

CATALYZING EXPORTS AND CREATING JOBS IN THE FRESH FRUITS AND VEGETABLES SECTORS

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PRELIMINARY GLOBAL VALUE CHAIN ANALYSIS FOR TURKEY

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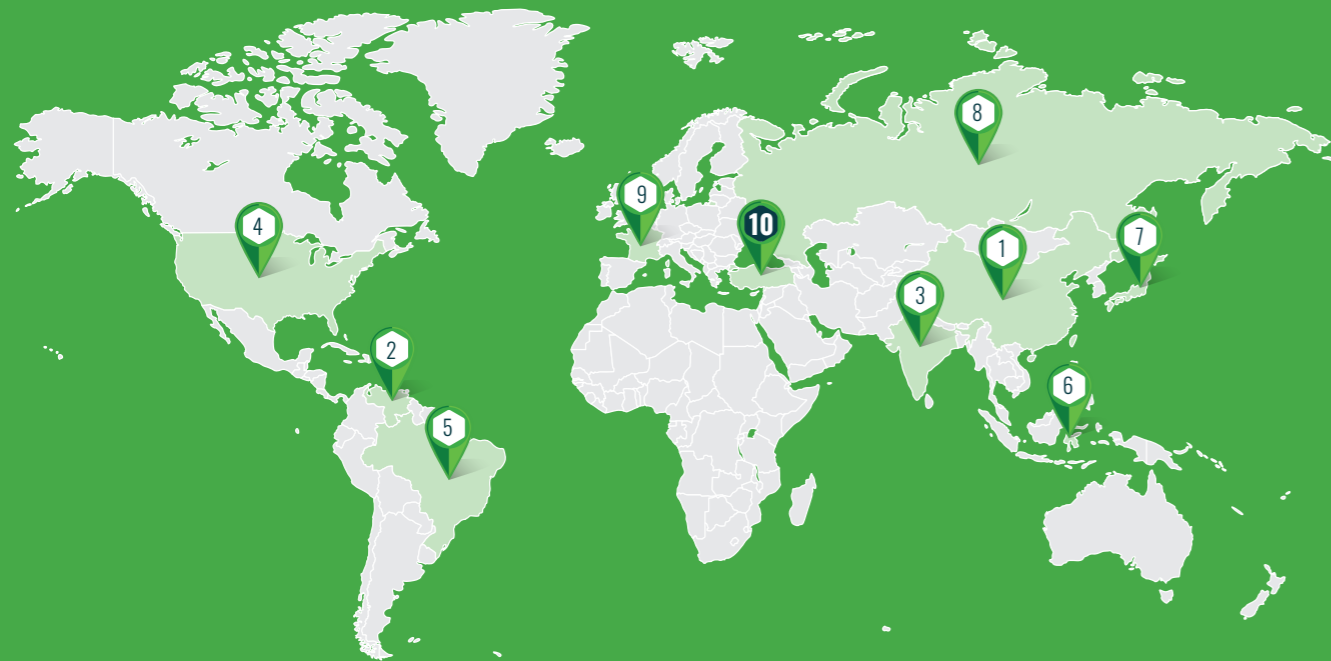
CATALYZING EXPORTS AND CREATING JOBS IN THE FRESH FRUITS AND VEGETABLES SECTOR

Global Value Chain Unit

Department of Strategy and Transformation

<https://strategy.isdb.org>

TURKEY RANKS 10TH IN TERMS OF AGRICULTURAL OUTPUT WITH USD 64 BILLION OF ANNUAL FOOD PRODUCTION VALUE



AGRICULTURE MAKES UP 6% OF GDP, IT IS A MAJOR CONTRIBUTOR OF EMPLOYMENT WITH 19% OF TURKISH LABOR FORCE EMPLOYED IN THE SECTOR

Executive Summary

a. Overview

Turkey is seeking to integrate more deeply into global agriculture Global Value Chains (GVC). Agriculture makes up 6% of GDP, it is a major contributor of employment with 19% of Turkish labor force employed in the sector. Agriculture is one of the priority areas in the 11th Development Plan, which entered into force in July 2019, with multiple goals including: food safety and security and to drive rural development and sector competitiveness. Improving agricultural performance offers a particularly important tool for addressing Turkey's socio-economic disparity among its 81 provinces.

Despite significant agricultural output levels, ranking 10th globally, production is geared for local consumption, a small share of the USD 64 billion of production was exported, and Turkey became a net importer of essential cereals and pulses. Nonetheless, the sector accounts for 10% of total exports and Turkey ranks as a significant agricultural exporter of hazelnuts, apricots, figs, and fresh vegetables like tomatoes and cucumber. The main export destinations for fresh fruit and vegetables include, Iraq, Syria as well as countries of the European Union. This preliminary GVC analysis focuses primarily on this subsector.

b. Outcomes, Opportunities and Challenges

The key preliminary GVC analysis outcomes for the fruits & vegetables - agriculture industry include:

1. The industry lacks export diversification with a large share of fresh fruits and vegetables going to three countries: Syria, Iraq and Russia.
2. Turkey has a low agricultural productivity per worker compared to neighboring countries. The predominance of small-sized, subsistence and semi-subsistence farms hinders productivity growth.
3. Turkey carries production risk for fresh fruit and vegetable as production is concentrated in few regions: Antalya, Mersin and Hatay.
4. Dominance of lower value "commodity" fruits and vegetables over higher value produce.

Key opportunities for Turkey include:

1. Favorable climate conditions, vast farmlands and a rich biodiversity position the country well for fresh produce production.
2. Access to a wide range of markets due to its strategic location.
3. Potential to become a top exporter of fresh fruit and vegetable.
4. Ideal farming structure to produce high value-added fruits and vegetable.

However, challenges to the sector are:

1. Major losses throughout the fresh fruit and vegetable value chain.
2. Highly concentrated in domestic markets.
3. Low-quality farming standards.
4. Small and fragmented farms structures.

c. Recommendations

Our recommendation for upgrading include:

- Product Upgrading: Diversifying into higher-value products and decrease concentration on commodity products.
- Market Diversification: Diversify away from countries with high exposure and relatively low value-added markets.
- Functional Upgrading: Improve agri-food processing, specially frozen vegetable and fruit juice manufacturing.
- Process upgrading: Increase the yields for fresh fruit and vegetable in the regions that are lagging and invest in the infrastructure to reduce losses.

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1. Introduction

Turkey is an important agricultural country due to its size, favorable climate and soil conditions. According to FAO data, Turkey ranks 10th in terms of agricultural output with USD 64 billion of annual food production value (see Table 1).

Countries	Value of Agriculture Production for Food Use (USD billion)
China	1,181
Venezuela	675
India	340
USA	320
Brazil	153
Indonesia	134
Japan	86
Russia	70
France	65
Turkey	64

Table 1: Top 10 Countries in Agricultural Production for Food Uses.

The agricultural sector has marked a 378% increase in exports from 2002 to 2018. It recorded agricultural export values of USD 17.7 billion to 190 countries from 1800 products in 2018. In the same period, the composition of exports also diversified, across types of products as well as value chain stage. For example, exports of processed products such as bakery products and products of the milling industry increased.¹

The agriculture value chain is defined by FAO as “the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a vertical link or network between various independent business organizations and can involve processing, packaging, storage, transport and distribution.”² Within Global Value Chains (GVC), inputs and raw materials can be derived domestically or imported, while exports are either intermediates plugging into production systems in another country, where the good is further processed, or delivered to final demand in a foreign market.

The agriculture sector’s complex GVC brings together multiple actors: it spans input companies, farmers, traders, food companies and retailers, all of whom must ultimately satisfy the varying demands of the consumer in a sustainable manner. The sector encompasses huge diversity and variety at each stage, from R&D-based input companies to generic manufacturers, subsistence farmers to high tech, biotech boutiques and small and medium-sized enterprises (SMEs) to multinational corporations.

The agriculture supply chain is generally depicted as composed by three main levels: agricultural production, industrial processing and wholesale or retail distribution. At each level of the supply chain, firms as well as other organizational forms perform specific

¹ Agrofood - Invest in Turkey. (2019). Retrieved 25 December 2019, from <https://www.invest.gov.tr/en/sectors/pages/agrofood.aspx>

² Agricultural Value Chain Development: Threat or Opportunity For Women's Employment? (2010) Retrieved 25 December 2019, from <http://www.fao.org/3/i2008e/i2008e04.pdf>.



activities supplying goods or services. At the same level, there may be one or more firms performing the same or complementary activities, adding specific value at their stage of activity.³ Along the food supply chain, firms perform their activities together with and in compliance to governmental agencies and NGOs regulatory regimes and certifications. Agricultural commodities generally undergo a processing stage before being distributed. However, in some cases they are sold directly to consumers (direct chain) or through the sole mediation of the wholesale industry (short supply chain).⁴

⁴ Global Food Value Chain and Competition Law BRICS Draft Report, CLES Paper Series, 2017.

³ Global Food Value Chain and Competition Law BRICS Draft Report, CLES Paper Series, 2017.

2. Quantitative Analysis of Agriculture Value Chain

To identify potential sectors within Agriculture in Turkey, we utilize IsDB's GVC Selection tool.⁵ The tool provides a systematic approach to assess a country's competitiveness and global value chains' trade potential. Secondly, it provides a framework to analyze value chains in order to achieve industrial deepening and upgrading.

a. Natural Potential

The relative comparative advantage (RCA) of the agriculture industry has been in a state of decline. Manufacturing of food (cluster of HS10-21 and 23), edible fruit and nuts (HS07) and edible vegetables (HS08) are the three categories that have an average RCA above 1. As presented in figure 1 below, the RCA for edible fruit consistently increased until 2005, followed by a sharp decline until 2008, between 2012 to 2018, there has been a steady decline. Manufacturing of food and edible fruits has been stable throughout the years.

b. Dynamic Potential: Product Champion Index

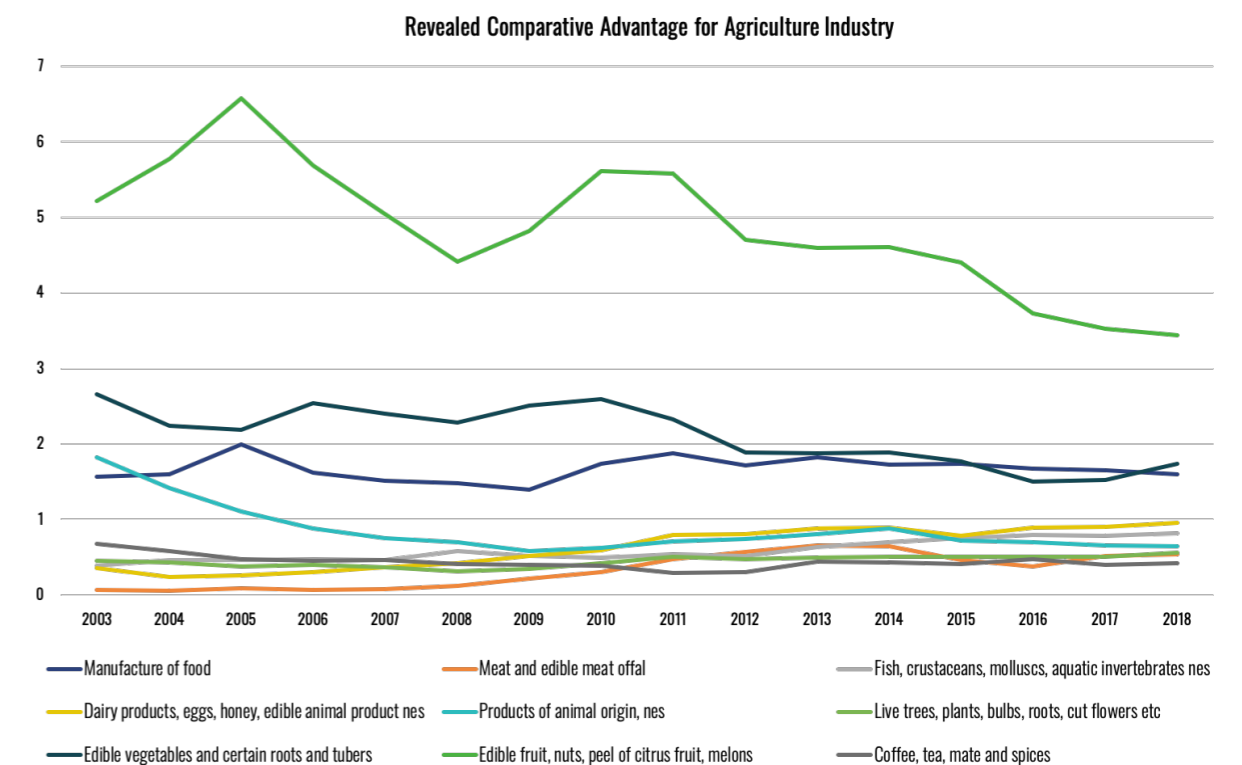


Figure 1: RCA for the Agriculture and Food Industry in Turkey, Source: Authors using UN Comtrade data.

⁵ The methodology can be accessed at <https://strategy.isdb.org/global-value-chains>

By breaking down the exports data at HS4 level for the agriculture industry, the Product Champion Index (PCI) was calculated and ranked according to the six indicators. The PCI identifies at more disaggregated level, the highest potential products that a country can produce to plug into the GVC. This step ends up with an index that ranks several products. The results are presented for PCI Static Supply, PCI Dynamic Demand and PCI Market Access. These indices reflect the potential product champions in the industry that could guide policymakers to integrate these products in the GVC.

As presented in figure 2, Turkey's agriculture industry exports are very diverse at the HS 4 level ranging from products performing well in winning sectors, whereby, the country exports have shown growth trajectory in tandem with global growth in demand for these products. Some products are performing poorly (losing sector), whereby, the country growth of exports has not been able to meet global growth in demand. Looking at the bubble graph, there are five products in the top right quadrant (winning sector in a growing market):

- HS0302, fresh or chilled fish;
- HS0809, fresh apricot, cherries, peaches, nectarines, plums and sloes;
- HS1915, bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa: communion ...
- HS1902, pasta, whether or not cooked or stuffed with meat or other substances or otherwise prepared, ...
- HS0804, dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried.

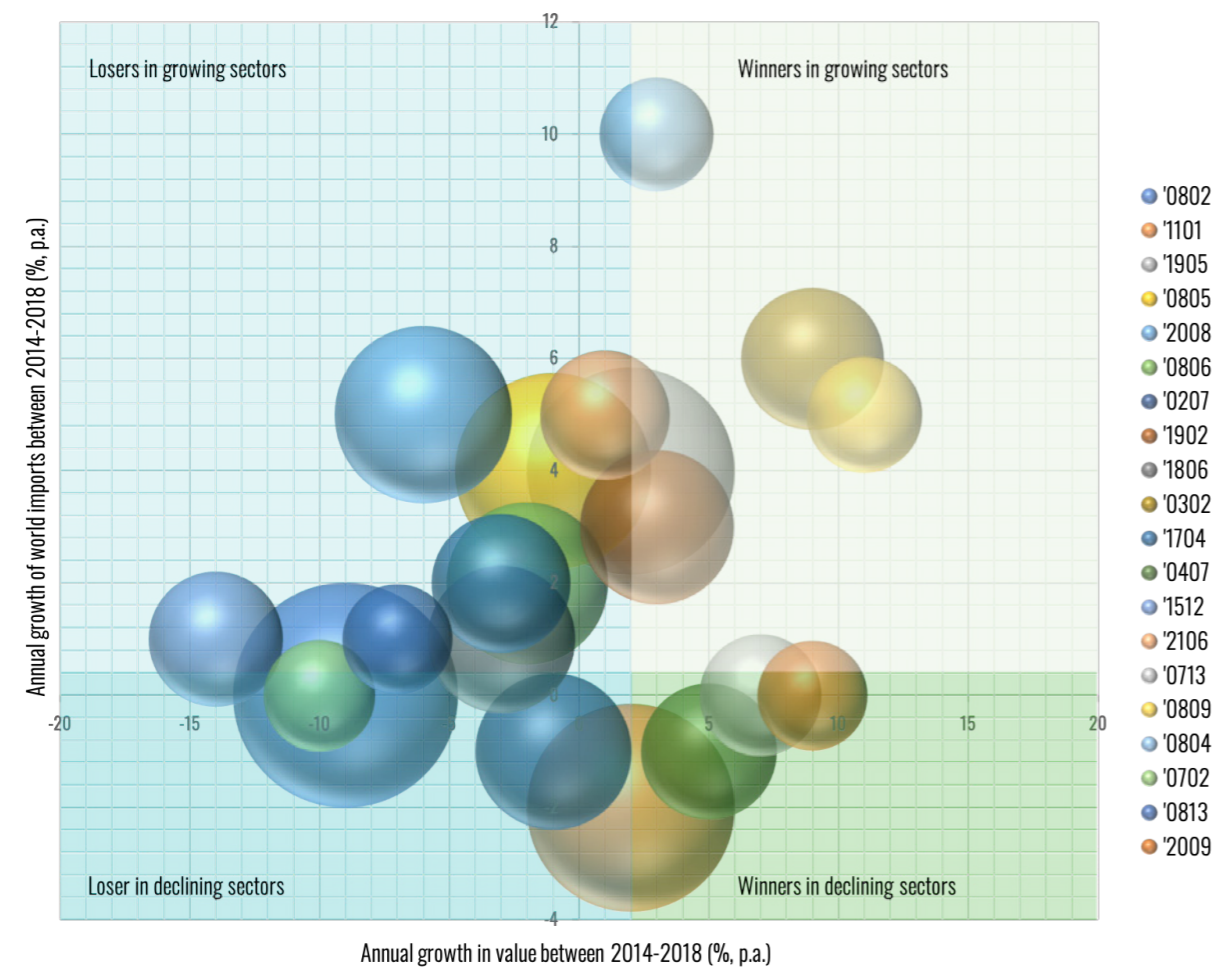


Figure 2: Performance of Selected Agriculture Exports, Source :Authors using UN Comtrade data.

Using IsDB's methodology to capture the product champion index (PCI), shown in table 2, the top 10 HS4 product for the different type of PCI index is consistent. There is two product which is always in the top 3 in all the list: one is HS0302, fresh or chilled fish; and HS0809, fresh apricot, cherries, peaches, nectarines, plums and sloes.

Product	PCI STATIC	Product	PCI DYNAMIC	Product	PCI MARKET ACCESS
Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa: communion...	0.296139866	Fish, fresh or chilled (excluding fish filets and other fish meat of heading 0304)	0.381966858	Apricots, cherries, peaches incl. nectarines, plums and sloes, fresh	0.083973501
Fish, fresh or chilled (excluding fish filets and other fish meat of heading 0304)	0.284889383	Apricots, cherries, peaches incl. nectarines, plums and sloes, fresh	0.379343348	Fish, fresh or chilled (excluding fish filets and other fish meat of heading 0304)	0.08176414
Apricots, cherries, peaches incl. nectarines, plums and sloes, fresh	0.261583228	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried	0.316530611	Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa: communion...	0.027511113
Citrus fruit, fresh or dried	0.237550736	Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa: communion...	0.270907258	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried	-0.000507208
Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried	0.2195028	Citrus fruit, fresh or dried	0.195395611	Citrus fruit, fresh or dried	-0.001731649
Wheat or meslin flour	0.166095281	Food preparations, n.e.s.	0.174790932	Dried leguminous vegetables, shelled, whether or not skinned or split	-0.018023557
Food preparations, n.e.s.	0.156611703	Dried leguminous vegetables, shelled, whether or not skinned or split	0.163519444	Food preparations, n.e.s.	-0.049388618
Fruits, nuts and other edible parts of plants, prepared or preserved, whether or not containing ...	0.132383859	Pasta, whether or not cooked or stuffed with meat or other substances or otherwise prepared, ...	0.141430731	Fruits, nuts and other edible parts of plants, prepared or preserved, whether or not containing ...	-0.123158491
Pasta, whether or not cooked or stuffed with meat or other substances or otherwise prepared, ...	0.131323586	Fruit juices, incl. grape must, and vegetable juices, unfermented, not containing added spirit, ...	0.141013102	Birds' eggs, in shell, fresh, preserved or cooked	-0.12586738
Dried leguminous vegetables, shelled, whether or not skinned or split	0.130569155	Birds' eggs, in shell, fresh, preserved or cooked	0.096594609	Wheat or meslin flour	-0.152687175

Table 2: Product champion index (PCI) for static supply, dynamic Demand and market access, Source :Authors using UN Comtrade data.

c. Surplus and Spillover Potential

Surplus and spillover potential aims to analyze the value-added in industries by considering the interlinkages of industries. Figure 3 below depicts the breakdown of output for domestic and international uses. Only 12% of the gross output of agriculture industry was exported. Of the exported product, 30% were used as final, and 70% were intermediate goods. While the food and beverage industry, gross export was only 8% of the gross output of which 52% was used as a final good.

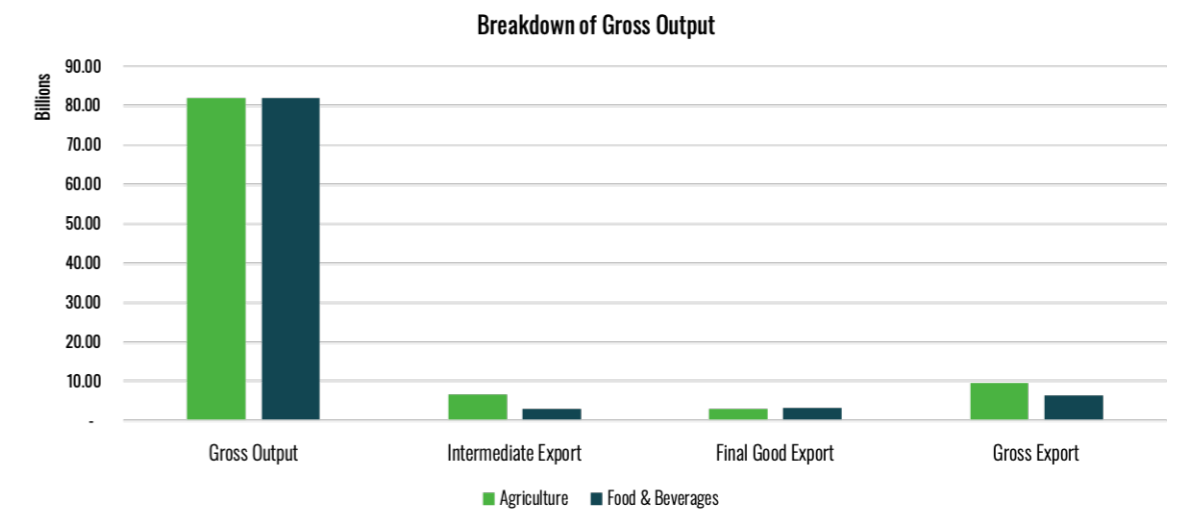


Figure 3: Breakdown of Output and Export of Agriculture industry, Source :Authors using EORA input output table.

The extent at which domestic (or foreign) inputs are used can be found by checking the decomposition of exports into its domestic and foreign sources. Domestic value added (DVA) indicates the share of domestic supplier industries in total exports, whereas foreign value added (FVA) indicates the share of foreign supplier firms (imports) in total exports.

The domestic value added in the agriculture industry in Turkey is around USD 9 billion. Nearly 94% of the agriculture industry is based on domestic value-added. The remaining 4% is foreign value-added. The share of domestic value-added in a third countries export, indirect value-add (DVX) is around USD 4.2 billion. About 43% of agriculture exports are exported to third countries.

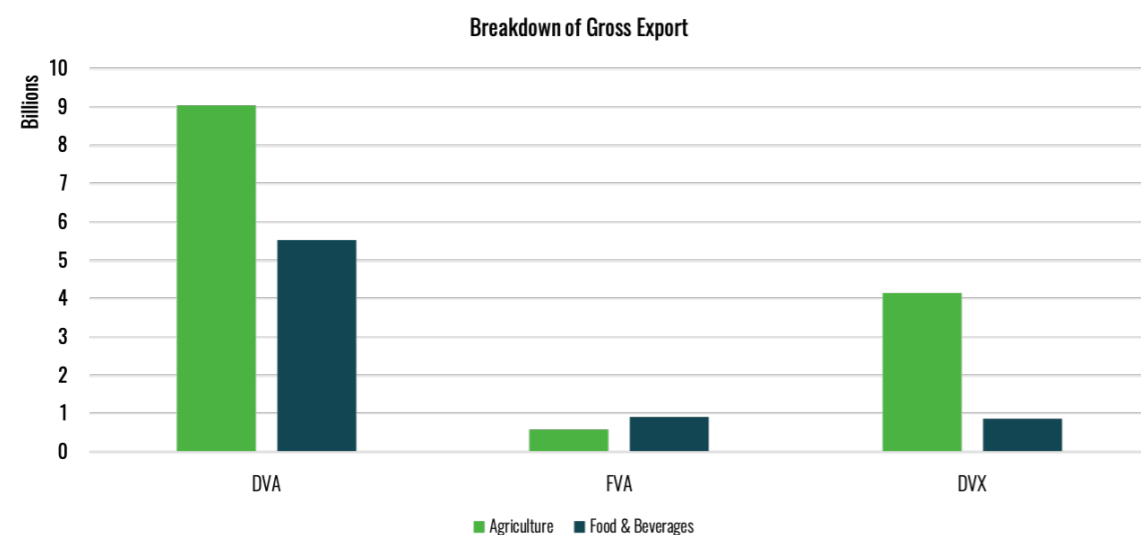


Figure 4: Domestic value added (DVA) Foreign value added (FVA) and, Indirect value-add (DVX), Source :Authors using EORA input output table.

The domestic value added in the food and beverage industry in Turkey is around USD 5.5 billion. 86% of industry exports are based on domestic value-added, and the rest is made up of foreign value-added. The indirect value-added is around USD 900 million, 13% of agriculture exports are exported to third countries.

The current engagement of Turkey in GVCs can be quantified and evaluated by two indexes proposed by Koopman et al., (2014) and IsDB (2019): i) The GVC position index identifies the role of a country as upstream or downstream position, and ii) The GVC participation index that summarizes the importance of the global supply chain for the country for which it is calculated (Koopman et al., 2011). It measures the participation degree to GVCs by the sum of the shares of foreign value-added in exports and domestic value-added in third countries exports in total export. The GVC position index uses the difference between these shares in logarithmic form.

High values of GVC participation index signal high integration into GVCs. ISDB calculated Turkey's GVC participation index as 49% and 28%. In other words, 49% and 28% of the agriculture and food and beverage exports is related to either foreign value-added or indirect value add. Both have the lowest GVC participation compare to the other industries.

Two types of upstreamness can be distinguished (Koopman et al., 2014): The first, natural resource exporters whose goods are used by other countries to produce intermediate goods exports, and the second, intermediate goods exporters to be used by other countries in their production. Those countries with high upstreamness, other than natural resource exporters, tend to be generally specialized in skill- and design- intensive goods. Koopman et al., (2014) remark that advanced countries export relatively more upstream components and a part of this value-added embedded in these export activities returns to advanced countries in imports from other countries. Downstreamness generally defines a user position in a GVC. Positive values of GVC position index define upstream positions, whereas negative values define downstream positions.

The GVC position of Turkey's agriculture industry was calculated as 0.29, and the food and beverage were calculated as -0.005. This implies the agriculture industry is in the upstream and the food and beverage industry at the downstream of production.

3. The Global Fruits and Vegetables Industry

a. Overview

The fruit and vegetables GVC is comprised of five major segments; input provision, production (farming), packing & storage, processing and distribution and marketing. R&D activities are carried out to support each of these different stages, with the highest value R&D considered to be in the production of inputs.

Produce may be traded fresh/chilled, in bulk or packaged. These products may be repackaged for fresh consumption by importing countries or oriented to processing plants. Value distribution in the chain is driven by the perishable and seasonal nature of the specific products. (1) Fresh produce generates the highest profit margins early in the end-market season, with margins declining as available volumes increase. (2) Processing consists of drying, freezing, preserving or juicing fresh produce. This stage allows producers to orient peak-season and/or lower quality produce towards an alternative end-product which is less subject to seasonality/perishability challenges. These products can be sold year-round. Processing generally requires sufficient capacity in the production stage of the chain to ensure optimal utilization of capital equipment. (3) Geographic end-markets vary in quality requirements and potential value opportunities for both fresh and processed produce. Potential shipping distance to end-market is determined by product shelf-life.

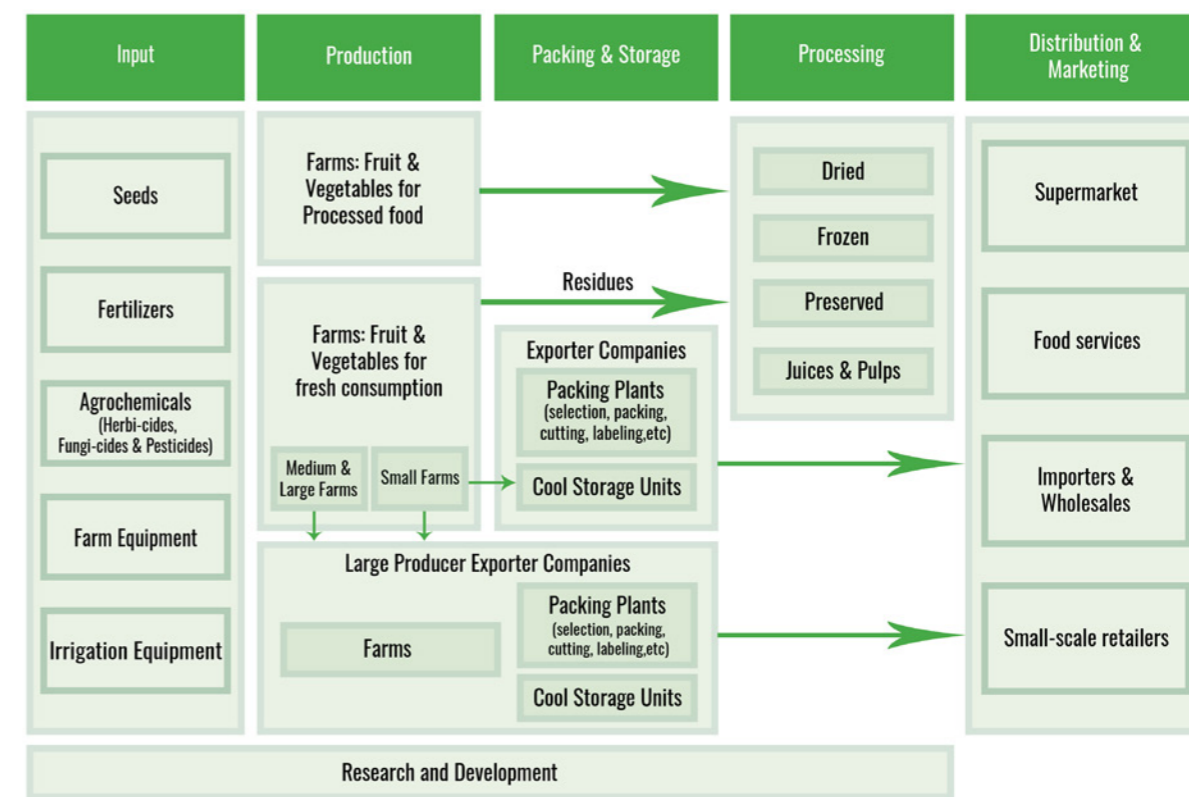


Figure 5: Fruit & Vegetable Global Value Chain, Source: (Fernandez-Stark et al., 2011).

b. Global Supply and Demand in the Fruit and Vegetable GVC⁶

The global fruit and vegetable trade has grown considerably over the past two decades. Since 2000, volume⁷ has doubled, while value has quadrupled: increased returns have encouraged further growth of the sector. Growth has been driven primarily by the demand for off-season fresh produce by developed countries, which accounted for 71% of imports in 2017 (UN Comtrade, 2018). The expansion of trade has been helped by innovations in packaging and shipping techniques which have increased shelf-life and ensured sanitary and phytosanitary standards (SPS) compliance into key markets.

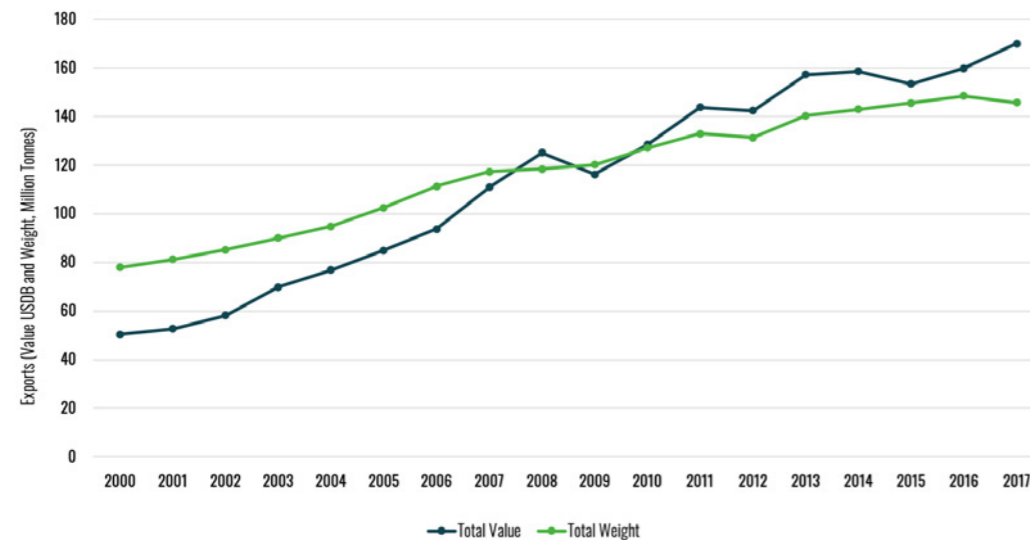


Figure 6: Global Trade in Fruits, Nuts & Vegetables by Value & Weight, 2000-17, Source: UN Comtrade, 2018 (HS-2002, 07 – Vegetables, & 08 Fruits & Nuts).

Includes some, but not all processed fruits and vegetables as a result of use of aggregate data. H2-20 not included). Downloaded 2019/12/10.

Global fruit and vegetable trade is comprised of approximately 2/3 fruits and 1/3 vegetables. This share has remained steady over the past decade.

Fruit: Fruit can be divided along a spectrum of high volume, low-value fruit (e.g. banana, citrus, apples, pears, grapes) to low volume, high-value fruit (e.g. avocados, cherries, fruits, berries). High volume fruit collectively perform well in long-distance shipping, allowing them to be relatively cheaply transported around the world. Year-round supply, widespread production areas, consolidated supply chains and general commoditization mean that these fruits are highly competitive with low margins and require economies of scale to turn a profit.

High-value fruit are generally more delicate and labor intensive; they require specific production conditions and post-harvest handling to ensure they arrive in optimal condition. Long-distance shipping of these products has increased over the past five to ten years as packing and shipping technologies have improved (Bamber & Fernandez-Stark, 2019). Fruit is primarily exported fresh, with only 32% of traded value in the industry derived from processed products. Processed fruit is dominated by fruit juice and canned/preserved fruit (UN Comtrade, 2019).

⁶ This section is based on analysis of UN Comtrade international trade statistics, using the primary HS2002 categories 07, 08 and 20. Data downloaded March 15, 2019 unless otherwise specified.

⁷ References to volume in this report should be considered as Weight if not otherwise specified, as per global trade statistics definitions.

	Value (USD, M)		Volume (KT)	
	2017	CAGR 2012-2017	2017	CAGR 2012-2017
Fresh Fruits				
Citrus, fresh/dried	13,521	2%	14,861	1%
Bananas, incl. plantains, fresh/dried	10,891	2%	18,804	0%
Grapes, fresh	8,143	3%	4,449	3%
Apples, fresh	7,544	1%	8,199	0%
Avocados, fresh/dried	5,816	25%	1,933	13%
Berries, All Excl. Strawberries & Cherries	4,080	13%	704	10%
Kiwifruit, fresh	2,700	6%	1,493	1%
Pears & quinces, fresh	2,635	0%	2,808	1%
Guavas, mangoes & mangosteens, fresh/dried	2,588	10%	1,859	1%
Strawberries, fresh*****	2,570	2%	935	2%
Cherries, fresh	2,197	6%	533	5%
Peaches, incl. nectarines, fresh	2,167	-1%	2,378	5%
Pineapples, fresh/dried	1,974	3%	3,609	2%
Watermelons, fresh	1,637	8%	4,771	15%
Dates, fresh/dried	1,136	6%	733	-2%
Plums & sloes, fresh	826	1%	706	2%
Durians, fresh	618	12%	229	-18%
Figs, fresh/dried	490	8%	136	5%
Apricots, fresh	429	1%	372	4%

Table 3: Trade in Fresh Fruits, 2017, Source: Bamber and Fernandez-Stark, 2019 based on UN Comtrade, 2019. Downloaded 2019/03/12. Exports.

Dynamics in vegetable trade differ slightly. The largest volume, mature vegetables (e.g. potatoes, tomatoes) growing a faster rate than mature fruits. Nonetheless, trade in mid- and low-volume vegetables (e.g. peas, cabbage, cucumbers is growing faster than large volume products.) Processed produce accounts for a higher share of traded value (54%) than fresh vegetables. Frozen and prepared, but uncooked vegetables account for the majority of processed vegetables.

	Value (USD, M)		Volume (KT)	
	2017	CAGR 2012-2017	2017	CAGR 2012-2017
Fresh Vegetables				
Tomatoes, fresh/chilled	8,927	1%	7,642	1%
Capsicum/Pimenta, fresh/chilled	5,034	5%	3,506	5%
Potatoes (excl. seed) fresh/chilled	3,345	2%	11,126	2%
Onions & shallots, fresh/chilled	3,168	3%	7,944	3%
Garlic, fresh/chilled	3,128	4%	2,150	4%
Cucumbers & gherkins, fresh/chilled	2,452	5%	2,890	5%
Lettuce (excl. cabbage) fresh/chilled*****	1,386	2%	1,014	2%
Cauliflowers & broccoli, fresh/chilled	1,356	3%	1,342	3%
Carrots & turnips, fresh/chilled	1,249	3%	2,824	3%
Mushrooms, fresh/chilled	1,015	2%	464	2%
Cabbage lettuce, fresh/chilled	977	10%	1,309	10%
Seed potatoes, fresh/chilled	908	3%	1,740	3%
Beans, fresh/chilled	813	3%	559	3%
Peas, fresh/chilled	397	11%	480	11%

Table 4: Trade in Fresh Vegetables, 2017, Source: Bamber and Fernandez-Stark, 2019 based on UN Comtrade, 2019. Downloaded 2019/03/12. Exports.

The United States (US) leads the global import markets for both fruits and vegetables with 17% and 18% respectively (Table 5, Table 6), followed by Germany (Fruit: 8%, Vegetables: 12%). China has become an increasingly important buyer of fruits, now accounting for 6% of the global market. The United Kingdom remains a major importer of both fruits and vegetables with 6% and 8% of global markets respectively.

Importers	Value (USD, M)	Share (%)
World	82,156	100%
USA	13,840	17%
Germany	6,745	8%
China	5,116	6%
Netherlands	4,854	6%
United Kingdom	4,838	6%
Russian Federation	4,237	5%
France	4,138	5%
Canada	3,531	4%
Belgium	3,005	4%
China, Hong Kong SAR	2,609	3%
Japan	2,116	3%
Others	7,127	33%

Table 5: Leading Importers, Fresh Fruit, 2017, Source: UN Comtrade, 2019. H2. Downloaded 2019/03/12. Importers.

Importers	Value (USD, M)	Share (%)
World	32,440	100%
USA	5,815	18%
Germany	3,811	12%
United Kingdom	2,484	8%
Canada	2,242	7%
France	1,857	6%
Netherlands	1,834	6%
Belgium	1,362	4%
Russian Federation	987	3%
Italy	779	2%
Japan	772	2%
Others	10,498	32%

Table 6: Leading Importers, Fresh Vegetables, 2017, Source: UN Comtrade, 2019. H2. Downloaded 2019/03/12. Importers. Note: Lebanon excluded from data due to outlier data point.

World exports of fruits and vegetables are led by Spain, US, Mexico and China. Spain and Mexico are very strong intra-regional exporters, with the bulk of their exports (+80%) destined to Europe and the US respectively. Chile, Ecuador, South Africa, Peru lead extra-regional exports and are primarily focused on fruits.

	Value (USD, M)	Share (%)
World	75,648	100%
Spain	8,055	11%
USA	5,930	8%
Mexico	5,567	7%
Netherlands	4,963	7%
China	4,358	6%
Chile	4,305	6%
Italy	3,437	5%
Ecuador	3,151	4%
South Africa	2,879	4%
Belgium	2,422	3%
Viet Nam	2,411	3%
Peru	2,195	3%
Others	25,977	34%

Table 7: Leading Exporters, Fresh Fruit, 2017, Source: UN Comtrade, 2019. H2. Downloaded 2019/03/12. Exporters. Note: Netherlands and Belgium serve roles as distributors within Europe, with high levels of re-exports.

	Value (USD, M)	Share (%)
World	32,108	100%
Netherlands	4,825	15%
Spain	4,453	14%
Mexico	3,916	12%
China	2,707	8%
USA	2,679	8%
France	1,401	4%
Italy	1,317	4%
Canada	1,240	4%
Belgium	842	3%
Germany	772	2%
India	643	2%
Egypt	570	2%
Others	6,744	21%

Table 8: Leading Exporters, Fresh Vegetables, 2017, Source: UN Comtrade, 2019. H2. Downloaded 2019/03/12. Exporters. Note: Netherlands and Belgium serve roles as distributors within Europe, with high levels of re-exports.

	Value (USD, M) 2017	Share
World	35,918	100%
China	3,987	11%
USA	2,793	8%
Netherlands	2,649	7%
Brazil	2,241	6%
Germany	1,936	5%
Thailand	2,003	6%
Spain	1,458	4%
Poland	1,226	3%
Mexico	1,449	4%
Belgium	1,500	4%
Italy	1,035	3%
Turkey	1,046	3%

Table 9: Exporters, Processed Fruits, 2017, UN Comtrade, 2019. H2. Downloaded 2019/12/10. Exporters. Note: Netherlands and Belgium serve roles as distributors within Europe, with high levels of re-exports.

c. Lead Firms and Governance Structures in the Fruit and Vegetable GVC

Large supermarket chains⁹ are the leading actors in the key export markets, with controlling market shares of up to 80% across the EU and in the US (Reardon et al., 2007), and a growing share of the market in Asia. These buyers seek enhanced cost competitiveness, consistency and product differentiation from their global supply chains.

During the past 20 years, they have continuously globalized and consolidated, gaining more power over the suppliers; in 2018, for example, UK giant Tesco entered into a strategic partnership with French leader, Carrefour, for a collaborative procurement program (Deloitte, 2019).

Company	Origin	Retail Revenue FY 2017 (USDB)	Number of Countries	Retail CAGR FY12-217
Walmart	US	500	29	1.3%
Costco	US	129	12	5.4%
The Kroger Co.	US	118	1	4.2%
Amazon	US	118	14	18%
Schwarz	Germany	112	30	7.5%
Aldi	Germany	98	18	7.2%
Tesco	UK	74	8	-2.4%
Ahold Delhaze	Netherlands	72	10	13.8%
Target	US	72	1	0.0%
Aeon	Japan	70	11	8.7%

Table 10: Leading Global Retailers in Fast-Moving Consumer Products, 2017, Source: Deloitte. (2019). Global Powers of Retail 2019. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Consumer-Business/cons-global-powers-retailing-2019.pdf>

⁸Including both supermarkets and hypermarkets.

Today, these lead firms exert significant influence over the entire value chain and dictate how fresh produce is cultivated, harvested, transported, processed and stored (See Table 11).

	Public		Private	
	Mandatory	Voluntary	Individual	Collective
National	<ul style="list-style-type: none"> National legislation (pesticide use, labor regulations, sanitary inspections etc.) USDA Standards 	<ul style="list-style-type: none"> HACCP USDA National organic program 	<ul style="list-style-type: none"> Nature's Choice (Tesco) Field-to-Fork (M&S) Terre et Saveur (Casino) Conad Percorso Qualità (Italy) Albert Heijn BV: AH Excellent (Netherlands) 	<ul style="list-style-type: none"> British Retail Consortium (UK) Assured Foods Standards (UK)
Regional	<ul style="list-style-type: none"> European Union Regulations 		<ul style="list-style-type: none"> Filieres Qualite (Carrefour) 	<ul style="list-style-type: none"> GlobalGAP⁹ Dutch HACCP Qualitat Sicherhiet (QS – Belgium, Holland, Austria) International Food Standard (German, French, Italian)
International	<ul style="list-style-type: none"> World Trade Organization SPS Agreement 	<ul style="list-style-type: none"> ISO 9000 ISO 22000 	<ul style="list-style-type: none"> SQF 1000/2000/3000 (US) 	<ul style="list-style-type: none"> GlobalGap Global Food Safety Initiative SA 8000 IFOAM Standard

Table 11: Prominent Standards in the Fruit & Vegetables Industry, Sources: Duke GVC Center.

⁹ GlobalGap is one of the most widely adopted standards. This standard was first developed in Europe in 1997 by an association of European fresh produce importers and retailers, and principally concerns pesticides and chemical use as well as the environmental impact of farming systems. US retailers began to adopt this standard for fresh produce in 2008 (GlobalGAP, 2008).

d. Upgrading in the Fruit and Vegetable GVC

	Description
Production (Entry in the value chain)	<ul style="list-style-type: none"> •Entry point for the fruit and vegetable value chain. •Opportunity for low-income countries to export higher value added agro-products.
Packing & Cold Storage (Functional Upgrading)	<ul style="list-style-type: none"> •Countries looking to increase the value of their exports and to improve supply for their clients will improve their packing and cold storage systems. •This can include sophisticated packing for fresh fruit and vegetables, such as ready-to-eat products, that are pre-washed, cut, and bagged.
Processed Fruit & Vegetables (Functional Upgrading)	<ul style="list-style-type: none"> •To enter in this segment, countries have to master the production stage. •Countries need new infrastructure and a workforce prepared to engage in this activity.
Product Upgrading	<ul style="list-style-type: none"> •Diversification or shift into higher value products. •Within the FFV, this includes moving from the production of more commoditized produce – such as citrus and/or deciduous fruits – into smaller niche segments, such as berries, cherries, figs or avocados.
Product Upgrading	<ul style="list-style-type: none"> •Improve the product characteristics. This can happen in all the stages of the value chain— production, packing and storage, and processing. •Some of the standards that have been adopted by the industry, such as GAP standards, focus on product upgrading, as well as ensuring that the sanitary and phytosanitary conditions of the product are met.
Process Upgrading	<ul style="list-style-type: none"> •Introduction of new technologies in the production system or the restructuring of the existing system to generate services more efficiently. •Companies implement more efficient systems in the search to improve productivity and remain competitive.
Market Diversification	<ul style="list-style-type: none"> •Entering into new geographic markets to supply FFV. This requires securing market access through SPS compliance amongst other things.

Table 12: Key Upgrading Trajectories in the Fruit and Vegetables Global Value Chain, Source: Duke GVC Center.

e. Lessons for Upgrading from Other Countries in the Fruit & Vegetable GVC

The upgrading trajectories of other large players in the fruit and vegetable industry can be informative for Turkey as the country develops its strategy for GVC integration. These include Chile and Mexico. Major upgrading paths have included (1) process upgrading, that is, improving production processes to boost both productivity and improve the quality of the fresh product to improve shelf-life. This allows more fruit to reach its market in better condition. (2) Product upgrading, that is, expanding beyond low value fruits to enter into a diverse range of products. This upgrading trajectory has allowed producers to reduce seasonal production impacts, allowing them to retain a permanent workforce and optimal use of fixed assets. (3) Market Upgrading: This has been stronger for Chile than for Mexico, which continues to concentrate primarily on the US market. (4) Functional upgrading into processed fruits and into R&D has taken place in both countries but remains secondary to product and market upgrading in terms of value contributions.

Chile: While Chile ranks 6th amongst global fruit exporters, it is the leading extra-regional exporter (by value). **Product Upgrading:** Between 2001 and 2017, Chilean fresh fruit exports diversified significantly (Figure 8), reducing its dependence on commodity products, including apples (2001: 21%, 2017:13%), grapes (2001: 43%, 2017:32%) and pears (2001:6%, 2017: 3%), and increasing its exports of higher value fruits. By 2017, high value cherries accounted for 13% of export value (compared to just 2% in 2001), avocados 10% (compared to 4% in 2001) and berries 10% (compared to 1%).

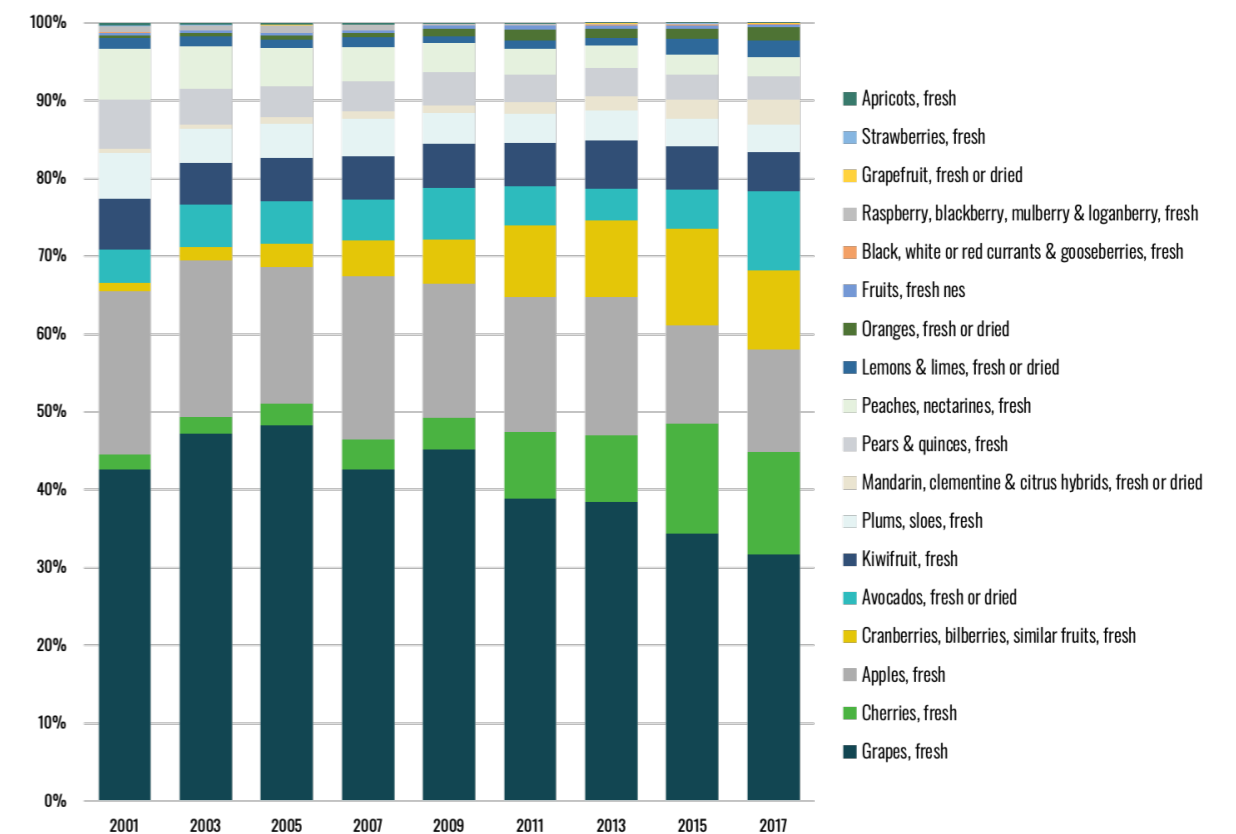


Figure 7: Chilean Fresh Fruit Export Composition, 2001-2017, Source: UN Comtrade, 2019.

Market Upgrading: Chilean exporters have diversified their markets (Figure 8), slightly reducing dependence on the US market and gained access to new markets, particularly in Asia following new sources of demand. At the same time, exporters have retained their position in high value US and EU markets.

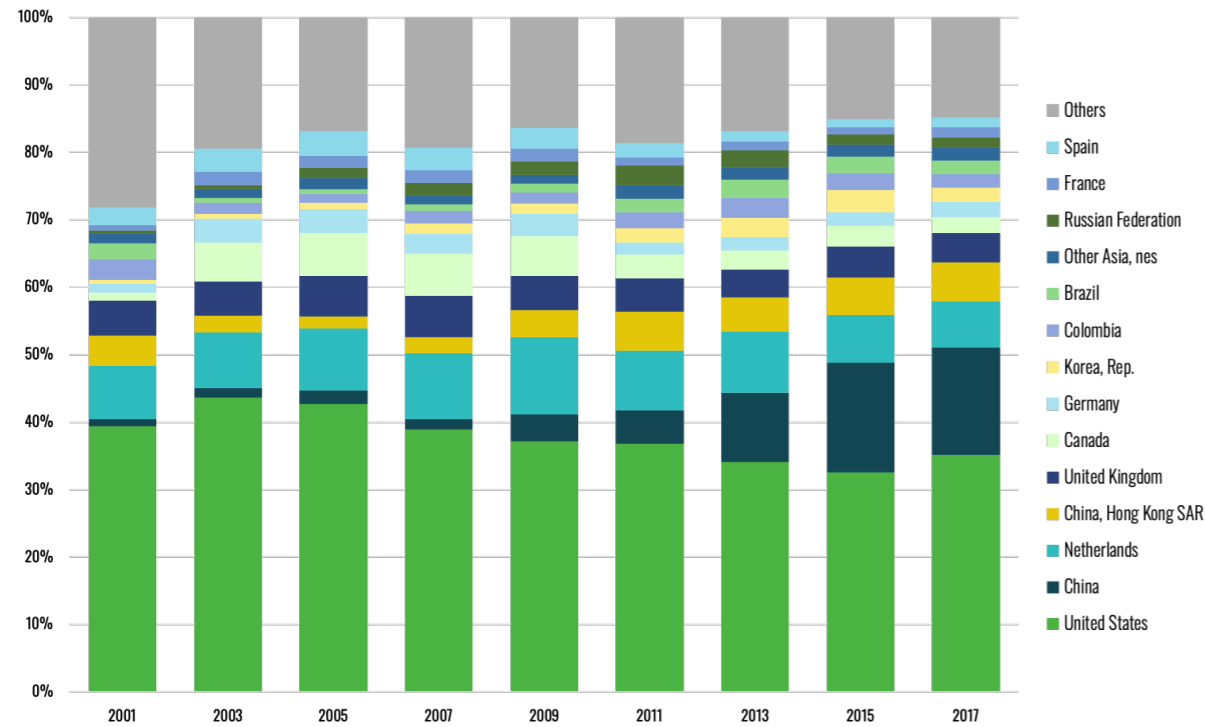


Figure 8: Chilean Fresh Fruit Export Destinations, 2001-2017, Source: UN Comtrade, 2019.

Functional Upgrading: Chilean exports have focused on fresh exports, although firms have begun exporting more processed produce over the past fifteen years (Figure 9). Frozen and dried fruit account for higher shares of value (5% each) compared to fruit juice (3%). In addition to moving up the value chain into processing, the country has upgraded into both upstream and downstream services activities, including R&D in new genetic materials as well as engineering and consulting services for standards compliance at both the public and private levels.

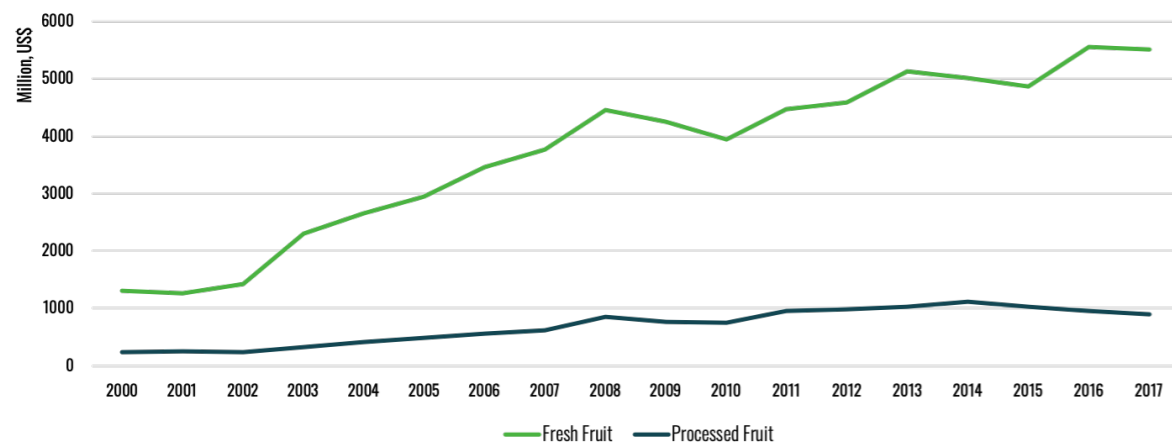


Figure 9: Chilean Fruit Exports by Value Chain Stage, Source: UN Comtrade, 2019. Note: Processed Fruit includes HS96, 2009, 2008, 0806, 0812, 0813.

These upgrading strategies have been supported by significant process upgrading, in both the production and packing and cold storage operations. Major process upgrades include widespread adoption of precision agriculture techniques such as drip irrigation, netting for orchard protection and harvest and post-harvest training. In addition, digitized real-time tracking of fruit from the orchard to the supermarket has helped optimize fruit condition on arrival. These methods have helped to increase the quantity, quality and shelf-life of output. The 2018/9 season resulted in historic volumes of exports.

Mexico: Mexico is the 3rd largest exporter of fruit and the 2nd largest vegetable exporter globally. Fruit and vegetable exports have increased from USD 5.5B in 2007 to USD 13B in 2017 (UN Comtrade, 2019). **Product upgrading:** Mexico has steadily decreased the share of vegetables in exports, moving towards a greater concentration in higher value fruits. Fruits accounted for approximately 60% of value by 2017.

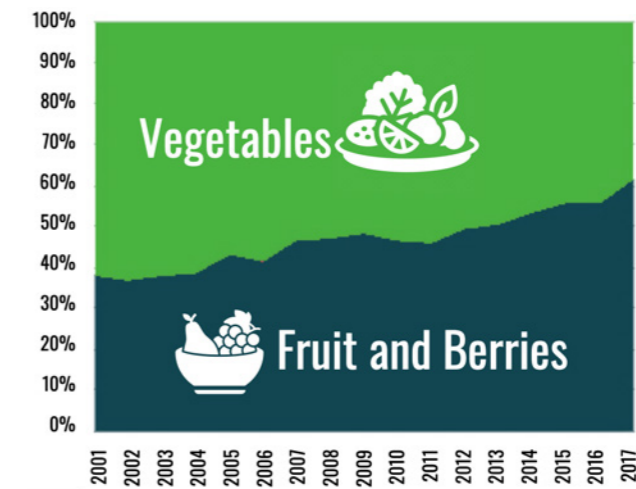


Figure 10: Export Composition by value, Fruits & Vegetables, Mexico 2001-2017, Source: UN Comtrade, 2019.

Within fruits, Mexico increased the share of export revenue derived from higher value fruits (Figure 11), including avocados (+29%) and berries (raspberries +13%, cranberries +3%, strawberries +2%), and decreased its share of more traditional products including melons (-12%), citrus (-3%) and pineapple (-1%).

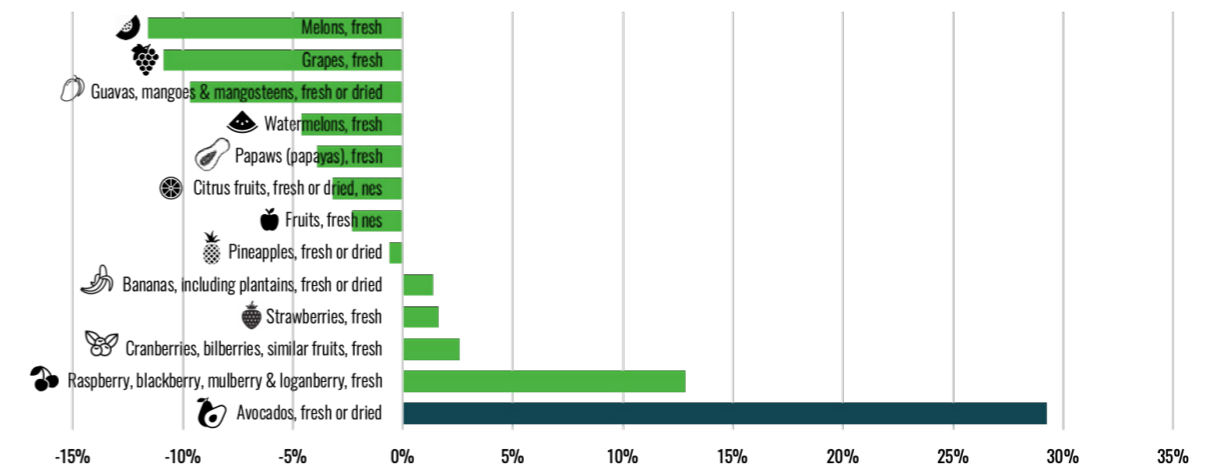


Figure 11: Change in Share of Exports, Fresh Fruit 2001/17 Source: UN Comtrade, 2019. Note: Fruits with no or <1% change excluded for illustrative purposes.

Exports of vegetables are concentrated in very few products, with tomatoes (32%) and peppers (18%) accounting for half of exports. Processed vegetable exports have tripled in value since 2001 but remain marginal (7%) of total vegetable exports. Frozen vegetables account for the largest share of these.

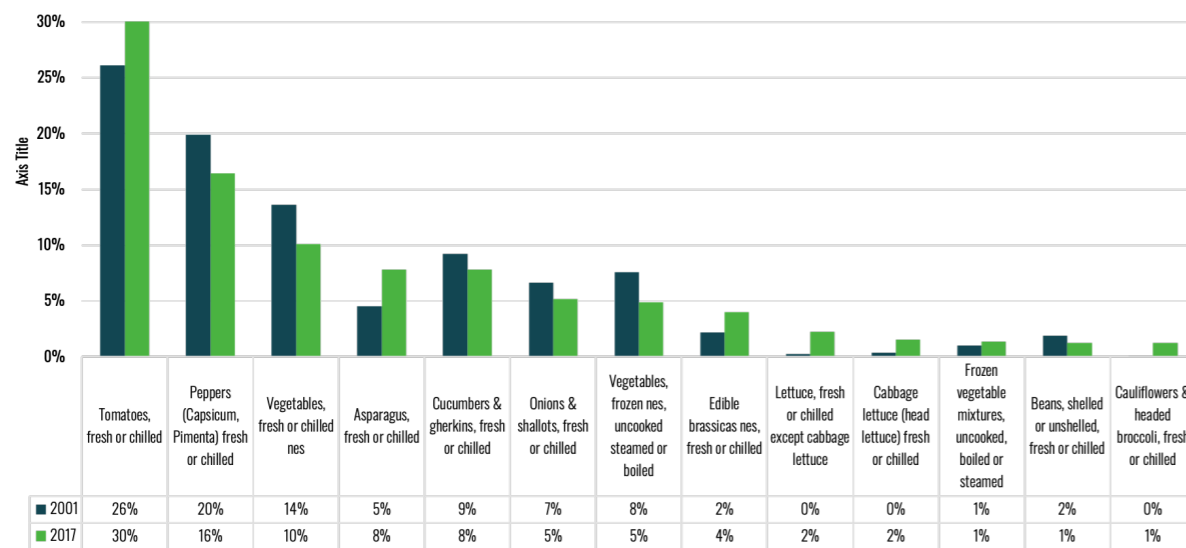


Figure 12: Export Share of Vegetables, Mexico 2001-2017, Source: UN Comtrade, 2019. Products with less than 1% of exports are excluded for illustrative purposes.

Market Upgrading: Due to the size, value and proximity of the North America market, Mexico’s export destinations remain focused on the US market (2001: 87%, 2017:84%), although Mexico has diversified slightly, increasing the share of its output destined to Canada (2001:4%, 2017:8%). A marginally lower share of fruits are destined to North America compared to vegetables (88% vs 92%). Mexico actively promotes its competitive advantage in terms of proximity to the high value US and Canadian markets, which allows it to provide high-quality fresh fruit locally.

Functional Upgrading: As with vegetables, while Mexico increased its processed fruits, although these remain a small share of total fruit exports (11%). In particular, Mexico has significantly increased exports of fresh and frozen orange juice, and frozen strawberries.

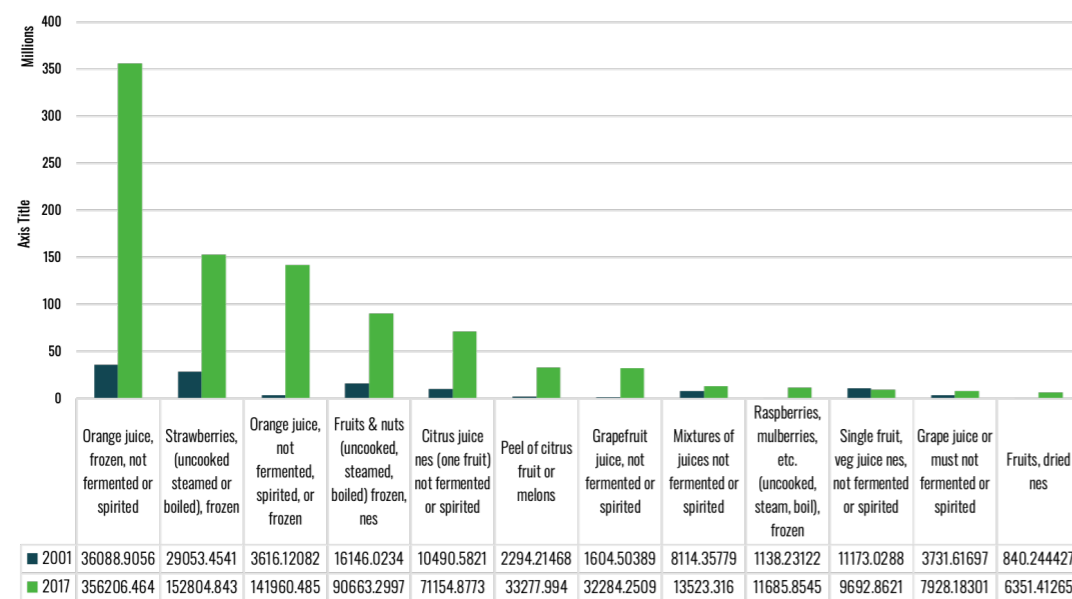


Figure 13: Mexican Exports of Processed Fruits, 2001 & 2017, Source: UN Comtrade, 2019.

Key Takeaways for Turkey:

- Significant export value can be harnessed by increasing output and diversifying into high value products, particularly fruits.
- Proximity in the case of Mexico and sophisticated technologies (improved processes for quality) in the case of Chile have enabled each country to leverage their potential to supply major markets with high quality fruit.
- Functional upgrading into processing has been a lower priority for producers, accounting for increasing export value, but still a small share of total product exports.



4. Turkey and the Agriculture Global Value Chain

While agriculture comprises a small share of Turkey’s economy, at 6% of GDP, it is a major contributor of employment with 19% of Turkish labor force employed in the sector. A focus on Agriculture is particularly important for addressing Turkey’s socio-economic disparity among its 81 provinces. Low productivity in agriculture in Turkey compared to other economic sectors has resulted in lagging growth in provinces that are agricultural powerhouses. Most importantly, for rural women, agriculture is practically the only form of employment.¹⁰

There are more than 5.3 million farmers in Turkey, with a large number working as small-holder farmers. One key characteristic of Turkish agriculture is the relatively small farm sizes at 6 ha per farm.¹¹ This is indicative of the small-holder nature of the median Turkish farmer.

Our focus on fruit and vegetable (FV) sector is driven by socio-economic considerations. The overwhelmingly largest share of employment in the agriculture sector is in the FV sector, due to its labor-intensive processes.¹² Secondly, the FV value-chain has employment creation prospects in the distribution, marketing and retail segments. Lastly, the sector has strong potential for growth, as research indicates that the sector is underperforming its true potential with a focus on low-value commodity type products like tomatoes and apples. Reduction of reliance on rain-fed agriculture, increase in productivity, a focus on quality, and improvement in market access mechanisms can unlock significant potential in the FV value chain.

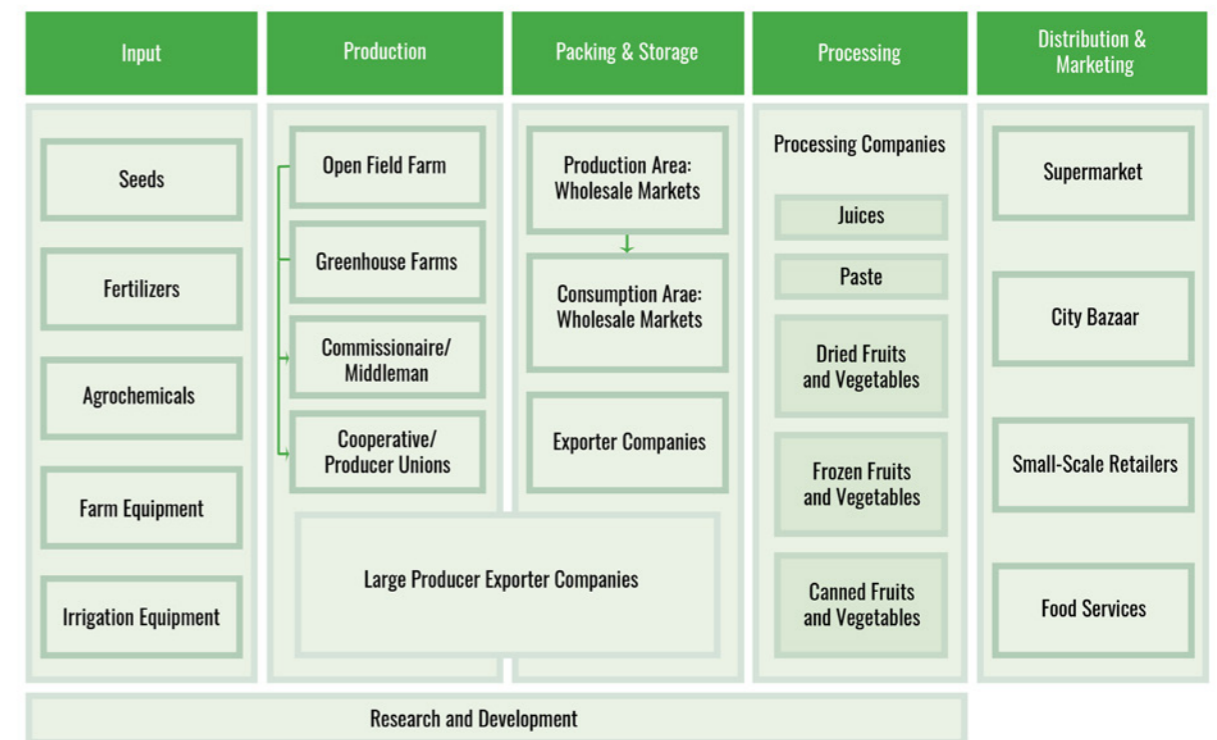


Figure 14: Schematic of Fresh Fruit and Vegetable Value Chain, Source: Author.

¹⁰ National Gender Profile of Agriculture and Rural Livelihoods - Turkey Retrieved 25 December 2019, from <http://www.fao.org/3/a-i6192e.pdf>

¹¹ Agrofood - Invest in Turkey. (2019). Retrieved 25 December 2019, from <https://www.invest.gov.tr/en/sectors/pages/agrofood.aspx>

¹² Vural H. Marketing structure of fresh fruit and vegetable in Turkey. Horticult Int J. 2018;2(5):277-279 Retrieved 25 December 2019, <http://medcraveonline.com/HIJ/HIJ-02-00064.pdf>

a. Mapping Turkey's Participation in the fruit and vegetable GVC

Inputs

The most important input for the Turkish fresh fruit and vegetable are seeds, fertilizers, agro-chemicals and fuel.

The majority of the inputs are imported and sold through contracted dealer, chemical stores or cooperatives. Local production of fertilizer and seed cannot meet the local demand; hence majority of these inputs is imported. Even though Turkey produces fertilizer, the lack of raw materials (primarily phosphate) in the country, make it dependent on foreign supply, which is the same for pesticide and other chemicals.

Production

Fresh fruit and vegetables are grown in approximately 20 million decare of land; 9% of total agriculture land (TURKSTAT). As shown in figure 4, citrus land area has increase by 30% from 2007 to 2018. Whereas, vegetables land area has decreased by 3% in the same period.

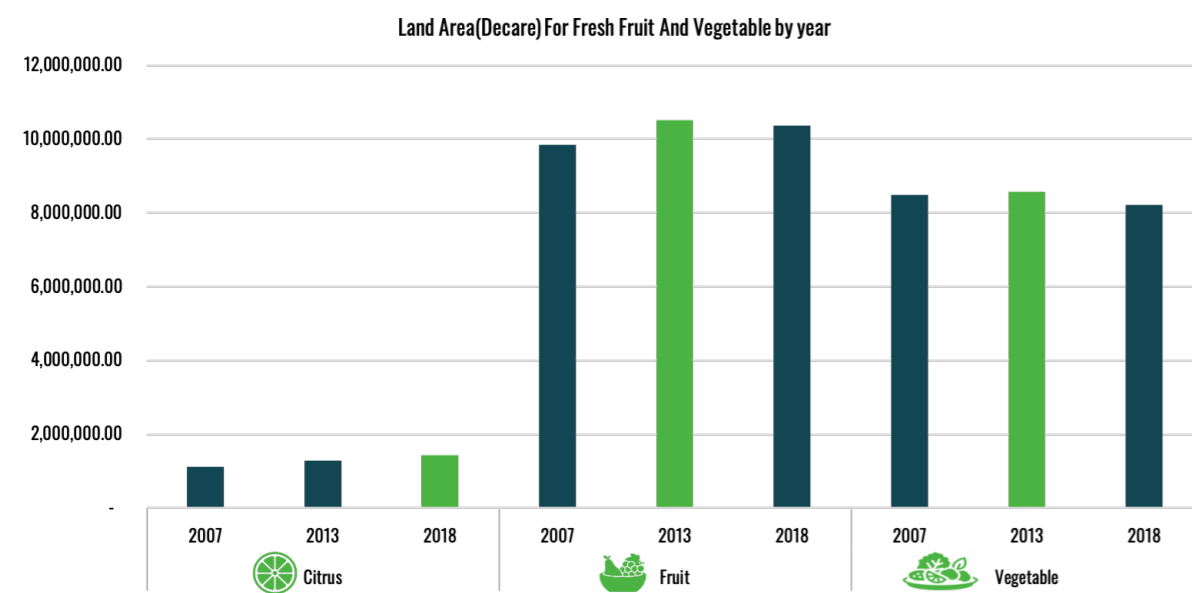


Figure 15: Area under Production for Fruit and Vegetables, Source: TURKSAT.

Fresh fruits and vegetable production is mostly operated by small & medium scale farmers with an average size of 0.99 ha for fruits and 0.98 ha for vegetable (TUKAS). In the production stage, there is only a handful of large investors, the rest prefer to use either contract farming or buy from the wholesale market.

The production process can be split into two major groups; open field and greenhouse farming. Open field farming is widespread across the country due to favorable climate conditions. However, greenhouse production is clustered around the coastal region with warm climates, like Antalya, Mersin, and Adana, as it requires less energy to maintain internal temperatures. The harvest periods are extended by 9-10 months in greenhouse production. The harvest areas for greenhouse production are 95% vegetable, 4% fruit, and 1% ornamental plants. Industrial greenhouse producers concentrate on the export market (Agency, 2015).

Producers have four primary ways to sell their goods: through commissionaires, cooperative, direct to the wholesale market, direct to retail/manufactures. Going through the commissionaires mean the producer gives the right to the commissionaires to sell to the merchant in the wholesale market. Even though this adds an extra layer in the value chain, the small producer prefers to go through this route as it minimizes their logistic cost (BİRCAN). Producers can also sell their produce directly to the retailer; however, more and more retailers prefer to work with larger producers, edging the small producer out of the market (GÖKKÜR). Cooperative is another solution for small farmers to sell their produce without going through the wholesale market.

Packing & Cold Storage

This stage is a very critical part of the transportation of fresh fruit and vegetable as it maintains the quality of the produce and allows the producer to sell to higher value-added customers further afield. This stage is the weakest link in the value chain in Turkey as only the exporter/distributor/large buyer have both the packing and the storage units to handle fresh fruit and vegetable adequately. The lack of cold storage, inadequate packing, and distribution account up to 40% losses in the fresh fruit and vegetable value chain (TANYAŞ).

Processing

The processing observed in Turkey can be split into five parts: fruit juice production, paste products, dried, frozen, and canned fresh fruit and vegetables. The fruit juice sub-sector uses the lower quality products which cannot be consumed by the end market, and the main fruit inputs are apples, peach, pomegranate, orange, and cherries. Apple is the most used fruit for juice production with 47.8%, followed by peach 10.9%, pomegranate 10.4%, orange 9.3%, and cherries 6.3% (Ministry of Economy(Turkey)). The leading firms in this space only produce fruit juice, source from wholesale markets and it is uncommon to see contract farming in this sector. Due to the scattered and small size of farmland in Turkey, it is difficult for juice producers to source the required type and volume of fruits (MEYED).

The paste industry for the fruit and vegetable industry is mainly made up of tomatoes and peppers. Unlike the juice industry, these products require a certain standard from their raw materials, hence, it is common to see contract farming in this part of the industry (Gunes). For the dried fruit and vegetable industry, Turkey is a significant player in the global market. This industry is made up of two types of investors: industrial players who use modern techniques and traditional players still using traditional methods (e.g., Sun-drying, small-scale drying) to dry the fruit and vegetables. The main exported dried products are grape, apricot, fig, and tomatoes (Kartal).

Frozen fruit and vegetable production is mainly focused on exports due to the low demand in the domestic market. There are no large firms in this space, and it is underdeveloped compared to the rest of the processing functions in the fruit and vegetable space, however large fresh fruit and vegetable companies are starting to invest in this area to fill the gap in the value chain.

The main canned fruit and vegetable products are jams, pickled, and canned fruit and vegetables.

The main products processed in this industry are beans, peas, okra, carrots, cucumbers, and potatoes for vegetables and sour/sweet cherries, apricots, and berries for fruits.

Distribution & Marketing

After the grading of the products based on the quality, it is sold from the wholesale market of the producing region to the large cities retailers and distributors (BİRCAN). 48% of fresh fruit and vegetables are bought the traditional way, from small scale retailers and city bazaars (PWC). The majority of companies that export are private Turkish firms and there appear to be very few foreign firms exporting fresh fruits and vegetables from Turkey.

b.Key Firms

In the GVC analysis, the top firms at different stages in the value chain can shed light on power dynamics within the chain and the expected strategy the market will follow. Hence, for this analysis, we use the top 1000 companies listed in the ISO 1000 to study the firms that are involved in the fresh fruit and vegetable value chain. The strategies indicate an increase in coordination throughout the chain, either through contract farming or vertical integration by processors/traders into production.

As mentioned earlier, most of the large players are in the processing stage of the value chain, particularly firms producing tomato products such as ketchup and paste. In Turkey, the firms involved in producing tomato products have similar product lines including pickled vegetable, mayonnaise, jam, and canned vegetables. This can be seen with both *Yonca gıda* and *Tat gıda*, the top companies in the ISO 1000 list under fruit and vegetable processing. These firms are not involved in the production process, however, their strategy - like most paste producers - is to engage in contract farming to control the quality of their inputs.

Juice processors like *Dime* and *Aroma* are the second category of large players after the tomato product producers in the fresh fruit and vegetable value chain. Due to the nature of the business, these firms only use the lower quality fruits; they do not invest in the production stage of the value chain and their typical upgrading strategy is product-oriented; that is, as they invest in different products derivatives (different type of juice and soft drinks).

The third category of large players are the traders (i.e. exporters only) of fresh food and vegetables, the strategy of these firms changes as they grow their business, but all the top firms have invested vertically along the value chain to have greater control over their supply chain. A typical path for a trading company starts with investing in a storage and packing unit then progressing into investing in logistics both locally and abroad. The investments in logistics help boost sales, which in turn, pushes the firms to invest in the production stage of the value chain, to ensure their supply. The latest trend has been to invest in freezing units to extend the shelf life of their perishable produce and advance into to higher value-added products.

For example, *Ucak Kardesler*, one of the leading exporters of fresh fruit and vegetable in Turkey, started first started investing in logistics space in Poland, Romania and Russia. Following this, they invested in 500-thousand-meter square of greenhouse production and, by 2017, they had invested in a freezing unit. Looking at figure 15, we see a jump of 165% in Turkey's exports of frozen vegetables since 2013, implying multiple firms have exploited this since 2013.

The current leading firm (list in the ISO 1000) that produces fresh fruit and vegetable is *Çekok Gıda*. They followed a similar pattern to *Ucak Kardesle*, although they have also invested in open farming and started producing higher value niche kiwi products. In addition, they have invested in USD 4.2 million (25 million TL) on automating the picking of fruit as they anticipate they will not have enough labor to pick the produce up in the future.

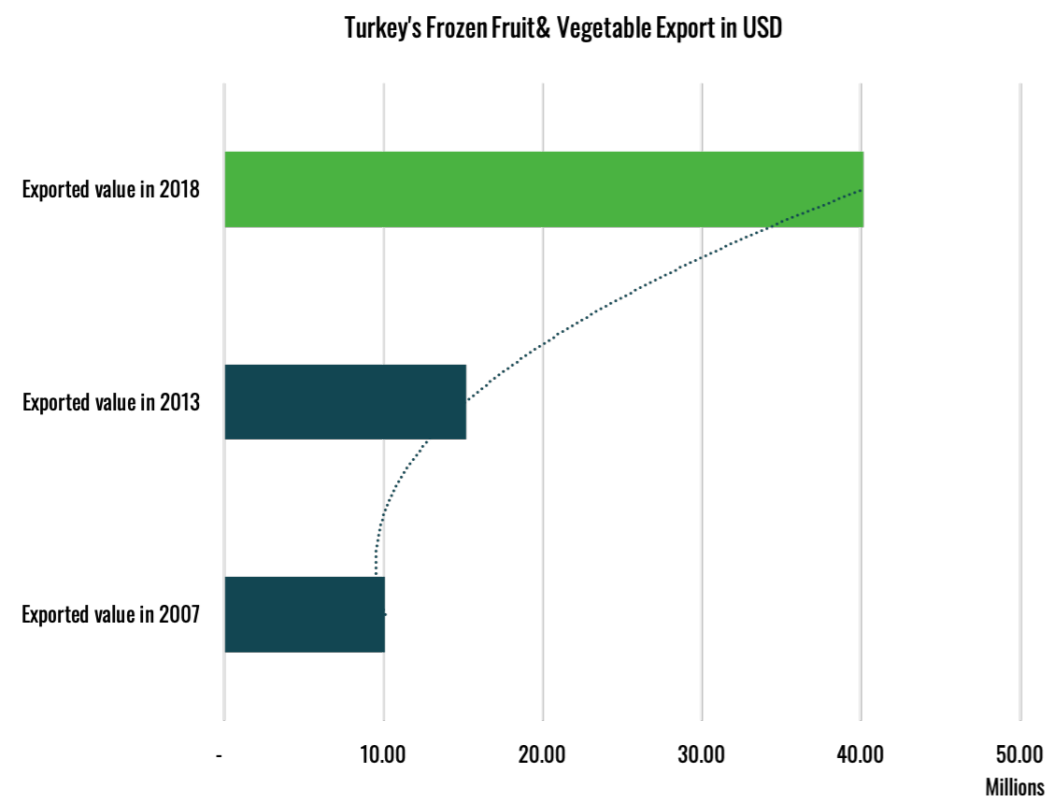


Figure 15: Area under Production for Fruit and Vegetables, Source: TURKSAT.

Firm	Net Sales (TL)	Export (\$)	Produce Items
Yonca Gıda Sanayi İşletmeleri İç ve Dış Ticaret A.Ş.	714,541,273	87,883,000	Tomato products (ketchup, spread and sauce), oil products, canned fruits, pickled vegetables
Tat Gıda Sanayi A.Ş.	1,207,344,910	27,401,000	Tomato products, pickled vegetable, mayonnaise, jam, and canned vegetable
Tamek Gıda ve Konsantre San. ve Tic. A.Ş.	456,904,155	16,453,000	Tomato products, pickled vegetable, mayonnaise, jam, and canned vegetable, fruit Juice
Çekok Gıda San. ve Tic. A.Ş.	906,360,814		35 types of FFV also import exotic fruits
Tukaş Gıda San. ve Tic. A.Ş.	371,529,768	15,124,000	Tomato products, pickled vegetable, mayonnaise, jam, and canned vegetable
Dimes Gıda San. ve Tic. A.Ş.	344,008,733		Fruit Juice
Aroma Bursa Meyve Suları ve Gıda Sanayii A.Ş.	265,260,510	5,797,000	Fruit Juice and soft drink
Oğuz Gıda San. ve Tic. A.Ş.	257,743,073		Fruit Juice
Burcu Gıda Konservelik ve Salça Sanayi A.Ş.	249,432,458		Ketchup, other tomato product, canned and pickled goods
Penguen Gıda Sanayi A.Ş.	185,318,029	16,330,000	Tomato products (not including ketchup), pickled vegetable, jam, and canned vegetable
Ucak kardesler*	Top exporter of fresh fruit and vegetable		35 types of FFV

Table 13: Top firms in the fresh fruit and vegetable value chain from ISO 1,000 list, Source: ISO, 2019; *Not in the ISO 1000 list, example of a top export for fresh fruit and vegetables.



5. Current Participation of Turkey in the Fruit and Vegetable GVC

Analysis of the production and export trends of the fruit and vegetable sector in Turkey reveals some important dynamics. First, while vegetables production makes up bulk of the production by volume, it is almost less than half the value of fruit production. Secondly, the vast volume of exported fruits is concentrated on low-value products. The top three exports in fruits and vegetables are commodity products that command low value in export markets.

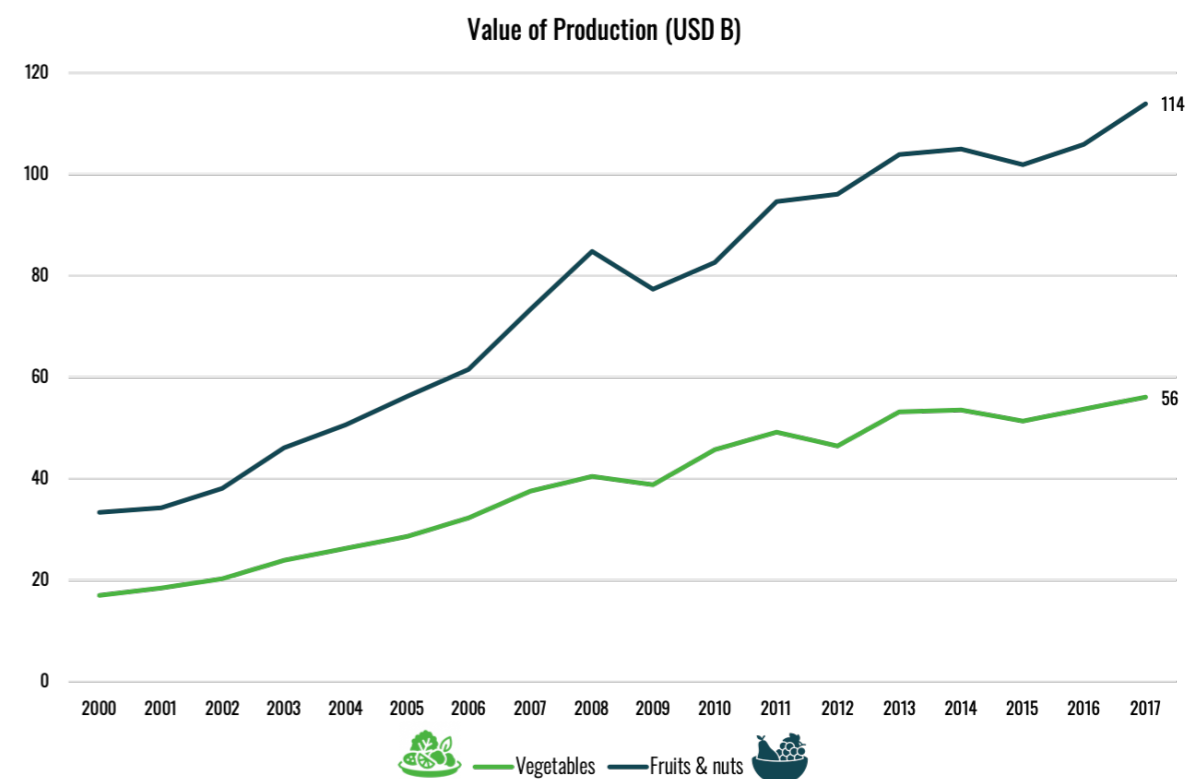


Figure 17: Export Performance of Turkey's Fruits and Vegetables Sector, Source:UN Comtrade.

The following table shows the volume (KG) and value (USD) of Turkey's main FV export. Highlights include a concentration in low-value commodity products. Lemons, mandarins, tomatoes and oranges together – at an average unit price of USD 0.54/kg – comprise 54% and 49% of export volume and value. This means that just four products account for half of the country's FV exports. Secondly there is low production of high value commodity products, despite their relative value contribution. For example, cherries make up just 2% of total production, but 7% of value.

	Products	2018			Amount (KG) (% of total FFV production)	Value (USD) (% of total FFV value)
		Amount (KG)	Value (\$)	Unit Value		
1	Lemon	634,897,986	332,840,267	0.52	15%	15%
2	Mandarin	744,418,790	311,921,846	0.42	17%	14%
3	Tomato	538,585,972	291,903,059	0.54	12%	13%
4	Cherry, Sour Cherry	76,138,270	161,686,260	2.12	2%	7%
5	Orange	448,059,479	160,613,612	0.36	10%	7%
6	Grape	182,163,177	121,856,678	0.67	4%	5%
7	Pepper	128,753,389	118,662,315	0.92	3%	5%
8	Pomegranate	207,622,755	114,752,607	0.55	5%	5%
9	Apple	245,306,630	95,475,499	0.39	6%	4%
10	Grapefruit	194,660,747	88,163,161	0.45	4%	4%
11	Peach	128,587,524	87,537,639	0.68	3%	4%
12	Chestnut	12,963,625	43,247,430	3.34	0%	2%
13	Cucumber	66,922,818	41,348,797	0.62	2%	2%
14	Apricot	71,406,911	41,120,641	0.58	2%	2%
15	Pumpkin	67,714,499	40,418,846	0.60	2%	2%
16	Fig	17,032,431	38,896,600	2.28	0%	2%
17	Potato	258,169,993	26,387,573	0.10	6%	1%
18	Strawberry	20,112,839	23,973,257	1.19	0%	1%
19	Plum	69,810,482	22,326,765	0.32	2%	1%

Table 14: Exported FFV in 2018 from Turkey by Value of Exports, Source: Turkey Fresh Fruit and Vegetable Sector Council.

Figure 18 highlights a key trend in relative yields and land use. In 2017, vegetable uses 29.38% of total area under fresh fruit and vegetable cultivation but produces 55.48% of total production. On the other hand, fruit covers 61.96% of land under FV cultivation while only producing 31.73% of volume but has twice the value of vegetable production. Fruits are farmed on open fields and yield less product per area compared to the vegetable sector.

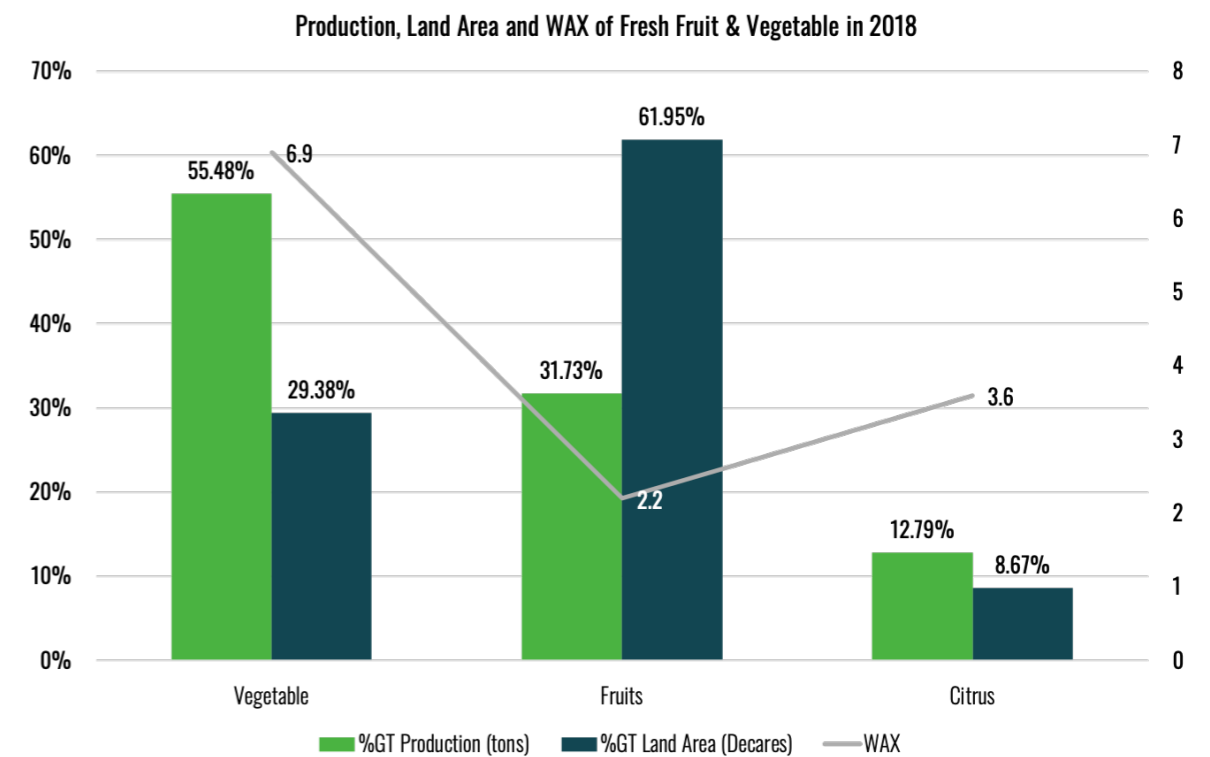


Figure 18: Production of FFV in Turkey (2018) - WAX= Weighted Average Yield by production, Source: Authors using TurkStat.

This is indicative of prevalence in intensive, high-productivity, farming techniques like greenhouse farming in the vegetable sector. Indeed, data analysis reveals that of the farms under green-houses, 94% are focused on vegetable, 5% on fruits and 1% on ornamental plants.¹³

The following table highlights the share of top export markets for Turkey's vegetable sector. The sector displays a large concentration of exports to low-value markets. As the table highlights, the largest value of exported vegetables is to Romania and Russia. While this may represent traditionally accessible markets, the worrying feature is that these markets do not provide premium returns compared to higher value markets in the EU (Germany, France etc). Secondly, a large volume of trade is with Syria and Iraq where the average per-unit value of vegetables sold is 0.15 and 0.13 USD/unit but together these two countries account for a third of Turkey's exported vegetables.

¹³ Agrofood - Invest in Turkey. (2019). Retrieved 25 December 2019, from <https://www.invest.gov.tr/en/sectors/pages/agrofood.aspx>

	Country	2017	2018				
		Unit Value	Amount (Kg)	Value (\$)	Unit Value			Amount (% Of Total Production)	Value ($)
1	Romania	1.04	95,103,692.00	85,699,958.00	0.90	7%	14%
2	Russia	0.39	102,219,465.00	72,302,579.00	0.71	8%	12%
3	Germany	1.22	46,874,900.00	52,198,144.00	1.11	4%	9%
4	Bulgaria	0.53	74,065,594.00	39,903,630.00	0.54	6%	7%
5	Ukraine	0.51	73,195,110.00	37,943,100.00	0.52	6%	6%
6	Iraq	0.17	289,965,730.00	37,777,664.00	0.13	22%	6%
7	Belarus	0.55	54,326,863.00	30,149,965.00	0.55	4%	5%
8	Israel	0.71	50,140,007.00	29,595,117.00	0.59	4%	5%
9	Saudi Arabia	0.32	86,123,891.00	26,179,207.00	0.30	7%	4%
10	Georgia	0.29	92,109,471.00	25,654,346.00	0.28	7%	4%
11	Syria	0.15	128,656,730.00	18,712,630.00	0.15	10%	3%
12	Poland	0.94	19,975,873.00	18,362,967.00	0.92	2%	3%
13	Netherlands	1.10	15,937,991.00	16,499,492.00	1.04	1%	3%
14	Moldavia	0.65	14,839,591.00	11,257,368.00	0.76	1%	2%
15	Austria	1.13	8,497,806.00	8,538,756.00	1.00	1%	1%
16	United Kingdom	1.21	5,577,228.00	6,647,010.00	1.19	0%	1%
17	Bosnia Herzegovina	0.49	12,728,907.00	6,065,471.00	0.48	1%	1%
18	Azerbaijan	0.24	31,839,152.00	5,725,840.00	0.18	2%	1%
19	France	1.49	3,291,428.00	5,226,743.00	1.59	0%	1%
20	UAE	0.26	12,121,240.00	4,412,212.00	0.36	1%	1%
	Total	0.44	1,308,233,119.00	593,286,615.00	0.45		

Table 15: Export Destination of Vegetables, 2018, Source: Turkey Fresh Fruit and Vegetable Sector Council.

A snapshot of the fruit exports to top market destinations reveal an even starker disparity with 39% of fruit export value destined to Russia, at an average unit value of USD 0.84. Note that Iraq buys 31% of Turkey’s fruit exports but contributes to 9% of value.

	Country	2018				
		Amount (KG)	Value (\$)	Unit Value			Amount (KG) (% of total production)	Value (USD) (% of total value)
1	Russia	342,478,786.00	287,606,869.00	0.84	32%	38%
2	Germany	71,645,462.00	140,973,764.00	1.97	7%	19%
3	Iraq	325,649,429.00	65,200,850.00	0.20	31%	9%
4	Italy	13,949,418.00	39,629,346.00	2.84	1%	5%
5	Romania	25,027,945.00	23,760,586.00	0.95	2%	3%
6	Saudi Arabia	51,732,412.00	23,179,463.00	0.45	5%	3%
7	United Kingdom	12,269,427.00	19,806,238.00	1.61	1%	3%
8	Netherlands	12,208,200.00	19,311,679.00	1.58	1%	3%

Table 16: Export Destination of Fruits, 2018, Source: Turkey Fresh Fruit and Vegetable Sector Council.

Productivity by Region

Turkey’s productivity in the FV GVC varies notably by region as illustrated by Figure 19. We have focused our report on Izmir, Antalya, Hatay and Mersin. Our preliminary analysis focused on high producing regions and compared trends in productivity across regions and over time to identify opportunities for improving quality as well as moving to higher-value products and markets.

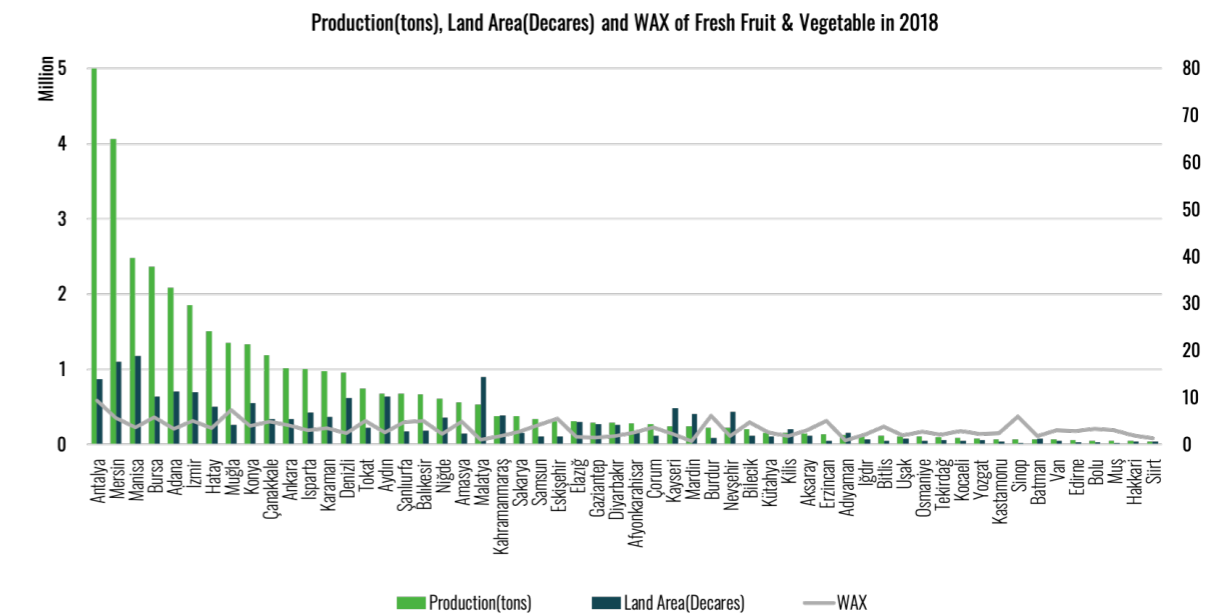


Figure 19: Production by Subnational Region - WAX= Weighted Average Yield by production, Source: Authors using TurkStat.

As per the breakdown by the top five regions below (Tables 17, 18 and 19), they are the clear performers in the fresh fruit and agriculture sector in Turkey. With reference to tables below, Antalya and Mersin are the main producers of fresh fruit and vegetables. Amongst the top producing regions, Antalya has the largest yields. This indicates potential for process upgrading for the rest of the country.

	Region	Amount (KG)	Value (\$)	Amount (KG) (% of production)	Value (\$) (% of value)
1	Mersin	755,627,085	349,361,309	37%	39%
2	Hatay	507,376,232	225,755,560	25%	25%
3	Adana	219,206,263	98,626,611	11%	11%
4	Trabzon	160,039,317	79,872,997	8%	9%
5	Izmir	61,362,884	32,883,632	3%	4%

Table 17: Citrus Production (Volume and Value in the top 5 Regions in Turkey), Source: Turkey Fresh Fruit and Vegetable Sector Council.

	Region	Amount (KG)	Value (\$)	Amount (KG) (% of production)	Value (\$) (% of value)
1	Antalya	297,163,920	230,171,681	23%	39%
2	Hatay	258,752,394	103,751,428	20%	17%
3	Mersin	142,737,833	66,754,552	11%	11%
4	Trabzon	53,319,779	32,772,755	4%	6%
5	Izmir	40,812,562	28,922,402	3%	5%

Table 18: Vegetable Production (Volume and Value in the top 5 Regions in Turkey), Source: Turkey Fresh Fruit and Vegetable Sector Council.

	Region	Amount (KG)	Value (\$)	Amount (KG) (% of production)	Value (\$) (% of value)
1	Antalya	148,145,419	141,451,487	13%	17%
2	Mersin	229,530,581	129,417,793	19%	16%
3	Hatay	205,773,145	122,845,773	17%	15%
4	Izmir	73,007,333	90,490,917	6%	11%
5	Trabzon	83,493,625	66,366,598	7%	8%

Table 19: Fruit Production (Volume and Value in the top 5 Regions in Turkey), Source: Turkey Fresh Fruit and Vegetable Sector Council.

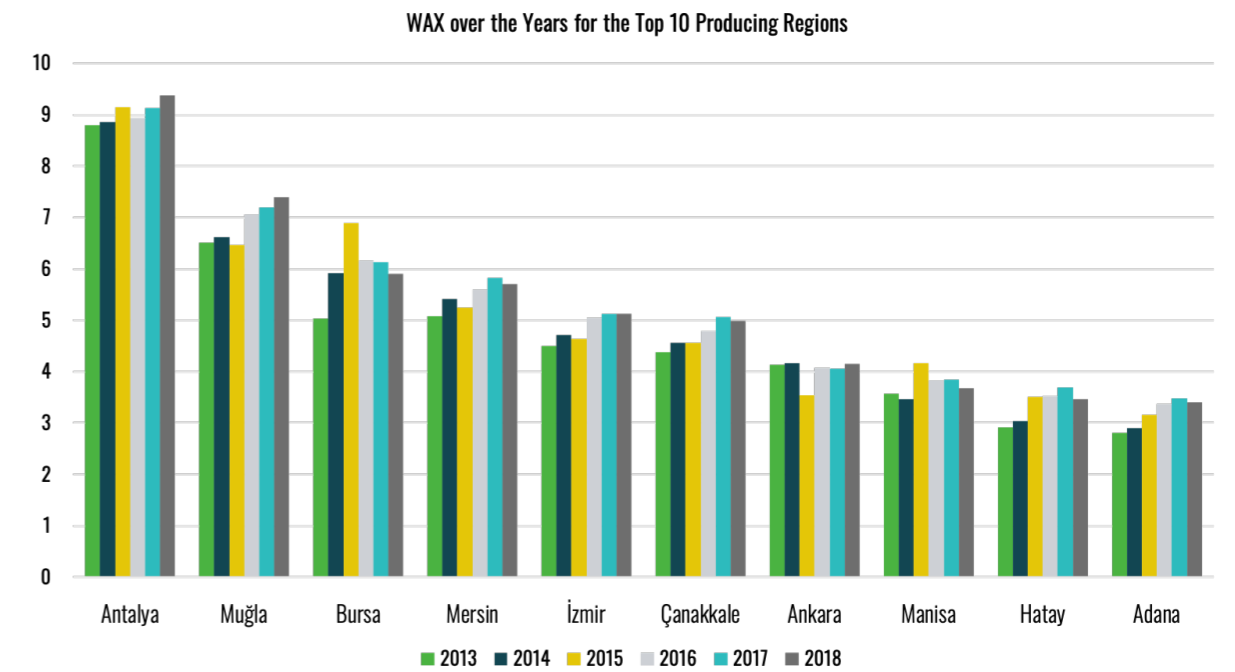


Figure 20: Yield over time for Selected Subnational Regions, Source: Authors using TurkStat.

Figure 20 above, highlights changes in productivity over the last 6 years. There is a general trend in increase of productivity for the top 6 producing regions. It would be beneficial to learn more about the Antalya region as a case study for the region.

Taking citrus fruit as an example, there are yields of 4.02 tons/decare in the Antalya area, while yields in Adana, the number one producer of citrus fruit, are considerably lower at 3.11 tons/decare. The variation in yields can also be seen at a product level, taking an example of lemons, Turkey's number one exports (USD 333 million) for fresh fruit and vegetables, where Adana, second largest producer of lemons can have a yield of 2.02 tons /decare and Mugla the third largest producer can have yields of 4 tons/ decare.

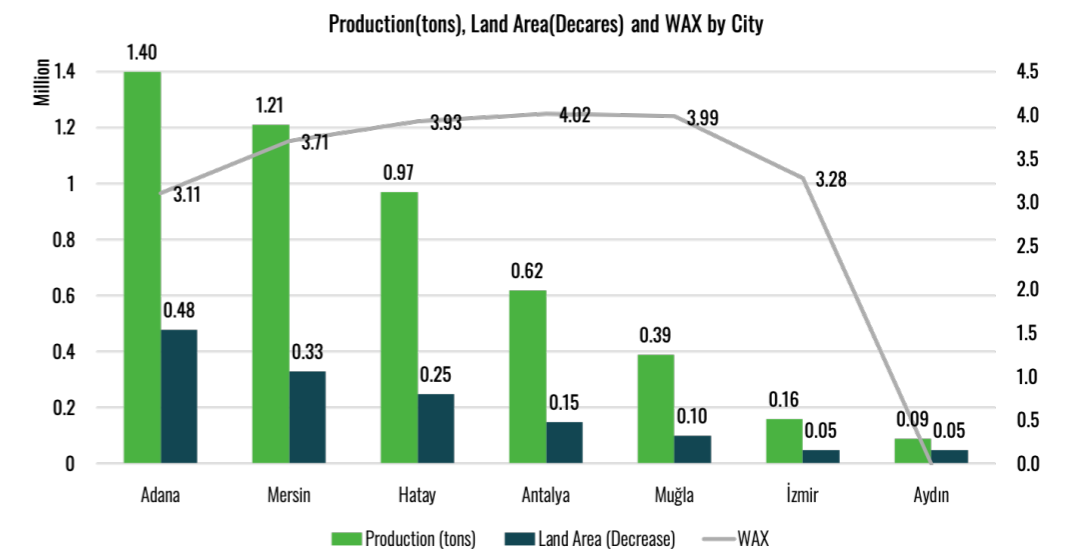


Figure 21: Production, land area and WAX for the top 7 producers of citrus ,Source: Authors using TurkStat.

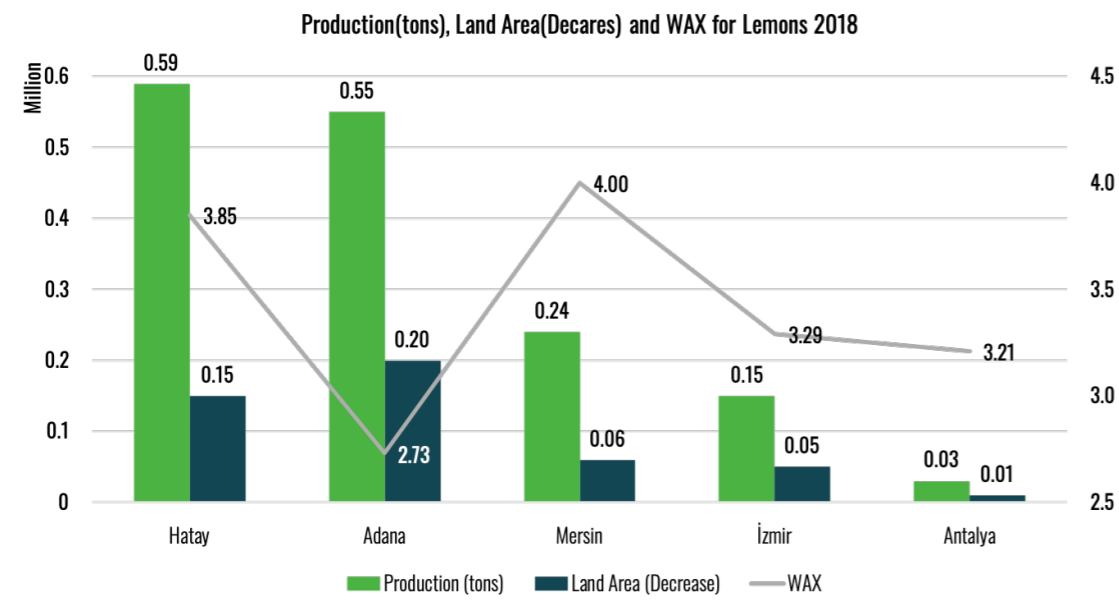


Figure 22: Production, land area and WAX for the top 5 producers of lemon ,Source: Authors using TurkStat.

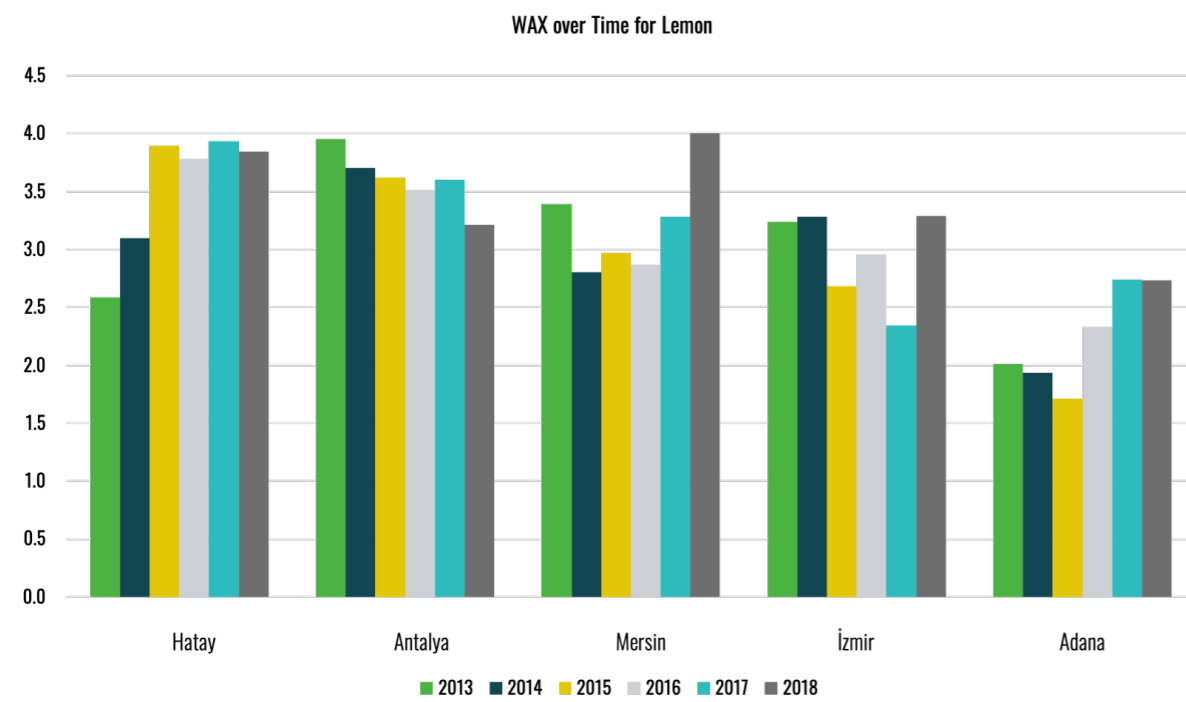


Figure 23: Wax over time for lemons, Source: Authors using TurkStat.

a. Employment & Human Capital

In order to explore strategies for improving Turkey’s low productivity, it is important to understand the structure of labor, a critical input. Agriculture accounts for approximately 1/5th of employment in Turkey and is a key employer. However, relative share of employment in agriculture has decreased by approximately half since the early 1990s.

The most pronounced changes occurred between 2000 and 2007, after which it has stabilized (see Figure 24 below). Turkish agriculture is predominantly reliant on family labor using outdated techniques and on subsistence production.

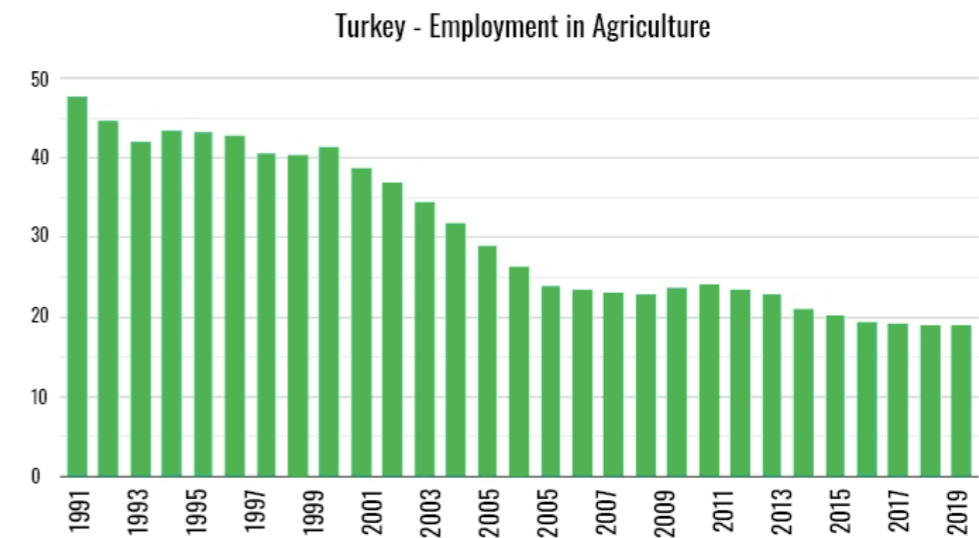


Figure 24: Employment in Agriculture in Turkey, Source:World Bank.

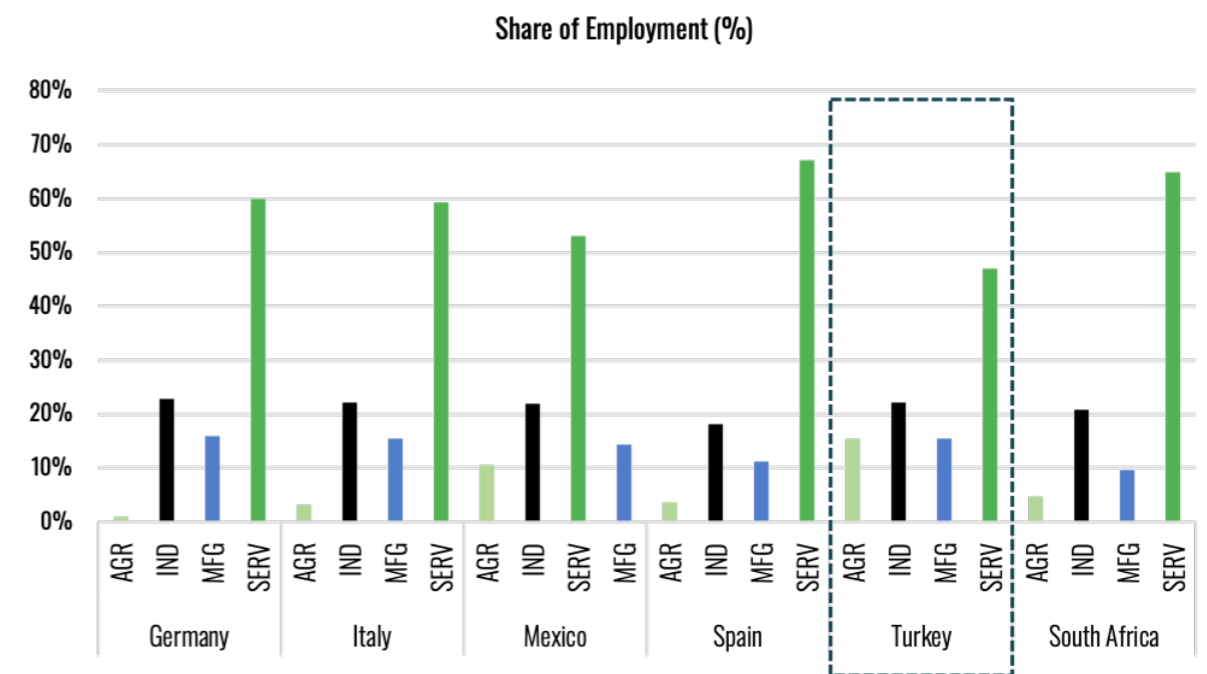


Figure 25: Share of Employment in Select OECD countries, Source: OECD.

Turkey’s share of agricultural employment is considerably higher than that of large scale exporters. As mentioned, agriculture is critically important for rural employment despite the decreasing share of employment.

Zooming in on the rural unemployment in the tables indicates significant regional and gender disparities. Hatay in particular has high unemployment for both genders in the 20-24 age group. This is explained in part by a large refugee cohort in the region.¹⁴ Based on this, we anticipate significant opportunities to address socio-economic disparities through opportunities in organic agriculture, packaging, and processing value-chain segments.

Unemployment Rate	Mersin	Antalya	Hatay	Izmir
Female (15- 19)	15.9	19.6	26.7	22
Female (20- 24)	29.6	37.6	40.9	32.7
Female (25- 34)	19.2	20.2	21.2	21.5
Female (35- 54)	9.1	12.1	13.5	15.5
Female (55+)	3.5	4.4	4.2	11.3
Male (15- 19)	10.6	17.6	11.6	18.2
Male (20- 24)	18.2	20.2	27.2	19.5
Male (25- 34)	12.6	8.4	11.7	10.3
Male (35- 54)	7.1	6.6	9.5	8.1
Male (55+)	7.2	7.9	10.9	12.4

Table 20: Unemployment in Selected Regions in Turkey.

Labour Force Participation Rate (%)	Mersin	Antalya	Hatay	Izmir
Female (15- 19)	18.2	19.6	20.6	22.8
Female (20- 24)	46.8	57.3	41.2	61.6
Female (25- 34)	43.1	52.9	40.9	57.5
Female (35- 54)	40.3	52.6	36.6	49.9
Female (55+)	16.3	22.9	18.5	15.8
Male (15- 19)	40.9	37.3	43.5	45.1
Male (20- 24)	76.9	74.6	74.6	78.8
Male (25- 34)	91	94	92.4	94.9
Male (35- 54)	86.7	90.8	88.5	91
Male (55+)	48	55.5	54	56.4

Table 21: Labour Participation in Selected Regions.

b. Investment Regimes

In order to address regional disparities, accelerate economic growth and attract foreign investors, the Turkish Government has implemented a new incentive regime.¹⁵ Under this regime, the country is divided into six regions, based on economic growth and prioritizing less advantageous regions.¹⁶

¹⁴ Turkish Red Crescent and World Food Programme. (2019). Refugees In Turkey: Livelihoods Survey Findings. Ankara, Turkey.

¹⁵ Decision on the State Investment Incentives numbered 2012/3305

¹⁶ A Brief Overview Of The Investment Incentive Regime In Turkey (Mondaq) Retrieved 25 December 2019,

<http://www.mondaq.com/turkey/x/872634/Economic+Analysis/A+Brief+Overview+Of+The+Investment+Incentive+Regime+In+Turkey>



Figure 26: Map of Regions by Investment Regime.

Antalya and Izmir are in region 1 while Mersin is classified as region 3. Hatay is classified as region 4. The table below shows a breakdown of investment incentives by region:

Support Measures	REGIONS						
	1	2	3	4	5	6	
Vat Exemption	.	.	.	.	.	.
Customs Duty Exemption	.	.	.	.	.	.
Tax Deduction	Tax Reduction Rate(%)	50	55	60	70	80	90
	Reduced Tax Rate (%)	10	9	8	6	4	2
	Rate of Contribution (%)	15	20	25	30	40	50
SSP Support (Employer's Share)	Term of Support (year)	2	3	5	6	7	10
	Cap for Support (Certain Portion of Investment Amount-%)	10	15	20	25	35	No Limit
Land Allocation	.	.	.	.	.	.
Interest Rate Support	TL Denominated Loans (points)	-	-	3	4	5	7
	FX Loans (points)	-	-	1	1	2	2
	Cap for Support (Thousand TL)	-	-	500	600	700	900
SSP Support (Employees Share) (years)	-	-	-	-	-	10	
Income Tax Withholding Support (year)	-	-	-	-	-	10	

Table 22: Support Measures of Regional Investment Incentive Scheme.¹⁷

¹⁷ Regional Investment Scheme - Ministry of Trade Retrieved 25 December 2019, <https://www.trade.gov.tr/investment/schemes/regional-investments>

Region 1 is granted the least advantageous incentives, whilst Region 6 was granted the best incentives. From the tables above, Antalya and Izmir are ranked as Region 1, which is indicative of regions that are well-developed and receive less support for tax exemption as well as concessional interest rates. This will disincentivize foreign direct investment compared to Hatay (Region 4). With the right upgrading strategy, these incentives can catalyze Hatay's export values and productivity and narrow the gap in regional disparities.

Apart from regional regimes, the country has additional policies aimed at agriculture. According to the Agricultural Strategy Paper (2006-2010) and the Agriculture Law, the focus of agriculture investment regimes in Turkey is to foster a sector that is "sustainable, highly competitive and organised by taking into account economic, social, environmental and international development dimensions within the principle of the utilization of the resources effectively."¹⁸ This aligns well with our GVC analysis which aims to identify opportunities to increase investment, catalyse job creation and increasing export value of the FV sector.

The 2018-22 Strategic Plan of the Ministry of Food, Agriculture and Livestock (MoFAL) has the objectives of ensuring sustainable production, access to adequate and reliable food, rural development and competitiveness of the sector. Measures to support this includes the Agricultural Basin Model where the Ministry has mapped Turkish climate and topography and has selected suitable and optimal products for particular regions. Farmers are incentivized to grow those crops in the selected basins, the scheme also support the financing of warehouses for products selected in the basins.¹⁹

In addition to direct payment to producers, Turkey has applied import tariffs, market price support, export subsidies and production quotas. Total Support Estimates for agriculture sector in 2017 are 14 billion Euros.²⁰ Table below highlights total monetary support estimates to agriculture for selected countries.²¹

Total Support Estimate (Euro Millions) 2017

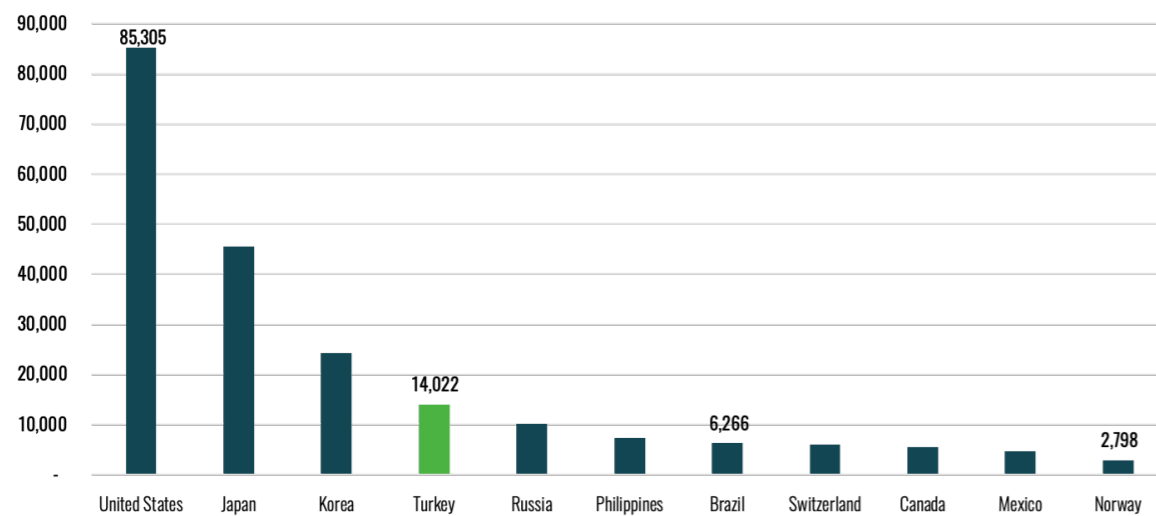


Figure 27: Total Support Estimates to Agriculture for Selected Countries, Source:OECD.

¹⁸ Strategic Plan of the Ministry of Agriculture and Forestry Republic of Turkey . (n.d.). Retrieved from <https://www.tarimorman.gov.tr/Links/23/Strategic-Plan>

¹⁹ Agricultural Basin Model of Ministry of Agriculture and Forestry Republic of Turkey . (n.d.). Retrieved from <https://www.tarimorman.gov.tr/Konular/Plant-Production/Agricultural-Basins>

²⁰ OECD defines this as "Total Support Estimate (TSE): The annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of the associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products." <https://www.oecd.org/unitedstates/producerandconsumersupportestimatesdatabase.htm#tables>

²¹ OECD - Producer and Consumer Support Estimates Database <https://www.oecd.org/unitedstates/producerandconsumersupportestimatesdatabase.htm#tables>

The OECD estimates that the level of agricultural support is at 20%, which is higher than for OECD peers. For General Services Support, defined as "total budgetary expenditure to support general services provided to agriculture."²² Of this support, the bulk is in the form of producer support.²³ Producer support dominates the agricultural support services and is focused primarily on livestock and arable crops with fruits and vegetables receiving a comparably small share, driven by a need to ensure domestic price stability for meat and milk products.²⁴

Producer Support Estimate by Commodity (TRL mn)

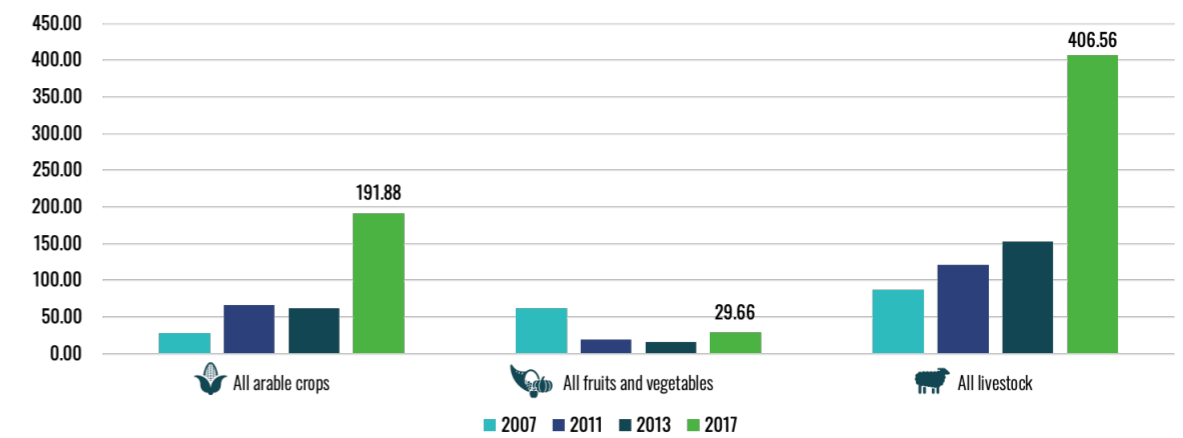


Figure 28: Producer Support Estimates for Turkish Producers.

c. Evidence of Industry Upgrading in Turkey

In general, both the values and volumes of both the fruit and vegetable sectors has increased over time. Unpacking this, we investigate whether there been a shift in product composition in the FV sector as well as diversification of export markets.

Change in Product Composition (Vegetables)

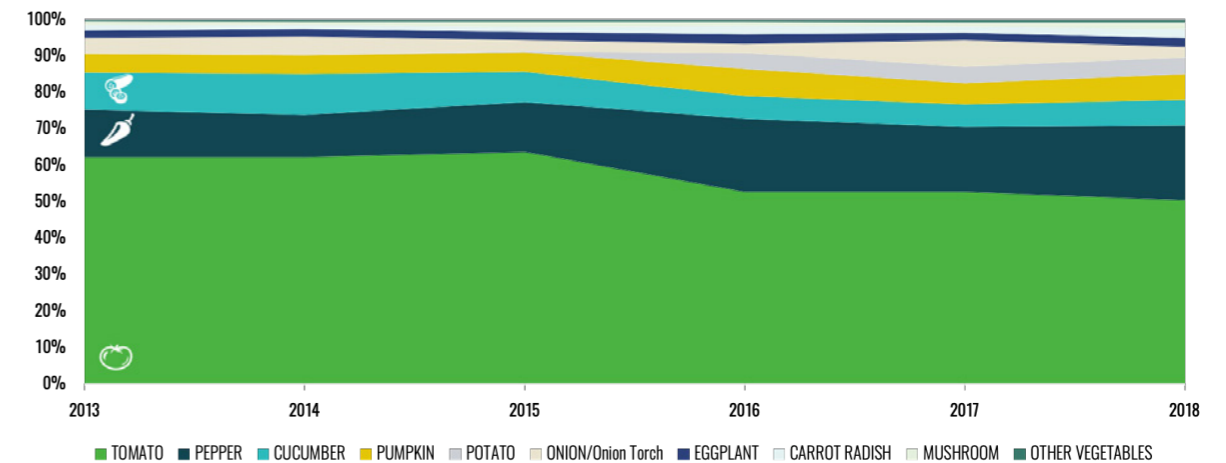


Figure 29: Change in Product Composition (Export Values) for Vegetables 2013-2018, Source: fresh fruit and vegetable sector council.

²² OECD's Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculation, Interpretation and Use (the PSE Manual) available on the OECD public website www.oecd.org/tad/agricultural-policies/psemanual.htm

²³ OECD - Producer and Consumer Support Estimates Database <https://www.oecd.org/unitedstates/producerandconsumersupportestimatesdatabase.htm#tables>

²⁴ Ibid

Breaking down the proportionate changes in export composition for vegetables reveals that tomatoes (unit value USD 0.54) have maintained the largest share over time although this has decreased from a high of 64% of total vegetable export value in 2015 to 50% in 2018. There is evidence of some degree of product diversification, and hence upgrading, with increase in share of total exports of peppers (USD 0.94), pumpkin (USD 0.60) and potatoes (USD 0.10). It is worth noting that while potatoes have a low unit value per kg, they might contribute to diversification in other ways as a cash crop, with long shelf life.

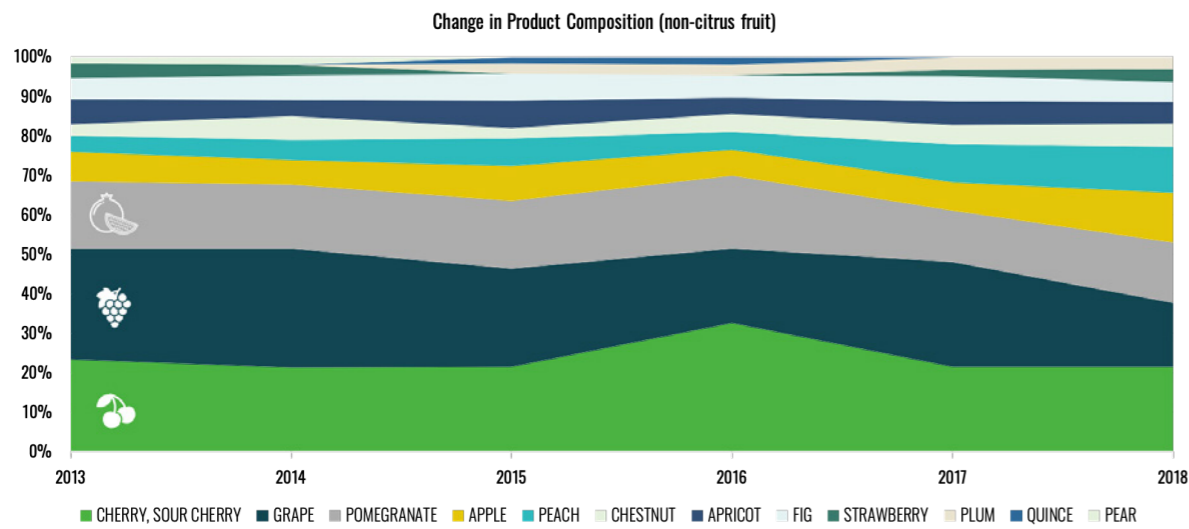


Figure 30: Change in Export Market Concentration for non-Citrus Fruits, Source : fresh fruit and vegetable sector council.

Moving to the fruit segment (as per the figure above) reveals a similar dynamic with decreasing share of grape exports, and increase in share of apples, peaches, and apricots, cherries record the highest share at 23% in 2018. The value of peach exports increased from 4% in 2013 to 12% in 2018.

To establish if there has been a diversification in exports markets, we look at the relative changes of exports, and entry into new markets. Figure 31 indicate that markets remain highly concentrated with ample opportunity for diversification.

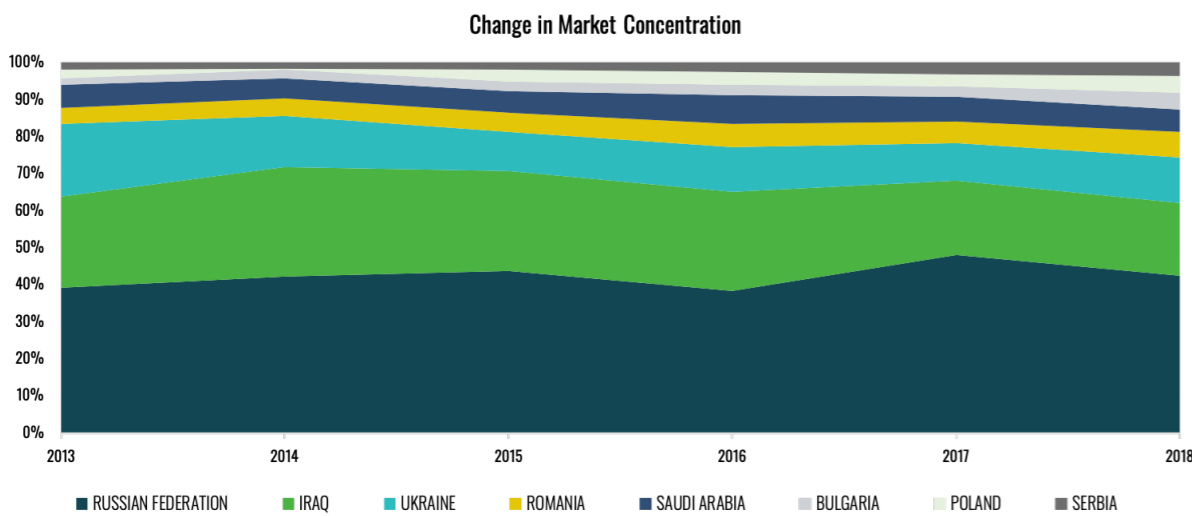


Figure 31: Change in Export Market Concentration for Turkish Citrus Fruits, Source : fresh fruit and vegetable sector council.

The market for citrus fruits (as per the table above in 2013 and 2013 was very concentrated with the majority of exported citrus fruits headed to just three countries, Russia, Iraq and the Ukraine. Moving to 2017, the exports have slightly diversified, although three countries still dominate. Russia and Iraq also continue to account for close to half of non-citrus fruit exports, although there has been a small increase in market share into higher-value EU markets.

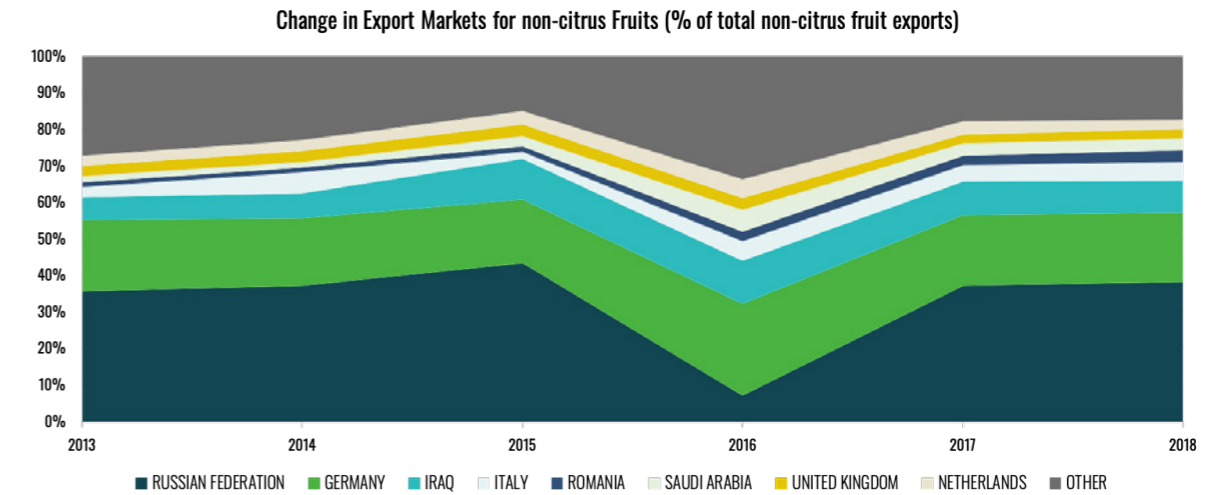


Figure 32: Change in Export Market Concentration for Turkish non-Citrus Fruits, Source : fresh fruit and vegetable sector council.

Due to the country's export dependence on Russia, a 2016 ban on Turkish fruits and vegetables to Russia created significant disruption in the sector. Vegetable exports to Russia still have not recovered and stand at 13% in 2018 down from 52% in 2018.

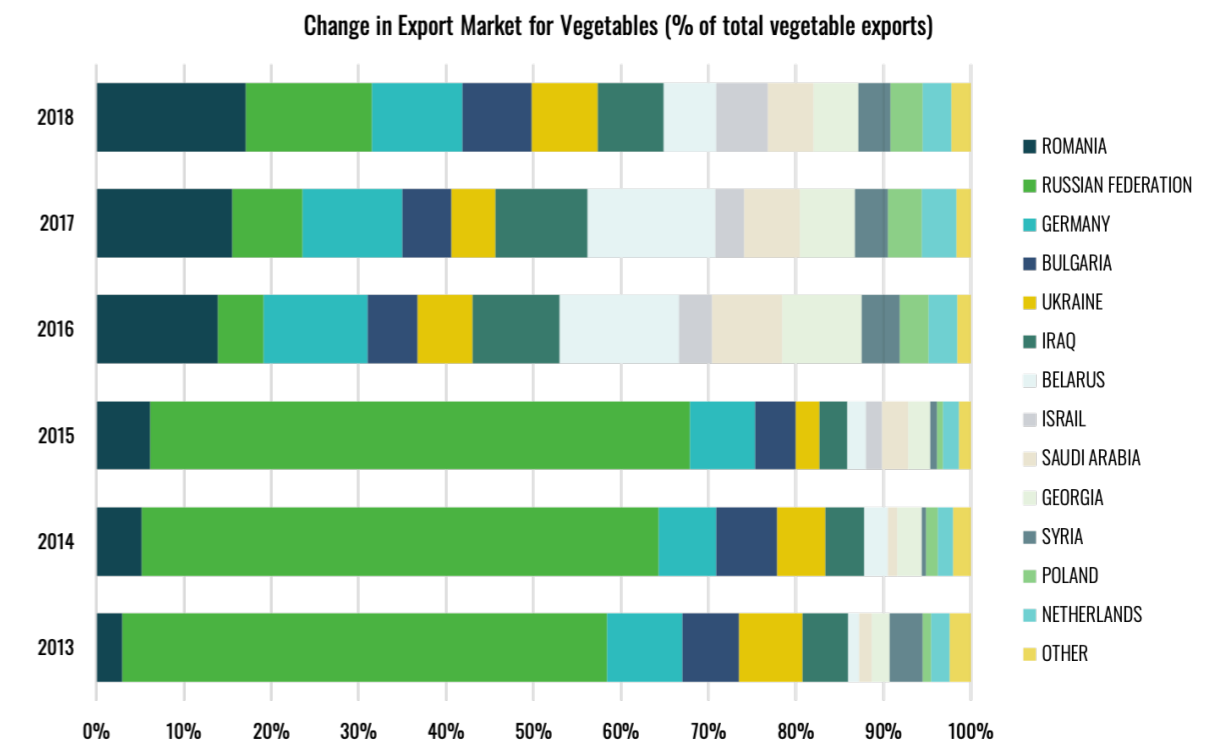


Figure 33: Change in Export Market Concentration for Turkish Vegetables, Source: fresh fruit and vegetable sector council.

6. Opportunities and Challenges

a. Opportunities

- Turkey is an ideal country to implement product diversification due to Turkey's favorable climate conditions, vast agricultural land and rich biodiversity.
- The geographical location makes Turkey an ideal logistics hub, having access to different types of markets, ranging from high-end markets like the EU to the lower-value markets in Africa.
- Turkey has a huge potential to become the top exporting countries for fresh fruit and vegetables, even though Turkey produces similar volume of fresh fruit and vegetable as Spain, its export value is significantly lower.
- The current small-scale farm structure makes it an ideal situation to produce high value-added fruits and vegetables, where it is difficult to mechanize, boosting incomes for rural populations.

b. Challenges

- Historically the agriculture sector has always concentrated in meeting local demand, and with a large local market, producers have not been required to integrate into the market, resulting in poor marketing and sale skills.
- A lower focus on quality standards forces producers to focus on low-value markets.
- Small and fragmented structure of agricultural farmland limits farmers to access finance and lowers their bargaining power with respect to other value chain actors.
- Too many associations without the necessary skills for coordination hinder the flow of information resulting in poor planning and execution.



7. Potential Upgrading Trajectories

This preliminary analysis illustrates that there are multiple ways to increase the value add for Turkey's fresh fruit and vegetable industry. The most obvious way is to improve food processing in the country. However, you can also achieve higher value-added production by diversifying away from commodity product (product upgrading), expanding to other higher-end market (market diversification) or by improving the process of production to increase the yields (process upgrading).

Product Upgrading: Diversify into higher-value products and decrease concentration on commodity products.

Currently, the majority of Turkey's export for fresh fruits and vegetables are in "commodity" products. This results in pressure on the price of products that are exported. As highlighted in figure 34, the unit price, whether fruit, vegetable or citrus is in a declining trend. The most alarming part of this trend is that the biggest and the most consistent decrease is witnessed for citrus fruit, Turkey's number one export of fresh fruit and vegetable. Turkey needs to diversify the varieties they produce and increase the production of higher value products, or they face the risk of losing its competitive edge in this industry. Chile is an example where they saw the potential to diversify by producing berries, and now in less than 20 years, Chile's export of berries exceeds USD 600 million (Comtrade).

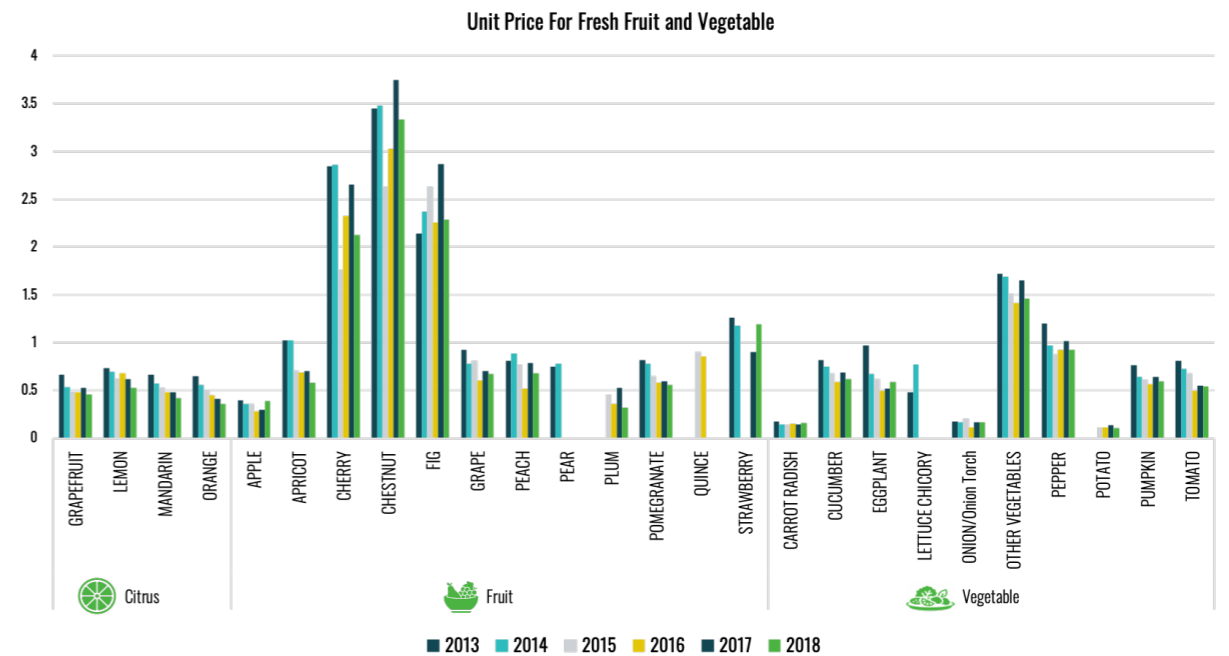


Figure 34: Unit price over the years for Turkey fresh fruit and vegetables, Source: fresh fruit and vegetable sector council. Note: Mushroom has been removed due to a very high unit price compared to the rest. Mushroom unit price has a decreasing trend.

Market Diversification: Diversify away from countries with high exposure and low value-added markets.

Over the years, Turkey has started to concentrate its exports of fresh fruit and vegetables in just two countries, Russia and Iraq. The two countries account for 38% of Turkey's total export for fresh fruit and vegetables in 2018. There are two issues in concentrating exports in these countries; first, both countries have a high political risk, as seen in 2016 ban (excluding citrus) by Russia reducing exports from USD 581 million to only US 60 million. The second issue, as illustrated in table 13, both Russian and Iraqi market are low to mid end. Lowering the value-added earned by producers.

Functional Upgrading: Improve agri-food processing, specially frozen vegetable and fruit juice manufacturing.

Even though Turkey has 3% share of the global exports of processed fruit and vegetable, a deeper look shows two areas that are lagging compared to other fruit and vegetable manufacturing, the two areas are:

- Frozen vegetables and production of juice. Despite the fact, Turkey has a 1.45 % global share of fresh vegetable traded and 1.77% share of chilled processed vegetable; Turkey only has a 0.45% global share for traded frozen vegetables.
- Similarly, Turkey's global share of juice manufacturing is only 1.73%, while having a 3% share of the traded fresh fruit market.

Furthermore, the average loss of fresh fruit and vegetable throughout the value chain is approximately USD 3.4 Billion (TL 20 billion), which is 25% of production. The main factor is a lack of cold storage, inadequate packing, and distribution; investing in infrastructure can reduce major loss and increase usable production significantly. (TANYAŞ)

Process Upgrading: Increase the yields for fresh fruit and vegetable in the regions that are lagging and invest in the infrastructure to reduce losses. There are significant gaps in yields between regions, even top producing areas can observe relatively low yields, which has a negative effect on the country's productivity. This is an opportunity for process upgrading and diversifying to other products to get the most value from the land. Increasing the yields will also trickle down to support the expansion of the food processing segment which depends on stable and sufficient raw material to maximize on fixed capital.

Among the key preliminary GVC analysis outcome for the agriculture industry are as follows:

1. The industry lacks export diversification with a large share of fruits and vegetables going to three countries: Russia, Iraq and Syria.
2. The predominance of small-sized, subsistence and semi-subsistence farms reduces productivity.
3. Dominance of lower-value commodity fruits and vegetables over higher value produce.
4. Turkey has a low agricultural productivity per worker compared to neighboring countries.
5. Turkey has major losses throughout the fresh fruit and vegetable value chain.

Upgrading Strategy	Domestic Value Added	Exports	Employment
Product Diversification	Increase By applying product diversification, more niche products can be produced. The produce can be sold for a higher value and create more domestic value add.	Increase The result does not directly increase the export quantity, however, will increase the export value.	Increase Product diversification help make small farms more competitive as economies of scale have less effect for some niche product. These products require higher level of delicacy and require more labor.
Market Diversification	Increase Nearly 40 % of market concentration is in low to medium value markets. Diversifying to higher end market, will increase the margins of the producers.	Increase Export values will increase when concentrating in higher end markets. Diversifying exports from the countries of high exposure will help reduce export risk and in the long term can lead to higher exports.	Neutral Rather than increase employment this will require an increase the skill of the farmer. Positive employment effects for agronomists providing training to farmers.
Process Upgrading	Increase Process upgrading can be achieved by utilizing technology or best practices to increase the yields of the production area and reduce losses. Increase productivity will increase the output.	Increase Process upgrading will lead to the use of resource more efficiently, hence increase the output and export amounts.	Minor increase Increasing yields may result in increase in temporary labor for harvest, however, investing in cold storage, packing unit, and distribution will increase the employment in the process section of the value chain.
Functional Upgrading into Agro-Processing (Expansion)	Increase By capitalizing the gaps in the processing stage of the value chain will result in domestic value add.	Increase Exporting different type of products or expanding current product manufacturing will increase the export for the sector.	Minor Increase Upgrading into processing will increase the amount of skill jobs required to run the processing plant.

Table 23: Potential Upgrading Trajectories for the fresh fruit and vegetable value chain.

8. Appendix

Table 24: HS-Codes Included, Fresh Fruit (H2)

Apples, fresh	H2-080810
Apricots, fresh	H2-080910
Avocados, fresh/dried	H2-080440
Bananas, incl. plantains, fresh/dried	H2-080300
Black/white/red currants & gooseberries, fresh	H2-081030
Cherries, fresh	H2-080920
Cranberries, bilberries & oth. fruits of the genus Vaccinium, fresh	H2-081040
Dates, fresh/dried	H2-080410
Durians, fresh	H2-081060
Figs, fresh/dried	H2-080420
Fresh fruit, n.e.s.	H2-081090
Grapefruit, fresh/dried	H2-080540
Grapes, fresh	H2-080610
Guavas, mangoes & mangosteens, fresh/dried	H2-080450
Kiwifruit, fresh	H2-081050
Lemons (Citrus limon/limonum) & limes (Citrus aurantifolia/latifolia), fresh...	H2-080550
Mandarins, incl. tangerines & satsumas; clementines, wilkings & sim. citrus...	H2-080520
Oranges, fresh/dried	H2-080510
Peaches, incl. nectarines, fresh	H2-080930
Pears & quinces, fresh	H2-080820
Pineapples, fresh/dried	H2-080430
Raspberries, blackberries, mulberries & loganberries, fresh	H2-081020
Strawberries, fresh	H2-081010
Watermelons, fresh	H2-080711
Plums & sloes, fresh	H2-080940

Table 25. HS-Codes Included, Fresh Vegetables (H2)

Asparagus, fresh/chilled	070920
Aubergines (eggplants), fresh/chilled	070930
Beans (Vigna spp., Phaseolus spp.), shelled/unshelled, fresh/chilled	070820
Brussels sprouts, fresh/chilled	070420
Cabbage lettuce (head lettuce), fresh/chilled	070511
Cabbages, kohlrabi, kale & sim. edible brassicas (excl. cauliflowers, heade ...	070490
Carrots & turnips, fresh/chilled	070610
Cauliflowers & headed broccoli, fresh/chilled	070410
Celery (excl. celeriac), fresh/chilled	070940
Chicory (excl. witloof chicory), fresh/chilled	070529
Cucumbers & gherkins, fresh/chilled	070700
Fruits of the genera Capsicum/Pimenta, fresh/chilled	070960
Globe artichokes, fresh/chilled	070910
Leeks & oth. alliaceous vegetables, fresh/chilled	070390
Leguminous vegetables (excl. of 0708.10 & 0708.20), shelled/unshelled, fresh...	070890
Lettuce (Lactuca sativa) (excl. cabbage lettuce) fresh/chilled	070519
Mushrooms of the genus Agaricus, fresh/chilled	070951
Mushrooms other than of the genus Agaricus, fresh/chilled	070959
Onions & shallots, fresh/chilled	070310
Peas (Pisum sativum), shelled/unshelled, fresh/chilled	070810
Potatoes other than seed potatoes, fresh/chilled	070190
Salad beetroot, salsify, celeriac, radishes & sim. edible roots (excl. carr ...	070690
Seed potatoes, fresh/chilled	070110
Spinach, New Zealand spinach & orache spinach (garden spinach), fresh/chill ...	070970
Vegetables, n.e.s., fresh/chilled	070990
Witloof chicory (Cichorium intybus var. foliosum), fresh/chilled	070521

Table 26: HS-Codes Included, Processed Fruits (H2)

Fruit, nuts and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included.	2008
Fruit juices (including grape must) and vegetable juices	2009
Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter.	0811
Vegetables, fruit, nuts, fruit-peel and other parts of plants, preserved by sugar	2006

Table 27: HS-Codes Included, Processed Vegetables (H2)

Vegetables (uncooked or cooked by steaming or boiling in water), frozen.	0710
Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared.	0712
Manioc, Arrowroot, salep etc, fresh, dried, sago pith	0714
Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid	2001
Tomatoes prepared or preserved otherwise than by vinegar or acetic acid.	2002
Mushrooms and truffles, prepared or preserved otherwise than by vinegar or acetic acid	2003
Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, frozen, other than products of heading 20.06.	2004
Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, not frozen, other than products of heading 20.06.	2005

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