

Ministry of Higher Education and Scientific Research

**ECOLE SUPÉRIEURE DE COMMERCE
Kolea-Tipaza**

***Dissertation Submitted in Partial fulfillment of the requirements for
the Degree of Master in commercial and financial Sciences***

Major: Corporate finance

Theme:

**The impact of oil crisis of 2014 on financial situation of
Algerian construction firms**

Presented by:

Fatima Zohra Benkhiat

Supervised by:

Mr. Touati-Tliba Mohamed

**Internship at: Banque de l'Agriculture et de développement rural –Blida-
From 04/04/2021 to 04/05/2021**

Academic year: 2020/2021

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Dedication

I dedicate this modest work;

To the memory of my dear father "Allah yerhimo", may God protect you in his paradise,

I hope you are proud of me.

To my mother whom I would like to thank from the bottom of my heart for her sacrifices, her moral support,

love, prayers for me throughout my studies. May Allah give her good health and a long life.

To my lovely sisters Yasmine, Ines, Maroua and my brother Karim, for their support, I love them so much.

To all my cousins and family members.

To my dearest friends: Samra, Rania, Imane, Amani and Zahra.

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In the name of Allah, the Most Gracious and the Most Merciful,

Praise is to God for His mercy which has enabled me possible to complete this thesis

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Liste of abbreviations

BADR	Banque de l'agriculture et du développement rural
CPA	Crédit populaire d'Algérie
CPI	Consumer Price Index
EVA	Economic Value Added
GDP	Gross Domestic Product
IEA	International Energy Agency
IMF	International Monetary Fund
IPE	International Petroleum Exchange
NYMEX	New York Mercantile Exchange
OPEC	Organization of the Petroleum Exporting Countries
ROA	Return On Assets
ROE	Return On Equity
ROI	Return on Investment
SIMEX	Équipements Hydrauliques Pour Engins De Terrassement
STD	Short Term Debt
TD	Total Debt
US	United States

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Abstract

The objective of this research would be to determine the impact of the 2014 oil shock on Algerian construction companies. A panel data model based on a sample of 30 companies is estimated for the years ranging from 2012 to 2017. The results demonstrate that the oil shock has a negative and significant influence on indebtedness as assessed by short-term and total term debt. However, there is no influence of the oil shock on the financial performance of these firms.

Key words: shock of 2014, panel data of construction firms, financial performance, short term debt, total debt.

Résumé

L'objectif de ce travail est d'étudier l'impact du choc pétrolier de 2014, sur la situation financière des entreprises de construction algériennes. Un modèle de données de panel d'un échantillon de 30 entreprises pour la période allant de 2012 à 2017 est estimé. Les résultats montrent que le choc pétrolier a un impact négatif et significatif sur le niveau d'endettement mesuré par les dettes à court terme et totale des dettes. Cependant, le choc pétrolier n'a aucune influence sur la performance financière de ces entreprises. Mots clés : choc pétrolier, données de panel, performance financière, dette à court terme, dette totale.

Mots clés : Choc 2014, données de panel, performance financière, dette à court terme, dette totale.

General Introduction

General introduction

Recent decline in oil prices have affected the global economy in general specifically the economy of major oil exporting countries. Firms operating in this region have also felt the impact and consequently their various financial indicators have been affected.

There is a need to study such an impact to help firms and regulators to better understand current economic scenario arising after volatile decline in oil price. Oil market has experienced a sharp decline in oil prices from the second half of 2014. exporting countries found themselves facing a scenario they had never expected. For these countries, this oil counter-shock has been an important factor explaining economic imbalances including deficits in the balance of trade and the state budget. In exporting countries such as Algeria, trade in hydrocarbons represents about 98% of external revenues; this dependence on hydrocarbons has put Algeria in a very difficult situation, following the drop of more than 50% in oil revenues.

Our study aims to investigate the impact of the decline in oil prices on the financial performance of construction firms and financing process.

The 2014 oil shock had a negative impact on financial performance, we are particularly interested in this dissertation by the financial situation of Algerian construction firms, and the sample studied is composed of 30 construction firms observed over the period 2012-2017. These years include both the period of rising oil prices (average of 107.66 dollars for 2012-2014) and falling oil prices (average of 44.98 dollars for 2015-2017).

Development and success of each enterprise are highly bound to its finance and the evolution within the frame of its means of production, the latter is the main factor and marker of production's capacity and the pillar of profitability increase. In order "for such a firm" to finance its investment and operating activities, it expresses its financing needs, which must be satisfied by several modes of financing: Self-financing, debt and overdraft, the first mode is based on the self-financing of the firm's activities; the second mode consists in resorting to financial debts to finance the firm's assets and the third mode consists in financing the investments by equity and the current assets by bank loans.

General introduction

Moreover, the relationship between economic and financial activities and oil has been of particular interest to interested economists, which has been a major concern for the world economy. Concern, many articles have already suggested that oil price fluctuations could have an important influence on financial situation of Algerian construction firms.

Problematic

Both firm's financial performance and its financing are the essence of the economy. Therefore to know if the latter were impacted by the oil crisis, we interrogate:

What are the effects of the oil crisis of 2014 on the financial situation of Algerian construction companies?

From the central question, we have the following sub-questions:

- What are the different effects caused by the oil crisis of 2014 on the financing Algerian construction firms?
- What is the impact of oil crisis of 2014 on the financial performance of Algerian construction firms?

Research model and hypotheses

Principal hypothesis

- **H1:** There is a significant relationship between the shock of 2014 and the level of indebtedness in one hand, on the other hand significant relationship between the shock of 2014 and the financial performance of construction firms in Algeria.

Under hypothesis

- **H2:** Liquidity impacts positively the financial performance and negatively the level of indebtedness.
- **H3:** Firm's Size impact positively financial performance and negatively the level indebtedness.

Motivation of the research

The theme of my research has a direct relationship with my specialty "corporate finance", which was the greatest interest to me. Moreover, it is from there that my motivation for

General introduction

choosing this topic on the one hands. On the other hand, it represents a current topic and it reflects the real economic situation in Algeria especially with the fall of the oil prices during its last years. It revives the debate on the dependence of the country with regard to its hydrocarbons.

Plan of the study

Methodological approach

In order to carry out the study and to better answer the problematic of the impact of oil crisis on financial situation of Algerian construction firms, I used panel data model for 30 firms observed for the period ranging from 2012 to 2017.

Construction study

This study is composed of three chapters. The first chapter discusses the effects of oil crisis in general, then specifically about Algeria and its impact on the macroeconomic indicators.

The second chapter explains the financial performance and capital structure, it illustrates an overview situation. Lays down on the theoretical background of the study, it also contains a literature review of similar research realized on the subject in different countries.

The final chapter illustrates the empirical case. This study chose to use linear multiple regressions along with empirical tests to examine what factors impact financial situation and their nature of those effects.

Chapter One: The effects of oil crisis

Chapter one: The effect of oil crisis

Introduction

Oil wealth is considered as a natural resource with important economic benefits, for many economies in the world, especially those countries that rely almost entirely on its oil exports.

The economic realities have shown that these countries, with their rentier economies, have long been affected by oil price fluctuations, which has made them vulnerable to acute economic crises.

Algeria has relied heavily on hydrocarbon export revenues, particularly oil revenues, to achieve some of its development objectives, during the years when hydrocarbon prices peaked in the oil markets. But, due to the decline and instability of oil prices, especially during the 1990s, Algeria suffered from enormous negative effects.

In this chapter we will deal with the following sections:

- Section one: Oil market;
- Section two: The effects of oil crisis on the Algerian economy and its main macroeconomic indicators;

Chapter one: The effect of oil crisis

Section one: The oil market

The oil market is considered as the largest commodity market in the world. It is, therefore, unstable due to the strong fluctuations of oil prices. This is mainly due to the continuous variations of supply and demand in the oil market.

The hydrocarbon sector plays a major role in the Algerian economy ,given its importance: 98% of export revenues, 65% of state revenues and 50% of and 50% of the GDP.

1 The international oil market

The international oil market is a place of confrontation between oil suppliers and oil seekers. Over the past 20 years, the oil market has become the largest commodity market in the world. It has undergone major evolutions from a simple market of physical trade in oil and petroleum products to a sophisticated financial market where the horizons of trade extend today»¹.

1.1 The physical market

1.1.1 Physical spot market ²

The physical spot market is the exchange place on the day on which the deliveries are made in cash. The oil is not physically present on this market; in fact it is a contract between the offer and the applicant whose trader plays the role of intermediation of the latter two. The price of oil is fixed by comparing supply and demand on this free market; so the price of crude oil is determined by the market.

1.1.2 The physical futures or deferred delivery market

The forward physical market also known as the forward market. It is a market in which oil shipments are exchanged at a later date and for an immediately fixed price,³it is an OTC market in which the buyer and the seller describe in a tailor-made contract all the conditions of their transactions which must be complied by both contractors.

¹ MATHIEU.A, Or noir :La grande histoire du pétrole»,La découverte,2006,paris, p75.

²DURUSSET.M, «le marché du pétrole»,Ellipes,EditionmarketingS.A,1999, pp57.

³PERCEBOIS. J, «Energie et théories économiques propos de quelques débats contemporains », Cujas,paris,1997, pp.55

Chapter one: The effect of oil crisis

1.1.3 The oil futures financial market

The financial futures market also known as the “paper market” on which barrel-bonds are traded. This type of system emerged in the mid-1980s. These are futures contracts traded on commodity exchanges in particular in New York (the NYMEX "New York Mercantile Exchange"). London (IPE International Petroleum Exchange), Singapore (SIMEX Singapore International Monetary Exchange).

Futures operations can meet three objectives: hedging, arbitrage and speculation¹:

- Hedging operations protect them against the risk of changes in oil prices.
- Speculation on the futures market is the result of expectations on oil price developments; it is a question of buying an asset in order to resell it with price higher than the purchase price.
- Unlike the speculation transaction, the arbitrage transaction does not present any risk on the oil market and consists of correcting all the anomalies that exist between the different prices of the same product on two different markets.

1.2 Trends and determinants of oil prices

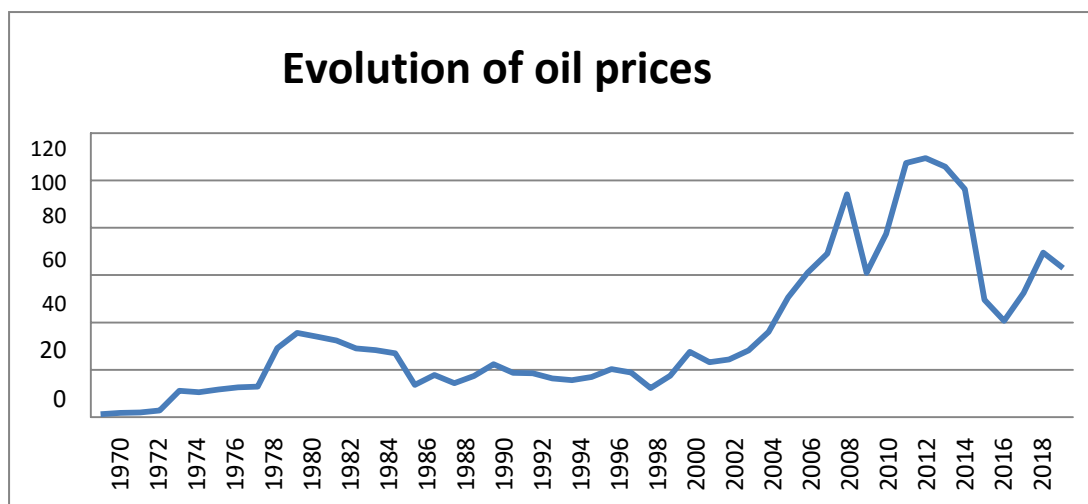
Determining oil prices remains more complicated task than simply matching supply to demand. Two main categories of actors are confronted with divergent interests, the exporting and importing countries, to which are added the interests of oil firms, traders and final consumers. The dependence of the Middle East is increasingly worrying given the geopolitical tensions and instability of these countries².

1.2.1 Evolution of oil prices

The oil market has experienced several periods of either upward or downward price fluctuation that have significantly shaken the economies of oil-exporting importers. The chart below summarizes the evolution of oil prices from 1970 to 2017.

¹YAICIFarid, précis de finance internationale, ENAG éditions, Alger, 2008, p105.

² Déterminants des prix hydrocarbures Sophie MERITET, Maître de Conférences, CGEMP, Université Paris Dauphine.

FIGURE1: EVOLUTION OF OIL PRICES

Source: based on data from the site prixdubaril.com

1.2.2 The determinants of oil prices

The main determinants of oil prices are:¹

Changes in oil supply and demand: Changes in oil supply levels affect oil prices in particular. An unexpected combination of low supply and high demand drives up prices. And a combination of high supply and low demand leads to lower prices.

OPEC Production Decisions: OPEC announcements, particularly changes to production quotas, can have immediate impacts on oil prices.

OPEC Excess Production Capacity Levels: OPEC's excess oil production capacity reassures the market that supply can be maintained and demand can be met. As a result, OPEC's high levels of spare production capacity are generally correlated with falling or low prices and vice versa.

Marginal Cost of Production: Rising marginal costs of oil production have an upward effect on oil prices.
US Commercial Crude Oil Inventory Levels: Low crude oil inventories cause uncertainty about the ability of the market to recover from demand, leading to higher prices; conversely, high crude oil stock levels favor lower crude oil prices.

¹Direction des ressources pétrolières secteur de l'énergie ressources naturelles canada (2010) « Examen des enjeux qui influencent le prix du pétrole», 2010, p5.

Chapter one: The effect of oil crisis

The declining value of the US dollar: The price of oil is expressed in US dollars and fluctuations in its value influence the price of crude oil. Between 2002 and July 2008 the euro rose by 78% against the US dollar, that's why OPEC sought to establish higher crude oil prices.

Hypersensitivity to geopolitical events, beyond the logic of the market, other decisive factors can be highlighted, the political problems and tensions that exert another pressure on the price of oil. The link between political tensions and the rise in oil prices is obvious, even if these tensions are not the only and the main cause or the main cause of the rise in crude oil prices. This was the case during the two oil shocks, the Iran-Iraq conflict or the Gulf Wars¹

2 The various oil crises (counter oil shocks)

2.1 Oil Counter-shock from 1986 to 2012

The first oil shock was partly in 1986, a consequence of a change in strategy by Saudi Arabia, which decided to increase its production in order to recover OPEC market shares decreased after the increase in oil production in Mexico and Angola, despite the low level of demand world. As a result, oil prices fell or even collapsed in 1986 to around 7 dollars/barrel against 28 dollars at the end of 1985, despite the reduction of almost half of OPEC production. In order to deal with this situation, the OPEC countries decided, at their conference held in Geneva from 28 July to 5 August 1986, to return to the quota system in order to be able to reduce their production. The application of this decision immediately raised crude oil prices, which stabilized at about US\$15/barrel in late 1986 and US\$18 in early 1987². The second oil counter shock of 1997 came after the financial crisis in emerging South-East Asia which put an end to the rise in oil prices. In November 1997, OPEC increased production by 10%, regardless the Asian crisis. Prices plummeted from 40% at the end of 1998 to less than 10 dollars a barrel.³ Asia is considered as the largest consumer of oil and petroleum products. The Asian financial crisis caused a slowdown in economic activity,

² Direction des ressources pétrolières secteur de l'énergie ressources naturelles canada (2010) « examen des enjeux qui influencent le prix du pétrole», Op.cit. p13

³ Chocs et contre-chocs pétroliers depuis 1973, disponible on the site : <http://prixdubaril.com/> 11/05/2021

Chapter one: The effect of oil crisis

which resulted in lower demand for oil and consequently lower inflation for developed countries. Thus, the fall in oil prices affects the exporting countries through a fall in the year of 2008. oil prices exceeded for the first time the 100 dollars, so in July 2008 prices reached 145 dollars a barrel, then from October 2008, prices fell below 100 dollars. At the beginning of 2009, oil prices fell to \$40 a barrel. This counter-shock is due to the crisis of Suprime¹. (Counter-shock of 2009).

2.2 The 2014 oil counter-shock:

Oil prices were relatively stable between 2011 and the first half of 2014, with oil prices falling almost 45% of its value and now approaching \$50. In June 2014, the barrel would rely on \$112, a dizzying fall that reassures some but worries others. The reasons for this drop in oil prices are numerous. Initially, the overabundant supply no longer corresponds to international needs; stocks fill and flow more slowly than expected, Saudi Arabia, Russia and Iraq, which are among the largest oil-exporting countries. They have long held their ground and refused to lower their pumping volumes, despite pressure from other countries, strengthening the oil crisis by overheating stocks. At the same time, US oil production has increased sharply, so the share of US oil consumption covered by imports has decreased from 60% to 22% at the end of 2015.

Another factor justifying the collapse of prices; the exploitation of new deposits discovered in the Middle East, in the Caspian Sea and in West Africa. All these new sources have irreparably increased pumping operations and inflated petrol stockpiles.²

2.3 The causes of the oil shock 2014

2.3.1 An abundant supply

Much of the decline in oil prices is related to supply side developments. According to figures from the International Energy Agency (IEA), world oil production increased between 2013 and 2014 by 4 about 1.9 million barrels per day (from 91.4 to 93.3 Mb/d), including 1.6 million barrels per day in the United States and Canada.

²La chute du prix du baril de pétrole <https://www.fioulmarket.fr/actualites/baisse-prix-petrole-quelles-causes-comment-relancer-marche> 12/05/2021

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2.3.2 A slowdown in demand:

Weak demand, due to the slowdown in global growth and in particular in emerging countries, has also played a role in lower oil prices. The IEA oil demand forecasts for 2015 are 0.5 million barrels per day lower than forecast in June, when prices began to fall.

2.3.3 The economic recession:

The third factor, is that of the global economic recession that has led to significant reductions in consumption (energy saving), growth in global demand on the one hand, and the development of renewable energies. The American Energy Information Agency (IEA), in its December 2014 report “Short Term Energy Market Outlook”, revised the global outlook for oil consumption downwards, even after the 18% drop in oil prices in November 2014. The IEA’s 2015 oil demand forecast has already been revised down by 0.7 Mn/d due to lower-than-expected economic activity, further reducing oil demand.¹

2.3.4 The Organization of Petroleum Exporting Countries (OPEC) decision to maintain production levels

However, these revisions in demand and supply are not enough to explain the magnitude of the recent decline in oil prices, the first factor explaining the fall in prices and the change in the behavior of OPEC countries. The latter, in particular Saudi Arabia, allegedly sought to remove from the market non-conventional oil producers (shale, sand, oil) whose production costs are high, not reducing their production in order to balance the market and support prices»².

2.3.5 The anticipated entry of Iranian oil into international markets

The World Bank reported on August 10, 2015 that Iran’s full return to the international market could bring an additional one million barrels per day, reducing the price of \$10 per barrel next year and according to Western experts are convinced that Iran will be able to supply up to 500,000 barrels per day on the world market immediately.»³

¹Hubert. P, «Guide pratique de la baisse des prix du pétrole», <http://www.les7duquebec.com/actualites-des-7/guide-pratique-pour-le-pétrole>, consulted 17/05/2021

² Idem, /05/2021 à 19h30

³<http://www.lorientlejour.com/article/934574/la-levee-des-sanctions-contre-liran-va-peser-sur-les-cours>

Chapter one: The effect of oil crisis

2.3.6 The appreciation of the dollar

Since June 2014, the dollar has appreciated by more than 15% major currencies, in foreign trade-weighted terms. A general appreciation of the dollar tends to raise the currency cost of oil in countries whose currency is not indexed to the greenback, which weakens the demand of these countries. This also implies an increase in the supply of producers, such as Russia, which does not use the dollar and whose costs are mainly denominated in national currency.

3. The role of hydrocarbons in the Algerian economy

The hydrocarbon sector (oil and gas) in Algeria occupies a central place in the functioning of the economy; it is the main source of currency considered as a vital resource for the financing of economic activities. The central place of the hydrocarbon sector has strongly influenced the structure and management of the Algerian economy, this has allowed Algeria to have a good potential favorable to economic growth. Thus, the development of Algeria's economic growth and public finances is highly exposed to fluctuations in oil prices.

Over the past decade, oil and gas revenues have helped finance the country's various economic recovery programs and significantly reduce its external debt. Thus, gross domestic product (GDP) remains strongly influenced by the behavior of production in the hydrocarbon sector, given the weight of this sector in the formation of GDP.

“Hydrocarbons accounted for all of our exports abroad during 2016 with a share of 93.84% of the total volume of exports, and a decrease of 17.12% compared to 2015.

Section two: The effects of oil crisis on the Algerian economy and its main macroeconomic indicators

Algeria is a country whose economy is highly dependent on hydrocarbon revenues; the oil market has had several oil price crises over the past 40 years. In this section, we will discuss the crises of falling oil prices; particularly those of 1986, 2009 and 2014. Also, we have devoted this section to analyze the impact of oil price fluctuations on the macroeconomic variables.

1. Oil crisis

1.1 The concepts of "oil shock" and "oil counter-shock"

Oil crises can be of different natures depending on the case and on their impact on economic activity indicators and stock markets.

Definition of an oil shock

An oil shock is a massive and rapid increase in the price of oil that generally triggers a crisis for countries that do not produce enough oil and are dependent on imports. Oil shocks are of two types:

Supply shock

Even if demand does not increase, the reduction in oil output means a fall in supply on the global market, causing an imbalance since supply falls below demand. Crude oil prices are rapidly increasing from this perspective. This event is referred to as "oil supply shock," and it is primarily driven by Producer behavior, which is responsible for the choice to raise or reduce oil supply on the market.

Demand shock

“In the oil market, a demand shock is produced by a spike in demand relative to supply. Unlike the supply shock, which is produced by consumer behavior, it is marked by a rise in the price of oil barrels. The demand shock is typically determined by market demand for oil, which is determined by a country's economic position. To put it another way, the oil demand shock comes during a period of economic boom, which promotes oil consumption”¹

¹PERCEBOIS Jacques, «**Economiedel'énergie**», Préface de MAINGUY Yves, Ed Economisa, 1989, P 24.

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Definition of an oil counter-shock

"On the world oil market, an oil counter-shock is a sudden reduction in oil prices; it is a combination of either a drop in price and a contraction in demand or a drop in price and plentiful supply."¹

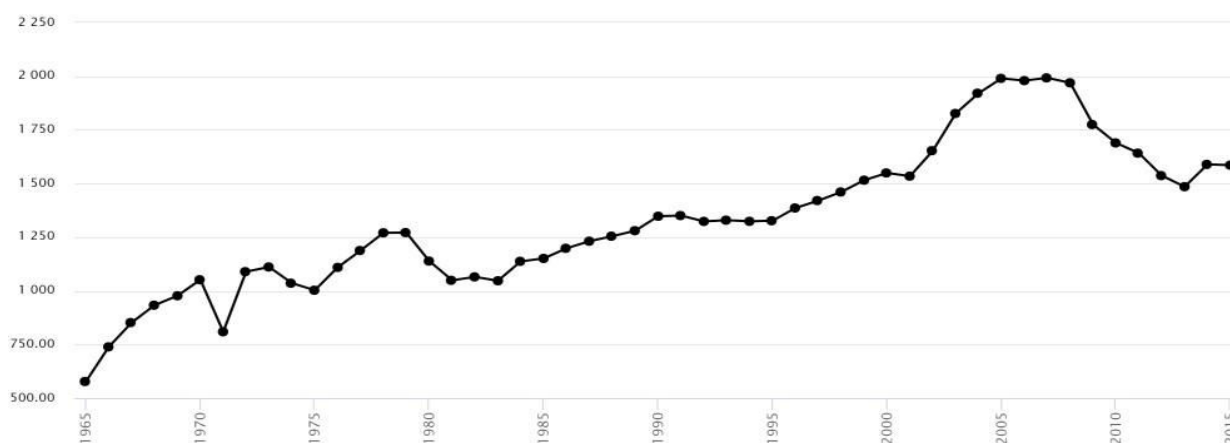
The meanings of these two terms will be inverted for oil exporting countries..

2. Oil Production in Algeria

In the 1930s, the first speculations began about the presence of oil in Algeria. At the end of the 1950s, French firms discovered hydrocarbon deposits (Hassid Masoud oil field), thus in 1963, the national company SONATRACH was created, and in 1969 the country became a member of OPEC.

FIGURE2: ALGERIAN OIL PRODUCTION

Production d'énergie: pétrole en milliers de barils par jour, Algérie



Perspective monde, date de consultation: 11/5/2019, source: British Petroleum [via QUANDL]

Source: <http://perspective.usherbrooke.ca/viewed18/05/2021>

According to this graph, the Algerian oil production is in continuous evolution during the period from 1965 to 2005, except for the dates corresponding to the two oil shocks (1973/1979) when oil reduction measures were taken by the OPEC countries. In 2008, the volume of oil production reached the level of 196900 b/d, this increase is mainly due to the increase of the world demand for oil products. From the year 2009 the oil production dropped,

¹ Agnès BENASSY-QUERE et al, Politique économique, Ed. De Boeck, Bruxelles, Belgique, 2012, P26.

Chapter one: The effect of oil crisis

it reached 1485000 b/d in 2013 against 1990000 b/d in 2005; this is mainly explained by the subprime crisis of 2008 which caused a decrease in the global demand for oil. In 2014, oil production experienced an increase which is 1.8% compared to 2013 and finally in 2015 Algerian oil production declined again.

3. The management company of the hydrocarbon sector in Algeria

The management of the hydrocarbon sector is entrusted to SONATRACH1, the creation of which was established by Decree No. 63-491 of 31 December, published in the Official Journal of the People's Democratic Republic of Algeria on 10 January 1964. The objective of this organization was to achieve the following goals:

- Execution of any search operation;
- Oil exploitation and marketing;
- Transportation and processing of hydrocarbons;
- Distribution and sale of hydrocarbons.

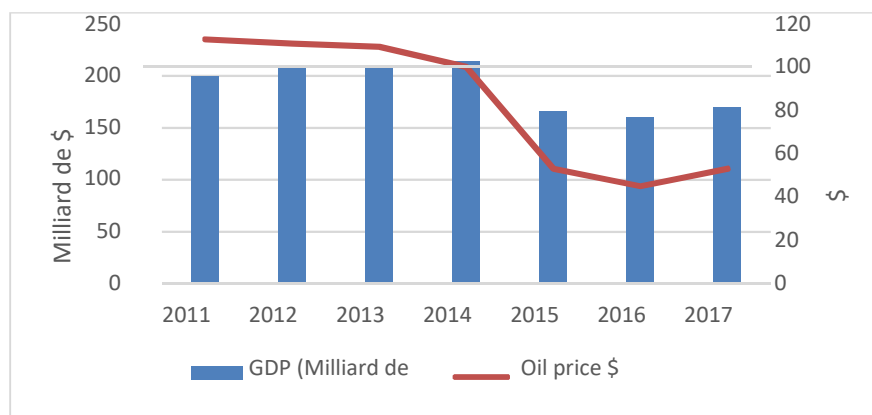
SONATRACH is the pillar of the oil industry in Algeria; its mission is to optimize the national hydrocarbon resources and to create wealth at the service of the economic and social development of the country. Thus, this company is classified as the first hydrocarbon company in Africa and the Mediterranean.

4. The different effects of the oil shock on the main macroeconomic indicators in Algeria

4.1 The impact of oil price fluctuations on Gross Domestic Product (GDP) of Algeria

GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. GDP is an important indicator of a country's economic power.

FIGURE3: ALGRIA'S GDP



Source: elaborated by ourselves from Algeria's foreign trade statistics and reports from the Bank of Algeria.

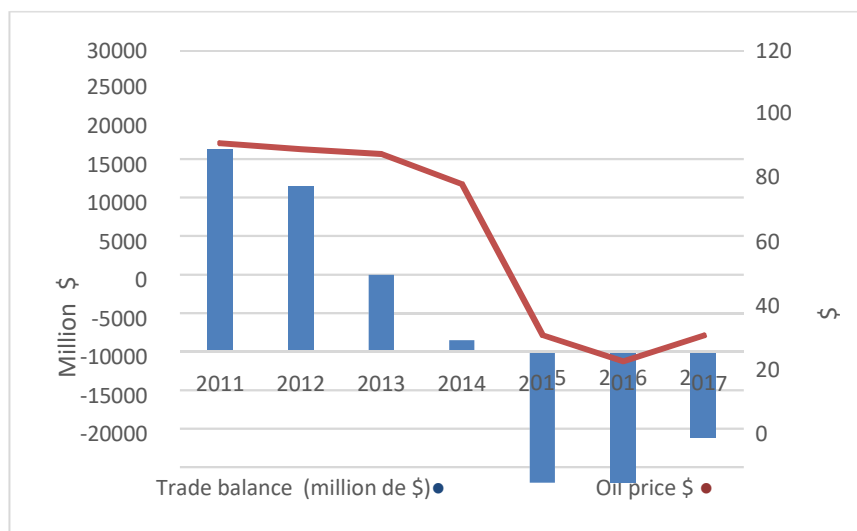
While economic growth of Algeria has slowed Gross Domestic Product fell by 1.7% in 2012, 1.4% in 2013 and 8.5% in 2014. Gross Domestic Product of Algeria grew 3.7% in 2015 compared to last year. This rate is 1 -tenth of one percent less than the figure of 3.8% published in 2014.

4.1The impact of oil price fluctuations on the trade balance

The trade balance is an indicator that corresponds to the difference between the values of exports and imports of goods. The trade balance is an indicator that corresponds to the difference between the values of exports and imports of goods and services of a country.

Chapter one: The effect of oil crisis

FIGURE4 : EVOLUTION OF TRADE BALANCE ON ALGERIA IN RELATION TO OIL PRICES IN DOLLARS (2011-2017)



Source: elaborated by ourselves from Algeria's foreign trade statistics and reports from the Bank of Algeria.

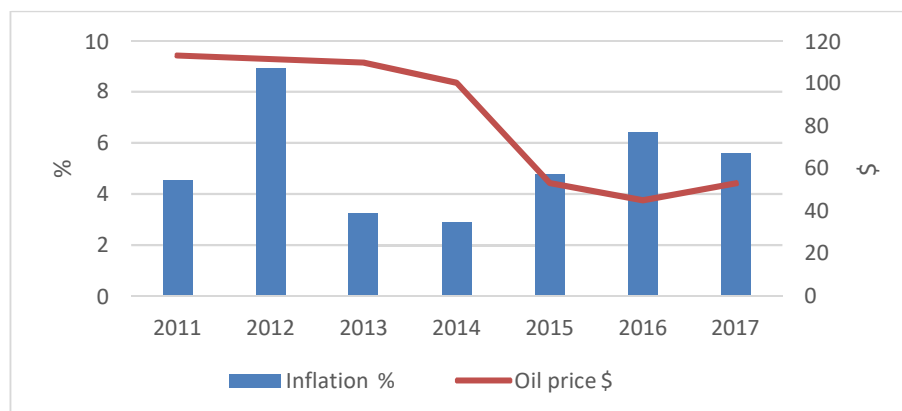
According to FIGURE N°04, in 2012 the price of oil decreased by 1.9 Dollars, the surplus of the trade balance also decreased by 18.1%. Then, a decrease in the price of oil continues to follow the years that arrive at the price of 100.2 dollars per barrel, is accompanied by a decline in the trade balance until 2014. In 2015, a drastic drop in oil prices is noted. The latter is reduced to 53.1 Dollars with a deficit of 17034 million Dollars for the balance of trade that had reached in 2011 the threshold of 26242 million Dollars. Indeed, the fall in the price of oil has had negative effects on the balance of trade that has become a deficit, which allows admitting a strong correlation between the price of oil and the balance of trade

4.2 The impact of oil price fluctuations on inflation

Inflation as measured by the consumer price index reflects changes in the cost of a basket of goods and services purchased by the average consumer. The contents of this basket may be fixed or may change at regular intervals, such as every year.

Chapter one: The effect of oil crisis

FIGURE 5: EVOLUTION OF INFLATION MEASURED BY CPI IN RELATION TO OIL PRICES IN DOLLARS (2012-2017)



Source: elaborated by ourselves from Algeria's foreign trade statistics and reports from the Bank of Algeria.

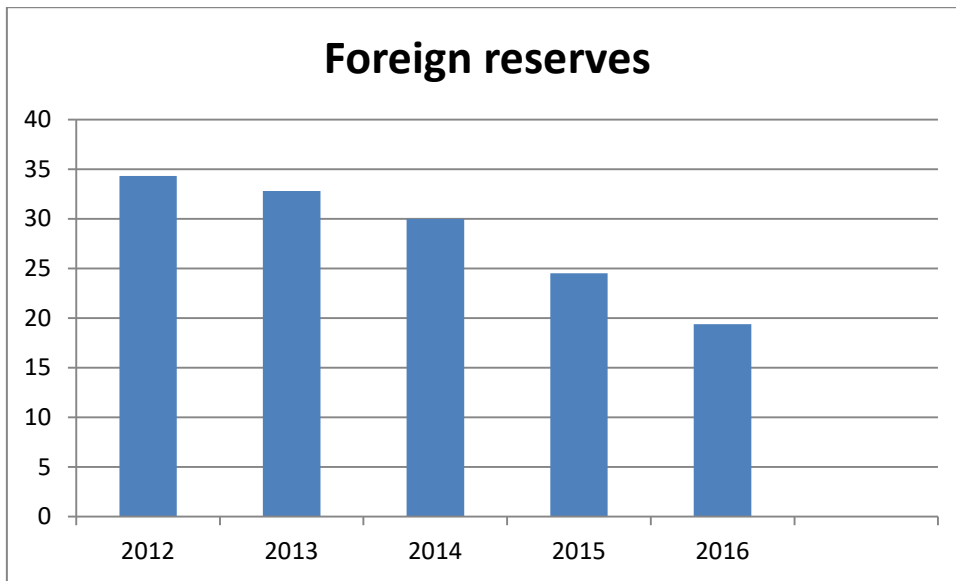
The figure shows a disinflation during the period 2013 and 2014, the latter interrupted in 2015 following the oil fall to reach 4.8%. It is clearly increasing compared to the years 2013 (3.3%) and 2014 (2.9%).

Consumer prices have increased throughout the period 2016 – 2017 This evolution is near 6.5%.

6. The impact of oil price fluctuations foreign reserves:

Since June 2014, foreign reserves have plunged by more than US\$35 billion, the Oil Fund by more than 30 percent, while the Algerian dinar has fallen against the US dollar by more than 30 percent. The government itself expects the FRR to fall to a third of its 2014 level by the end of 2016.

FIGURE6: ALGERIA'S RESERVE



Source: elaborated by ourselves from Algeria's foreign trade statistics and reports from the Bank of Algeria.

oil prices on various economies. There are several instances of empirical data to explain oil price variations as well as to analyze the macroeconomic effects of oil price oscillations. For many decades, the price of oil has drawn a great deal of interest.

Chapter one: The effect of oil crisis

Conclusion

The Algerian economy is mainly based on oil revenues but since the last few years, a collapse of the prices of hydrocarbons due to the abusive production of this energy has caused a significant disruption on the economic development of all the sectors of the country. Thus, an economic revival has been considered by the authorities outside of oil in order to overcome the negative impact caused by the fall of oil prices. Algeria in possession of resources: agricultural, tourist and energy, can therefore exploit them to emerge from the current economic crisis. The exploitation of these resources plays an important role in the stimulation of the Algerian economy. To do so, the state must deploy structural reforms to diversify its activities and take benefit of its assets.

**Chapter two: Financial
performance and capital structure**

Introduction

The financial performance of a firm is the ability of this firm to achieve its predicted results, in an effective and efficient way. In fact the success of a firm is measured by its ability to create wealth and to maximize its value.

The question of the capital structure of firms has been the subject of debate since the work of Miller and Modigliani (1958). They were the first to conduct a theoretical analysis of the impact of the financial structure, particularly on the debt/equity ratio and on the value of the firm.

Since 1958, there has been a succession of studies on the financing behavior of firms, giving rise to numerous theories. However, these theories are only validated under hypothetical assumptions. The end of the 1950s also marked the beginning of an excess of empirical studies on firms financial structure. Most of these studies seek to show the main determinants of debt, focusing only on large and listed companies and not on construction firms.

In this chapter, we have two sections as follows:

- **Section one:** Generalities about financial performance
- **Section two:** Theoretical aspects of capital structure
- **Section three:** Empirical studies on capital structure and financial performance

Chapter two: Financial performance and capital structure

Section one: Generalities about financial performance

In this section, a brief review is presented for each of the financial performance measures.

Performance is a concept commonly used in the field of business. Indeed, this concept covers a vast corpus of definitions and practices in different fields of socio-economic activity. However, it remains difficult to give a simple definition because of its multiple dimensions.

1 The definition of performance

The term performance dates back to the 13th century. Etymologically, it comes from the old French 'performer' which means "to accomplish, to perform" in the 13th century (Petit Robert). The English verb "to perform" appeared in the 15th century with a broader meaning. It means both the accomplishment of a process, of a task, but also the results obtained as well as the success of which one can boast.¹

From the 19th century onwards, it refers both to the results obtained by a racehorse on the racecourse and by extension, the success of an athlete. At the beginning of the 20th century, this term applied to the numerical indications characterizing the possibility of a machine, and designates by extension a performance or an exceptional reliability. (Richard; Hubault and Noulon,)²

Gilbert, describes performance in a ternary relationship between the objectives sought (targets, estimates, projections), the means to achieve them (human, material, financial or informational resources) and the results obtained (goods, products, services), financial or informational resources) and the results obtained (goods, products, services). This definition of performance applies to any ordered system (individual, organization, this definition of performance applies to any ordered system (individual, organization, system, etc.) that produces results from its basic resources.

We could propose our proper definition after taking into account the various definitions

¹ISSOR, Z, « Projectics, proyéctica, projectique : La performance de l'entreprise un concept complexe aux multiples dimensions », Boeck supérieur, 2008, pp93-103.

²SANNI Y, « La problématique de la performance organisationnelle, ses déterminants et les moyens de sa mesure », Edition : faculté des sciences de l'administration de l'université Laval, direction de la recherche, 2003. P.34

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Financial performance is the ability of the company to generate profits and benefits for its various stakeholders, by designing products and services that can satisfy customers.

Performance measurement is then carried out on three axes:

- **Relevance:** this is the relationship between the initial objectives and the resources to achieve them.
- **Efficiency:** the relationship between the results obtained and the resources used.
- **Effectiveness:** the relationship between the results obtained and the initial objectives.

We can therefore talk about performance optimization by applying the latter on each of the three axes, i.e. optimizing the methods of resource acquisition to obtain only what is necessary (relevance), optimizing the methods of to reduce resource consumption (efficiency) and optimizing the setting of objectives on the basis of optimizing the setting of objectives based on the results obtained as realistically as possible (effectiveness).

According to Bourguignon, performance in management is defined on three levels¹

- **Action:** performance refers simultaneously to the results and the actions implemented to achieve them to achieve them, i.e. a process.
- **The result of the action:** performance corresponds to a result measured by indicators and in relation to a benchmark that may be indigenous or exogenous.
- **Success:** performance refers to a positive result of specific success to each individual and each institution.

To better explain performance, we will use Bourguignon's definition because the three meanings listed above and explicitly recognize its polysemous character. Thus, it can be defined as "the achievement of organizational, regardless of the nature and variety of these objectives. This achievement can be understood in the strict sense (result, outcome, etc.), or in the broad sense of the process that leads to the result as action."²

For Michel Lebas, performance only exists if it can be measured and this measurement cannot be limited to the knowledge of a result. This measurement can never be limited to the knowledge of a result.

Results achieved by comparing them to desire results or benchmarks. He constructed his definition by presenting what he called the common performance characteristics as following³

¹BOURGUIGNO, A, " Peut-on définir la performance. Revue française de comptabilité, 1995, p 62.

²BOURGUIGNO, A. « Performance et contrôle de gestion », *Economica* 2000, p934.

³LEBAS, « Michel. Définir la performance », *Revue française de comptabilité* , 1995. P62.

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To accomplish, to carry out an activity with a determined goal.

- Achieving a result.
- Comparison of a result with an internal or external reference.
- Ability to achieve or accomplish a result (achievement potential).
- Applying concepts of continuous progress.
- Judgment of performance by several stakeholders who may not have the same vision and have the same vision and approach.
- Measuring by a communicable figure or expression

2 Financial performance

Financial performance could be defined as the achievement of good profitability, satisfactory growth and the creation of shareholder value. It aims to ensure the stability of the company's financing in order to have as little recourse as possible to credit.

The financial performance of the company depends on the management of the financial resources available to the company. This management conditions the profitability of the funds invested at the outset and the renewal of the most profitable operations for the company. Today, the company no longer seeks to generate profits for its own account, but must also think about the impact of its activities on all its stakeholders. It should be pointed out that the financial performance of the company is associated with the governance of the company. As Miloud (2003)¹ states, weak governance can have a negative impact on the company's financial performance. Good governance allows establishing better accountability, management and control of the company (corporate governance) and responsible behavior within the company.

The financial performance of a company can be considered as its capacity to cover all its charges with its income and to generate a surplus to finance its growth.

It is generally evaluated from accounting documents. The measurement of financial performance is essential. Indeed, certain organizations such as firms must produce at the end of each accounting period documents and their appendices contain the basic information to measure financial performance.

¹Miloud, T, « Introduction en bourse, la structure de propriété et création de valeurs ». Presses Universitaires de Louvain, 2003, pp. 202.

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The financial performance measurement is essentially based on accounting information, and particularly on the annual accounts which are the financial statements that the company must have; understand them, know how to use them and interpret them

Traditionally, in business, performance measures both the adequacy between the strategic objectives initially defined and the results actually achieved (effectiveness) and the adequacy between the results and the means used (efficiency). However, when defined in this way, the idea of performance does not solve any problem for the company, but rather gives rise to an immense diversity of questions that the company must answer on a daily basis.

3 Financial Performance Measures

As will be seen from the literature review a wide number of variables can be used as performance measures and determinants. However, variables are selected based on its importance from the point view of the researcher, and upon the availability and easy access of information.

There are many measures of profitability. As a group, these measures evaluate the firm's earnings with respect to a given level of sales, a certain level of assets, the owner's investment, or share value. Without profit, a firm could not attract outside capital. Moreover, present owners and creditors would become concerned about the Company's future and attempt to recover their funds. Owners, creditors, and management pay close attention to boosting profits due to the great importance placed on earnings in the market place¹.

3.1 Return on Assets (ROA)

It was not until the early part of the twentieth century that the return on investment criterion was developed. Although business firms used net earnings to measure performance long before 1900, earnings were measured relative to either sales revenue or the cost of operations. They were not measured relative to the organization's investment in the production cost. ROA considers the return on the total funds invested in the company.

- **ROA = Net Income / Total Assets**
- **ROA = (Profit / sales) * (Sales/Assets)**

The Net Profit Margin and Total Assets turnover could be decomposed into their component parts, representing accounts from the income statement and the balance sheet. So that senior managers could understand how performance of individual activities contributed to the overall measure of organizational effectiveness.

¹ GITMAN.A, "Principles of Managerial Finance", 9th edition, Addison , 2009, pp.137

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ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage.

3.2 Return on Equity (ROE)

Return on Equity measures the return earned on the owner's investment in the firm, focuses on the return to the common shareholders

➤ **ROE = Net Income / shareholder equity**

ROE is based on 3 variables:

1- Profit margin, which measures the company's efficiency of cost control and profit generation.

2- Total asset turnover, which measures the company's efficiency at using assets to generate sales.

3- The financial leverage multiplier, which measures the amount of leverage the company employs.

Return on equity = Return on Assets * Financial Leverage multiplier

ROE = ROA * FLM

= (NPM * TAT) * FLM

= (Net Income / Sales) * (Sales / T. Assets) * (Assets / Equity)

Generally, the higher the return, the better off is the owners. It is based on profit margin, total assets turnover, and financial leverage multiplier. It is important to note that the first two variables in the model can be used to calculate the ROA.

3.2.1 The Difference between ROA and ROE

The big factor that separates ROE and ROA is financial leverage, or debt. The balance sheet's fundamental equation shows how this is true:

Assets = Liabilities + Shareholders' Equity, This equation tells us that if a company carries no debt, its shareholders' equity and its total assets will be the same. It follows then that their ROE and ROA would also be the same. But if that company takes on financial leverage, ROE would rise above ROA. The balance sheet equation - if expressed differently - can help us see the reason for this: shareholders' equity = assets - liabilities. By taking on debt, a company increases its assets thanks to the cash that comes in. But since equity equals assets minus total debt, a company decreases its equity by increasing debt. In other words, when debt increases, equity shrinks, and since equity is the ROE's denominator, ROE, in turn, gets a boost. At the same time, when a company takes on debt, the total assets –the

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denominator of ROA - increase. So, debt amplifies ROE in relation to ROA, because ROE weighs net income only against owners' equity, it doesn't say much about how well a company uses its financing from borrowing and bonds. Such a company may deliver an impressive ROE without actually being more effective at using the shareholders' equity to grow the company. ROA - because its denominator includes both debt and equity - can help you see how well a company puts both these forms of financing to use.

ROA is a measure of how much a dollar invested in assets creates a dollar in sales;

ROE is a measure of how much a dollar invested by shareholders creates a dollar in sales.

ROA equals net income divided by average total assets and ROE equals net income divided by average shareholders' equity.

One has to look at ROA as well as ROE. They are different, but together they provide a clear picture of management's effectiveness. If ROA is sound and debt levels are reasonable, a strong ROE is a solid signal that managers are doing a good job of generating returns from shareholders' investments. ROE is certainly a "hint" that management is giving shareholders more for their money. On the other hand, if ROA is low or the company is carrying a lot of debt, a high ROE can give investors a false impression about the company's fortunes.

3.3 Return on Investment ROI

The ROI is the percentage return on capital invested. It is mainly used to determine whether the investments made in launching a project are justified by the results obtained (Pinardon, 1989). It corresponds to the ratio between costs and benefits. The ROI has always been considered as a complete and synthetic measure of the company's performance. From this point of view, it makes it possible to update the various elements that affect the company's financial statements. It is an indicator that is easy to calculate and understand by the user. On the other hand, it can be applied to any organization and consequently. It allows determining the different profit centers of the company or even of the organization.

$$\text{ROI} = (\text{Sales} - \text{Costs}) / (\text{Investment} + \text{Changes in WCR})^1$$

3.4 The economic value added EVA

EVA is used to measure the value added by the company after remuneration of all capital employed. It is obtained by the following formula²: EVA = (economic profitability - cost of capital) × (capital invested) But it can also be calculated on the basis of equity. In this case, it is obtained by the following formula: EVA of equity = (return on equity - cost of

¹Est-ce que le ROI est compatible avec le lean ?, www.institut-lean-france.fr, consulté 18/06/2021 à 23:24

²DAMODARAN, A, « finance d'entreprise théorie et pratique », De Boeck, 2001, p 617.

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equity) \times (Amount of equity invested in the project or company) When the EVA of equity is positive, the company creates value for its shareholders. When it is negative, the company destroys value for its shareholders. The EVA thus allows the company to determine whether the amount invested to launch a project is greater than the amount obtained at the end of the operation (Mowen, Hansen and Heitger 2008). Among other things, it allows the firm to make correct investment and divestment decisions.

3.5 TOBIN'S Q

The Q Theory is a theory of investment behavior developed by the US economist James Tobin. Commonly referred to as Tobin's Q Theory Tobin's Q plays an important role in many financial interactions, calculated as the summation of market value of a firm's equity and the market value of the firm's debt divided by the book value of total assets.

$$TQ = \frac{\text{Market value of equity} + \text{market value of debt}}{\text{Book value of total assets}}$$

A Tobin's Q of more than one means that the market value of assets (as reflected in share prices) is greater than their replacement cost. This means it is likely that the company will create wealth for shareholders. If Tobin's Q is greater than 1.0, then the market value is greater than the value of the company's recorded assets. This suggests that the market value reflects some unmeasured or unrecorded assets of the company.

High Tobin's Q values encourage firms to invest more in capital because they are "worth" more than the price they paid for them.

A Tobin's Q of less than one suggests that the market value of the assets is less than replacement cost. We believe that this ratio has considerable macroeconomic significance and usefulness.

Section two: Theoretical aspects of capital structure

The concept of capital structure received much attention after Modigliani and Miller (1958) they demonstrated that the choice between debt and equity does not have any material effects on the value of the firm. This proposition indeed assumes the perfect capital markets. A perfect market is one in which there are no frictions such as transaction and bankruptcy costs. However, in the real world, one may ask whether all capital markets are perfect. When market imperfections such as transaction and bankruptcy costs are considered, capital structure may well be relevant. As pointed out by Strabulaev (2007: 1787), small adjustment costs may cause large variations in capital structure.

1 Modigliani.F et Miller.M (M&M) en 1958

The first rigorous analysis of the impact of the capital structure on the value of the firm is due to the work of M&M in 1958, which showed that in the absence of taxes and in an equilibrium market, the value of the firm is independent of its capital structure. In other words, the value of the levered firm is equal to that of the unlevered firm¹. However, this result is very general in scope and is based on elements that M&M (1958) left out of their analysis. First, these two authors ignored the effect of taxes. Second, they assumed that the costs of bankruptcy are zero. In reality, however, this is not the case, since these costs are associated with financial difficulties, even if legal bankruptcy is ultimately avoided. Third, M&M (1958) also ignored the potential conflicts of interest between shareholders and creditors and between shareholders and managers. Finally, they also assumed that these three actors (shareholders, managers and creditors) all have the same information about the value of the firm, its risk and its prospects. However, this assumption is not verified in practice¹. The first of these is known as the trade-off theory, which considers that firms implement a financing policy using an optimal capital structure. While the second, which is part of the pecking order theory, considers, in contrast to the first, that there is no target debt ratio².

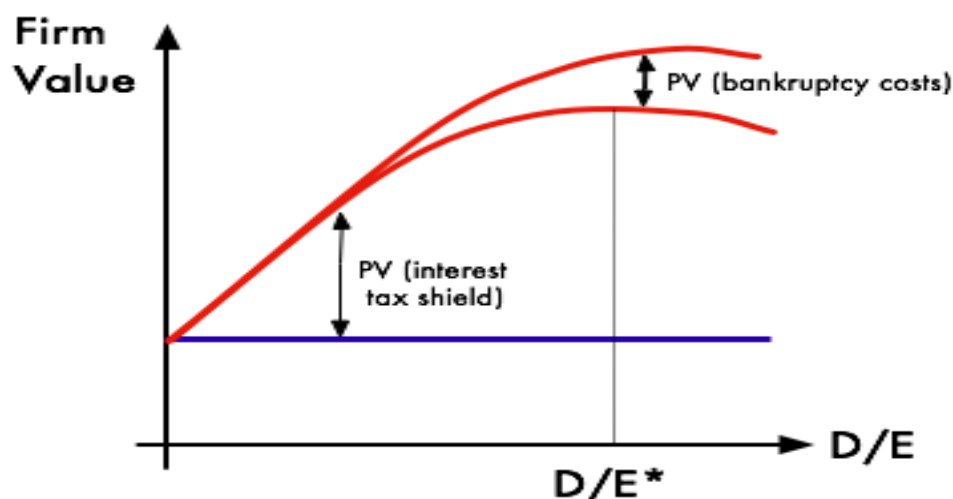
¹SHAH. A, KHAN.S, “determinants of capital structure : evidence from pakistani panel data”, international review of business, Australia, 2007, p.3.

²H. KENT GERALD S.“Capital structure and corporate Financing Decisions”,John Wiley & Sons, Inc,2011, pp151.

2 The trade-off theory

The trade-off theory of capital structure states that managers attempt to balance the benefits of interest tax shields against the present value of the possible costs of financial distress (Myers 2001). This theory originated from the study of Kraus and Litzenberger(1973), who formally introduced the interest tax shields associated with debt and the costs of financial distress into a state preference model. According to Chakraborty(2010), the trade-off theory postulates that some form of optimal capital structure should exist pursuant to the balance between the present value of interest tax shields and the cost of bankruptcy. Bankruptcy costs can be classified under direct and indirect costs. As shown in Baxter (1967), direct costs of bankruptcy include, inter alia, the administrative and legal expenses incurred by a firm that goes bankrupt. On the other hand, the indirect costs relate to the reduction in the market value of the firm due to the firm's inability to service its debt obligations. According to Barclay and Smith (1999: 10) the indirect costs of bankruptcy can constitute a substantial portion of the market value of the firm. Having said this, the dilemma in capital structure theory has been to determine to what extent debt can be employed in order to offset tax implications to the extent that the risk of excessive debt is avoided.

FIGURE7: THE TRADE OF THEORY



Source: Brealey, Myers and Allen (2007, 504)

Figure 7 illustrates the trade-off that exists between the present value of the tax subsidy associated with an increase in leverage and the present value of bankruptcy costs. This provides a scenario whereby firms will seek for the optimal capital structure. This is the level

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at which the tax benefits are maximized while minimizing the risk of bankruptcy, which arises from the use of excessive debt.

3 Agency theory

The agency theory is based on the notion that managers will not always act in the best interest of the shareholders. Jensen and Meckling (1976: 305) further elaborate on this concept by identifying two main conflicts between parties to a company, firstly, between the managers and shareholders, and secondly, between the shareholders and the creditors. In the first instance, managers are tempted to pursue the profits of the firms they manage to their own personal gain at the expense of the shareholders. In the latter instance, debt provides shareholders with the incentive to invest sub-optimally. Harris and Raviv (1991: 301) argue that if an investment yields returns higher than the face value of the debt, the benefits accrue to the shareholders. Conversely, if the investment fails, the shareholders enjoy limited liability by exercising their right to walk away. This leaves the debt holders with a firm whose market value is less than the face value of the outstanding debt.

4 The signaling theory

MM assumes that investors and managers have the same information about a company's future. This is known as symmetric information. Managers, on the other hand, frequently have more knowledge than outside investors. This is referred to as asymmetric information by Ehrhardt & Brigham (2011), and it has a significant impact on the optimal capital structure. Corporate financial choices, according to signaling theory, are signals given by the company's managers to investors in order to shake up these imbalances. The cornerstone of financial communications policy is these signals. The reasoning here, according to Gangeni (2006) the argument here is that management will only issue debt or equity if there are not enough internal resources to finance the desired investments or the risk is not in line with the anticipated returns. In this case, the emphasis will be on identifying what trends in the type, level and reliability of the information supplied. So the managers would not issue additional equity if they thought the current stock price was less than the true value of the stock (given their inside information). Hence, investors often perceive an additional issuance of stock as a negative signal, and the stock price falls.

5 Pecking order theory

The preference of the chosen type of financing is also derived from the size and profitability of a company. First, firms are financed from operating cash flow and, if further capital is needed, borrowed capital is preferred to equity. The issuance of new shares is considered to be the last option and only applied in cases where the debt-to-equity ratio has been exhausted. An equity investment sends negative signals to investors. The chosen date for the issuance of new shares is interpreted by new shareholders as a phase of an enterprise overvaluation. On the other hand, the acquisition of equity is not financially interesting. The asymmetry of information thus favors borrowing before the issue of equity capital. For managers as well as investors act rationally and try to anticipate the thoughts and consequences of the other party (Myers and Majluf, 1984). The idea of Meyer that firms prefer internal to external finance because of adverse selection was refined by Shyam-Sunder and Myers in 1999, and a model was established as follows (Shyam-Sunder and Myers, 1999)

Section three: Empirical studies on capital structure and financial performance

1 Empirical studies about financial performance

1.1 1.1 study of Cuong Duc Pham, Quan Xuan Tran, Lan ThiNgoc Nguyen(2018)

The goal of this research is to examine at how internal variables affect the financial performance of firms listed on the Vietnam Stock Exchange. The panel data regression approach was used in this study to analyze a sample of 30 businesses in the construction materials sector from 2011 to 2015. Using ROA and ROE as dependent factors and five other independent variables: growth ratio, capital structure, fixed capital investment, accounts receivable management, and risk as independent variables.

The findings revealed that the size of the firm, growth, and risk have a substantial and favorable impact on financial success, whereas the other variables had a little impact.

The authors propose that construction materials firms properly identify market demand in order to enhance their efficiency based on the findings. Companies could, for example, concentrate on controlling accounts receivable by modifying credit rules for consumers. In addition, businesses must make better use of their assets.¹

1.2 The study by UI Haq I. (2017)

This study aims to analyze the impact of oil prices on the financial performance of companies in Oman sultanate. The key indicators used to assess financial performance are: Revenue, Profitability and Earnings per share.

The quantitative analysis was conducted by data collected during 4 years which represent the period that experienced the oil counter-shock in 2014. The analysis is based on the total revenue, earnings and earnings per share, of all companies over the period 2012-2015.

¹ CUONG. D, QUAN. X, LAN .T, *Effects of Internal Factors on Financial Performance of Listed Construction-Material Companies: the Case of Vietnam*, Research Journal of Finance and Accounting, Vol.9, No.10, 2018, PP1-7.

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The data was analyzed using correlation, scatter plot, and student test. The results of this study show that company performance and earnings per share are affected by the decline in oil prices.¹

1.3 Study by Sidra Ali Mirza and AttiyaJaved (2013)

Sidra Ali Mirza and AttiyaJaved seek to study the impact of some internal and external factors: ownership concentration, form of ownership, short term debts, long term debts, business risk and firm size on the financial performance of 60 Pakistani firms listed in Karachi Stock Exchange during the period 2007-2011. Econometric results show that: Financial performance is positively influenced by ownership concentration, per capita income and business risk and negatively by inflation and long term debts.²

2 Empirical studies about capital structure

2.1 Rajan & Zingales study 1995

This study was conducted by Rajan and Zingales (1995) where they studied and compared the G7 countries at that time. These countries were United States, Japan, Germany, France, Italy, United Kingdom and Canada. The main objective of their paper was to investigate if other countries' capital structures were different from the United States. They found that the level of leverage in firms is similar across 5 of the countries in the sample except for Germany and the UK, which are lower in their leverage. They also added that there are substantial differences in the institutional characteristics. The differences could be summarized by different tax and bankruptcy costs, corporate control and banks' historical roles. Furthermore, they found that the correlation between leverage and other determinants of capital structure in the US is similar in other countries as well.³

¹UIHaq,I.(2017).ImpactofOilPricesonFinancialPerformanceofCorporateFirms:ASTudyofOmaniCompanies.*InternationalJournalofAccountingResearch*,42(90), 1-8.

²ALI MIRZA. S, JAVED. A, «*Determinants of financial performance of a firm: Case of Pakistani stock market*», in *Journal of Economics and International Finance*, Vol. 5, No. 2, 2013, pp. 43-52.

³R. G. Rajan and L. Zingales, «*What Do We Know about Capital Structure? Some Evidence from International Data*», *The Journal of Finance*, VOL L, N°5, December 1995, p 1453

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2.2 S.Titman & R.Wessels study 1988

Through a study based on about 469 American institutions in which information was available about various Model variables in the period between 1974 and 1982, Using three ratios to measure financial leverage as a dependent variable (long term debt LTD/BVE , short term debt STD/BVE , convertible debt C/BVE , When using the long-term debt ratio as a dependent variable, it was found that there is a positive statistically significant relationship with the wealth variable; And negative statistical significance with the non-diversification variable in products and the size variable, and there was no statistical significance for the other independent variables, and when using the short-term debt ratio, it became clear that there is a negative statistically significant relationship between the dependent variable and the non-diversification variable in products (Uniqueness) and the size variable , there was no statistical significance for the other independent variables, and when the last dependent variable was used, the convertible debt ratio, there was no statistical significance for the independent variables.

2.3 The study of Amarouche K.I.

The purpose of this study is to analyze the determinants of the capital structure of a sample of 31 Algerian firms in the form of joint stock firms, observed over a period of 5 years (from 1997 to 2001). The data used are collected from a database that contains accounting information on firms registered at the level of the National Center of Trade Registers (CNRC). It used as a variable to explain the debt ratio determined by the sum of debts in the short, medium and long term compared to the total assets, through the explanatory variables: economic profitability, asset structure, growth opportunities, size, the level of operational risk.

Using one of the econometric methodologies on Panel data, this study focuses on establishing the main determinants that affect capital structure of Algerian enterprises. The survey sample size is 102 Algerian enterprises, conducted over a four-year period from 2012 to 2015, and the firms are operating in a variety of industries. The Tobit model has identified the majority of the theoretical variables. as well as empirical literature The empirical results of this model clearly suggest that tangibility of assets has a positive impact on debt, which is consistent with the interpretations provided by the information asymmetry theory. As a result, Algerian banks employ a true risk aversion policy, which manifests itself in genuine loan access restrictions.

Chapter two: Financial performance and capital structure

2.4 The study of M. GUERRACHE (2014/2015)¹

The study of M. GUERRACHE aims to explain the financial behavior of a sample of Algerian firms for a period spread between 2005 and 2008. These firms have been selected for several reasons, most probably because of the fiscal changes that occurred during this period. The interest of his study is to try to find the most interpretative theory of the financial behavior of Algerian private firms.

Among the results of his study, he found that:

level of significance (-0.089). This, according to him, is due to the increase in short-term loans (the largest proportion of total debt is short-term debt), this was confirmed by the inverse relationship with a high degree of significance between total debt and short-term debt (-0.178).

- According to the author, there is no significant relationship between size and long- and medium-term debt, and this is due to the lack of trust between banks and firms. Also, a significant positive relationship between size and short-term debt.
- There is a significant negative relationship between profitability and total debt, also with long and medium term debt, which confirms, according to him, the pecking order theory, such that companies with high profitability prefer to finance their needs through self-financing, if this is insufficient, they turn to debt financing.

TABLE 1: SUMMARY OF THE EMPERICAL REVIEW.

authour/years	Sample	dependant Variables	independant Variables	Relati on found
Cuong DUC PHAM, Quan Xuan TRAN, Lan ThiNgoc NGUYEN(2018)	Sample of 30 Vietnamese companies, operating in the building materials sector from 2011 to 2015.	ROA ROE	-size -growth of sales -risks - capital structure -investissement - Accounts receivable management	+ + + - - -
IkramUIHaq(2017)	Analysis is based on the total revenue, earnings and earnings per share, of all companies 2012-2015.	financial performance	-Revenue -Profitability - Earnings per share	+ + +
SidraALI MIRZA et	60 Pakistani companies listed on the Karachi Stock Exchange over	ROE	concentration of	+

قراش محمد, "محددات السياسة المالية للمؤسسات الجزائرية الخاصة. دراسة حالة لعينة من المؤسسات الجزائرية في الفترة بين 2005 و¹

2008", أطروحة لنيل شهادة الدكتوراه في علوم التسيير, المدرسة العليا للتجارة, 2014/2015, ص 282-284

Chapter two: Financial performance and capital structure

AttiyaJAVED (2013)	the period 2007-2011.		ownership -income -inflation -Long-term debt -Short term debts	+ - - NS
Rajan & Zingales study 1995	Studying and comparing the G7 countries in 1995	Level of leverage (STD ,LTD, TD)	-size -profitability -level of guarantee	- + +
S.Titman & R.Wessels study 1988	469 American institutions period between 1974 and 1982	Level of leverage (STD ,LTD, TD)	-size -profitability -level of guarantee	+ - -
IAMAROUCH E	31 Algerian firms in the form of joint stock firms, observed over a period of 5 years (from 1997 to 2001)	Level of leverage (STD ,LTD, TD)	- Profitability = earnings before interest and taxes / total assets - Asset structure = (Net tangible assets + inventory)/ Total assets - growth opportunities= (CA _t -CA _{t-1})/ CA _{t-1} size = ln(sales) -The level of operational risk.	+ - - -
The study of M. GUERRACHE (2014/2015)	Sample of private firms in the period 2005 and 2008	Level of leverage (TD, STD ,LTD)	- Size - Profitability	NS -

Source: Developed from various articles read.

Chapter two: Financial performance and capital structure

Conclusion

This chapter has made it possible to clearly define the concept of performance, to distinguish financial performance and its measurement tools and finally to present the oil market as well as the various counter-shocks experienced by this market.

Indeed, we have found that financial performance is the objective sought by any company and for this the measurement of the latter takes on an essential dimension within any organization whose existence depends on a better use of the means implemented.

Finally, we concluded that fluctuations in oil prices affect economic growth, particularly in exporting countries.

The ability of a company to survive, regardless of its financial structure, depends on its ability to make a profit. If its profitability is seriously impaired, its survival is threatened. In this case, it would be difficult to establish a proper analytical system for measuring performance if the latter was not well defined.

From this chapter, we see that financial performance can be measured by several tools, which may call into question the use of different financial measures as the only system for assessing the achievement of objectives and the success of firms.

Chapter three:

**An empirical study about the impact of oil
crisis on the financial situation of the
Algerian construction firms**

Introduction

The main objective of this chapter is to conduct an empirical analysis on the financial situation of construction firms. This chapter is divided into three sections:

The first section will be devoted to the presentation and description of the sample. In the second section, we will make a descriptive analysis after the presentation of the variables retained as well as the specification of the econometric model and the tests used. Finally, in the last section, we will interpret the results.

Based on a sample of 30 firms from 2012 to 2017, the study has chosen to use the multiple linear regression model with panel data as statistical tool to analyze the impact of oil crisis (2014) on the financial situation of the firms composing our sample.

Section one: A descriptive analysis of the sample and the specification of the econometric model

1 Sample description

Our sample consists of 30 construction firms, the list of these firms is obtained through the practical training carried out in the bank (BADR) and also from the documents drawn from the (CPA) bank including financial statements (balance sheets and income statement) and all information concerning its firms.

The criterion for the selection of the firms was the availability of all the balance sheets and income statements for the period from 2012 to 2017. The description of the sample consists in presenting the distribution of the firms of our study according to the legal status, sectors of activities as well as the size.

1.1 The distribution of firms by legal status

TABLE2 : DISTRIBUTION OF FIRMS ACCORDING TO THEIR LEGAL STATUS

Sample of of the study	LLC	SMLLC	SC	Sample of study
Number of firms	13	7	10	30
percentage	43%	33%	23%	100%

Source: made from the collected data of our sample.

This table shows that our sample is mainly divided, in terms of legal status of the firms, into three distinct legal forms. It is composed of 13 limited liability firms (LLC), 10 joint stock company (SC), 7 Single member limited liability company (SMLLC). They represent respectively 43%, 33%, 23% and the total number of firms studied.

1.2 The distribution of firms by size

The classification of firms in Algeria according to the 2017 finance law and as follows:¹

- **Article 8:** The medium-sized company is defined as a company employing from fifty (50) to two hundred and fifty (250) people and whose annual turnover is between four

¹Loi n° 17-01 du 11 Rabie Ethani 1438 correspondant au 10 janvier 2017

hundred (400) million Algerian dinars and four (4) billion Algerian dinars, or whose annual balance sheet total is between two hundred (200) million Algerian dinars and one (1) billion Algerian dinars.

TABLE3 : DISTRIBUTIONOFFIRMSACCORDINGTOTHEIRSIZE

Size	Large firms	Small and medium firms	total
Number	2	28	30
Percentage	7%	93%	100%

Source: made from the collected data of our sample

According to this table, our sample is composed of 28 small firms that represent 93% of all firms, and 2 large firms that represent 7% of the total number of firms, and 28 medium and large firms that represent 93% of the sample.

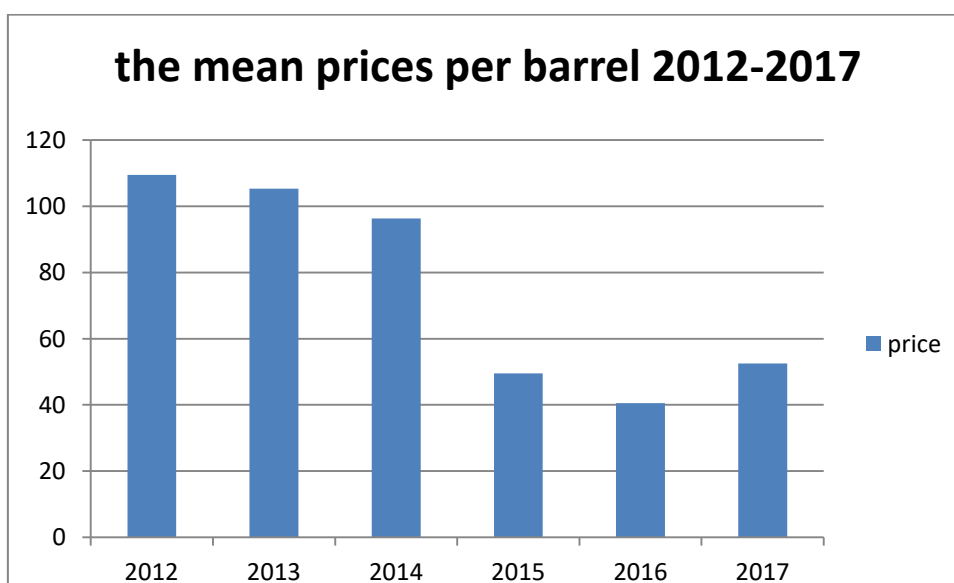
1.3 Variation of oil prices during the period 2012-2017

TABLE 8:THE PRICEPERBARRELBETWEEN 2012 and 2017

YEAR	2012	2013	2014	2015	2017	2017
PRICE OF BARIL	109.45	105.87	96.29	49.49	40.48	52,51

Source : <http://fr.statista.com/statistiques/564926/prix-annuel-du-pétrole-de-l-opec-1960/>

FIGURE8:THEMEANPRICESPERBARREL 2012-2017



Source: made by us from Algeria's foreign trade statistics and reports from the Bank of Algeria.

The diagram above represents the average barrel prices from 2012 to 2017. In 2012 the price of a barrel reached \$109.45, then it slowed down with a rate of (3.38%), but it settled at a level above \$100 (\$105.8) in 2013. The beginning of 2014 saw a slowdown of 9.94% and had the second half of this year prices collapse, falling below the \$ 50 mark and reached the (\$ 49.29) when the year 2015 opened. The main cause was an oversupply. In January 2016 the price of a barrel fell below \$30, the lowest level since 2003, and from February onwards the price rose again and reached an average annual price of \$40.48, in 2017 it reached 52.51.

Given that Algeria is an oil producing country and its economy based on oil, it has experienced a very difficult situation.

Section two: Presentation and descriptive analysis of variables

In this section, we will present the descriptive statistics of the variables retained in the empirical model, and the results of the T-test for the equality of means and the correlation matrix between the variables.

1 Dependent and Independent variables

Dependent variables

In our study we are going to investigate the impact of oil prices shock on indebtedness's level, and on the financial performance of the firms composing our sample, the variables to be explained are divided into 2 categories; the first category are the variables that represent the level of indebtedness which are the total debt (TD) and short-term debt (STD); the second category represent the variables about the financial performance of the firms which are the return on asset (ROA) and the return on equity (ROE).

1.1 Short-term debt (STD)

This ratio is measured by the short-term debt divided by total assets. We use this measure to study the impact of asset financing through the short-term debt on the financial situation of firm.

$$\text{STD} = \text{total short debts} / \text{total assets}$$

1.2 Total term debt (Td)

This variable is defined as the ratio of total debt to total assets, it can be interpreted as the proportion of firms' assets that are financed by debt.

Measured as follow:

$$\text{TD} = \text{total short debts} + \text{total long debts}$$

The interest in choosing these two variables is to measure the firm's debt and financial performance in relation to the 2014 oil crisis.

Indebtedness is also an important factor that determines the performance of a firm. There should be an appropriate financing level that generates the maximum profit for the organization.

1.3 Return on assets (ROA)

The (ROA) gives an idea about the ability of assets to generate earnings. (ROA) tells you what earnings were generated from invested capital (assets).

Its measurement is as follows:

$$\text{ROA} = \text{Net Income} / \text{Total Assets}$$

1.4 Return on Equity (ROE)

This variable is measured by the net income divided by common equity. This ratio is used to measure the profitability of the firm in terms of its equity investments.

It is obtained by the following formula:

$$\text{ROE} = \text{Shareholders' Equity} / \text{Total}$$

Independent variables

1.5 The oil crisis

The country's economy is based on hydrocarbon exports, for this, we will analyze a series of oil prices in the period from 2012 to 2017 to test the influence of its variation on the level of debt and financial performance.

The choc is a dummy variable that takes the value 0 before the crisis (the years 2012-2014) and the value 1 after the crisis (The years 2015, 2016 and 2017).

$$\text{Choc} = \begin{cases} 0, \text{years} \leq 2014 \\ 1, \text{years} > 2014 \end{cases}$$

- **H1:** There is a significant relationship between the shock of 2014 and the level of indebtedness in one hand, on the other hand significant relationship between the shock of 2014 and the financial performance of construction firms in Algeria.

2 Control variable

The explanatory variables that can be considered as determinants of level of indebtedness and financial performance are the following:

2.1 Liquidity (LIQ)

The term “liquidity” expresses the ability of the company to meet its deadlines and repay its debts in the short term, usually within a year. Therefore, the company must have

sufficient resources to pay its financial commitments to its creditors for instance salaries, supplier debts, tax debts, banks, etc.

Liquidity is a measure of the ability to repay short-term debts. It represents the most liquid assets used by the firm to cover its debts.

The ratio of this measure is as follows:

$$LIQ = \text{current assets} / \text{current liabilities}$$

H2: The liquidity affects positively the financial performance and negatively the level of indebtedness.

2.2 Size

Large firms are less exposed to the risk of bankruptcy than the smaller firms. For this, size can play a determining role in the capacity of bank indebtedness. In our analysis, size is measured as natural logarithm of Sales growth.

The relationship between firm size and financial performance has been extensively studied in theories of the firm. Moreover, many studies demonstrate the influence of firm size on financial performance. Some have empirically demonstrated a positive relationship between size and performance.

$$SIZE = \ln(SG)$$

H3: firm's size affects positively the financial performance and negatively the level indebtedness.

3 Descriptive statistics and test of equality of means

The descriptive statistics of dependent and independent variables by using STATA 13 are reported in Table 3.

TABLE4 : DESCRIPTIVESTATISTICS (2012-2017)

Variable	years	obs	Mean	Std.Dev	Min	Max
ROA	2012	30	0,0510836	0,0524834	0,0007488	0,2093424
	2013	30	0,0921078	0,1987058	-0,0319015	1,11129

	2014	30	0,032363	0,0962737	-0,4322505	0,1539503
	2015	30	0,0576862	0,0511733	-0,0452062	0,1905678
	2016	30	0,567999	0,050555	-0,0003665	0,2288632
	2017	30	0,0374946	0,0587271	-0,113743	0,1701601
ROE	2012	30	0,4165641	0,5962353	0,0113465	2,442354
	2013	30	0,4685419	0,6479631	-0,0937565	2,658982
	2014	30	0,1025842	0,416507	-1,896671	0,8827327
	2015	30	0,1572354	0,1535034	-0,1796445	0,714934
	2016	30	0,169784	0,1824464	-0,0016726	0,8182538
	2017	30	0,2868435	0,976511	-0,3963885	5,336744
LQD	2012	30	8,818382	37,6288	0,0298428	207,4415
	2013	30	2,72118	6,740803	0,1407521	37,81825
	2014	30	2,264872	3,754831	0,0981837	21,37755
	2015	30	1,986688	2,194953	0,4930516	12,60165
	2016	30	2.092108	2.384765	.5782478	11.35928
	2017	30	1,83232	1,566294	0,5223242	7,992441
STD	2012	30	0,5869261	0,2952206	0,0546734	0,9998542
	2013	30	0,6360734	0,3894431	0,0262686	2,094573
	2014	30	0,537261	0,2520847	0,0274739	0,9134587
	2015	30	0,5349032	0,2493223	0,0573501	0,9722993
	2016	30	0,5269218	0,2319259	0,0684147	0,9175512
	2017	30	0,5531043	0,2210077	0,1097086	0,8794156
TD	2012	30	0,6677755	0,2857121	0,0546734	0,9998542
	2013	30	0,7170042	0,4266922	0,0262686	2,456488
	2014	30	0,617583	0,2450654	0,0274739	0,9622053
	2015	30	0,5840768	0,2423393	0,0573501	0,9817805
	2016	30	0,6121645	0,2180278	0,1435038	0,9232509
	2017	30	0,6314897	0,1953111	0,211572	0,9186451
SIZE	2012	30	9,941286	4,376817	6,748775	20,58403
	2013	30	9,979216	4,391351	6,761241	20,97699
	2014	30	10,12456	4,525704	6,572284	21,29711

	2015	30	10,25782	4,578443	6,975374	21,10531
	2016	30	10,35984	4,588517	6,94289	20,97108
	2017	30	10.23007	4.461724	6.96206	20.95671

Source: statistical processing of data according to STATA 13.

The descriptive statistics of the dependent variables show that the mean of return on asset (ROA) is limited between (3%) and (9%) during the period (2012-2017), the latter was in 2013 as highest degree of performance and the lower with (3%) during the oil crisis in 2014 ,while the average return on equity (ROE) is increasing from (41%) in 2012 to the maximum percentage of (46%) in 2013 then it falls down to a minimum percentage of (10%) due to the oil choc.

The total debt rate is relatively stable over the study period at 6%.On the other hand; the short-term debt is almost stable with averages 5.5 %, from 2012 to 2017.

Moreover, liquidity is generally unstable with averages of 8.8%, 2.7%, 2.26%, 2%, 2.09 %, and 1.83% respectively from 2012 to 2017.

The average size of firms (respectively 2012 to 2017), despite the oil crisis of 2014, firms have continued their progress.

Comparison of variables with respect to the shock

In our sample, we followed 30 firms during the period 2012- 2017. Below, a comparison of variables before and after the shock. We consider the binary variable 'choc' which takes the value 0 before the oil crisis (i.e. years 2012-2014), and the value 1 after the crisis (2015-2017).

TABLE5 :RESULTSOFTHE T-TESTFOREQUILITYOFMEANS

	Choc=0		Choc=1		T	Sig
	Mean	Std.Dev	Mean	Std.Dev		
ROA	0,0585181	0,1319574	0,0506602	0,0538298	t = 0.5231	Ns
ROE	0,3292301	0,5793079	0,204621	0,5767877	t = 1.4461	*
LQD	4,674091	22,3789	1,958114	2,036586	t = 1.1592	Ns
STD	0,5867535	0,3164964	0,5383098	0,2319889	t = 1.1712	Ns
TD	0,6674542	0,3273517	0,6092437	0,2178036	t = 1.4045	*
Size	10,08187	4,419796	10,23005	4,456769	t= -02239	Ns
oil	106,943333	4,8	50,3633333	3,82	t = 87,22	Ns

Source : statistical processing of data by STATA 13.0 program

(***) Significant at 1% (highly significant)

- (**) Significant at 5% (significant)
 (*) Significant 10% (insignificant)
 (Ns) Not significant

The Student test shows that only (ROE) and (TD) are significant.

After the results obtained from the T-test of equality of means presented in Table 5, we can notice that the mean of oil price fell by more than half after the crisis. The mean of the firm size increases proportionally after the shock. For liquidity, (LQD) we notice that the mean fell by almost 1/3 after crisis.

Correlation analysis

The correlation matrix shows the relationship or the association between the dependent variables and independent variables.

TABLE6:CORRELATION MATRIX

	STD	TD	ROA	ROE	LQD	SIZE	CHOC
STD	1						
TD	0.8474*	1					
ROA	-0.1826*	-0.2343*	1				
ROE	0.1407	0.1925*	0.3337*	1			
LQD	-0.2387*	-0.2231*	0.0664	0.2205*	1		
SIZE	-0.0666	-0.0909	0.0056	-0.0958	-0.0790	1	
CHOC	-0.0876	-0.1109	-0.0384	-0.1129	-0.0866	0.0168	1

Source : statistical processing of data by STATA 13.0 program

The above table 6 indicates the correlation matrix of dependent and independent variables in the period 2012-2017. It shows that the short term debt (STD) and (TD) variables are negatively and significantly correlated with the (ROA) and (LQD) on one hand, in the other hand We notice that the shock has a negative impact and not significant on (STD), (TD), (ROA), (ROE) and (LQD).

The table shows that the correlations between the explanatory variables are relatively weak, so there are no problems of multi-co linearity.

To verify this latter we apply the (VIF) test as follows

4. Multicollinearity of explanatory variables

In a regression, multicollinearity is a problem that arises when some of the model's predictor variables are correlated with others. To measure multicollinearity, we will look at the variance

inflation factors (VIF). This indicator measures the degree, which the standard error is increased by due to the correlations of one variable with others. Thus, the degree of tolerance, which is equal to $1/VIF$. According to Chatterjee, Hadi and Price (2000), when the VIF is less than 10, and the degree of tolerance is greater than 0.1, we can assume the absence of multicollinearity.

TABLE7: MULTICOLLENEARITYTESTUSINGTHE VIF METHOD

Variable	VIF	1/VIF
ROA	1.26	0.795061
ROE	1.25	0.801588
TD	1.18	0.851010
CHOC	1.02	0.977983
SIZE	1.02	0.985079
Mean VIF	1.14	

Source: results obtained from STATA13

From this table, we notice that the values of the VIFs are all less than 1.26, while the values of the tolerance are all more than 0.7, which indicates the absence of the multicollinearity between the explanatory variables of the model.

Section three: Results and discussion

The specification of the econometric model will be presented and the tests will be applied in this section.

1 Model specification

1.1 Fisher test

In panel data studies, it is necessary to ensure the homogeneous or heterogeneous specification of the data generating process. That is to know the best model for the estimation. This step serves to discriminate between the specific effect (fixed effect or random effect) and the common effect. We will use the software STATA 13 to perform the specification test and the estimations. The detailed results of the test and regression will be presented only in the synthesis of these results, which will be highlighted in the rest of the document.

This test allows checking the global homogeneity of the model; it also serves as a global significance test. The hypotheses of the test are the following:

H0: The coefficients of the variables are not different from zero.

H1: The coefficients of the variables are different from zero.

The calculated Fisher statistic follows under the hypothesis H0 a Fisher distribution. The null hypothesis is rejected if the calculated statistic is more than the value read on the table.

The results of the tests are as follows:

TABLE8: FISHERTEST

Fixed-effects (within) regression		Number of obs = 180
Group variable: ent		Number of groups = 30
Model 1: STD	F test that all $u_i=0$: F(29, 145)= 5.83	Prob > F = 0.0000
Model 2: TD	F test that all $u_i=0$: F(29, 145)= 6.27	Prob > F = 0.0000
Model 3 :ROA	F test that all $u_i=0$: F(29, 146) = 1.63	Prob > F = 0.0317
Model 4: ROE	F test that all $u_i=0$: F(29, 146) = 1.49	Prob > F = 0.0650

According to the results of the Fisher test, we have the probability value of the test statistic is equal to 0.00000 in the first and the second model, and 0.0317 in the third model. so these three probabilities are lower than 5% (the significance level), which shows the existence of an individual effect (fixed or random)

In the fourth model, we found that the probability value of the test statistic = 0.0650 is more than 5 % (the significance level) which shows the existence of a common effect, so this model is not significant.

1.2 Hausman test

After having verified that the designed model has a specific effect, it remains to determine whether this effect is fixed or random. In order to do this, we proceed with the help of the STATA 13 software to the Hausman test, this test is based on the following hypotheses:

H0: Presence of fixed effects.

H1: Presence of random effects.

The results of the Hausman post estimation test are presented below.

TABLE9: HAUSMANTEST

Test: Ho: difference in coefficients not systematic	
Model 1: STD	chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 3.09
	Prob>chi2 = 0.5431
Model 2: TD	chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 6.52
	Prob>chi2= 0.1633
Model 3: ROA	chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 1.55
	Prob>chi2 = 0.8171

According to the Hausman test, we have the result probability = 0.8144 in the first model, 0.1633 in the second model and 0.8171 in the third model which is greater than 5%. Therefore we accept H1 which indicates the existence of random individual effects.

2 Results and discussions

In order to be able to determine the impact of the decline of oil prices in 2014 on the financial situation of construction firms, we opted for estimation on panel data using the random-effect multiple regression method with the statistical program (stata13).

We chose the variables based on previous studies that present a set of hypotheses to be tested on the few determinants of the financial situation of the firm.

After having specified the econometric model to be estimated from a panel data regression applied to the statistical program STATA 13. In the first place, we will explain the financial situation.

The total debt model (TD) and the short term debt model (STD)

The Hausman test was conducted to decide between fixed effect and random effects models. For both models the values for random effects model were significant, for the first model the p-value of chi2 was 0.5431 and for model two it was 0.1633 pointing towards the significance of random effects model.

Random effect model was applied for both financing measures separately.

TABLE10:REGRESSIONRESULTSOF THE FIRSTMODEL TD

TD	Coef.	Std. Err.	P> z
ROA	-0.3474574	0.162248	0.032 **
LQD	-0.0028146	0.0010019	0.005***
SIZE	-0.0061627	0.0080255	0.443
CHOC	-0.0684093	0.0291867	0.019**
cons	0.7641274	0.0902471	0.000

Note:* significance at $p<0.10$; ** significance at $p<0.05$; *** significant at $p<0.01$

TABLE11: REGRESSION RESULTSOF THESECONDMODEL STD

STD	Coef.	Std. Err.	P> z
ROA	-0.2911075	0.1660119	0.08*
LQD	-0.0031203	0.0010253	0.002***
SIZE	-0.0048839	0.0081578	0.549
Choc	-0.0575563	0.0298735	0.054*
Cons	0.6677022	0.0917591	0.000

Note:* significance at $p<0.10$; ** significance at $p<0.05$; *** significant at $p<0.01$

The results of the regression show that the model one and two can be presented as follows:

Model 1:

STD= 0.6677022 -0.5279621 ROA+0.11261 ROE- 0.0031015 LQD -0.0045279 SIZE- 0.0603463 Choc

Model 2:

TD= 0.7641274-0.4363217 ROA+0.0737098 ROE- 0.003986 LQD -0.0040101 SIZE-0.047573 Choc

According to the regression results, both model have the same results, the above table shows that the return on assets (ROA), liquidity (LQD), and shock are significant, while the other explanatory variable: firm size (SIZE) is not significant.

2.1 Financial performance

The firm’s performance is the measurement of what had been achieved by a firm, which shows good conditions for certain period of time. The purpose of measuring the achievement is to obtain useful information related to flow of fund, the use of fund, effectiveness, and efficiency. Besides, the information can also motivate the managers to make the best decision.

In this model return on assets was taken as the measure of firm's financial performance.

TABLE12: REGRESSIONRESULTSOF THE THIRD MODEL

ROA	Coef	Std. Err.	P> z
LQD	0.000046	0.0004846	0.924
SIZE	-0.0001939	0.0021444	0.928
STD	-0.0638882	0.0303087	0.035**
Choc	-0.0111311	0.014283	0.436
Cons	0.0980364	0.0317903	0.002

The results of the regression show that the model three can be presented as follows:

Model 3:

ROA = 0.0980364 - 0.000046 LQD - 0.0001939 SIZE - 0.0638882STD - 0.0111311Choc

From the results of random effect model we find that short-term debt has a negative and significant influence on firm performance, indicating that in case of more financing of assets through these sources the firms' profits may suffer, because of heavy interest payments.

The firm size affects negatively its performance while the liquidity of firm's assets will positively influence its performance.

There is a negative relationship between the shock (choc) and the financial performance measured by ROA.

3 Interpretation of results

SIZE: the firm’s size measured by the logarithm of growth sales is negatively and not significant with total debt and short-term debt.

size is a reflection of the firm's financial health and would be negatively correlated with debt. This negative influence is explained by the fact that a profitable firm will be able to finance its activities by its own resources and therefore will use less debt.

Financial performance: Firm's financial performance is measured by ROA, the ROA variable is measured by the ratio net income to total assets. It has a negative and significant impact. This result is in line with the predictions of the pecking order theory (POT) which states that the more profitable a firm is, the less it will contract debt since it will first prefer to finance itself by its free cash flow and then it will turn to debt if internal financing is not sufficient.

Indeed, several empirical studies that we have treated have demonstrated this inverse relationship between profitability and total debt including Titman & Wessels (1988) in the USA and Rajan & Zingalas (1995) in industrialized countries and Guerrache (2014) in Algeria.

Liquidity: According to the results obtained above, there is a significant negative relationship at 1 % between liquidity and the short-term debt and total debt, which means that the more the current assets cover the current liabilities, the lower the probability of having a short-term debt, then we deduce that the least liquid firms have a better chance of accessing to the short-term financing.

Liquidity (LIQD) also negatively affects the debt ratio. This result means that the more current assets cover current liabilities, the lower the use of short-term debt.

Firms with high liquidity tend to take on less debt.

Shock: Oil prices negatively affect debt, this means that the probability of having access to debt before the 2014 oil crisis is lower than the probability of having access to debt after the 2014 oil crisis.

TABLE12: VALIDATION OF HYPOTHESIS

Based on the empirical results obtained, we will in the following explain and verify the validity of our hypotheses

Hypothesis	result
<p>H1: There is a significant relationship between the shock of 2014 and the level of indebtedness in one hand, also with financial performance of construction firms in Algeria.</p> <ul style="list-style-type: none"> ➤ Indebtedness ➤ financial performance 	<p>Accepted Rejected</p>

<p>H2: Liquidity impact positively the financial performance and negatively the level of indebtedness</p> <ul style="list-style-type: none"> ➤ financial performance ➤ level of indebtedness 	<p>Accepted Accepted</p>
<p>H3: firm's Size impact positively financial performance and negatively the level indebtedness.</p> <ul style="list-style-type: none"> ➤ financial performance ➤ level of indebtedness 	<p>Rejected Accepted</p>

Conclusion

In this chapter, both descriptive and analytical analysis were used, the panel regression to examine the impact of oil shock on financial situation (the financial performance and the level of indebtedness) (STD), (TD), (ROA) and (ROE) are chosen as dependent variables.

The test of evaluation of the models (Fisher's test) gave satisfactory results on the acceptance of the three first models, the one explaining ROA and the one explaining short term debt and total debt.

Our results shows that oil crisis have a negative and significant impact on the level of indebtedness measured by short-term debt and long-term debt.

The panel regression results show that shock have no significant impact on ROA.

General Conclusion

General Conclusion

This research aiming at making crystal clear, the idea of the impact of the oil crisis of 2014 on the financial situation of construction firms this paper research aims to study the existence of the impact of oil shock (2014) on the financial situation of construction firms while referring to data from the (BADR) Bank and data from the (CPA) using a sample of 30 construction firms. This allowed us to carry out an econometric study in order to answer our problematic. We use a regression of random effect model using STATA 13. For both financial performance , and indebtedness ratios.

We attempt to answer the following question:

What effects has the oil crisis of 2014 had on the financial situation of Algerian construction companies?

To answer the central problem of our research, we divided our dissertation into two parts:

The first part is a theoretical part, which deals with the concepts related to the oil crisis ,financial performance and capital structure.

The second part is an empirical part. Which analysis the impact of the drop of oil prices on the performance of Algerian construction firms through a study on data from a sample of 30 firms observed over a period from 2012 to 2017, we tried to model the relationship between the firm's financial situation that contents two fields the first is the financial structure and the second is the financial performance of construction firms measured by the ratios: total debt (TD), short-term debt respectively, and financial profitability (ROE) and economic profitability (ROA) for financial performance as well as the control variables size, liquidity and shock .

The last oil counter-shock started from the second half of 2014, when the price of oil dropped significantly, this price drop reflected on oil market balance. Given the place of oil in the world economy and its big importance, such a decline induces multiple consequences. For oil-exporting countries, such as Algeria, this counter-shock has not only affected debt state revenues, but also should impact public and private firms including construction firms.

The results obtained:

According to the results observed in the empirical case of this research, the short term debt and the total debt are negatively and significantly influenced by the oil shock; however there is no influence of oil shock on the (ROA) ratio, for the ratio of (ROE) there is insignificant impact between the latter and oil shock. Which confirms partially the hypothesis (H1).

The (STD) influenced negatively the financial performance measured by (ROA), these results come to confirm the result of the packing financing theory (POT).

There is a negative and insignificant relationship between the liquidity and the variables STD and TD, and also the relationship between the liquidity and ROA is n insignificant which confirms the hypothesis (H2).

Regarding the variables SIZE, there is a negative and no significant relationship between the variable SIZE and the variable of financial performance (ROA) and the level of indebtedness (STD, TD), the (H3) was rejected for financial performance and accepted for the level of indebtedness.

The Student test shows that only (ROE) and (TD) are significant.

Limitation of the study

Among the main limitations of this research we cite:

The size of the sample and the lack of information, the study is based on a small sample of 30 firms, this is due to the unavailability of accounting information (Assets, liabilities and income statements) for several periods especially before the year 2014, which reduced the size of our sample to 30 firms. For these reasons we are unable to generalize the results obtained on the totality of the construction firms.

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ANNEXES

ANNEX1: DATA BASE

ENT	YEARS	ROA	ROE	Liquidity	SIZE	STD	TD	CHOC
1	2012	0.16128	0.20855	2.78320	19.11720	0.22665	0.22665	0
1	2013	0.15443	0.21161	1.86098	19.45235	0.27019	0.27019	0
1	2014	0.13203	0.16665	2.91023	19.65440	0.20771	0.20771	0
1	2015	0.13526	0.16733	2.71534	19.84154	0.19165	0.19165	1
1	2016	0.13322	0.16878	2.36848	19.88151	0.21071	0.21071	1
1	2017	0.11877	0.29949	1.14212	19.78809	0.60342	0.60342	1
2	2012	0.00846	0.05214	0.45925	16.10734	0.83769	0.83769	0
2	2013	0.02948	0.16316	0.33765	18.03941	0.81932	0.81932	0
2	2014	0.06063	0.20647	0.66534	18.50745	0.70636	0.70636	0
2	2015	0.06007	0.15365	1.23171	18.57147	0.60906	0.60906	1
2	2016	0.06156	0.21606	0.89121	18.85517	0.71507	0.71507	1
2	2017	0.01839	0.05044	0.52232	17.16465	0.61683	0.63531	1
3	2012	0.06099	0.08626	2.60280	18.59922	0.19332	0.29295	0
3	2013	0.03164	0.04571	1.69132	17.34284	0.24302	0.30788	0
3	2014	0.04018	0.08336	1.06882	18.82338	0.46944	0.51799	0
3	2015	0.08004	0.14332	1.70600	19.50965	0.30745	0.44155	1
3	2016	0.04405	0.09869	1.25163	19.52759	0.44527	0.55366	1
3	2017	0.03205	0.07838	1.15684	19.53644	0.49121	0.59103	1
4	2012	0.02033	0.02538	2.13092	18.50699	0.19410	0.19892	0
4	2013	0.00406	0.00549	0.98549	17.30159	0.25620	0.26106	0
4	2014	0.00551	0.00928	0.75397	17.53636	0.25171	0.40617	0
4	2015	0.02265	0.04207	1.08914	18.04354	0.30505	0.46163	1
4	2016	0.01237	0.02127	0.77996	17.91046	0.38689	0.41840	1
4	2017	-0.04557	-0.08157	0.69896		0.42208	0.44136	1
5	2012	0.05482	0.22137	1.98446	17.48367	0.24800	0.75236	0
5	2013	0.09031	0.21069	0.14075	17.47265	2.09457	2.45649	0
5	2014	0.05910	0.14590	1.66687	17.08475	0.29858	0.59489	0
5	2015	0.03879	0.06492	1.12867	17.67682	0.30958	0.40242	1
5	2016	0.04736	0.11051	1.23276	18.30369	0.40723	0.57141	1
5	2017	0.06428	0.08221	5.52886	18.15548	0.10971	0.21810	1
6	2012	0.02315	0.32713	0.38960	20.58403	0.85731	0.92922	0
6	2013	0.10542	0.74560	0.44673	20.97699	0.82206	0.85861	0
6	2014	0.07751	0.35161	0.60415	21.29710	0.74308	0.77956	0
6	2015	0.05412	0.19406	0.50195	21.10531	0.68391	0.72111	1
6	2016	0.01784	0.05715	0.57825	20.97108	0.64866	0.68788	1
6	2017	0.01457	0.04374	0.52589	20.95671	0.65214	0.66680	1
7	2012	0.01532	0.05879	1.10123	7.46376	0.73946	0.73946	0
7	2013	-0.00569	-0.02536	1.07055	7.38703	0.77562	0.77562	0
7	2014	-0.00732	-0.02387	1.25012	7.72969	0.69337	0.69337	0
7	2015	-0.04521	0.17964	0.73947	7.72164	0.74836	0.74836	1

7	2016	0.03130	0.12968	0.86209	7.12262	0.75867	0.75867	1
7	2017	0.01911	-0.05875	0.82965	7.56098	0.67466	0.67466	1
8	2012	0.02108	0.21491	1.07119	7.37495	0.90190	0.90190	0
8	2013	0.07721	0.51552	1.06848	7.92682	0.85023	0.85023	0
8	2014	0.05704	0.36697	1.08198	7.97085	0.84457	0.84457	0
8	2015	0.05279	0.28622	1.17092	8.07453	0.81557	0.81557	1
8	2016	0.07526	0.40376	1.18519	8.19186	0.81360	0.81360	1
8	2017	0.09639	5.33674	1.11643	8.22099	0.85090	0.85090	1
9	2012	0.03539	1.04621	1.77938	6.86368	0.77843	0.94299	0
9	2013	0.05790	0.90145	1.32721	7.12950	0.68520	0.93577	0
9	2014	0.01948	0.08472	1.56375	6.75559	0.57485	0.77008	0
9	2015	0.01721	0.09449	1.44686	6.97537	0.66483	0.81785	1
9	2016	0.01292	0.07800	1.44178	7.82757	0.69269	0.83437	1
9	2017	0.01742	0.10997	1.23814	6.96206	0.80713	0.84156	1
10	2012	0.02275	0.17122	1.01703	7.37274	0.86716	0.86716	0
10	2013	0.02750	0.17493	1.09004	7.47179	0.84522	0.84522	0
10	2014	0.04809	0.26093	0.96680	7.81975	0.81571	0.81571	0
10	2015	0.04347	0.20484	1.08798	7.92684	0.78778	0.78778	1
10	2016	0.06575	0.26916	1.21414	8.05249	0.75573	0.75573	1
10	2017	0.03523	0.12601	1.31806	7.68907	0.72045	0.72045	1
11	2012	0.02497	0.16917	0.82774	9.12298	0.85241	0.85241	0
11	2013	0.01322	0.09327	0.80331	8.90783	0.85823	0.85823	0
11	2014	0.01485	0.02394	0.09818	8.75205	0.84024	0.84024	0
11	2015	0.00497	0.03155	0.92199	8.68376	0.84237	0.84237	1
11	2016	0.00410	0.02875	0.95344	8.83069	0.85726	0.85726	1
11	2017	0.00208	0.01613	0.88455	9.08021	0.87075	0.87075	1
12	2012	0.00270	0.07809	1.54347	7.90325	0.57378	0.57378	0
12	2013	1.11129	1.70253	2.49309	7.29656	0.34727	0.34727	0
12	2014	0.02960	0.05562	1.84533	8.18752	0.46788	0.46788	0
12	2015	0.03292	0.05460	2.03329	8.38887	0.39712	0.39712	1
12	2016	0.02881	0.05345	1.73304	8.44791	0.46094	0.46094	1
12	2017	0.01982	0.03982	1.64123	8.40799	0.50218	0.50218	1
13	2012	0.03278	0.08670	1.46625	7.46542	0.62188	0.62188	0
13	2013	0.02618	0.06210	1.56800	7.41842	0.57845	0.57845	0
13	2014	0.03278	0.08670	1.46625	7.46542	0.62188	0.62188	0
13	2015	0.02618	0.06210	1.56800	7.41842	0.57845	0.57845	1
13	2016	0.01697	0.06754	1.30458	7.64514	0.70753	0.74882	1
13	2017	0.00376	0.01499	1.31146	7.33575	0.70891	0.74947	1
14	2012	0.00697	0.01135	4.68125	7.45635	0.12886	0.38566	0
14	2013	-0.03190	-0.09376	1.60277	6.95875	0.50417	0.65974	0
14	2014	0.02269	0.04932	2.59734	7.22283	0.33997	0.53994	0
14	2015	0.05202	0.10082	2.95861	7.63966	0.28242	0.48406	1
14	2016	0.02814	0.05184	3.67668	7.38446	0.24499	0.45194	1
14	2017	-0.11374	-0.20540	4.19404	7.19737	0.19863	0.44623	1
15	2012	0.08135	0.11311	3.36271	7.92872	0.21170	0.28077	0
15	2013	0.12738	0.15969	4.91922	8.24630	0.16013	0.20238	0

15	2014	0.06769	0.07541	2.92747	8.22326	0.24854	0.26476	0
15	2015	0.06343	0.10136	2.52715	8.63179	0.36711	0.37427	1
15	2016	0.03865	0.07846	1.80444	8.58836	0.50192	0.50741	1
15	2017	0.00861	0.01828	1.75536	8.53124	0.52515	0.52895	1
16	2012	0.13725	0.36614	1.27373	7.53139	0.62515	0.62515	0
16	2013	0.10956	0.24779	1.49057	7.42391	0.55784	0.55784	0
16	2014	0.11368	0.26788	1.59874	7.68865	0.57564	0.57564	0
16	2015	0.19057	0.25692	3.13597	7.67833	0.25825	0.25825	1
16	2016	0.13596	0.26286	1.69216	7.73625	0.48278	0.48278	1
16	2017	0.17016	0.56917	1.13796	7.92559	0.70104	0.70104	1
17	2012	0.02811	0.44431	0.59201	8.42131	0.56971	0.93672	0
17	2013	0.06405	1.85348	0.98798	8.31900	0.47768	0.96544	0
17	2014	0.02885	0.40535	1.07444	8.41803	0.56108	0.92883	0
17	2015	0.00840	0.11571	1.14637	8.34623	0.63357	0.92741	1
17	2016	0.00630	0.07736	1.30480	8.14376	0.60704	0.91852	1
17	2017	0.00590	0.07257	1.38120	7.99364	0.63021	0.91865	1
18	2012	0.11749	0.12429	16.70774	7.63170	0.05467	0.05467	0
18	2013	0.06606	0.06784	37.81825	7.18654	0.02627	0.02627	0
18	2014	0.15395	0.15830	21.37755	7.28125	0.02747	0.02747	0
18	2015	0.06788	0.07200	12.60165	7.74163	0.05735	0.05735	1
18	2016	0.05298	0.10560	1.81501	7.65833	0.49829	0.49829	1
18	2017	0.03622	0.08943	1.61407	7.75258	0.59506	0.59506	1
19	2012	0.03909	0.23517	0.93771	6.88878	0.83379	0.83379	0
19	2013	0.10136	0.31893	0.90239	7.17342	0.68218	0.68218	0
19	2014	0.05481	0.19350	1.10262	7.16220	0.71675	0.71675	0
19	2015	0.04724	0.18826	1.17954	7.25489	0.74907	0.74907	1
19	2016	0.08013	0.10359	0.91446	7.72598	0.55958	0.55958	1
19	2017	0.03696	0.04722	1.53592	7.48553	0.44042	0.44042	1
20	2012	0.11607	2.05782	207.44153	7.31283	0.05769	0.14309	0
20	2013	0.13665	0.33420	1.48160	7.67286	0.57990	0.59111	0
20	2014	0.07510	0.12741	2.21822	7.30041	0.40437	0.41053	0
20	2015	0.14121	0.24556	2.37968	7.59843	0.39494	0.42495	1
20	2016	0.13774	0.22086	2.44071	7.59281	0.37632	0.37632	1
20	2017	0.03767	0.07734	2.00933	7.73955	0.41761	0.51295	1
21	2012	0.03264	0.07821	1.32185	6.84602	0.44031	0.59837	0
21	2013	0.15928	0.25466	2.48186	7.49833	0.23801	0.37454	0
21	2014	0.11036	0.16390	2.73931	7.43958	0.24725	0.32666	0
21	2015	0.09288	0.12976	3.64196	7.24004	0.22180	0.25432	1
21	2016	0.07576	0.10553	2.67561	7.25612	0.27416	0.28209	1
22	2017	0.07437	0.14144	1.80804	7.40954	0.46892	0.47421	1
22	2012	0.03108	0.16693	0.96369	7.97181	0.71999	0.81380	0
22	2013	0.02656	0.14784	1.19639	7.98370	0.64395	0.82034	0
22	2014	0.12523	0.43153	1.60645	7.97096	0.54314	0.70980	0
22	2015	0.08514	0.19605	1.35704	7.98093	0.56572	0.56572	1
22	2016	0.03110	0.07015	1.45598	7.75163	0.55669	0.55669	1
22	2017	0.10926	0.17577	2.25565	7.85307	0.37837	0.37837	1

23	2012	0.02790	0.51860	1.03455	8.23221	0.94621	0.94621	0
23	2013	0.03439	1.44125	0.95431	7.83838	0.97723	0.97723	0
23	2014	-0.43225	-1.89667	0.75929	8.08153	0.84345	0.84345	0
23	2015	0.03181	0.05284	0.49305	7.64578	0.72686	0.72686	1
23	2016	0.05929	0.06922	9.60296	7.95668	0.08745	0.14350	1
23	2017	0.01697	0.03188	2.18286	7.81293	0.41496	0.46751	1
24	2012	0.01749	1.61739	1.39960	6.74877	0.65840	0.98373	0
24	2013	0.06010	0.92032	1.59128	6.76124	0.14446	0.98403	0
24	2014	0.03336	0.88273	3.30941	6.57228	0.29002	0.96221	0
24	2015	0.17257	0.71493	1.43911	7.16224	0.63509	0.75862	1
24	2016	0.05053	0.46082	11.35928	6.94289	0.06841	0.91357	1
24	2017	0.05968	0.52837	7.99244	7.01155	0.12395	0.88705	1
25	2012	0.03968	0.09918	1.16284	8.18966	0.59990	0.59990	0
25	2013	0.01286	0.02357	1.41596	7.74516	0.45458	0.45458	0
25	2014	0.00524	0.00796	2.10969	7.31552	0.34200	0.34200	0
25	2015	0.07623	0.11817	2.09163	7.88697	0.35487	0.35487	1
25	2016	0.11029	0.11907	1.84869	8.12499	0.34283	0.34283	1
25	2017	0.10579	0.13418	3.06868	8.02264	0.21157	0.21157	1
26	2012	0.00817	0.32548	0.93678	9.44050	0.82304	0.97490	0
26	2013	0.00945	0.35569	0.79277	9.68868	0.93751	0.97344	0
26	2014	0.00384	0.07770	0.80426	10.09415	0.91346	0.95167	0
26	2015	0.00514	0.28216	0.91613	9.00082	0.97230	0.98178	1
26	2016	0.06280	0.81825	1.01191	9.62171	0.91755	0.92325	1
26	2017	0.14472	0.72719	1.19478	9.79186	0.79672	0.80099	1
27	2012	0.20934	0.40919	1.13322	9.10909	0.48840	0.48840	0
27	2013	0.05202	0.14000	0.94331	8.73804	0.62841	0.62841	0
27	2014	0.07936	0.25458	1.03262	9.03168	0.68829	0.68829	0
27	2015	0.08716	0.25115	0.89891	9.15428	0.65296	0.65296	1
27	2016	0.22886	0.59010	1.44673	9.38092	0.61216	0.61216	1
27	2017	0.06744	0.23042	1.24634	9.27531	0.70732	0.70732	1
28	2012	0.03099	0.23174	0.92566	8.37130	0.85711	0.85711	0
28	2013	0.03530	0.23529	0.97201	8.38810	0.83906	0.83906	0
28	2014	0.02894	0.29711	0.90022	8.94012	0.81722	0.90261	0
28	2015	0.05756	0.44593	0.84798	9.12670	0.85853	0.87091	1
28	2016	0.04586	0.19815	0.90584	9.00917	0.72011	0.76854	1
28	2017	0.02138	0.10129	0.94256	8.76803	0.78569	0.78894	1
29	2012	0.00075	2.44235	0.02984	8.84709	0.99985	0.99985	0
29	2013	0.00022	2.65898	6.14537	8.77983	0.99891	0.99927	0
29	2014	0.01028	0.01597	5.12417	8.82965	0.14297	0.35630	0
29	2015	0.01495	0.02474	3.71570	8.92780	0.20493	0.39582	1
29	2016	-0.00037	-0.00167	2.07125	9.27580	0.23705	0.78087	1
29	2017	-0.06341	-0.39639	1.76279	9.09946	0.28772	0.84003	1
30	2012	0.02996	0.24515	0.84750	8.93192	0.87777	0.87777	0
30	2013	0.01836	0.13556	0.89511	8.85322	0.86456	0.86456	0
30	2014	0.01442	0.10863	0.87301	8.79976	0.86728	0.86728	0
30	2015	0.01314	0.10117	0.92885	8.78038	0.87016	0.87016	1

30	2016	0.00847	0.06051	0.94017	9.07746	0.86006	0.86006	1
30	2017	0.01054	0.08744	0.97307	9.11831	0.87942	0.87942	1

ANNEX2: FISHERTEST

. xtreg STD roa LQD SIZE choc, fe

```

Fixed-effects (within) regression      Number of obs      =      180
Group variable: ent                   Number of groups   =       30

R-sq:  within = 0.0759                Obs per group: min =        6
      between = 0.2097                  avg =              6.0
      overall = 0.1010                  max =              6

corr(u_i, Xb) = 0.1577                F(4,146)           =       3.00
                                          Prob > F           =       0.0206
    
```

STD	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
roa	-.2409748	.1714761	-1.41	0.162	-.5798707	.0979212
LQD	-.0028248	.0010454	-2.70	0.008	-.0048908	-.0007588
SIZE	-.0024339	.0479928	-0.05	0.960	-.0972843	.0924165
choc	-.0567486	.032209	-1.76	0.080	-.1204047	.0069075
_cons	.6386958	.4828565	1.32	0.188	-.3155957	1.592987
sigma_u	.19851376					
sigma_e	.19810139					
rho	.50103973	(fraction of variance due to u_i)				

F test that all u_i=0: F(29, 146) = 5.83 Prob > F = 0.0000


```
. xtreg TD roa LQD SIZE choc ,fe
```

```
Fixed-effects (within) regression      Number of obs      =      180
Group variable: ent                    Number of groups   =       30

R-sq:  within = 0.0824                  Obs per group: min =       6
      between = 0.1448                                avg =      6.0
      overall = 0.0914                                max =       6

                                          F(4,146)          =      3.28
corr(u_i, Xb) = 0.1234                  Prob > F          =      0.0132
```

TD	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
roa	-.2719618	.1664707	-1.63	0.104	-.6009654	.0570419
LQD	-.0025025	.0010149	-2.47	0.015	-.0045082	-.0004968
SIZE	.0026846	.0465919	0.06	0.954	-.0893971	.0947664
choc	-.0686217	.0312688	-2.19	0.030	-.1304197	-.0068237
_cons	.6692221	.4687621	1.43	0.156	-.2572138	1.595658
sigma_u	.20555303					
sigma_e	.19231885					
rho	.53322568	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(29, 146) =      6.27      Prob > F = 0.0000
```

```
. xtreg roa LQD SIZE STD choc,fe
```

```
Fixed-effects (within) regression      Number of obs      =      180
Group variable: ent                    Number of groups   =       30

R-sq:  within = 0.0226                  Obs per group: min =       6
      between = 0.0002                                avg =      6.0
      overall = 0.0005                                max =       6

                                          F(4,146)          =      0.84
corr(u_i, Xb) = -0.8783                Prob > F          =      0.5005
```

roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
LQD	-.0000623	.0005135	-0.12	0.904	-.0010771	.0009526
SIZE	-.022272	.0229342	-0.97	0.333	-.067598	.023054
STD	-.055383	.0394102	-1.41	0.162	-.1332712	.0225051
choc	-.0060365	.0155964	-0.39	0.699	-.0368605	.0247874
_cons	.315264	.2314004	1.36	0.175	-.1420633	.7725912
sigma_u	.11127956					
sigma_e	.09497079					
rho	.57858133	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(29, 146) =      1.63      Prob > F = 0.0317
```

```
. xtreg roe LQD SIZE STD choc,fe

Fixed-effects (within) regression           Number of obs   =       180
Group variable: ent                        Number of groups =       30

R-sq:  within = 0.1084                     Obs per group:  min =        6
        between = 0.0053                   avg =           6.0
        overall = 0.0238                   max =           6

corr(u_i, Xb) = -0.5102                    F(4,146)        =       4.44
                                                Prob > F        =       0.0020
```

roe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
LQD	.0099423	.0028965	3.43	0.001	.0042177	.0156669
SIZE	.0461474	.1293653	0.36	0.722	-.2095231	.301818
STD	.5628234	.2223012	2.53	0.012	.1234794	1.002167
choc	-.0872671	.0879749	-0.99	0.323	-.261136	.0866017
_cons	-.5064945	1.305261	-0.39	0.699	-3.086142	2.073153
sigma_u	.36178422					
sigma_e	.53570203					
rho	.31323031	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(29, 146) =      1.49      Prob > F = 0.0650
```

ANNEX3 : HAUSMAN TEST

```
. hausman fixed random
```

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
roa	-.2409748	-.2911075	.0501328	.0429429
LQD	-.0028248	-.0031203	.0002956	.0002038
SIZE	-.0024339	-.0048839	.00245	.0472944
choc	-.0567486	-.0575563	.0008077	.0120412

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 3.09
Prob>chi2 = 0.5431
```

```
. hausman fixed random
```

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
roa	-.2719618	-.3474574	.0754957	.0372569
LQD	-.0025025	-.0028146	.0003121	.0001615
SIZE	.0026846	-.0061627	.0088473	.0458955
choc	-.0686217	-.0684093	-.0002124	.0112194

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 6.52
Prob>chi2 = 0.1633
(V_b-V_B is not positive definite)
```

```
. hausman fixed random
```

	— Coefficients —			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LQD	-.0000623	.000046	-.0001083	.0001698
SIZE	-.022272	-.0001939	-.0220781	.0228338
STD	-.055383	-.0638882	.0085052	.0251902
choc	-.0060365	-.0111311	.0050945	.0062646

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 1.55
 Prob>chi2 = 0.8171

ANNEX4: REGRESSION RESULTS

```
. xtreg STD roa LQD SIZE choc ,re
```

```
Random-effects GLS regression           Number of obs   =       180
Group variable: ent                     Number of groups =        30

R-sq:  within = 0.0756                   Obs per group: min =         6
      between = 0.1836                       avg =         6.0
      overall  = 0.1027                       max =         6

Wald chi2(4) =       15.45
Prob > chi2   =       0.0039

corr(u_i, X) = 0 (assumed)
```

STD	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
roa	-.2911075	.1660119	-1.75	0.080	-.6164848	.0342698
LQD	-.0031203	.0010253	-3.04	0.002	-.0051299	-.0011108
SIZE	-.0048839	.0081578	-0.60	0.549	-.0208729	.0111051
choc	-.0575563	.0298735	-1.93	0.054	-.1161073	.0009948
_cons	.6677022	.0917591	7.28	0.000	.4878577	.8475468
sigma_u	.18282719					
sigma_e	.19810139					
rho	.45996709	(fraction of variance due to u_i)				

```
. xtreg TD roa LQD SIZE choc,re
```

```
Random-effects GLS regression           Number of obs   =       180
Group variable: ent                     Number of groups =        30

R-sq:  within = 0.0816                   Obs per group: min =         6
      between = 0.2260                       avg =         6.0
      overall  = 0.1234                       max =         6

Wald chi2(4) =       17.41
Prob > chi2   =       0.0016

corr(u_i, X) = 0 (assumed)
```

TD	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
roa	-.3474574	.162248	-2.14	0.032	-.6654577	-.0294572
LQD	-.0028146	.0010019	-2.81	0.005	-.0047783	-.0008508
SIZE	-.0061627	.0080255	-0.77	0.443	-.0218923	.009567
choc	-.0684093	.0291867	-2.34	0.019	-.1256142	-.0112044
_cons	.7641274	.0902471	8.47	0.000	.5872464	.9410084
sigma_u	.17901866					
sigma_e	.19231885					
rho	.4642289	(fraction of variance due to u_i)				

```
. xtreg roa LQD SIZE STD choc, re
```

```
Random-effects GLS regression           Number of obs   =    180
Group variable: ent                     Number of groups =    30

R-sq:  within = 0.0160                   Obs per group: min =    6
      between = 0.0999                       avg =    6.0
      overall = 0.0365                       max =    6

Wald chi2(4) =    5.17
corr(u_i, X) = 0 (assumed)               Prob > chi2     =    0.2706
```

roa	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
LQD	.000046	.0004846	0.09	0.924	-.0009038	.0009958
SIZE	-.0001939	.0021444	-0.09	0.928	-.0043969	.004009
STD	-.0638882	.0303087	-2.11	0.035	-.1232921	-.0044844
choc	-.0111311	.014283	-0.78	0.436	-.0391252	.0168631
_cons	.0980364	.0317903	3.08	0.002	.0357286	.1603442
sigma_u	.0347193					
sigma_e	.09497079					
rho	.11789182	(fraction of variance due to u_i)				

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