

China's Export of Dry Beans: The Reverse Side of the Domestic Grain Market

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Abstract

The purpose of this paper is to reveal the development of China's exports of dry beans by examining bean production, trade, and conditions for peasants since 1995. Analysis in this paper shows that the production and exports of dry beans reflect reverse trends from those in China's domestic grain market. The surplus of grain in northeast China led to the shift of productive capacity from major grains to dry beans; thus, fostering the rapid growth of exports in the dry bean industry during the late 1990s and early 2000s. However, since 2010, the recent grain boom has brought obstacles hindering further growth of dry bean exports and, at the same time, the surplus of major grain is shrinking. The development of dry bean exports in northeast China reminds us of what Myint referred to as "vent for surplus."

Keywords

Dry bean export, kidney bean, vent for surplus, China's grain market, peasants

I Introduction

As the world's largest importer of soybeans as well as a net importer of corn since 2010, China's grain production and trade—especially those of major grains such as corn, rice, wheat, and soybeans—have drawn increasing attention from scholars. However, to gain a better understanding of China's grain market, we must also examine the dry bean industry because it can be viewed as the reverse of China's major grain market.

The main purpose of this paper is to reveal several simple facts related to China's dry bean exports since 1995 by examining trade data and changes in the domestic market of

three major export commodities, namely the kidney bean, mung bean, and adzuki bean. The argument here is that dry bean exports do not merely reflect the reverse state of the major grain market. Rather, the expansion of dry bean exports was actually caused by the surplus productive capacities of major grains in the northeastern provinces during the late 1990s and early 2000s, a development model that Myint (1958) called the vent-for-surplus.

Dry beans are officially considered grain crops (*liangshi zuowu*) in China; dry bean production is also included in the count of the country's grain production.¹⁾ Areas of dry bean production overlap substantially with those of corn, soybean, and potato. Although dry beans are categorized as vegetables in the international trade commodity classification, I will adopt China's official categorization of grains in this paper; therefore, defining beans as grains, and dry beans as beans excluding soybean and dry peas.

Within China's agricultural policies, dry beans appear the least often of all grains. The central government removed restrictions on the dry bean market in 1984. No policy has been announced since then to support dry bean production. Its belittled political presence is due mainly to small-scale and dispersed production of each commodity, which also leads to a lack of official statistics. The limited available data on dry bean production consists of incomplete information on the provincial production of mung beans, adzuki beans, and broad beans since 1998 (*China Agriculture Statistics Report*), as well as producer price indices of several commodities since 2002 (*China Yearbook of Agricultural Price Survey*).

Political unimportance and lack of official statistics have led to a dearth of academic research on China's dry bean industry. However, this topic is worth studying for the following reasons. First, according to UN Comtrade, China is the world's largest exporter of kidney beans (37.4% in world export value in 2012), mung beans (47.8%), and adzuki beans (67.9%). Changes in China's domestic market of these commodities greatly affect international prices and related industries in importing countries. Second, because dry beans are generally produced as cash crops by peasants on marginal land where productivity of major grains is relatively low, the production and marketing of dry beans

1) According to *China Statistical Yearbook 2013*, grain production (*liangshi chanliang*) includes production of cereals (corn, rice, wheat and others cereals such as millet, buckwheat etc.), beans (soy bean, mung bean, kidney bean etc.) and potatoes (5kg counted as 1kg of grain).

reflects the bottom tier of China's agricultural sector. Third, dry beans are among those agricultural products whose production and distribution were liberalized as early as 1984 in China. Unlike the major grain market, the dry bean market has not been under strong state control for approximately 30 years. This makes the dry bean market essential to understanding the behavior of peasants and traders in a comparatively free market.

Recently, several studies on the dry bean industry have been conducted in China and Japan. Liu (2012) offers general trade data of dry beans and peas from the 1990s. Chai and Wan (2007) provide an informative industry report on minor crops including dry beans, and they estimated the production volume of each commodity by province. At the University of Tokyo, we set up a research project on China's dry bean industry in November 2012. Some fruits of the project are published as Tajima and Zhang eds. (2013) and Zhang (2014b); the former focused on the mung and adzuki beans while the latter focused on kidney beans. The two studies show that the mung and adzuki beans have been important commodities for export, and have contributed to the economic development of rural areas in northeast China since the 1950s. The export of mung and adzuki beans became stagnant in the 2000s; however, the export of kidney beans grew dramatically during this period.

The aforementioned studies have revealed each dry bean commodity's production and export volume. In this paper, by utilizing the outcomes of previous studies, I will focus on the development of the kidney bean, mung bean, and adzuki bean market as a whole, in comparison with the major grain market.

China's central government liberalized its rural grain market nationwide only after 2004. While most studies measured the effects of China's constantly changing agricultural policies and the grain distribution reforms since the 1980s,²⁾ Huang and Rozelle (2006) offered an insightful view that the grain market had possibly developed even before the official liberalization in 2004. After analyzing prices in major wholesale markets across the country, they pointed out that the grain market had steadily developed in rural China since the late 1990s. However, this conclusion can be interpreted from another perspective if we consider the fact that the market situation was sluggish due to a large grain surplus in the late 1990s and early 2000s.³⁾ When grain prices were low and the surplus of major grain was large, it would be natural for producers and traders to shift

2) For instance, Wu and McErlean (2003), Yamamoto (2000).

3) See Ikegami (2012) Chap. 6 and Chap. 7 for details. Among numerous studies on China's grain market and

their resources to other profitable commodities in the grain market.

When Myint (1958) brought forward the now well-known “vent for surplus” theory, he clearly pointed out that with a surplus of productive capacities, peasants would apply their resources to producing export commodities while remaining self-sufficient with respect to basic food crops. He also mentioned that peasant export sectors usually managed to expand as rapidly as plantation export sectors. In this way, the surplus of productive capacities may form opportunities and foster the growth of the export sector of a new crop in land-abundant areas. However, surplus does not guarantee sustainable development of the export sector or the local economy. Rather, as Myint (*ibid.* p334) suggested, and by using the case of Java as an example, when population pressure begins to increase, the resources that have already been diverted into export production might be shifted back to the production of domestic food crops; under deliberate policies, the export sector will thus be pushed back to an unfavorable position.

Myint would not have expected “vent for surplus” to be applicable to China because the nation as a whole has always been considered populous and land-scarce. Nevertheless, I must argue that northeast China, the nation’s most important grain-producing area today, is endowed with abundant agricultural land and labor. This part of China had suffered from problems caused by grain surplus during the 1990s and early 2000s. The argument here is that the surplus of grain in northeast China led to producers shifting grain productive capacity to dry beans and fostering the rapid growth of the dry bean export industry in the 1990s. The grain boom since 2008, backed by the government’s production support, has led to the decline of the surplus of grain, and at the same time, introduced obstacles to further expansion of the dry bean export.

In Sections II and III, I will explain changes in grain production and trade of dry beans after 1995. In Section IV, I will describe the conditions of dry bean production. In Section V, I will summarize how dry beans acted as the vent for domestic grain surplus and will touch upon several policy implications on the economic development of major grain-producing areas in China.

grain procurement system, Ikegami (2012) is a comprehensive study that covers changes in both market conditions and government policies from the 1980s.

II Grain Production and Dry Beans

China's grain production after 1995 went through four stages as shown in Tables 1 and 2: (i) the period of high production, high price (1995-1999). Grain production in 1996 reached 504 million tons for the first time, and it remained around 500 million tons until 1999. Average grain price was 1.32 yuan/kg, but prices started to decline in 1996 due to increased production; (ii) the period of low production, low price (2000-2004). During this period, annual production never reached 500 million tons. Production in 2003 was 430 million tons, the lowest in 20 years. Producer price of major grain dropped to a 5-year-average of 1.11 yuan/kg; (iii) the recovering period (2004-2007). Production and producer price were back to levels of the late 1990s. Production recovered gradually from 469 million to 501 million tons. Average price also rose to more than 1.40 yuan/kg, except in 2005; (iv) the grain boom (2008-present). This may be the most pleasant time for grain producers in China after 1949. Production boomed from 528 million tons in 2008 to 589 million tons in 2012, and the price soared from 1.67 to 2.40 yuan/kg at the same time.

What interests us is that, although beans (including soybeans) have always been considered part of the grain production, they have exhibited different trends from the production trends of major grains. When production and producer price of major grains was at the lowest from 2000 to 2004, bean production was comparatively high, accounting for more than 4% of total grain production (Table 1). If we examine bean production by dividing it into the four periods as mentioned above, we can find that it went through stages of: (i) low annual production of around 18-19 million tons; (ii and iii) high annual production above 20 million tons in most years; and (iv) decrease of production to the level of the late 1990s.

Soybeans generally account for 70-80% of China's bean production. Other beans include the mung bean, adzuki bean, kidney bean, and the broad bean; the former three being the major export commodities in recent years. Table 1 shows that production of the mung bean, adzuki bean, and others were all at high levels between 2000 and 2004. Production of these beans, however, declined sharply after 2008. Unlike the mung bean and broad bean, the kidney bean is not consumed widely in the Chinese diet. It is estimated that more than 80% of China's kidney beans are exported to other countries (USDA, 2011). The large increase in kidney bean exports in 2001 and 2002 (Table 4) reveals that the production of kidney beans also expanded when the major grain market

was stagnant. These facts show that the changes in bean production and major grain production have contradicted each other since 1995.

On the other hand, producer price of dry beans is largely influenced by the price of major grains. Two facts can be pointed out according to the producer price indices shown in Table 3. First, producer price indices (2002=100) of major grains and dry beans were all at their lowest levels around 2002 and they recovered gradually after 2004. Notwithstanding the reverse trends in the production of dry beans and major grains, the prices of these commodities generally fluctuated in the same direction. Second, the price of dry beans did not increase as fast as that of major grains after 2004. While the prices of major grains kept rising after 2011, prices of the mung and adzuki beans started to decline. This is because market demand for corn kept increasing after 2006 and the Chinese government continued to raise the price floors of the four major grains by implementing policies of national grain purchase and storage. No supportive agricultural policies are targeted at dry beans, leaving the production and prices of dry beans under the direct influence of the domestic market and international demand.

Another point worth mentioning is that since the late 1990s, production of the kidney, mung, and adzuki beans is concentrated in the grain-producing area in northeast China. This area covers Inner Mongolia, Jilin, and Heilongjiang.

Prior to the 1990s, kidney beans were mainly planted in small scale in the mountainous areas of Sichuan, Yunnan, and Guizhou for local consumption and only a small portion was exported. Currently, however, kidney beans are planted in more than 11 provinces in China, and the main producing areas are the northeastern provinces mentioned above (famous for commodities such as light speckled beans, small white beans, and black beans), Shanxi Province (dark red beans), and Yunnan Province (large white beans) (USDA, 2011). According to Zhang (2014b), large-scale kidney bean production did not appear in the northeastern provinces until the end of the 1990s. Nevertheless, more than half of China's kidney beans have been produced there since 2008.

In 1995, Henan Province was the largest producer of adzuki and mung beans at a respective 145,047 tons (29% of China's total) and 108,466 tons (18%). Other major producing areas are Yunnan, Jilin, and Heilongjiang for the adzuki bean, and Shaanxi, Jilin, and Hebei for the mung bean (*China Agriculture Statistical Report 1995*). Jilin, Heilongjiang, and Inner Mongolia became increasingly important in dry bean production after 2000. In 2012, Inner Mongolia and Jilin accounted for 25% and 12%, respectively, of

China's mung bean production while Heilongjiang and Inner Mongolia accounted for 30% and 14% of the adzuki bean production (*China Agriculture Statistical Report 2012*).

III Trade of Dry Beans

Dry beans are categorized as leguminous vegetables (dried, shelled) with HS code 0713 in the international trade.⁴⁾ According to the Global Trade Atlas, more than 80% of leguminous vegetables imported to China are peas, and this has been fairly consistent since 1995. Due to the increase of pea imports, China's annual import of leguminous vegetables rose from around 100,000 tons prior to 2005 to more than 1 million tons in 2013.⁵⁾ While the trade of peas is beyond the interest of this paper, it should be noted that imported peas are mainly used as raw material to replace corn in processing starch, and to replace mung beans in processing vermicelli (*fensi*, a traditional food commonly eaten in China). With rising prices of corn and mung beans, China's import of peas soared in recent years.

The quantity of imported kidney and adzuki beans are below several thousand tons each year, so they are definitely export commodities. As for mung beans, reflecting the recent increase in domestic demand, annual imports jumped to more than 79,000 tons in 2008 and 2010, from the normal quantity of 10,000-20,000 tons. Even so, compared to the volume of exports, mung bean should also be considered a net export commodity.

More than 90% of China's export of leguminous vegetables consists of various dry bean commodities, while pea exports only accounted for less than 1% by quantity in 2013. The export of leguminous vegetables has been increasing over the years. Annual volume was around 600,000 tons before 2001 but reached more than 800,000 tons after 2002. Years in which China exported large volumes of leguminous vegetables were 1995, 2003, 2008, 2009, and 2010; each year with a recorded quantity of over 1 million tons.

The structure of dry bean exports changed dramatically after the late 1990s. The growth in dry bean exports has been driven by the expansion of kidney bean exports since 1995. According to Chai and Wan (2007), kidney bean exports were 6,455 tons in

4) Trade figures are from the Global Trade Atlas unless otherwise noted.

5) In 2013, China's import of leguminous vegetables reached 1,106,000 tons, recording an increase of 364,000 tons from the previous year, with peas accounting for 93% in total. More than 90% of imported peas are from Canada.

1983. This figure rose to 375,000 tons in 1995, and further increased to 755,000 tons in 2008. The volume on average from 2009 to 2013 was 718,000 tons, 2.5 times of that from 1995 to 1999.

In 1995, the kidney bean was already the most important export commodity; the broad and mung beans were also major commodities with annual export of 233,000 tons and 184,000 tons, respectively. After 2000, kidney bean exports continued to expand, but exports of all other kinds of beans stagnated or even decreased.⁶⁾ Mung bean exports, although remaining at 120-130 thousand tons a year, have been unstable since 2004. China's annual export of adzuki beans had been above 60,000 tons in the late 1990s, but this figure also dropped to around 50,000 tons after 2004.⁷⁾

There are two reasons why the exports of adzuki and mung beans could not expand at the same pace as the kidney bean. First, the volume of international trade of the three is quite different. Taking the world import quantity in 2012 as an example, imports of adzuki beans were 90,085 tons and mung beans 898,171 tons. As for the kidney bean, import was 1,651,086 tons, 18 times that of the adzuki bean and twice that of the mung bean.

Another reason lies in the differences in the export structure concerning the adzuki, mung, and kidney beans. About 80% of adzuki bean production is for domestic consumption in China, leaving only around 20% for export. Japan and South Korea are China's major trade partners, together accounting for more than 70% of export quantity each year. Japan used to be the biggest importer of adzuki beans because its domestic production cannot fulfill the demands of the traditional confectionary industry. However, South Korea surpassed Japan in quantity and became the biggest importer of China's dry adzuki beans after 2004.⁸⁾ In 2013, exports were 25,056 tons to South Korea and 16,081 tons to Japan.

Mung bean exports generally account for 15-20% of domestic production. Export volume increased largely in 1999, 2002, 2003, and 2009, mainly due to the increase of

6) Broad bean export also declined to 20,000-30,000 tons a year after 2000 and further to 13,000 tons in 2013.

7) It must be noticed that in spite of its comparatively small trade volume, adzuki bean has been exported from China to Japan since before World War II. See Liu (2014).

8) According to Tajima and Zhang eds. (2013), since 2007 annual export of the adzuki bean paste from China to Japan has been around 75,000 tons which is equivalent to 25,000 tons of dry beans. Therefore, Japan is still considered the most important trade partner for China's adzuki bean industry.

exports to India. However, mung bean exports to India have not been stable. The major importers of China's mung beans are Japan, Vietnam, the United States, the Philippines, and Indonesia. Japan and Vietnam together account for more than half of the total export quantity. In recent years, annual exports were 45,000 tons to Japan and 20,000-30,000 tons to Vietnam. However, exports to both countries decreased as China's export price became higher and higher after 2009. In 2013, exports to Japan and Vietnam was 43,670 tons (\$1,660/ton) and 18,783 tons (\$1,322/ton). As for exports to Japan, the unit price has been higher than average since 1995 because Japan buys the qualified mung beans called "Bright Mung Beans," which are produced mainly in the northeastern provinces. Thus, mung bean production and export from northeast China is under the influence of Japan's market demand in addition to changes in the domestic market.

China's kidney bean industry is an export-oriented industry. China exports more than 80% of its kidney bean production to countries all over the world. Table 4 shows that kidney bean exports increased largely in 2001, 2003, and 2008, each year expanding about 150,000 tons. In 2008, export quantity reached 755,228 tons. Large increases in export quantity indicate that there were large increases in domestic production around the years of 2000, 2002, and 2007.

Cuba, South Africa, Pakistan, Brazil, Turkey, and Italy have been major importers of different varieties of kidney beans since 1995. However, the quantity exported to each country fluctuates greatly from year to year. Cuba, once the largest importer of China's kidney beans, accounted for 10-20% of total export in most years from 1995 to 2007.⁹⁾ After 2008, South Africa (81,414 tons in 2010) and Brazil (65,654 tons in 2010) emerged as major importers. The latest trade figures show that the top importers of China's kidney beans in 2013 were Brazil (217,341 tons, 34.9% of total), Venezuela (56,793 tons, 9.1%), India (52,758 tons, 8.4%), and Italy (45,944 tons, 7.3%).

No single trade partner has had constant and essential influence on China's kidney bean exports like South Korea and Japan have had on the exports of adzuki and mung beans. The expansion of kidney bean exports was not brought by expansions of trade with one or several existing trade partners, but rather by developing sales to different countries from time to time. In other words, one of the strengths of China's kidney bean industry is its capability to produce and market diversified commodities at low costs in

9) In 1998 and 2010, no export of kidney beans to Cuba was reported according to the Global Trade Atlas.

order to meet the needs of countries on different continents.

One commonality among the exports of adzuki, mung, and kidney beans is that Dalian became the most important exporting port after 2000, while Tianjin's presence as an exporting port decreased over the years. Tianjin has had an important position in China's dry bean export since the 1950s. In 1999, export via the custom of Tianjin accounted for 62% of China's total leguminous vegetables export quantity. It was so essential for dry bean exports that the adzuki beans imported from China are commonly called *Tianjin Red* in Japan, even though Japanese merchants know that these beans are not produced near Tianjin but from all over the country.

Dalian's share in leguminous vegetable exports increased over the years. In 2010, Dalian's share was 75%, while Tianjin's share dropped to 18%. As for dry beans, Dalian has been the largest exporting port for mung beans since 1999. It replaced Tianjin as the most important port in kidney and adzuki bean exports in 2000 and 2011. In 2013, export of the adzuki, mung, and kidney beans via Dalian was 28,889 tons, 88,873 tons, and 537,395 tons, respectively. The fact that Dalian is located in northeast China is essential in explaining the development of China's dry bean exports. The rise of Dalian port in dry bean exports again proves that export growth is connected to the expansion of production in northeast provinces, as mentioned in Section II.

Figure 1 shows that total exports of kidney beans, mung beans, and adzuki beans increased by the largest quantities during 2002-2003, and this coincided with the period when major grain prices were at their lowest. Another period when exports grew rapidly was 2007-2009. This trend, however, did not last long. The halt of export growth of dry beans after 2010 must have been related to the rise of major grain price as shown in Figure 1. The above facts indicate that not only the production of dry beans, but also their exports, follow the reverse of the trends seen in the major grain market.

IV Market Conditions and Peasants' Decision-making in Producing Areas

Tajima and Zhang eds. (2013, p20) point out that the production of dry beans is hardly more profitable than the production of major grains. Table 3 shows that prices of dry beans have followed similar trends of major grain prices, especially the price of corn. Then, why has dry bean production followed trends that are the reverse of major grain production? To answer this question, we must discuss the market conditions and the

decision-making of peasants' in producing areas,¹⁰⁾ especially the areas in northeast China.

There are two reasons underlying the expansion of dry bean production after the late 1990s. First, and most important, is the sluggish state of the major grain market in the late 1990s. Large increases in grain production in Jilin, Heilongjiang, and Inner Mongolia caused severe problems in the local economy due to low grain prices and an imperfect grain procurement system. Corn has been an important crop in these areas since the 1970s. The decline in corn price pushed many peasants to shift a portion of their corn production to dry beans. As shown by the price index in Table 2, producer price of corn decreased by a larger extent than the average price of major grain from 1996 to 2006. It even dropped to a level below 60 (1995=100) during 1999-2002. According to Zhang (2014a, Table 3-1), corn producers' profit was 2,811 yuan/ha on average during 1995-1999, and 2,935 yuan/ha during 2000-2004. The profitability of corn production did not recover until after 2004. Rural family earnings depend largely on grain sales in northeast China, so the stagnant price and low profitability of corn no doubt negatively affected the livelihood of rural economies.

What made the situation worse is that, even at a low price, it was not easy for peasants to sell their grains to state-owned grain companies because these companies often did not have enough funds or storage space to continue purchasing. It was obvious that state-owned companies were not capable of purchasing all of the locally produced grains. Nevertheless, the grain procurement system based on the planned economy restricted private entities from freely joining the rural grain market in major producing areas until 2004. As a result, in the late 1990s and early 2000s, the yards of peasant homes and grounds of state-owned grain companies were often piled with corn during the winters.

Producers, grain companies, and local governments all suffered from the surplus of major grains. They needed to shift part of the production to other commodities that were easier to sell. As the distribution of dry beans was not restricted by the central government since the 1980s, producers and grain companies decided to shift their production and marketing resources to dry beans. The local governments in many rural areas soon supported their decision. For example, Taonan Wholesale Market of Beans located in Taonan (洮南), Jilin Province first appeared spontaneously as an informal distribution center, formed by a number of private merchants in the late 1980s. It started

10) The majority of dry beans are produced by peasants, while some state-owned farms in Heilongjiang also produce kidney and adzuki beans.

to gain support from the local government in 2000 and is now China's biggest wholesale market of mung beans (Tajima and Zhang eds., 2013, p106). Also, state-owned farms in Heilongjiang started to plant kidney beans in order to cover losses from the decreased sales of major grains (Zhang, 2014b).

The second reason for the expansion of dry bean production in the late 1990s is that dry beans are generally planted on marginal lands in cold, mountainous, dry, or alkaline areas.¹¹⁾ Given that the productivity for major grains on these types of land is below average, peasants prefer to plant pulses for their stronger resistance to unfavorable soil and climate conditions. In major grain-producing areas, such as the central and eastern part of Inner Mongolia, the northern part of Heilongjiang, and southern Jilin, there are also large areas of marginal lands being cultivated commonly with mixed production of corn and dry beans. Producers usually decide what to plant on each piece of land according to weather conditions in the sowing season and prices from the previous year. In dry areas of eastern Inner Mongolia, peasants often have to plant beans in May, especially mung beans, as substitutes for corn if the corn planted in April did not germinate in unfavorable weather.

There is significant fluctuation in the productivity and price of dry beans. The weather conditions each year are important determinants of production. Furthermore, not only do the domestic market conditions affect dry bean price, so do the international market conditions. These are determinants on which individual peasants have no force or influence. As a result, peasants tend to use their best land for corn production. Dry bean production is pushed to the marginal lands with as few inputs as possible to reduce risks from unfavorable weather and price fluctuation. Dry bean production as a means of reducing risk is seen widely in China, especially in grain-producing areas in the northeast.

Producer price of dry beans did not increase as fast as domestic retail price and export price. According to our December 2012 field research in Inner Mongolia and Jilin, there is a large gap between retail price and producer price. In 2012, the farm gate price of adzuki beans in Inner Mongolia was 6.6 yuan/kg, meanwhile packed adzuki beans were sold at 18 yuan/kg as gifts in the local supermarket. Tables 3 and 4 also show that the kidney bean export price in 2012 was 3.5 times higher compared to the price in 2002,

11) Situations of producing areas in northeast China are based on the author's field research, conducted in December 2012 and March 2013.

while producer price rose by only 90% during the same period.

When the price of major grain stagnates and sales are difficult, like in the late 1990s, peasants and state-owned farms with experience in dry bean production will choose to use even the “not-so-marginal” land to produce beans. The opposite is true as the market price of major grains, namely corn, recovers continuously, peasants will consider producing corn even on marginal lands. With the price hike of major grains after 2008, producers are now expanding the production of corn to the largest extent possible, and at the expense of bean production.

V Conclusion

The growth of China's dry bean industry after 1995 is a two-fold story about how dry beans acted as the “vent for surplus” of major grain's productive capacity. In Section II, we discussed that dry bean production increases when the market for major grains was stagnant. In China, dry beans are not a staple food, so increasing dry bean production will easily result in surplus in the domestic market if the export volume has not increased. In fact, it was the export of mung beans and adzuki beans that first became vents for surplus productive capacity of major grains through the existing export channels established in the 1980s.

Although overseas demand for the mung and adzuki beans is limited, it did not deter peasants and traders from producing and exporting dry beans in the late 1990s. In addition to existing commodities, state-owned farms and local businesses started to expand production of, and develop export channels for, kidney beans. Pioneers of China's kidney bean export are Sichuan, Yunnan, and Guizhou. Yet, after 1995, northeastern provinces became the driving force of China's kidney bean production as well as its export.

Low grain prices in the domestic market during the late 1990s and early 2000s brought price competitiveness to kidney bean production and exports in northeast China. Producers and export companies seized this opportunity, developing overseas markets in various countries. Even with the major grain surplus shrinking and its domestic market price continuously increasing after 2004, a further export expansion occurred around 2008. This expansion indicates that at this point, China's kidney beans still held price competitiveness in the international market. However, as the grain boom continued

after 2010, the shift of resources to producing major grains has led to rising prices of dry beans. If this situation continues, the export sector of dry beans will likely confront structural changes in the near future.

Problems caused by the major grain surplus were solved around 2006. We must admit that, in northeast China, these problems were not solved solely by the expansion of dry bean exports. Dry bean export was one of the effective solutions for overcoming the surplus productive capacity of major grains. Others included the development of a local corn processing industry,¹²⁾ the improvement of infrastructure for transport, and the intensive grain procurement system reform.

Analysis of China's dry bean exports sheds light on how to understand the meaning of "vent for surplus" in underdeveloped economies, in the contemporary sense. Myint and most scholars referred to "surplus" as a condition measured by quantity of resources. While agreeing to this point, we also need to realize that what makes "vent for surplus" effective in fostering the export sector is the condition of profitability, that is, low in existing food crops and comparatively high in export commodities. The scale of dry bean exports was quite small compared to the surplus of major grain in northeast China. Nevertheless, China's dry bean industry developed following the same trace of Myint's theory, and it has grown into the world's largest exporter in 20 years. We need to reconsider the meaning of "vent for surplus" by focusing on the potential for profitability of each commodity rather than on a quantified base. With this in mind, it is then not difficult for us to understand the current situation in China. The global demand for dry beans continues expanding and there are still abundant, underdeveloped land resources in the northeastern provinces. Still, production and exports of dry beans have not increased since 2010 because dry beans began to lose their competitiveness, not only in price in the international market, but also in profitability on the producer's side.

The growth of China's dry bean exports also shows that even with restrictions on grain distribution, producers and business entities successfully developed means of coping with risks in the grain market prior to 2004. The capability to create "vents" exists within the agricultural sector. Policymakers should recognize this and consider how to encourage and leverage this type of capability in order to help producers and distributors cope with market risks on their own.

12) For details, see Zhang (2014a).

Finally, we should not take it for granted that China will always be a major and stable supplier of dry beans in the international market. In China, producers of dry beans are not restricted to dry bean production.¹³⁾ Peasants can always shift their productive resources to other, potentially more profitable crops. Increasing demand for various minor crops from coastal provinces and overseas countries has led to the rise in producer price and production volume of peanuts, oats, and buckwheat since 2010. These crops have become common alternatives to beans for peasants in Inner Mongolia and Jilin. The processing industry of minor crops is also growing rapidly in northeast China.

The decrease in China's dry bean exports and increase in its export price are issues of international concern.¹⁴⁾ Especially, considering that peasants in China have not benefitted much from the rising export price since 2000, I shall conclude here by emphasizing the necessity of further studies on domestic and international marketing channels on China's dry bean industry.

13) Producers of dry beans have to rotate crops in their fields. Therefore, in the first place, no farmer is a producer of beans only.

14) To give some examples, the rise of adzuki bean's export price has resulted in Japan's confectionary industry looking for other trade partners such as Canada. South Africa, which relied on China for 84% of its total dry bean import during 2002-2011, faced a rise of kidney bean price from \$330/ton to \$750/ton during the same period. China's export price of kidney beans to South Africa further increased to \$1,260/ton in 2013 (the Global Trade Atlas).

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Table 1 China's production of grain and beans

Year	Grain (1,000 tons, %)			Beans (1,000 tons)			
	Total	Beans	Beans/ total	Soybean	Mung bean	Adzuki bean	Others
1995	466,618	17,870	3.8%	13,502	594	496	3,278
1996	504,535	17,900	3.5%	13,224	n.a	n.a	n.a
1997	494,171	18,760	3.8%	14,732	n.a	n.a	n.a
1998	512,295	20,010	3.9%	15,152	789	358	3,711
1999	508,386	18,944	3.7%	14,245	771	242	3,686
2000	462,175	20,100	4.3%	15,409	891	345	3,455
2001	452,637	20,528	4.5%	15,409	891	338	3,893
2002	457,058	22,412	4.9%	16,505	881	390	4,636
2003	430,695	21,275	4.9%	15,393	1,186	338	4,358
2004	469,469	22,321	4.8%	17,401	992	283	3,645
2005	484,022	21,577	4.5%	16,348	1,005	353	3,871
2006	498,042	20,037	4.0%	15,082	710	365	3,880
2007	501,603	17,201	3.4%	12,725	832	295	3,349
2008	528,709	20,433	3.9%	15,542	904	314	3,673
2009	530,821	19,303	3.6%	14,982	769	224	3,328
2010	546,477	18,965	3.5%	15,083	954	250	2,678
2011	571,208	19,084	3.3%	14,485	952	251	3,396
2012	589,580	17,305	2.9%	13,050	867	274	3,114

Data source: China Agriculture Statistical Report.

Table 2 Producer price and price index of major grain and corn

Year	Producer Price (yuan/ kg)		Price index (1995=100)	
	Average of major grain	Corn	Average of major grain	Corn
1995	1.50	1.34	100	100
1996	1.51	1.14	100	76
1997	1.30	1.12	87	74
1998	1.24	1.08	83	72
1999	1.06	0.87	71	58
2000	0.97	0.86	64	57
2001	1.03	0.87	69	58
2002	0.98	0.91	66	61
2003	1.13	1.05	75	70
2004	1.41	1.16	94	77
2005	1.35	1.11	90	74
2006	1.44	1.27	96	84
2007	1.58	1.50	105	100
2008	1.67	1.45	111	96
2009	1.83	1.64	122	109
2010	2.08	1.87	138	125
2011	2.31	2.12	154	141
2012	2.40	2.22	160	148

Note: Major grain includes rice, wheat and corn.

Data source: *Data assembly of National Agricultural Products' Cost and Profit*.

Table 3 Producer price indices of major grain and dry beans

Year	Major grain	Corn	Kidney bean	Mung bean	Adzuki bean
(2002 = 100)					
2001	105	95	n.a	116	101
2002	100	100	100	100	100
2003	115	116	110	100	104
2004	144	127	119	117	133
2005	137	122	122	124	140
2006	146	139	124	128	136
2007	160	164	145	143	152
2008	170	159	152	141	161
2009	185	180	159	147	169
2010	211	205	175	204	197
2011	234	233	175	227	195
2012	243	244	192	190	188

Note: Major grain includes rice, wheat and corn.

Data source: Table 2 and *China Yearbook of Agricultural Price Survey*.

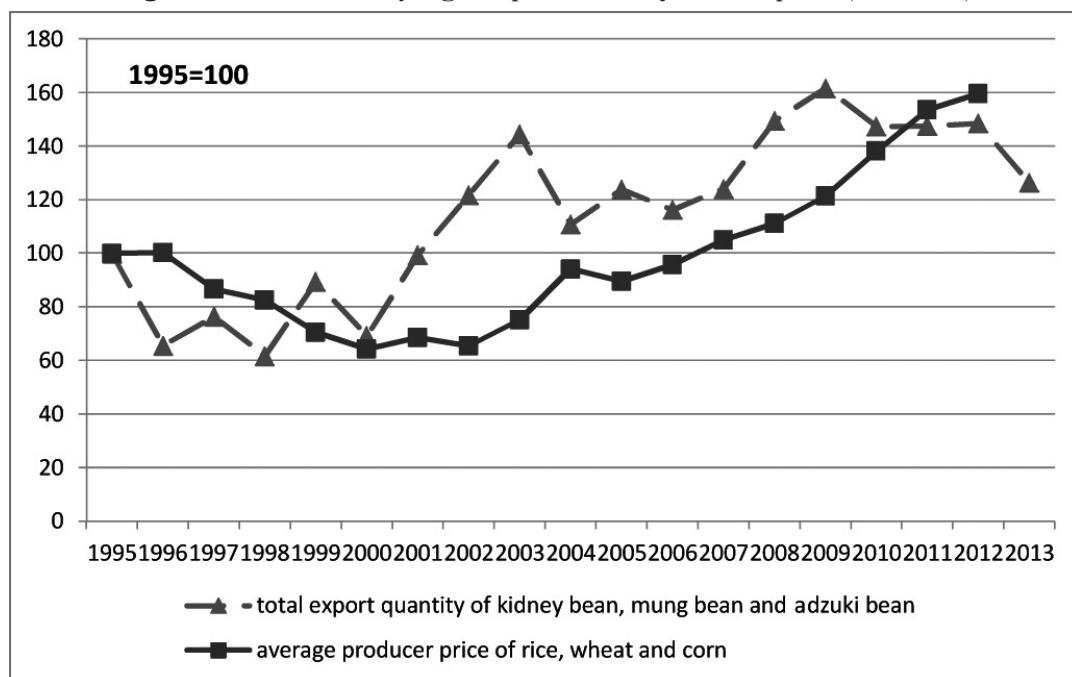
Table 4 China's export of dry beans

Year	Quantity (1,000 tons)					Unit Price (US dollar/ton)		
	Total	Kidney bean	Mung bean	Adzuki bean	Others	Kidney bean	Mung bean	Adzuki bean
1995	1,041	375	184	73	410	380	441	379
1996	547	270	81	63	133	429	680	499
1997	595	370	76	37	112	412	767	529
1998	472	222	114	53	82	442	577	454
1999	811	215	289	62	245	376	377	471
2000	572	288	88	62	135	396	565	495
2001	721	431	136	60	93	362	497	481
2002	860	472	220	78	91	377	387	375
2003	1,040	634	214	66	126	333	387	459
2004	795	501	138	61	95	370	468	805
2005	868	594	135	53	85	390	606	745
2006	802	544	135	56	67	474	660	483
2007	860	597	123	65	76	621	752	613
2008	1,031	755	139	51	86	793	852	931
2009	1,096	697	274	51	74	692	879	816
2010	1,000	758	122	52	69	705	1,418	1,297
2011	992	765	115	54	59	790	1,781	1,203
2012	984	749	134	56	45	960	1,372	1,040
2013	842	622	120	57	43	1,153	1,481	1,196

Note: HS code for each commodity is total 0713(all leguminous vegetables), kidney bean 071333, mung bean 071331, adzuki bean 071332, all dried and shelled.

Data source: the Global Trade Atlas.

Figure 1 Index of major grain price and dry bean exports (1995=100)



Data source: Table 2 and Table 4.

