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Summary

This paper examines patterns of recent change in China's international export trade in high quality fresh-vegetables between 2002 and 2005 since its WTO membership and some of the underlying determinants that will determine its future export opportunities. Concepts of product quality are first reviewed and the key characteristics of China's international trade in fresh produce are outlined based on a detailed analysis from the UN Comtrade international trade data at the 2, 4 digit and finally 6 digit levels. High quality fresh and chilled vegetables are identified through their average unit export values. In 2005, China was the 4th largest exporter of vegetables in the world with a 9.8 percent share of world trade, and almost a 6 percent share in fresh and chilled vegetables. The competitiveness of China in world trade in high value fresh produce is assessed through a trade-shares accounting and decomposition approach which enables both structural and performance effects on China's exports to be isolated, and the contributions its major trading partners have made to changes its share of world trade. China's aggregate market share rose by over 1.5 percentage points over the period, and there is evidence of an emerging orientation in its trade shares from E Asia to SE Asia, and to further progress in the Russian Federation and US markets. China's underlying comparative advantage in such labour-intensive products is reflected in the positive performance effect on the increase in its market share.

KEYWORDS: China, vegetables, international trade.

1. Introduction and Objectives

In December 2001 China acceded to the WTO, thereby rendering its agricultural and food sectors more open to international competition through imports, but also cementing China's food sector more firmly into the global trading economy as an exporting nation. Indeed China's Ministry of Agriculture (MoA, 2004: 49) was particularly positive about its WTO membership, recognising that it presented not only challenges (especially in soybeans and cereals), but also opportunities. In particular, it would be entitled to most favoured nation treatment in its international trade and access to a WTO regulatory framework for settling trade disputes, have a potential to reduce its costs in international trade in farm produce, and also it would be able exploit its cost advantages in the production (and processing) of certain agricultural, aquatic and horticultural products.

OECD also observed (OECD, 2005) that China had a comparative advantage in the production of labour intensive products such as vegetables and fruit and that WTO membership had created high expectations within China for its labour intensive agricultural sectors to exploit new export markets and export growth. Vegetable production costs in 2004 were reported at less than \$0.07 per kg (Huang et al., 2006). Furthermore, a consequence of WTO membership has been to enhance and accelerate inward investment into China by overseas firms, and such Foreign Direct Investment (FDI) in turn has stimulated growth and development in food processing and in multiple-retailing. This is already having ramifications for the development of China's internal agri-food supply chain

organisation and logistics sectors, and in the longer run, consequently for its potential ability to export fresh produce.

The objectives of this paper are thus to examine patterns of recent changes in China's international export trade in high quality fresh-produce since its WTO membership between 2002 and 2005, and to identify some of the underlying changes that have taken place in the competitiveness of its exports, and to see whether the initial expectations of positive gains in exporting fresh vegetables have been realised thus far, and what adjustments in China's global trading patterns have emerged in this sector.

Concepts of product quality are first reviewed. However, in the context both of international trade and consumer behaviour theory, the identification of quality products or their attributes is neither straightforward, nor is there universal agreement on what constitutes a "quality product". The paper then examines the key characteristics of China's international trade in fresh produce, and places this in the context of developments in its overall trade in vegetable products and of world trade in fresh produce. The paper also assesses changes in the competitiveness of China in world trade in high value fresh produce since its WTO membership through the application trade-shares accounting methodology, and examines developments in the regional and country orientation in its exports of high value fresh vegetables. Finally, the significance of the emergence of "Green Food" in China, and the potential for development of specific organic exports is considered.

2. Background

Within the societies in both developed and in many emerging economies, issues of healthy eating and food safety have risen to prominence over the past decade. Much emphasis has been placed on fruit and vegetables and their contribution to maintenance of a balanced and healthy diet. Some consideration of recent developments in international trade in vegetables would seem justified on these grounds alone. In the fresh produce sector, there has also been strong growth in the demand for organic vegetables reflecting consumer concerns about a range of issues including sustainability of production, pesticide and herbicide residues or perceived taste and flavour, not least in China (China Business News, 2007; Mei et al., 2006). However, despite rapid growth from a low baseline, organic produce still only accounts for a small share of total consumer spending on fresh vegetables within Western (and Chinese) diets.

Furthermore, we focus on China because, as Table 1 shows, it is a major player in international trade in vegetables. In 2005, exports of fresh, chilled, frozen and preserved vegetables from China were valued at \$3.1 billion and China ranked as the 4th largest exporter in the world of unprocessed vegetables, with a 9.8 percent share of the world market, compared with an 8.1 percent share in 1998 (Liu et al., 2006).

Table 1 about here

A brief explanation of the international trade data analysed in this paper will at this point be helpful in clarifying subsequent definitions and discussion relating both to fresh vegetables and high quality vegetables. The UN online Comtrade Database (United Nations, 2007) has provided the source trade data using the Harmonised System HS 2002 classification at the 2, 4 and 6 digit levels. The aggregate 2 digit category HS07 contains "*All Edible Vegetables and Certain Roots and Tubers*". At the 4 digit level, codes HS 0701 to HS 0709 categorise fresh or chilled vegetables into broad product groups, the primary focus of this paper. Thus for example, HS 0703 contains "*Onions, shallots, garlic, leeks and other alliaceous vegetables*" and HS 0708 "*Leguminous Vegetables, shelled or unshelled, fresh or chilled*". Codes HS 0710 – HS 0713 relate to frozen, provisionally preserved or dried vegetables. These are not considered in this paper, in part because more significant product

transformation has taken place which makes a like-for like comparison of unit export values difficult, and also because in general fresh produce will usually command a premium over frozen and preserved product. Likewise, vegetable preparations and processed vegetables (HS 20) are not considered. Moving to the 6 digit level data enables identification of specific vegetables, such as for example HS 070320 “*Garlic*” or HS 070970 “*Spinach*”, and has been used to focus on particular high quality products.

The value of world vegetable exports grew at annual rate of 13 percent between 2002 and 2005 (Table 2), with no difference between fresh and chilled and the frozen, dried and preserved groups. Fresh and chilled vegetables accounted for over 70 percent of the value of all unprocessed vegetable exports, with other vegetables, tomatoes, and onions the major categories traded.

Table 2 about here

Vegetables are also a major source of China’s primary agricultural food export earnings and accounted for 39% by value of China’s exports of primary (i.e. unprocessed) agricultural food products in 2005. As Table 3 reveals, China’s total vegetable exports have grown at 17.5 percent p.a. since 2002, and fresh and chilled vegetable exports at over 22 percent p.a., both significantly higher than world exports for these product groups. The value of China’s fresh and chilled vegetable exports in 2005 was \$1.7 billion, and accounted for almost 41 percent of its total vegetable exports. Onions, shallots and garlic (HS 0703) are the most important product exports, making up over 23 percent of China’s total 07 exports, and around 58% of its fresh and chilled exports, with root vegetables (HS0706) and other vegetables (HS0709) the other major product groups.

Table 3 about here

For fresh and chilled vegetables, China’s share of world trade was almost 6%, up by 1.2 percentage points from 2002 (Table 4). There were however significant and strong increases in its shares of world trade in both onions and root vegetables.

Table 4 about here

Around one-third of China’s total vegetable exports go to Japan, but evidence is later presented to show that even within the period 2002-2005, some noticeable shifts in the shares of China’s fresh produce exports in particular markets have taken place. Other East and SE Asian markets are also major destinations. Overall, the top 14 export destinations account for a slightly greater share of China’s fresh vegetable exports compared with its total exports of vegetables. It is noticeable that the export shares of China’s HS 07 (i.e. all vegetables) exports to Japan, the EU¹, Malaysia and the USA are greater than the respective shares for fresh produce only, implying a relatively greater penetration in these markets of frozen, preserved and dried product.

Table 5 about here

3. Data and Methodology

International trade statistics and product category definitions are somewhat generic in nature and within any specific product reporting code, there is no means of differentiating directly between high and low quality exported product. This is because the Comtrade database only gives total volumes and trade values for the range of products within a given HS code. Nor for example, are other qualities of products identified (beyond their states of freshness, preservation and processing). Hence, organic fresh produce is not specifically identified. Of course, texture, appearance, colour and flavour /taste are important quality attributes, but cannot be readily observed other than through experimental and survey data.

¹ Those countries that regularly import vegetables from China viz. France, Germany, UK, Italy, Spain, Denmark, Netherlands.

However, of the range of extrinsic and intrinsic attributes (Fandos and Flavian, 2006) which contribute to the overall judgement of quality by consumers, product freshness rates highly (Revell and Kupiec, 2001). This is one descriptor available within the trade data. Price can be another clear identifying attribute associated with product quality, with higher quality products generally commanding a higher price. Of course, a high price may also reflect scarcity and/or high production costs expressed in the supply schedule, but in general, it will also be a reflection of relative market demand.

Whilst we cannot distinguish between product qualities within individual HS category codes it is possible to differentiate between products in both the same and different HS categories using their average unit export values as proxies for prices. This study therefore focuses on those fresh vegetable export products with relatively high prices as an indicative expression of some measure of their quality (albeit arbitrary and incomplete), whilst recognising that there will still be other quality differences in such products, and also some products with high quality characteristics which may have lower export prices. The paper initially identifies the main higher-priced fresh vegetable groups at the 4 digit level, and then subsequently focuses on individual products at the 6 digit level.

A trade-shares accounting methodology (Gehler and Vollrath, 1997; Liu et al., 2003, 2004, 2006) is then used to measure changes in China's world trade shares of high value fresh produce on a product by product basis. These are decomposed in relation to both aggregate changes in world trade and the recipient country compositional shares of world trade, and to changes in China's competitiveness in penetrating specific importing country markets. The approach also breaks down the changes in China's aggregate market share of fresh produce attributable to its major country trade partners and on a regional basis.

Define an exporting country i 's share of importing country j 's market for a product as:-

$$p_{ij} = \frac{X_{ij}}{X_{wj}} \quad (1)$$

where X_{ij} represents the value of exports from i to j , and X_{wj} the value of world (w) exports of the product to country j .

Define P_j as country j 's share of world trade of for the product, i.e. its *structural share*.

$$P_j = \frac{X_{wj}}{X_{ww}} \quad (2)$$

where by definition $\sum_j P_j = 1$

Let exporting country i 's *aggregate market share* (AMS_{iw}) of total world trade for the product be :-

$$AMS_{iw} = \frac{\sum_j X_{ij}}{X_{ww}} = \frac{X_{iw}}{X_{ww}} \quad (3)$$

$$\text{So that } AMS_{iw} = \sum_j p_{ij} P_j \quad (4)$$

and if for simplicity we define $AMS_{ij} = p_{ij} P_j$, then (4) can be expressed as:-

$$AMS_{iw} = \sum_j AMS_{ij} \quad (5)$$

Over a period of time τ between a base period $\tau = \beta$ and final period $\tau = \Phi$, the **total effect** (TE_{iw}^τ) of a change in i 's AMS can be decomposed into its individual country shares as follows:-

$$TE_{iw}^\tau = \sum_j E_{ij}^\tau \quad (6)$$

$$\text{Where } E_{ij}^\tau = \Delta AMS_{ij}^\tau \text{ and } \Delta AMS_{ij}^\tau = AMS_{ij}^\Phi - AMS_{ij}^\beta \quad (7)$$

The change in AMS can also be decomposed into the sum of two effects, a **structural effect** (SE) reflecting changes in structural shares of world trade (i.e. within the share mix of importing countries) relative to the base period, and a **performance effect** (PE), reflecting the changes in i 's country shares of trade. Three separate measures of the AMS are needed: what the AMS would have been with fixed base-period country shares and final period structural shares (Eq.8), together with the base and final period AMS . Equations 8-10 define them:-

$$AMS_{iw}^{f\beta} = \sum_j p_{ij}^\beta P_j^\Phi \quad (8)$$

$$AMS_{iw}^\beta = \sum_j p_{ij}^\beta P_j^\beta \quad (9)$$

$$AMS_{iw}^\Phi = \sum_j p_{ij}^\Phi P_j^\Phi \quad (10)$$

The structural effect is given by:-

$$SE_{iw}^\tau = AMS_{iw}^{f\beta} - AMS_{iw}^\beta \quad (11)$$

the performance effect by:-

$$PE_{iw}^\tau = AMS_{iw}^\Phi - AMS_{iw}^{f\beta} \quad (12)$$

and the total effect by

$$TE_{iw}^\tau = SE_{iw}^\tau - PE_{iw}^\tau \quad (13)$$

Hence, the structural effect can be thought of as the change in the exporting country's AMS that would have taken place if its market shares in its individual country export markets in the final period had remained similar to those in the base period. This thus reflects the impact of changes in the importing country shares of world trade over the period. The performance effect, then measures the AMS change attributable to changes in the exporting country's market shares of its importer-countries, having adjusted for their changing shares of world trade. Equations (7) and (13) thus represent alternative views of the changes in the AMS , with Equation (13) reflecting both changes in global trade and in i 's individual country market shares adjusted for changes in their shares of world trade.

It should also be noted that where an exporting country has more than a minor share of world trade, it is necessary to subtract the exporting country's exports from total world exports, in order to avoid a trade bias effect through the dominant exporter.

4. Results

Table 6 presents the first pass filter at the 4 digit level to identify those fresh vegetable groups with relatively high average unit export values. As stated above, it is a somewhat arbitrary decision as to what is a product with a "higher price", and a lower threshold of \$0.25/kg has been used. HS 0703 *Onions...*, HS 0708 *Leguminous Vegetables..* and HS 0709 *Other Vegetables..* are clearly the highest priced groups of fresh and chilled product, with HS 0704 *Cabbages..* and HS 0706 *Carrots..* also with somewhat higher unit export values.

The subsequent analysis in this section concentrates on these five categories of fresh vegetables –the “*high quality group*”.

Table 6 about here

Table 7 provides detailed 6 digit level information about the specific products within these five highest-priced 4 digit categories –the “high quality group”. Garlic, leeks, peas, other legumes, asparagus, mushrooms (and agarics), and truffles were China’s highest priced fresh vegetable exports. HS 70959 *Other Mushrooms*, at over \$3 per kg generated significant export earnings for China in both total value and volume in 2005, although HS 70320 *Garlic* was China’s principle fresh vegetable export in value terms. Nevertheless, there is still considerable variation in individual product export prices within each of the 4 digit categories, and for example, eggplants and onions are relatively low-priced. Products within the higher-priced 4 digit groups.

Table 7 about here

Figure 1 presents both the average unit export values and annual growth rates in exports between 2002 and 2005 for the 4 digit code aggregates and 6 digit individual products. The vertical arrow denotes the average annual export growth rate for all-fresh vegetables over the same period. It also enables us to gain an insight, albeit somewhat of a quasi-BCG analysis (BCG, 1970), into the strategic positioning potential of China’s fresh vegetable product exports. Spinach, although accounting for a tiny share (<0.5%) of the value of fresh high-quality exports, has exhibited high growth and high prices. Mushrooms and agarics, had slightly below average growth but very high prices and made up over 11% of export earnings from this high quality group, whereas exports of asparagus and truffles, also in the relatively high price group have exhibited negative growth over the period, and only make up 0.4% of export earnings. Although the growth rate in garlic exports was slightly below the average of all fresh vegetables, the price is firmly within the mid-price zone, and garlic contributed some 48% of export revenues from the high quality group. Leeks accounted for almost 3% of export earnings in this group, and realised above average prices and growth rates. However, despite high growth rates for Root Crops and the Brassica Groups (Cabbages etc), prices were relatively low, although carrot exports themselves nevertheless contributed almost 9% to China’s export earnings from high quality fresh produce.

Figure 1 about here

In summary, China has some products such as leeks and spinach, currently relatively small contributors to export earnings in the fresh produce sector, but with future growth potential as “stars” within the high quality group. They have been realising relatively high prices and growth rates. Other products, such as carrots and cauliflowers are somewhat more important in terms of total export earnings and have shown above average export earnings growth rates, but are in the mid to lower price ranges in this high quality group. Fungi and garlic represent China’s “cash cows”. They contribute a large share of its export earnings, are highly priced, but have shown only around average growth rates over the period. Products such as peas, other leguminous vegetables (excluding beans), artichokes and peppers would appear to have some future development growth potential, though less so than for leeks and spinach and a comparatively more low priced.

Focusing on the highest priced products - mushrooms, truffles, agarics, asparagus and spinach - Table 8 shows that EU countries, viz. France, Italy, Germany, Spain and Netherlands, feature strongly within China’s top 5 markets for these products, except for spinach, where Asian countries are the main recipients. Furthermore, the top five markets for each of the highest value products account for over 90% of China’s export earnings for that category. The Japanese market however still takes the greatest overall share of China’s exports for these products.

Table 8 about here

Table 9 presents the results of the trade shares accounting and decomposition of China's performance in the high quality fresh vegetables sector between 2002 and 2005 and also for all vegetable exports (HS 07) as a comparator. Although China's AMS for all vegetables has risen by just under 0.5 percentage points since 2002, that for its high quality vegetables increased by over 1.65 percentage points. There was strong growth in its export market shares for onions etc (HS 0703) and root vegetables (HS 0706), but it lost ground within the leguminous (HS 0708) and other vegetables (HS 0709) categories.

Changes in China's main export markets' shares of world trade in vegetables (especially for non-high quality, frozen and preserved categories) have contributed to a negative structural impact on China's AMS for total HS 07 exports since WTO membership, whereas the structural effect for high quality vegetables was marginally positive. There was an especially strong positive structural effect in the market for the alliacious product group (HS 0703). In contrast, in the HS 0708 and HS 0709 groups, there have been adverse structural effects in China's main export markets.

The increased competitiveness of China in world vegetable trade between 2002 and 2005 can be seen in the positive performance AMS effects both for high quality vegetables and all vegetables groups as a whole. China's penetration of its traditional markets has thus improved in general over the period. We note that the significant increases in AMS for root vegetables (HS 0706) was largely driven by an strong increase in the performance effect of China its main markets, and indeed the performance effect for China's high quality exports was positive for all but the HS 0709 Other Vegetables category. In contrast, the 12 percentage points increase in its AMS for HS 0703 was driven largely by structural changes in its markets. Only for leguminous fresh vegetable exports, has China suffered a decline in competitiveness.

Table 9 about here

Table 9 also shows changes that China's country and regional markets have made to its overall AMS over the period. The relative importance of China's traditional markets of Japan and PRC Hong Kong, have declined since China's WTO membership, and for Hong Kong, even for China's high quality vegetable exports. The strongest contributors to China's AMS increases in high quality products over the period have been in the Republic of Korea, Indonesia (largely driven through an increase in HS 0703), Malaysia, the Russian Federation and the USA. At the regional level, there has been a marginal fall in its AMS in the E Asian region, where its competitive advantage and geographic proximity is greatest. However, there is evidence of an increased orientation towards SE Asian markets, from where it has gained its largest increase in AMS. It is also noticeable that China has achieved some success since WTO membership in diversifying its export market base to the rest of the world (ROW). A recent Australian study observed that "*China currently had no strong links in the EU market nor any clear-cut competitive advantages*" (ABARE, 2006: 219), whilst OECD commented on the moderate average tariffs for fruit and vegetables and entry price regime which would also act as a barrier to China's export growth into the EU for these products(OECD, 2005:125-127). The small increase in contribution to China's AMS over the period for high quality fresh vegetables derived from its exports to the EU would seem to bear out these conclusions.

5. Final Remarks

China's trade gains in the high value fresh vegetable sector since 2002 have thus been positive, and there is some evidence that it is diversifying its customer base beyond traditional East Asian markets. Even within the E. Asian region, there has been some relative re-orientation within its market growth towards South Korea and away from Hong Kong. The Japanese market has made a positive contribution to China's high quality

vegetable AMS growth, in contrast to a negative impact on its AMS for vegetable exports as a whole, although it still dominates as China's major customer. Similarly, there has been expansion into the S.E. Asian market which has made a positive contribution to China's AMS growth. Market share growth has also emanated from the Russian Federation and USA, but less so within the EU market.

Product safety remains one of the greatest limiting factors to China realising the full potential of its competitive cost advantage in fresh produce. Pesticide residues are a primary problem in fresh produce production in China, and there was considerable disruption to China's exports of spinach to Japan in 2002-03 as a consequence of such residues. The Chinese government has been making great efforts to improve the registration system for pesticides and fertilisers, and encouraging farmers only to buy from registered suppliers (OECD 2005). The Chinese Government is also updating laws to cover consumer food products. However, national laws are subject to enforcement by provincial officials which can be variable in the extreme.

FDI by Japanese and Korean businesses, particularly into joint ventures with Chinese producers and key processing and marketing enterprises in which there is a degree of vertical integration has been oriented towards the production of fresh produce for export (Calvin et al., 2006). The joint venture model is also one (Zhou, 2003) which is regarded as having been most successful for the development of organic vegetables, and in 2003, some 80 percent of organic vegetables were estimated as being for export, mainly to Japan. Anecdotal evidence also suggests a number of EU countries also beginning to explore sourcing of organic fresh vegetables within China, in part as a consequence of the need to ensure year-round supplies into supermarkets. However, it should be noted that an important driver for organic or "green" produce is also domestic Chinese consumer concerns over food safety, although Chen 2006 observes that the market is still in its infancy, and prices are 3 to 5 times higher than for equivalent conventional products.

Food safety is also linked in part to what is as yet a relatively undeveloped chill supply chain within the country. FDI by western supermarket chains such as Carrefour, Tesco, Walmart will in the longer run result in changes to the logistics infrastructure for fresh produce as they work with specialised farming companies for direct supply, or through specialised wholesalers (Revell et al. 2006). Currently there is a dearth of both centralised cold storage facilities and also refrigerated transport, both of which are essential for the efficient handling and transportation of fresh produce. There is also an undeveloped market in load back-hauling which raises overall transportation costs.

Enhancements to its food safety systems and in supply chain organisation and management will also however add to the costs of final delivery for fresh produce within and from China, and erode some of its competitive edge, unless there are considerable scale economies to be gained. Many of these developments are capital, rather than labour-intensive, which is where the current cost advantage to China resides. Furthermore, China at present benefits from a relatively undervalued exchange rate for the Yuan RMB, and longer run pressures driven by its internal economic growth will be towards exchange rate appreciation. There is also some recent evidence that ethical concerns (not necessary well based in economic rationale) over air-freighting of fresh produce may cast a shadow over the future potential of exports of organic fresh produce from China into parts of the EU, notwithstanding the effects of increases in overall costs of fuel on air transport. Hence there are a number of factors which in future may serve to constrain the rate of growth in China's high quality fresh vegetable exports and its steady rise in the aggregate share of the world market over the past decade.

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Tables

Table 1 World Exporters of Vegetables HS 07 2005

	Value US\$ mn.	Share of World total
Spain	4,308	13.8%
Netherlands	4,258	13.7%
Mexico	3,122	10.0%
China	3,052	9.8%
USA	2,421	7.8%
France	1,813	5.8%
Belgium	1,801	5.8%
Canada	1,714	5.5%
Italy	1,056	3.4%
Poland	624	2.0%
World Total	31,144	

Table 2. World Exports of Fresh Vegetables 2005

Product	HS Code	Value \$ US mn.	Growth 02-05 % pa	Share of 07
Potatoes	0701	1765.9	3.6	5.7%
Tomatoes	0702	4924.6	13.3	15.8%
Onions, shallots, garlic, leeks	0703	2518.6	14.5	8.1%
Cabbages, cauliflowers, edible brassicas	0704	1413.5	12.3	4.5%
Lettuce and chicory	0705	1709.6	14.9	5.5%
Carrots, turnips and edible roots,	0706	845.4	14.3	2.7%
Cucumbers and gherkins	0707	1418.6	16.1	4.6%
Leguminous vegetables, shelled or unshelled	0708	538.4	13.4	1.7%
Other vegetables	0709	6925.7	14.1	22.2%
Total Fresh and Chilled	0701- 0709	22060.2	13.0	70.8%
<i>Total All Vegetables</i>	07	31143.7	13.0	

Table 3 China's Exports of Vegetables in 2005

Product	HS Code	Value \$m	Share of 07	Share ch. 2002-05 %pts	%pa growth 02-05
Potatoes, fresh or chilled.	0701	45.5	1.5%	0.8%	49.1
Tomatoes, fresh or chilled.	0702	18.0	0.6%	0.2%	36.0
Onions, shallots, garlic	0703	713.7	23.4%	2.0%	21.0
Edible brassicas	0704	76.1	2.5%	1.3%	49.5
Lettuce (and chicory)	0705	9.3	0.3%	0.2%	91.1
Carrots, edible roots	0706	139.4	4.6%	1.7%	37.8
Cucumbers, gherkins	0707	3.4	0.1%	0.0%	14.3
Legum. veg.	0708	20.7	0.7%	0.1%	20.5
Other veg	0709	220.7	7.2%	-1.5%	10.1
Total Fresh and Chilled	0701-0709	1246.9	40.9%	4.7%	22.4
Veg. (uncooked), frozen.	710	445.7	14.6%	-1.3%	14.2
Veg. provis. preserved	711	177.9	5.8%	-2.1%	6.1
Dried veg.	712	702.0	23.0%	3.1%	23.4
Dried legum. veg.	713	388.2	12.7%	-4.2%	6.7
Manioc and similar	714	91.5	3.0%	-0.3%	14.0
Total 07		3052.1	100.0%		17.5

Table 4 China's Share of World Trade for Fresh and Chilled Vegetables 2005

Product	HS Code	World Trade Share	Share change % pts
Potatoes	0701	2.6%	1.7
Tomatoes	0702	0.4%	0.2
Onions, shallots, garlic, leeks	0703	28.3%	4.3
Cabbages, cauliflowers, brassicas	0704	5.4%	3.1
Lettuce and chicory	0705	0.5%	0.4
Carrots, turnips and edible roots,	0706	16.5%	7.1
Cucumbers and gherkins	0707	0.2%	0
Legum. vegetables, shelled/ unshelled	0708	3.9%	0.6
Other vegetables	0709	3.2%	-0.4
Total Fresh and Chilled		5.7%	1.2
<i>Total All Veg Fr., Ch., Froz, Preserved</i>	<i>07</i>	<i>9.8%</i>	<i>1.1</i>

Table 5 China's Principal Export Markets for All and Fresh Vegetables in 2005

	\$ million US	% share China's fresh exports	% share China's total 07 Exports
WORLD	1246.9		
Japan	334.8	26.8%	33.3%
Indonesia	128.1	10.3%	4.5%
Malaysia	117.7	9.4%	5.0%
Rep Korea	72.2	5.8%	7.1%
Russian Federation	71.4	5.7%	2.9%
PRC Hong Kong	65.2	5.2%	5.2%
EU "7"	56.8	4.6%	9.2%
USA	52.8	4.2%	6.9%
Brazil	39.4	3.2%	1.7%
Thailand	32.7	2.6%	2.1%
Vietnam	29.9	2.4%	1.5%
Pakistan	29.3	2.3%	1.6%
Philippines	26.9	2.2%	1.2%
Singapore	15.6	1.3%	1.2%
Total of top 14	1072.8	86.0%	83%

Table 6 Unit Values of China's Vegetable Exports in 2005

Product	HS Code	Unit value \$/kg
Potatoes, fresh or chilled.	0701	\$0.19
Tomatoes, fresh or chilled.	0702	\$0.21
Onions, shallots, garlic, leeks and other alliaceous vegetables	0703	\$0.40
Cabbages, cauliflowers, kohlrabi, kale and similar edible brassicac	0704	\$0.28
Lettuce (<i>Lactuca sativa</i>) and chicory (<i>Cichorium spp.</i>)	0705	\$0.16
Carrots, turnips and similar edible roots,	0706	\$0.29
Cucumbers and gherkins, fresh or chilled.	0707	\$0.19
Leguminous vegetables, shelled or unshelled, fresh or chilled.	0708	\$0.62
Other vegetables, fresh or chilled.	0709	\$0.57
Vegetables (uncooked), frozen.	0710	\$0.80
Vegetables provisionally preserved	0711	\$0.70
Dried vegetables, whole, cut, sliced, broken or in powder	0712	\$2.90
Dried leguminous vegetables, shelled	0713	\$0.45
Manioc, arrowroot, sweet potatoes and similar roots	0714	\$0.52

Table 7 China's 6 Digit High Value Fresh and Chilled Vegetable Exports in 2005

	HS code	Value \$ mn.	Volume '000 t	Unit value \$/kg	Value Growth % pa 02-05
Onions, shallots, garlic, leeks etc	703	713.7	1,784.1	<u>0.40</u>	21.0
Onions & shallots	70310	117.6	570.0	<u>0.21</u>	37.7
Garlic	70320	562.5	1,155.6	<u>0.49</u>	17.7
Leeks	70390	33.6	58.5	<u>0.57</u>	37.3
Cabbages, cauliflowers, kohlrabi, brassicas.	704	76.1	273.3	<u>0.28</u>	49.5
Cauliflowers , headed broccoli	70410	47.6	131.8	<u>0.36</u>	46.7
Brussels sprouts	70420	4.1	23.7	<u>0.17</u>	18.0
Cabbages, kale, kohlrabi etc	70490	24.3	117.7	<u>0.21</u>	67.7
Carrots, turnips , edible roots	706	139.4	477.0	<u>0.29</u>	37.8
Carrots & turnips	70610	103.8	389.9	<u>0.27</u>	61.8
Beetroot, salsify, celeriac, radishes	70690	35.6	87.1	<u>0.41</u>	7.3
Leguminous vegetables, shelled or unshelled	708	20.7	33.5	<u>0.62</u>	20.5
Peas	70810	11.9	14.5	<u>0.82</u>	17.1
Beans	70820	0.0	0.1	<u>0.41</u>	-34.3
Other Leguminous vegetables	70890	8.8	18.9	<u>0.47</u>	26.8
Other vegetables, fresh or chilled.	709	220.7	387.7	<u>0.57</u>	10.1
Globe artichokes	70910	0.0	0.0	<u>0.25</u>	52.6
Asparagus	70920	1.9	1.2	<u>1.63</u>	-12.2
Aubergines (egg-plants)	70930	3.2	24.7	<u>0.13</u>	13.1
Celery	70940	1.6	5.8	<u>0.27</u>	51.0
Mushrooms (Agaricus)	70951	8.3	2.7	<u>3.03</u>	12.6
Truffles	70952	1.7	1.1	<u>1.46</u>	-18.5
Other Mushrooms	70959	129.8	40.6	<u>3.19</u>	16.9
Peppers Capsicum/Pimenta,	70960	10.2	39.4	<u>0.26</u>	34.5
Spinach	70970	3.3	2.2	<u>1.46</u>	44.4
Other Vegetables	70990	60.8	269.8	<u>0.23</u>	-1.8

Table 8 Export Destinations of China's Highest Quality/Value Fresh Vegetables

Product	Share of total
Asparagus (70920) \$1.9mn	
Japan	51%
Netherlands	13%
Belgium	12%
Spain	10%
France	7%
<i>Top 5 total</i>	93%
Agaricus Mushroom (70951) \$8.3mn	
Italy	65%
France	8%
Japan	7%
Malaysia	6%
Netherlands	5%
<i>Top 5 total</i>	91%
Truffles (70952) \$1.6mn	
France	34%
Japan	24%
Germany	19%
Rep. of Korea	8%
Spain	7%
<i>Top 5 total</i>	92%
Other Mushrooms (70959) \$129.8mn	
Japan	80%
USA	6%
France	3%
Italy	3%
Rep. of Korea	2%
<i>Top 5 total</i>	94%
Spinach (70970) \$3.2mn	
PRC HK	66%
Malaysia	27%
Japan	3%
Singapore	1%
Myanmar	1%
<i>Top 5 total</i>	100%

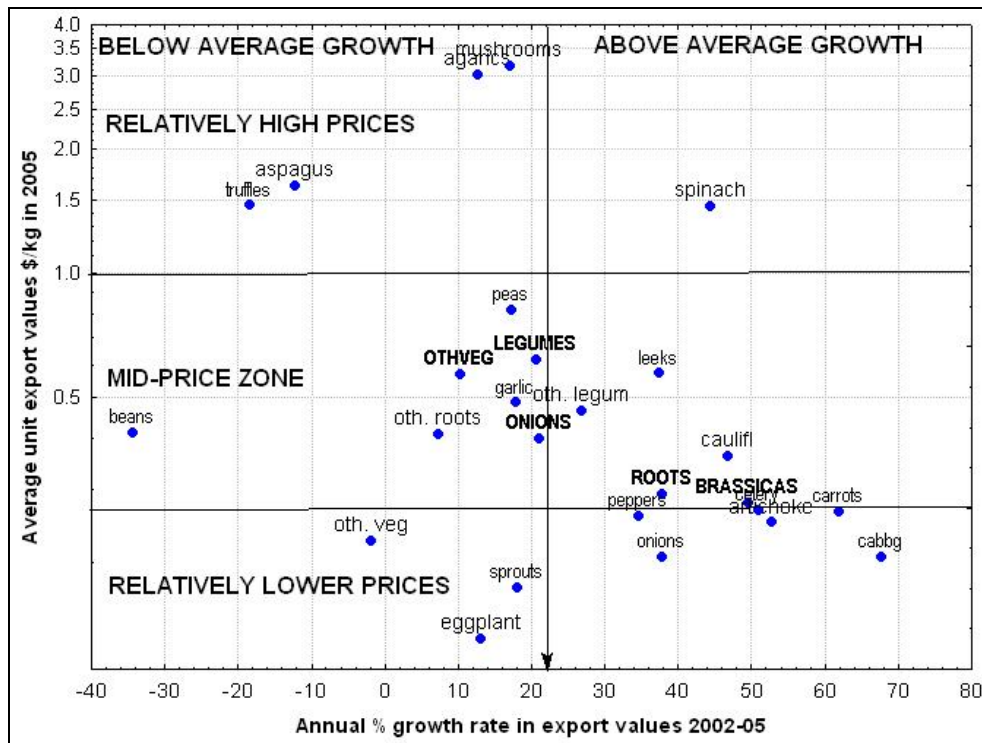
Table 9 Decomposition of China's AMS for High Quality/Value Exports

Product: HS	0703	0704	0706	0708	0709	High Quality/ Value	All 07
China's AMS 2005	37.47	11.20	19.95	4.01	3.61	10.76	10.26
Structural Effect	10.77	-2.37	0.06	-1.87	-1.06	0.05	-1.01
Perf. Effect	1.62	4.11	8.84	-0.07	0.28	1.60	1.45
Total AMS Effect	12.39	1.74	8.91	-1.94	-0.78	1.65	0.44
Japan	3.16	0.70	1.75	-1.80	-0.54	0.18	-0.67
Hong Kong	-0.10	-0.69	0.03	-0.25	-0.52	-0.41	-0.23
Rep. Korea	0.22	0.29	2.59	***	0.01	0.21	0.20
E ASIA						-0.02	-0.71
Indonesia	1.96	***	0.18	***	0.04	0.25	0.10
Malaysia	0.69	0.84	1.56	-0.11	0.09	0.31	0.14
Philippines	0.47	***	-0.12	***	***	0.04	***
Thailand	0.29	0.23	1.66	0.07	0.01	0.18	0.12
Singapore	-0.04	0.35	0.20	-0.23	-0.01	0.01	-0.02
Vietnam	0.11	0.04	***	-0.12	***	***	0.01
S E ASIA						0.80	0.35
Denmark	0.03	***	***	***	***	***	***
France	-0.07	***	***	***	***	-0.01	***
Germany	0.18	***	0.01	***	***	0.03	-0.02
Italy	0.14	***	***	***	***	0.01	0.03
Netherlands	0.14	0.01	***	***	0.03	0.04	***
Spain	0.12	***	***	***	***	0.02	0.03
UK	0.04	-0.02	***	0.02	***	0.01	0.05
EU "7"						0.10	0.09
Russian Fedn.	0.95	0.20	0.84	***	0.08	0.24	0.19
USA	1.62	***	-0.10	0.01	0.02	0.23	0.17
Brazil	0.86	***	***	***	***	0.11	0.06
Rest of World	1.60	-0.20	0.30	0.50	-0.00	0.20	0.31

*** < |0.01%|

Figures

Figure 1 China's High Quality Vegetable Exports : Unit values and Growth Rates



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