery at several locations at differentials that reflect average price differences between locations can raise the correlation between futures and spot prices of both deliverable and non-deliverable points and can deter long manipulation. Hranaiova et al. (2005) analyzed the value of timing and location delivery options on the CBOT corn futures contract and found that the joint delivery options allowing different dates and locations in the CBOT contract increases deliverable supplies with small effects on basis levels, with the inference being that they increase futures market convergence (efficiency) with the CBOT corn contract.

Irwin et al. (2009) documented and analyzed non-convergence problems in the corn, soybeans, and wheat CBOT contracts using measures of full carry and hedging effectiveness. Their analysis showed that storage rate changes between existing delivery locations would likely have been sufficient to resolve the convergence problems with corn and soybeans, but not for wheat; structural issues in the wheat industry are likely to require delivery point changes to resolve convergence issues with the wheat contract.

Wang and Chidmi (2011) used three different models to evaluate hedge ratios for cotton across countries; this study has direct implications for expanding delivery points for the ICE contract (in this case beyond U.S. borders and U.S. grown cotton). They examined the cotton markets in the U.S., Australia, China, and Africa Franc Zone countries using 30 years of data. Their results showed that (1) spot prices adjust more rapidly than futures prices and (2) spot prices and the New York Cotton Exchange (which became the ICE) futures prices are cointegrated in the U.S., Australia, and China, but not in Africa, cash markets. The cointegration of prices suggests that co-movement of prices is high enough such that introduction of Australia, for example, as a delivery point would not likely increase price volatility for ICE. This is important because the increase in deliverable supply (non-U.S. supply) would help convergence.

They concluded that the NYCE/ICE contract could serve as a hedging tool for U.S., China (because of their market dominance), and Australia (because of low market distortions) cotton. Realistically, however, China would not be a good candidate because of its heavy intervention in markets (political risk). Thus, Australia is the most likely candidate for inclusion as a delivery point. It is not a valid hedging tool for countries like West African countries, Pakistan, Turkey, Brazil, India, and Egypt because those countries rely less on market-based systems and/or have growth/quality characteristics sufficiently different as to post cross-hedge difficulties. Brazil is the most likely next candidate as their system evolves. Like Australia, Brazil is most responsive to March, May, and July futures prices, as those are closer to delivery months for those growth regions.

Conclusions and Recommendations

The anomaly in the cotton futures market that became obvious in the events of 2008 appears to have been the result of a declining deliverable supply of cotton, and particularly the supply deliverable without penalty, that was especially acute in 2008 and was exacerbated by a rapid increase in speculative activity that year, driven largely by the increase in index fund activity. The convergence of these events had severe effects in the futures market and the cotton industry in general; several large cotton merchandizing firms, some with over 100 years of business experience in the industry, exited the industry because of the financial stress of margin call costs. Those problems highlighted underlying structural issues regarding the cotton futures contract, which has marginally changed since its inception, notwithstanding substantial changes in the structure of the cotton industry itself.

A range of alternatives have been purported to address the ICE cotton futures contract price volatility associated with the occurrence of small deliverable supplies. Of those measures presented in this paper, several (banning index funds, tightening price limits, speculative position limits) fail to address the problem *per se*. They simply act as restraints on short-run price movements, "mask" market adjustments, and may create more problems than solutions. The approaches that directly address the threat of delivery, which is the driving force for convergence between futures and cash prices, appear to offer more productive, longer-lasting solutions.

Deliverability of cotton within the contract may be increased by changing (a) quality specifications within the contract and/or (b) delivery locations. There are several ways of altering quality or location specifications. To simply increase the range of quality attributes that is deliverable under the contract, with or without allowing more price premiums/discounts, has merit, but also carries additional unhedgeable risk for speculators, thus a disincentive for speculators (a necessary component) to enter that market. Raising the base quality specifications of the contract to a set of specifications closer to the qualities being produced and consumed in today's market offers the advantage of increasing the deliverable supply, but without *necessarily* raising the risk for speculators (depending on the details of deliverable qualities and premium/discount specifications). It would raise the average price of a contract because the average quality is higher, but likely by a small proportion. Raising the quality specifications would likely enhance price discovery because the futures contract would more closely reflect the commodity market.

The addition of Dallas, TX, as a delivery point in 2013 will facilitate the effective deliverability, the extent of which has yet to be determined.[9] Other delivery locations further west in the U.S. may be worth considering, especially since the predominant cotton market is Asia and most U.S. cotton now moves through ports in along the West Coast. However, the added risk for speculators would need to be better understood. Empirical research done on deliverable locations outside the U.S. imply that adding Australia as a delivery point (and including Australian cotton) would increase deliverable cotton, and would spread deliverable cotton more evenly throughout the year, given that Australia's crop is roughly 6 months away from the U.S. crop. Also, Australian cash price movements are already tied to the ICE cotton futures price movements so that price discovery is facilitated even more. At the same time, including Australia would make the contract more international, covering more cotton.

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[9] Dallas is located closer to the concentration of U.S. cotton production in the Texas Plains region, but only 250 miles closer than to Memphis, TN. Also, the amount of approved warehouse space in Dallas is yet to be determined.

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APPENDIX: U.S. COTTON PRODUCTION, DELIVERABLE SUPPLY, AND FUTURES CONTRACT VOLUME DATA (in bales), 2001-2010.

	Year									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
U.S Production	21,380,330	15,319,600	17,823,000	22,505,000	23,078,000	19,850,000	18,143,000	12,111,000	11,624,000	16,720,000
Delta	6,936,000	5,771,000	6,541,000	7,134,000	7,470,000	7,975,000	5,277,000	3,488,000	2,610,000	3,827,000
South West	7,273,230	5.325.300	4,638,000	8,114,000	8,886,000	6,050,000	8,531,000	4,712,000	4,935,000	7,840,000
South East	4,487,100	2,065,300	4,529,000	4,631,000	4,934,000	4,390,000	3,077,000	3,062,000	3,324,000	3,948,000
West	2,584,000	2,158,000	2,115,000	2,626,000	1,788,000	1,435,000	1,258,000	843,000	755,000	1,105,000
U.S. Deliverable Quality	11,826,626	8,183,443	12,892,231	13,921,248	16,101,506	14,249,510	12,536,584	7,607,723	7,716,040	11,372,269
Delta	3,226,547	2,955,285	4,629,631	5,292,880	5,497,732	6,055,108	3,096,155	2,545,981	1,956,745	2,010,362
South West	2,315,677	2,430,507	2,748,563	2,972,450	5,145,452	3,360,886	6,403,778	1,876,059	2,538,650	6,118,203
South East	4,259,942	1,076,841	3,838,126	3,600,509	4,042,621	3,695,719	2,005,601	2,540,115	2,680,966	2,477,471
West	2,024,460	1,720,810	1,675,911	2,055,409	1,415,701	1,137,797	1,031,050	645,568	539,679	766,233
U.S. Deliverable quality less 36+	8,460,331	5,474,097	9,075,073	8,254,007	11,437,630	7,677,792	6,317,786	3,410,094	4,181,069	5,160,616
Delta	2,387,084	2,175,543	3,629,222	3,234,130	4,363,973	3,570,153	2,255,841	748,448	996,614	1,107,158
South West	1,815,826	2,000,804	1,817,771	1,761,271	3,632,929	1,275,456	2,186,985	607,206	1,179,539	2,508,856
South East	3,654,719	981,954	3,386,205	2,660,358	3,171,306	2,695,348	1,666,135	1,979,524	1,917,605	1,456,139
West	602,702	315,796	240,505	598,248	269,422	136,835	208,825	74,916	87,311	88,463
Warehouse space										2,775,881
Delta										2,077,320
South West										311,561
South East										387,000
West										0
Avg. daily vol. in open interest contracts	6,753,300	6,421,300	7,635,200	8,472,400	9,235,500	12,865,000	19,452,000	24,297,100	14,721,600	16,912,800

Sources: ICE (2012a); USDA (various issues).