

Confectionery

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The confectionery manufacturing sector in Turkey illustrates the importance of modernization and downstream development in the health of an industry's competitive dynamics and productivity. With the traditional segment dominating employment in the sector, with a few domestic players dominating retail shelves, and with stiff barriers to entry for global best practice competitors, the industry faces a significant gap between its current productivity level and its potential. Policy changes to encourage modernization and promote competition (especially from global players) would help to address this gap. Players would then, alternatively, adapt operational practices to compete more effectively, face acquisition, or exit the industry.

At one level, the domestic market in confectionery manufacturing is more concentrated than many other food processing sectors. The leader provides for almost half the domestic market and the next three players share another quarter; all are domestic companies. However, the balance of the market is then strikingly fragmented: some 350 companies produce biscuits and related products, chocolate and chocolate products, candies, and chewing gum. The most relevant consequences of this fragmentation are that the average scale of operations is low, investment in automation lags what it should be, and capacity utilization is well below 50 percent. In short, productivity suffers just as one would expect.

To a large degree this fragmentation is rooted in recent history. In the early and mid-1990s, Turkish confectionery manufacturers discovered a very large Russian market and the exports of confectionery items to Russia boomed, bringing a rapid increase in sector capacity. The industry continued to expand until 1997, when the Russian crisis hit. Some of the small-scale, low-automation players shut down their plants and some others were bought by the bigger, more powerful players, but a large proportion still remains. In fact, traditional operators index at only 18 percent of US levels, contributing greatly to weak total sector productivity.

And yet, modern processors too are mediocre in productivity terms: they index at only 69 percent of US levels.

Why is industry consolidation not taking place more quickly, rapidly reducing the number of small, unproductive operators? Why do modern processors not more closely approximate their US counterparts in an industry that is not so capital intensive, and in which skills requirements are relatively low? The common denominator is lack of competitive intensity. On the one hand, a vast majority of confectionery manufacturers operate informally, staying in business through the evasion of taxes and social security obligations, resisting acquisition in the

relatively rare instance it is offered, and destroying overall capacity utilization. They are in the market but they do not push the market leaders. On the other hand, the structure of the retail food distribution channel and the skillful way in which modern processors manage their relationships within that channel make it very difficult for all but the one or two largest players in any product subsector to get their products shelved. The net result is a market comprising many players with none obliged by competitive dynamics to maximize productivity.

In other sectors and in other countries, international best practice operators significantly increase competitive intensity. Indeed, in developing or recently developed markets, such as Portugal and Malaysia, global companies account for from 25 to 45 percent of confectionery sales. In Turkey they account for only 6 percent. One barrier is the distribution channel dynamics described. Another is indirect tariffs and import-related costs, which can add as much as 38 percent to the cost of an imported product. In combination, these two factors make it very difficult for international players to secure trial and distribution of products that have proven to have strong consumer appeal elsewhere.

Increasing the level of competition and ensuring pressure from global best practices would foster major improvements in the productivity performance of the sector over time. At the same time, enforcement of tax, social security, and plant hygiene obligations for traditional manufacturers would expedite the removal of the non-level playing field that exists in the sector. The results would be a dramatic increase in competitive intensity and a rapid transition to more productive performance. The traditional manufacturers would either increase productivity or leave the industry, and greater output would flow through modern processors, themselves more compelled to be productive.

In this chapter, we elaborate on these topics in the following sequence:

- ¶ Overview of the industry structure and development
- ¶ Sector productivity analysis
- ¶ Opportunities to close the productivity performance gap
- ¶ Other factors affecting productivity, both within the sector and external to it
- ¶ Recommendations for policy and industry changes.

INDUSTRY OVERVIEW

Turkish confectionery manufacturing constitutes 0.4 percent of GDP and approximately 0.2 percent of the total employment in Turkey. In those terms, Turkish confectionery is 2 times bigger than the US confectionery sector, both in value added and in employment, suggesting that it is a relatively well-developed sector for Turkey.

Industry segmentation by type of product

The industry has four segments, which are based on the types of products that confectionery manufacturers produce: biscuits, cakes, wafers, and cookies; chocolate and chocolate products; sugar confectioneries (candies); and chewing gum. Together, these subsegments include 350 companies. We summarize below each segment's key attributes and market share¹ (Exhibit 1):

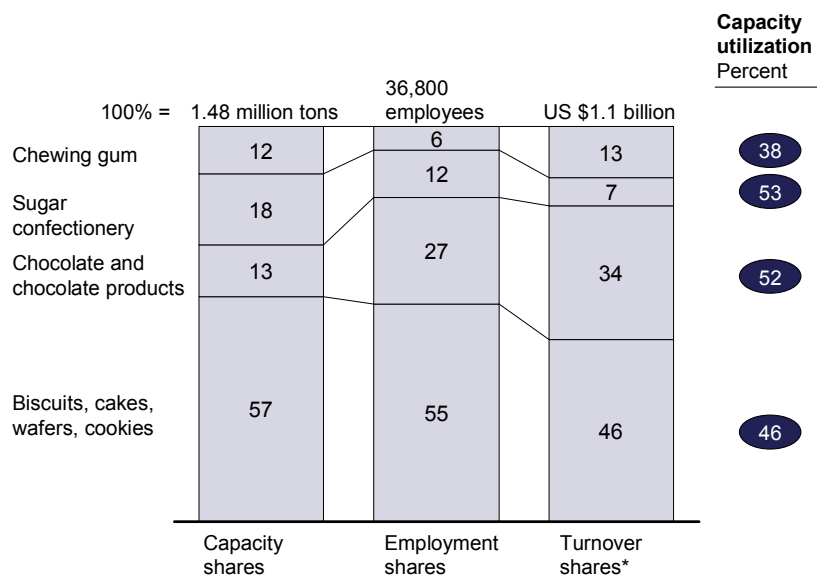
- ¶ **Biscuits, cakes, wafers, and cookies.** With 20,000 employees, this segment represents 55 percent of the labor force, more than any other segment. Approximately 50 establishments operate in this segment, with total production capacity at 840,000 tons per year – 57 percent of the total capacity in the sector. The capacity utilization rate for the segment is rather low, at 38 percent.
- ¶ **Chocolate and chocolate products.** This segment employs about 10,000 people. It includes 80 facilities in operation, and its production capacity is approximately 190,000 tons per year. The capacity utilization level for the segment is 53 percent, the highest in the sector.
- ¶ **Sugar confectionery.** This segment represents 12 percent of employment in the sector, at 4,500 people. It has 180 establishments, making it much more fragmented than the other segments. The total production capacity for the segment is 270,000 tons a year, and the capacity utilization rate is 52 percent.
- ¶ **Chewing gum.** This is the industry's smallest segment, with 2,300 employees and 40 establishments in operation. Production capacity is 180,000 tons a year, and capacity utilization for the segment is low, at 46 percent.

¹ Segment market shares are approximate figures.

Exhibit 1

CAPACITY AND MARKET SHARE BY SEGMENT IN THE TURKISH CONFECTIONERY SECTOR

Percent



* Reported by AC Nielsen based on the market size it covers
Source: State Planning Organization; AC Nielsen Zet; MGI analysis

Industry segmentation by type of player

In addition, we can segment the confectionery manufacturing industry by its two types of players, modern and traditional. We define these segments based on how they perform the industry’s basic operational functions: raw material receiving, mixing, processing, and packaging.²

Modern manufacturers, which account for one-third of sector employment, have relatively higher levels of automation in their manufacturing process, operate on a larger scale, and produce higher quality outputs. Traditional manufacturers have labor-intensive operations, smaller scales, and lower-quality products. The quality differences are reflected in the retail prices of confectionery items. Comparable products from traditional manufacturers are approximately 25 percent cheaper than those of modern manufacturers.

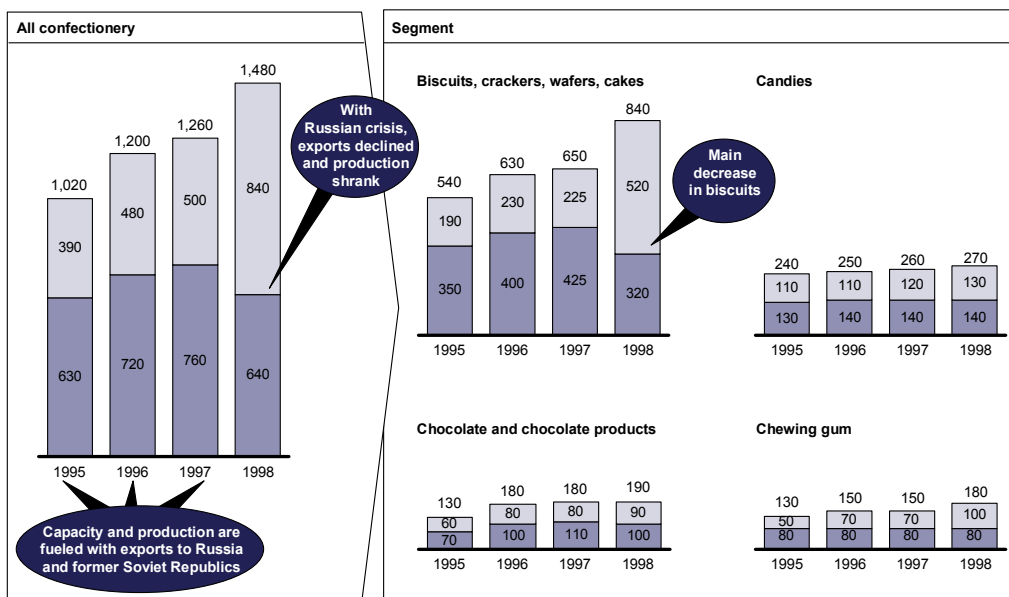
Industry evolution

Turkish confectionery manufacturers, particularly the traditional manufacturers, grew rapidly for a few years in the early to mid 1990s, but more recent declining demand has led to increasing consolidation in the industry. Through the mid-1990s, high levels of exports to Russia and the former Soviet Republics

² Farming and distribution are excluded from the scope of the study.

Exhibit 2
**CAPACITY AND PRODUCTION DEVELOPMENT –
 TURKISH CONFECTIONERY**

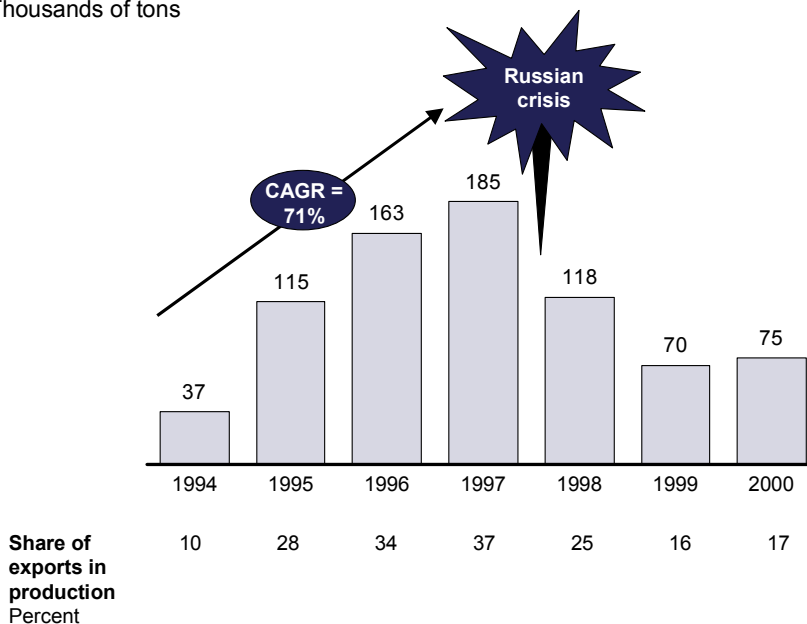
Thousands of tons



Source: State Planning Organization ÖİK reports; MGI analysis

Exhibit 3
DEVELOPMENT OF EXPORTS IN CONFECTIONERY – BISCUIT* EXAMPLE

Thousands of tons



* Biscuits, cakes, wafers, and cookies
 Source: State Planning Organization

fueled capacity increases and new plant openings. Since the focus was on quantity of production rather than quality or value added, capacity increases centered primarily on labor-intensive, low-automation manufacturing lines.

In 1997, the Russian crisis hit and related exports dropped dramatically. With this sudden contraction in exports, production volumes and thus capacity utilization rates dropped significantly, with the biscuits segment hit hardest (Exhibits 2 and 3).

Faced with low-production volumes and capacity-utilization rates, traditional manufacturers have begun to focus on increasing sales through deeper penetration in the domestic market and/or new export markets. However, the domestic market has several strong modern manufacturers, and there have been no export markets as fruitful as Russia. As a result, numerous traditional manufacturers have gone out of the business and some have been bought by modern players. This consolidation is expected to continue.

PRODUCTIVITY PERFORMANCE

In this sector, our productivity analysis focuses only on labor productivity since labor inputs have the largest share in total factor inputs (TFI). The labor productivity performance of Turkish confectionery manufacturing industry is calculated as value added per labor hour worked. Value added, in turn, is calculated as value of sales minus cost of goods sold. Both value of sales and cost of goods sold figures for Turkish manufacturers are adjusted with purchasing power parity (PPP). For this purpose, confectionery output and input PPP factors were calculated respectively.³

Labor productivity for Turkish confectionery manufacturers is about 35 percent of the US average. Although overall sector productivity is low compared to the US, the productivities of players within the industry differ: the traditional manufacturers are operating at around 18 percent of US levels, whereas modern manufacturers are operating at about 69 percent (Exhibit 4).

OPPORTUNITIES TO CLOSE PRODUCTIVITY GAP

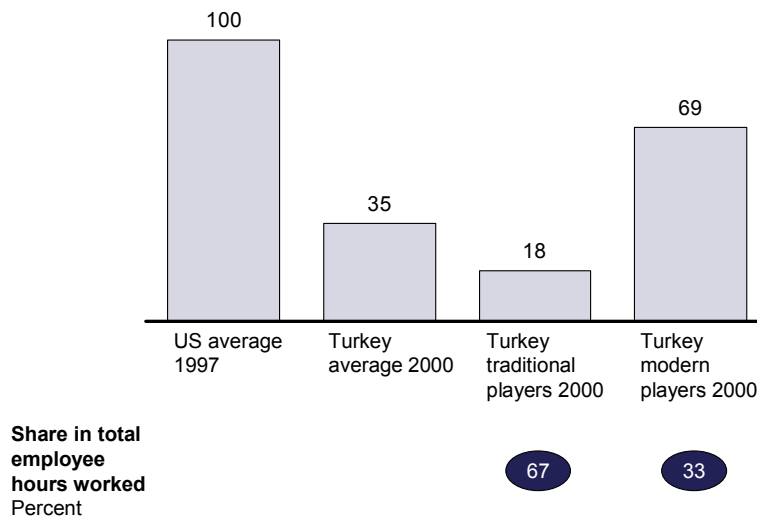
We estimate the potential labor productivity of the Turkish confectionery industry to be 87 percent of US levels. Interestingly, confectionery is one of the two sectors that constitute traditional and modern segments in which the productivity horizon is the same for each. This reflects the low capital intensity, low minimum scale, and low skills demanded in the sector. As Exhibit 5 illustrates, we have identified two main opportunities to close the labor-productivity gap between current and

³ See chapter Appendix for more details on our methodology.

Exhibit 4

TURKISH CONFECTIONERY LABOR PRODUCTIVITY

Indexed, US (1997) = 100

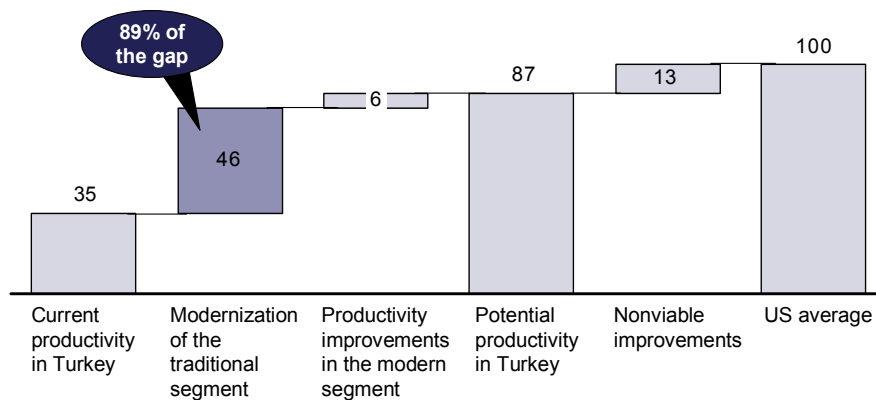


Source: Company interviews; State Planning Organization Sector Reports; MGI analysis

Exhibit 5

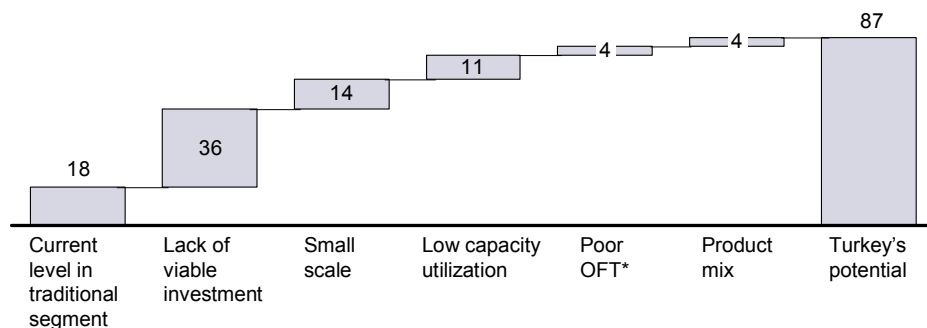
SOURCES OF LABOR PRODUCTIVITY IMPROVEMENTS IN CONFECTIONERY

Indexed, US (1997) = 100



Source: Interviews; US Census of Manufacturing; MGI analysis

Exhibit 6
**OPERATIONAL FACTORS EXPLAINING PRODUCTIVITY GAPS –
 CONFECTIONERY MANUFACTURING – TRADITIONAL SEGMENT**
 Indexed, US (1997) = 100



* Organizations of functions and tasks
 Source: Interviews; MGI analysis

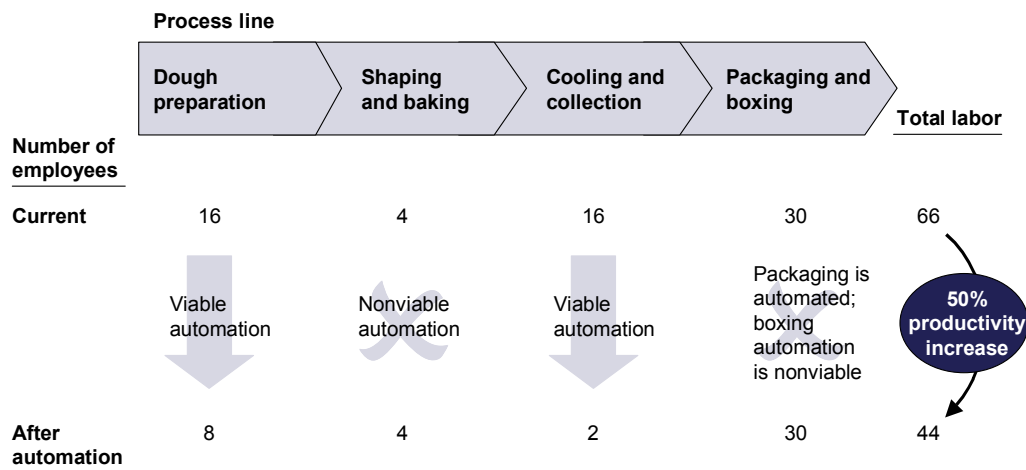
potential productivity levels: modernization of the traditional segment and productivity improvements in the modern segment. In this section, we examine the relevance of different operational factors for productivity improvement of each supplier segment.

Modernization of the traditional segment

Nearly 90 percent of the gap between the sector’s current and potential productivity will be closed by modernization of the traditional segment, with its extremely low labor productivity. Absence of some viable automation investments, low capacity utilization rates, and low scale are responsible for the largest part of the productivity gap for this segment (Exhibit 6). Additional contributors include weak organization of functions and tasks (OFT) and product proliferation.

Low capital intensity and automation. Low capital intensity and automation account for half of the 69-percentage point gap between current and potential productivity levels in the segment. By automating where possible in the production process, the industry could address 36 points of the gap. We found four improvement areas along the value chain: dough preparation, collection after baking, packaging, and continuous production facilities versus batch production facilities (particularly for chewing gum and sugar confectionery manufacturing). Automation in dough preparation, for example, could reduce by half the

Exhibit 7

VIABLE AUTOMATION – TRADITIONAL COMPANY EXAMPLE

Source: Interviews

employment dedicated to this task, while automation in collection could reduce related employment numbers to one-eighth of current levels (Exhibit 7).

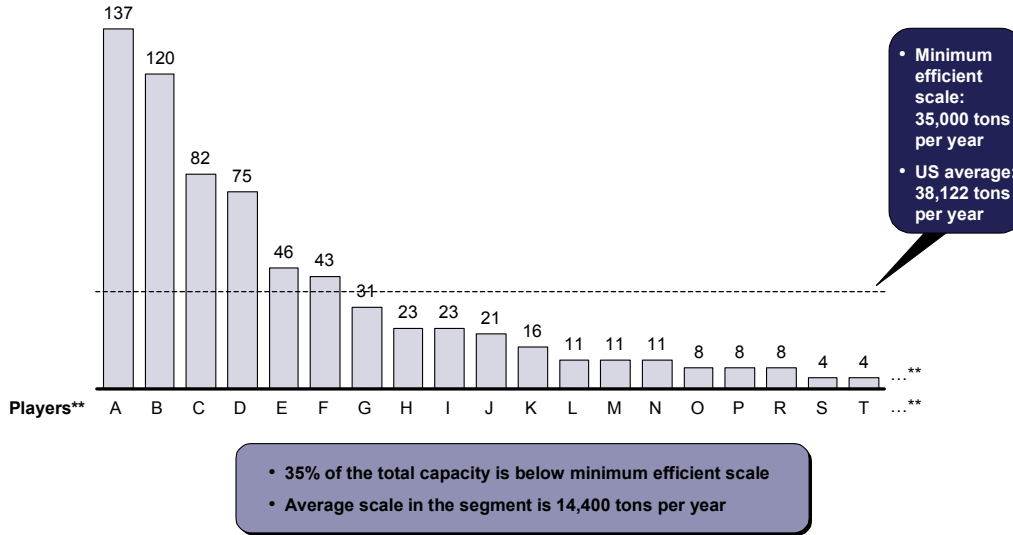
Small scale of Turkish traditional confectionery plants. The segment could gain up to 14 percentage points by increasing the average scale to even the minimum levels of efficiency. Most traditional players are small-scale establishments. With close to 350 companies in operation in the industry and a total capacity of approximately 1.5 million tons of output per year, these manufacturers are operating at low productivity levels; if market forces spur them to increase their average scale, the productivity of the whole confectionery manufacturing industry would increase accordingly (Exhibit 8).

Low capacity utilization. Capacity utilization represents about 11 points of the gap. Our findings indicate that the traditional segment suffers from similar levels of low capacity utilization as modern players; and currently, the capacity utilization rate for the industry overall is 43 percent, varying from 38 to 53 percent among the product segments. If the industry could achieve the US utilization level of 77, the overall productivity gap would narrow accordingly (Exhibit 9). Even though substantial consolidation has taken place since the Russian crisis, excess capacity remains far above the current production levels.

OFT. Four points of the productivity gap between current and potential labor productivity in the traditional segment are attributable to OFT. This issue could be addressed primarily through multitasking in workforce organization and through

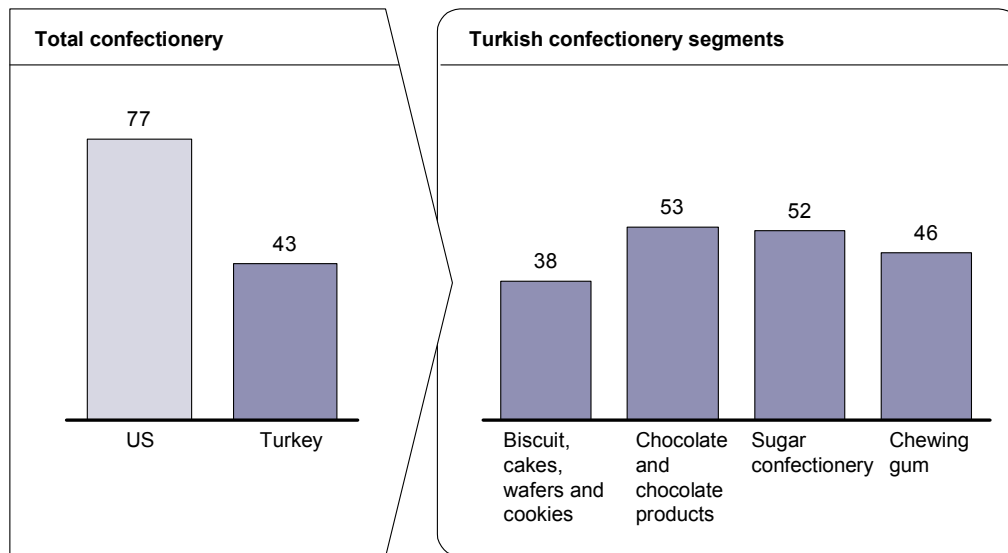
Exhibit 8
SCALE: INSTALLED CAPACITY OF CONFECTIONERY MANUFACTURERS – BISCUIT* EXAMPLE

Thousands of tons per year



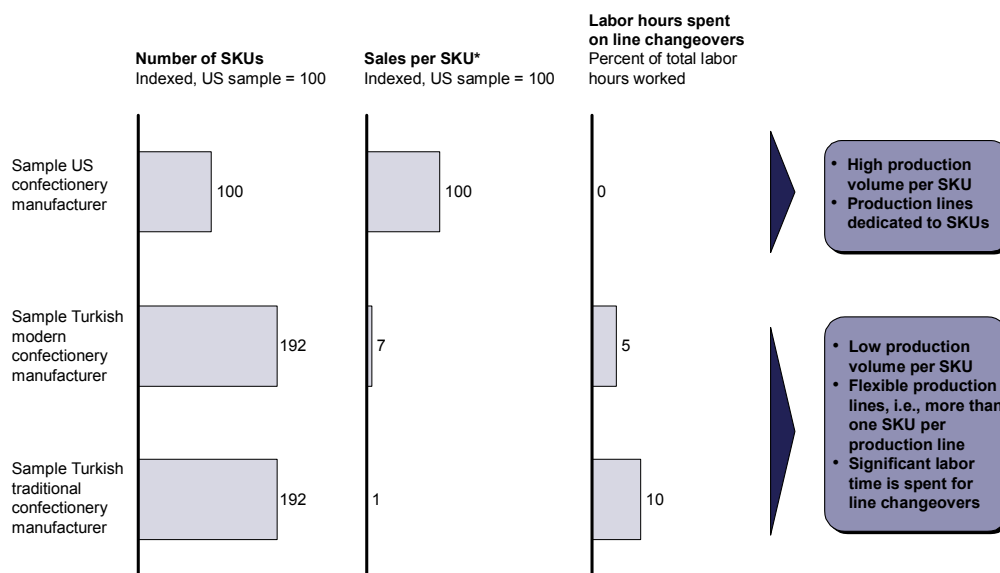
* Biscuits, cakes, wafers, and cookies
 ** Not exhaustive, 35 players with total capacity of 94,000 tons per year are not shown
 Source: State Planning Organization; MGI analysis

Exhibit 9
CAPACITY UTILIZATION
 Percent



Source: State Planning Organization; MGI analysis

Exhibit 10
PRODUCT PROLIFERATION



* Figures adjusted for relative company size in the country and PPP
 Source: Interviews; company websites; MGI analysis

in-house training. To save hours worked, manufacturers could, for instance, incorporate supervisor-level workers into production, and enhance the maintenance capabilities of line workers. Through improved labor force training, they could also reduce bottlenecks and idle hours from equipment breakdowns caused by improper usage. Some confectionery manufacturers in Turkey have proven this potential by making similar OFT changes to increase their productivity by as much as 20 percent.

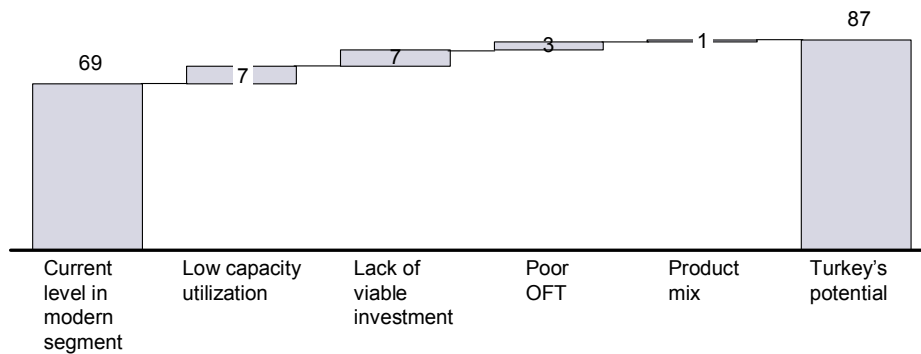
Product proliferation. Traditional manufacturers produce a large range of stock-keeping units (SKUs) relative to the scale of their operation. This results in very low production volumes per SKU. These low-volume SKUs are manufactured on flexible lines, those that handle more than one product. Flexible lines are inherently lower in productivity than dedicated lines – those focused on one SKU – because they need frequent changeovers, which consume extra labor hours. In fact, 10 percent of the total labor hours are spent on line changeovers (Exhibit 10). Rationalizing SKUs would eliminate changeover times and increase industry productivity by up to 4 percentage points.

In this sector, we do not estimate the potential impact of change in the mix of traditional and modern players because there is no difference between the potential productivity levels that can be achieved in each segment.

Exhibit 11

OPERATIONAL FACTORS EXPLAINING PRODUCTIVITY GAPS – CONFECTIONERY MANUFACTURING – MODERN SEGMENT

Indexed, US (1997) = 100



Source: Interviews; MGI analysis

Productivity improvements of the modern segment

With average labor productivity at 69 percent of US levels, modern manufacturers are much more productive than those in the traditional segment. This is mainly due to the fact that modern manufacturers operate with larger scale and more capital investments in automation. However, a potential labor productivity of 87 percent of the US suggests that modern suppliers can further improve their productivity by as much as 18 percentage points (Exhibit 11). Our analysis points to similar areas as seen in the traditional segment responsible for the gap with much less effect in productivity.

Even modern manufacturers have been affected by the Russian crisis, and therefore are suffering from low capacity utilization as well. In addition, even though modern manufacturers have automation in basic production functions like dough preparation and cooling and collection, some of the modern players lack other viable investments, such as continuous production facilities versus batch production facilities (particularly for chewing gum and sugar confectionery manufacturing). In addition modern manufacturers also suffer from OFT problems albeit to a lesser extent, mostly multitasking and problems in product proliferation.

Again, with improvements across both the traditional and modern segments, labor productivity in confectionery manufacturing could reach 87 percent of US levels by the year 2015. The remaining 13 percent would be nonviable for the sector due to factor cost differences between the two countries (Exhibit 5). Specifically,

lower labor costs in Turkey decrease the viability of some automation options, such as automated boxing and warehousing. Different consumption behaviors also limit Turkey's ability to achieve US productivity levels. US consumers consume more high-value products. For instance, per capita consumption of chocolate is 3 times higher in the US than in Turkey; biscuit consumption, however, is about the same.

INDUSTRY DYNAMICS AND EXTERNAL FACTORS AFFECTING PRODUCTIVITY

Productivity improvements in the confectionery sector have been slow. Even modern producers have substantial room for improvement, but traditional producers have been much slower to progress. Looking to the future, the improvement of productivity gaps discussed above depends on three critical factors: higher levels of competition in domestic sales, increased presence of best practice global players, and fewer exit barriers for unproductive players.

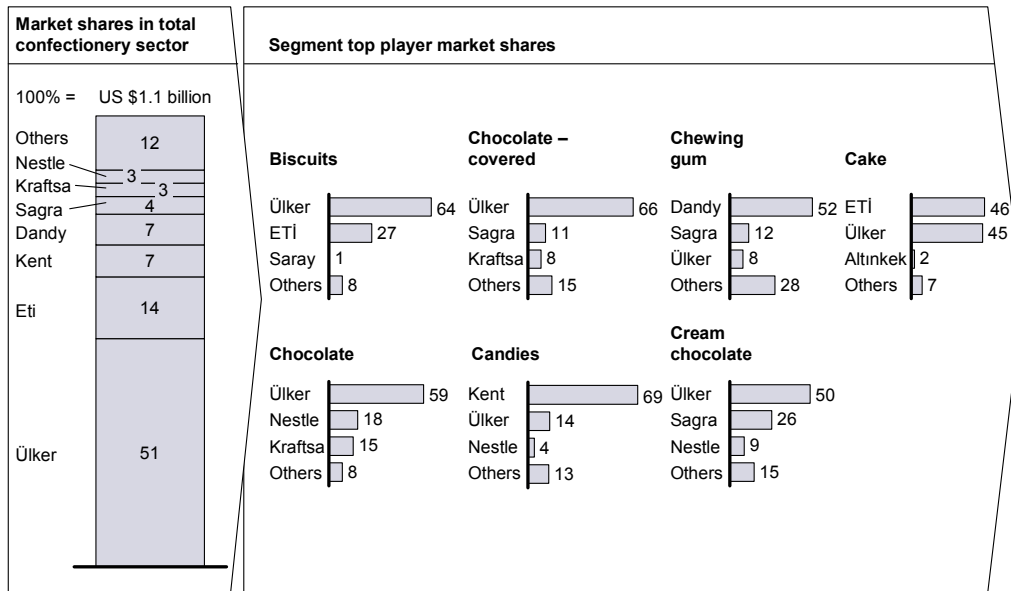
Higher levels of competition in domestic sales

Two factors are responsible for today's low level of competition in domestic sales: the role of traditional retail channels and dominance of these channels by market and sector leaders, and lack of sufficient enforcement of competition rules. First, in Turkey, when one or two manufacturers penetrate a retailer, the other manufacturers are effectively locked out of the competition. Confectionery products in Turkey are an "impulse," or unplanned, purchase. Ninety-five percent of traditional retailers – groceries, snacks, small markets, medium markets, dry fruit vendors – carry confectionery items on their shelves, and these retailers account for 77 percent of the volume in the sector.

However, because they have limited shelf space, traditional retailers can stock only one or two brands in any SKU, limiting penetration at a retailer to a few manufacturers. This creates a barrier to competitive pressure from players that are not sector leaders. In fact in almost all subsegments, no more than three players – and usually two or less – have more than 50 percent distribution (Exhibit 12). This shelf space limitation also acts as an entry barrier for the industry, preventing new entrants and the competitive pressure that new entrants would bring to the market. In the US, almost all smaller retailers carry confectionery items as well, but they only account for 26 percent of the volume in the sector (Exhibit 13). Thus, their shelf space limitations have less impact on the competitive dynamic.

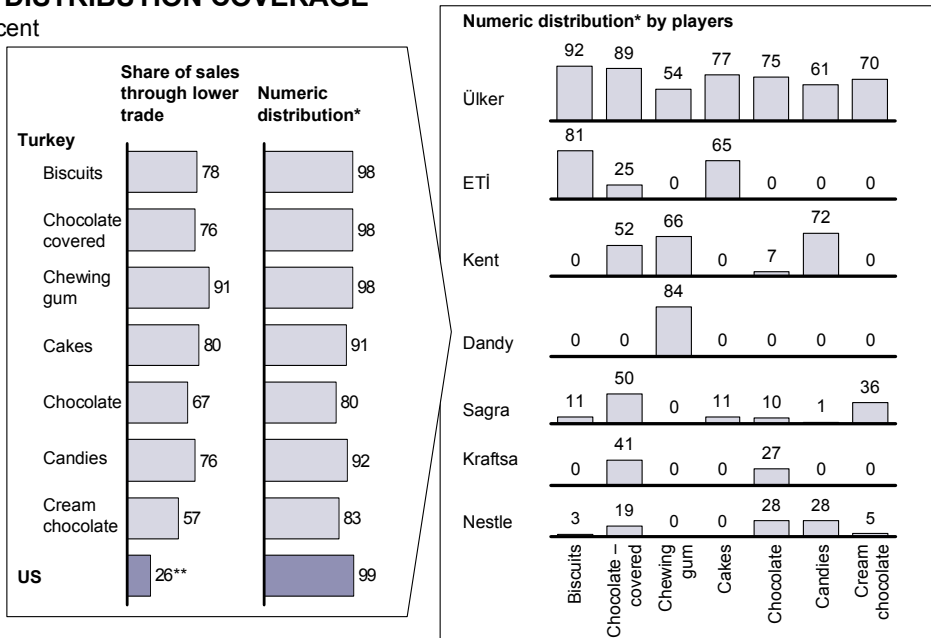
Over time, the rapid emergence of modern retailers is the best antidote to this constraint, since they both wish to and can stock multiple SKUs from multiple

Exhibit 12
MARKET SHARE OF TURKISH CONFECTIONERY PLAYERS
 Percent



Source: AC Nielsen Zet; MGI analysis

Exhibit 13
COMPETITIVE ENVIRONMENT – IMPORTANCE OF DISTRIBUTION COVERAGE
 Percent



* Percentage of retailers who have the respective product

** Sales through convenience stores and vending machines, which are not lower trade but impulse purchase product sellers

Source: AC Nielsen Zet

manufacturers. This would foster substantially greater competition in the industry, motivating all players to be more productive.

Second, competition rules are not always enforced. For example, contrary to Competition Act rules, one of the market leaders has been allowed to print retail prices on chocolate packages, thereby dictating prices to retailers and distorting how the market determines price.

Limited presence of best practice global players

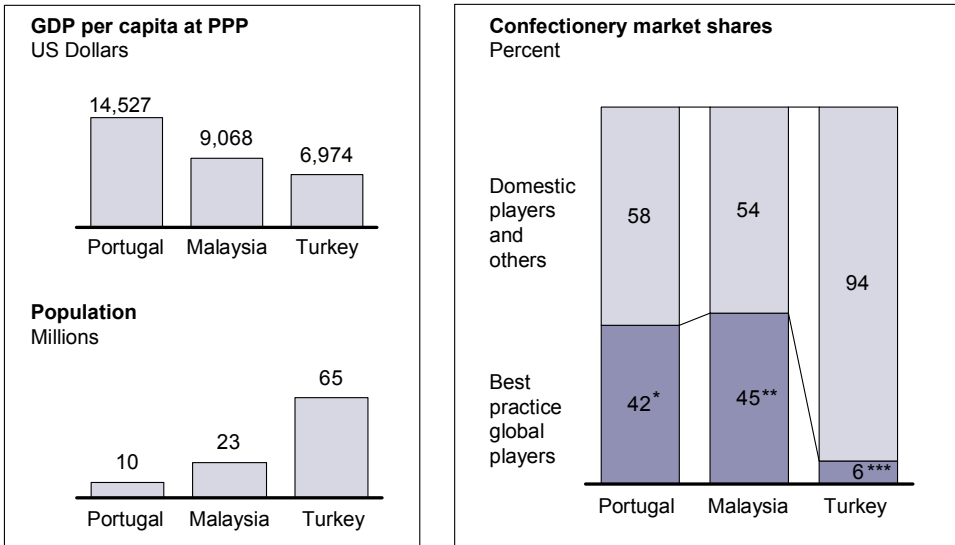
In many developing and recently developed countries like Malaysia and Portugal, global best practice players have a significant market share because they view these markets as major sources of sustained growth over time. Turkey is a notable exception in that only two global best practice players have entered the confectionery manufacturing market, and they account for only 6 percent of the market (Exhibit 14). As with most sectors in Turkey there are no direct barriers to foreign direct investments (FDI), but we observe two factors that effectively act as barriers:

- ¶ First, foreign players have limited access to primary distribution. Turkish traditional retailers account for more than 70 percent of all commodity volume, and thus dominate distribution for confectionery items. (In Malaysia they account for 45 percent of total volume and in Portugal only 25 percent.) With this channel open to only a few manufacturers, and with one or two local players represented in every product subsegment, distribution access will be limited for foreign players until the transition from traditional to modern retailers has progressed substantially further.
- ¶ Second, indirect tariffs and import-related costs discourage global players. There are no direct tariffs on finished product imports from the European Union. However, indirect tariffs such as weight tariffs, combined with the cost of dealing with customs bureaucracy and exchange rate translations, can add as much as 38 percent to the cost of a product. (Exhibit 15).

Furthermore, foreign players can gain distribution access only by leveraging existing, less-competitive, third-party distributor networks at a disadvantaged cost structure (if they can get distribution at all). This is the incremental cost – over and above the real cost of primary distribution – of achieving access (Exhibit 15). Not surprisingly, these extra costs are reflected in much higher shelf prices for comparable products.

Exhibit 14

BEST PRACTICE GLOBAL PLAYERS IN DEVELOPING/RECENTLY DEVELOPED COUNTRIES

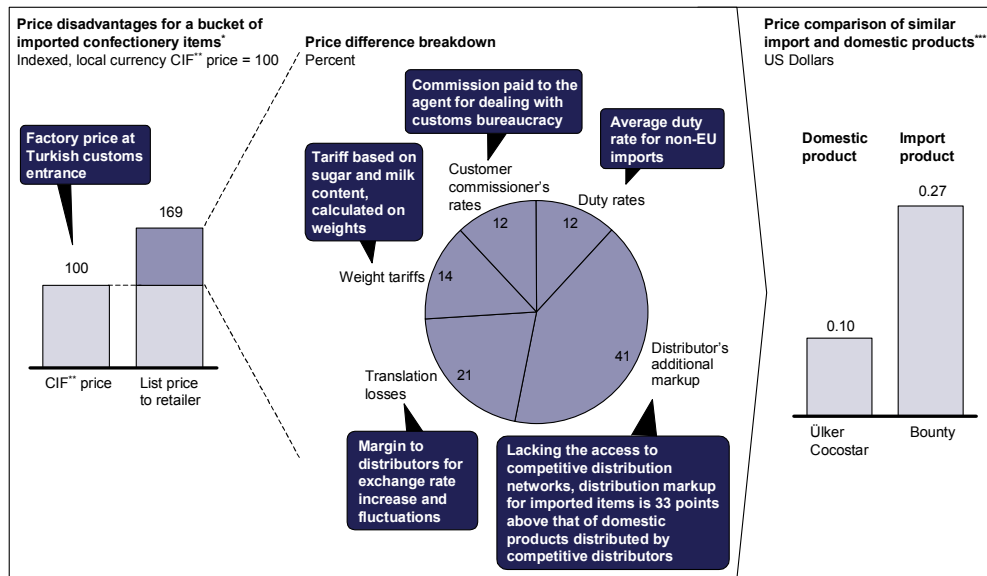


* Nestle, Warner-Lambert, Mars, Ferrero, Cadbury
 ** Nestle, Cadbury, Van Melle, Trebor, Mars, CJ Van Houten, Wrigley's
 *** Nestle, Kraft

Source: AC Nielsen; ERC Statistics International 1996 Confectionery Report; Euromonitor

Exhibit 15

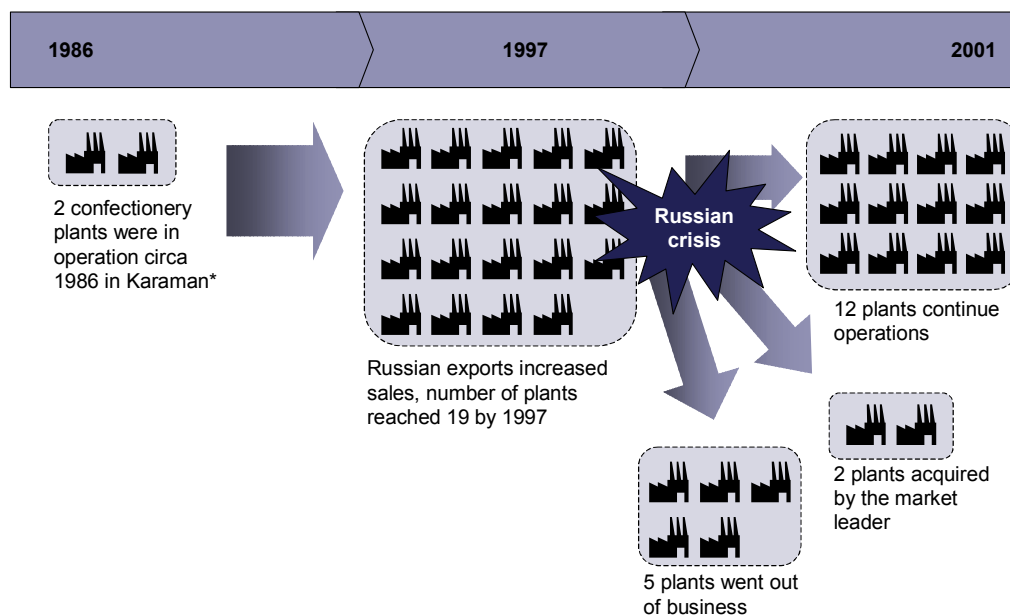
IMPORT BARRIERS TO CONFECTIONERY ITEMS



* A bucket of 13 confectionery items with different types and sizes
 ** Cost, insurance, freight
 *** Retail prices adjusted for compared product size

Source: State Planning Organization; Official Gazette; MGI analysis

Exhibit 16
**EVOLUTION OF TRADITIONAL CONFECTIONERY
 MANUFACTURERS – REGIONAL EXAMPLE**



* As a representative for the whole sector, traditional confectionery manufacturers in a specific city (Karaman) have been used
 Source: Interviews

Exit barriers for unproductive players

There is dramatic overcapacity in the industry, most of it resulting from a fragmented set of unproductive traditional players. In a sector with a fully level playing field, one would expect to see rapid consolidation in the form of acquisitions and exits from the industry. In fact, there have been a few acquisitions in the past 5 years, and about one-fourth of traditional players have exited the industry. However, this activity is minor compared to what the industry needs (Exhibit 16).

We attribute this relative lack of consolidation to informality among traditional players as it creates real barriers to exit. As in many sectors, a substantial majority of traditional players – estimated by industry observers – evade income taxes, do not record and pay VAT, and evade social security obligations. As Exhibit 17 illustrates, this affords them a 7-percent cost advantage, which at the margin is just sufficient to keep them in business, but at least makes their costs lower than they normally would be.

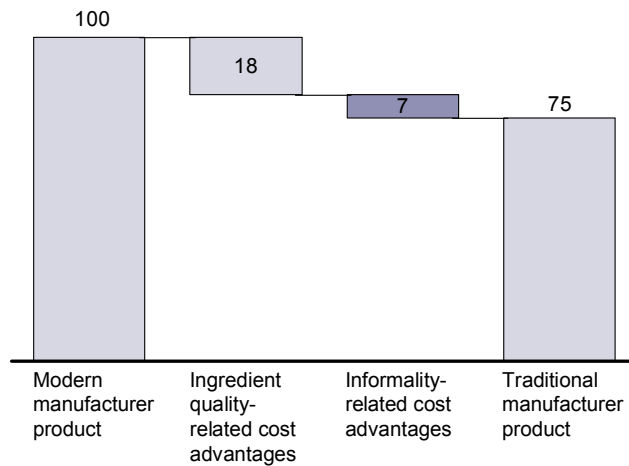
Exhibit 17

PRICE ADVANTAGE OF TRADITIONAL MANUFACTURERS

ESTIMATE

Retail sales price*

Indexed, modern manufacturer product = 100



* A basket of 34 products formed from modern manufacturers' and traditional manufacturers' products is analyzed for the price comparison
 Source: MGI analysis

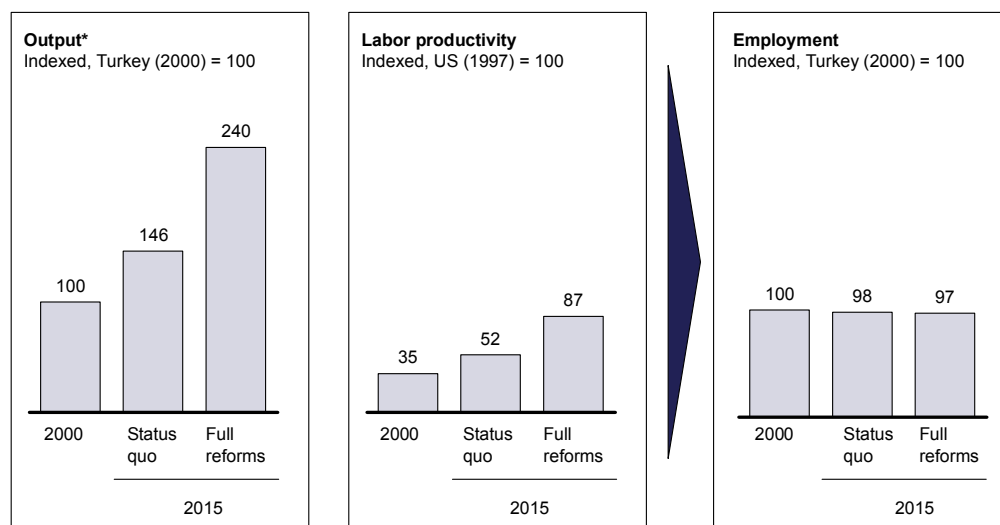
POLICY RECOMMENDATIONS AND IMPLICATIONS

We recommend four policy changes that will enable productivity in this sector to reach its full potential as quickly as possible:

1. **Remove informality in the sector.** Enforcing tax and labor regulations would address the informality in the sector. This will help to increase productivity because informal, unproductive players will be forced to either improve their productivity or exit the industry.
2. **Remove informality in FMCG retail.** Confectionery manufacturing illustrates the effects that successfully dealing with informality in the downstream retail sector could have on the upstream elements of the value chain.⁴

⁴ See FMCG chapter for more discussion of this recommendation.

Exhibit 18

IMPLICATIONS OF POLICY RECOMMENDATIONS

* For status quo scenario, 26% export share is used, which is State Planning Organization year 2005 estimate; for full reform scenario, 31% export share is used (5 percentage points increase in exports is due to increased productivity and decreased prices)

Source: MGI analysis

3. **Eliminate import barriers.** Reducing import barriers, such as indirect tariffs and bureaucracy-related costs, will make the domestic confectionery manufacturers face competition from abroad. The influx of imported products and global best practices would motivate the confectionery manufacturers to increase their productivity so that they can remain competitive. In addition, the quality of confectionery products would increase and the prices may further decrease from increased competition and productivity.
4. **Enforce competition laws.** To create the level playing field and healthy competition necessary for stimulating productivity increases in the sector, the Competition Board needs to strictly enforce the competition laws equally for all players.

Implications of policy recommendations

If all the barriers were removed in the sector together with the barriers in the overall economy, the output of the sector would grow by ~6 percent annually due to stimulated domestic consumption based on a GDP growth of ~8 percent per annum for the 2005 to 2015 period. However, this will not result in employment creation in the sector since the ratio between output and productivity increase rates are similar (Exhibit 18).

Appendix: Measuring productivity

Labor productivity was used for measuring the productivity performance of the confectionery manufacturing sector. The definition of labor productivity is US dollars value added per labor hour worked.

Value added

To reach value added, the value of inputs is subtracted from the value of outputs. Where confectionery ingredients and packaging material are forming the inputs, all confectionery products are forming the output. Both value of inputs and the value of outputs have been converted to dollars using PPP exchange rates based on confectionery input and output prices respectively. We computed the PPP exchange rates by forming similar product baskets in Turkey and the US and then dividing the value of the Turkish basket in Turkish Lira by the dollar value of the US basket. The baskets were formed along the following guidelines: for input, confectionery ingredients wholesale prices; for output, sample basket of retail items of the main confectionery items that have similar qualities and package sizes in Turkey and the US. The prices of the confectionery products have been gathered through large-scale retailers of both countries, and the resulting PPP exchange rate of retail has been used for wholesale PPP exchange rate with an assumption of similar retail margins for both of the large-scale retailers of both countries.

Overall productivity levels

Due to the lack of exhaustive top-down data for the sector, to calculate the overall productivity levels we gathered bottom-up data for companies and computed the overall productivity of the sector by extrapolating bottom-up productivity data with top-down employment figures.

Labor hours worked

The labor hours worked in the confectionery manufacturing sector is computed as the total number of persons engaged in confectionery manufacturing activity multiplied by the estimated number of working hours per day (8) and working days per year (250).

Data sources

The data for the US have been taken from the US census of manufacturing (1997). Due to the lack of such comprehensive data for Turkey, the Turkish figures have been derived from a number of sources: State Institute of Statistics, State Planning Organization sector reports, Istanbul Chamber of Industry, company interviews, expert views, sector reports and McKinsey analysis.