

RESEARCH ARTICLE

Explaining Policy Failure in China

John Kojiro Yasuda

Department of Political Science, Johns Hopkins University, Baltimore, MD, USA

Email: jyasuda1@jhu.edu

Abstract

Why do policy experimentation regimes breakdown? And, if there are recognizable patterns of experimental failure, what might explain the variation? Focusing on aviation, finance and food safety, this article considers why a policy style that has been credited with China's successes in the past is failing to address governance challenges in these sectors at present. The article moves beyond discussions of policy misimplementation by reframing experimental failure as a case of policy maladaptation under conditions of complexity and ambiguity. Maladaptation describes how approaches used in previous periods to foster adaptation can inadvertently make a system less resilient in the future. The analysis shows how the degree of consolidation of previously successful experimental regimes lends itself to certain types of maladaptation in the present: consolidated regimes are unable to generate policy alternatives (aviation), moderately consolidated regimes are maladapted for selection (finance), and unconsolidated regimes impede niche creation (food safety).

摘要

为什么政策试验机制陷落？而且，如果存在可识别的实验失败模式，如何解释这变种？本文以航空、金融和食品安全为重点，探讨了为什么中国过去曾取得成功的政策风格目前未能解决这些领域的治理挑战。之前的研究强调实验机制的挑战主要源于政策执行不当的相关问题。与以往的研究不同，我认为制定政策在复杂和模糊的条件下导致“政策适应不良”（policy maladaptation），而给实验机制造成了根本的政策挑战。“适应不良”（maladaptation）描述了以前时期为促进适应性而采取的方法使系统未来的弹性降低。分析显示了先前成功的实验性制度的巩固程度如何导致当前适应不良的类型：巩固的制度无法产生政策多样化（航空），适度巩固的制度有选择机制的故障（金融），以及未巩固的制度问题在于“生态位创造”（niche creation）（食品安全）。

Keywords: experimental governance; policy maladaptation; regulatory failure; bureaucratic politics; finance; food safety; aviation

关键词: 实验性治理; 政策适应不良; 监管失败; 官僚政治; 食品安全; 金融; 航空

Scholars have long credited China's experimentalist policy style with the country's institutional reinvention following reform and opening. Whereas Soviet socialism was hampered by sclerotic bureaucratic processes, China's governance model has been characterized by its dynamism, innovative capacity and flexibility owing to its “embrace of uncertainty.”¹ In particular, “policy experimentation under hierarchy” has facilitated China's smooth transition from plan to market across a host of sectors.² But recent scholarship has highlighted limitations of China's experimental model that stem from local obstructionism, central government factional infighting and a politically compromised diffusion process.³ Building on this scholarship, this article examines how the breakdown

1 Heilmann 2011.

2 Heilmann 2009.

3 Yu 2012; Teets, Hasmath and Lewis 2017; Florini, Lai and Tan 2012.

of China's experimentalist model not only speaks to the challenge of getting policy experimentation right but also the real dangers of when an adaptive regime can turn maladaptive.

A reassessment of China's policy experimentation model is particularly timely given how policymakers point to persistent problems in a range of sectors where policy solutions have not been forthcoming. This article looks at three sectors which have been a major focus of the central government over the last decade: aviation, finance and food safety. In aviation, previous regulatory trials had led to marked improvements in air safety, but officials have been less successful in addressing crippling delays.⁴ In finance, specifically in its stock market, trial regulations have not led to the development of responsible institutional investors nor smoothed out market volatility.⁵ And, in food safety, the use of model production zones, which created islands of regulatory excellence in the past, has not resulted in fundamental improvements in China's vast food markets.⁶ Why has experimentalist governance failed to address these cases of regulatory governance? And, if these experiments have failed in specific ways, what explains the variation of these failures?

I argue that initial adaptive responses to policy challenges in the 1990s and 2000s have turned maladaptive in the face of increased complexity and ambiguity. Maladaptation describes how approaches taken in previous periods to foster adaptation can inadvertently make a system less resilient in the future. Specifically, this article highlights maladaptation that limits policy variation, weakens the selection mechanism and obstructs niche creation – key elements that were credited for the success of China's brand of adaptive governance.⁷ The analysis shows how the initial institutional architecture of an experimental regime lends itself towards different types of maladaptation as the policy context changes. Consolidated experimental regimes, such as in aviation, where a single central government agency had controlled the experimental process, later struggle to generate significant variation in policy alternatives. In moderately consolidated regimes, such as in finance, where experimentation is centrally managed in coordination with a number of ministries, one observes a compromised selection mechanism. In unconsolidated regimes, such as in food safety, where experiments are locally managed across a fragmented bureaucracy, experiments foster balkanization rather than niche creation.

This research on maladaptation makes two contributions to the study of policy experimentation in China. First, it seeks to move beyond discussions framing experimental failures as one of policy mis-implementation.⁸ In so doing, it explores the deeper institutional problems with the experimental regime itself that impugn the mechanisms of variation, selection and niche creation that are crucial to adaptive governance. Second, the article points to how the effectiveness of certain approaches to experimentation might be conditioned by a sector's stage of market development. China's hierarchical mode of experimental governance appears less robust in sectors facing high levels of complexity and ambiguity.

Experimentalism and its Discontents

China's variant of an experimentalist regime, sometimes referred to as "guerrilla governance," "experimentalism under hierarchy" or "directed improvisation," emphasizes a more hierarchical experimentalist framework than its European and US counterparts.⁹ In China, the central government provides policy objectives but allows experimentation on the part of ministries and local

4 Huang and Mo 2018.

5 Hsu 2016.

6 Macdonald 2020.

7 Ang 2016.

8 Kim and O'Brien 2021.

9 Heilmann 2011; Ang 2016; Heilmann 2009.

governments. The centre then ultimately decides which policy experiments to apply nationwide, which reforms are written into law, and which pilot zones are to be shutdown.¹⁰

Officially sanctioned experimentation takes three main forms: experimental regulation (provisional rule changes through ministries), experimental points (new policies or institutions in a certain policy area or sector by specific units) and experimental zones (geographical zones with wide discretion).¹¹ In some instances, experiments involve tinkering with an established policy repertoire leading to incremental change; in others, experiments can be dramatic, such as the establishment of a stock exchange, which Sebastian Heilmann refers to as “technocratic, grand experimentation.”¹² Whatever their form, experiments are retractable, delimited to a sector or locality, and allow various stakeholders some discretion to design policies. Experimentation also encompasses unapproved experimentation with subunits, civic organizations or individuals that take cues from policy speeches, development plans or perceived political vacuums to engage in new approaches.¹³

Even the most vocal interlocutors of China’s distinctive experimentation process point to its potential limitations as the country’s policy context changes. An experimentalist model of governance was expected to be less effective as policy consistency, accountability and procedural stability became more important for market development.¹⁴ Recent scholarship suggests China’s experimentalist mode of governance is indeed faltering owing to sub-optimal pathways of diffusion, central and local political interventions, rising government debt and corruption.¹⁵

This article adds to and moves beyond this discussion of policy experimentation failure by framing it in terms of maladaptation. Maladaptation, which has been a primary focus in the climate change literature, describes how the adoption of policies taken to address a problem at an earlier stage may at a later point exacerbate the vulnerabilities of a target group, shift the problem onto others and erode the sustainability of development.¹⁶ These maladaptations can be as bad as the problems avoided: short-term fixes increase exposure and sensitivity in the long-term or local responses create severe externalities in other regions.¹⁷ Maladaptations may occur because of negative feedback at a local or macro scale, layering effects of policies, environmental change, or path dependence. Path dependence, which describes institutional lock-ins that limit choice in the long-term, is particularly relevant to this discussion of maladaptations which emerge due to the initial institutional setup of an experimental regime.¹⁸

With respect to China’s experimentalist model, this article focuses on maladaptations that target elements intrinsic to adaptability. Yuen Yuen Ang’s seminal study of China’s economic development model highlights why the country’s experimental regime was particularly successful: first, reformers managed to generate substantial policy variation; second, clear benchmarks of success for policy trials enabled reformers to select good trials from bad ones; third, policymakers used the diversity of experiments to promote niche creation in which diverse subunits compete with and learn from one another to facilitate greater change.¹⁹

As much as Ang’s framework helps to capture how an adaptive process can lead to regulatory evolution, it also provides a theoretical lens through which to understand how a maladaptive process can obstruct a system’s further development by limiting variation, compromising selection and

10 Mei and Liu 2014.

11 Heilmann 2008.

12 *Ibid.*, 12.

13 *Ibid.*

14 Heilmann 2011.

15 Mei, Chen and Wu 2016; Teets and Hurst 2015; Mei and Liu 2014.

16 Juhola et al. 2016.

17 Magnan et al. 2016.

18 Barnett and O’Neill 2010.

19 Ang 2016.

obstructing niche creation. The key question is why previously successful models of experimentation are facing problems of maladaptation now.

Complexity, Ambiguity and Regulatory Development

The article proposes an endogenous breakdown of experimentation owing to the increased complexity and ambiguity in the current moment of regulatory reform. In the reform era, during the late 1990s, regulatory development involved establishing the basic foundations of a regulatory regime: a specialized agency, a new body of laws and capacity-building efforts.²⁰ This process was politically fraught, but the regulatory agenda involved readily identifiable problems, a relatively undeveloped market and building national champions.²¹ Prior to 2008, the global state-market orthodoxy was premised on leadership by autonomous, non-majoritarian institutions dominated by technocratic experts.²² While China did not implement the orthodoxy completely, it did appropriate certain institutional forms and parts of the agenda, such as the establishment of quasi-independent agencies, partial liberalization and an increased role for market self-regulation.²³ This explains the emergence of a host of agencies in the 1990s and 2000s, such as the State Food and Drug Administration, which mimicked Western counterparts.

By contrast, China's current stage of regulatory development is marked by a relatively higher level of uncertainty - a function of a notable increase in *complexity* and *ambiguity*. In policy sciences, complexity speaks to the high levels of interdependence, spillovers and cascades, rather than the technical difficulties involved in a policy sphere.²⁴ The concept of complexity is used in contradistinction to a notion of complicated, in which a collective is made of separate parts that do not interact with each other.²⁵ In China, the increase in complexity is tied to larger, more integrated markets, a result of three-decades of successful reforms. Ambiguity refers to the difficulty of setting clear policy goals because of competing values.²⁶ A major driver for increased ambiguity has been the collapse of the global state-market orthodoxy among Chinese leaders following the global financial crisis in 2008.²⁷ It is important to note that China's rejection of a liberal market regulatory approach has not resulted in a clear alternative, as we shall see.

The effects of complexity and ambiguity on the experimental process vary in accordance with the degree of consolidation of the experimental regime. Jessica Teets and William Hurst point to different levels of bureaucratic fragmentation (multiple versus single agency) and degrees of centralization (central government versus local government) in determining the outcomes of experimentation.²⁸ This article extends this work by collapsing these two factors into a single spectrum based on the consolidation of an experimental regime - from those that are centrally managed and single agency to those that are locally managed and multi-agency (Figure 1).

Maladaptation emerges because the institutional foundations of the experimental system have ossified. The initial architecture of experimentation in a sector resulted from a host of factors, including the strategic importance of a sector, central-local relations, bureaucratic conflicts, factional politics and the political will of the central leadership. Over time, in spite of a changing policy context, these experimental regimes have been stubbornly impervious to reform. Problems of maladaptation emerge as the demands of experimentation change, but the institutional setup remains

20 Yang 2004.

21 Pearson 2005.

22 Coen and Roberts 2012.

23 Hsueh 2010; Pearson 2005; Foot and Walter 2010.

24 Renn, Klinke and van Asselt 2011.

25 Ang 2016, 10.

26 Ibid.

27 Heilmann 2009.

28 Teets and Hurst 2015.

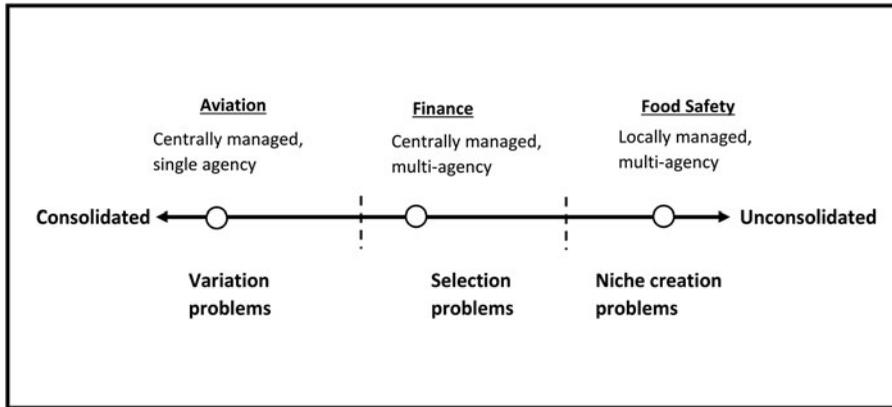


Figure 1: Regime Consolidation and Maladaptation

the same. Under periods of complexity and ambiguity, this gap leads to a breakdown in policy variation, selection and niche creation. Of course, the experimental regimes identified below are ideal types and, in reality, one can observe a variety of maladaptations at work in any sector.

In more consolidated regimes, experiments are managed by a single agency at the central government level. These regimes were optimized to address a single regulatory problem by centralizing control through an agency and enforcing trials with little variation. In most cases, these regimes emerged in sectors associated with China's strategic industries.

The same institutional framework that enabled a unified, top-down approach to innovation, however, has been found to be ill-equipped to generate new alternatives under a moment of heightened complexity and ambiguity. The over-centralized, hierarchical structure is incompatible with markets that have grown larger, involve diverse stakeholders, and are deeply interconnected. The difficulties of identifying where a problem might originate requires greater participation by stakeholders. However, these systems find themselves incapable of receiving input from a wide variety of actors because of an underdeveloped deliberative mechanism.²⁹ This lack of input is further complicated by an increase in policy ambiguity from regulators regarding the goals of the system. In a hierarchical, punitive system in which there are now multiple goals whose trade-offs are ill-defined, innovators are loathe to pioneer new solutions, leading to a policy variation problem.

In unconsolidated experimental regimes, experiments are locally managed by a fragmented bureaucracy. Originally, given the local orientation of a regulatory issue and the limited risk experiments posed to other sectors, central leaders delegated experimental authority to localities. Multiple agencies would launch their own pilot projects to develop regulatory solutions. However, as markets grew further integrated, tying disparate localities together in a unified market, problems have mounted as an array of local standards come into conflict with one another. Owing to the centre's multiple and often contradictory goals, it has failed to adjudicate these conflicts. Whereas under niche creation, diverse subunits interact to further propel the system to evolve, under balkanization, diversity leads to further fragmentation of the policy space, increases the cost of collective decision making or leads to the preservation of the status quo.³⁰

Moderately consolidated regimes take two forms: centrally managed, multi-agency or provincially managed, single agency. The provincially managed form tends towards balkanization, a problem that was observed following the soft centralization of policy spheres in the early 2000s.³¹

29 Dunlop and Radaelli 2018.

30 Renn, Klinke and van Asselt 2011.

31 Mertha 2005.

Centrally managed, multi-agency experimental regimes, by contrast, exhibit problems associated with failed selection. In these regimes, owing to a sector's importance to the overall economy, experiments were managed by central authorities. But because a sectoral issue affected shared bureaucratic interests, experiments were conducted by several ministries.

Initially, despite fragmentation of experimental authority across central ministries, clearer overarching goals meant that experiments largely cohered into a recognizable reform programme. However, under high levels of ambiguity, the host of interim trial regulations has become increasingly uncoordinated, with experimental rules working at cross-purposes. Central reformers struggle to make sense of mixed results, leading to an inability to select against failed trials. Additionally, ministerial competition has led regulators to prematurely select small-scale trials for national roll-out that are incompatible with a complex market.

Methods and Cases

What follows is an account of maladaptations that have led to problems in variation, selection and niche creation. Over 200 semi-structured interviews were conducted with regulators and market participants through a snowball sample from 2013 to 2019. In the aviation sector, interviews focused on former regulators with the Civil Aviation Authority of China (CAAC), airline executives and pilots in Beijing and Shanghai. In finance, interviews were conducted with China Securities Regulatory Commission (CSRC) and China Banking Regulatory Commission (CBRC), stock exchange officials and financial executives in Beijing, Shanghai and Shenzhen. Food safety interviews involved the State Food and Drug Administration (SFDA), the Ministry of Agriculture (MOA), the Ministry of Health (MOH), market practitioners and third-party operatives in Sichuan, Jiangsu, Ningxia, Shandong, Yunnan and Zhejiang. Interviews were triangulated by ensuring discussions with regulators were followed up by meetings with market practitioners who were directly affected by experiments, and then with third-party analysts (academics, journalists and think tank researchers). In more decentralized sectors, such as food safety, interviews were also conducted at various levels of government to contrast accounts from provincial-level authorities with those operating on the ground. To the extent possible, interview data were corroborated with archival materials in Chinese and in English.

Aviation, financial and food safety regulation serve as typical cases in terms of the degree of consolidation of each experimental regime.³² Each sector has also faced high levels of complexity and ambiguity. Selecting other sectors in which complexity and ambiguity are more benign, and the degree of consolidation less apparent, may obscure rather than accentuate the problematic dynamics unravelling the experimental process.³³ The selected cases help to establish internal validity through in-depth process tracing. Because the theoretical framework was constructed inductively through the cases studied, there are limits to the external validity of my findings. However, one should expect to find similar maladaptive processes at work in sectors with comparable levels of consolidation.

Aviation, finance and food safety are instructive given that they also address several alternative explanations for each type of maladaptation. For example, one might argue that the lack of policy variation in aviation results from the high levels of risk in the sector. However, in the other two sectors, major regulatory failures – in 2008, following the infant formula scandal, and in 2015, following the stock market rout – have highlighted the major risks inherent to governance in these sectors as well. Weaknesses in selection and niche creation could be attributed to a lack of state capacity, in so far as weak institutional support may make it more difficult to learn from small-scale trials (selection) or coordinate model production zones (niche creation). But regulators in each

³² Gerring (2008).

³³ Gerring (2008) notes this would be an example of a case selection that is both typical and extreme. Typical in so far as each case is representative of a type, i.e. consolidation, and extreme in terms of treatment, i.e. high levels of complexity and ambiguity.

sector have benefited from a significant increase in budgetary allocations, manpower and legal authority with which to carry out their respective mandates. Moreover, similarities across two or more of the sectors in other respects cannot explain the variation in the maladaptations observed. For example, in terms of industry make-up, aviation and finance both are designated as lifeline industries and are dominated by state-owned and state-adjacent enterprises, yet different maladaptive processes obtain.

To be sure, the failures of experimentalist governance have not been helped by the change in the political climate under Xi Jinping 习近平. The escalation of top-level design through the Party apparatus has led to the proliferation of leading small groups at every level of state hierarchy with the consequent narrowing of local experimentation.³⁴ In contrast to policy experimentation, Party-led innovation seeks to quickly address information asymmetries between principals and local state agents through centralizing control over personnel and to breakdown collusive relationships between regulators and corporations by imposing policy uniformity from the top-down.³⁵

However, the breakdown of experimentation cannot solely be laid at the feet of Xi Jinping. Centralization under the Xi regime can only be associated with one maladaptation in China's experimentalist approach: the lack of policy variation. As we will see in the aviation sector, the origins of this problem were set well before Xi came to power. In the arena of food safety, problems in niche creation persist despite Xi's penchant for centralization. And selection issues in the financial sector preceded and continue under Xi.

Maladapted for Variation in Aviation

China's experience with aviation reform provides a clear demonstration of how a consolidated regime under conditions of complexity and ambiguity becomes maladapted for the purposes of generating policy variation. In the late 1990s, a revamped CAAC re-oriented China's accident-prone airlines towards safety.³⁶ The transformation of China's aviation regime to a centralized, hierarchical system led to accident rates falling well below the global average.³⁷ However, the same centrally managed, bureaucratically consolidated sector has limited the policy alternatives available to address severe efficiency problems that plague the sector today.³⁸ Some may argue that consolidation suggests a lack of experimentation writ large, not simply a maladapted regulatory system for experimentation. However, innovations in aviation management do take place but are severely constrained in terms of the parameters for experimentation.

From the mid-1990s through the 2000s, the CAAC reasserted control over local governments and consolidated its control in the bureaucracy. Sustained elite attention to a series of devastating air disasters made it clear that the leadership would not tolerate further lapses in aviation safety.³⁹ Although its bureaucratic position was tenuous at first, a crucial intervention by Deng Xiaoping 邓小平 in 1980 helped the CAAC to distance itself from the military, and by the 1990s, the CAAC was the sole regulator in the arena of civil aviation.⁴⁰

The policy regime was initially experimentalist in a limited way given that trials were designed, implemented and evaluated by the top-levels of the CAAC and singularly focused on improving safety. Under the leadership of Yang Yuan Yuan 杨元元, from 2002 to 2007, the CAAC implemented a host of new programmes on a trial basis, including soliciting assistance from Boeing and international airlines for pilot training programmes, expanding access to international aviation bodies to

34 Ahlers 2018.

35 Heilmann 2005.

36 Meyer 2001.

37 Pasztor 2007.

38 Williams 2016.

39 Suttmeier 2008.

40 Chung 2003.

conduct inspections of crash sites, developing new airline partnerships and implementing safety checklists for ground staff and pilots.⁴¹ Many of the decisions regarding trials – and whether to stop them – were made by Yang himself.⁴² To identify where problems in safety were emerging, Yang deliberately slowed the growth of the sector, closing down routes, shutting down airports and delaying plane deliveries. Airlines that failed to adhere to new standards were warned that their licences would be revoked.⁴³

Once the regulatory system brought safety issues under control in the early 2000s, aviation officials turned to address severe delays, encouraging airports and airlines to experiment with new protocols for routing, scheduling and airport management. China has the global lead in flight delays, with average delays of 43 minutes in comparison to the global rate of 27 minutes.⁴⁴ The aviation system has thus far been incapable of making any headway in improving efficiency. In 2013, a trial launched in eight airports, which was referred to as “unrestricted take off,” allowed planes to take off from airports without knowing whether a runway slot would be open at a destination.⁴⁵ As the trial was expanded to more airports, observers noted that while on-time departures improved, the policy led to an increase in air traffic as planes would circle destinations for hours.⁴⁶ In 2016, the CAAC introduced trial regulations specifying that Chinese and foreign airlines would be required to pay passengers whose flights were delayed or cancelled.⁴⁷ However, in 2017, average delays stubbornly increased by 50 per cent.⁴⁸ This was then followed by a CAAC policy paper advocating for a reduction in flight volumes by 75 per cent in Beijing and Shanghai, as a signal to airlines to experiment with new programmes to improve punctuality.⁴⁹ But airlines had little incentive to trial new rules or scheduling procedures that would ease congestion for fear of losing passengers in a market that was already saturated with new entrants.⁵⁰ Moreover, major airlines were set to benefit from increased access to new major airport hubs, such as Beijing Daxing Airport, which also blunted the pressure to innovate.⁵¹ Failing to see broad-based changes, the CAAC then applied trial punitive measures against airports that did not achieve punctuality standards by banning additional flights and not approving routes.⁵² The measures did increase efficiency, but these gains were offset by a decrease in capacity. As of 2019, flight delays in China remain a frequent feature of travel.⁵³

Officials conveyed that the difficulties of experimentation in this phase of regulatory development results from a centralized, hierarchical structure struggling under conditions of complexity and ambiguity. In terms of complexity, the rapid expansion of the air market links thousands of actors in a seamless system of governance, making it all the more difficult to identify the source of problems. As one executive noted, “A single route from Detroit to Beijing required the coordination of four governments and fourteen agencies ... If other executives were working at Six Sigma, we were working at Ninety-nine Sigma.”⁵⁴ The increase in complexity thus required a

41 Email communication with Boeing executive, Beijing, 13 August 2013.

42 Interview with former CAAC official, Beijing, 29 August 2013; interview with Boeing executive, China, 5 August 2013.

43 Interview with airline executive, Beijing, 9 May 2016.

44 “Why China leads the world in flight delays.” *The Economist*, 30 October 2017, <https://www.economist.com/graphic-detail/2017/10/30/why-china-leads-the-world-in-flight-delays>.

45 “New policy launched to tackle China’s flight delays.” *CNTV*, 1 August 2013, http://www.china.org.cn/video/2013-08/01/content_29591339.htm.

46 Timmons 2013.

47 Zhou 2016.

48 Huang and Mo 2018.

49 Chen 2017.

50 Jennings 2017.

51 Saxon et al. 2019.

52 Moore 2018.

53 Ma 2019.

54 Interview with retired airline executive, Beijing, 9 May 2016.

commensurate increase in the number and types of trials by multiple stakeholders to develop solutions. However, a consolidated experimentalist regime has been maladapted for increased participation by airlines, airports and aviation staff.

Scholars of experimentalist governance emphasize the importance of harnessing innovations implemented by frontline agents working in close conjunction with a regulator.⁵⁵ Even minor adjustments and trials by pilots and air traffic controllers can lend themselves to productive experimentation when applied more broadly by a regulator. Instead, stakeholders complain that the CAAC has often sought to engage in cosmetic trials and shift the burden of experimentation onto airlines, which were not equipped to handle delays on their own. From 2009 to 2018, Chinese airlines had already accumulated nearly US\$29 billion in losses, and price competition suggested even slimmer margins in the future; airlines felt they were not a position to experiment without losing market share.⁵⁶ Moreover, a punitive structure dis-incentivized on-the-ground actors from innovating. An important aspect of improving a regulatory system involves pilots actively reporting emerging conditions to regulators and suggesting new ways to deal with air traffic management. As Boeing's chief adviser in China explained, a host of problems can arise during taxiing, take off and landing of which regulators may be unaware. The typical response in other countries would be for a pilot to inform air traffic control of the problem. However, the chief adviser stated, "no pilot will talk about a [problem] in China because they know that they will get fired. The system will not allow for this degree of flexibility, and it will hold them back."⁵⁷ The lack of a clear channel through which stakeholders can participate in the experimentation process limits the ability to identify problems and provide solutions.

Another major reason for the lack of new experiments on the part of stakeholders is because of the well-known fact that the space for experimentation is highly delimited, given that the military control at least 70 per cent of China's airspace. Many delays are often caused by the military's unannounced drills along a flight routes. In 2014, a dozen airports in eastern China had to reduce flights by 25 per cent over two months because of military exercises being conducted in the vicinity.⁵⁸ In fact, the one innovation that airlines have been calling for since as early as 2010, when the-then chairman of China Eastern Airlines, Liu Shao Yong 刘绍勇, asked for a reassessment of the civil-military airspace management system, has gone unrealized.⁵⁹ Attempts by the CAAC to corral airport administrators and the airlines to experiment with new scheduling systems to ease delays were thus considered disingenuous: "It seems unreasonable for regulators to call on airports and airlines to make up for this inadequacy," aviation insiders commented.⁶⁰

In terms of ambiguity, attempts to rebalance the sector's prioritization of safety towards other goals, including efficiency and capacity, were also far from straightforward. Observers note that the aviation system had a lopsided emphasis on safety, with little regard for efficiency of air traffic management and passenger capacity.⁶¹ Here, ambiguity is less an issue about the target of reforms – to reduce delays – than about how to effectively balance the trade-offs within the system.

The hierarchical punitive structure of the aviation system has made attempts to experiment with re-balancing these priorities extremely challenging. Trial schemes, including allowing temporary access to restricted airspace, are never taken up by air traffic controllers for fear of a potential complication in an unchartered area and potentially being fired.⁶² There have been instances when regulators will grant temporary access along a corridor from Beijing to Shanghai to ease congestion, but

55 Sabel and Zeitlin 2010.

56 Saxon et al. 2019.

57 Interview with Boeing chief China adviser, Beijing, 29 August 2013.

58 Kuo 2014.

59 CAPA 2010.

60 Chen 2017.

61 Interview with head of aviation cooperation programme, Beijing, 3 May 2015.

62 Ibid.

air traffic controllers hesitate to grant approval.⁶³ Encouragement to experiment with different modes of sequencing – that is, the manner in which landings are coordinated – is generally ignored. One aviation executive described the extreme conservatism of air traffic controllers: “you don’t have parallel landings and take-offs ... and there are huge distances between planes – around 3 minutes rather than 90 seconds. And no multiple altitudes on the same route.”⁶⁴

What proved essential in overcoming the aviation sector’s disastrous safety record – a consolidated regulatory regime – has led to maladaptation in terms of policy variation. A regime that restricted the number of stakeholders, established a command-and-control structure and resorted to punitive tactics, has proven incapable of generating new solutions in a complex and ambiguous environment.

Maladapted for Niche Creation in Food Safety

In food safety, maladapted model production zones under an unconsolidated experimental regime have impeded niche creation. In terms of complexity, the food market has rapidly integrated local production systems into regional and national distribution chains, requiring the coordination of millions of producers, wholesalers and distributors. At the same time, ambiguity over how food should be produced, what is considered safe enough and how to navigate the trade-offs between food safety and food security is deeply contested.⁶⁵

Following a series of major food safety crises in the early 2000s, the central government sought to expand the formation of model production zones (MPZs) to improve food cultivation, processing and distribution procedures.⁶⁶ Local agencies established new agricultural production bases to facilitate the modernization of the agricultural sector in line with their own interests. According to the “one village, one product” policy, agencies would adopt their own village to produce a specified high-value crop, develop production standards and conduct inspections.⁶⁷ By 2007, 24,600 hazard-free production bases, 593 central-level demonstration zones and 3,500 provincial-level demonstration zones were established.⁶⁸

County-level regulators observed that MPZs were successful in ensuring regulations were implemented in a cost effective way and also in addressing local food-safety concerns.⁶⁹ The zones aggregated farmers in a single base, which allowed regulators to conduct inspections in a delimited geographical space.⁷⁰ Regulators found that when farmers adopted a standard operating protocol for planting, pesticide application and harvest, it was easier to identify problems at an early stage.⁷¹ By the early 2000s, MPZs had created islands of regulatory excellence from which officials hoped best practices would diffuse to the broader community.

As MPZs began to proliferate, however, agencies from different localities began to compete with one another over new food production and safety protocols as local markets were integrated into regional supply chains. When standards or testing procedures for additives were not granted equivalence across local governments, conflicts would prevent good models to diffuse. For example, when a major agricultural conglomerate from Shandong province began operating within Ningxia, they sought to bring with them the Shandong model for greenhouse agricultural production. Shandong province had been a major leader in greenhouse production because of its shorter

63 Interview, retired airline executive.

64 Ibid.

65 Yasuda 2017.

66 MOA 2011.

67 Han 2007.

68 State Council 2007.

69 Ibid.

70 Interview ZZ38, with township official, 7 April 2011.

71 Interview ZJ15, with agricultural county bureau official, Zhejiang, 12 October 2011.

growing season, and agronomists had developed a simple, low-cost design that met environmental standards, minimized pest damage and improved the safety of produce. However, as the conglomerate attempted to establish its own greenhouses within Ningxia, the local governments argued that they did not meet the provincial standard. Negotiations between the CEO of the agricultural conglomerate and the Ningxia agricultural department came to a head when the CEO argued that Ningxia's greenhouse model was not fit for purpose, and local agronomists threatened to derail the agricultural conglomerate's expansion plans.⁷²

In the Ningxia case, a number of interjurisdictional barriers to diffusion were evident.⁷³ First, local officials in Ningxia felt that the agribusiness did not have an adequate understanding of Ningxia's growing conditions, particularly its arid environment. Second, the Ningxia agricultural department viewed the Shandong model as a threat, as Ningxia officials sought to use their own standard as a national model for greenhouse production. Finally, local officials refused to even pilot the new greenhouse to test its effectiveness.

In another case, interprovincial conflicts over fishery production standards threatened to shut down an entire market for farm-raised fish.⁷⁴ In 2006, following the discovery of excessive carcinogens in turbot fish from Shandong, major cities throughout China closed their markets for farm-raised fish from Shandong province.⁷⁵ The Shanghai FDA sent an investigative team to Shandong province to investigate fish farming practices in Weihai 威海市 and Rongcheng 荣成市. However, after finding that major fishery bases were using nitrofurans and chorymycelin, the Shanghai FDA asserted that Shandong MPZs failed to meet Shanghai's standard. As a result, Shanghai closed its market to Shandong, as did Tianjin, Beijing and Guangdong. As the conflict escalated, each locality accused the other of local protectionism; however, the crux of the problem lay with varying standards of what constituted safe fish.

In an unconsolidated regime, the lack of a clear arbiter to parse experiments can lead to an interjurisdictional impasse that is fertile ground for balkanization. Although the central government provided no explanation for not intervening in the interprovincial turbot fish dispute, its wait-and-see stance likely speaks to the ambiguity over how best to produce safe food. First, a new Farmer's Cooperative Law was set to be promulgated in 2007, highlighting the central government's increasing ambivalence towards agroprocessor-led industrialized agriculture on MPZs.⁷⁶ Second, issues related to agricultural pollution stemming from MPZs had become increasingly salient during this period.⁷⁷ Whatever the reason, the central government's inaction nearly decimated Shandong's turbot fish industry and led to a breakdown of the nationwide fish market.

Model production zones have been prone to balkanization in a moment of complexity and ambiguity. One should note that the problem with this system is not because experiments are locally managed but rather that they remain highly dependent on central coordination. A lack of guidance from the centre leads to problematic forms of competition among subunits that, at times, result in local protectionist behaviour, interprovincial disputes over standardization and market disintegration.

Maladapted for Selection in Finance

In finance, we observe how experimentation in a moderately consolidated regime is maladapted for selection. Selection involves the ability to identify positive adaptations for nationwide application

72 Interview with agroprocessor executive, Ningxia, 15 November 2011.

73 Ibid.

74 Thompson and Hu 2007.

75 "Shandong bans sales of contaminated turbot." *Xinhua*, 20 November 2006, www.china.org.cn/english/health/189526.htm.

76 Day 2013; interview YL 10, with township official, Yunnan, 18 July 2011; interview YL 17, with township official, Yunnan, 19 July 2011.

77 Gu and Mason 2017.

and also to discard ineffective innovations. Alongside the growing complexity of the market has been an increase in ambiguity regarding the appropriate role of finance in the economy. In this new context, a host of uncoordinated trial regulations from different central agencies have posed major problems for selection, particularly for China's stock markets. First, regulators have struggled to learn from failed policy trials with the result that the same experiments are pursued again and again. Second, even when pilots are selected for a nationwide roll-out, regulators misjudge the applicability of trial regulations to the broader market, leading to stalled diffusion.

Owing to the political sensitivities of establishing a stock market in a socialist market economy, the central government reasserted its grip over the new stock exchanges in Shenzhen and Shanghai by the mid-1990s. Due to cross-cutting policy issues, a number of ministries pushed for experimental regulations throughout the 1990s, including trials for the repackaging of SOEs for listing in Hong Kong, split share reform, the reduction of state shareholdings and the gradual opening of the capital markets through the Qualified Foreign Institutional Investor Scheme.⁷⁸ While pursued by different ministries, experimental regulations did cohere into a recognizable programme, which was shepherded but not exclusively controlled by the China Securities Regulatory Commission (CSRC), to facilitate the initial growth of the market and address financing problems in the moribund state-owned sector.

As the market evolved, however, regulators have grown increasingly ambivalent about the trajectory of the stock market's development. The CSRC operates as the primary regulator of the securities markets, with the Ministry of Finance, People's Bank of China and the China Banking and Insurance Regulatory Commission having adjacent interests and different views on how the market should develop. A senior official explained that the host of new trial regulations involving market stabilization, consumer protection and a more decisive role for market-based pricing, belie a lack of clarity regarding what type of market is appropriate given China's stage of development and tradition of state intervention.⁷⁹ This reality is reflected in the tortuous reform of the Securities Law, which had been debated for over a decade and was dangerously close to being tabled after its third reading.⁸⁰ A senior adviser to the CSRC commented on the proliferation of trials and its implications for systemwide reform: "we don't really have a guiding philosophy at the moment ... everyone likes to talk about high-level issues, about system reform, but at the end of the day, you need to talk about how to actually get things done ... we don't have a plan at this point."⁸¹

In the context of pervasive ambiguity, interim trial regulations reflecting the different interests of central government players have led to incoherent trials whose results have been difficult to parse and have led to the same policy trials being repeatedly conducted. As noted above, a key aspect of selection involves discarding innovations that are viewed to be ineffective. For nearly two decades, the Shenzhen and Shanghai governments have sought to establish start-up friendly boards that are geared towards the listing of high-growth technology companies. Yet central government bodies' interest in experimenting with new boards have diverged because of their different views on financial risk, threats to the state-owned sector and rapidly changing market sentiment.⁸² Regulators balancing the multiple objectives of different bureaucratic stakeholders opted for a host of conflicting trial regulations that at once advocated for market mechanisms and state control. Reforms loosened particular aspects of the listings approvals process related to a company's business operations, such as reducing profitability requirements from three years to two years, while at the same time retaining strong state controls over listing protocols. Within three years of the ChiNext board's establishment in 2009, China's first attempt at a Nasdaq-like board, the waiting list for listing candidates

78 Interview with former cross-border products director, Hong Kong, 27 June 2017.

79 Interview with CSRC official, Hong Kong, 4 July 2017.

80 Interview with adviser to NPC on finance, Beijing, 3 June 2019.

81 Interview with CSRC official, Hong Kong, 10 March 2017.

82 Interview, adviser to NPC on finance; interview with senior government think tank analyst, Beijing, 6 June 2019.

quickly grew to over 300 firms.⁸³ Following the failures of the ChiNext Board, financial regulators once again attempted to build a start-up friendly board through the National Equities Exchange and Quotations Board in 2012, which also involved a mixed bag of rule changes. This project ultimately failed, leading to China's best technology firms continuing to list offshore. One financial adviser in a Chinese think tank highlighted the *déjà vu* quality of these experiments: "there's a boom-and-bust cycle, we close a board, and we then create a new board [trying the same thing]."⁸⁴

The breakdown in learning in China's quest for a Nasdaq-like board was attributed to the internal incoherence of these trials. Because the experiments relaxed market entry requirements while also retaining state approval for listing, regulators were uncertain if weaknesses in the new boards were a function of an overly conservative state, or if the relaxed requirements allowed weaker entrants to gain approval for listing. The design of the interim regulations did not provide clear evidence, so regulators repeated the same trials to no avail. One regulatory advisor commenting on this reform process said, "We tried to learn from [past failure], but we didn't learn from it correctly. We still tried to create state requirements but, ultimately, that undermines the whole notion of moving towards a [market-based] model."⁸⁵

Regulators have also problematically selected trials that were unlikely to succeed as the basis for broader application. Bowing to pressure from other ministerial-level or provincial players, the CSRC has moved forward with trials without a clear view as to how trial regulations delimited to a select group of participants were applicable to a broader market that had grown increasingly complex.⁸⁶

The new STAR Market established in 2019 sought to trial a number of new regulations that would liberalize listings management and trading. The CSRC had been reluctant to establish a new board because of the recent stock market rout in 2015, but the Shanghai government, eager to establish itself as an international financial centre, lobbied other central officials to launch a pilot scheme.⁸⁷ When Xi Jinping unexpectedly announced the new board at the Import Expo in 2018, CSRC officials rushed to set in place new rules for the board. The new trial guidelines in Shanghai explicitly sought to move the entire stock market towards a registration system, requiring firms to file documents with the CSRC for the purposes of information disclosure, and allowing the exchanges to manage listings themselves. The STAR Market's first year was heralded as a success by some and, in 2020, the new regulations were applied to the ChiNext Board in Shenzhen. Later in 2021, the new Beijing Stock Exchange also opted to adopt a registration system.

From the outset of the trial, the CSRC was sceptical of the STAR Market's applicability to the entire market due to the predominance of retail investors, high rates of corporate fraud and weak market intermediaries. Regulators in charge of the pilot were concerned that the emphasis on information disclosure was misplaced, given that investors lacked the ability to process this information. This in turn increased the risk of fraud. One regulator asked, "can a process of asking for more information really address the fraud and manipulation in the market?"⁸⁸ Regulators were also worried about volatility, particularly because high-tech firms were inherently risky.⁸⁹

Recent problems in the experimental boards seem to substantiate the CSRC's original concerns, despite recent central government pronouncements in 2022 suggesting an accelerated roll-out.⁹⁰ Trading on the boards has been subject to extreme volatility, which at one point reached 3,000

83 Güçbilmez 2014.

84 Interview with finance analyst, government think tank, 6 June 2019.

85 Interview with NPC adviser, Beijing, 3 June 2019.

86 Interview with finance analyst, Beijing, 26 May 2019; interview with finance analysts, Beijing, 12 June 2019; interview with government official, Beijing, 6 June 2019.

87 Interview, financial analyst; interview with legal adviser to CSRC, 3 June 2019.

88 Interview with CSRC regulator, Shanghai, 19 June 2019.

89 Ibid.

90 "China to stabilize markets, adopt registration IPO system – official." *Reuters*, 30 December 2021, <https://www.reuters.com/world/china/china-stabilise-markets-adopt-registration-based-ipo-system-official-2021-12-30/>.

per cent.⁹¹ As of August 2021, over 40 per cent of IPOS had been frozen or terminated owing to the regulator's concerns about their lack of viable business operations.⁹²

In the financial sector, we observe how a moderately consolidated regime is maladapted for selection in the face of increased complexity and ambiguity. In the stock market, pressures from major ministerial-level agencies lead to incoherent trials, the results of which the state struggles to understand, leading to unsuccessful trials being run repeatedly. In addition, pilots that are unlikely to succeed are prematurely expanded nationwide.

Discussion and Conclusion

China's embrace of uncertainty in the 1990s was credited for a number of the country's dramatic transformations. But as markets have become more complex and ambiguous, we are now observing the other side of uncertainty – its negative consequences – in a maladapted experimental regime that renders the policymaking system less resilient. Consolidated experimental regimes are unable to generate sufficient variation in policies owing to the lack of channels for stakeholder engagement and unclear trade-offs between policy goals. Once-successful model production zones in unconsolidated experimental regimes have tended towards balkanization, rather than niche creation, owing to complications that emerge as local markets are integrated into national supply chains and a central government that is unwilling to adjudicate disputes. And in moderately consolidated experimental regimes, such as finance, an uncoordinated host of interim regulations emanating from major power brokers in the central government lead to problems in selection.

That China's hierarchical experimentalist regime is encountering difficulties in a moment of significant complexity and ambiguity should not be particularly surprising. The system's emphasis on adaptation, disruption and innovation has sat in constant tension with a routinized, top-down bureaucratic apparatus. In each maladaptation, one can observe problems with the hierarchical approach to experimentation: in aviation, central leadership has shut out lower-level actors; in finance, central reformers' lack of a clear agenda has led to incoherent trials; and, in food safety, central reformers have failed to adjudicate local disputes. In other countries, experimental governance is neither top-down nor bottom-up, with autonomy conditional on the reporting of findings and being subject to peer review, and diffusion occurring on a voluntary basis.⁹³ This article contends that China may need to adapt its adaptive regime in order to address a new market context.

The limits of state-driven regulatory reform in a moment of heightened complexity and interdependence have also led some scholars to advance a notion of safety culture to address the lapses in regulatory oversight.⁹⁴ A safety culture approach emphasizes a more bottom-up process by which organizations themselves inculcate a system of risk management that identifies risks, communicates the importance of managing risk and mitigates risk in demonstrable ways.⁹⁵ Such advances provide a positive spin on persistent regulatory deficits in China – that more bottom-up approaches to address safety problems will still emerge, even as the state's experimental apparatus struggles to identify solutions.

Are we witnessing the end of the reform era, a period marked by institutional diversity, incremental reform and partial liberalization, as some suggest?⁹⁶ Perhaps another way to consider the end of reform is to highlight how an increasingly complex and ambiguous policy context has placed China's experimental apparatus under extreme strain. How the regime responds to uncertainty will

91 Gopalan 2020.

92 Lu and Wang 2021.

93 Sabel and Zeitlin 2010.

94 Suttmeier 2008.

95 Guldenmund 2000.

96 Minzner 2018; Fewsmith 2013.

determine whether the post-reform era will be characterized by a period of transformative governance or a state that is trapped in transition.

Acknowledgements. I would like to thank the following individuals for their thoughtful comments on this article: Yuen Yuen Ang, Iza Ding, Jieun Kim, Kevin O'Brien, Kyle Jaros, Xiao Ma, Margaret Pearson, Elizabeth Perry, Denise van Der Kamp, Megan Rithmire, Jessica Teets and Yuhua Wang. The paper also benefited from comments given during the following workshops and conferences: "China happy hour workshop," SAIS Johns Hopkins University, September 2020; "Chinese bureaucratic politics in the new era," Harvard-Yenching Institute, May 2021. Funding by Chiang Ching Kuo Scholars Grant 2018–2019 supported this research.

Competing interests. None.

References

- Ahlers, Anna Lisa. 2018. "Introduction: Chinese governance in the era of 'top-level design'." *Journal of Chinese Governance* 3 (3), 263–67.
- Ang, Yuen Yuen. 2016. *How China Escaped the Poverty Trap*. Ithaca, NY: Cornell University Press.
- Barnett, Jon, and Saffron O' Neill. 2010. "Maladaptation." *Global Environmental Change* 20(2), 211–13.
- CAPA. 2010. "China's airlines renew the call for airspace reform." *Centre for Aviation report*, <https://centreforaviation.com/analysis/reports/chinas-airlines-renew-the-call-for-airspace-reform-23844>.
- Chen, Shanshan. 2017. "Civil Aviation Administration rolls out new regulation to reduce flight delays at China's airports." *Yicai Global*, <https://www.yicai.com/news/civil-aviation-administration-rolls-out-new-regulation-to-reduce-flight-delays-at-china-airports>.
- Chung, Jae Ho. 2003. "The political economy of industrial restructuring in China: the case of civil aviation." *The China Journal* 50, 61–82.
- Coen, David, and Alasdair Roberts. 2012. "A new age of uncertainty." *Governance* 25(1), 5–9.
- Day, Alexander F. 2013. *The Peasant in Postsocialist China: History, Politics, and Capitalism*. Cambridge: Cambridge University Press.
- Dunlop, Claire A., and Claudio M. Radaelli. 2018. "The lessons of policy learning: types, triggers, hindrances and pathologies." *Policy and Politics* 46(2), 255–272.
- Fewsmith, Joseph. 2013. *The Logic and Limits of Political Reform in China*. Cambridge: Cambridge University Press.
- Florini, Ann M., Hairong Lai and Yeling Tan. 2012. *China Experiments: From Local Innovations to National Reform*. Washington, DC: Brookings Institution Press.
- Foot, Rosemary, and Andrew Walter. 2010. *China, the United States, and Global Order*. Cambridge: Cambridge University Press.
- Gerring, John. 2008. "Case selection for case-study analysis: qualitative and quantitative techniques." In Janet M. Box-Steffensmeier, Henry E. Brady and David Collier (eds.), *The Oxford Handbook of Political Methodology* (Vol. 10). Oxford: OUP Oxford Handbooks of Political Science, 645–684.
- Gopalan, Nisha. 2020. "When 3000% price swings are a sign of maturity." *BloombergQuint*, 31 August, <https://www.bloombergquint.com/gadfly/chinext-3-000-price-swings-show-china-stocks-maturing>.
- Gu, Hallie, and Josephine Mason. 2017. "No joke: China's war on pollution roils world's top pig farming sector." *Reuters*, 5 November, <https://www.reuters.com/article/us-china-pollution-pigs/no-joke-chinas-war-on-pollution-roils-worlds-top-pig-farming-sector-idUSKBN1D500K>.
- Güçbilmez, Ufuk. 2014. "Why do some Chinese technology firms avoid ChiNext and go public in the US?" *International Review of Financial Analysis* 36, 179–194.
- Guldenmund, Frank W. 2000. "The nature of safety culture: a review of theory and research." *Safety Science* 34(1–3), 215–257.
- Han, Jun (ed.). 2007. *Zhongguo shipin anquan baogao (Report on Food Safety in China)*. Beijing: Social Sciences Academic Press China.
- Heilmann, Sebastian. 2005. "Regulatory innovation by Leninist means: Communist Party supervision in China's financial industry." *The China Quarterly* 181, 1–21.
- Heilmann, Sebastian. 2008. "Policy experimentation in China's economic rise." *Studies in Comparative International Development* 43(1), 1–26.
- Heilmann, Sebastian. 2009. "Maximum tinkering under uncertainty: unorthodox lessons from China." *Modern China* 35(4), 450–462.
- Heilmann, Sebastian. 2011. "Policy-making through experimentation: the formation of a distinctive policy process." In Sebastian Heilmann and Elizabeth Perry (eds.), *Mao's Invisible Hand: The Political Foundations of Adaptive Governance in China*. Cambridge, MA: Harvard University Asia Center, 62–101.
- Hsu, Sara. 2016. "China's financial reforms face big challenges." *Forbes*, 18 July, <https://www.forbes.com/sites/sarahsu/2016/07/18/progress-of-chinas-financial-reforms/#5da9998a2043>.
- Hsueh, Roselyn. 2010. *China's Regulatory State: A New Strategy for Globalization*. Ithaca, NY: Cornell University Press.

- Huang, Rong, and Yelin Mo.** 2018. "China's average flight delay soars 50% to 24 minutes in 2017." *Caixin Global*, 22 May, <https://www.caixinglobal.com/2018-05-22/chinas-average-flight-delay-soars-50-to-24-minutes-in-2017-101254356.html>.
- Jennings, Ralph.** 2017. "China's airports can't solve the serious problem of flight delays – here's why." *Forbes*, 6 June, <https://www.forbes.com/sites/ralphjennings/2017/06/06/hogging-of-space-explains-why-so-many-flights-still-take-off-late-in-china/?sh=1b8b09102610>.
- Juhola, Sirrku, Erik Glaas, Björn-Ola Linnér and Tina-Simone Neset.** 2016. "Redefining maladaptation." *Environmental Science and Policy* 55, 135–140.
- Kim, Jieun, and Kevin J. O'Brien.** 2021. "Understanding experimentation and implementation: a case study of China's government transparency policy." *Asian Survey* 61(4), 591–614.
- Kuo, Lily.** 2014. "The military isn't giving up China's airspace, no matter how many flight delays it causes." *Quartz*, 24 July, <https://qz.com/239771/the-military-isnt-relinquishing-control-over-chinas-airspace-no-matter-how-many-flight-delays-it-causes/>.
- Lu, Shen, and Clara Wang.** 2021. "Data: IPO path narrows on China's star market." *Protocol*, 13 April, <https://www.protocol.com/china/shanghai-star-ipo-termination-data>.
- Ma, Josephine.** 2019. "Passengers wait it out at Beijing airport as flights delayed, cancelled following summit." *South China Morning Post*, 27 April, <https://www.scmp.com/news/china/society/article/3007971/passengers-wait-it-out-beijing-airport-flights-delayed-cancelled>.
- Macdonald, Scott.** 2020. "China, food security, and geopolitics." *The Diplomat*, 30 September, <https://thediplomat.com/2020/09/china-food-security-and-geopolitics/>.
- Magnan, A.K., E.L.F. Schipper, M. Burkett, S. Bharwani, I. Burton, S. Eriksen, F. Gemmene et al.** 2016. "Addressing the risk of maladaptation to climate change." *Wiley Interdisciplinary Reviews: Climate Change* 7(5), 646–665.
- Mei, Ciqi, Kang Chen and Xun Wu.** 2016. "Introduction: local government entrepreneurship in China: a public policy perspective." *China: An International Journal* 14(3), 3–15.
- Mei, Ciqi, and Zhilin Liu.** 2014. "Experiment-based policy making or conscious policy design? The case of urban housing reform in China." *Policy Sciences* 47(3), 321–337.
- Mertha, Andrew.** 2005. "China's 'soft' centralization: shifting *tiao/kuai* authority relations." *The China Quarterly* 184, 791–810.
- Meyer, Gabriel S.** 2001. "US–China aviation relations: flight path toward open skies." *Cornell International Law Journal* 35, 427–455.
- Minzner, Carl.** 2018. *End of an Era: How China's Authoritarian Revival is Undermining its Rise*. Oxford: Oxford University Press.
- MOA (Ministry of Agriculture).** 2011. "National modern agriculture development plan (2011–2015)," http://english.agri.gov.cn/hottopics/five/201304/t20130421_19482.htm. Accessed 10 March 2012.
- Moore, Nicholas.** 2018. "Chinese flight delays increased by 50% in 2017." *CGTN*, 23 May, https://news.cgtn.com/news/3d3d514f32516a4e77457a6333566d54/share_p.html.
- Pasztor, Andy.** 2007. "How China turned around a dismal air-safety record." *The Wall Street Journal*, 10 October, <https://www.wsj.com/articles/SB119198005864354292>.
- Pearson, Margert M.** 2005. "The business of governing business in China: institutions and norms of the emerging regulatory state." *World Politics* 57(2), 296–322.
- Renn, Ortwin, Andreas Klinke and Marjolein van Asselt.** 2011. "Coping with complexity, uncertainty and ambiguity in risk governance: a synthesis." *Ambio* 40(2), 231–246.
- Sabel, Charles F., and Jonathan Zeitlin (eds.).** 2010. *Experimentalist Governance in the European Union: Towards a New Architecture*. Oxford: Oxford University Press.
- Saxon, Steve, Xie Qiao, Zhiwei Sok and Zi Chen.** 2019. "How Chinese airlines can brace for impending turbulence." *McKinsey and Company*, 6 November, <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-chinese-airlines-can-brace-for-impending-turbulence>.
- State Council.** 2007. "White Paper on food quality and safety," <http://www.china.org.cn/english/news/221274.htm>. Accessed 5 October 2012.
- Suttmeier, Robert P.** 2008. "The 'sixth modernization'? China, safety, and the management of risks." *Asia Policy* 6, 129–146.
- Teets, Jessica C., Reza Hasmath and Orion A Lewis.** 2017. "The incentive to innovate? The behavior of local policymakers in China." *Journal of Chinese Political Science* 22(4), 505–517.
- Teets, Jessica C., and William Hurst (eds.).** 2015. *Local Governance Innovation in China: Experimentation, Diffusion, and Defiance*. New York: Routledge.
- Thompson, Drew, and Ying Hu.** 2007. "Food safety in China: new strategies." *Global Health Governance* 1(2), 1–19.
- Timmons, Heather.** 2013. "China's solution to flight delays: take off first, find a place to land later." *Quartz*, 1 August, <https://qz.com/110719/chinas-solution-to-flight-delays-take-off-first-find-a-place-to-land-later/>.
- Williams, Alan.** 2016. *Contemporary Issues Shaping China's Civil Aviation Policy: Balancing International with Domestic Priorities*. New York: Routledge.
- Yang, Dali.** 2004. *Remaking the Chinese Leviathan: Market Transition and the Politics of Governance in China*. Stanford, CA: Stanford University Press.

Yasuda, John K. 2017. *On Feeding the Masses*. New York: Cambridge University Press.

Yu, Keping. 2012. "Government innovations in China and the United States: a comparative survey based on Chinese and American government innovation awards programs." *Academic Monthly* 3.

Zhou, Laura. 2016. "Airlines flying in China must pay compensation to passengers for delays and cancellations: regulators." *South China Morning Post*, 15 July, <https://www.scmp.com/news/china/society/article/1990167/airlines-flying-china-must-pay-compensation-passengers-delays-and>.

John Kojiro YASUDA is assistant professor of political science at Johns Hopkins University.