"Valuation of Attock Refinery Limited – A lucrative investment decision in the Oil industry of Pakistan?"

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ABSTRACT

Share prices are present value of future cash flows discounted at weighted average cost of capital. Future cash flows depends upon the forecasted values of variables, however it is difficult to precisely calculate these variables. Expected volumes and prices are influenced by the political, economic and security situation. Factors that greatly affect refinery sector are GDP growth, spending on public sector development program, poverty reduction/per capita income, fuel prices, exchange rate and risk free interest rate.

This Research is focused on the valuation of Attock Refinery Limited and analyzes the Social, Economic, and Political & Global Events on Corporate Valuation of Oil Refinery Industry. The Study uses the data from 2004 till 2011 for Attock Refinery limited applied DCF method for company stock valuation. The Results showed that it's the right time to invest in the refinery sector as the current refinery sector can meet only 60% of the Country's refined oil products requirements.

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1. INTRODUCTION

1.1 GLOBAL OIL REFINERY INDUSTRY – A BRIEF OVERVIEW

Oil Refinery Industry holds immense importance for all the oil producing countries. If we focus on the global trend of this Oil Refinery Industry then we will see that this industry has experienced a lot of ups and downs over the decades.

In the period from 1970s to 1990s considerable amount of investment was made in the Oil Refinery Industry. But because of the oil shocks of 1973-74 and 1979-80 and because of the Asian Financial Crisis, the market demand was quite low. This resulted in surplus refining capacity of global Oil Refinery Industry.

But, the present scenario is different. As the Demand for Refined Petroleum and other Refined Products is increasing, Surplus Refining Capacity of the industry is diminishing very fast. So, in today's world, the Oil Refinery Industry has to concentrate on additional capacity building so that the Growing Market Demand can be met accordingly.

This additional capacity building naturally requires Heavy Investment. This is where the problem lies as the much needed investment in the Oil Refinery Industry is not attaining its required level because of the uncertainty of the investment returns. This is because, returns to the investment in Oil Refinery Industry were very low in the past three decades. But, the good news is that in the recent years the rates of return are improving. At present, the average margin per barrel has reached a level which is enough to cover the Capital Cost.

But many companies are not willing to invest in new oil refinery plants may be because of the factor that any Oil Refinery Plant requires at least five years to be established and this long period increases the risk of investing. The investor companies fear that the future margins may not be enough to cover their total investment cost.

According to a survey, Global refining capacity will grow from 89 million bpd in 2009 to 102 million in 2020

This means the global Oil Refinery Industry has to grow at an average Growth Rate of 1.8% per year. This will be possible only if the Oil Refinery Industry becomes successful to attract sufficient volume of investment from different investors.
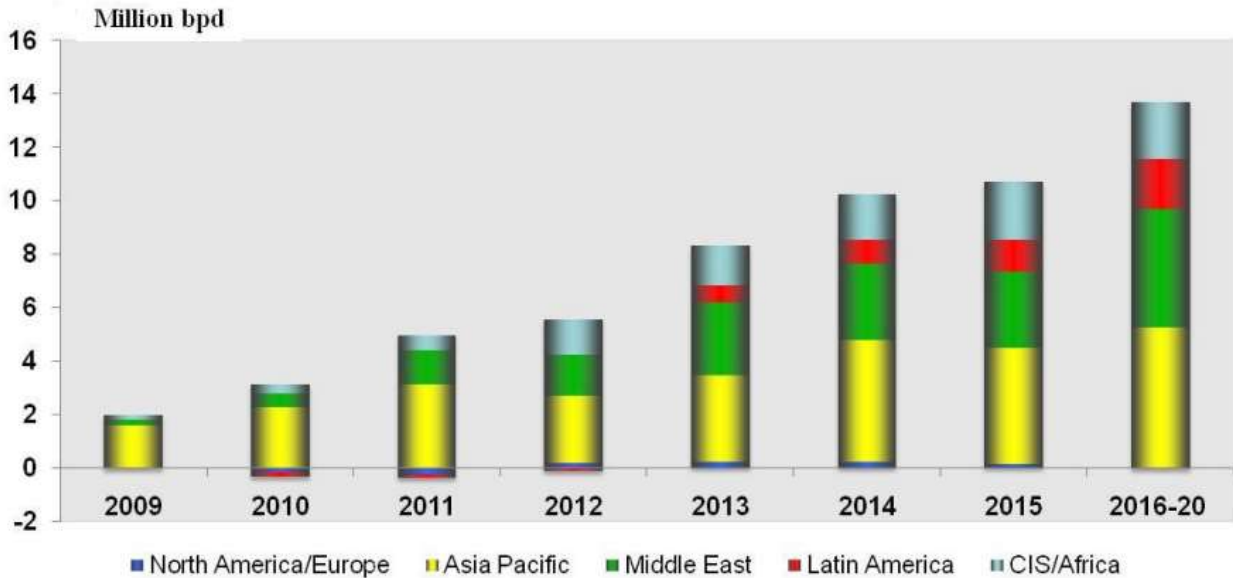
Figure 1: Region Wise Refinery Capacity Additions

1.2 REFINERY INDUSTRY OF PAKISTAN – AN INTRODUCTION

Pakistan economy is growing steadily. This growth demands higher energy consumption and consequently putting high pressure on countries economy. Pakistan mainly depends upon oil and gas resources to fulfill energy requirements .Indigenous resources of Oil are not enough to quench energy thirst of the growing economy. As a result Pakistan has to import large quantity of oil and oil based products from Middle East countries. Gas reserves in the country are enough for current gas requirements. So natural gas is playing a key role in power sector. Currently in oil upstream and downstream sector there are some local and international companies involved and government of Pakistan is establishing such policies that it can attract more international investors in this sector but the rapid pace of change, high degree of uncertainty and unstable political situation of the country present significant challenges and risk to foreign investment.

Net oil imports of Pakistan are projected to rise in coming years as demand for these products are very high and production capacity is very low at a constant rate. Demand for refined petroleum products also exceeds domestic oil refining capacity, so nearly half of Pakistani oil imports are refined products.

Share of the petroleum products is about 40 percent of the current energy consumption in Pakistan. This consumption has grown sharply during 1980s at rate of almost 7 percent per annum but it has

shown a decreasing trend during 1990s and later it gained the pace during 2004-2005 at about 10 percent per annum.

In total Pakistan has three older hydro skimming refineries and one mid country refinery named Pak-Arab Refinery (PARCO) which started its operation in year 2000 and a Bosicor Pakistan Limited which started its operation in 2003. Together the major five refineries have a total capacity of 12.82 million tons per annum, and processed 11.33 MMT of crude in the year 2004-05. Share of each refinery in countries refinery capacity is explained below with total capacity of 12.8 MTOE per year.

1.3 MAJOR REFINERIES AND THEIR CAPACITY

Pakistan has annual oil refining capacity of 12.8 mn tons, whereas the annual demand currently stands at 20.6 mn tons; well above the support rendered by the refineries. Refineries are heavily dependent on imported crude oil - as a result imported crude constitute 72% of total crude processed. Pakistan currently has 5 major refineries out of which 4 are listed on KSE. Currently there are about five major refineries operating in Pakistan, which are explained below:

- Pak. Arab Refinery (PARCO) with refining capacity of 4.50 MTO
- Attock Refinery (ARL) with refining capacity of 1.80 MTO
- National Refinery (NRL) with refining capacity of 2.70 MTO
- Bosicor Pakistan Limited (BPL) with refining capacity of 1.50 MTO
- Pakistan Refinery Limited (PRL) with refining capacity of 2.20 MTO
- Dhodak Refinery Limited (DRL) with refining capacity of 0.12 MTO

Pak Arab Refinery (PARCO) is the largest and unlisted refinery in Pakistan with throughput of 100,000bpd, followed by National Refinery (NRL), Pakistan Refinery (PRL), Attock Refinery (ATRL) and BYCO Refinery (BYCO) with throughput of 65,000bpd, 50,000bpd, 40,000bpd and 33,000bpd respectively.

The refineries produce a full range of products, including lube base oils and asphalt. However, only 60 percent of their production is HSD and FO, resulting in a significant mismatch between refined product output and market profile. Pakistan exports surplus gasoline and naphtha, and is self-sufficient in other petroleum products, such as kerosene and aviation fuels [Ministry of Petroleum Pakistan]

Shareof Each Refinery in refining capaity of the country

Total Capacity of 12.8 MTOE per Annum
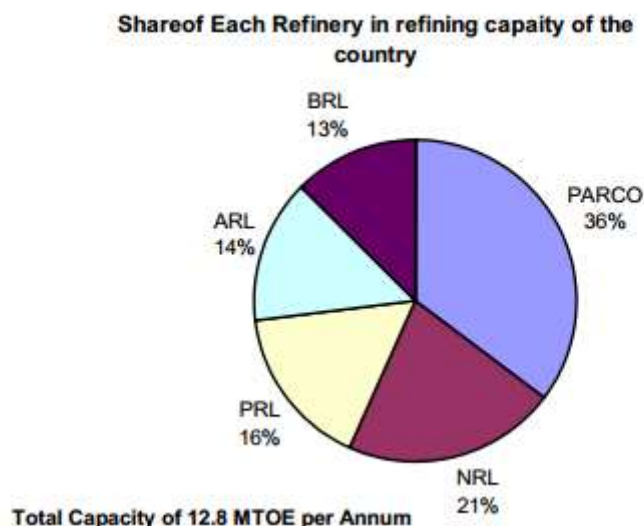
1.4   CONSUMPTION OF REFINED PETROLEUM PRODUCTS AND THEIR FUTURE

Oil consumption of different energy products is dominated by Gasoline and Fuel oil. Gasoline in Pakistan consists of High speed diesel (HSD) and Light speed diesel oil (LSDO). While fuel oil is normally used in terms of furnace oil which is being used for thermal power generation projects.

Transport sector and agricultural sector are the two major users of Gasoline. Transport sector include both private and commercial types. In the recent years a high amount of subsidy was being provided by the government of Pakistan over gasoline due to which its consumption has increased .but in the recent scenario increase in oil prices in international market has also effected Pakistan economy due which government is no more in a position to provide same amount of relaxation on gasoline as before some years due to which government is gradually reducing the subsidy levels as result Gasoline prices are   increasing locally also and effecting the consumption. Secondly government is promoting the compressed natural gas (CNG) sector in Pakistan and both encouraging and forcing the transport sector to convert on CNG. This indicates that in the coming years Pakistan will see reduced consumption of Gasoline products. But there is no alternative of Gasoline in Agriculture sector and as a result, this sector is facing extreme difficulties due to rise of Gasoline process.

1.5   FUTURE DEMAND OF PETROLEUM PRODUCTS IN PAKISTAN

Furnace oil or fuel oil is normally used for production of Electricity via thermal power plants. As 1999-2004 Pakistan has surplus of electricity and during this period most of the oil based power plants were converted to Natural Gas based systems so there was decline in Furnace oil consumption. But at the moment country is facing extreme energy crisis and government is Planning

for short term power generation plants that are oil based and also encouraging independent power producers to invest in the country. As all the new thermal power plants are oil based and also country has now very limited natural gas resources the consumption of furnace oil will also increase in the coming years [World bank report]. Future demand of different petroleum products is explained in the table below (figures in 1000 tons).

Long Term Petroleum product projection

Product	2004-05	2008-09	2010-11	2013-14	2017-18
100 LL	2.5	2.5	2.5	2.5	2.5
JP-1	749.4	806.4	835.4	879.4	934.4
JP-4	150	150	150	150	150
MS	1125.7	1218.5	1267.8	1345.3	1456.2
HOBC	15	15	15	15	15
SKO	300	300	300	300	300
HSD	7297.2	8133.3	8628.6	9428.7	10612.1
LDO	275	275	275	275	275
FO	4993	5383	5492	5465	5545
T o t a l	14907.8	16283.7	16956.3	17860.9	19290.2

Source: Oil Companies Advisory Committee Pakistan

2.   LITERATURE REVIEW

2.1   AIM OF THE RESEARCH

The aim of the research is to analyze the information asymmetry of the investors while determining the share price of Attock Refinery in the last couple of years. Analyzing whether the share price at that time would be same if we discount the actual cash flows generated in year 2004 to 2011.This will explain the gaps in the forecasting undertaken by the investors at the time of investment. Exploring the reasons for variation and investigating the events in the subsequent years which influenced the FCF's and the share price.

This Research is focused on the valuation of Attock Refinery Limited and analyze the lucrative investment decision in the oil industry of Pakistan.

2.2   CORPORATE VALUATION

We should evaluate the effects of alternative strategies on firm's values. This means forecasting financial statements under alternative strategies, finding the present value of each strategy's cash flow stream, and then choosing the strategy that provides the maximum value. The corporate valuation model does not depend on dividends, and it can be applied to divisions and subunits as well as to the entire firm. Corporate assets are of two types: operating and non-operating. Operating assets are of two forms: assets in place and growth options. Assets in place include such tangible assets as land, buildings, machines, and inventory, plus intangible assets such as patents, customers lists, reputation, and general know how. Growth options are opportunities to expand that arise from the firm's current operating knowledge, experience, and other resources. The assets in place provide an expected stream of cash flows, and so do the growth options. To illustrate, Wall Mart owns stores, inventory, and other tangible assets, it has a well-known name and reputation, and it has a lot of business know-how. These assets produce current sales and cash flows. And they also provide opportunities for new investments that will produce additional cash flows in the future. Similarly, Merck owns manufacturing plants, patents, and other real assets, and it has a knowledge base that facilitates the development of new drugs and thus new cash flow streams.

Most companies also own some non-operating assets, which come in two forms. The first is a marketable, securities portfolio over and above the cash needed to operate the business. For example, Ford Motors Company's automotive operation has about USD 11.4 billion in marketable securities as of early 2002, and this was in addition to USD 16 billion in cash. Second, Ford also has

USD 2.4 billion of investments in other business, which were reported on the assets side of the balance sheet. So in total Ford had USD 13.8 billion of non-operating assets, compared with its USD 94.4 billion of automotive assets, or 15 percent of the total. For most companies the percentage is even lower. For example, Wal-Mart's percentage of non-operating assets was only 1 percent, which is more typical.

For most companies operating assets are far more important than non-operating assets, companies can influence the value s of their operating assets, but the values of non-operating assets are largely out of their direct control.

We estimate the value of operations by estimating the expected revenues, costs and requirements of operating capital. Growth rate of revenue is high in the beginning of the business but as the market is saturated the revenues grow at a smaller rate. Profit margins are expected to improve as the production process become more efficient and marketing costs decreases since the costs are high at beginning due to introduction of products.

Free cash flow is the cash from operations that is actually available for distribution to investors, including stockholders, bondholders, and preferred stockholders. The value of operations is the present value of the free cash flows the firm is expected to generate out into the future discounted at its weighted average cost of capital, WACC, plus the value of its non-operating assets.

2.3   MACRO ECONOMIC GROWTH

Pakistan's energy sector is in a state of crisis and over the past few years has negatively impacted the social and economic development of the country. Primary energy consumption in Pakistan has grown by almost 80% over the past 15 years, from 34 million tons oil equivalent (TOEs) in 1994/95 to 61 million TOEs in 2009/10 and has supported an average GDP growth rate in the country of about 4.5% per annum. However since 2006/07 energy supply has been unable to meet the country's demand leading to shortages. Meanwhile per capita energy consumption in Pakistan at under 0.5 TOEs/capita remains only one-third of world average.

Oil Refineries are fundamentally one of the key support structure upon which a nation is built and run. Oil refineries directly help build infrastructures, support transport system, provide employments and helps build pipeline networks for smooth supply of petroleum products. Refineries also ensure continuous supply and storage of Strategic Oil Reserves. Above all, the refineries ensure supply of petroleum products for Defense needs and any unto do incidents. Refineries also improve foreign exchange reserves for our nation. It is estimated that the five refineries provide an annual savings of over $700 million to the national exchequer.

Oil demand is currently running at an estimated 411,000b/d, with imports during 2011 expected to have been 344,000b/d. With oil consumption expected to reach 452,000b/d by 2016 and modest growth in domestic liquids production, we see oil imports reaching about 399,000b/d by 2016. Crude oil import costs in 2011 are estimated to have been US$12.79bn, rising to US$13.56bn by 2016.

The country's total demand FY 2007-08 was 18.29 Mtons as against the refining capacity of 11.69 M. Mtons. Two major deficit products are High speed diesel and Fuel oil. The supply/demand gap is covered with the imports of fuel oil and high speed diesel. Following graphs provides details on the alarming gap between the supply and demands of these two products.

Fuel Oil (FO) Supply & Demand

Fuel Oil Prod.   Fuel Oil Sales)

Diesel (HSD) Supply & Demand

HSD Prod.   HSD (Sales)
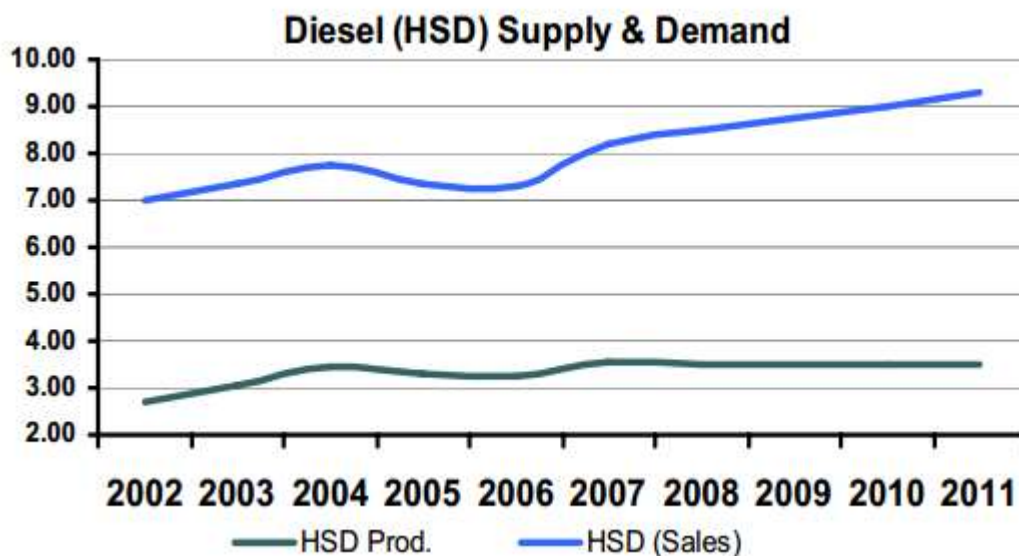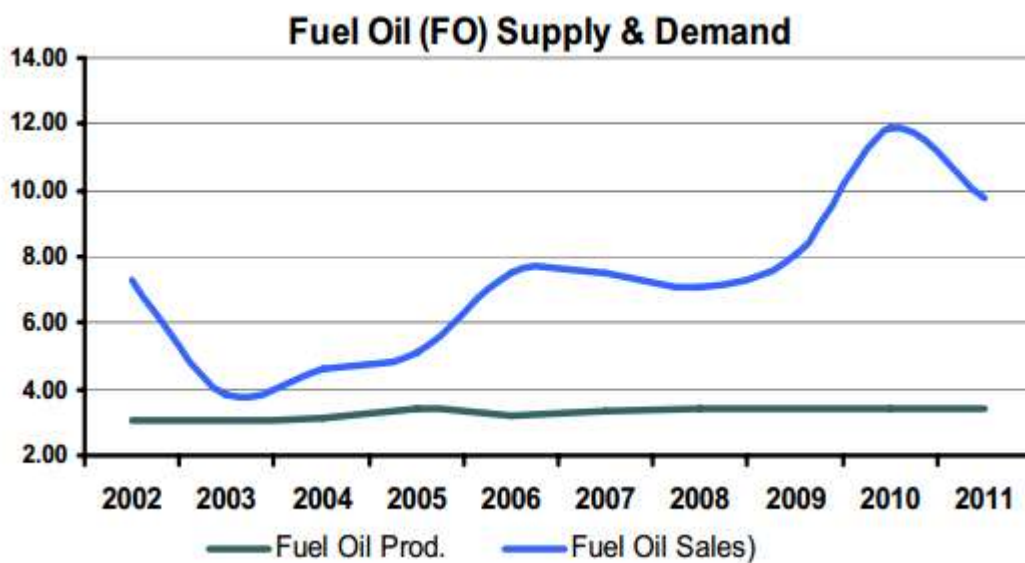
2.4   CRUDE OIL AND PETROLEUM PRODUCT PRICING IN PAKISTAN

2.4.1   DEREGULATION

Until 1999, the government had tight control over the petroleum sector in Pakistan. All the decisions were made solely by the government and were often based on political as opposed to economic considerations. Petroleum product prices were under tight government regulation. Since 2000, the government has initiated an ambitious pro-market reform programme in the sector. The objective behind these market base policies was to limit the government role to only policy related issues, and pricing and regulatory responsibilities passing to an independent regulatory authority.

The government also changed the guaranteed return formula of the refineries to an Import Parity Price (IPP) formula. Previously, the refineries were working under a fixed return formula where the return was capped in the range of 10-40% of their equity. Thus government was liable to meet any loss in the profitability of the refineries. Under the new formula, an import tariff is applied to the FOB price of the petroleum product to determine the ex-refinery prices.

Here it would be useful to add that the bulk of the crude oil requirement of Pakistan refineries is met through government to government contracts with Saudi Arabia. The terms of these contracts are not made public and refineries are charged market (international) related prices, any benefit or discount goes to the government. Domestic crude is supplied to the refineries at prices consistent with the policy applicable at the time the concession was awarded.

In 2001, the government authorized the Oil Companies Advisory Committee (OCAC) to review, fix and announce the prices of petroleum products on fortnightly basis in accordance with the approved pricing formula with effect from July 1, 2001 as a part of deregulation policy. Therefore, between July 1, 2001 and April 1, 2006, OCAC reviewed and announced the ex-depot prices of motor spirit (gasoline), kerosene, and light diesel oil fortnightly in accordance with the approved formula (Table A1). Later on, the function of price fixation was transferred to Oil and Gas Regulatory Authority (OGRA). Since April 16, 2006 OGRA is responsible for price notification.

In the pricing formula, ex-refinery price (or import parity price (IPP)) are determined on the basis of average fortnightly prices of petroleum products in international market (Arab Gulf market). Other components are customs and excise duty, petroleum development levy (PDL), distribution margin for oil marketing companies (currently 3.5% of ex-depot sale price), dealer's commission (4 %) and a 15% sales tax. Most components of the end user price, other than IPP are relatively stable, although the government has often adjusted PDL in an ad-hoc fashion to keep the final price constant.

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Since 2000, oil imports have been deregulated; as a result all licensed refineries are free to import crude oil. The government gradually lifted controls on the imports of petroleum products. All licensed oil marketing companies (OMCs) are now free to import as per their requirements. However, they are required to first meet their requirement from the local refineries and then meet any deficit through imports. Prior to that petroleum imports were carried through Pakistan State Oil, the state owned oil marketing company. None of the private company was allowed to import directly. After market based reforms, the margins of oil marketing companies has been increased and now capped at 3.5% of the retail price of the petroleum product.

2.5 IMPACT OF HIGH OIL PRICE

Since 2003, oil prices are constantly on the rising side. End of 2007 has seen the maximum of $100 per barrel. This rising trend in oil price in the international market has hurt the economies of many countries in the world including that of Pakistan. The extent to which economies hurt as a result of price shock depends on the country's dependency on oil. Before analyzing the impact of high oil prices at the macro level the paper will look at some of the indicators showing the vulnerability of the Pakistan's economy.

2.5.1 OIL DEPENDENCY

Oil dependency or how much vulnerable a country is to price shock can be observed from the following indicators,

2.5.1.1 OIL SELF-SUFFICIENCY INDEX:

It is the percentage change in oil production minus consumption to oil consumption. This ratio will be negative for oil importers. If its value is -1, country has no oil production and is totally dependent on oil imports; and a positive number means that a country is a net exporter. For Pakistan the index has remained negative from 1990-91 to 2005-06 (Table 7). It was -0.69 in 1990-91 and became -0.85 in 1999-2000 but later on started declining given the negative growth in oil consumption in the last five years, but still the index is at -0.79. Despite the slight decline country is highly susceptible to high oil prices.

2.5.1.2 OIL INTENSITY IN ENERGY CONSUMPTION

Vulnerability to rising oil prices also depends on the intensity with which oil is used. The intensity of oil use in energy consumption index measures the share of oil in an economy's primary energy consumption. If a country relies only on oil to produce energy, the value of the index is one; if no oil

is used in producing its energy, the value is 0. Oil intensity in Pakistan has declined over the years because of switching to alternatives, more specifically gas and to some extent coal.

2.5.1.3 NET OIL IMPORTS IN GDP

The magnitude of the direct effect of a price increase depends on the share of net oil imports in GDP. In other words, it is an index of the relative importance of the oil price rise to the economy in terms of the potential adjustments needed to offset it. For net importers this ratio will be negative. Higher value of this ratio create more concerns for the government, may be to reduce oil imports and more willingness to pass through the price to consumer so as to stimulate a reduction in demand. For Pakistan over the last few years, this ratio has risen to -5.24 in 2005-06.

In the long run, oil consumption can be reduced through efficiency and changes in industrial structure and household consumption patterns. A dynamic policy response will reduce the vulnerability of the economy.

Table   Oil Dependency in Pakistan

	Oil self-sufficiency	Intensity of oil use in energy Consumption	Energy intensity of Real GDP	Net Oil Imports in terms of GDP
1990-91	-0.69	0.46	0.91	-3.13
1995-96	-0.82	0.48	1.01	-2.60
1999-00	-0.85	0.47	0.99	-3.76
2000-01	-0.84	0.46	1.05	-4.60
2001-02	-0.82	0.43	1.02	-3.73
2002-03	-0.81	0.41	0.91	-3.71
2003-04	-0.78	0.38	0.93	-3.18
2004-05	-0.79	0.36	0.99	-4.20
2005-06	-0.79	0.32	0.90	-5.24

2.6 MACROECONOMIC EFFECT

The magnitude of the direct effect of a given price increase depends on the share of the cost of oil in national income, the degree of dependence on imported oil and the ability of end-users to reduce their consumption and switch away from oil.

Unless country is running in surplus, or has extremely large foreign exchange reserves, high oil price is dealt by a reduction in total demand for all imported goods, so as to restore balance of payments equilibrium. Higher oil prices leads to inflation, increased input costs, reduced non-oil demand and lower investment in net oil importing countries. Tax revenue falls and the budget deficit increases. It is the reduction in domestic demand (both consumption and investment) which leads to reduced imports and reduced domestic production. If real wages are sticky downwards this also results in increased unemployment. The rate of growth declines in the short term transferring income from oil

importing to oil exporting countries. The fall in final expenditure indicates that the shocks to households and firms in terms of welfare may be large since the price they pay for imports is much higher and has to be balanced by lower quantities.
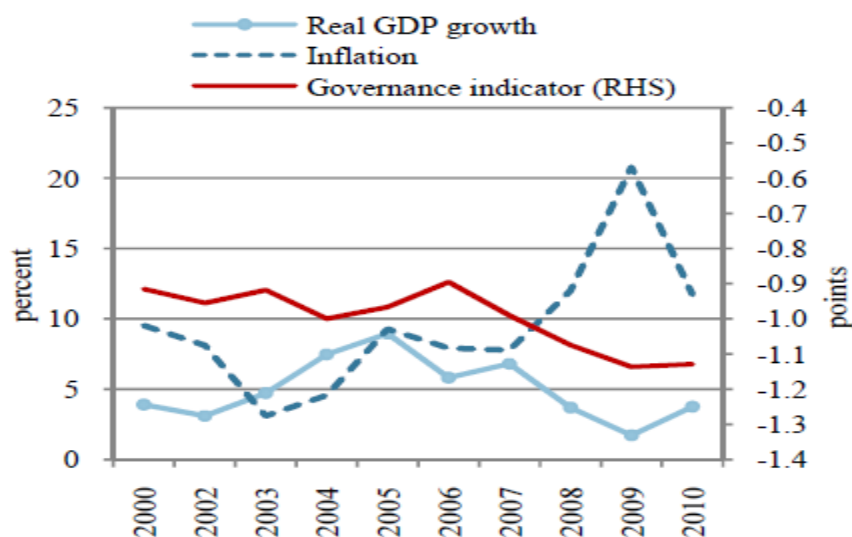
Note: Governance indicator is average of World Bank's six indicators of governance.
Source: World Bank

The simplest estimate available in the literature to calculate the direct impact of higher oil prices on GDP is based on the ratio of the net imports of oil and oil products to GDP. If there is a zero price elasticity of demand for oil and oil products then following a rise in the oil price, GDP will have to change by as much as the change in the value of net imports. For Pakistan household and industrial demand for energy products such as kerosene and gasoline is highly inelastic (Burney and Akhtar 1990). To calculate this ratio average values of GDP and net imports for the period 2001 to 2006, correspond to a base oil price of US$ 28.21 per barrel in 2001, which increase to US$ 65.14 per barrel in 2006, that is, increase of US$ 36.93 per barrel, equivalent to 130.9 percent increase of the base price. The ratio calculated for Pakistan comes out to be (-5.47), it indicates the proportional loss in GDP as a result of price increase of US$ 36.93 is equivalent to a shock lowering GDP by 5.5 percent.

2.6.1 OIL PRICES AND INFLATION

One way to represent the economics of a refinery is to calculate its Refinery Gross Margin: the difference in dollars per barrel between its product revenue (sum of barrels of each product multiplied by the price of each product) and the cost of raw materials (primarily crude, but also purchased additives like butane and ethanol). For example, if a refinery receives $80 from the sale of the products refined from a barrel of crude oil that costs $70/bbl, then the Refinery Gross Margin is $10/bbl. The Net or Cash Margin is equal to the gross margin minus the operating costs (excluding

income taxes, depreciation and financial charges). Continuing the example, if a refinery experiences operating costs of $2 per barrel, then the Net Margin is $8/bbl.

In competitive markets the refinery margins change daily as the market prices of both crude oil and products change. Under such conditions the refinery revenues (average margin x throughput) over the course of a year must be equal to or exceed its operating costs, depreciation and taxes, plus a fair return on investment. In order to realize the highest refining margins the refinery manager seeks to pay the lowest price for crude oil, maximize the yield of the higher value products (e.g., gasolines), control operating costs and receive the highest price for its refined products on a sustained basis.

Another channel via which high oil prices may affect macroeconomic performance is through the high costs of production thus reducing output. This supply side channel exerts an inflationary pressure on the economy. In addition, higher oil prices directly raise consumer prices via higher prices of imported goods and petroleum products in the consumption basket.

Figure 5.1: Inflation-Growth Nexus
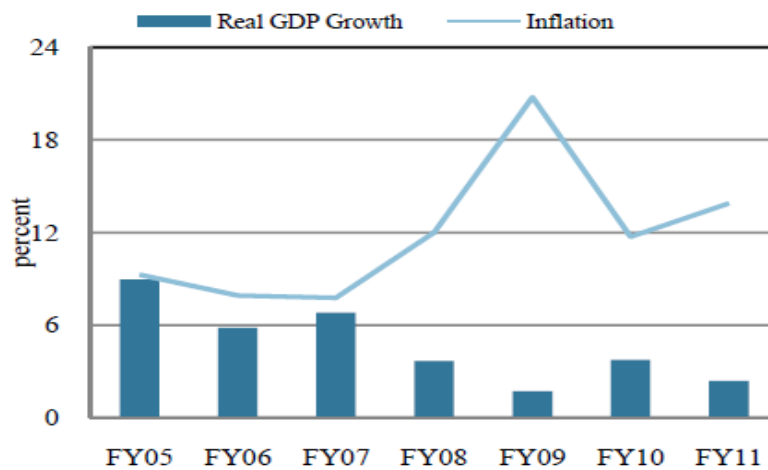
Source: State Bank of Pakistan

Another implicit effect is felt as producers pass some part of higher input (oil) costs to the price of final goods. Moreover, consumers who experience a loss in real income may consider seeking wage increases, which feed back into higher production costs, and then into prices. However, when oil prices fall, nominal wage and other price rigidities can limit the pass through to lower final goods prices.

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Average CPI Increase	4.4%	3.4%	3.3%	3.9%	9.3%	8.0%	7.9%

Source: Board of Investment 2008

2.6.2 BALANCE OF PAYMENT EFFECT

Our petroleum imports account for 24 percent of total imports (and represented up to 44 percent of export earnings) in 2006-07. While, in 1999-2000 the share of petroleum imports was 27 percent of total imports and accounts for 33 percent of total export earnings. Improving terms of trade would mean that a smaller volume of exports would be needed to pay for a given quantity of imports. For Pakistan this ratio however is decreasing, that is more exports are needed to offset the burden of rising import bill.

2.6.3 FISCAL IMPACT

Fuel taxes have important revenue implications for Pakistan. Oil and gas sector together accounts for a significant share of government revenues. Taxes on Petroleum products are the largest source of indirect revenues in Pakistan. Petroleum product prices are higher than the import parity price because of these taxes. Petroleum products contributed Rs.120 billion to government revenues in the form of indirect taxes (custom duty, excise taxes and sales tax) in 2006-07. It is 23.2 percent of total indirect taxes collected in 2006-07, while this share was only 12 percent in 2000-01. Petroleum development levy (PDL) is not included in this total. Petroleum development levies collected in 2005-06 were Rs 24500 million25. Adding this will make total indirect tax revenue from petroleum products to Rs. 129.6 billion for the year 2005-06 (that is 26.6 % of total indirect taxes). The share of PDL in petroleum taxes is almost 18.9 for 2005-06.

So is the case in Pakistan, in the light of rising fiscal burden government in the current fiscal year has also decided to slash the PSDP (public sector development programme) for the remaining five months of FY2007-08 by Rs. 70 billion. According to Ministry of Finance, oil prices have remained unchanged for the last 13 months, and government was finding it difficult to pay Rs. 14 billion every month in oil subsidy.

2.6.4 DISCOUNT RATE

The WACC of the organization directly depends upon the discount rate of SBP. Nowadays all the borrowings of the companies are on floating rates and changes in discount rate changes the financial cost. Any increase in discount rate increases the interest rate of borrowings, these results in increase in WACC. Similarly any decrease in discount rate decrease the borrowing cost and decreases WACC.

Trend in Monthly Average Rates of Treasury Bills
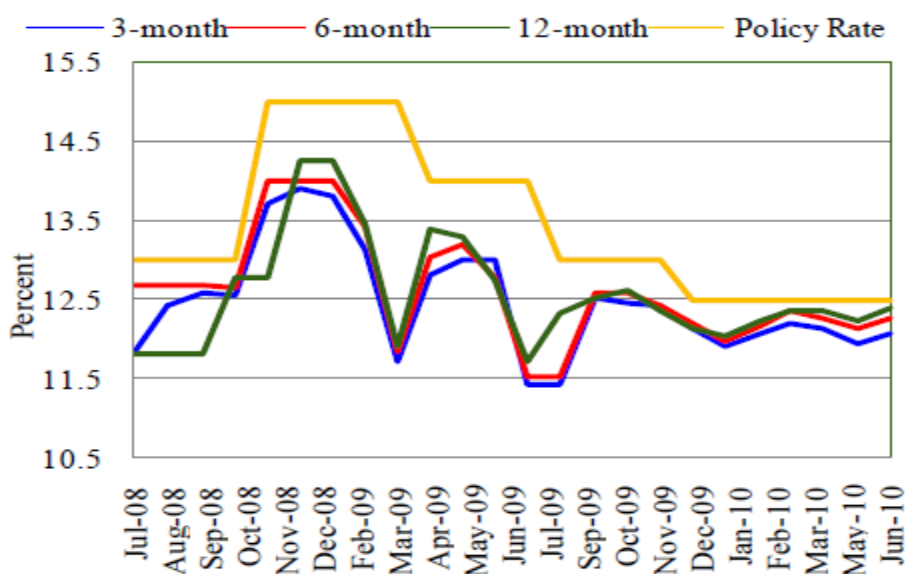
2.6.5 CURRENCY DEPRECIATION

If the domestic currency depreciates in response to induced payments deficits, this further cuts the purchasing power of domestic income over imported goods.. However currency depreciation has favorable impact since the sale proceeds in foreign currency are translated at favorable rate.

Financial Year	2011 -12	2010 -11	2009 -10	2008 -09	2007 -08	2006 -07	2005 -06	2004 -05	2003 -04	2002 -03	2001 -02
US $ Exch Rate	91	86.0	85.5	81.4	68.3	60.4	60.2	59.6	57.9	57.7	60.1

2.6.6 POLITICAL STABILITY

Political stability, good governance, rule of law, law and order situation and security situation are key factors which create an atmosphere to nourish strong economic growth and prosperity. Unfortunately in Pakistan political un stability is very common. Ex president had imposed emergency twice in the country and sacked chief justice. Similarly rifts among organs of the counties create unstability.

2.6.7 NATURAL CALAMITY

Pakistan has been hit hard by a large earth quake in 2005 in which around seventy thousand people lost their lives. We have been hit by floods twice in 2009 and 2011. These floods have destroyed valuable crops, cattle and capital assets. Last year, Pak-Arab Refinery Corporation (PARCO), remained closed due to infrastructural damages caused by the floods.

3. RESEARCH METHODOLOGY

3.1 DATA SOURCES

The research has been carried out from various sources including primary, secondary as well as tertiary data sources. The imperative data providing details of the variables of the research has been obtained from the Annual Reports of the individual companies as well as the State Bank of Pakistan's report titled, "Balance Sheet Analysis of Joint Stock Companies listed on the Karachi Stock Exchange." This data was used in the model and provided help in the acknowledging the veracity of the proposed model as well as hypotheses.

Apart from the primary research data the overall non-financial industry data was obtained primarily from the Annual Reports of the Companies, Ministry of Finance (Integrated Energy Plan 2009-22) , Economic Survey of Pakistan as well as the IMF Statistics website. Data such as industry production capacities, actual production, GDP growth rate etc. was taken from these sources. This data was helpful in overall industry as well as the related economic indicator analysis.

3.2 STOCK VALUATION MODEL - 3 SIMPLE TECHNIQUES TO VALUE STOCK

Stock valuation models are methods to value stocks. Everybody knows the stock price but only few understand how much it worth and the other investors do not even care. The reason can be due to different strategies, do not know how to value stock or just do not care how much it worth as long as the price increase the next day. If you are one of the intelligent investors, consider these valuation models in your next purchase.

3.2.1 DISCOUNTED CASH FLOW (DCF)

This is probably the most common model when it comes to stock valuation. The discounted cash flow model have to consider revenue growth and the escalated cost at the same time, which can be too difficult to estimate and forecast as an outside investor.

Nevertheless, you can use this method in valuing stock by projecting future cash flow; from the sales and costs, and discount back to current value with Weighted Average Cost of Capital (WACC).

3.2.2 DIVIDEND DISCOUNT MODEL (DD)

This model suits best for income investors. The idea is to project future dividend distribution based on the average historical dividend payout ratio and discount it back to present value. Although this is the simplest among all, it works best for high dividend yield stocks.

Nonetheless, the stocks must have very strong business performances that can guarantee the dividend payments 10 years down the road. And normally, penny stocks cannot be evaluated this way.

3.2.3 EARNINGS GROWTH MODEL (EG)

Future earnings are projected using constant or variable growth rate. Either constant or variable growth rate depends on the expectation of its business performance within that period. Normally we use the historical business performance as a baseline provided its fundamental value remain intact. Then, we discount the future earnings with the expected return on investment (ROI).

This model is highly valuable since the stock price is easily reflected by its earnings. For example, the stock price will reflect its earnings and earnings growth. Assuming the P/E is the same throughout the year, you can expect the stock price to increase the same rate as the company's growth rate.

In this research we have used Discounted Cash Flow in valuing Attock Refinery limited stock because it suits the Refinery Industry best, by projecting future cash flow; from the sales and costs, and discount back to current value with Weighted Average Cost of Capital (WACC).

4.   CORPORATE VALUATION

4.1   CORPORATE VALUE

The share price of Attock Refinery limited has been calculated from FY 2004 to FY 2011. Free cash flows have been calculated based on actual results for the period 2002 to 2011. However ever cash flows from 2012 to 2015 have been calculated based on company historical financial trends.

4.2   INCOME STATEMENT ASSUMPTIONS

- I.   Reimbursements from the government have been taken at a rate of 2% of gross sales
- II.   The administration expenses have been increased by 10% each month
- III.   The distribution cost has been taken as a percentage of sales - .02%
- IV.   In the finance cost only WPPF & bank and other charges are being considered
- V.   Owing to strong solvency situation it is expected that the company would not take any loans. Apart from this, the stabilizing economy would nullify the chances of currency depreciation and eventually currency losses.
- VI.   The other charges are being considered the same as 2008
- VII.   Other income would increase by 30%. (Average growth rate over the last 4 quarters)
- VIII. Tax rate has been considered as 35%.

4.3   BALANCE SHEET ASSUMPTIONS

- I.   The Operating ROA is being taken as 6% to calculate total assets. The 6% value has been obtained by taking an average of ROA's of the past 4 years.
- II.   For year 2009, the total assets are being taken based on the past trend of assets to sales i.e. 50%.
- III.   ROE is being taken as 25%, the average of the past 5 years. The difference between total assets and total equity and liabilities has been added to equity.
- IV.   The equity is being increased at 10%, looking at past trends.
- V.   Current liabilities are 75% of the total assets
- VI.   Long term liabilities are being considered to be 0the same as previous year.
- VII.   Current assets are 65% of total assets, looking at common size balance sheets of past years.
- VIII. Total operating assets are being considered as 75% of total assets, looking at past trends.
- IX.   Trade payables are being considered as 94% of current liabilities, looking at past 5 year average.
- X.   Net fixed assets are being taken as 8% of total assets, considering the past 3 year's trend.
- XI.   Depreciation is being taken as 5% of fixed assets.
- XII.   The issued subscribed and paid-up capital increases by 20% each year.

4.4 ASSUMPTIONS FOR CALCULATION OF COST OF CAPITAL

The cost of equity is calculated on the basis of capital asset pricing model, we have used t bill rates at the end of each fiscal year to calculate the risk free rate. Market risk premium is calculated by subtracting risk free rate from market return. But since in year 2002 to 2007 market made exceptionally high returns since the economy of the country was picking up momentum and in year 2008 and 2009 market had negative returns due to political un stability therefore in order to make it reasonable we have used a constant risk premium of 9% in calculation of CAPM.

Description	2004	2005	2006	2007	2008	2009	2010	2011
Risk Free Rate	8.13%	8.70%	8.79%	9.15%	11.68%	12.09%	12.38%	13.98%
Average risk free rate	5.61%	8.41%	8.74%	8.97%	10.42%	11.89%	12.24%	13.18%
Beta	1.145	0.940	0.881	1.085	1.394	1.230	1.336	1.555
Market Return	53.80%	39.31%	33.82%	43.41%	-11.78%	-41.40%	33.02%	28.41%
Risk Premium	51.10%	30.74%	25.03%	34.25%	9.00%	9.00%	20.62%	14.40%
CAPM*	61.20%	37.48%	30.84%	46.31%	24.32%	23.16%	39.93%	36.40%

*since market premium is negative for two years, I have used a constant risk premium of 9% in the calculation of CAPM.

4.5 THE OVERALL INTEREST RATE SCENARIO SINCE 2002 TILL 2011

The interest rates have increased from 8.8% in 2002 to 13.98% in 2011, and the average interest rates are around 10% during the period under discussion. The primary reason for high interest rates is high Government spending in relation to its revenues. In order to finance its budget deficit Government is desperate borrower and offering higher rates to borrow money to meet its expenses.

Interest rates are also high to control inflation. At high interest rates i.e. tight monetary policy Government controls inflation. Higher interest rates are an incentive to savers to save instead of spending. This decreases demand of goods and services. At higher interest rates the borrowing cost is high, this discourages people to borrow money and spend. This helps in controlling inflation.

At high interest rates the prices of shares fall so that the return on them is in line with the prevailing high interest rates. Similarly when the interest rates fall the prices of shares increases. At lower interest rates people prefer to buy stock since the return on them is high.

Description	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
KSE 100 index	1,366	1,770	3,403	5,621	7,450	9,989	13,772	12,289	7,162	9,722	12,496
Risk Free Rate	12.48%	8.82%	3.08%	8.13%	8.70%	8.79%	9.15%	11.68%	12.09%	12.38%	13.98%
Inflation(%)	4.40%	3.50%	3.10%	4.60%	9.30%	7.90%	7.80%	12.00%	20.80%	11.70%	14.00%

4.6 VALUATION OF SHARE PRICE FOR FY 2004

ECONOMIC OUTLOOK

Pakistan's economy continued at accelerated pace in FY04, with real GDP crossed arobust 6.4 percent, well above the 5.3 percent target for the year. As in the previous year 2003, the growthwas led principally by industry dominated by**Large Scale Manufacturing (LSM),** which benefitedfrom a further acceleration in collective domestic demand as well as strong external demand.However, in FY04 main growth was observed in investment activities with a much smaller contribution ofcredit-led consumption demand. Investment growth rate has jumped to a record 22.3 percent–thehighest ever in the recent history of Pakistan, pushing the investment-GDP ratio to 18.1 percent. PTA (Pakistan Telecommunication Authority) issued GSM licenses which attracted large amount of direct foreign investment.

CAPITAL MARKET PERFORMANCE

The stock market remained resilient during this period and the KSE-100 Index witnessed aimpressiveprogress as it reached a level of 5,279.18 on 30 June 2004 from 3,402.48 at the close of last year. The KSE-100 Index touched an all-time high at 5,620.7 on 19 April 2004. A record turnover of over a billion shares was also witnessed in mid of April 2004.

> ➢ Aggregate market capitalization of KSE surged by 88 percent to Rs. 1,421 billion.
> ➢ Market capitalization of KSE was approximately US$ 24.30 billion as compare to US$ 13.05 billion of previous year
> ➢ Average daily turnover of shares to 389 million during the year as compared to 215 million shares during last year.
> ➢ The FY 2004 has been exemplary for the stock market in Pakistan, with unprecedented growth in market activity.

During the year, KSE sustained its position as one of the best performing markets in the world. The landmark performance of the capital market has largely been the result of effective implementation of reforms by the SECP as well as a number of positivefactors, namely:

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i.   continuation of sound macro-economic and investment friendly policies by the Government;

ii.   strong economic growth and substantial improvements in economic fundamentals;

iii.   successful privatization of SOEs through the capital market; and

iv.   huge build-up of rupee liquidity driven, in large, by continuing foreign exchange flows into Pakistan, thereby making available cheap credit to the private sector.

Valuation 2004

Terminal value	1,039,641
Growth	5%
WACC	58%
PV of free cash flows + PV of Terminal Value	3,565,819
Value of Operations	3,565,819
Value of Non-Operating Assets	208,593
Value of debt	60,000
Total Value of Firm	3,714,412
Number of Shares ('000)	29,160
Value per share	127
Price at June 2004	92

4.7   VALUATION OF SHARE PRICE FOR FY 2005

ECONOMIC OUTLOOK

The economy continued to accelerate for yet another year in FY05,

- ➢ Real GDP growth rising to a 20-year high of 8.4 percent,
- ➢ Above-target contributions from all three major sectors of economynamely agriculture, industry and services.
- ➢ Similarly, thevigorous growth of industry, despite capacity constraints in key industries speaksvolumes of the impact of pro-business policies on generating domestic demand and maintaining thecompetitiveness of exports (particularly for textiles).

CAPITAL MARKET PERFORMANCE

The spectacular risein all the stock markets which lasted till March-FY05 was largely driven by growing confidence andenthusiasm of the market players on the performance of the economy as well as on improvements inthe fundamentals of the stocks traded. However, towards the end of this extended rally, the rise wasmore and more due to speculative positions and a correction looked inevitable.The KSE-100 index suffered a massive 2,706 point correction to surrender a significant portion of its FY05 gains and reducing the overall growth to 41.1 percent in FY05.

Valuation 2005

Terminal value	1721309
Growth	5%
WACC	37%
PV of free cash flows + PV of Terminal Value	3,624,830
Value of Operations	3,624,830
Value of Non-Operating Assets	2,874,174
Value of debt	30,000
Total Value of Firm	6,469,004
Number of Shares ('000)	34,992
Value per share	185
Price at June 2005	169

4.8 VALUATION OF SHARE PRICE FOR FY 2006

ECONOMIC OUTLOOK

Pakistan's economy turned in a strong performance for yet another year in FY06,

➢ Real GDPgrowth of 6.6 percent ,well above expected 6% target.

➢ Despite strong aggregate demand, CPI inflation plunged slightly below theannual target.

However, sustained strong growth has contributed to increased stresses because of

➢ a relatively narrow growth base,

➢ persisting high inflation,

➢ pressures in fiscal deficit in the backdrop of a nearly stagnant tax base which has kept the tax/GDP ratio in the 10 to 11 percent range for over a decade,

➢ widening of the external current account deficit. Sustainability of economic growth rates of over 6 percent in years ahead requires continued vigilance to ensure macroeconomic stability.

CAPITAL MARKET PERFORMANCE

The Karachi Stock Exchange (KSE) has performed remarkably well during most of the FY06. The index recorded a YoY growth of 34.1 percent during FY06.

The robust rise of KSE-100 index up to April, 2006 was mainly due to favorable market fundamentals, including

➢ expected corporate earnings as reflected in corporate results 2005.

➢ settlement of privatization transaction for PTCL and KESC

➢ high international oil prices and gas discoveries

➢ investor confidence on economic management specifically foreign investors

➢ the relatively low yields on financial assets and available market liquidity.

After touching its peak, the KSE-100 index however experienced a massive correction in April 2006 mainly due to following:

- ➢ Overbought position by big investors and as a consequence of foreign and institutional traders profit-selling in oil and bank shares;
- ➢ Petition against Pakistan Steel Millprivatization;
- ➢ Delays in the expected privatization of PPL PSO SSGC and SNGC;
- ➢ Pre-budget expectation of capital gain tax on trade

Valuation 2006

Terminal value	3,992,791
Growth	5%
WACC	19%
PV of free cash flows + PV of Terminal Value	1,995,421
Value of Operations	1,995,421
Value of Non-Operating Assets	9,334,048
Value of debt	1,136,750
Total Value of Firm	10,192,719
Number of Shares ('000)	45,490
Value per share	224
Price at June 2006	126

4.9 VALUATION OF SHARE PRICE FOR FY 2007

ECONOMIC OUTLOOK

Pakistan's economy recorded one of the fastest growth rates in Asia during FY07.

- ➢ Real GDP growth accelerated to 7.0 percent that was outdone only by China and India
- ➢ Investment to GDP ratio at a record 23 percent,
- ➢ More specifically, and in proportion to GDP, national savings rose, the external debt burden declined and total revenue increased while the budget deficit stayed at last year's level of 4.3 percent of GDP.

CAPITAL MARKET PERFORMANCE

The salient feature of Pakistan's capital markets in FY07 was the significantly large inflows of portfolio investment as measured by SCRA.This growing foreign interest in the equity market helped the Karachi Stock Exchange (KSE) to maintain its ascending trend index, particularly during H2-FY07. In overall terms, the benchmark KSE-100 index grew by 37.9 percent in FY07 despite facing two severe market corrections in H1- FY07.

Moreover, the rise in net SCRA flows (US $104 million in January FY07) further amplified the positive market sentiment. Moreover, the judicial crisis starting from March 2007 had some impact on the growth of the index. However, despite the prevailing political scenario in the country, the KSE-100 index gained on account of attractive prices particularly in banking, insurance and oil marketing scrips.

Valuation 2007

Terminal value	1,339,629
Growth	5%
WACC	46%
PV of free cash flows + PV of Terminal Value	60,736
Value of Operations	60,736
Value of Non-Operating Assets	9,859,177
Value of debt	-
Total Value of Firm	9,919,913
Number of Shares ('000)	56,862
Value per share	174
Price at June 2007	126

4.10 VALUATION OF SHARE PRICE FOR FY 2008

ECONOMIC OUTLOOK

The earnestness for macroeconomic stabilization is now evident throughout the economy, which has beenseverely buffeted by the concurrent unfolding of several adverse developments, particularly throughH2-FY08, and into the initial months of FY09. Global shocks such as an extraordinary andunanticipated rise in food and energy commodity prices, and disruptions in the international financialmarkets, as well as domestic shocks and policy decisions contributed significantly to the imbalancesin the economy.

Domestic production was hit by the energy shortages, disappointing harvest of some key cash crops,and policy uncertainty during the transition of governments. Consequently real GDP growth declinedto 5.8 percent in FY08, down considerably from the 6.8 percent growth recorded in the previous year.

CAPITAL MARKET PERFORMANCE

Stock market showed considerable flexibility at the back of robust economic growth. However, key macroeconomic indicators displayed less than satisfactory performance as a result of speedy changes in the political landscape. A buoyant stock market can be attributed to the continuity of the macroeconomic policies of the government and capital market reforms.

The KSE-100 index closed at 12,130.5 points on May 30, 2008, a decrease of 1,642 points or about11.9 percent in comparison to end June index position of 13,772.5 points, after touching itsalltimehigh of 15,676 points on April 18, 2008.

The outgoing fiscal year 2007-08 began with the **Red Mosque incident** in the early part of July, followed by the **restoration of Chief Justice of Pakistan** and confusion about imposition of **emergency rule in the country**. The stock market showed positive sentiments to the announcement of presidential elections and then re-election of President Musharraf on October 6. However, the market reacted against the incident of bomb blasts in the welcome procession of Ms. Benazir Bhutto on October 18.

The session on November 5 recorded a single day biggest slump of 636 points due to the impositionof emergency rule in the country. The suspension of Pakistan from the Commonwealth, Moody'sdowngrading of Pakistan's outlook from stable to negative and the uncertain political environment,led to a sharp fall in index in mid-November. Nevertheless, bulls took control of the Karachistock market as emergency was lifted on December 16. The Karachi stock market, grievingBenazir Bhutto's assassination, saw its all-time biggest crash. Poor law and order situation togetherwith massive rioting raised the fears of foreign capital flight.

Valuation 2008

Terminal value	5,105,677
Growth	5%
WACC	24%
PV of free cash flows + PV of Terminal Value	6,633,699
Value of Operations	6,633,699
Value of Non-Operating Assets	14,082,440
Value of debt	-
Total Value of Firm	20,716,139
Number of Shares ('000)	71,078
Value per share	291
Price at June 2008	255

4.11 VALUATION OF SHARE PRICE FOR FY 2009

ECONOMIC OUTLOOK

A variety of adversities took a heavy toll on Pakistan's economy during FY09.

➢ The previous fiscal year had ended with both, the fiscal and current account deficits at record highs

➢ Inflationary pressures continued to mount, reflecting the pass through of rising commodity prices in the international markets, and the excess domestic demand pressures in the economy that were supported by the lagged impact of the monetization of fiscal deficit.

➢ Domestic economy was compounded by the worsening global financial crises that severely dented global aggregate demand, decimated liquidity in the international capital markets, and reduced investor confidence.

➢ The decline in capital and financial account receipts (net foreign investment declined by 51.1 percent during FY09 on top of a 35.3 percent decline in the previous year), in the face of a widening current account deficit, led to a substantial depletion of the country's foreign exchange reserves, severe reduction in domestic liquidity, and a further impetus to domestic inflation (as the exchange rate depreciated).

CAPITAL MARKET PERFORMANCE

In the background of sluggish economic growth, large twin deficits, high inflation, heightened security risks and poor law & order situation as well as dwindled manufacturing activities amid power outages, asset markets remained under severe stress.

In addition, within equity market, regulator's decision to impose a floor for about 3½ months on KSE-100 index as well as depletion of leverage due to gradual elimination of CFS MKII and weakness in corporate earnings adversely impacted the performance of bourses during FY09.

These negative domestic developments coupled with global recession amid financial crises also led to massive outflow of portfolio investment. Consequently, downtrend in KSE-100 index, which was started in April 2008, was extended up to end-January 2009.

As a result, KSE-100 index witnessed a massive decline of 43.7 percent during FY09, though recovered 48.7 percent by end-June 2009 from its lowest level of 4815.3 seen on January 26, 2009. Similarly, the other markets of the country, (i.e., the Islamabad Stock Exchange and Lahore Stock Exchange) also showed net decline of 42.6 percent and 48.9 percent in their indices during FY09.

Valuation 2009

Terminal value	7,764,067
Growth	5%
WACC	36%
PV of free cash flows + PV of Terminal Value	8,048,084
Value of Operations	8,048,084
Value of Non-Operating Assets	16,273,680
Value of debt	-
Total Value of Firm	24,321,764
Number of Shares ('000)	85,293
Value per share	285
Price at June 2004	248

4.12 VALUATION OF SHARE PRICE FOR FY 2010

ECONOMIC OUTLOOK

Pakistan's economy witnessed a moderate but fragile recovery during FY10.

➢ Modest improvement in business and consumer confidence

➢ Real GDP growth rose to 4.1 percent, compared with a weak 1.2 percent in annual FY09.

➢ Deceleration in inflation, which fell to 11.7 percent from a multi-decade high of 20.8 percent,

➢ Decline in the current account deficit to only 2 percent of GDP in FY10 from 5.7 percent of GDP in the previous year 2009.

While these developments marked an improvement from the FY09 picture, fundamental structural weaknesses in the economy remained unaddressed. For example, some key reforms failed to gather traction:

➢ Development of the tax net through the introduction of a broad based GST

➢ The proposed restructuring of public sector enterprises, to improve efficiency and lower the fiscal burden, did not take place

➢ There was little or no progress at all in resolving the energy sector debt chain (the socalled "circular debt" problem) or substantially improving electricity supply.

CAPITAL MARKET PERFORMANCE

In the wake of improved economic growth, easing in inflationary pressures, increased foreign investment in the equity market, easier monetary policy stance and increasing investment by commercial banks, the asset markets came out of the stress and remained bullish during FY10.

The KSE-100 index staged a recovery, rising by 35.7 percent to 9,722 in FY10, from 7,162.0 in FY09. This was in stark contrast to a decline of 41.7 percent in FY09. Market capitalization also increased by 26.0 percent to Rs 2732.4 billion in FY10 compared to Rs 2,120.6 billion in FY09. The increased capitalization represents 18.5 percent of GDP at end FY10.

Valuation 2010

Terminal value	7,332,503
Growth	5%
WACC	39.9%
PV of free cash flows + PV of Terminal Value	8,930,333
Value of Operations	8,930,333
Value of Non-Operating Assets	13,867,374
Value of debt	-
Total Value of Firm	22,797,707
Number of Shares ('000)	85,293
Value per share	267
Price at June 2010	170

4.13 VALUATION OF SHARE PRICE FORFY 2011

ECONOMIC OUTLOOK

Pakistan's economy managed to grow by 2.4 percent in FY11, despite devastating floods in theearly part of the fiscal year. One-fifth of the country's agricultural heartland was inundated,which interrupted production processes and disrupted the subsequent supply of both labor andcapital. It is estimated that 6.6 million of Pakistan's labor force was out of work for 2 to 3months, and capital stock worth US$ 2.6 billion (1.2 percent of GDP) was lost.

Though, the 2010 floods cannot mask the physical deficiencies in Pakistan's economy. Forsimplicity, we would identify four inter-related issues that need urgent policy attention to breakout of Pakistan's current stagflation.

➢ First and foremost is the fiscal problem, specifically thelack of tax revenues

➢ Spillover of fiscal slippages on domestic debt

➢ Acute shortage of power

CAPITAL MARKET PERFORMANCE

During the period from July-March 2010-11, the capital markets demonstrated wavering rising trend and posted modest gains.Total 638 companies were listed at the Karachi Stock Exchange (KSE) on July-March 2010-11 with total listed capital of Rs. 920.1 billion.

Pakistan'sstock markets have remained buoyant during the first two quarters of the 2010-11 in terms ofmarket index and market capitalization, which was remained steady till January 2011.The KSEwitnessed a rise of 16 percent as compared to the corresponding period of 2009-10.However, volumes gathered pace and the averagevolume increased by 19 percent to touch 114.2 million shares per day during the third quarter ofthe 2010-11.

Valuation 2011

Terminal value	8,617,022
Growth	5%
WACC	36.4%
PV of free cash flows + PV of Terminal Value	12,621,852
Value of Operations	12,621,852
Value of Non-Operating Assets	13,949,725
Value of debt	-
Total Value of Firm	26,571,577
Number of Shares ('000)	85,293
Value per share	312
Price at June 20011	146

5. CONCLUSION– A LUCRATIVE INVESTMENT DECISION IN THE OIL REFINERY INDUSTRY OF PAKISTAN?"

Share prices are refection of present value of future cash flows discounted at weighted average cost of capital. Businesses should adapt a strategy which gives highest cash flows. This means forecasting under alternative strategies, finding the present value of each strategy's cash flow stream, and then choosing the strategy that provides the maximum value.The projection of future cash flows is based on assumptions. It is difficult to forecast precisely these input factors. Any change in prices of input changes the expected future free cash flows and the share price.

The share price is adjusted as the businesses future cash flows change. We have calculated share price for the years 2004 to 2011 and found that as the future cash flows of the business improves the share price also improves. Share prices increase when future is optimistic and businesses are expected to flourish. They are influenced by the current political, economic and security situation. Factors that greatly affect Petroleum & Oil Refinery sectors are GDP growth, spending on public sector development program, poverty reduction/per capita income, International fuel prices, exchange rate and risk free interest rate.

Prevailing interest rates in the economy also affects the prices of shares, when risk free rate increases prices of shares fall so that the yield on the shares is comparable with the risk free rate. Therefore when ever interest rates decline the prices of shares goes up and when the interest rate increases the prices of shares goes down.

Pakistan refinery sector production fall by 2 percent as it stood at 7.8 million tons in fiscal year 2011 (FY11) as compared to 8 million tons in the corresponding period last year, data issued by Oil Companies Advisory Committee (OCAC) showed.

Furnace Oil (FO) is the major product that Pakistan refineries produce; contributing 31 percent in total refining production which declined by 2 percent YOY. Other refinery products whose production declined were Mogas (7 percent) and Jet fuel (10 percent). The main reason behind the decline was floods which started in late July 2010 and which hit refinery sector drastically, as key players like PARCO and other refineries operations got severely affected. However, growth of 4 percent YoY in High Speed Diesel (HSD) has positively acted in mitigating the impact.

Attock Refinery Ltd (ATRL) GRMs stood at $5.7 per barrel in FY11 compared to $2.9 per barrel over the same period last year. In the month of June, Attock Refinery Ltd GRMs fell by 26 percent to $3.81 per barrel according to OGRA data.

Gross Refining Margins
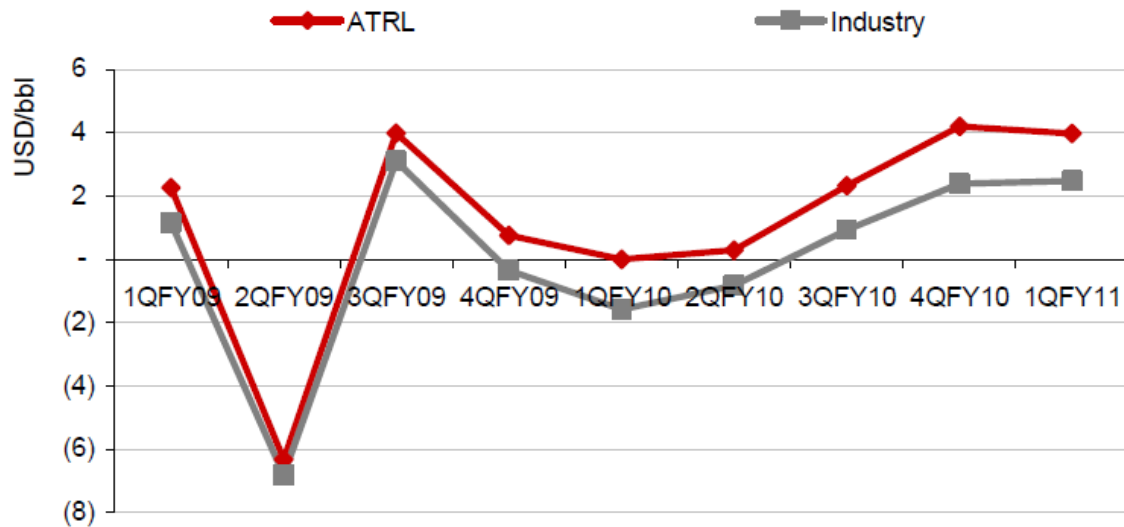
Source: Bloomberg, BMA Research

Recent quarters have witnessed sequential improvement in GRMs as a result ofwhich most of the refineries have shown improvement in their profitability, withAttock Refinery Limited (ATRL) being no exception.

We feel that there is still room for improvement in GRMs as they are stillconsiderably lower than those witnessed in FY08 and can be further boosted by the ongoing rally in international commodities. However, any sharp rise in crude oil pricescan result in higher inventories with OECD economies and may pressurize GRMsfor the international refining industry.

ATRL's product mix currently stands second best in the sector and hence it shouldcontinue to outperform Pakistan Refinery (PRL) and Byco Petroleum (BYCO). For2QFY11 we expect healthy EPS of PKR13.31 on the back of continuity in healthyGRMs and PKR7.8/share income from non-refinery operations in the form ofdividends from NRL, APL and Attock Gen.

Attock Refinery Ltd (ATRL) plans to upgrade its refinery in northern Pakistan over the next two years by adding new units to produce more gasoline and feed a growing national supply deficit,The $100 million upgrade to build an isomerization and a preflash unit will stall the company's naphtha exports in favor of more valuable gasolinethat will take the refinery capacity to more than 55,000 bpd by the end of 2013.

Currently the company has strong liquidity and solvency position as is evident from the z-score and current ratio. The profitability margins are also in line with industry averages. The company offers an attractive return on the capital invested.

Analyzing the company, the following critical success factors were identified:

1. Crude oil prices fluctuation risk
2. Currency risk
3. Oil pricing formula
4. No debt financing
5. The government changed the oil pricing formula (set in 2002) and this has had an impact on the profitability of all the refineries. With the negotiations going on it is expected that the government would change the oil pricing formula to include a formula incorporating ceiling and floor prices. Such a measure is expected to enhance the profitability margins of the refineries. The company is solely financed by equity. Given that demand for petroleum products is rising in Pakistan, combined with the fact that the refinery is operating at 100% capacity, it would be advisable for the refinery to expand its capacity by leveraging its strong credit rating and obtaining debt.
6. Overall, the company has a stable future outlook with profits increasing from the FY2012. Thus, the share of the company **(with the fair value of Rs. 312)** is a good buy.

6. RESEARCH DATA

6.1 RATIO ANALYSIS(2004-11)

RATIOS								
Ratio	2004	2005	2006	2007	2008	2009	2010	2011
Liquidity Ratios								
Current Ratio	1.00	0.92	0.83	0.75	0.88	0.87	0.91	0.96
Quick Ratio	0.38	0.40	0.39	0.34	0.49	0.21	0.09	0.09
Cash Ratio	0.38	0.40	0.39	0.34	0.49	0.21	0.09	0.09
Activity Ratios								
Inventory Turnover	16.7	20.4	19.7	15.9	20.6	15.5	14.7	12.7
Receivables Turnover	10.2	11.3	12.6	10.8	11.9	6.2	3.8	4.2
Payables Turnover	3.3	3.6	3.5	2.6	2.8	2.2	2.4	2.8
Number of Days of Payables	111.8	101.3	104.7	142.7	129.1	168.0	154.4	131.7
Working Capital Turnover	(74.3)	(74.0)	(23.6)	(11.6)	(16.4)	(17.5)	(21.7)	(40.8)
Fixed Asset Turnover	7.1	12.5	18.2	20.8	35.4	30.7	34.7	19.6
Total Asset Turnover	2.3	2.7	2.4	1.9	2.2	1.6	1.7	1.9
Purchases	23,139,635.0	37,403,078.0	54,457,151.0	56,495,029.0	87,729,294.0	72,769,565.0	88,057,722.0	115,120,369.0
Working Capital	29,186.0	(1,154,172.0)	(3,577,215.0)	(6,610,380.0)	(4,578,046.0)	(4,162,348.0)	(3,967,429.0)	(1,743,096.0)
Profitability Ratios								
Gross Profit Margin	3.67%	6.13%	1.02%	1.47%	4.36%	2.51%	-0.58%	1.34%
Operating Profit Margin	2.55%	4.81%	0.55%	0.97%	3.87%	2.03%	-0.97%	0.84%
Pretax Margin	3.05%	5.26%	0.78%	1.63%	3.14%	1.40%	-0.21%	2.14%
Net Profit Margin	1.54%	2.94%	0.54%	1.27%	6.69%	1.78%	0.14%	1.88%
Operating ROA	5.88%	13.03%	1.29%	1.87%	8.64%	3.21%	-1.63%	1.59%
Return on Total Capital	7.15%	14.45%	3.93%	3.94%	10.04%	5.27%	0.24%	4.15%
Return on Equity	11.66%	29.85%	6.33%	14.06%	70.97%	10.60%	0.96%	13.09%
Return on Capital	7.15%	14.45%	3.93%	3.94%	10.04%	5.27%	0.24%	4.15%
Operating Profit	646,755	2,001,505	306,705	572,262	3,553,745	1,550,454	(856,530)	972,097
EBIT	787,376	2,219,592	933,787	1,207,428	4,131,596	2,544,154	126,805	2,537,687
Solvency Ratios								
Debt-to-Assets Ratio	0.713	0.747	0.830	0.823	0.768	0.696	0.792	0.667
Debt-to-Capital Ratio	0.713	0.747	0.830	0.823	0.768	0.696	0.792	0.667
Financial Leverage Ratio	3.274	3.750	4.943	5.752	4.749	3.752	3.993	3.661
Coverage Ratios								
Interest Coverage	67.154	73.863	1.873	4.897	3.320	1.729	0.411	55.886
Fixed Charge Coverage	67.154	73.863	1.873	4.897	3.320	1.729	0.411	55.886
Valuation Ratios								
Price / Earnings	8.170	4.835	16.467	15.380	1.629	7.654	53.446	4.780
Price / Cash Flows	2.100	1.254	1.223	1.624	0.904	(0.906)	(1.803)	(5.298)
Price / Sale	1.050	1.421	0.896	1.559	1.090	1.365	0.765	0.898
Price / Book Value	7.530	12.716	10.103	16.165	8.617	7.395	5.531	4.928
Price per share at balance sheet date (Rs.)	91.500	168.950	110.000	162.100	140.900	122.54	79.1	122.52
Per Share Quantities								
Basic EPS	13.44	34.94	6.68	13.17	86.49	16.01	1.48	25.62
Diluted EPS	13.44	34.94	6.68	13.17	86.49	16.01	1.48	25.62
Cash Flow per Share	43.577	134.766	89.956	99.836	155.804	(135.324)	(43.865)	(23.127)
EBITDA per Share	33.749	66.036	3.269	12.004	37.999	2.425	(12.163)	12.133
Dividends per Share	5.000	4.667	2.500	4.000	8.000	0.000	0.000	2.000
Issued no. of shares	29,160	34,992	45,490	56,862	71,078	85,293	85,293	85,293
Dividends	145,800	163,300	113,724	227,448	568,620	0	0	170,586
EBITDA	984,119	2,310,723	148,691	682,586	2,700,878	206,861	(1,037,395)	1,034,880
Dividend Related Quantities								
Dividend Payout Ratio	0.372	0.134	0.374	0.304	0.092	0.000	0.000	0.078
Retention Rate	62.80%	86.64%	62.55%	69.63%	90.75%	100.00%	100.00%	92.19%
Sustainable Growth Rate (g)	7.32%	25.86%	3.96%	9.79%	64.41%	10.60%	0.96%	12.07%

6.2 FREE CASH FLOWS (2004 -19)

With Growth = 5%, WACC = 35.5%

FCF Calculations	2003	2004	2005	2006	2007	2008	2009	2010	2011
EBIT		787,376	2,219,592	933,787	1,207,428	4,131,596	2,544,154	126,805	2,537,687
NOPAT		511,794	1,442,735	606,962	784,828	2,685,537	1,653,700	82,423	1,649,497
Depreciation	337,379	349,089	339,268	340,410	356,869	391,506	127,932	122,894	107,531
Addition			102,291	102,291	141,530	128,787	264,796	164,009	59,743
CA	5,624,478	8,751,525	12,499,438	17,080,000	19,789,769	33,783,918	28,140,279	42,284,524	40,588,659
CL	6,031,620	8,662,339	13,623,610	19,520,465	26,400,149	38,361,964	32,302,627	46,251,953	42,331,755
Working Capital	(407,142)	89,186	(1,124,172)	(2,440,465)	(6,610,380)	(4,578,046)	(4,162,348)	(3,967,429)	(1,743,096)
Net Change in WC		496,328	(1,213,358)	(1,316,293)	(4,169,915)	2,032,334	415,698	194,919	2,224,333
FCF=NOPAT-CAPEX-Working Capital									
FCF		364,556	2,893,070	2,161,373	5,170,082	915,922	1,101,138	(153,611)	(527,048)

FCF Calculations	2012 F	2013 F	2014 F	2015 F	2016 F	2017 F	2018 F	2019 F
EBIT	3,026,882	3,220,212	3,459,911	3,566,701	3,711,726	3,789,011	3,831,004	4,023,453
NOPAT	1,967,473	2,093,138	2,248,942	2,318,355	2,412,622	2,462,857	2,490,153	2,615,244
Depreciation	302,688	322,021	345,991	356,670	371,173	378,901	383,100	402,345
Addition	63,925	68,400	73,188	78,311	83,793	89,658	95,934	102,650
CA	49,186,829	52,328,439	56,223,556	57,958,883	60,315,549	61,571,424	62,253,822	65,381,106
CL	52,188,934	60,378,968	64,873,334	66,875,634	69,594,864	71,043,951	71,831,333	75,439,738
Working Capital	(3,002,105)	(8,050,529)	(8,649,778)	(8,916,751)	(9,279,315)	(9,472,527)	(9,577,511)	(10,058,632)
Net Change in WC	(1,259,009)	(5,048,424)	(599,249)	(266,973)	(362,564)	(193,212)	(104,984)	(481,121)
FCF=NOPAT-CAPEX-Working Capital								
FCF	3,465,246	7,395,183	3,120,994	2,863,688	3,062,566	2,945,311	2,882,304	3,396,061
Terminal Value								8,617,022

6.3 DU PONT ANALYSIS

DU PONT ANALYSIS								
Ratio	2004	2005	2006	2007	2008	2009	2010	2011
ROE	11.66%	29.85%	6.33%	14.06%	70.97%	10.60%	0.96%	13.09%
Leverage	0.0547	0.0238	1.1506	0.0227	0.0100	0.0098	0.0136	0.0127
ROA	5.88%	13.03%	1.29%	1.87%	8.64%	3.21%	-1.63%	1.59%
Net Profit Margin	1.54%	2.94%	0.54%	1.27%	6.69%	1.78%	0.14%	1.88%
Total Assets Turnover	2.309	2.709	2.352	1.929	2.234	1.584	1.677	1.904
Tax Burden	49.44%	52.48%	18.49%	52.49%	69.53%	37.85%	261.45%	44.82%
Interest Burden	98.51%	98.65%	46.62%	79.58%	69.88%	42.16%	-143.52%	98.21%
EBIT Margin	3.10%	5.33%	1.67%	2.04%	4.50%	3.32%	0.14%	2.18%

6.4 CAPM

Description	2004	2005	2006	2007	2008	2009	2010	2011
Risk Free Rate	8.13%	8.70%	8.79%	9.15%	11.68%	12.09%	12.38%	13.98%
Average risk free rate	5.61%	8.41%	8.74%	8.97%	10.42%	11.89%	12.24%	13.18%
Beta	1.145	0.940	0.881	1.085	1.394	1.230	1.336	1.555
Market Return	53.80%	39.31%	33.82%	43.41%	-11.78%	-41.40%	33.02%	28.41%
Risk Premium	51.10%	30.74%	25.03%	34.25%	9.00%	9.00%	20.62%	14.40%
CAPM*	61.20%	37.48%	30.84%	46.31%	24.32%	23.16%	39.93%	36.40%

7. <u>BIBLIOGRAPHY</u>

Modigliani, F. and Miller, M. H. (1958).The Cost of Capital, Corporate Finance and the Theory of Investment. American Economic Review, 48, 261-97.

Copeland T., T. Koller & J. Murrin*, Valuation: Measuring and Managing the Value of Companies; and Fernandez P.,Valuation Methods and Shareholder Value Creation.*

Titman, Sheridan and Roberto Wessels. 1988. The Determinants of Capital Structure Choice. *Journal of Finance 43: 1-19.*

Index Historical Data. http://www.ksestocks.com/index.php?page=Quotations_Data

Market Index composition. http://www.ksestocks.com/index.php?page=MarketIndexes

Company Data: http://www.arl.com.pk/