ASIA & THE PACIFIC POLICY STUDIES
Australian National University

Received: 5 November 2017 | Revised: 19 February 2018 | Accepted: 1 March 2018
Asia & the Pacific Policy Studies, vol. 5, no. 2, pp. 331–346
doi: 10.1002/app5.226

Original Article

Insurance Plus Futures: Agricultural Commodity Price Reform in China

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Abstract

China's agricultural support policies are moving towards market institutions through a quasi-market transition. Ten years of direct minimum purchase price procurement on agricultural commodities resulted in overcapacity, oversupply, mixed-market signals and grey-market imports. The Insurance Plus Futures (保险 + 期货) policy pilot in agricultural price reform is a leading indicator of reform in China's agricultural production and rural finance architecture. State procurement of staple crops is now ending, and an interim governance structure is in place for the transition to market prices. This article assesses the historical institutional development of three key economic institutions in Chinese agricultural production: agricultural prices, insurance and futures. It examines government plans to move from a centrally procured to a provincially variable agricultural production model, examines the provincial sectoral target-price mechanisms constructed in 2016–2018 as interim price-setting mechanisms, looks at the emergence of government mandated agricultural insurance as a measure to cover the subsidy previously served by the minimum purchase price system and assesses the prospects for institutional development of futures contracts, commodities exchanges and price formation institutions in China.

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Key words: China agriculture, futures markets, agricultural insurance, agricultural subsidies, agricultural commodities

1. Introduction

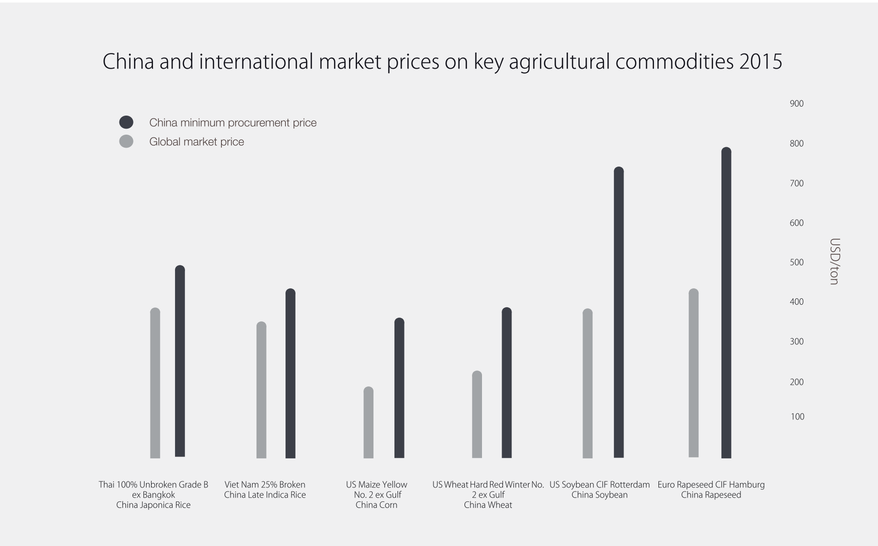
Since 2004, China's central government has been buying agricultural commodities at above international market prices directly from farmers and putting it into storage, while domestic processing firms have been largely importing the commodities that are actually entering consumption chains (Gale 2005; Gale et al. 2006; Lohmar et al. 2009; Gale 2013). Following a period of high international agricultural commodity prices in the 2000s, China's central government established price supports and state purchasing institutional infrastructure across core agricultural commodities. State procurement was established on oilseeds, cotton, corn, rice and wheat. Soon enough though, falling international commodity prices and shipping costs attracted imports that had become significantly cheaper than state procured commodities, see Figure 1. The resulting distorted market meant that crushers and processors were importing cheaper foreign commodities while the state was supporting high domestic prices and purchasing commodities, which were not entering circulation (Naughton 2016). Black market imports of agricultural commodities coupled with state minimum purchase price plans meant that crushers and processors did not buy from the State, and stockpiles grew, sitting in state granaries. This system is now being dismantled and replaced with an interim system of provincially set target prices coupled with state support for the development of both agricultural income insurance and agricultural futures contracts.

This article takes a historical institutionalist approach to assessing the policy trajectories of three key agricultural reforms in China and analyses them as a contiguous whole. The article analyses primary sources of government policy to demonstrate the causes and divergence in agricultural policy discourse in the period 2014–2017 and to form a central narrative which encompasses agricultural commodity production and rural finance. The article first looks at the extant state procurement system and how the 2015–2017 *Central Documents Number One*, the core policy direction for agricultural policy, have changed the trajectory of China's wider agricultural policy by introducing the '*Insurance plus Futures*' policy pilots. The article explores the challenges and evolution of rural policy reform considering the institutional bottleneck of the centralised state production of agricultural commodities and then analyses the extant institutional rural financial system and challenges to reforming it. The article then examines the three pillars of the agricultural commodity production reforms through, first, the introduction of an interim provincial target-price quasi-market system on state procurement; second, the development of an agricultural insurance market and how farmer incomes and revenues will be secured by state subsidised insurance at the provincial level as a replacement to the income support previously served by state procurement; and finally, articulates the challenges of establishing and maintaining institutional trust in a market price-setting mechanism through the further development of futures contracts on China's commodities futures exchanges. It concludes with praise for the movement of China's domestic agricultural commodities into market-based or at least quasi-market production systems, yet hesitation over the resultant social policy vacuum and persistent rural poverty problem confronting China's social legitimacy mandate with its essentially peasant rural population (Qin 2003, 2005) (Figure 1).

2. *Insurance Plus Futures*: Emergence of a Policy Solution

In 2015, China's central government rhetoric was already pushing for target prices, agricultural insurance and agricultural subsidy reform.

Figure 1 China 2015 International Market Prices on Key Agricultural Commodities. Global Agricultural Commodity Prices Have Been Below China's State Procurement Prices for Years, Creating Clear Arbitrage Opportunities. Oilseeds in Particular Have a Large Spread in Domestic and International Price Differentials



Despite agreement on the need for price reform away from state procurement, a variety of policy options were still present. Wu Xiaoling at the National People's Congress Financial and Economic Affairs Committee had been outspoken in March 2015, when she put her weight behind target-price insurance as a transition policy to eventual market-driven prices on all agricultural commodities in China (Zhang 2015b). And later in 2015, policy consensus coalesced around Wu with a policy solution centred on *Insurance plus Futures* (保险 + 期货), a simplification of the previously floated *Insurance plus Futures pus Banks* (保险 + 期货 + 银行) as the policy formula to tackle the *Three Rurals*.[1]

The policy transmission from central government to lower levels of government and the public ran initially from Economic Daily in August 2015, a key state media organ under the CCP Central Committee and the State Council. This was quickly replicated at People's Daily and a variety of agriculture-related news outlets (Wang 2015). In December 2015, *Futures Daily* disseminated a widely republished editorial echoing this decision to pursue *Futures plus Insurance* (期货 + 保险, with the arithmetic flipped). The editorial spelled out the policy and related it to the market and institutional reforms that it would entail (Li 2015). The *Futures Daily* article argued China's agricultural insurance reform should mirror the US Crop Revenue Insurance model. The US model provides subsidised revenue insurance to a portion of primary producers' revenues, derived from a combination of 5-year average crop yields and prices derived from Chicago Mercantile Exchange futures contracts.

By the 2016 Central Number One Document in January, the policy arithmetic was codified. The *Insurance plus Futures* policy was designed to offer government subsidies to insurance companies to offer agricultural income insurance policies based on fluctuating futures prices, to be trialled in small-scale pilots The policy consensus across central government was to abandon state procurement, moving all agricultural commodities through a staggered interim target-price policy system before moving towards full marketisation of agricultural commodity prices (CPC Central Committee Policy Research Office of Economic Affairs 2015; Lin 2016).

Provincial policy pilot programs were to be the key regional testing grounds for new target price, insurance and futures system (Securities Times 2015). The policy narrative embodied an acceptance of futures markets as a necessity in price formation and planned to shield the rural population from crop-derived revenue risk with agricultural income insurance (Xinhua 2015).

Agricultural income insurance based on commodities futures prices and marketised production would eventually replace the newly established interim target-price system (Chen 2013). Meaning that government support for agricultural production would no longer centre on price controls and central purchasing, but rather shift to government subsidised agricultural insurance. And the interim quasi-market target-price structure would eventually be replaced with state support for credit (General Office of Sichuan Provincial People's Government, 2015), insurance and futures markets, which would in turn support agricultural production while allowing the market to set commodity prices.

3. Rural Finance Policy Reform Matrix

Any rural, agricultural production or agricultural finance reform in China is a very top-down driven policy process. Opaque Party Leading Group discussions on policy direction become more transparent as they move through both National People's Congress working committees and State Council ministerial directives to provincial and lower levels of government. Knowing China Communist Party internal policy debates is close to impossible, but following the legal and regulatory documentary evidence as it trickles from

1. The *Three Rurals* (三农问题) or 'three rural issues' is the historical and political shorthand in China for the interrelated problems of agricultural production, rural area backwardness and guaranteeing peasant incomes. They are literally the three '农's of 'Agriculture', 'Rural' and 'Peasantry'—农业, 农村 and 农民 (Qin 2003, 2005).

the Central Party Leading Groups down to rural village-level governance gives an extraordinarily clear idea of what government is planning, how it plans to do it and what the institutional consequences will be.

The central policy basis for the expansion and integration of an agricultural insurance architecture to replace direct subsidies to farmers came in Section 25 of the *2016 Central Number One Document—Opinions on the Implementation of New Ideas to Develop and Accelerate Agricultural Modernisation and Achieve a Moderately Prosperous Society* (CCP Central Committee and State Council 2016), while Section 22 of the *2016 Central Number One Document* described the continuing use of the target-price system reform to create the price basis on which to move away from subsidies and towards operation of an agricultural insurance system (CCP Central Committee and State Council 2016).

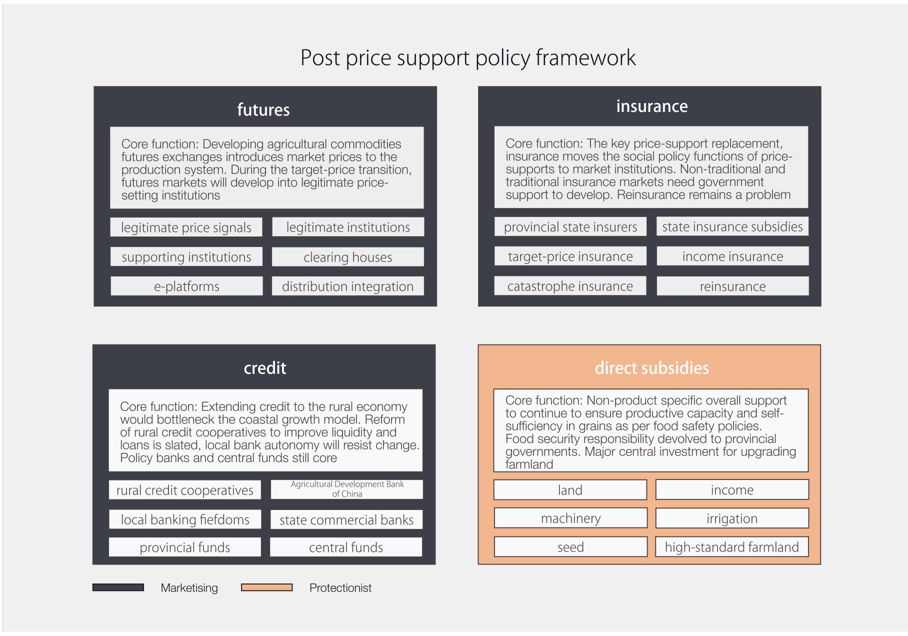
The previous year's *2015 Document Number One* had already laid out policy trajectories for developing insurance for primary producers of staple crops on the central government subsidy lists and pushed for agricultural price insurance pilots. May 2015's later *Guidelines for Adjusting and Improving the Three Agricultural Subsidies* from the Ministry of Agriculture (MoA) and Ministry of Finance (MoF) delivered the policy framework for restructuring the agricultural subsidy system (MoA 2016). The guidelines cited a need to adjust the system of subsidies for crop seeds and addressed long-term goals of upgrading and upscaling agricultural production (MoA 2016). These guidelines promoted provincial financial service pilots and agricultural credit and insurance systems that could be used to later leverage production into upscaled farms, from the current mainly small plots of family-held and worked agricultural land (MoA 2016). The 2015 Central Rural Work Conference stressed the structural problems with the prevailing price differential of domestic and imported agricultural products, with high domestic prices and increasing production costs (Farmer's Daily 2015). The wider 2015 Central Economic Work Conference also promoted agricultural modernisation, with key agricultural policy narratives to maintain subsidies while reforming pricing and financial services (CCP Central Committee and State Council 2015; Yang et al. 2015).

2016 *Document Number One* proposed to set up a provincial agricultural credit guarantee system in 2016 and a national credit guarantee system by 2018. Other highlights included the development of futures and options pilots and a call for rural bond development to be part of a multi-tiered rural capital structure (CCP Central Committee and State Council 2016; Ek & Kenderdine 2016). Other agricultural financial reform measures and pilots included a provincial rural credit cooperative reform pilot; a rural contracted land management and operational rights mortgage pilot; an agricultural futures and options pilot; pilots on target-price insurance, income insurance and index-based weather insurance; and provincial rural land contract right registration and certification pilot. Insurance and ownership rights reforms were already at pilot stage, and funding was introduced to support new farming entities to professionalise and to upscale agribusiness and to push commercial, policy and postal banks to increase rural lending and reform rural credit cooperatives (Ek & Kenderdine 2016).

To smooth the transition arrangement, February 2016 State Council *Opinions on Developing Institutions for Accountability of Provincial Governments for Food Security* delineated a greater role for provinces in setting agricultural production levels and price setting while continuing to move towards a variable provincial price model (State Council 2016). The policy required provincial governments to take a greater governance role in the production of agricultural commodities (Figure 2).

Figure 2 makes clear the four systemic reforms currently under operation in order to transform the agricultural production system from a state-procurement system to a market-priced production system while simultaneously reforming the rural finance system to ensure primary producer livelihoods. Overall subsidies will naturally be nominally reduced as state-procurement ends; however, a wide array of direct and indirect subsidies will continue to

Figure 2 China 2016 Agricultural Production Subsidy Reform Matrix. Rural Banking and Credit Reform Have Been Dropped From the Central Narrative as Too Hard, While Many Direct Subsidies Are to Remain or Expand. 'Insurance' and 'Futures' Are the Two Institutional Reforms to Develop Under the Current Policy Framework



support primary producers through machinery, seed and irrigation subsidies.

Insurance reforms will gradually step in to replace the state procurement guaranteeing peasant incomes; however, the industry is currently too nascent to shoulder this burden or even to operate effectively. In order for a cluster of agricultural insurance firms to develop according to market principles, there must be market incentives to enter the market and offer insurance, as well as market-based prices on which to hedge risk. The Government is incentivising agricultural insurance firms to form, mostly at the provincial level, by both direct subsidies from the provincial governments backstopping the new firms, as well as offering insurance firms a 'sure bet' allowing them to issue insurance policies on target prices which enjoy a state-guaranteed floor. Perhaps the greatest institutional obstacle to the development of the agricultural insurance industry is the lack of a sufficient domestic reinsurance market for firms to resell policies and spread risk. International reinsurers could shoulder this responsibility, but China is unlikely to open its domestic market and will likely try to develop a domestic reinsurance market behind the closed capital account.

The third quadrant of the table represents the development of futures markets in order to be able to create and transmit credible price signals to buyers and sellers. A range of institutional upgrades are necessary for these previously hollow institutions to become effective agents in the agricultural production system. Sidelined for decades from actual agricultural production, the futures exchanges will be dependent on government support to attract technical transfers from foreign institutions in order to establish best practice in clearinghouse operations and effective institutional integration with wider markets.

The final quadrant is the field of policy reform most likely to fail, or at least to stagnate. A system of less subsidies, strengthened insurers and viable futures markets is ultimately dependent on a banking system. China's rural finance system has been shambolic since reform and opening. Many agricultural communities left behind and institutionally hollowed out as the main commercial bank system operates only tangentially in agricultural sectors and geographies, while rural credit cooperatives have failed to establish a viable alternative to central state finance and remain institutionally hamstrung by the *danwei* system they emerged from. Rural finance reform remains the greatest barrier to reforming prices and incomes in the agricultural sector in China (Girardin 1997; Kumar et al. 1997; Ayyagari et al. 2007; Cheng & Degryse 2010). Dependence on rural credit cooperatives, unclear policy banking mechanisms, disincentives for commercial banks to enter or operate and local banks operating as regional fiefdoms all contribute negatively to the prospects for developing market prices in agricultural commodities or rising wages among primary producers.

While the insurance and future reforms are discussed in more detail in the succeeding texts, without adequate strengthening of the rural finance system to support the nascent insurance and futures industries and to provide adequate loans for producers and purchasers, the real policy pill in rural finance is yet to be swallowed. Wu Xiaoling, a former deputy chair of the People's Bank of China, has argued that China should maintain existing rural credit cooperatives and mutual funds which allow farmers not only to access to bank loans but also to promote other financing institutions to create a holistic alternative to subsidy-based farmer support by acting as access points for rural bank loans. Wider challenges are even more obviously the problem of the peasantry and the land rights system in China's agricultural production (Qin 2003, 2005). China has not yet untangled agricultural production from the peasant class system. The shifting of financial risk from taxpayers to farmers entails a twin political risk of ostracising the small-holder peasant and further decoupling the rural from the urban development experience in China.

4. Target Prices as Interim Support Measure

Decoupling prices from subsidies and moving towards a target-price (目标价格) system has been on China's central agricultural agenda since 2014. State Council, China's central administrative power structure, moved in 2014 to decouple support from prices and to set up a target-price support system. A target price is simply a price floor below which the market price cannot fall; it is essentially a quasi-market price to replace the minimum purchase price system for staple crops in the interim years until allowing market prices into the mix. Thus, staple crop subsidies implemented since 2008 over the period 2016–2018 are being replaced by provincially set target prices, which replace the central minimum purchase price but do not come with the guarantee of state procurement.

There had been widespread agreement in central policy circles on decoupling price-based subsidies from production targets. Han Jun, director of the Office of the Central Rural Work Leading Group in May 2015, confirmed the policy trajectory towards devolving purchase price setting powers to provincial governments (Shao 2015). And persistent policy support from Chen Xiwen, vice-director of the Central Rural Work Leading Group, and Lou Jiwei, Finance Minister and director of the Rural Reform Leading Group, signalled the central government's imperative to adjust agricultural support in accordance with central budget constraints (Li 2016). Chen Xiwen had consistently argued since 2012 that the international/ domestic price spread made reform of the minimum purchase price system inevitable.

The years 2014–2016 were critical years for the policy agenda which has aimed to wean prices off the state and into the market. The *2015 Document Number One—Opinions on Deepening Rural Reform to Accelerate the Modernisation of Agriculture* argued for the 'gradual establishment of an agricultural target-price system' and for 'target-prices to explore agricultural insurance pilots' (CCP Central Committee and State Council 2015, see also CCP Central Committee and State Council 2017). The *2015 Central Document Number One* further instructed government 'to actively carry out agricultural price insurance pilots' starting with the Northeast and Inner Mongolia soy price subsidy pilots and the Xinjiang cotton price subsidy pilot and ' to explore food, pig and other agricultural product target-price insurance pilots' while continuing to implement the rice and wheat minimum purchase price policy and the corn, rapeseed, and sugar temporary purchasing and storage policy (CCP Central Committee and State Council 2015).

Target prices set by provinces were thus being introduced as an interim solution between state procurement and market pricing through the 2016–2018 period, see Figure 3. Minimum purchase prices for soybean, cotton and rapeseed had in 2016 already been replaced by target prices. Prices are free to fluctuate with the market above the floor, and as each province will be able to set its own target prices, a semivariable price model is being introduced, with multiple provinces proposing target prices on multiple crops. The variable target-price model means that rather than one centrally set price for the nine key food security commodities (soy, rapeseed, cotton, sugar, early indica

Figure 3 China 2016 Pilot Target Prices and Central Minimum Purchase Prices (National Development and Reform Commission, Ministry of Finance, Ministry of Agriculture, State Grain Administration, Agricultural Development Bank of China 2015, SGA 2015, 2016; NDRC 2016; Ningxia Provincial Government 2016; China Chemical Fertiliser Network 2015; China Feed Information Network 2016) Central State Minimum Purchase Prices Remain on Sugar, Rice, Corn and Wheat Although Policy Consensus Is to Phase Them Out. Soy and Cotton Provincial Target Prices Are Being Piloted in the 'Three Northern' Regions: Northeast, North and Northwest. Target Prices on Rapeseed Are Expected to Begin in 2017

Provincial target prices and central prices matrix 2016

		Moving to a variable price model by province/sector			Central government price and procurement					
		Soybean	Cotton	Rapeseed	Sugar	Rice: Early Indica	Rice: Late Indica	Rice: Japonica	Corn	Wheat
		C¥ per ton								
Target price pilots	Liaoning	4800								
	Jilin	4800								
	Heilongjiang	4800								
	Inner Mongolia	4800								
	Xinjiang		18600							
Agricultural production core	Shandong									
	Henan									
	Sichuan									
	Guangdong									
	Jiangsu									
	Hunan									
	Hubei									
	Guangxi									
Post-agricultural	Hebei			4800-6000	480	2660	2760	3100	2000	2360
	Shanxi									
	Shaanxi									
	Zhejiang									
	Fujian									
Agricultural subsidies to persist	Yunnan									
	Guizhou									
	Anhui									
	Jiangxi									
	Ningxia									
	Gansu									
	Hainan									
	Qinghai									
	Tibet									

Target-price pilots

rice, late indica rice, japnic rice, corn and wheat), each of the nine commodities will have a different price in each province, reflecting local cost and efficiency factors. It is simply devolving state pricing and procurement to the provincial level in order to begin to operate a national system with geographically different prices.

The target-price system is really a quasi-market price. It is basically the central state procurement price model but devolved to the provincial governments. The target-price policy is already being piloted in soybean, cotton and rapeseed. Sugar and corn will follow. Wheat and rice, as national food security core grains, will be the last to be marketised, assuming the successful deployment of the target-price system in the other commodities (Yun 2015). From this provincially governed target-price (quasi-market) model, China can move towards open market transactions setting prices. By the end of 2018, the target-price policies will have replaced the central minimum purchase price in place since 2008 (Yun 2015), making it easier to transition to a fully market-based pricing mechanism (CCP Central Committee and State Council 2014).

Allowing for provincial target-price variation within a centrally state-controlled model allows insurance and futures industries to begin to form, while the state maintains macro control over production. So insurance and futures policies and contracts are developed on provincial prices, strengthening the institutional environment before introducing market prices, to avoid a shock therapy situation.

5. Agricultural Insurance as Social Policy

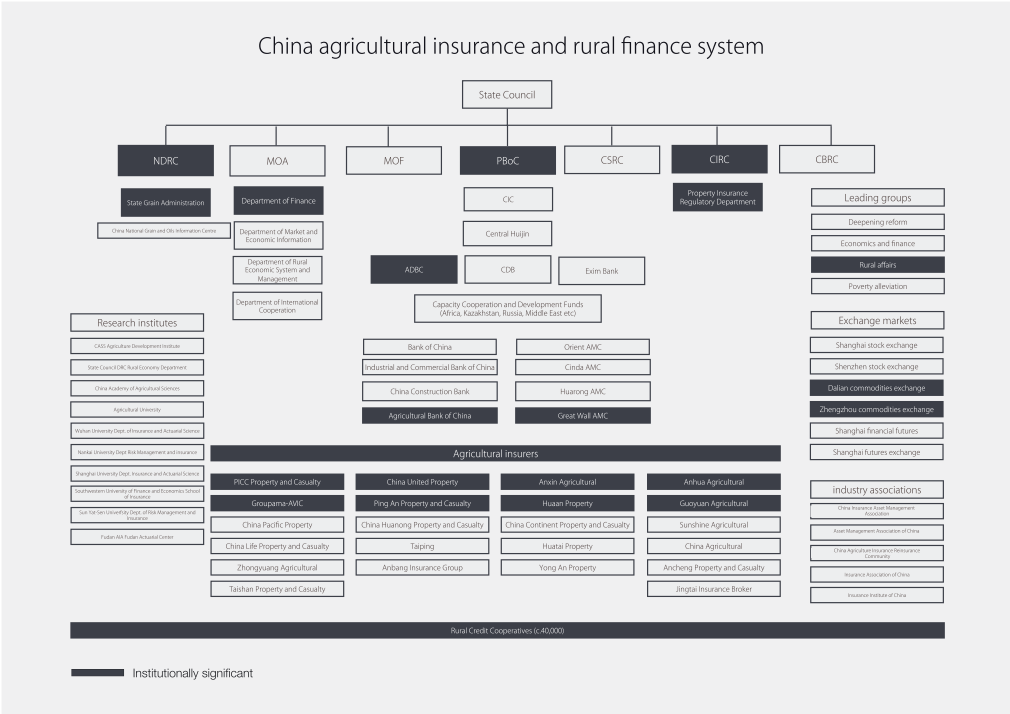
Target-price insurance is to be the backbone of the state subsidy system as target prices become the default interim measure between state procurement and market pricing. The core of the triple policy pillars of target prices, insurance and futures is the social policy function previously performed by the minimum purchase price procurement, ensuring farmer income. Agriculture insurance as social policy is thus a core part of the wider agricultural financial remodel. And the state will begin supporting insurers to sell policies to currently state-subsidised farming households.

Discussion of agricultural income insurance as a response to the agricultural overcapacity caused by the stimulus and price controls largely stems from a 2013 article in *Qiushi*, the China Communist Party journal for political ideology and theory (Wang 2013). In the agricultural income insurance debate, the *Insurance plus Futures* argument was that insurance companies should offer insurance based on fluctuating futures prices to replace the minimum purchase price. Insurance companies then take out reinsurance, and risk management companies repeat the process on the markets, further spreading risk until it is minimised. With insurers enjoying solid government backing and at least initial subsidies, farming households would thus be protected against income and revenue risk and the state could begin to withdraw from direct procurement.

In advanced economies, there is a clear distinction between revenue insurance and income insurance. In the context of China developing a rural insurance mechanism to move agricultural commodities into a price-based production model, there is as yet no such distinction, with central policies referring only to 'income insurance.' Xie (2017) writing for People's Daily asserts that that 'farmer income insurance' should protect farmers holistically from 'natural risks, market risks, and policy risks'. But if the China model is to develop to mirror advanced economies, the concept of crop revenue insurance needs to be separated from rural household income insurance (Figure 4).

After a *National Insurance Ten-point Plan* was released in 2014, Chen Wenhui, China Insurance Regulatory Commission (CIRC) vice chair, said in 2015 that agricultural income insurance was essential for rural development. State Council's 2015 *Opinions on Expediting Transforming the Agricultural Development Model* called for major state financial infrastructure to support the development of new rural financial systems (State Council General Office 2015). Also, in 2015, the

Figure 4 China 2016 Agricultural Insurance and Rural Finance System. Development of Agricultural Insurers at the Provincial Level Is Expected to Rapidly Increase. Institutional Linkages Among Different Aspects of the Rural Financial System Remain Weak



MoF, MoA and the China Banking Regulatory Commission issued *Opinions on Guiding the Establishment of an Agricultural Credit System* designed to overcome the institutional banking shortfall in rural areas (MoF, MoA and CBRC 2015). CIRC in February 2015 released an upgrade of the agricultural insurance rules, which included regulation for 15 agricultural commodities and six kinds of breeding species. 2016 CIRC *Interim Measures on the Management of Insurance Underwriting Agriculture* then provided clearer guidelines for farming policies under the *Insurance Law* (China Insurance Regulatory Commission 2016, State Council General Office 2015, Pacific Insurance Online 2015). CIRC, MoF and MoA later issued *Notice on Further Improving the Drafting of Clauses on Agricultural Insurance Products Receiving Insurance Premium Subsidies* which encouraged insurance companies to develop agricultural products tailored to specific production and risk factors (CIRC, MoF and MoA 2016). This ultimately built on State Council's *Opinions on Financial Services for the Development of the Three Rurals* (Zhang & Liu 2015). This insurance industry makeover of 2015 directed agricultural insurers to launch target-price insurance policies. However, offering target-price insurance is currently still unattractive for all but policy-supported insurers.

Developing provincial agricultural insurance institutions was then devolved to provincial government, enacted through local government pilots (He 2016). Perhaps the most important aspect of the agricultural reform process generally and the agricultural insurance system specifically is the devolution of administrative power to provincial governments. Provincial-level governments across the nation are to establish credit organisations within 3 years (MoF, MoA and CIRC 2015), i.e. by 2018. Lack of insurers in the market led Henan State-owned agricultural enterprises to create their own with provincial government support: Zhongyuan Agricultural Insurance Company, see Figure 4. The pattern set by Henan state-owned enterprises (SOEs) forming Zhongyuan will likely repeat as provincial governments and local SOEs unite to form local insurance blocs. Provincial governments will subsidise the development of provincial state insurers that will provide target-price insurance, catastrophe insurance, agricultural income insurance and reinsurance.

Also at the central level, institutional development is needed if the reforms are to be taken up via market incentives (Lu & Li 2015, Jia 2016). Currently, the regulatory agencies have disparate administrative power networks and little real-world experience with open market operations (Ouyang 2016). Reforms to the wider insurance, banking and exchange regulatory systems are likely to result in stronger central oversight of both the insurance industry through CIRC Commission and the futures industry through the China Securities Regulatory Commission (CSRC) and the development of more empowered micro institutions such as the newly formed China Insurance Asset Management Association.

6. Developing Price Signals With Futures Exchanges

Agricultural futures exchanges had existed in China since the early 1990s but have traditionally suffered from limited liquidity and lack of price-setting legitimacy. Throughout the target-price transition, China's central government has intended to revitalise the agricultural futures exchanges in Dalian and Zhengzhou which have not been effectively transmitting price signals, given the state was practicing arbitrary procurement and price setting. The failure of the futures exchanges to develop is probably at least partly as a reaction from contemporary central governments against the championing of the futures exchanges since purged China Communist Party Secretary General Zhao Ziyang in 1989. Redeveloping the futures exchanges throughout the target price and agricultural income insurance reform though will eventually allow for transition from the quasi-market target prices to genuine market prices.

Developing agricultural commodity futures exchanges into legitimate price-setting institutions is intended to eventually allow the introduction of market prices to the agricultural production system. However, a range of institutional developments are still needed, including clearing houses, distribution integration, e-platforms and other price-signal supporting institutions. Neither the commodity exchanges at Zhengzhou nor Dalian currently have enough liquidity to provide legitimate signals on major commodities, let alone introducing new contracts, although this is not surprising as most international commodity exchanges struggle to attract the necessary liquidity to set effective prices on peripheral commodities such as seafood and meat. Where commodity exchanges do provide effective domestic price signals, there often exists significant arbitrage between differing geographical price centres, such as between Indonesian spot prices and Malaysian futures prices in palm oil, or consider that many developed economy agricultural commodity markets operate completely without recourse to futures exchanges such as Australian wool or Norwegian salmon and that in many middle-income countries such as Thailand, almost all seafood operates on a point-to-point basis. Futures contracts and exchanges are *not* an inevitable institutional development (Phillips 1966).

However, developing futures exchanges for price discovery would allow China's central government to eventually transition from target prices to market prices. The benefit of operating within a market with a futures exchange to set commodity prices is that the burden of price setting is moved to speculators and hedgers, leaving producers free to concentrate on supply, and processors to concentrate on demand (Phillips 1966). In a transition market such as China's, futures contracts to set prices for agricultural commodities have a unique role to play, not only increasing transparency of price discovery in opaque markets but also completely creating prices where before prices were set centrally by the National Development and Reform Commission Price

Department. Attracting more speculators in China should be easy as the closed capital account means investors are desperate to speculate on anything from postage stamps to steel rebar futures, but attracting hedgers, and the invaluable role they play in smoothing prices, will be more difficult given that almost all agricultural producers are currently SOEs (Black and Scholes 1973, Hirshleifer 1998, Natenberg 2014).

Zhengzhou Commodities Exchange currently trades contracts in cotton, japonica rice, late indica rice, early indica rice, wheat, rapeseed oil, rapeseed, rapeseed meal and white sugar. While Dalian Commodities Exchange trades contracts in corn, corn starch, soybeans, soybean meal, eggs and palm olein (Dalian Commodities Exchange 2016, Zengzhou Commodities Exchange 2016). Each commodity has clear standards and around 6 contracts per commodity. However, the Zhengzhou exchange has existed since 1990 and Dalian since 1993, with little success serving price signals. Lack of liquidity and lack of knowledge on futures contract functions have meant that the prices discovered by the market are not transmitted to producers. Various regimes of government agricultural support policies have also made the futures exchanges hollow institutions for decades.

Yet China has recently redeveloped a taste for agricultural futures contracts. Protein commodities, such as pork, most seafood and chicken, currently have ceiling prices to protect consumers, as opposed to grain price floors which guarantee income for producers. But pork futures and apple futures contracts have recently been launched, and a variety of other soft commodity futures are slated for development (Xinhua 2017; Patton 2017; Kenderdine 2017).

In May 2016, rising financial policy architect Fang Xinghai, CSRC vice minister, made an influential speech on the possibility of opening futures markets to foreign speculators (CSRC 2016). Where previously only locally registered non-financial firms are allowed to trade China-listed futures through brokers, Fang said measures would be taken to allow both foreign-invested financial institutions to deal in futures contracts while domestic commercial banks would be encouraged to participate in commodity futures trading as a hedge-risking mechanism (CSRC 2016). Zhengzhou Commodities Exchange had already indicated plans to open trading to international speculators in an attempt to align domestic prices with international ones, by opening up an overnight trading window in rapemeal in December 2016.

Dalian Commodities Exchange in 2016 approved 12 '*Insurance plus Futures*' projects on corn and soy (Song 2016). However, most commentators agree that futures markets are as yet too immature to serve as adequate price signals for agricultural insurance and reinsurance markets (Zhang 2015a). Encouraging more individuals and enterprises to speculate on futures contracts would introduce the elements of liquidity and transparency needed for stable price discovery and transmission (Mao et al. 2016). And institutional development of exchange clearing houses are also needed to bridge gaps between buyers and sellers in different markets (Xu 2016).

Overall, the policy direction of China's central government in developing futures markets and adjacent institutional support should be a welcome direction for international grain producers seeking to enter the Chinese market, for the Chinese taxpayer who will no longer have to burden the cost of subsidies and for the Chinese farmer who should be able to vary agricultural production based on reliable price signals, allowing for a scalable and variable production model. However, the three-step institutional reform that China's central government is planning comes with its own inherent policy risks. To move from a state procurement system set by the central government, to a target-price system set by provincial governments, to a market-price system set by individual buyers and sellers means that each step must move seamlessly into the next and that individuals, families, communities and firms are not overtly disrupted as they would in a shock therapy transition. Development of viable futures exchanges will go a long way towards creating and transmitting viable price signals, but this alone is not enough without wholesale reform of the rural financial system.

7. Conclusion

Reforming a price mechanism in a transition economy is difficult. Reforming a price mechanism in a transition economy the size of China is a highly delicate policy operation. To reform the price mechanisms defining grain production in a country which struggles to produce enough food under severe land and water constraints and in which agricultural production is the subsistence livelihood of a large rural polity is a severe test of political legitimacy and policy competence.

Absence of market mechanisms for setting price signals in China is now accepted by the policy community and central government establishment as harmful to both agricultural production, wider social goals, and food security. Under a state procurement system designed to ensure food security and guarantee peasant incomes, grain production increased only slightly while stockpiling policies left the government with years' worth of commodities it is struggling to sell. Clear arbitrage points were exploited by the processors, and China was de facto importing agricultural commodities for consumption while stockpiling domestic production.

The entire agricultural commodity production system in China is currently being overhauled with target-price mechanisms the flagship of a reform process that will reach deep into the countryside. The new framework of indirect support will ensure central government maintains at least limited control over a variable output model, a half-way measure between state procurement and market prices. While broad policy consensus has been reached, interim systems will take 2 to 3 years to form. After which, transition from interim agricultural support mechanisms to conventional market mechanisms will again be a thorough institutional undertaking. The key price-support replacement, agricultural insurance, moves price supports to market institutions. And yet no viable government policy for strengthening the required rural credit system has emerged.

And despite policy gains and institutional reform through *Insurance plus Futures*, modern agricultural production remains a far cry from the persistent structural problem of China's peasantry. For agricultural insurance to be a viable policy solution to China's agricultural production, distribution and trade strategy, it must face the *Three Rurals* head on and move towards a land reform and ownership system while simultaneously extending commercial bank credit to an area of industrialisation that 40 years of *Reform and Opening* has left behind: agroindustrialisation.

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