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FOOD RETAILING  
TRANSITIONS AND NEW  
RETAIL BUSINESSES IN  
NANJING, CHINA

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## Abstract

China's food retailing sector is transitioning towards a digitalized consumer society in the context of widespread food safety anxiety. At the forefront of this transition is an innovative form of food retailing called New Retail Businesses (NRBs). Based on field research and interviews with key stakeholders in Nanjing, this study outlines distinctive features of NRBs in contrast to the conventional food system. It also points out that NRBs have shared goals with the government's Vegetable Basket Project. Thus the implementation of this project in Nanjing has propelled the growth of a local NRB. Equipped with an integrated ecological food supply chain and omnichannel retail logistics, NRBs represent a promising solution to China's food safety and sustainability challenges. In theory, they accelerate the greening of urban food systems, backed by government funding. However, this paper highlights four contradictions in this hybrid public-private transition approach: the investmentization of food consumption, over-packaged ecological food, supply chain external dependency, and undermining of the local ecological sector. The study details these contradictions and calls for further research to reconceptualize urban food system planning in the face of the current boom in NRBs.

## Keywords

China, Vegetable Basket Project, New Retail Business, urban food system planning

## Suggested Citation

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## Introduction

In China, a flood of investment from tech/internet giants into the fresh food sector has caught public attention, and led to an explosion of media coverage and business analyses. The investment has produced an innovative food retailing model known as New Retail Businesses (NRBs) (Lin et al 2019, Shi et al 2019, Wang and Li 2019, Wang and Somogyi 2019, Zhang and Wei 2018, Wang and Ng 2018). The innovative features of NRBs include the integration of online and offline sales channels (Shi et al 2019, Wang and Ng 2018), provision of dining-in services (Zhang and Wei 2018), and the application of cutting edge information technologies (Li and Subramanian 2019). These studies focus on how NRBs' technological and commercial innovations affect consumer perception and behaviour from a business perspective. Less attention has been paid to the economic and political forces underpinning NRB development, let alone the broader implications for food security, food safety, and the sustainability of local food economies.

The Vegetable Basket Project (VBP) is a central food system planning policy in China (Zhong et al 2019); its implementation at the municipal level propels the development of NRBs. VBP is implemented in a top-down manner and holds the mayors of enlisted cities accountable for urban food governance. Mayors are evaluated by a set of performance indicators from food security, food safety, to greening in production and consumption. By reviewing the policy framework, political process, and performance indicators of VBP, this paper highlights the comprehensive food system planning in China and critically assesses its merits and disadvantages in addressing China's most pressing food challenges in combination with the NRBs.

Various studies have shown that food is an invisible element in traditional urban planning in the Global North, leading to a growing emphasis on the importance of food system planning (Morgan 2009, 2013, Pothukuchi and Kaufman 1999, 2000, Vitiello and Brinkley 2014). In contrast, food provisioning in urban China has a tradition of being centrally planned and managed, and this

legacy continues to steer food system development (Zhang and Pan 2013). Researchers have recently highlighted the continuing role of public interventions in governing food security and food access in cities (Lang and Miao 2013, Zhong et al 2019). In particular, Zhong et al (2019) examine the "public-private hybrid food provisioning system" which contributes to achieving close to zero hunger in Nanjing, a city with a population of over 8 million. However, questions remain on how municipal food planning affects food safety and food system sustainability, particularly with the advent of NRBs.

This paper examines the roles of NRB and VBP in addressing food safety and environmental sustainability challenges in Nanjing using the analytical lens of risk society. This perspective has been used to understand the interlocking relations between food safety, food governance and forces of modernization (Augustin-Jean and Poulain 2018, Chatalova et al 2016, Klein 2013, Si et al 2018, Spaargaren et al 2012, Veeck et al 2008, Zhang and Zhao nd, Yan 2012, 2015). First, food risk is a useful entry point to synthesize social perceptions and reactions to food safety and environmental concerns in China, as food safety and agricultural pollution have interconnected health risks. Food-related health risks are prevalent in Nanjing. A survey of 1,170 households in the city found over three-quarters of residents worry daily about health risks in food such as input residues, adulteration, and counterfeit foods (Si et al 2018). In this paper, we propose a three-dimensional food risk framing: (a) the financial risk connected to food purchasing; (b) the environmental risk connected to food waste and packaging; and (c) the oft-discussed health risk.

Second, the risk society concept links the technical issue of food safety and environmental management to the socio-ecological process of modernization. Originating in the sociological imaginary of post-industrial welfare states in Western Europe (Beck 1992, Ekberg 2007, Giddens 1999), this concept has also been employed to discuss the social and economic roots of food safety crises (Augustin-Jean and Poulain 2018, Klein 2013, Si et al 2018, Veeck et al 2008, Yan 2012, 2015, Zhang and Zhao nd). Some argue that China has become a risk society

China (Theirs 2003, Yan 2012), while others disagree (Veeck et al 2008). According to its seminal conception (see Beck 1992), risk society comprises a postmodern critique of modernization and the reconstruction of modernity by shifting the means of modernization. The reconstructed modernization is defined by Beck as reflexive modernization. Considering this, we argue that with regard to the food system, China has not reached the stage of risk society because of its reliance on technical measures in treating social roots of food risks.

This paper examines how the NRB-VBP partnership is steering a green transition to address food risks in China's food retail sector. The paper also evaluates the NRB-VBP partnership with reference to China's alternative food networks (AFNs). The deep involvement of government differentiates the NRB-VBP partnership from the grassroots AFNs that have emerged out of food safety anxiety and environmental concerns (Schumilas and Scott 2016, Scott et al 2018,). However, criticisms of AFNs such as neoliberal complicity (Alkon and Guthman 2017) or economic excludability (Guthman 2003, Klein 2015) do not apply to this partnership. Thus NRBs have the potential to make ecological foods affordable and accessible, more so than AFNs, but this potential is restricted by contradictions between the ecological claims and practices among NRBs.

In this discussion paper, we introduce the research design and methods, and then describe the etymology of New Retail Businesses in China and compare NRBs to conventional food retailing actors. Then the Vegetable Basket Project and its role in the development of NRBs are examined. We then analyze the pros and cons of NRB-VBP joint efforts in a transitioning food retailing sector. Finally, key research findings and avenues of further research are identified.

## Research Methodology

The research for this study addressed three questions: (a) how to characterize NRBs in contrast to the conventional food retailing sector? (b) what are the political and economic forces boosting the

growth of NRBs? and (c) how effective are NRBs in addressing the risks in food security, safety, and environmental sustainability? To address these questions, four NRBs were studied during fieldwork in the city of Nanjing: two large chains (CloudKitchen and Hema) and two smaller businesses (VillageMarket and Joynow). We conducted non-participant observations within sampled NRB stores to identify the features of food packaging, pricing, and green advertising. We also set up semi-structured interviews with key stakeholders working for the local government agencies and for the NRBs. To examine the effects of NRBs on food security, safety, and system sustainability, we compared the actual practices of NRBs with their advertising claims, and analyzed consumer opinions of NRBs through online public posts on *Weibo* (a widely used social media platform, the Chinese equivalent of Twitter). The NRB advertising claims were extracted from their marketing taglines and promotional materials.

Field research data was first collected in November 2017 and primarily between April and May 2019. In total, interviews at CloudKitchen were conducted with five retail staff, one production manager, and one procurement manager with his assistant. Three sales staff at VillageMarket and one at Joynow, were also interviewed. We had informal discussions with retail staff at Hema. To draw comparisons between NRBs and organic businesses, 11 sales staff and a marketing manager at local organic enterprise, Planck, were interviewed. To understand the political support underpinning the growth of NRBs, the chief coordinator for the implementation of the Vegetable Basket Project in Nanjing, which supports the growth of enrolled NRBs, was interviewed. To investigate connections between NRBs and local ecological farms, four local organic farmers were interviewed about their interpretation of NRB models and inclination to collaborate. Two were small-scale organic farms and two were large certified organic enterprises. For the online research on NRB business development and consumer *Weibo* analysis, the following were scanned: four NRBs' websites, their WeChat (most used communication mobile app in China) public profiles, and their self-developed mobile apps

where applicable. *Weibo* tweets hashtagged under NRB names were scanned for information about consumer perceptions of NRBs. *Weibo* analysis particularly focuses on CloudKitchen because of its recent controversy. As of August 2019, in total we analyzed 47 *Weibo* posts and 580 discussion comments embedded in these posts.

## Etymology of “New Retail” in China

The phrase New Retail was coined by Ma Yun (also known as Jack Ma), founder of e-commerce giant Alibaba in 2016 (Wang and Ng 2018, Zhang and Wei 2018). In a public speech, Ma Yun introduced the concept as an innovative business prototype: New Retail erases the boundary between online stores and brick-and-mortar stores, and positions physical stores as delivery hubs for online orders (Aliyun 2017). Through stimulating online food shopping, Alibaba aims to reanimate the recent sluggish growth in its e-commerce (Wang and Ng 2018). The New Retail concept was brought to life by food store Hema (Hema *Xiansheng* in Chinese, which directly translates as hippo fresh food).

Alibaba’s competitors promptly launched their own counterparts to Hema. At the beginning of

2017, China’s fifth largest supermarket chain Yonghui (YH Group) launched an NRB SuperSpecies, under the banner of Smart Retail. In 2018, Alibaba’s e-commerce rival Jingdong (JD) piloted its project 7Fresh in Beijing, touting its invention of “borderless retail” which mirrors Hema’s philosophy of online/offline integration. These NRBs spread across the country in similar fashion. First, they established roots in China’s first-tier cities, and then gradually replicated in less affluent cities. Overall, these competing retail businesses embody similar concepts and business practices, albeit giving nuanced names to their business models. They have usually been discussed and contrasted as variants of NRBs among business reports (e.g. EqualOcean, 2019 and Econsultancy, 2019).

The media identify the rivalry between Alibaba and Tencent in the rise of NRBs (Forbes 2018, 36Kr 2018, KrASIA 2019). Because the founders of both tech conglomerates share the surname Ma, meaning horse in Chinese, this rivalry has been dubbed a two-horse race (Fortune 2018). As noted above, Alibaba is the parent company of Hema. Both Tencent and JD hold significant stakes in Superspecies, while Tencent is also the largest shareholder of JD and JD is the parent company of 7Fresh (Figure 1). There is shared trade and logistical collaboration between businesses within the same circle, but rarely across the two circles.

FIGURE 1: Shareholding relations between NRBs and parent companies



Source: Authors

As the concept of NRBs has gained traction, regional food companies begin to associate themselves with it for marketing purposes. In the city of Nanjing, local food retail chains have strategically adopted the title of New Retail in their branding. For example, the largest Nanjing-based new retail business, CloudKitchen, was initially named Babuluo E-commerce Company. In 2017, it updated this name to CloudKitchen New Retail Company.

The NRB concept also caught the attention of English-language business analytics including the Harvard Business Review (2018) and consulting firms Bain and Company (2018) and Oliver Wyman (2018). These reports depict Alibaba's NRB debut as a pioneer, foreshadowing the future of food retail in a globalized digital economy. Studies of the "Amazonification" of the food economy reveals parallel innovations led by Amazon (McKee 2018), although Alibaba is ahead of Amazon in various ways. To name one of them, many of China's 800 million mobile internet users use Alibaba's e-payment and online shopping services. It remains to be seen whether the country's NRB model will extend beyond China as the world embraces mobile apps and delivery in grocery shopping.

## Characterizing NRBs

This section describes the features of NRBs which distinguish them from conventional retail businesses. Based on the geographical distribution of storefronts, NRBs fall into two subgroups: national NRBs and local NRBs. NRBs in each group share more similarities than they do with the other group. National NRBs are dispersed across the country rather than agglomerated in any one city. Examples are Hema, Superspecies and 7Fresh. In contrast, local NRBs are mostly located in Nanjing, with a small number of branches in other cities adjacent to Nanjing. Examples are CloudKitchen, Village Market, and Joynow.

### National NRB: Example of Hema

Hema has multiple lines of products. Some are more expensive than wet markets. Others are more affordable (Table 1). One distinguishing feature is the seafood kitchen where customers could order seafood swimming in fish tanks and have it cooked in store. This sets Hema apart from wet markets.

**TABLE 1: Price Comparison, May 2019**

Produce	Produce price at different retail outlets (CNY per 500 grams)			
	Market average (12 wet markets)	CloudKitchen	Hema	Hema Organic
Shanghai Bok Choy	2.4	2.9	1.4	23.0
Carrots	2.8	3.4	2.4	23.5
Broccoli	6.1	9.0	6.6	n/a
Crown Daisy	4.7	4.8	8.0	23.0
Green chilli peppers	4.5	4.7	12.0	25.6
Celery	4.0	4.8	3.8	n/a
Romaine lettuce	2.7	4.9	8.0	19.7
Chives	2.8	n/a	19.7	25.6
Edible amaranth	3.2	5.8	7.0	23.0
Tomatoes	4.1	7.8	5.6	25.4

Source: Authors

Colour coding indicates the price difference in contrast to the average level among 12 selected wet markets. The average level was monitored and published online by Nanjing Bureau of Commodity Price.

■ Green lower than market average.

■ Orange higher than market average and the price difference is below 100%.

■ Dark red higher and the price difference is between 100% and 500%.

■ Bright red higher and the price difference is above 500%.

Vegetables at Hema are sold in various categories including Best Deal, Daily Fresh, or Organics. Its line of Daily Fresh supplies fresher food than at wet markets. As of May 2019, 43 varieties of leafy greens, legumes, tubers, mushrooms and fungus fell into this category. As the name suggests, Daily Fresh claims that its foods claim are shelved the same day they are harvested. Also, they only stay on the shelf for one day before disposal. In contrast, the majority of wet market vendors procure food from wholesale markets and cannot guarantee that their foods are harvested the same day.

Organic foods at Hema are sourced from a local organic enterprise Back to Farm, and similar to other certified organic foods on the market, they are consistently and significantly more expensive. They are also certified with the most strict standards of production and are associated with good quality and low health risk. Therefore, organics appeal to consumers who are willing to pay for quality.

The Best Deal line provides more affordable foods. Three vegetables below the average price levels of wet markets are in the Best Deal category.

Another distinguishing feature is the unit-based standardization of food assortment and quality control. At Hema, every vegetable is individually packed with plastics and priced by unit rather than by weight. For instance, we saw two Daikon radishes individually wrapped in plastic and marked at the same price despite different weights. The sales staff explained that despite the variation, no vegetables weighed less than what was on their tags, so consumers suffered no loss. The standardization of food sales facilitates online sales by sparing consumers the need to pick foods at physical stores.

Overall, the national NRBs have abundant investor funds and are armed with logistic innovations and broadened categories, and therefore provide competition with wet markets.

### Local NRBs

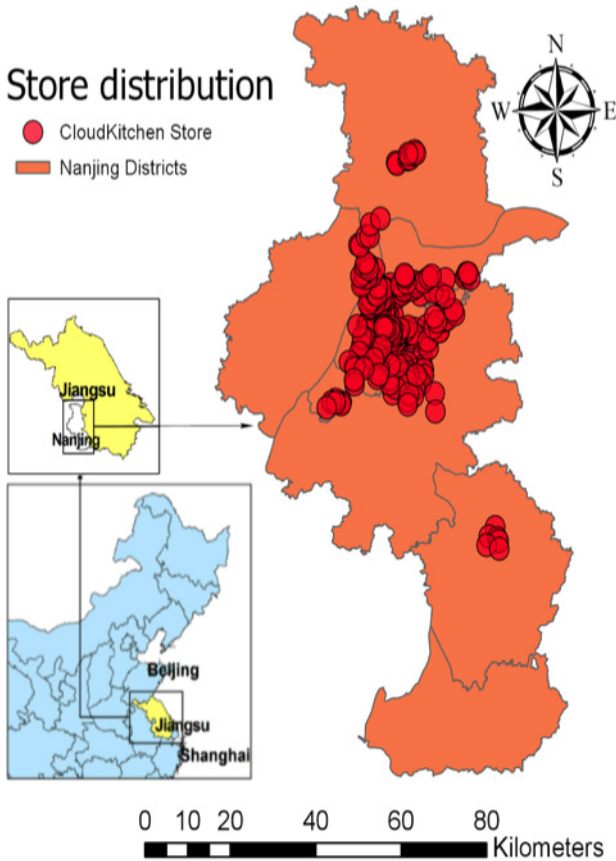
Local NRBs mimic national NRBs in their unit-based standardization and online-offline

integration, but they have new features such as community-based store planning, integrated supply chains, and affordable ecological foods. Ecological foods in China are officially certified by three progressively strict standards—hazard-free, ecological, and organic. Local NRBs in common sell hazard-free foods. CloudKitchen sells food of all three standards.

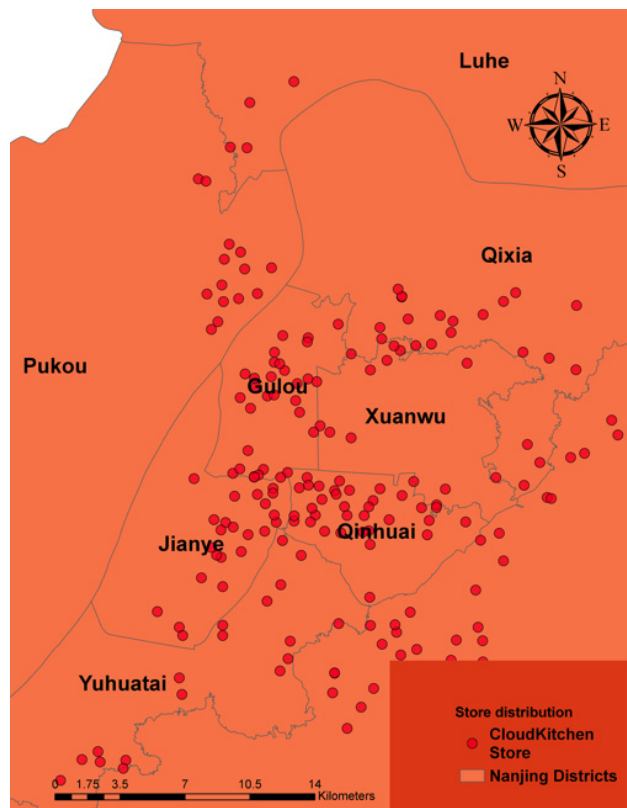
The fast growth of local NRBs is enabled by their small-sized community store model. A standard CloudKitchen chain store is around 100m<sup>2</sup> (Jiangsu Department of Commerce 2018), although most stores are below the standard size, and many are smaller than 50m<sup>2</sup>. VillageMarket and Joynow own similarly sized storefronts. Smaller size means smaller costs such as rent and employment. At local NRBs, only one or two employees tend the store. In contrast, each Hema storefront is between 5,000m<sup>2</sup> and 10,000m<sup>2</sup>. Two of the Hema stores researched both have over 30 employees who were tending the shelves, ushering customers, cooking in the kitchen, and sorting items for online orders for delivery. The stark contrast in store size and number of employees between local and national NRBs indicates that national NRBs commit larger initial investment and maintenance costs to each storefront.

CloudKitchen is the largest NRB in the city, and its staggering growth has occurred in a very short timeframe. In only three years from April 2016 to May 2019, CloudKitchen built 238 stores. The majority of the stores are clustered within the central urban districts (Figures 2 and 3). On its website, CloudKitchen claims that it serves 300,000 households and 800,000 members with further growth anticipated. The procurement manager at CloudKitchen mentioned that the company aims to expand further to 300 stores within the city, and to 1,000 stores in peri-Nanjing region, stretching into adjacent cities such as Changzhou. Overall, the business model of CloudKitchen prioritizes speed and scale, both premised on continuous expansion of investment. To maintain the inflow of capital, CloudKitchen seeks investments from its parent company, government departments, and consumers. Growth in quantity of stores and scale

**FIGURE 2: Distribution of CloudKitchen Stores in City of Nanjing, 2019**



**FIGURE 3: Distribution of CloudKitchen Stores in Central Nanjing, 2019**



of production attracts more consumer and government interest, leading to further expansion.

Local NRBs can be seen as community stores not only because of their small size, but also because they employ various strategies to build and maintain a consumer community. For example, CloudKitchen store managers create chat groups on WeChat and invite consumers to join. Special sales and promo codes are first published within such WeChat groups. Customers can also request that store managers reserve orders for pick-up. Moreover, consumers are invited by staff to sign up for special memberships, and the business regularly organizes free outings for members at its production centres. Local NRBs therefore cultivate a consumer community with exclusive membership benefits and direct in-person communication with store staff.

Another feature of local NRBs is that they provide affordable ecological vegetables. In their marketing campaigns, they tout their self-operated food supply chain as the reason for the affordability. CloudKitchen, for example, declares on its website that vegetables are freshly shipped to stores within six hours of harvest at its two production centres. It profiles one of its production centres as environmentally conscious, safe, and green. Only organic and non-toxic pesticides are used and weeds are pulled out by hand. Similarly in marketing campaigns, another local chain, Joynow, claims that its vegetables are sourced from certified hazard-free farmer cooperatives and large farms in Jurong. VillageMarket’s official vegetable production centres are in Mingguang, Anhui Province, and are described as “from the wilderness” and “no contamination.” Table 2 shows the diverse narratives adopted by local NRBs. They therefore appear to



**TABLE 2: Food Quality and Ecological Features in NRB Marketing Campaigns**

NRBs	CloudKitchen	VillageMarket	Joynow
Variety of ecological foods	Hazard-free food Organic foods	Self-claimed ecological food	Hazard-free food
Discourse on ecological foods (keywords)	“Hazard free” “Cleaner” “Direct from production centre”	“From the wilderness” “No contamination”	“Green” “Hazard free” “No contamination”
Source: NRB websites and interviews with sales staff			

be addressing safety risks by building their own food supply chains. And they undercut organic farmers, thus forming an affordable alternative to organics. With hazard-free certifications, local NRBs deliver eco-themed narratives to convince consumers the quality superiority over conventional foods.

## Vegetable Basket Project

Local NRBs have various innovative features including building their own food supply chains, standardization, diversified food quality claims, and omnichannel food provision. This section argues that the boom in local NRBs is linked to local government efforts to manage food risks. It shows how the Vegetable Basket Project (VBP) has animated and accelerated CloudKitchen’s growth. We explicitly focus on the case of CloudKitchen because its market expansion has outpaced that of other NRBs in Nanjing and it is a confirmed member of the VBP. CloudKitchen’s extensive involvement in VBP was emphasized by both its sales staff, procurement manager, and VBP’s official coordinator. To contextualize VBP’s influence on CloudKitchen, a brief overview of this project is necessary.

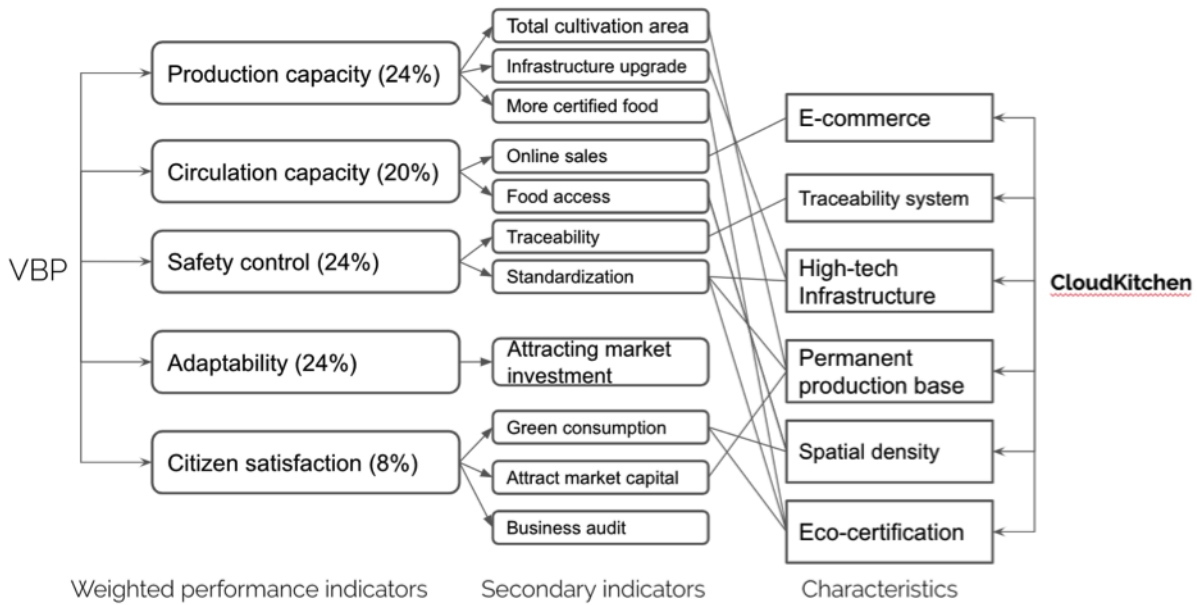
VBP was initially launched by the central government in 1989 to stabilize the non-grain food supply in Chinese cities (Tuan and Ke 1999, Zhong et al 2019). It initially concentrated on infrastructure enhancement and its objective was to increase yields and ease the shortage of non-grain foods such as vegetables, meat, and fish in cities. Over three decades, the policy objectives evolved beyond the productivity imperative and expanded to risk

monitoring and food safety enhancement. In 2017, the state council outlined five evaluation parameters to assess the implementation of VBP among 36 listed Chinese cities. From then on, an evaluation score is assigned to each city every two years. Mayors of participating cities are held accountable for their city’s score and the score is translated into a four-grade rating: excellent, good, fair, or failed. Failed cities are required to carry out a self-improvement plan. In contrast, mayors garnering two excellent ratings are publicly praised and acknowledged. Given the explicit impact on a mayor’s political performance, it stands to reason that municipal governments are politically motivated to fulfill the five parameters and obtain a good rating.

The five parameters are each assigned a weight in the rating rubric: production capacity (24%), safety control (24%), adaptability (24%), circulation capacity (20%), and citizen satisfaction (8%). In the city of Nanjing, VBP is implemented through a localized “hybrid public private model” which has made Nanjing a city close to “zero hunger” (Zhong et al 2019). The 2018 VBP implementation mandate from the Nanjing mayor’s office breaks down the mission into 14 tasks for subsidiary government departments. These tasks demand the transformation of multiple food retailing entities such as wet markets (Zhong et al 2019).

Figure 4 synthesizes relevant content in the document and outlines CloudKitchen’s role. CloudKitchen contributes to and benefits from the implementation of VBP in Nanjing. The chief coordinator for the implementation of VBP in Nanjing said that CloudKitchen gained more attention than other NRBs from local government as it was a local company and because of its sheer

FIGURE 4: VBP Performance Indicators and Alignment with CloudKitchen



size and abundant stores. In addition, he indicated that CloudKitchen’s staggering growth is fuelled by government subsidies, and as a business grows it can qualify for even larger subsidies. A chain like CloudKitchen with more stores and operating such a large scale would inevitably attract attention from multiple government departments.

The procurement manager for CloudKitchen helped quantify government support. He said that whenever CloudKitchen opens a new location the company receives a government subsidy worth CNY100,000 (approx. USD14,500). In addition, CloudKitchen’s 800-hectare production complex, Babuluo, has received support for large-scale modern farming. Its central kitchens and food processing workshops were also built with public funds, although the exact amount of public funding was not disclosed. In addition to monetary subsidies, local government department provides in-kind support. The production manager at Babuluo stated that the rapid expansion of CloudKitchen had “earned respect” from local government.

Babuluo is both a designated production complex for CloudKitchen and an ecotourism site with facilities including hotels, restaurants, water golf, and hot air balloon fields serving CloudKitchen customers and other tourists. In late August 2018,

a nation-wide agricultural land audit action was launched, for farmland conservation, to demolish unregistered non-agricultural structures on farmland. This action initially was put forward to remove residential structures illegally built on arable land (see Govcn 2018). Since then, farmers across the country, including some ecological farmers in Nanjing, reported that their agrotourism facilities and buildings were demolished at their own expense. Yet, Babuluo managed to keep all its recreation infrastructure intact including its hotels and restaurants, because local officials assisted them in altering the registry of their tourism land from agricultural use to commercial use. This is only one example of how CloudKitchen benefits from in-kind political support.

CloudKitchen is expected to return the favour to the government. The procurement manager noted that to help the Nanjing government meet the VBP criteria of fresh food outlet density and the promotion of certified foods, CloudKitchen cooperates to hit various benchmarks. The benchmarks include the total number of stores, varieties in food certifications, and quality requirements. Despite being somewhat opaque to the public, the liaison between CloudKitchen and the municipal government marks a novel approach to govern food risks in food retailing and consumption. The emphasis

of VBP is access to fresh food outlets, technological upgrading, and promotion of safe and ecological food. CloudKitchen assists with all these goals by combining e-commerce services with a physical store network, building a high-tech large-scale permanent vegetable production base, and supplying certified foods.

At least on the surface, this partnership between CloudKitchen and the municipal government contributes to food access, food safety, and sustainable transitions of local food production in Nanjing. Through regulatory reform and corporate innovations, the NRB-VBP partnership has the potential to make food more accessible, healthier, and sustainable for all. However, in spite of its promise, this NRB-VBP partnership to govern food risks is not without its contradictions. Long-term food risk mitigation goals are compromised in favour of short-term profitability and capital accumulation. Thus, NRBs may not effectively address food safety risks by exposing consumers to broader risks.

## Contradictions in NRB-VBP partnership

Using the example of CloudKitchen, this section divides the contradictions into four categories: investmentization of food consumption,

over-packaged ecological food, supply chain external dependency, and undermining of the local ecological sector.

### Investmentization of food consumption

At local NRBs, customers are invited to sign up for memberships. Members can make investments in two ways: deposits and capital investment.

First, consumers can make deposits in their prepaid member cards. The NRBs periodically offer rewards based on deposits. In order to incentivize larger deposits, the value of the rewards are proportional to the volume of deposits. Rewards are given as credits on prepaid cards and are allocated in installments. Table 3 shows the reward protocol at three local NRBs. Customers also garner other benefits by making deposits. For example, complimentary group tours are organized by the three local NRBs. These tours take consumer groups to visit the production centres with pick-your-own activities and workshops. At Babuluo, customers who have made deposits at CloudKitchen can access hotel and restaurant services with a discount.

This deposit scheme reflects the investmentization of food consumption, because consumers make deposits upfront, not for short-term consumption but for financial rewards in long-term installments.

**TABLE 3: Rewards for Prepaid Card Deposits at Local NRBs**

CloudKitchen	VillageMarket	Joynow
Deposit 10,000 for 3,000 bonus credits (1,000 credit immediately, 1,000 next year, 1,000 the year after next)	Deposit 500 for 50 bonus credits	Deposit 1,000 to get 120 back, with two coupons for agro-tourism worth of 68 each
Deposit 5,000 for 2,000 bonus credits (320 immediately, the rest is redeemable at 70 per month for 24 months)	Deposit 1,000 for 100 bonus credits	
Deposit 3,000 for 800 bonus credits (200 immediately, the rest is redeemable at 50 per month for 12 months)	2,000 for 400 bonus credits	
Deposit 1,000 for 150 bonus credits (30+20*6)	9,000 for 3,000 deposited in installments	

Source: Interviews with in-store staff and online research

Second, according to *Weibo* posts and comments, CloudChicken also has an investment program separate from deposits. It is an underground and possibly illicit channel for capital investment with an above 10% return on investment. Its target investors are elderly customers. No formal contracts are signed and no public announcements are made about this investment program.

The investmentization of consumption has several drawbacks. First, consumer deposits run the risk of depreciation in value in the event of store-wide food price hikes. Local NRBs do not guarantee that food prices will follow the indices of general inflation. If local NRBs decide to raise their prices faster than the general food market, consumer deposits shrink in value. Second, a related and perhaps more severe financial risk, is for consumers to lose their deposits altogether. So far no insurance or exit planning is built into deposits or capital investments.

In August 2019, the financial struggles and impending collapse of CloudKitchen spread angst among invested consumers. *Weibo* tweets and media reports revealed that CloudKitchen was troubled by a capital chain rupture. CloudKitchen employees reported on *Weibo* that their salary payments had been stalled for months. In addition, numerous physical CloudKitchen stores shut down. Those that remained open only had a limited supply of food that sold out immediately upon delivery; CloudKitchen announced to consumers that their membership credits were frozen for three months and any purchases during those three months had to be paid in cash.

Operational failures in the NRB model are already starting to surface, and consumers are beginning to realize that they risk losing their deposit and investments (which can amount to hundreds of thousands of *yuan*). Respondents at both the production centres and headquarters declined to comment on the investment scheme. CloudKitchen's procurement manager did mention that CloudKitchen was running at a deficit and all investments are "like a gamble". If the business is a gamble, then the risk of gambling is clearly shouldered by consumers.

In September 2019, CloudKitchen was acquired by a dragon-head dairy enterprise based in Nanjing, although it is unclear whether the dairy enterprise will refund CloudKitchen customers' investments.

### Over-packaging the ecological

Across the board, unit-based standardization is the default fashion to display and deliver food in NRBs. Each vegetable and fruit is individually packaged so they could be sold as a "stock keeping unit." The standardization process, involves the use of excessive packaging. To keep food wrapped in uniform styles, with tags and QR codes attached, clear plastic bags or plastic mesh bags are used, even on foods like bananas, apples, and squash that are not individually wrapped at other outlets such as supermarkets. Si et al (2015) find that consumers of ecological food are less concerned about environmental effects than health implications. To a certain extent, this explains the overpackaging of ecological foods at NRBs. With little consumer backlash, NRBs are not inclined to invest in plastic food waste management.

Additionally, waste management protocols at some NRBs contradict the ecological philosophy of minimizing food waste. At CloudKitchen, for example, old vegetables will go on sale at reduced prices, but unsold vegetables eventually end up in dumpsters still wrapped in plastic. According to one company respondent, dumping expired food made the most economic sense, and it was too costly to retrieve expired vegetables from 238 shops to centrally compost them. News reports indicate that Hema also dumps fresh food on a "large scale", prompting public outrage (Guanha 2019). This is different from wet markets which have agreements with waste management companies to handle food waste. Wet market vendors also take unsold food home which reduces food waste.

## Supply Chain External Dependency

Despite NRB efforts to establish their own private food monitoring system, loopholes exist. In 2018, for example, one media outlet revealed a “labelgate” scandal at a Hema chain in Shanghai (Techfood 2018). Staff intentionally attached mismatching labels and QR codes to “expired” carrots. Original labels were torn off, and new labels attached which indicated a new expiration date. This example shows how one small manual misconduct can corrupt the credibility of Hema’s hightech-backed supply chain and traceability system.

Similar drawbacks are found in CloudKitchen’s self-managed food supply chain. CloudKitchen’s traceability is based on its food supply chain including two production bases, six central kitchens, and over 200 cold-chain transportation trucks. During interviews, CloudKitchen’s sales staff claimed that all vegetables are freshly picked from their production centres. However, CloudKitchen’s production centres are unable to supply sufficient vegetables and fruits to all of its rapidly expanding number of stores. The production manager at its largest production centre, Babuluo, said that none of the food harvested at that centre was delivered to retail stores, but rather catered to visitors and on-site restaurants.

Furthermore, CloudKitchen’s procurement manager observed that 70% of the company’s second largest production centre (*Runkang* of 100 hectares) is left fallow due to rising labour costs. Consequently, the major source of produce for stores is actually not their production centres but external producers or wholesale markets. Importantly, externally procured food does not guarantee the ecological standards as advertised. The manager further disclosed that when it comes to selecting external produce sources, price and quantity outweigh other factors such as quality or environmental integrity.

Another source of external procurement is a local organic food enterprise, Back to Farm, although

only one store stocks this organically certified food. CloudKitchen initially sold Back to Farm organics at 10 of their stores, but most stores terminated organics due to a lack of demand. The one store was left to prove to government that they carry organically-certified foods.

## Undermining Local Ecological Sector

Organic farmers interviewed were very critical of NRBs. A Shanghai-based organic business leader, Xiang, openly denounced Hema for its slogan of “making organics cheaper”, telling us that it will only drive honest organic farms out of business. In his words, “Hema’s low price strategy will not only destroy new retail, but will also destroy the organic sector”, because authentic enterprises cannot tolerate prices that are lower than production costs. He also believed that household consumers of organics are not price sensitive, and as an organic enterprise, they needed to maintain a high price to ensure revenues and good service. One local certified large organic farmer had a business negotiation with Hema, yet refused to accept the proposal. In his account, Hema proposed to take the majority of profit by reselling his organic products, leaving him with thin margins. In a meeting, a sales representative from Hema noted: “To work with us, you will have to realize one thing – (in profit redistribution) we shall eat the meat, and you will only get the broth.”

The perception of power imbalance is consistent with the views of sales managers at several other local organic farms. The manager of one large local organic farm, said “if we work with Hema, we essentially are becoming their employees,” indicating that working with Hema would not only squeeze their profit, but also undermine their autonomy. They also take issue with the standardization feature of NRBs. Hema demands a stable supply of standardized food units, and its fixation on standardization contradicts organic farmers’ fundamental principle of producing seasonal and natural foods.

## Conclusion

NRBs are forerunners of a retail transformation embedded in China's booming digital economy. In contrast to supermarkets, NRBs feature omnichannel shopping, cost-free delivery, and unit-based standardization in packaging and shelving. These features may appeal to China's tech savvy and time-crunched millennial eaters. While China's embrace of digitalization and standardization in the fresh food sector is not unique, the speed and scale of these transformations are unparalleled. A key question for further research is whether New Retail will supplant traditional wet markets to become the dominant retailing format of fresh foods in China.

At the local level in Nanjing, the NRB Cloud-Kitchen is enrolled in the implementation plan for the government's Vegetable Basket Project. Armed with VBP funding, this partnership has the potential to stimulate ecological food production and consumption. However, as this paper shows, the current partnership is flawed by four contradictions: the investmentization of consumption, supply chain external dependency, undermining local ecological sector and over-packaging. The rise of NRBs is disrupting Nanjing's food retailing sector and undermining the viability of wet markets and marginalized ecological farms, which have important implications for food security, food safety, and sustainability in the region. Also, it remains to be seen how CloudKitchen will adapt in the face of its financial struggle and how the NRB-VBP partnership will adapt to address its contradictions. These important questions merit further research.

Building on the existing literature that examines food safety through the lens of the risk society (Augustin-Jean and Poulain 2018, Chatalova et al 2016, Klein 2013, Veeck et al 2008, Si et al 2018, Spaargaren et al 2012, Yan 2012, 2015, Zhang and Zhao nd), it is necessary to extend the parameters of food risks beyond health factors, and include financial and environmental risks that are pertinent to day-to-day food shopping. This three-dimensional understanding of food risks allows us to grasp the

growing complexity faced by consumers in China's shifting food environment. Contradictions between the VBP goals and NRB practices suggest that China's food system transitions have yet to embark on a process of reflexive modernization. The crux of reflexive modernization is disenchantment with technical solutions to social problems and a turn from uniformity to diversity. However, technology innovations and uniformity building attract ever-growing investments while diversified alternative food networks remain marginalized. Food risks are reshaped, but not reduced, by these trends when combined with lax corporate regulation and a formalistic approach to environmentalism. Further research is urgently needed into these regulatory constraints and the evolution of the modernization trajectory of China's food system.

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