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Article in *Proceedings of Business and Economic Studies* · November 2018

DOI: 10.26689/pbes.v1i2.494

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Market Analysis to the Steel Industry: Evidence from Egypt

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Abstract: This case study is guidance for the market forces in one of the important industries. This study is prepared to analyze the market forces affecting the flat steel industry during the period from 2013 to 2017 in Egypt. The steel market in Egypt is a very wide market with many companies and a wide variety of products. The study will provide insight on the supply, demand, and elasticity of flat steel produced by Al-Ezz Dekheila Steel Company which is one of the biggest producers of flat steel in the Middle East. Finally insight for this industry for the future business opportunities

Keywords: *steel industry; oligopoly market; driving forces; elasticity*

Published date: June 2018

Published online: 30 June 2018

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0 Introduction

Al-Ezz Dekheila Steel Company (EZDK) is the largest steel manufacturing facility in Egypt. It lies in Dekheila, west of Alexandria, Egypt's second biggest city, and its main port. The Company was established in 1982 and started production in 1986. The former name for the company was the Alexandria National Iron and Steel Company (ANSDK). ANSDK was established between Egyptian public sector companies, global development agencies, and Japanese corporate enterprises. ANSDK was in 2006 and it is renamed EZDK through an acquisition process by Ezz Steel Company. This acquisition process was in four phases from 1999 to 2010 as follows: In October 1999–January 2000 (total stock percentage owned by Ezz steel reached 20.89%), in

October 2003 (the percentage reached 32.68%), during April 2004–July 2005 (the percentage increased to 51%), and finally, in June 2008–April 2010 (it reached 54.59%). EZDK produces two main products: Steel rebars and flat steel. This research will focus on analyzing the supply and demand of flat steel produced by EZDK. Flat steel from Ezz Steel is used in a wide variety of industrial, commercial, and domestic applications^[1].

The following sections will review the market structure and market volume followed by market driving force and elasticity's and elasticity's calculation and interpretation, followed by conclusion.

1 Market structure

The Egyptian Market has many companies which produces lots of types of steel products. The flat steel market in Egypt has only four players which are: EZDK Company, Egyptian Iron and Steel Company, Ezz Flat steel (EFS) Company (also owned by Ezz group and started producing flat steel in 2016), and Kandil Steel [Figure 1]. The market type in this case is an oligopoly where there is a state of limited competition, in which a market is shared by a small number of sellers^[2].

These percentages of each company's quantity demanded (sales) of flat steel relative to the total market quantity demanded show that Al Ezz Dekheila Company has the most market share with about 53% of the market followed by Egyptian iron and Steel company with 23%, then EFS Company (also owned by Ezz Group and started producing flat steel in 2016) with 13% and finally Kandil steel with 11%. The market volume reflects the sales volume for the three companies affiliated with Ezz Group which are EZZ Steel Rebars, EZDK, and EFS^[2].

Sales (EGP millions)	ESR	EZDK	EFS	Consolidated
Long	8569	18,665	3201	30,462
Flat		8523	2378	10,901
Others		329	50	379
Total	8569	27,517	5629	41,742

ESR: EZZ Steel rebars, EZDK: Al Ezz Dekheila Steel Company, EFS: EZZ flat steel

The long steel products accounted for EGP 30.5 billion or 73% of sales in 2017, while the flat steel products sales represented 26% of sales at EGP 10.9 billion. Consequently, EZDK sales represented about 8.5 billion EGP^[2].

2 Demand driving forces

Due to strong local housing construction needs and infrastructure projects, Egypt's demand for Changgang has increased dramatically. The demand curve seems to follow the demand law during the depreciation period from the fourth quarter of 2016 to the first quarter of 2017 [Figure 2]^[3].

By zooming more, we find that the trend line shows a typical demand curve following the law of demand. In general, except for Q2 2015, as prices increase, the quantity demanded decrease [Figure3].

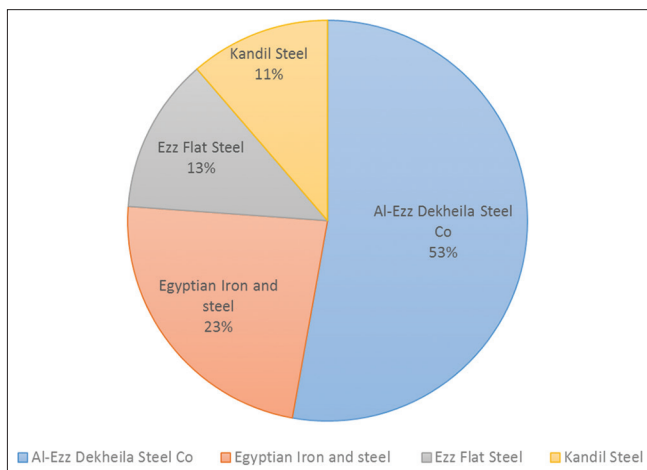


Figure 1. Flat Steel Market share figures from 2016

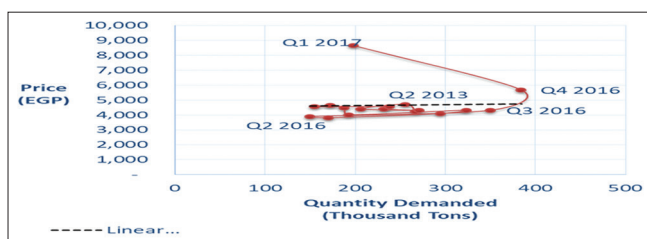


Figure 2. Flat steel demand curve during 2013–2017

2.1 Factors affecting the demand for this product include

- Price of the product itself (was apparent when the Egyptian pound devaluation sharply decreased the demand).
- This product is a raw material in several industries, so the conditions of the market for these industries also affect the demand for the product.
- Expectations of higher or lower prices in the future affect the current demand of the product.

3 Supply driving forces

The supply curve was following the law of supply until the devaluation of the Egyptian pound.

From Figure 4, the trend line shows a violation to the law of supply, suggesting that quantity supplied does not mainly respond to prices, where other factors affect the supply.

The factors affecting the supply of this product are as follows:

- Increase or decrease in the cost of production
- The exchange rate of the Egyptian pounds (since some raw materials are imported)
- Production efficiency and capacity
- Expectations of higher or lower prices in the future affect the current demand of the product.

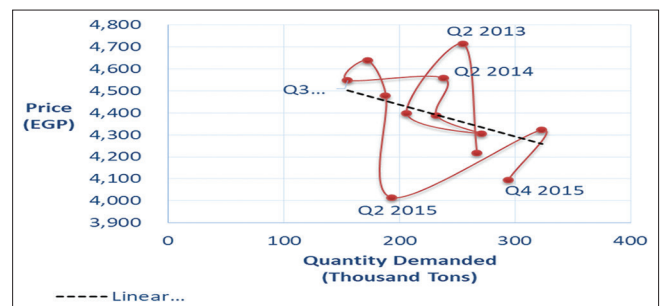


Figure 3. Flat steel demand curve during 2013–2015



Figure 4. Flat steel supply curve during 2013–2017

3.1 Supply and demand zoom-in

Using the trend lines for both supply and demand curves, we would find that the equilibrium point lies at quantity = 230 and price = 4400. Intersection between supply and demand curves happen the most when the prices are between 4400 and 4700 [Figure 4].

The previous graphs are interpreted as follows:

- The supply and demand for this product are closely related with the shapes of the supply and demand curves being almost identical through the period of study (from 2013 to the beginning of 2017). This indicates that the quantity supplied is usually bought by consumers.
- The price of the product was mostly stable from Q1 2013 to Q3 2016 with the highest price

recorded during this period being 4714 EGP at Q2 2013 (June 30 revolution in Egypt). Yet this relative increase did not have a lot of effect on either the quantity demanded (fell 4.5%) or the quantity supplied (fell 5%).

- After the Egyptian pound devaluation following the adoption of a free exchange rate by the Egyptian government, the prices of flat steel jumped first by 27.1% in Q4 2016 then by about 42% in Q1 2017. This devaluation led to a sharp decrease both in quantity demanded (about 61%) and in quantity supplied (about 75%) in this quarter.
- The trend analysis showed that, for the most part, the law of demand was followed. Yet the law of supply was not followed [Figure 5].

4 Price elasticity of demand

Period	Quantity Demanded (Thousand tons)	Price (EGP)	% change in quantity Demanded	% change in price	Elasticity	Comment	Factors Affecting Elasticity
Q1 2013	267	4,217					
Q2 2013	255	4,714	↓ 5%	↑ 11%	0.41	Inelastic	The quantity demanded decreased and prices increased because of increased prices of imported materials, however the % decrease in quantity demand was less than the % increase in price because the exporting quantities have increased, causing a relatively lower % decrease in total quantity demanded.
Q3 2013	206	4,398	↓ 21%	↓ 7%	3.07	Elastic	The quantity demanded decreased by large % due to the political disturbance at the time and market uncertainty.
Q4 2013	271	4,306	↑ 27%	↓ 2%	12.92	Elastic	In this quarter the political disturbance impact was much less than previous quarter, thus the demand increased while prices were almost the same.
Q1 2014	232	4,388	↓ 16%	↑ 2%	8.26	Elastic	The quantity demanded was again affected by several factors such as some political unrest and market uncertainty
Q2 2014	238	4,559	↑ 3%	↑ 4%	0.67	Inelastic	The % quantity demanded increase was very close to the % price increase, and overall not very different from previous quarter
Q3 2014	155	4,548	↓ 42%	0%	184.30	Perfectly Elastic	Quantity demanded was affected by the shortage in quantity supplied in market due to Lack of natural gas supply to production factories.
Q4 2014	172	4,640	↑ 10%	↑ 2%	5.24	Elastic	Quantity demanded started to increased after the huge drop in previous quarter.
Q1 2015	188	4,479	↑ 9%	↓ 4%	2.52	Elastic	Price decreased due to the decrease in raw materials prices
Q2 2015	193	4,016	↑ 3%	↓ 11%	0.24	Inelastic	Price decreased due to the decrease in raw materials prices
Q3 2015	323	4,322	↑ 50%	↑ 7%	6.85	Elastic	Quantity demanded continued to increase with much higher percentages despite the increase in prices.
Q4 2015	294	4,095	↓ 9%	↓ 5%	1.74	Elastic	Both price and quantity demanded decreased
Q1 2016	170	3,812	↓ 53%	↓ 7%	7.45	Elastic	In this quarter the dollar prices increased and governmental regulations have been imposed on foreign currencies as well as import, causing market uncertainty and decrease in quantity demanded
Q2 2016	150	3,900	↓ 13%	↑ 2%	5.46	Elastic	In this quarter prices started to increase after the increase of dollar exchange rate, while demand kept on decreasing due to market uncertainty
Q3 2016	350	4,314	↑ 80%	↑ 10%	7.93	Elastic	This is the quarter right before devaluation, and demand has enormously increased as consumers wanted to secure as much quantity as possible before prices increase.
Q4 2016	384	5,667	↑ 9%	↑ 27%	0.34	Inelastic	Devaluation occurred at the middle of this quarter thus prices kept increasing and demand also increased but not with the same % as prices
Q1 2017	198	8,646	↓ 64%	↑ 42%	1.54	Elastic	As prices increased enormously after devaluation, the demand has decreased with a notable % due to market uncertainty

5 Price elasticity of supply

Period	Quantity Supplied (Thousand tons)	Price (EGP)	% change in quantity Supplied	% change in price	Elasticity	Comment	Factors Affecting Elasticity
Q1 2013	259	4,217					
Q2 2013	246	4,714	↓ 5%	↑ 11%	0.46	Inelastic	Due to the governmental limitations on natural gas and electricity consumptions, the company was not able to work in full capacity, causing the quantity supplied to decrease.
Q3 2013	229	4,398	↓ 7%	↓ 7%	1	Unit Elastic	The % decrease in the price was met with the same % decrease in quantity supplied
Q4 2013	256	4,306	↑ 11%	↓ 2%	5.28	Elastic	The % quantity supplied increased to meet the increased demand after the decrease from previous quarter due to political unrest, while prices were almost the same
Q1 2014	221	4,388	↓ 15%	↑ 2%	7.81	Elastic	The quantity supplied was again affected by several factors such as some political unrest, governmental regulations and an accident in a supply line in the factory that reduced the capacity of quantity supplied
Q2 2014	231	4,559	↑ 4%	↑ 4%	1	Unit Elastic	The % increase in the price was met with the same % increase in quantity supplied
Q3 2014	114	4,548	↓ 68%	0%	295.94	Perfectly Elastic	Lack of natural gas supply has caused major equipment and elements in the factory to stop for 57 days during this quarter, causing a severe decrease in quantity supplied %, while the prices were unchanged.
Q4 2014	224	4,640	↑ 65%	↑ 2%	32.81	Elastic	In this quarter the company was able to recover the stoppage occurred in the factory elements during previous quarter, thus the quantity supplied returned back from the huge drop as the company gained higher production efficiency.
Q1 2015	199	4,479	↓ 12%	↓ 4%	3.35	Elastic	Price decreased due to the decrease in raw materials prices
Q2 2015	185	4,016	↓ 7%	↓ 11%	0.67	Inelastic	Price decreased due to the decrease in raw materials prices, while the quantity also decreased but with lower % change than price causing an inelastic elasticity
Q3 2015	341	4,322	↑ 59%	↑ 7%	8.07	Elastic	In this quarter the company was able to efficiently increase its quantity supplied that decreased during the previous 2 quarters due to lack of natural gas, while the prices have also increased
Q4 2015	295	4,095	↓ 14%	↓ 5%	2.68	Elastic	Both price and quantity supplied decreased
Q1 2016	156	3,812	↓ 62%	↓ 7%	8.60	Elastic	The dollar prices increase and governmental regulations imposed on foreign currencies as well as import, caused a decrease in quantity supplied
Q2 2016	182	3,900	↑ 15%	↑ 2%	6.72	Elastic	In this quarter quantity supplied started to increase along with prices
Q3 2016	361	4,314	↑ 66%	↑ 10%	6.54	Elastic	In this quarter supply noticeably increased as to adjust to the increasing demands due to rumors already being heard for devaluation
Q4 2016	393	5,667	↑ 8%	↑ 27%	0.31	Inelastic	Devaluation occurred at the middle of this quarter thus prices kept increasing and supply also increased but not with the same % as prices
Q1 2017	178	8,646	↓ 75%	↑ 42%	1.81	Elastic	As prices increased enormously after devaluation, the supply has decreased with a notable % due to market and demands uncertainty

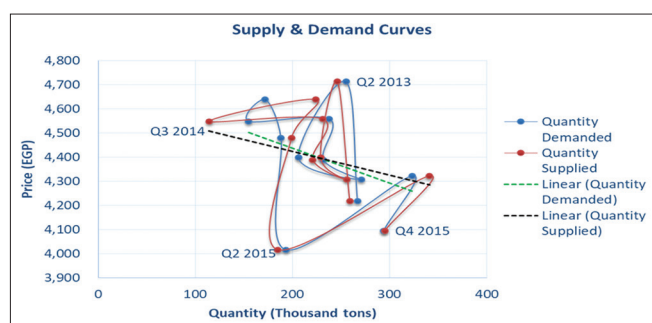


Figure 5. Flat steel supply curve during 2013–2015

6 Conclusion

The flat steel product is mostly elastic for both supply and demand. The quantity supplied is affected by other factors (mainly costs of production and efficiency) not only price changes. It is evident from the analysis that, other than prices, the supply factor is mostly the driving factor for demand where the EZZ steel usually produces the maximum or needed supply quantity it is able to

produce and quantity demanded follows such quantity supplied given that it is a relatively closed market. The devaluation had a major effect both quantities: Decreasing quantity demanded (following the law of demand), while decreasing quantity supplied (violating the law of supply).

The market type being an “Oligopoly” one is expected to continue for at least the upcoming decade, where the number of steel suppliers in the market is very limited and there are no real measures taken by the government to reduce oligopoly or monopoly in the markets. Consequently, Ezz steel will continue to be a price maker and the quantity

supplied/demanded will still be affected by prices (but not as a main) as well as many other factors as previously discussed.

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ISSN (ONLINE): 2208-3693

ISSN (PRINT): 2208-3685

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