



 Reinsurance

Agricultural Insurance Survey, 2018

A comparison of agricultural insurance
markets in Brazil, China and India



Foreword

We are pleased to present findings from the AXA XL Agriculture Insurance Survey, 2018, which focuses on the three emerging markets of Brazil, China and India. Based on in-depth interviews with agricultural insurers, brokers, associations and public institutions operating in these markets, this survey provides a unique view on the trends and drivers for agricultural insurance in these three countries. This survey was conducted and written by Dr. Schanz, Alms & Company, an independent (re)insurance consultancy based in Zurich, Switzerland.

As one of the leading global (re)insurers, AXA XL is committed to develop the markets and lines of business in which it operates and to facilitate an informed dialogue among market participants. This report compares the agricultural insurance markets of Brazil, China and India, three of the world's top five agricultural producers. Collectively, these three countries are the main drivers of the rapid expansion of the agricultural insurance market, which has recorded gross written premiums of more than US \$30 billion in the last decade. For the sake of comparability, the report focuses on crop insurance only, although in some interviews reference was also made to other classes such as aquaculture or livestock insurance.

In each of the three markets agricultural insurance is highly dependent upon public subsidies, although regarding the role of the governments and its involvements, there are significant differences between Brazil, China and India. Nevertheless, in all three cases agricultural insurance serves a multi-faceted approach to stabilise farmers' income, enhance the productivity of the agricultural sector and improve access to financing.

In combination these factors help to strengthen food security not only in rural areas but also for society at large. While Brazil has been a food exporter since its colonial days, China and India still consume most agricultural products. However, in each of these markets the agricultural sector plays a key role for economic growth and the transition to a modern, high performing economy.

We are proud to be part of this process and aspire to provide further inspiration and ideas for agricultural insurance with this research. In addition, we would like to thank our clients and other business partners who participated in this research for sharing their time and expertise with us.

We hope you enjoy reading this report and very much look forward to your feedback.
Sincerely,

Peter Schmidt
Chief Executive, Middle East & Africa,
Asia Pacific and Latin America,
Chief Underwriting Officer, Credit and Surety
AXA XL, a division of AXA

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Methodology

The findings of this report are based on in-depth and structured telephone interviews with executives representing 34 regional and international insurance companies, brokers, agricultural associations, think tanks, producers and government institutions operating in Brazil, China or India. The interviewees were split fairly evenly across the three markets.

The answers of the executives polled were fairly homogenous throughout the individual markets. In particular in India and China, where authorities assign the right to provide cover to a predefined region in a public bid or tendering process, interviewees assess their market with a high degree of consistency. In Brazil, by contrast, answers had a greater spread as the subsidised market segment is smaller than in China and India. In addition, the government defines the criteria and the amount of subsidies available to cover a certain risk, but is less involved in market

access, other than granting the overall agricultural insurance license through the Brazilian insurance regulator SUSEP.

The interviews were conducted by Dr. Schanz, Alms & Company, a Zurich-based research, business development and communications consultancy, in the summer of 2018.

Key findings

The agricultural insurance markets of Brazil, China and India have all experienced phenomenal growth. Since the launch of the current scheme in China, premiums increased dramatically to US \$6.3 billion in 2016 from just US \$110 million in 2006 (Agroinsurance April, 2017). By the end of 2018, premiums could reach US \$8.0 billion, according to latest estimation from CARP Agri pool in Nov 2018.

With the introduction of the Pradhan Mantri Fasal Bima Yojana (PMFBY) scheme in India in 2015/16, premiums ballooned by 300% to US \$3.3 billion from US \$850 million within just one year (GIC, March 2017). Premiums are forecast to reach US \$4.0 billion by the end of the 2018//19 planting season, based on an estimate from GIC as of the end of November 2018.

Similarly, in Brazil: When the current Programa de Subvenção ao Prêmio do Seguro Rural Privado (PSR) became operational in 2006, premium volume grew from US \$90 million in 2006 to US \$1.1 billion in 2017 (SUSEP).

For each of the three markets, interviewees expect premium growth to remain dynamic. Growth estimations range from 10% to 15% or even 20% annually. The majority of interviewees said premiums could potentially double within the next three to five years as schemes are rolled out to more farmers and across more arable land. Coverage levels or sums insured could also increase while different products and other crops are included in public schemes. In addition,

premium growth may benefit or be hampered by market mechanisms such as higher demand and rising exports or increasing input cost for seeds, fertilisers, machinery or land.

To the insurers polled, the key strength of these three crop insurance markets is the importance of the agricultural sector to the countries' economies and societies at large. Governments support and facilitate the markets through subsidies and additional measures. Public agricultural insurance schemes date back to 1973 in Brazil, 1982 in China and 1985 in India. All three markets revamped these schemes considerably and triggered the enormous boom in agricultural insurance in recent years.

Although the executives polled agree on the outstanding relevance of the agricultural sector for their country, government approaches vary. China's government has committed itself to eliminate poverty by 2020. Agricultural insurance is integral to China's current five-year strategic plan to modernise the country's agricultural sector. India pursues similar objectives with the PMFBY scheme by stabilising farmers' income, enhancing agricultural productivity and improving financial inclusion to ultimately strengthen food security and competitiveness. In Brazil the current PSR scheme is one of the strategic pillars of the country's agricultural policy, aiming to reduce cash flow volatility in the agricultural sector and improve risk management.

The quality of the scheme, its maturity and the players involved are another asset to the executives polled. Since the introduction of its scheme, China has become the world's second largest agricultural insurance market, followed by India, where agricultural insurance is now

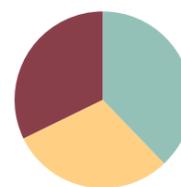
the third largest line of business. In Brazil, where agricultural insurance is considerably smaller, it similarly offers substantial opportunities in terms of volume growth and geographic diversification.

However, according to the interviewees, government support can be both a bane and boon as policymakers may pursue different interests to those of insurers or insureds. Authorities may prioritise scale over the level of protection, aiming to cover as many people as possible, but in turn keeping coverage levels low for farmers and rates and margins tight for insurers. They might favour simple or generic solutions over more complex but flexible products. Annual tendering processes might run counter to insurers' long-term return targets. Where indexes are involved, accuracy, basis risks and claims payments can be an issue, in particular, if data quality is limited. Also high subsidies might increase farmers' buy-in to the scheme (if voluntary) but deter risk management.

For the insurance executives polled, the growth potential of the crop insurance sector is the markets' most significant opportunity. Penetration is still low, if measured against the total value of agricultural production, share of arable or cultivated land, number of farmers or level of coverage. Premium volume will benefit from the overall amount of subsidies, the willingness of authorities to improve the schemes, allow for the introduction of new technologies, add further crops, increase the sums insured per farmer or expand the current coverage of production risks to include market risks.

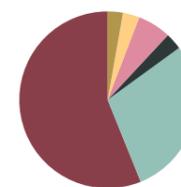
Farmers' awareness, trust and confidence in the schemes are of paramount relevance for the acceptance and long-term viability

Interviewees by market and type



Interviewees by market

38% Brazil
30% China
32% India



Interviewees by type

3% Government institutions
3% Agri Pool
6% Associations / Think Tanks
3% Producers
29% Brokers / Intermediates
56% Insurers

of crop insurance. Low sums insured, slow and cumbersome claims payment processes or – as in the case of India – mandatory schemes for all loan farmers may undermine risk management efforts. In Brazil, where the share of unsubsidised premiums is higher than in China and India, some executives suggest that public subsidies could strangle the development of a more modern, commercially oriented and sustainable market structure, independent of swings in political mood.

Interviewees said rates are under pressure. In India and China governments try to limit subsidies, while competition, attracted by the growth potential in agricultural insurance, pushes into the markets. Excess reinsurance capacity weighs on rates as well. However, the growing market size and improving claims experience allow insurers to better diversify their risk. In Brazil pricing is seen as slightly more favourable, benefitting from the growing size of the markets, rising revenues from higher valued exports, better data quality and farmers buying protection.

Despite the pressure on rates, interviewees expect profitability to remain unchanged or even improve. Profits may benefit from better diversified markets, a rebound of the economy (Brazil) and benign claims experience (India). Since ultimately subsidies are financed from public budgets, governments exert pressure on insurers to reduce margins in exchange for greater market volume.

In all three markets, Multi-Peril Crop Insurance products (MPCI) account for at least 90% of the market. To the majority of interviewees this product fulfils most farmers' needs because it is easy to understand. In India, accuracy in determining the index and assessing claims remains an issue and requires recurrent

improvements. In China sums insured are low and farmers are keen to see coverage levels increase and include price risk as well. In Brazil the average sum insured is also regarded as too low to protect the farmer's earnings and the reference yield, on which the MPCI is based, has to improve to increase farmers' confidence and trust in the programme.

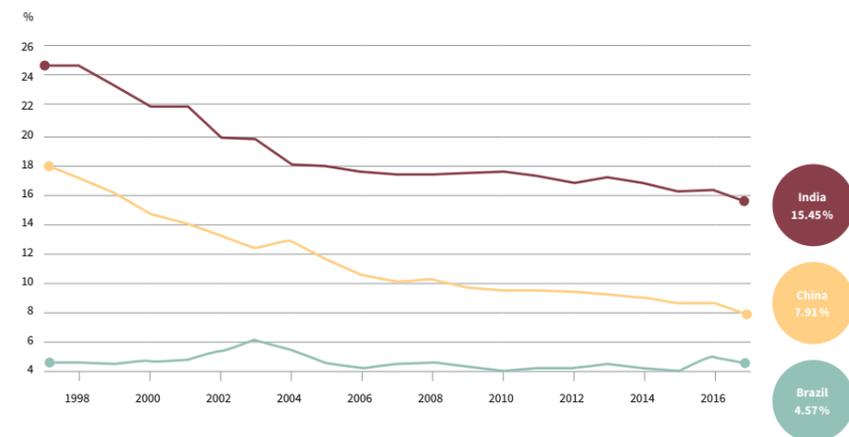
The executives polled see additional demand for a policy that combines production and market risk. However, a commodity trading platform, where prices are established transparently, is seen as an essential precondition for such a product. While in Brazil the country's stock exchange B3 fulfils these requirements, in China and India such efforts need to mature. In China a commodities future market is already established, but its market size, number of different commodities and influence are limited as speculations are common.

The relevance of 'price' for farmers' insurance purchasing decision depends on the amount of subsidy available. In India, where the farmers only pay 2% of the premiums, price is not perceived as decisive. Awareness, access to farmers and confidence in the scheme are seen as more relevant. In China, where subsidies amount to 80% of premiums, service, claims handling, and higher sums insured are thought to have a greater impact on the farmer's purchasing decision. In Brazil, where the subsidies amount to between 35% and 55% of premiums, service components are more relevant than cost and for larger farms product innovation and customisation are increasingly important.

“Premiums could potentially double within the next three to five years as schemes are rolled out to more farmers and across more arable land.”

The agricultural insurance markets of Brazil, China and India

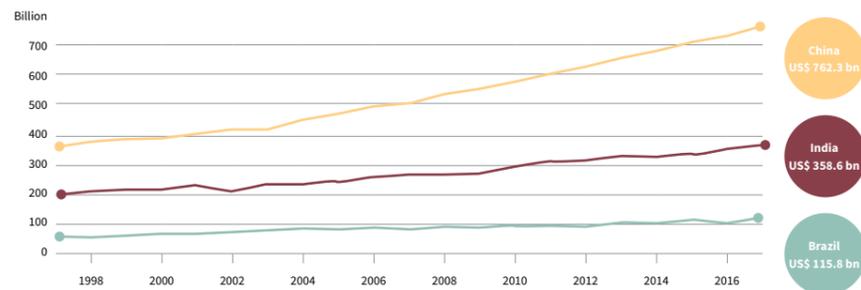
Agriculture, forestry and fishing as a share of GDP, 1997 – 2017



The agricultural sector is of essential relevance to Brazil, China and India. All three countries belong to the top five global agricultural producers with China at the top, followed by India and Brazil in fifth position, with the USA at third and the European Union at fourth. However, Brazil also ranks among the top five agricultural export nations, while China and even more so India consume the largest share of domestic agricultural production.

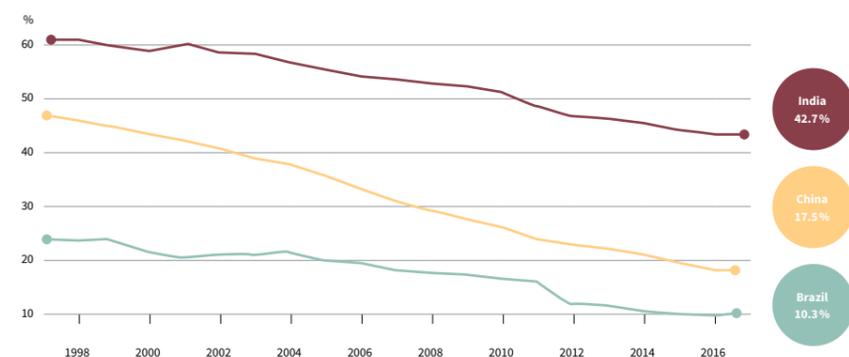
Although of declining relevance, large parts of each country's workforce live in rural areas and depend on the agricultural sector. In India alone around 50% of the country's population is employed in agriculture. The number of farmers is estimated at 100 million to 140 million. In China about half of the country's 1.4 billion people live in rural areas. Thus, the modernisation of the agricultural sector is of prime importance to policymakers in the three countries.

Agriculture, forestry and fishing, value added (at constant 2010 US\$), 1997 – 2017



Agricultural insurance is a key pillar within these modernisation strategies. Overcoming poverty and stabilising farmers' income are of primary relevance alongside an increase in productivity, competitiveness and financial inclusion as means to establish food security and self-sufficiency for the whole nation. Finally, agricultural insurance also serves to maintain social stability while these countries' transition to become modern and more affluent economies. Without the safety net of agriculture insurance every drought, flooding or windstorm might drive farmers off their land. Agricultural insurance is an effective instrument to divert this pressure.

Employment in agriculture (% of total employment)



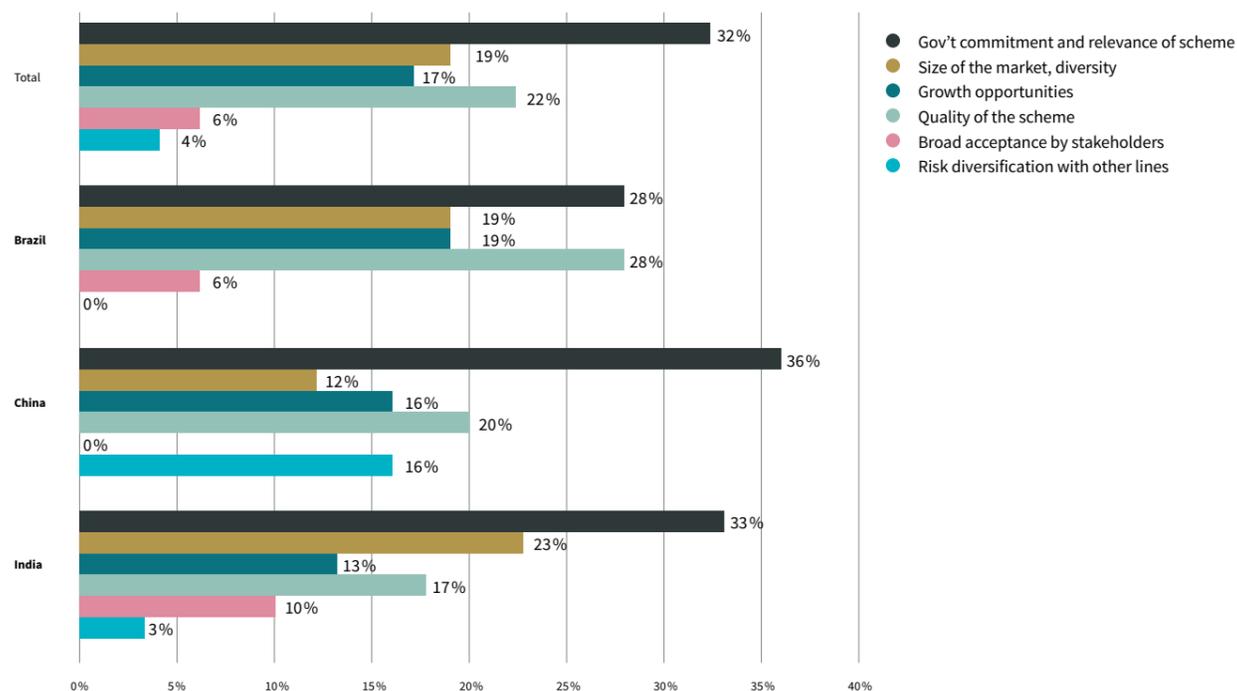
Key indices for agricultural insurance in Brazil, China and India:

	Brazil	China	India
Average farm size	63 ha	0.6 ha	1.3 ha
Current scheme	Programa de Subvenção ao Prêmio do Seguro Rural Privado (PSR)	Government Subsidized Agriculture Insurance	– Pradhan Mantri Fasal Bima Yojana: Prime Minister Crop Insurance Scheme (PMFBY); – Revised Weather based insurance scheme (RWBCIS)
Launch of programme	2003, operational since 2006	2006	2015/16
Main products	– Multi-Peril Yield Insurance (MPCI): based on the average yield of the last five years from official statistics or farmers – Nominated risks – Crop revenue	Multi-peril Yield insurance (MPCI), based on the farm-level yield.	Multi-peril Yield insurance (MPCI), based on the area-yield index
Agricultural premiums*	2006: US \$88.3 million 2017: US \$1.1 billion	2006: US \$110 million 2016: US \$6.3 billion	2015/16: US \$850 million 2016/17: US \$3.3 billion
Premium subsidies	2016: US \$107 million	2016: US \$2.3 billion	2016/17: US \$1.5 billion
Area insured	2016: ha 6.4 million (approx. 10% of plantable area)	2016: ha 115 million (75% of cultivated land)	2016/17: ha 57 million (approx. 30% of gross cropped area (GCA))
Farmers insured	2016: 48'000	2017: 213 million	2016/17: 57.2 million
Subsidies	– 35% – 45% of premiums paid by Federal government. Rest by the farmer, depending on the crop – Some States offer additional subsidies of up to 50%	Central government subsidises 40% of premiums, provincial government 25%, county 15%, the remaining 20% of insurance premiums are covered by farmers (depending on crop and province)	Farmer pays 2% of premiums for Kharif crops, 1.5% for Rabi crops and 5% for annual commercial/horticultural crops. Central and State government share the remainder 50:50
Coverage level	Average 65% of yield	Sum insured per farmer at about 75% – 99% of direct production cost or at about 30% – 40% of total product cost	Indemnity level: 70%, 80%, 90% of sum insured

* In Brazil agricultural premiums (Seguro rural) include life and pledge insurance targeted at farmers. Also in China, agricultural premiums include property products (for buildings, machinery, infrastructure) geared towards the agricultural sector.

Survey results

Strengths of the crop insurance market, as a share of total mentions (in %)



Strengths, weaknesses, opportunities and threats of Brazil's, China's and India's agricultural insurance markets

Strengths

When asked about the key strengths of their agricultural insurance market, 32% of all interviewees saw their governments' commitment to the schemes and the relevance of the sector for the countries' economies and societies as the markets' most important asset. Although the sector's contribution to the GDP of each country is declining, its relevance in terms of employment, food security and for the country's exports (Brazil) is considerable. In India, where the share of agriculture in the overall employment is still at approximately 50%, the current scheme is closely associated with the current President Narendra Modi. But also in China and Brazil, agricultural insurance is of key importance to the central or federal government, as well as to the governments at state, provincial and municipal level.

There are some variations though. In China and India interviewees strongly emphasised the high share of subsidies that governments contribute to the overall premium rates, while in Brazil, where the share of subsidies is lower, the executives polled focused more on the relevance of the sector as a leading exporter for grains. The quality of the scheme, the maturity of its products and the players involved are considered the second biggest

asset of the markets. In all three markets, crop insurance and the schemes supporting it have a strong tradition and have been refined over time, benefiting from the strong involvement of its stakeholders. The Chinese and Indian interviewees emphasised that the schemes have undergone significant improvements since their initial versions and are the result of the close collaboration of public and private sector stakeholders. In Brazil the focus is more on the strengths, experience and solvency of the industry in general, its attraction, how the market evolved over time and on the quality and variety of products available.

“In all three markets agricultural insurance is one of the largest non-life lines of business, which provides insurers with diversification opportunities against other risks.”

The size of the markets is the third most frequently mentioned strength. All three countries are among the world's largest in

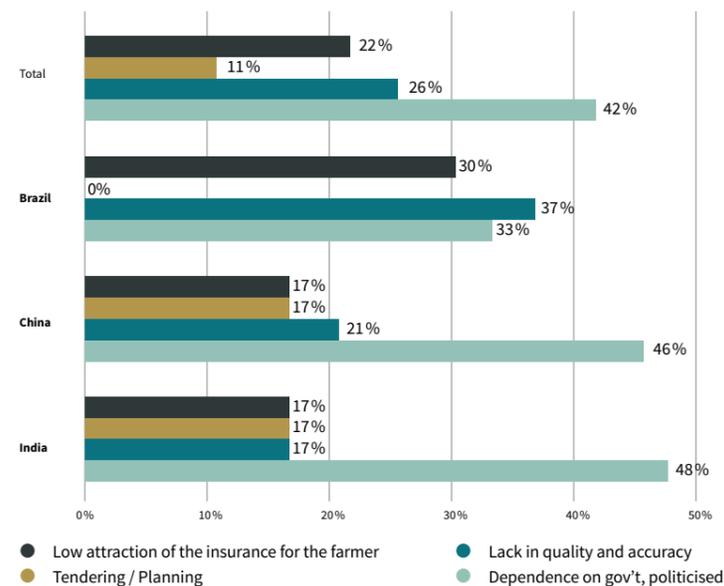
terms of geographic size and population. China is now the world's second largest agricultural insurance market with an estimated premium volume of US \$8 billion, followed by India with US \$4 billion for the 2018/19 season, while Brazil was at US \$ 1.1 billion by the end of 2017. However, premium volume is not the only measure. In all three markets agricultural insurance is one of the largest non-life lines of business (in India the third largest after motor and health, in Brazil the third largest after motor and property and in China among the top five), which provides insurers with diversification opportunities across the business. Given the market's volume and its geographical spread, interviewees also emphasised the inherent opportunities to diversify risk across the market.

Weaknesses

In terms of weaknesses, three aspects stand out: The governments' commitment, the quality of the solutions and their accuracy and their relevance to farmers or producers.

Firstly, the governments' involvement is seen primarily as a bane. Government support depends on voters and public budgets. Thus, the reliability of the commitment is sometimes

Weaknesses of the crop insurance market, as a share of total mentions (in %)



questioned, in particular ahead or following elections, as in Brazil (October 2018) and due in India in 2019. Furthermore, governments have a different interest in crop insurance to insurers. In all three markets, government's primary objective is to design an affordable and workable protection for the farmers. Ultimately, premiums, rates or the share that farmers have to pay are determined by the government. Insurers might have different aspirations in terms of innovations, product mix, pricing or risk management. Also, for instance in China, farmers might be keen to increase their sum insured, while the government would rather include more producers and roll-out the scheme geographically. Furthermore, in all three countries, federal, state or provincial governments or municipalities contribute and share the subsidies. However, at state-level the commitment to the programme can be weaker, while its implications for the provincial budget might be graver. In addition to this, state governments will be closer aligned to their farmers than federal governments, which might "politicise" some decisions in favour of voters rather than insurers.

“Government's primary objective is to design an affordable and workable protection for the farmers.”

The second most frequently mentioned weaknesses relate to the planning and organisation of publicly tendered schemes as

well as the quality of the schemes and their assurance determined by insurers, producers and governments.

In China and India agricultural schemes are government programmes. In China the allocation is negotiated between the local government and the insurer. In India it is a bidding process. The tendered period includes two crop seasons from early summer to late spring of the coming year. That period is seen as too short for insurers to obtain a reasonable return on their upfront investments into marketing the programme in the tendered region or building up the necessary infrastructure and distribution. Furthermore, the bidding process is unpredictable and provides no guarantee for a further year.

In terms of quality and its assurance, uncertainty about data and access to information is mentioned by interviewees from each market. Both in Brazil and in India crop insurance is distributed to a large extent through the banking channel. In fact, insurance serves as collateral of the farmer's loan. Again, this creates a conflict of interest, because the banks' sales interests might not match those of the insurers. In Brazil, brokers form another distribution channel, where again priorities and expertise are sometimes lamented. Even in Brazil, the least regulated of these three markets, insurance is seen to be "bought, rather than sold". This is the usual complaint that insurance products are not marketed but bought out of necessity or obligation – as in India or Brazil – those who do not buy insurance, have no access to credit or cannot plant crops for instance.

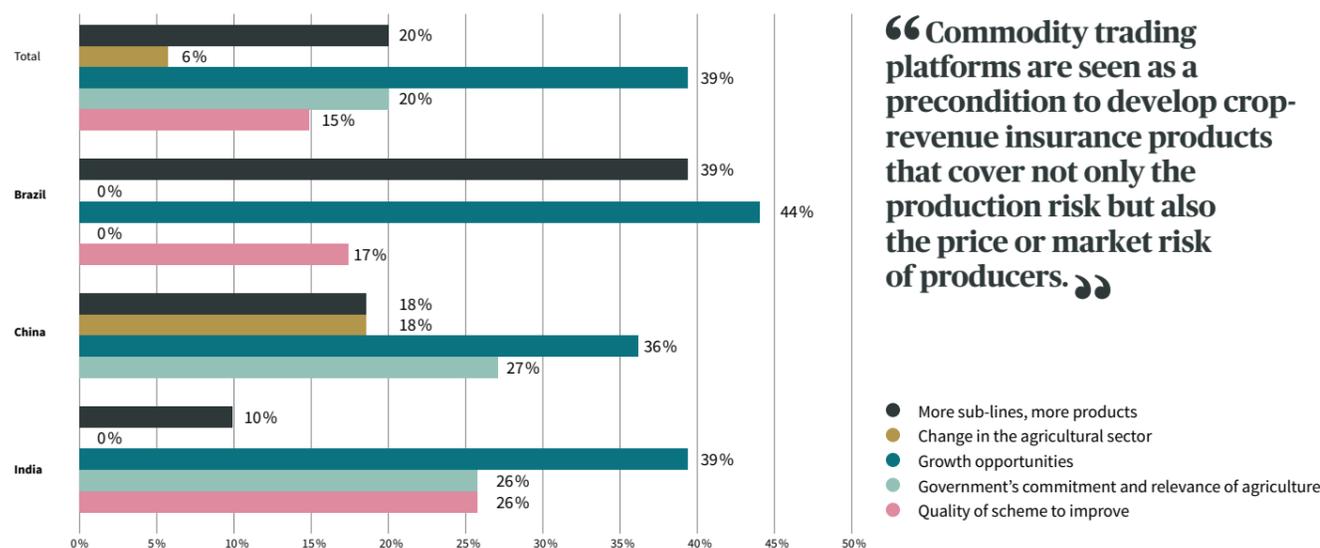
Subsidies are tied to specific products. In China and India these are Multi-Peril yield-based solutions. This product preference, which rightly might be due to needs of simplification, is seen to strangle innovation and product variation. In Brazil, where subsidies play a reduced role and the non-subsidy market is larger, the product mix is wider and seen as more tailored to producers' needs.

Most importantly though, human intervention, in particular in the case of India, is frequently mentioned as a weakness. The yields-index, the basis for the Indian Multi-Peril Yield insurance, is determined by the government which organises crop-cutting experiments (CCE) across the whole country and compares the results with the historical average derived from earlier measurements. Although insurers attend and audit some of the CCE, interviewees point out that the measurements are still inaccurate because they lack reliable historical data and open the door to some manipulation. Loss ratios are evaluated according to the same procedure with the government first executing the CCE to determine a reference yield which is then compared to the historical average.

Furthermore though, interviewees complained that insurers were only allowed to pay claims once they fully received the payment of their premiums. While the Federal government paid its 50% share of the subsidies in time, some of the state governments paid their 50% share of the subsidy late and often only after the losses occurred. In the meantime, farmers could not repay their loan and therefore have no access to further credit, which they needed to finance the next planting season. In the most recent update of the PMFBY scheme this issue has been addressed with an additional 12% interest rate payment for claims older than two months.

Related to the above, executives polled point out that the involvement of farmers in crop insurance is too small. On one side, sums insured are low and hardly cover production costs. Large parts of the risk rest with the farmers and thus the overall interest in the policy remains limited. On the other side, the farmers' share of premiums is small as well. In the case of India and China, subsidies amount to roughly 80% of the premium rate, or – in India's scheme – farmers' premium contribution is limited to 2% of the premium rate. Again, insurers believe that this is not enough to encourage farmers to rethink their own risk management or to get involved in the policy design.

Opportunities of the crop insurance market, as a share of total mentions (in %)



“Commodity trading platforms are seen as a precondition to develop crop-revenue insurance products that cover not only the production risk but also the price or market risk of producers.”

Opportunities

The interviewees perceive growth of the agricultural sector as the largest opportunity for crop insurance in their market. In Brazil, where only a small part of the arable land and just a minority of the farmers enjoy insurance protection yet new technology, efficiency improvements and particularly the introduction of further products open up additional market opportunities. The Brazilian interviewees also see the changing risk landscape, namely climate change, as creating further demand for crop insurance.

In India and China recent growth is driven by a further expansion of the agricultural schemes. In India, currently only about 30% of the country's more than 100 million farmers are seen to benefit from insurance protection. A similar percentage of the arable land was covered by insurance. That percentage is expected to increase, based on the government's ambition to rollout the scheme to cover 50% of plantable land (Gross Cropped Area - GCA) by 2019, but also by increasing the number of farmers insured to a similar share of 50%.

In China the government is also driving further opportunities in crop and – more widely – agricultural insurance in general. As in India, policymakers are committed to enrol more farmers and regions into the programme. In addition, the government is expected to steadily increase the current sum insured from 40% of production costs to a cover that eventually might include the farmer's price or market risk as well. However, the Chinese government follows a broader masterplan for its agricultural sector that extends beyond agricultural insurance. The current average

size of a farm holding is still below 1ha. The government is seen to be pushing for farms to merge to increase the size of the holdings. That will allow a more industrialised approach to agriculture, enable productivity gains and open the door for more complex, demand-driven crop insurance products.

“The Chinese government follows a broader masterplan for its agricultural sector that extends beyond agricultural insurance.”

Some 20% of the interviewees see the governments' commitment and the relevance of the agricultural sector as a key driver for further growth in crop insurance. With the exception of Brazil, the executives polled expect the overall amount of subsidies to rise and thereby to fund the expansion of the schemes. In India and China the governments are open to further changes, not only by increasing coverage levels, but also by evaluating, introducing and utilising further products and technologies. In India these changes (26% of mentions) are expected to address the current flaws in the system, help overcome human intervention and contribute to improving the accuracy of the yield index as well as in assessing the claims. Similarly, in Brazil, hopes of insurers polled rest with technology and new products to improve the market's efficiency and increase penetration.

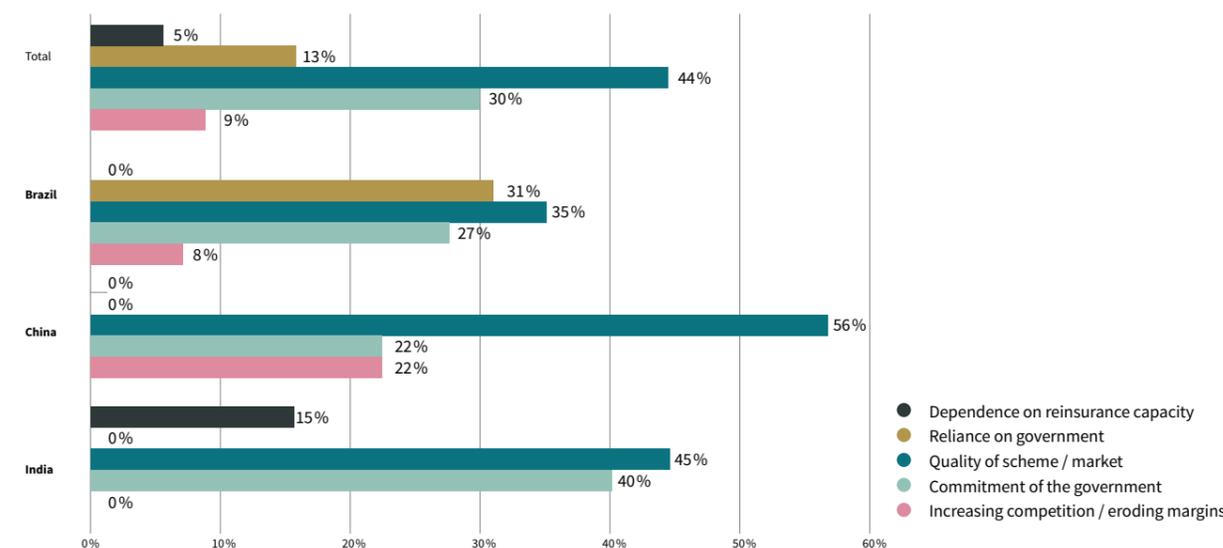
Another 20% of interviewees across the three markets expect opportunities for crop insurance to come from broader products as well as from extending the sector to include more sub-lines into the schemes.

In Brazil, the amount and level of the subsidised premiums are lower than in India and China. However, as insurers compete for customers, the range of available products and premium rates is seen to be wider as well. Also crop farm sizes are far larger than in India or China and vary from an average of 10ha in Brazil's Northeast to an average of more than 1000ha in the West. That facilitates a wider array of products and more sophisticated cover for the more commercial and industrialised producers. Brazil is one of the world's largest exporters of soy, maize and sugarcane. As such, product prices can be evaluated against the commodity trades at the Chicago Board of Trade or Brazil's B3 stock exchange.

Such trading platforms are seen as a precondition to develop crop-revenue insurance products that cover not only the production risk but also the price or market risk of producers. Insurers in India and even more so in China also see their markets on a long-term trajectory, moving from the current yield-based products to more revenue-driven coverages.

India and China's agricultural insurance markets are also expected to benefit from the expansion of subsidised insurance products to other sub-lines, such as aquaculture, livestock and horticulture.

Threats of the crop insurance market, as a share of total mentions (in %)



Threats

Accounting for 44% of mentions from respondents, the (lack in) quality of the scheme and of the (low) maturity of the overall market are the largest threats to crop insurance. In Brazil, insurers are concerned that products lack innovation, do not meet farmers' needs and insufficiently reflect current product technology. Insurers are seen to lack reliable data for an actuarial pricing of their products. Executives complain that Brazilian crop insurers rely on brokers, agents or banks to distribute their products, while they themselves are often not close enough to producers to properly respond to their needs.

The concerns of Chinese insurers are similar. They fear that subsidies strangle innovation and the development of a responsive service mentality as farmers are tied to the government's Multi-Peril input product. Also, there is some uncertainty how the scheme will react following a large catastrophic loss as its robustness has not yet been seriously challenged. More importantly though, the sum insured only covers 35% to 40% of the production cost to the farmer, which is not enough to demonstrate the true value of insurance and to build a market purely driven by demand.

In India, insurers saw the largest threat in the 50:50 split of government subsidies between federal and state government and late premium payments of the latter, although this has been addressed with the recent update of the PMFBY scheme. Furthermore, the annual tendering process is also perceived as a threat as it encourages short-termism and runs counter to establishing a sustainable and durable marketplace.

Given the large dependence of the crop insurance schemes on subsidies, the reliability of the government is a key concern. In Brazil, uncertainty is aggravated by the recent presidential elections and the fiscal restraints that the government faces. In India, general elections are a concern, primarily because the scheme is closely associated with the current Prime Minister Narendra Modi, and is still perceived to be too short in the market to survive with lower subsidies. In China, the dependence on the government is more of a general concern, as public institutions may change their course or exert some arbitrariness and are prone to moral hazard.

“In India the annual tendering process is also perceived as a threat as it encourages short-termism and runs counter to establishing a sustainable and durable marketplace.”

Brazil is again a special case in this comparison as there were relatively more insurers participating in the survey who see government subsidies as negative. Subsidies are lower than in India or China, but farmers may choose from a broader variety of products and the market structure is also different with more industrialised farmers producing for international export markets. Therefore, some insurers actually believe the market might be better off if it were no longer distracted in

its planning processes by the uncertainties surrounding the government's long-term commitment. In fact, the market is seen to be living with the risk of losses occurring due to a sudden government retraction. In addition, the subsidies are perceived as a reason for “slower” growth, as too much attention goes in accessing these incentives rather than developing products and services needed by farmers.

In China, and to a lesser extent in Brazil, heightened competition and eroding margins are a rising threat. Given the attraction and growth rates of the agricultural insurance market, more players are pushing into the market. In addition, given the amount of subsidies, the Chinese government reportedly exerts some pressure on margins while compensating insurers through volume growth. Also, it reportedly pressures insurers to take on further risks of previously uninsured crops or agricultural products, such as certain fruits or vegetables, although there might be little data available – potentially driving up loss ratios.

Market conditions

Premium growth and market size

The agricultural insurance market has been expanding significantly, driven by growth in China, India and Brazil. According to interviewees, the three markets accounted for approximately US \$13 billion in premium volume in 2018. China is the largest market with premiums estimated at US \$8 billion in 2018, followed by India which is thought to have reached premium volume of close to US \$4 billion for the harvest season 2018/2019. The Brazilian market is considerably smaller with premium volume of US \$1.1 billion in 2018 (according to SUSEP).

Interviewees expect double-digit growth to continue for the coming years. As a result, interviewees predict that premium volume could even double in the next three to five years in each of the three markets.

For India the executives polled assume that premiums may increase from current levels of approximately 29'000 Crore (US \$4.0 billion) to 45'000 - 50'000 Crore (US \$6.3 - US \$7.0 billion) between 2021 and 2023. The current government aims to increase the number of farmers enrolled in the scheme from today's 35% to 50%. In parallel the share of insured arable land is also expected to increase from 35% to 50%. In addition, insurers point out that the sum insured per farmer will go up as a result of increasing input cost and higher loans.

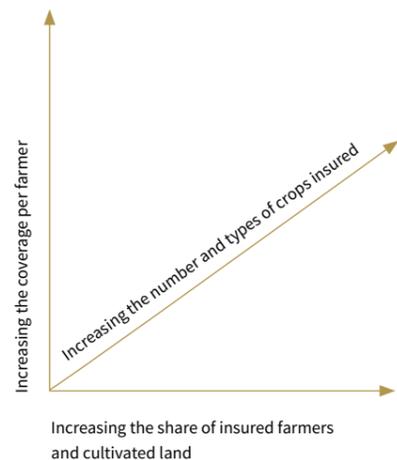
In China growth expectation are similar with executives predicting that the market will expand from its current size of an estimated RMB 55 billion (US \$8.0 billion) to between RNB 80 billion and RNB 100 billion between 2021 and 2023, based on an annual growth

rate of 10% to 15%. Growth will be driven by an expansion of the government's scheme, taking a threefold approach: the scheme will be rolled out geographically to include more cultivated land and farm holdings; trials are underway to increase the sum insured and move from the multi-peril production cost-based scheme to also include the price risk; and coverage will be expanded to other crops and agricultural products.

“Growth will be driven by an expansion of the government's scheme, taking a threefold approach.”

Strategies to increase agricultural insurance penetration through subsidies

Subsidized growth in agricultural insurance



Source: Dr. Schanz, Alms & Company, 2018

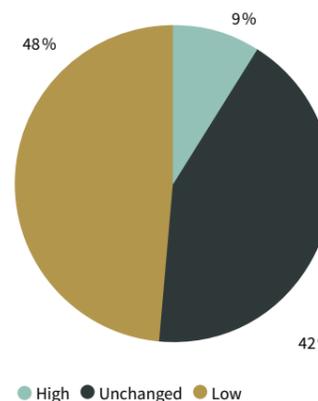
In 2017 Brazil's agricultural insurance premiums recorded US \$1.1 billion, according to SUSEP, up from Real 3'642 million in 2016 to Real 4'118 million. The class entails pledge and life cover targeted at protecting farmers and providing them with the means to access credit and financing. Although from an insurer's point of view Brazil's categorisation of its rural insurance might be broad, interviewees in India and China emphasised that public insurance schemes should consider subsidising risk coverages that improve the financial inclusion of farmers and enhance their opportunities for productivity gains.

Similarly to the other two markets, in Brazil interviewees expect their market to grow at a rate ranging from 10% to up to 20% annually and to potentially increase premium volume to US \$2 billion in the next three to five years. The interviewees also expect growth will depend on a geographic expansion of the scheme. Currently only about 10% of the plantable areas (penetration depends largely on the crop insured and region) are part of the scheme and a roll-out to include 30% of the area seems possible. In addition, the coverage level may also rise. Currently the average coverage level is 65%. Going forward

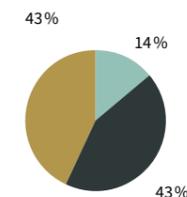
the wider inclusion of price risk would increase the level of a farmer's protection. The growth of Brazil's agricultural insurance market, in particular for crop, depends on demand from the export market, the price for crop for these markets, the exchange rate to the US dollar and productivity gains. In the last 10 years alone, the yield of grain for instance has increased from 3.5 tons per hectare to 5 tons per hectare (according to Bracale, MAPA Brasil, 2017).

Current rates as compared to the past 12 months

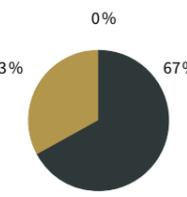
All markets



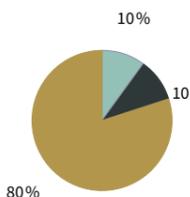
Brazil



China



India



Premium rates

Overall rates are under pressure as governments try to limit the amount of subsidies they spend. Competition increases in all three markets as new players, attracted by the growth potential, push into agricultural insurance. Excess reinsurance capacity weighs on rates as well. However, the growing market size and increasing claims experience allow insurers to better diversify their risks across their portfolio and to cede less premium.

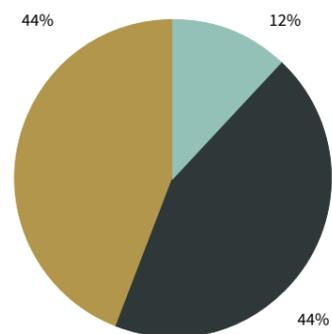
In India, where 80% of interviewees state that rates are low, the government reportedly exerts significant pressure on insurers to reduce rates while it aims to expand the overall sum insured. Furthermore in India's agricultural insurance market, reinsurers have a strong position as many of the country's primary insurers are insufficiently capitalised to retain much risk themselves. Therefore, excess reinsurance capacity has a strong influence on India's agricultural rates. The current PMFBY scheme was only launched in 2016, succeeding several previous schemes. Thus, since data and experience dates back only a few years, volatility remains high and is expected to only stabilise over time.

In China the government is seen to keep the sector stable. Altogether competition is increasing, interviewees emphasised that the government expects insurers to accept lower rates in exchange for a growing business. However, insurers are able to adjust rates or terms and conditions locally, if prior claims experience has been bad.

In Brazil the government is seen to have less influence on pricing. Rates are primarily determined by general market conditions. Values insured are influenced by the overall costs for agricultural input products and also the devaluation of the Real, as these costs are pegged to the US dollar. In addition, more favourable pricing is seen to benefit from the growing size of the markets, better data quality and more farmers buying insurance protection.

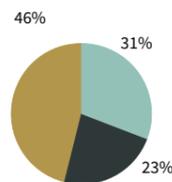
Outlook on rates for the coming 12 months

All markets

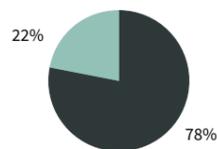


● Up ● Flat ● Down

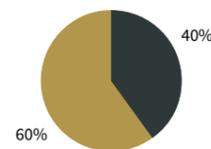
Brazil



China



India



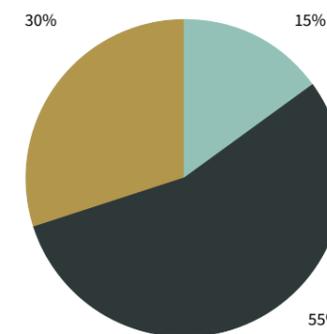
Outlook on premium rates

The overall outlook on premium rates is slightly more positive, as 56% of interviewees expect either flat or rising rates, driven by a more positive outlook in India and Brazil. In India, insurers are slightly more upbeat than for the past 12 months, as in response to prior

year losses more interviewees expect rates to firm. Similarly, in Brazil executives polled expect rates to remain flat or even improve, as the dollar continues its rise vis-à-vis the Brazilian Real. In addition, claims have been rising as well, which is expected to translate into higher prices.

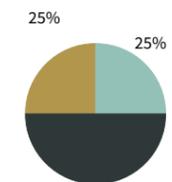
Outlook on profitability for the coming 12 months

All markets

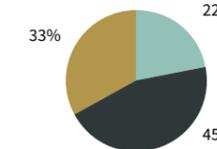


● Up ● Flat ● Down

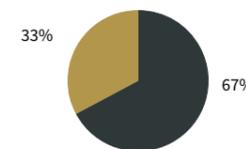
Brazil



China



India



Outlook on profitability

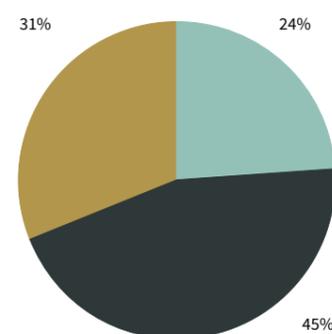
The outlook on profitability is fairly unchanged to the current status. In Brazil the rebound from 2016 is seen to level off, but still the line is expected to benefit from additional business opportunities and rising demand from export markets. In China those who see a decline in the market's profitability almost match those that expect an improvement – reflecting the two conflicting market forces of volume growth on the one hand and deterioration due to rising competition and excess reinsurance capacity pushing into the market on the other side.

In India insurers expect profitability to improve over prior year as the market continues to expand, reflecting the ambitious growth targets of the government in terms of market penetration. Still volatility will remain high as there is pressure to broaden the scheme and take on additional risks, which might cause surging losses.

“In Brazil about two thirds of interviewees predict that the number of insurers in the market will increase.”

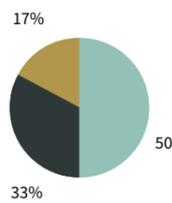
Current profitability as compared to the past 12 months

All markets

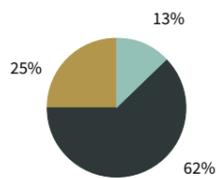


● High ● Unchanged ● Low

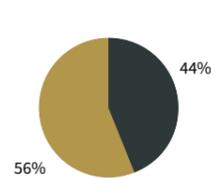
Brazil



China



India



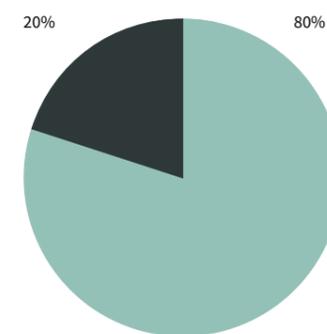
Current profitability

With 69% of interviewees seeing either unchanged or rising profitability, the overall results of the three markets are more favourable than the assessment of their current rates. In particular in Brazil, according to 50% of interviewees the market rebounded from its low in 2015 when the country was hit by a steep economic crisis and subsidies took a dive by 60% as compared to their previous height in 2014. In addition, Brazil's agricultural insurance market was perceived to be better diversified and more robust than in the past.

In China the decisive force for the market's profitability remains the government. As it influences the rates – in negotiation with insurers – it assures that insurers' margins reflect the fact that this is a public scheme. Besides, some Chinese insurers emphasised that although pressure on rates is high, the line is still more profitable than most other non-life lines in China. In India the heavily rainfall-dependent crop sector experienced a “normal” monsoon season 2017/18 according to interviewees. Nevertheless, costs are high as insurers make considerable efforts and

investments to enrol as many farmers as possible in the schemes while reinsurers are seen to use their strong position vis-à-vis their cedants to limit their commissions.

Outlook on competition – number of players in the coming 12 months



● Up ● Stable

Outlook on competition

There is a consensus across the three markets that competition will increase. Since the agricultural line of business experienced dramatic growth in the past, the markets have already witnessed an increase in market players. Each of the three markets has opened up to foreign insurers who either by themselves or – as in the case of India – joined forces with domestic players and built up sizable market positions. In India the number of insurers in the agricultural sector has increased from 12 to 18 players with the introduction of the new scheme. According to interviewees another two to four players are about to enter the market. In addition, further reinsurers are expected to open branches in India.

Also in China the majority of interviewees expect that the number of insurers will increase. However, about a third of executives believe that the government will closely

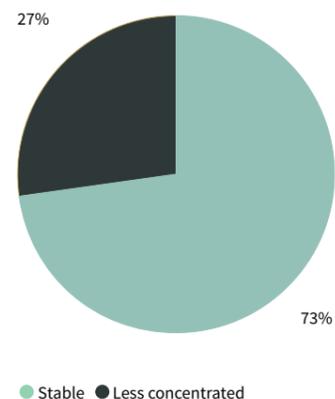
control the number of players in the market as capacity seems to be sufficient and authorities are keen to maintain stable market development. Again, insurers are attracted to the line by its sheer size, growth and profitability prospects, shifting excess capacity from other classes into the more profitable agricultural line.

In Brazil about two thirds of interviewees predict that the number of insurers in the market will increase. Already today five out of the 11 insurers in the sector are foreign-owned. Opportunities arise as Brazil is expected to further expand its position as a leading exporter of grains. In addition, the market will expand as further banks and cooperatives broaden the distribution network. Furthermore, the introduction of more advanced technology to gather data, assess claims and reach out to producers is expected to lend further momentum to the market.

“Costs are high as insurers make considerable efforts and investments to enrol as many farmers as possible in the schemes while reinsurers are seen to use their strong position vis-à-vis their cedants to limit their commissions.”



Market to become more or less concentrated in the coming 12 months



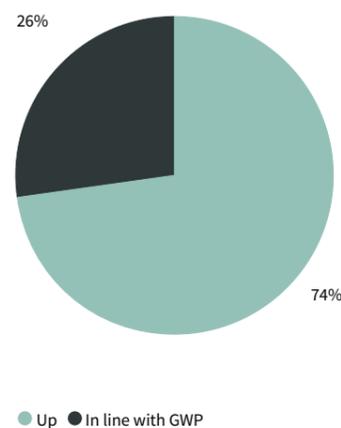
Outlook on market concentration

While the number of insurers increases, the market will become more heterogenic. In India access to the agricultural insurance sector is regulated by the insurance authority, which will only grant a license to general insurers. Only on the reinsurance side there have been some financial market investors entering the class.

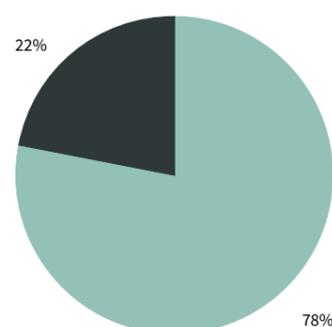
In the past, China has only issued single province licenses to the agricultural insurance sector but that has now been changed. Insurers can operate across the country, which obviously improves their ability to better diversify their book. Currently about 30 players operate in the Chinese market, some of them only focused on single provinces, where some government entities have been pushing into the sector as well.

In Brazil it is also predominately insurers that are keen to build a position in agricultural insurance. Since banks are the main distribution channel for agricultural products, some of them are moving into the sector or competing with insurance products by offering bonds as collateral for the credit they provide to farmers.

Development of insurance capacity, past and coming 12 months in all three markets



Development of insurance capacity
Capacity is expected to increase. In India, available capacity is driven by reinsurance, as many of the country's primary agricultural insurers are still seen to be insufficiently capitalised. Since the global reinsurance market suffers from an excess in capacity, some of it is attracted to the growth opportunities of the Indian agricultural market. Going forward that trend is expected to persist as the outlook on the market remains attractive and the government is predicted to award access to the market to meet demand for good quality capital and meet the ambitious growth objectives of the PMFBY scheme.



In China market dynamics are similar, but the regulator is assumed to take a more restrictive approach in providing access to the market. Some 60% of interviewees see capacity increasing only in line with the growth in gross written premiums, but not in excess. Clearly, the market fundamentals are attractive, but in an effort to contain competition and rate declines, the China Banking and Insurance Regulatory Commission (CBIRC) is expected to keep the number of players in the market stable. Going forward that is not expected to change.

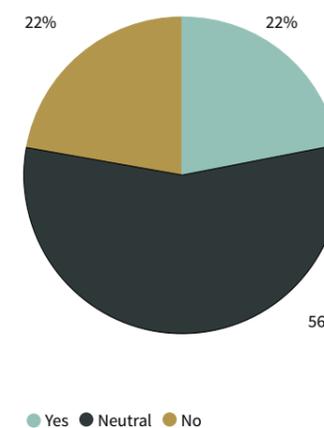
“In Brazil, agricultural insurance outgrows most other lines. Demand for expertise and good quality capacity is high and the increase in subsidies may not keep up with demand and premium growth.”

In Brazil insurers uniformly saw an increase in capacity in the past 12 months and expect a continuation of that trend for the next 12 months. The reasons are similar to the above. In the Brazilian context, agricultural insurance outgrows most other lines. Demand for expertise and good quality capacity is high and the increase in subsidies may not keep up with demand and premium growth. In the short-term the outcome of the recent presidential election in October 2018 might even aggravate this trend as it might increase political uncertainty and heighten demand for reliable risk protection.

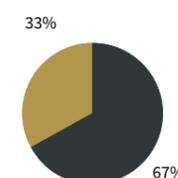
Products and farmers' preferences

Do current products meet farmers' needs?

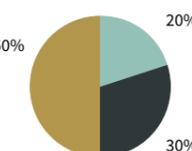
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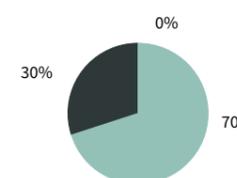
Brazil



China



India



Product preferences of farmers

Overall interviewees were evenly split on whether current products available to farmers meet their needs. To the majority of executives polled pros and cons neutralise each other.

In India about 90% of insurance covers sold are MPCl products, based on a yield index. The remainder are weather-index products. Their share used to be far larger but steadily reduced due to the complexity of the products and the relatively high basis risk, which undermined confidence in the product. Today only the MPCl cover is subsidised and promoted by the government under the current PMFBY scheme. Since in essence the Indian MPCl version is based on an index, almost 99% of available insurance covers are index products.

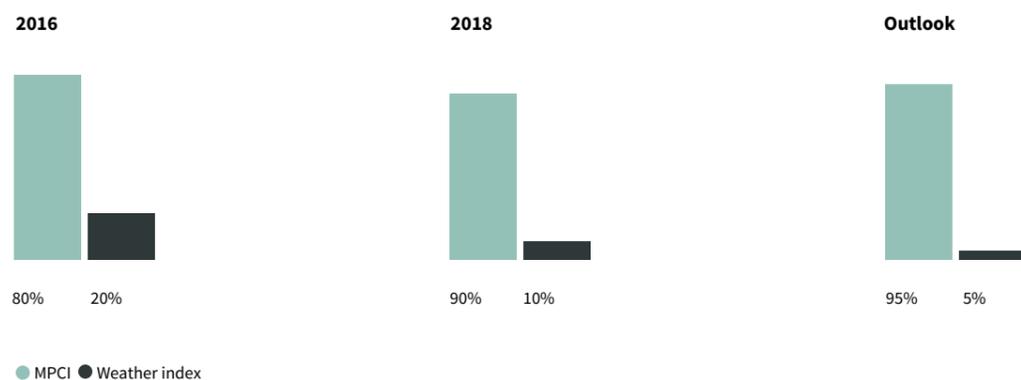
To 70% of interviewees, the standard MPCl index product fulfils the needs of farmers, as it is easy to understand, reasonably fair and accurate. It was modified and introduced in 2016, after the dominant share of weather index products had been steadily declining in relevance over the past years. The index of the yield and the claims adjustments are determined by a so-called crop cutting experiments at village level. The basis risk is perceived to be lower as with weather-index products. In addition, the MPCl includes also non-weather-related perils such as pests.

Going forward interviewees expect India's authorities to address the current flaws of the product: By reducing the measurement for the yield index and claims adjustments from

the village to the field level, the product will include more local specifics, become more accurate and eliminate further basis risks. Furthermore, the sum insured is expected to increase from the current 40% to 50% of the cost and to steadily move to include market or price risks as well. Interviewees also predict that the government will include more crops under the coverage.

“Farmers are keen to see the coverage level increase, steadily converting the product to first include the full production risks and eventually market risks as well, and to extend it to further crops too.”

Development of the split between MPCl and weather index products in India, based on interviewees' assessments

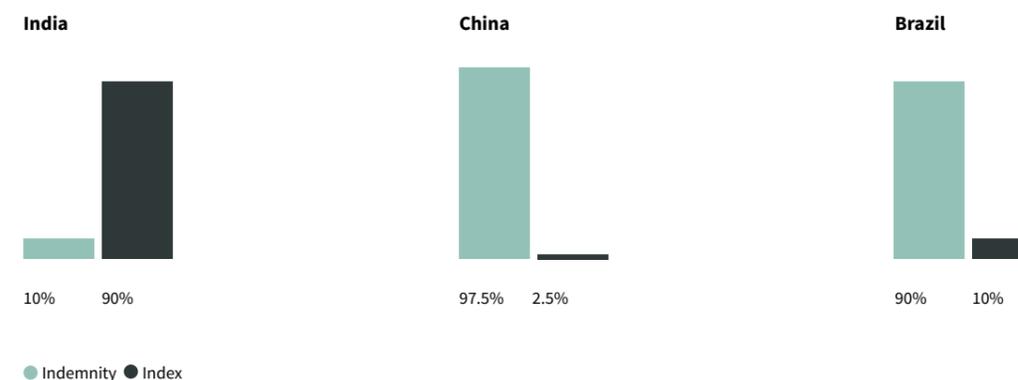


In China the predominate product with a share of about 90% is a MPCl cover based on the farmers' input cost. Contrary to India, it is an indemnity product, which covers material cost, such as seeds and fertilizers, but not labour or the rent for land. Coverage is seen at about 40% of the total production costs of about US \$2'000 per hectare. In addition, there are some revenue products and about 2.5% are weather index covers. Similarly to India, their acceptance suffers from the basis risk of the product and is perceived as less reliable as the standard MPCl product.

However, encouraged by the government, China's agricultural sector is undergoing a transition from the small subsistence farming of the past to a commercially driven, industrialised sector with higher productivity and larger farms. This conversion offers new opportunities to insurers as well, as demand for more sophisticated products, tailored to individual needs, is rising. As a first step interviewees see differentiation to the current scheme. Small farmers require a lower coverage or sum insured, but higher subsidy, as due to their low income they need a basic risk protection but cannot afford high insurance premiums. The larger farmers by contrast prefer a higher sum insured to protect their investments, but need lower subsidies, as their larger-sized farms mean they are able to afford higher premiums.

Furthermore, criticism focuses on the low sum insured of the Chinese MPCl product. According to insurers, farmers are keen to see the coverage level increase, steadily converting the product to first include the full production risks and eventually market risks as well, and to extend it to further crops too and in particular to China's enormous aquaculture industry. These interests however – thus the concern – may run counter to the short-term intentions of the authorities to first increase penetration rates and only secondly increase the coverage per farmer.

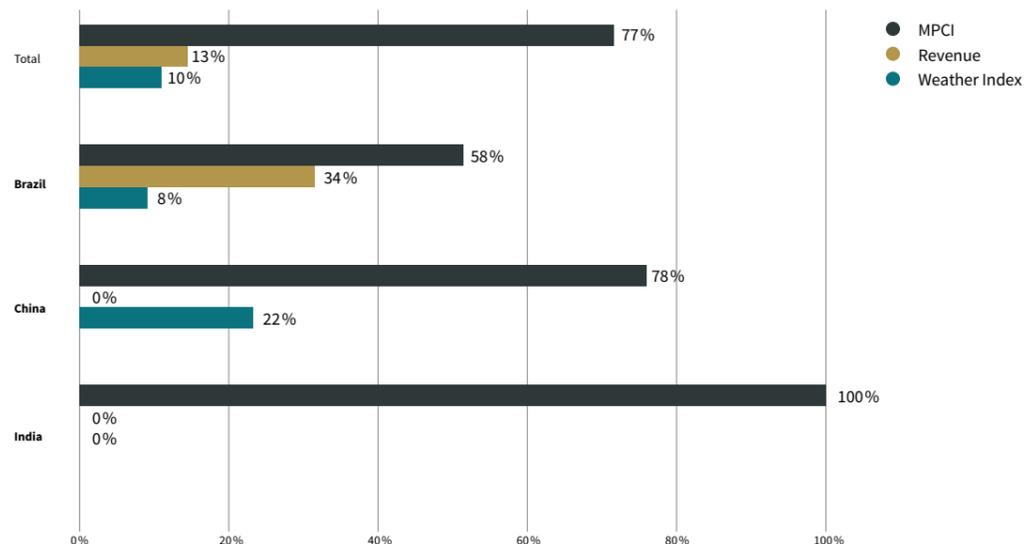
Split between indemnity and index products, based on interviewees' assessments



In Brazil the landscape of solutions available to farmers is quite heterogenic. Historically, there are a variety of programmes under different authorities that in part date back to the early 1970s, when Brazil realised the need to strengthen its small family farms. The most sophisticated and relevant scheme, the premium subsidies program (PSR), was introduced in 2003 and subsidises a combination of cost, production and revenue coverages that are either available in the form of a multi-peril or named-peril coverage. The split between the indemnity products and index products is seen by interviewees at a range of 85% to 90% for indemnity covers and at about 10% - 15% for index products.

Although the breadth of products aims to appeal to all farmers, insurers emphasise that also in Brazil products are geared more towards the needs of the small-hold farmers and do not meet the demands of large farming operations. Coverage varies from 50% to more than 80% (on average 65%), dependent upon the crop, which is regarded as too low to protect the farmer's earnings. The dominant MPCl is based on an historical average derived from a public data base, cooperatives, financial institutions and the farmer. Some of this data is scrutinised as they are established on previous yields, which in particular in technologically more advanced farming regions can be outdated. Furthermore, since the index also includes as a basis the total land of a farm, it disadvantages larger farms over smaller ones. Going forward accuracy is an issue as well as it is seen as a precondition to increase farmers' trust and confidence in the programme.

Fastest growing products, as a share of total mentions (in %)



Fastest growing products

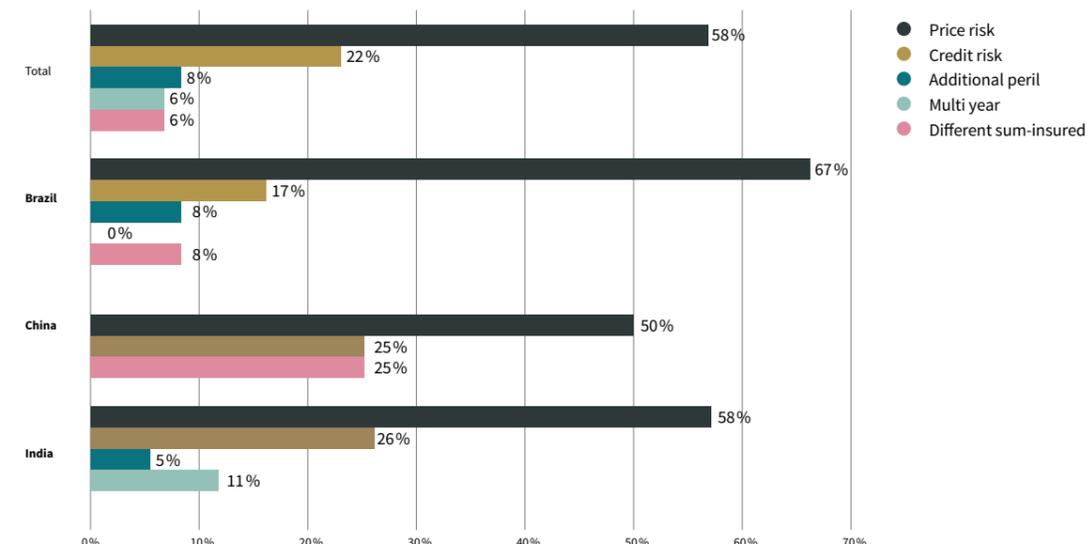
There is a gradual transition from the most basic agricultural insurance products that guarantee following a catastrophic event insured farmers have enough resources to meet their debt and are able to replant the following season to a revenue and eventually a market risk protection. In addition to that approach, governments in all three countries also subsidise the credit for farmers with the overarching goal to improve productivity of the agricultural sector. In as much as authorities succeed in achieving that objective, demand for more sophisticated products will increase.

However, change is slow. In terms of the product mix, neither India, nor China or Brazil have witnessed significant shifts in the past 12 months. Governments push the basic products to increase penetration, while it is the large commercial enterprises that buy unsubsidised revenue products or even index products. In India weather index products, which accounted for almost 50% of the markets at the start of agricultural insurance, are further marginalised, although providers try to contain the basis risk with more sophisticated technology and to overcome the low trust of farmers in the product. Given the endorsement through the PMFBY scheme, India's MPCY yield index insurance is preferred by farmers for its simplicity and accuracy, growing faster than any other product and is regarded as the most profitable product by insurers.

According to the insurers polled, in China there has been no noticeable change in the product mix during the past 12 months. The current MPCY product is expected to benefit from its geographic roll-out, an expansion to further crops or agricultural products and a steady increase of the coverage level. Although some insurers state that weather index products have been growing the fastest, the MPCY cover is regarded as the most profitable.

In Brazil, the dominance of the indemnity products is encouraged by the banks. Again, it is the basis risk of the weather-index products that turns them into a hard sell as banks are concerned they could lose clients if they would need to argue with them about justified or unjustified claims. Although the authorities and banks are thus seen to promote the MPCY solutions, weather-index products are perceived as more efficient and profitable. However, as in China too, multi-peril revenue-based coverages are earmarked to grow fastest, possibly at a rate of more than 25%, becoming the main product in the future. In the US, the world's largest agricultural market with premiums of US \$10.7 billion in 2017 revenue-based products accounted for 75% of the market.

For which product farmers see additional market potential



Market potential of additional products

With 58% of all mentions, demand is strongest for a policy that includes production risks as well as market risks. Interviewees said that in very productive seasons farmers may still incur a loss as prices may fall against high harvest yields. However, according to the insurers polled, India and China are both missing an important precondition for the introduction of price cover – a transparent commodity market. Since there is no platform in either market where crops are traded, comparative data is difficult to obtain. Nevertheless, apparently in both markets trials are under way to introduce such products.

Cover to protect farmers against credit risks is the second most mentioned product expansion in the three markets. However, in Brazil and India, banks are the main sales channel and agricultural insurance is bundled with the credit products sold to farmers and serves as essential collateral to obtain a loan. Since farmers' credits are subsidised as well – usually by the same authority as the insurance subsidy – farmers regard the need for credit cover as relatively low, unless they are a large commercial and capital-intensive entity.

Protection against additional perils is of limited need as well, since the main product in all three markets is a multi-peril cover, which protects against the main causes of a crop shortfall, including certain pests. In Brazil farmers may also focus on named perils, such as damages due to frost. Nevertheless, insurers see chances for products that would cover accidents.

Multi-year policies are mostly seen as too complex, because the current insurance products are tied to loans, which typically run for one harvest season or a year and have to be repaid and renewed for the coming season. Also, different sums insured are assessed with scepticism, as data is still insufficient to enable complex and highly differentiated products.

“China has been most successful with the implementation of its current scheme in 2007. Since then 115 million hectares of its main crops, or 75% of the cultivated area, are insured.”

Measures to increase penetration

Measures of agricultural insurance penetration vary. Typically, different types of categories are taken into account including the number of farmers enrolled, the amount of arable or cultivated land or the value of crops covered. Penetration is lowest in Brazil where in 2016 approximately 11% of the arable land of the principal grains was covered by insurance. In India that level is already substantially higher and increased to 30% of the gross cropped area with the introduction of the PMFBY in 2016. According to the Prime Minister's plan that should increase again to 50% by 2019. China has been most successful with the implementation of its current scheme in 2007. Since then 115 million hectares of its main crops, or 75% of the cultivated area, are insured.

In Brazil insurers are split in their attitude towards increasing market penetration. A large share of interviewees still see increasing subsidies and improving their reliability as the biggest lever for increasing agricultural insurance penetration. In fact,

Insurers' own strategies to increase penetration

Insurers invest heavily in awareness building measures, marketing and training for clients. In China the main point of distribution is through an appointed or elected village chief. Educating the farmers on modern production methods will increase client loyalty and reduce claims. Similar efforts are under way in Brazil where insurers also see significant benefit in improving their proximity to farmers, educating also the broker channel as a means of distribution and improving both their service level and their transparency. Interviewees emphasised that among the most efficient means in convincing farmers of insurance benefits is in communicating and “advertising” claims paid.

In India insurers' efforts in marketing their products are even more extensive. Once the insurer has won the tender, it then markets the product and enrolls as many farmers as possible. Thus, insurers will embark on extensive roadshows, moving from village to village, to enlist and attract as many farmers as possible. Against this background the one-year tendering process is obviously an issue and therefore insurers push for longer term contracts.

In Brazil the total amount of subsidies is decided each year and might vary. In 2015 subsidies dropped by 60% for the PSR and the insured area declined by 70% compared to 2014. Although subsidies recovered by 50% in 2016, consistent government support remains an issue, according to interviewees. They believe that agricultural productivity and as a result insurance would benefit too, if authorities were to increase rural credit and push banks to stronger insist that agricultural loans have to be fully insured. In addition, insurers see opportunities in increasing and simplifying the subsidised policies and in targeting more precisely large commercial farmers.

In India awareness for the benefits of insurance is still low. In addition, the scheme struggles with a lack of trust. While the issue of late claims payments has been addressed with the recent update of the scheme, insurers feel the confidence in the scheme could be further enhanced by reducing the basis for the yield measurement from the village to the field level. Furthermore, insurers argue that penetration

Interviewees in each market see opportunities in improving their product suit. In Brazil the focus is on simplifying products, making it more understandable and reliable for the mass market while also targeting commercial farmers with tailored products. In China the aim is to reduce cost through more efficient and technologically advanced products, develop capacity to move into further crops or geographies and finally, bundle agricultural insurance products with other liabilities farmers may incur. That in fact is also an approach pursued in India, where insurers aim to link agricultural insurance products to the loans for machinery.

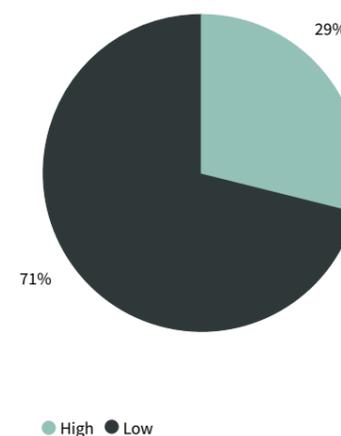
“In India insurers embark on extensive roadshows, moving from village to village, to enlist and attract as many farmers as possible.”

would increase substantially if it became mandatory for farmers to insure all agricultural loans. The vast majority of India's farmer are so-called loan farmers, who take out credit at the beginning of the season for their input cost and repay it after the harvest. Wherever the scheme has been rolled out, these loanfarmers have to insure themselves.

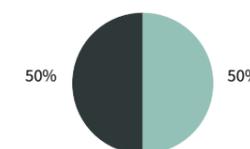
Chinese insurers recommend an increase of the sum insured to further increase penetration. The low coverage level is still one of the weaknesses of the scheme, however, allowing the government to roll out the coverage widely. Insurers see additional benefits in a similar approach to Brazil by aiming to increase agricultural productivity through the provision of greater loans to farmers. As a result, insurance coverage would have to rise as well. Although 170 different types of insurance products are available for crops, livestock, forest, fruit, vegetables, herbs and local products, an expansion of coverage to include additional crops or products would further increase penetration.

Relevance of price for the purchasing decision

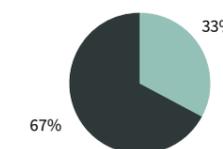
All markets



Brazil



China



India



“The larger the farmer, the more important product innovation and customisation become.”

Relevance of price for the purchasing decision

The relevance of price for the purchasing decision of the insurance coverage plays a very different role according to the market and the amount of subsidies provided.

In the case of India, the farmers pay just 2% (or 1.5% for the shorter season) of the premium. The rest is paid by local and national governments regardless of the amount of total premium rate. As a result, all interviewees agree the price is not decisive. Besides, executives emphasise that farmers have little choice. In India in states where the government participates in the PMFBY scheme, crop insurance is compulsory for all farmers who take out a loan to operate their farm holding. According to interviewees, these so-called loanee-farmers represent about 90% – 95% of all farmers, while the non-loanees amount for the remainder. However, the distinctions are blurry as India has two crop seasons per year and many farmers take out a loan for the first season and, if that season was successful, will not ask for another loan for the following season. For non-loanee farmers insurance is voluntary. Despite the low subsidy, take-up rate is only at about 5%. Against this background, interviewees agree that two elements are more relevant to increase the penetration or insurance purchasing among Indian farmers: to increase distribution and access farmers at the village level and secondly, to demonstrate reliable claims payments in order to build trust and confidence for the reliability of the scheme.

In China farmers pay about 20% of the premium. The rest is subsidised. As a result, a majority of interviewees think that their service, claims handling, and also the amount of the sum insured are decisive for the farmer's purchasing decision. Similarly, in Brazil the number of those who think the price is more decisive is higher, as the subsidy amounts to only 35% – 55% of premiums – depending on the type of crop. This cost has to be understood in addition to the relatively high interest rate that the farmer has to pay for his operating loan. Nevertheless, besides the coverage level, service components such as speed of claims paying and proximity to the farmer are perceived as equally important. The larger the farmer, the more important product innovation and customisation become. Also, the Brazilian insurers argue, for large-sized clients price risk becomes more paramount, while the production related climate perils represent a low risk to them.

Distribution channels

In all three markets their channels of distribution are defined by the scheme. In India cover is distributed to the loanee-farmers through the banking channel, where they also purchase their loan. Only the 5% – 10% non-loanee farmers are free to purchase insurance cover through either brokers, agents or the so-called community service centres, where they can acquire all kinds of different services. The relevance of this channel has been growing steadily as insurers more actively reach out to non-loanee farmers.

In China product distribution is administered directly between the insurer and an appointed or elected village chief who assumes the role of an agent. This municipal officer assembles

those farmers who are eligible to the programme and also assumes responsibility in the loss assessment or adjustment processes, alongside with the insurer and a government representative. Only for large, commercial farms that purchase unsubsidised insurance cover outside the scheme, the distribution channels may be direct or involve some kind of agent.

In Brazil insurers sell to farmers, grain collectors, cooperatives, rural syndicates and further agricultural producers. Their main distribution channels are the banks, and also brokers, cooperatives, the online channel as well as direct sales. Smaller, dedicated banks, which target the large commercial farms as

well as direct sales, are assumed to grow in relevance as the larger farmers have more specialist capital protection needs, while the small farm-holdings become more accessible through channels of mass distribution.

The role of the government

Government commitment and support are seen as an essential precondition for the continued growth of the agricultural insurance markets, although there are some striking differences between India, China and Brazil.

Agricultural insurance was first introduced in China in 1982, but was only converted into the current premium subsidy scheme in 2007. In its current 13th five-year plan the Chinese government emphasises the need for modernisation of the country's agricultural sector to increase productivity in an effort to further promote economic development in the rural areas and to ensure food security for the nation. Agricultural insurance subsidies are earmarked to rise in an effort to increase the geographic spread of the scheme and to expand the current sum insured from its low level of input protection to a revenue cover. According to interviewees, about 95% of all agricultural premiums in China are based on the government scheme. Only large farmers opt for solutions outside of the scheme.

The role of the Chinese government is expected to remain prominent. According to interviewees, current premium subsidies only account for about 5% of the total government spending for the agricultural sector including support for marketing, credit, machinery, etc. In fact, interviewees assume that the central government will take on even more control for the sector in an effort to improve efficiency through large scale solutions.

In India the role of the government is seen as equally essential as in China. The so-called Modi scheme, introduced in 2016, led to a 300% increase in premiums in the first year and to US \$4 billion in 2017/18. Although the government is committed to continue to provide and extend coverage, next year's general elections cause some uncertainty. As in China, agricultural insurance subsidies are just one type of support for India's farmers and thus far are perceived to have been highly beneficial for the current government. The assumption is therefore that even if there is a regime change, support for the sector will remain unchanged as agricultural insurance serves as collateral for the agricultural loans which in turn are a precondition to farming.

In Brazil agricultural insurance subsidies play a less prominent role. Although total premiums for the rural sector accounted for US \$1.1 billion in 2017, premiums related to the main government scheme PSR only accounted for about 25%. As a result, insurers view the role of the government with more scrutiny. While half of the interviewees hope for a more consistent role of government, the other half suggest that the market should strive to become less dependent on government support, allowing the sector to reposition itself, increase the accountability of farmers for their own risk management and encourage the industry to introduce different and more innovative products.

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