Introduction: Financial Implications of Regulations in the Energy Industry

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1 Regulation and the Energy Industry

The primary driver for regulation of infrastructure sectors is generally to ensure proper competition and to prevent the growth of a dominant group or a single utility. Energy utilities are more closely and strictly regulated than many other infrastructure sectors. This is due to the unique characteristics surrounding energy supply and delivery. Unlike many other industries in which there are numerous companies competing to sell the same product or service, electricity, and natural gas distribution and transmission are considered to be "natural monopolies." Specifically, the nature of electricity and natural gas service is actually a natural monopoly because of economies of scale and the significant capital necessary to build power plants, transmission lines, and natural gas pipes and plants. Through the years, laws, regulations, and other requirements have been basically are designed to act as a substitute for the economic forces that would normally be the influence in a competitive market. Another objective of the regulation of energy industry is the need to develop sustainable energy policies and energy efficiency by raising new issues for policymakers, regulators, and activists. Generally, the regulations in the energy sector attempt to integrate possibly conflicting policy goals.

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Industry compliance to regulation is a major business driver to the energy sector. Serious legal and regulatory implications threaten energy organizations that fail to implement the standards to comply with the regulation. Regulations are carried out in a number of different ways and each has strengths and weaknesses. Different types of regulation commonly in use include command and control, self-regulation, incentive-based regulation methods, and market controls.

Regulations are carried out by also different institutions. In other words, there are a number of bodies involved in the regulation of the energy sector. In state-owned systems, the government still plays an important role in deciding which technologies are used to generate power. The most common actors are government departments, specifically the agencies linked to the Ministry of Energy of a country (usually semi-independent) and fully independent regulators. Energy industries are also frequently subject to privatization, particularly when the underlying energy industry in the country transitions from a state-owned system to the liberalized system.

The free market movement of the 1990s started to challenge the concept of treating many fields in the industry as a natural monopoly. Herein, many politicians and academics started to suggest that regulation has outlived its value and markets should be deregulated so that prices can end up being determined through the forces of supply and demand. This deregulation movement has mostly manifested itself in the electricity sector (Steinhurst 2011).

2 Financial Implications of Regulations in the Energy Industry: Issues Covered in This Book

The aim of the book is to provide a broad overview of the financial, economic, and legal implications of regulations in the energy industry across different countries. This is due to the fact that, in the context of significant changes on the international scene, there are different ways to regulate and different institutions can be involved in the regulations. The chapters in this book provide insight on how these regulations on energy sector differ in different countries with different market structures and institutions and also with differing awareness and priorities of policymakers. Major themes covered by this book include laws and regulations geared to market competition and sustainability. In this book, all the chapters have been subject to the blind peer reviews by two referees. The chapters analyze the energy industry from the perspectives of, but not limited to, financial markets, financial risks, asset pricing, capital structure, capital budgeting, corporate (re)structuring, corporate governance, behavioral finance, financial performance, asset pricing, cost control, financial accounting, fiscal and legal issues, institutional, governance and legal aspects.

2.1 Regulations: Price and Trade Controls

The second chapter of this book states that across the European Union members states there is significant cross country variation in the implementation of the European Union's emission trading system (EU-ETS), which is the cornerstone climate policy. Frederiek Schoubben is the author of this chapter and he provides evidence on the existence of regulatory arbitrage as business groups exploit cross country differences in stringency of EU-ETS implementation through national allocation plans. Specifically, the author finds that foreign parent companies generate higher carbon emissions relative to their domestically owned peers. This chapter emphasizes that the opportunities for regulatory arbitrage created by these differences could be an important cause of the systems initial ineffectiveness.

With rising global awareness and binding energy prices, industrial enterprises are under environmental, social, and financial pressure to attain higher levels of efficiency in their usage of energy. Within the scope of energy efficiency, a contemporary approach is the Energy Management System (EnMS) that represents continuous and systematic efforts for improvement in efficient use of energy by the enterprises. The third chapter of this book, written by Kazim Atici, conducts an empirical analysis to measure relative performance of Turkish manufacturing firms that applied EnMS principles and carried out energy efficiency increasing activities between 2015 and 2017. The chapter lists several policy implications for different stakeholders in this matter.

The fourth chapter of this book is titled as "The Convergence of Electricity Prices for European Union Countries" and written by Erdinc Telatar and Nermin Yasar. Their chapter investigates the degree to which the aim of creating a single European market for electricity has been successful in terms of price convergence. Their results lend a considerable support to the nonlinear convergence among the countries.

2.2 Other Regulations

Starting with the fifth chapter, the book has more emphasis on other regulations. The authors of the fifth chapter, Özgür Arslan-Ayaydin, Prabal Shrestra, and James Thewissen, integrate blockchain technology and energy industry. Their chapter provides insights on how this novel technology that offers disintermediation, transparency, and flexibility is providing new ways of interaction to tackle challenges of communication, coordination, and efficiency in the clean energy sector. Along with providing a brief overview of the blockchain technology, the chapter discusses some of the prominent clean energy applications of the technology, such as micro energy exchange grids, cap-and-trade, and electrical vehicle charging networks.

In the sixth chapter, authored by Volkan Ş. Ediger, John V. Bowlus, and Mustafa Aydın, contemporary geopolitics and the security of energy transit by pipeline is

examined by focusing on the transit of gas to Europe as a case study. This chapter first provides a framework for understanding energy security and then presents a brief historical and geographic overview of natural gas transit. It moves on to analyze European strategies for gas-supply security in the context of Ukraine and Turkey. The chapter concludes by arguing that securing gas imports by pipeline will require a deeper appreciation of the geopolitics of transit and that consumers should not assess projects solely on market considerations.

The objective of seventh chapter, authored by Wietze Lise and Banu Bayramoglu-Lise, is to assess the contribution and role of National Renewable Energy Action Plan (NREAP) in connection with Turkey's Renewable Energy Source (RES) potential and goals. The authors then present the latest developments regarding RES in Turkey and the relevant literature is discussed and critically assessed. Finally, the chapter summarizes the proposed measures to reach the RES targets and discusses whether additional measures will be needed.

Halit Gonenc, Oleksand Lebediev, and Wim Westerman aim to identify theoretical reasoning in chapter "The Financing Decision of Oil and Gas Companies: The Role of Country Level Shareholder Protection" behind the way the oil and gas companies finance their investments and the determinants of alternative financing choices. Their results cover the period from 2001 to 2015 and provide strong support to the dynamic trade-off theory and partial support to the pecking order and market timing theories. Moreover, they show that companies in countries with a high level of shareholder protection are willing to issue more equity than companies in countries with a low level of shareholder protection.

2.3 Market Control

The remaining five chapters of this book focus on market control in the energy industry. Chapter "Attitudes of SMEs Towards the Elements of Eco-Efficiency: The Turkish Case" is authored by Fatih Cemil Ozbugday, Derya Findik, Sidika Basci, and Kivilcim Metin Ozcan. In this chapter, the authors investigate the attitudes of Turkish SMEs over three items concerning eco-efficiency: (1) increasing resource efficiency investments, (2) producing more environmentally compatible "green" products or services, and (3) the consumption of energy from renewable resources. The authors use Flash Eurobarometer, Small and Medium-Sized Enterprises, Resource Efficiency, and Green Markets (GESIS) 2017 dataset and their sample size is 299 observations. Overall, their chapter concludes that the firms do not prioritize the usage of predominantly renewable energy and production of more green products nor services.

Goknur Buyukkara, Onur Enginar, and Huseyin Temiz are the authors of chapter "Volatility Spillovers Between Oil and Stock Market Returns in G7 Countries: A VAR-DCC-GARCH Model" and they investigate the volatility spillover effects

between oil prices and G7 stock market returns, using multivariate VAR-GARCH-DCC analysis. The data set of this chapter is daily oil and stock prices from January 2014 to October 2016. The authors provide strong evidence of time-varying volatility spillovers in the G7 markets. Their results of the portfolio analysis also highlight that investors should consider conditional volatilities and correlations to maximize their returns and risks

Industry-specific regulations and directives related to the energy security and climate change have a considerable impact on the corporate strategies of energy firms. Chapter "Corporate Cash Holdings in the Oil and Gas Industry: The Role of Energy Directives," authored by Yilmaz Yildiz and Mehmet Baha Karan, investigates the impact of the energy directives on the corporate cash holding decisions of the energy firms in Europe. They study 244 firms and 2670 firm-year observations from 24 countries and their results suggest that there are significant differences among countries in terms of the corporate cash holding policies and speed of adjustments toward the target cash position. Their results posit that the role of Energy Directives on corporate cash holding decisions of energy firms significantly differs among countries.

Lars J. Hesselink, Lammertjan Dam, and Wim Westerman are the authors of chapter "The Determinants of Systematic Risk of Renewable Energy Firms." This chapter puts forth a dynamic beta model that estimates the systematic risk for the firms in the Renewable Energy (RE) industry with a combination of global and country-specific macroeconomic factors. The main conclusion of the chapter is that macroeconomic factors do influence systematic risk of the RE sector. Moreover, this chapter finds that the oil-returns is the most dominant factor in explaining the systematic risk of RE firms. Finally, the chapter confirms the effectiveness of environmental stimulating policies as the combination of overall political stability and environmental policy stringency has a diminishing effect on beta.

Our book finalizes with chapter "Optimizing Resource Usage in an Unobtrusive Way Through Smart Aggregation: The Case of Electric Vehicle Charging in Amsterdam," authored by Kees van Montfort, Halldora Thorsdottir, and René Bohnsack. The authors develop an optimization model that applies unobtrusive charging strategies (i.e. postponing, on-off charging, and two charging speed levels) for an electric vehicle (EV) charging aggregator. Its effectiveness is tested on 360,000 charging sessions at public charging points in Amsterdam during the year 2015, providing a realistic assessment of the effects of optimization in terms of reduced costs, change in peak demand, and long occupancy of charging points. Based on the model, an average reduction of electricity costs between 20% and 30% can be achieved, depending on the day of the week. The chapter also shows that changing EV owner's charging preferences such as starting earlier or later can benefit certain groups of EV drivers substantially and reduce electricity charging costs up to 35%.

3 Conclusions

Energy industry is one of the sectors that is subject to highest regulation by various channels. Economic regulation on this industry takes place by the direct intervention by public or governmental agencies into the market when it is deemed to be necessary to achieve public benefits as the market fails to achieve on its own. Energy industry also has a considerable effect on air, water, and land use, and the waste disposal has a significant environmental impact. Therefore, energy firms are also regulated for their environmental impact and usage of land.

Through the years the regulations on this industry change in terms of their intensity, nature, and sources. These regulations also differ across countries. This book presents studies that bring timely and innovative discussions and findings in the energy sector by integrating the areas of economics, finance, law, and legislations of regulations. The chapters of this book provide important results for not only academic research in the area of law, energy markets, financial markets, and energy economics, but also practitioners and policy makers. We hope that the readers both enjoy and benefit from the book.

Reference

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