

OIL PRICE AND ITS INFLUENCE ON EUROPEAN ENERGY POLICY

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Abstract

The purpose of this paper is to assess the influence of oil price on European Energy Policy, taking into account the effects of the current financial crisis on both oil price and European Energy Policy. In order to reach our aim, we made use of thorough research, combined with advanced statistical methods of analysis. The main conclusions drawn from the research undertaken show a certain determination in oil market dynamics and the current economic crisis.

Keywords: oil price, energy policy, financial crisis.

JEL Classification: F14, L71, O13, Q31, Q32

1. Introduction

The struggle for energetic resources became more and more intense since the middle of the 20th century, generating unexpected consequences in the world economy and geopolitics. The players from “the grand chess board”, as the American analyst Z. Brzezinski named the world scene, build their future strategies according to these resources, considered strategic. Concerns regarding the security of supply generated two main directions of action. One of them manifests itself through an increasing interest for alternative energy sources, such as natural gas and renewable energy technology, which starts to gain momentum. This last course of action is also related to the second direction, i.e. sustainable development and tackling with climate change. Among the leading areas in both directions is the European Union. The history of the EU shows common preoccupations regarding energy from the very beginning of European cooperation, accentuated after the first Oil Crisis. However, despite the many attempts to create a formal energy policy at European level, cooperation in this area is still an intergovernmental process. Events taking place during the last decade gave the European countries a strong incentive to work together and develop a European Energy Policy. The volatility of the crude oil price, as demonstrated in 2008-2009, has also forced governments to take initiatives, thus contributing to increasing the determination at European level to develop a

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common energy policy. A number of questions over how the price of oil is determined and the complex game of interdependencies between the physical and financial markets are raised by recent evolutions on the oil market.

2. Energy policies at European level

Presently, at EU level there already exist a number of energy policies for different domains. We will further present some of them.

SET Plan

Due to the fact that the seventh Framework Programme (FP7) is mainly devoted to fusion research and that this technology will be unable to help Europe meeting its climate and energy objective until 2050, the European Commission tried to redress this shortfall through the Strategic Energy Technologies Plan (SET Plan). The purpose of the Plan is to enhance coordination of national and EU research and innovation in order to place the EU in the forefront of the low-carbon energy markets. The initiatives proposed by the SET Plan are the European Wind Initiative, the Solar Europe Initiative, the Bio-energy Europe Initiative, the European CO₂ capture, transport and storage initiative, the European electricity grid initiative and the Sustainable nuclear fission initiative

EERA

The purpose of the European Energy Research Alliance (EERA) is to expand and optimise EU energy research capabilities by sharing top national facilities and jointly realising of national and European programmes. This new Research Alliance will be a key actor of the EU Strategic Energy Technology Plan (SET Plan) and will contribute to accelerate the development of new low carbon technologies for EU to move toward a low carbon economy.

Energy sources

In October 2001 a Directive on Electricity Production from Renewable Energy Sources obliged the Member States to meet certain targets with respect to renewable energy. The base year was set to 1997, and, although with variations between country targets, the EU must produce of 22% of its electricity from renewable sources by 2010. If the target is reached, the EU will have almost doubled its use of renewable sources in 13 years. Also, the European Commission has proposed a target of 20% renewable energy in the total EU energy mix, to be reached by 2020.

Energy markets

The EU has also promoted electricity market liberalisation and security of supply through the 2003 Internal Market in Electricity Directive, which replaced early directives in this area. The 2004 Gas Security Directive has been intended to improve security of supply in the natural gas sector.

Transport

EU policies include the voluntary European Automobile Manufacturers' Association (ACEA) agreement, signed in 1998, to cut carbon dioxide emissions for new cars sold in Europe to an average of 140 grams of CO₂/km by 2008, a 25% cut from the 1995 level. Because the target was unlikely to be met, the European Commission published new proposals in February 2007, requiring a mandatory limit of 130 grams of CO₂/km for new cars by 2012, with complementary measures being proposed to achieve the target of 120 grams of CO₂/km that had originally been expected. In the area of fuels, the 2001 Biofuels Directive requires that 5,75% of all transport fossil fuels (petrol and diesel) should be replaced by biofuels by December 31, 2010, with an intermediate target of 2 % by the end of 2005. In February 2007 the European Commission proposed that, from 2011, suppliers will have to reduce carbon emissions per unit of energy by 1% a year from 2010 levels, to result in a cut of 10% by 2020.

External energy relations

Beyond the bounds of the European Union, EU energy policy has included negotiating and developing wider international agreements, such as the Energy Charter Treaty, the Kyoto Protocol, the post-Kyoto regime and a framework agreement on energy efficiency; extension of the EC energy regulatory framework or principles to neighbours (Energy Community, Baku Initiative, Euromed energy cooperation) and the emission trading scheme to global partners; the promotion of research and the use of renewable energy. For ensuring efficient follow-up and coherence in pursuing the initiatives and processes, for sharing information in case of an external energy crisis, and for assisting the EU's early response and reactions in case of energy security threats, the network of energy correspondents in the Member States was established in early 2007. After the Russian-Ukrainian Gas Crisis of 2009 the EU decided that the existing external measures regarding gas supply security should be supplemented by internal provisions for emergency prevention and response, such as enhancing gas storage and network capacity or the development of the technical prerequisites for reverse flow in transit pipelines.

3. World oil market and the financial crisis

The oil markets have been transformed radically over the last ten years. Three sub-periods distinguish themselves since the turn of the century (see Figure 1). The first one, 2000-2003, was marked by a relatively stable price, varying between \$22 and \$28, decided by the Organization of Petroleum Exporting Countries (OPEC) as a consequence of the 1998 price collapse. This range was considered neither too low for the exporting countries, nor too high for the world economy. The years between 2004 and 2008, i.e. the second sub-period, are characterized through sharp increases in oil demand since during this period many countries experienced economic booms. The soaring of the oil price towards \$100 did not much affect the world economic growth. The upsurge in the financial markets for oil and commodities lead to an

increasing number of participants, financial products and marketplaces.

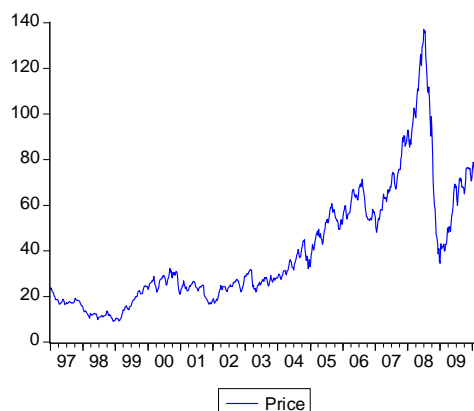


Fig. 1. Weekly world oil price evolution

Consequently, during the last sub-period, that of 2008-2009, the problem of interactions between the physical and financial elements was raised. It is marked by three successive phases: in the first half of 2008, oil prices rose to \$145. This raised certain questions regarding the role played by financial markets. The second half of 2008 brought with itself a plunge in the oil price, reaching \$36., which was caused by the adjustment of the investors' positions and decreasing demand caused by the economic crisis. During 2009, prices rose to 80 dollars which seems contrary to the state of the physical fundamentals, notwithstanding OPEC's production cuts. Determination of oil prices is essentially done on organised futures markets like the American WTI or the European Brent contracts. They take into account both physical and financial fundamentals. Due to the specificities of the two, oil generates two types of demand, i.e. for "physical" oil in the physical market and for "paper" oil in the financial market. It is difficult to establish clear causality links between the open positions of financial investors in futures markets and the prices observed in the spot market, based on the available statistical data.

3.1. World Oil Price – A Short Analysis

In order to better understand the evolution of the world oil price, we built an ARIMA model with the help of the Box-Jenkins method.

First, we used the *Census X12* method to remove the seasonal tendency from the series and then tested the seasonally adjusted series for stationarity by using the Augmented Dickey-Fuller unit root test. The series turned out to be not stationary, so we applied the first difference and repeated the test. It resulted that the model to be built should be an ARIMA(p,1,q) one, with no trend and no intercept. Due to the existence of outliers that exert unwanted influence on the analysis, we created a number of dummy variables. Their value is zero, except for the month they were created for. Their inclusion in the model will diminish the error, by allowing the outliers to influence only the months when they were recorded. The outliers were

created for November 2007, May, August, September, October, November and December 2008 and June and November 2009, months for which the variation compared to the previous value was significant. After testing different models, two were chosen as best fitting the trend of the analyzed series, taking into consideration certain criteria. These models are MA(11) and ARIMA(9,1,13). The first model was chosen because of the smallest value for the Akaike criterion, 4.78, and the second one because of the highest value of Adjusted R^2 , 0.7058, but taking into account both criteria. The two models were tested to see whether they fulfil the normality, homoskedasticity and non-autocorrelation of errors conditions. The last stage of the analysis was to predict the value of oil price for February 2010 and compare it with the real one. The obtained predictions were \$76.91 for the first model and \$75.35 for the second one, while the real value was \$73.04. Due to the existence of outliers, which the introduction of dummy variables could not cancel, the model overestimates a little the real price.

The conclusion to be drawn from this analysis is that the second model is more accurate than the first one, fact that could be explained by the higher value of R^2 , which shows how much of the variance is explained by the model. Thus, the model chosen is ARIMA (9,1,13). Also, we have found out that the world oil price is influenced not only by external factors, such as energy policy or economy, but also by past values of oil price itself.

4. An Energy Policy for Europe?

Despite the fact that the EU has long legislated in this domain, and although it evolved from an energetic cooperation initiative, the idea of a common energy policy at EU level seems to have become a possibility only in 2005, with the occasion of the European Council meeting in London. Relations with the other actors on the energy map, such as producer, consumer and transit countries, gained a great importance from geopolitical and economic perspective starting with 2006. The Commission's Green Paper *A European Strategy for Sustainable, Competitive and Secure Energy* underlined the need for an EU energy policy and established sustainability, competitiveness and security of supply as the three main objectives with respect to energy. Since then, the EU has undertaken dialogues with key energy partners such as Russia, Norway, the U.S., India, China as well as OPEC. Negotiations with Algeria and Iraq have been also carried out, and the European Commission has signed joint declarations on energy with Jordan and Morocco. At the end of the next year, the Commission adopted the 2nd Strategic Energy Review, i.e. the EU Energy and Solidarity Action Plan. The main challenges addressed by it are promotion of internal and external infrastructure, which is important for the energetic security of the EU, and ensuring the most effective possible security standards and internal crisis mechanisms security. An example in this sense was the oil and gas crisis caused by disputes between Russia and Ukraine and Belarus. The lesson learnt by Europe during the supply cuts was that the dependency level of the EU needs to be tackled through a suitable external

policy with respect to energy. The Recovery Plan of January 2009 underlines the commitment of the European Commission to enhance energy security. The Plan includes 3.5 billion euro dedicated to investment in infrastructure meant to enhance security of energetic resources in the EU.

5. Public opinion

In a poll carried out for the European Commission in October and November 2005, 47% of the citizens questioned in the 27 countries of the EU (including the 2 states that joined in 2007) were in favour of taking decisions on key energy policy issues at a European level. 37% favoured national decisions and 8% wanted that they be tackled locally. A similar survey of 29,220 people in March and May 2006 indicated that the balance had changed in favour of national decisions in these areas (42% in favour), with 37% backing EU policy making and 12% preferring local decisions. There was significant national variation with this, with 55% in favour in the Netherlands, but only 15% in Finland. A comprehensive public opinion survey was performed in May and June 2006. The authors propose following conclusions:

- Energy issues are considered to be important but not at first glance.
- EU citizens perceive great future promise in the use of renewable energies. Despite majority opposition, nuclear energy also has its place in the future energy mix.
- Citizens appear to opt for changing the energy structure, enhancing research and development and guaranteeing the stability of the energy field rather than saving energy as the way to meet energy challenges.
- The possible future consequences of energy issues do not generate deep fears in Europeans' minds.
- Europeans appear to be fairly familiar with energy issues, although their knowledge seems somewhat vague.
- Energy issues touch everybody and it is therefore hard to distinguish clear groups with differing perceptions. Nevertheless, rough distinction between groups of citizens is sketched.

6. Conclusions

The importance of energetic resources for the world economy cannot be denied. States build their strategies according to them, are more and more engaged in ensuring themselves the energetic security and seem keener on investing in alternative sources, since the hydrocarbon suppliers are more and more unpredictable. The EU is one of the main players in the area of renewable energy, its policies covering a vast domain, from wind and solar power to nuclear fusion. However, despite numerous attempts to create a common energy policy for the EU, cooperation in the area is still an intergovernmental process. Strong incentives are given to EU members for creating a common energy policy by events taking place on the world oil market,

such as great fluctuations of oil prices, as well as by the geopolitical interests of its suppliers. The financial and economic crisis that affected the world economy since 2007 had effects on the oil market as well. After a period of relatively stable prices varying between \$22 and \$28, the oil prices started to increase. This however did not much affect world economy due to the economic booms experienced by the developing countries and some of the developed ones. However, once financial markets increased both in size and in value, the oil prices started to fluctuate in a range of more than \$100 during 2008 and 2009. A clear distinction should be made between physical oil markets and financial ones. If the first deals with “physical” oil, the second is more concerned about “paper” oil. Also the various interests of the players in these markets must be taken into account. The complexity of interactions between the two types of markets makes it difficult to explain the significant fluctuations of oil price. Also, clear causality links between the positions of investors in the financial markets and the prices on the spot markets are hard to establish based on the available statistical data. A model was built by the authors for the analysis of oil price using the Box-Jenkins methodology. The conclusion to be drawn from this analysis is that the world oil price is influenced not only influenced by external factors, such as energy policy or economy, but also by past values of oil price itself. All these facts have direct influence on European energy policy making. The EU realised that enhancing relations with producer, consumer and transit countries is necessary, but not sufficient in order to ensure its energy security. A common policy is needed in order to tackle certain problems more effectively. As a multinational democracy, the EU must take into account the opinion of its citizens, which it assesses through polls. Slowly, the European public opinion begins to accept the fact that energy policy should be a European matter, rather than a national one, which constitutes a step forward towards development of a European common energy policy. However, this problem should be handled cautiously and bearing in mind that EU member states already proved that they are not ready to give up some of their national attributes in favour of the EU when they rejected the European constitution.

References

Chevalier, J.M.: *Rapport du groupe de travail sur la volatilité des prix du pétrole (Work Group Report on the Volatility of the Oil Price)*, French Ministry of Economy, Industry and Employment, February 2010, <http://www.economie.gouv.fr/services/rap10/100211rapchevalier.pdf>, last accessed on the 25th of March 2010.

Geden, O.: *Effective Provisions for Emergency Prevention and Response in the Gas Sector*, German Institute for International and Security Affairs (2009).

*** *A European Economic Recovery Plan*, Commission of the European Communities, Brussels, November 26th, 2008, http://ec.europa.eu/economy_finance/publications/publication_13504_en.pdf, last accessed on the 25th

of March 2010

*** *A European Strategic Energy Technology Plan (SET-PLAN)*, Brussels, November 22nd, 2007, <http://www.iea.org/textbase/nppdf/free/2008/EU2008.pdf>, last accessed on the 25th of March 2010.

*** *Attitudes towards Energy. Special Eurobarometer 247*, European Commission, January 2006, http://ec.europa.eu/public_opinion/archives/ebs/ebs_247_en.pdf, last accessed on the 25th of March 2010.

*** *The International Partnership for Energy Efficiency Cooperation*, Brussels, June 8th, 2008, <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/380&format=HTML&aged=0&language=EN&guiLanguage=e>, last accessed on the 25th of March 2010.