A new political economy of climate change, by *Michel Damian*

This article responds to Jean Tirole, winner of the Nobel prize for economics in 2014 and the signatories of the international appeal launched by Toulouse School of Economics and the Climate Economics Chair at Paris Dauphine University who propose setting a universal carbon price and establishing a transcontinental emissions trading system. We hold that the Paris Agreement, which disregarded such recommendations, represents a paradigm shift. The new economy of climate change departs from the standard approach with regard to its economic instruments (emissions prices and quotas), returning to a classical political economy approach in terms of production economics. It confers a strategic role on methods and techniques for cutting emissions, as part of a long-term vision of energy and industrial transition. It is underpinned by the concerted action of States and multiple actors operating on various scales. There can be no magic wand to swiftly reduce greenhouse gas emissions while disregarding the real conditions of States, which all differ in terms of their relative development, technological capacity and political and social situation, not to mention the diversity of their values and priorities.

Keywords: Paris Agreement, climate change, carbon price, carbon trading, political economy, regulation, decarbonization.

JEL classification: Q54, Q58, F53

Four years after introducing the 15 minutes power markets: Signs of life are there, by *Aymen Salah Abou el-Enien*

In December 2011, EPEX SPOT has introduced the 15 Minutes Continuous Intraday market within the German control areas. This paper describes this market, some new developments in the last four years and discusses the role that it can play to help overcome renewable energy intermittency. March 2015 solar eclipse illustrates how flexible generation and demand side management efforts can be rewarded on these markets.

Keywords: 15 Minutes continuous intraday market, energy demand, renewables

JEL classification: Q40, L94

Energiewende and competition in Germany: Diagnosing market power in wholesale electricity market, by *Thao Pham*

German power market has undergone many fundamental changes in 2011 following the Fukushima nuclear accident (March 2011). Prices on wholesale electricity market are at the highest level since mid-2009. The purpose of this chapter is to identify whether market

power is responsible for this increase. Following the method of linear programming as commonly used in the literature of electricity market modelling, we simulate a competitive benchmark for German wholesale market taking into account power plant characteristics, fuel and CO2-allowance prices and renewables power generation. On the basis of the difference between modeled marginal costs and observed market prices, we estimate the price-cost markups, or the Lerner Indexes across hours.

Keywords: electricity, market power, Germany, oligopolistic market.

JEL classification: L13, L94, D43

Macroeconomic effects of oil price fluctuations on emerging and developed economies in a model incorporating monetary variables, by *Farhad Taghizadeh-Hesary* and *Naoyuki Yoshino*

The goal of this paper is to examine the impact of crude oil price movements on two macro variables, the gross domestic product (GDP) growth rate and the consumer price index (CPI) inflation rate, in three countries, the People's Republic of China (an emerging economy), Japan, and the United States (developed economies), in a model incorporating monetary variables (money supply and exchange rate). The main objective of this research is to investigate whether these economies are still reactive to oil price movements and compare their reactions. Monetary variables are included in this survey because our earlier research showed that they have a significant role in oil price determination. To assess the relationship between crude oil prices and macro variables we adopt an N-variable structural vector autoregression (SVAR) model. The results suggest that the impact of oil price fluctuations on developed oil importers' GDP growth is much milder than on the GDP growth of an emerging economy. On the other hand, however, the impact of oil price fluctuations on the People's Republic of China's inflation rate was found to be milder than in the two developed countries that were examined.

Keywords: oil price, growth, inflation.

JEL classification: Q43, E31, O57

Recent developments in oil prices and effect on pump prices in Turkey, by *Erol Metin*

International oil prices have shown significant changes over the last year and have fallen down to 45$ /barrel level from around 110$ levels. The oil prices and the dynamics behind it have strongly affected many markets including the economies of countries such as Turkey. The paper briefly discusses oil price movements throughout 2014 including the first half of 2015 and presents major impacting factors that affect the price dynamics, such as US shale oil, supply and demand dynamics. The transmission of oil price fluctuations into Turkish pump prices has been evaluated and the constituents of pump prices have been analyzed over a period encompassing the last 10 years. The important factors that have affected the pump prices and the pricing behavior of oil companies in Turkey, apart from the international market trends, were the exchange rate (USD/Turkish Lira) and the price interventions by the Turkish Energy Market Regulatory Authority. The paper provides an in depth discussion and a comparative assessment on the development of pump prices in Turkey with some major European Markets in the Mediterranean region closer to the Turkish market such as Greece, Italy, France & Spain.

Keywords: oil price, gasoline price.

JEL classification: Q40, Q41

Quantifying the impact of coal on global economic growth and energy productivity in the early 21st century, by *Tarek Atallah* and *Jorge Blazquez*

Two intriguing circumstances have characterized the behavior of energy markets in the first years of 21st Century: a sharp increase in oil prices without a clear impact on real economic activity and a relative stagnation of energy productivity after 30 years of continuous improvement. This paper uses a standard macroeconomic production function to show that these two circumstances are consistent with sharp global increase in coal production and consumption. Our results suggest that the strong shift in coal production in the period 2000-2007 can explain why the sharp increase in oil prices did not impact negatively global activity and a relative stagnation in energy productivity. In addition, the paper also highlights the shift in the energy mix towards coal and natural gas and alerts that these fuels, and not only crude oil, can be sources of macroeconomic shocks in the future.

Keywords: coal, oil, natural gas, fossil fuels, energy productivity, economic growth.

JEL classification: Q41, Q43, O40

Development of preferential regulations, transmission tariffs, and critical technological components for the promotion of smart grid globally, by *Munish Manas*

Power utilities are raising their investment in smart grid sector because of the increasing demand for electric power, aging transmission and distribution infrastructure, and the requirement for real-time visibility of energy supply and demand to optimize service reliability and cost. The smart grid technologies, smart grid regulatory policies and tariff designs should be formulated in a reliable, efficient and innovative manner for the sustainable expansion of the smart grid globally. All the technologies provider and Electric Regulatory commission policy makers have to work hand in hand to realize this goal. Favorable regulatory policies and utility restructuring control the dynamics of electricity market will promote the smart grid and green energy technologies. Power sector innovative regulations and tariff designs are progressively getting more concerned with network users, both traditional and new, with the mutual aim to stimulating more active participation. Preferential transmission tariff to promote integration of renewable energy sources is also a practical need of the present power sector. In this paper, we are trying to review the critical components of smart grid technologies, preferential regulatory policies and smart grid related tariff designs which would assist in sustainable expansion of the smart grid globally.

Keywords: smart grid, renewable energy, advanced metering infrastructure, demand response, transmission tariff, regulatory policies, distributed generation, cyber security

JEL classification: L94, Q40

The cost of failing to prevent gas supply interruption: A CGE assessment for Peru, by *Carlos Adrián Romero*, *Omar Osvaldo Chisari*, *Leonardo Javier Mastronardi* and *Arturo Leonardo Vásquez Cordano*

Since 2000, there has been a noticeable progress in social and economic indicators of Peru. Even though the country risk has diminished dramatically, several threats remain. One of the key ones is the possibility of involuntary (transitory or permanent) interruptions of the natural gas pipeline transportation system. Given the significant endowments of natural gas reserves in Peru (Camisea gas field) and its relevance in the economy, shortages of natural

gas due to pipelines failures can wreak havoc because it is important from the government revenue and it is a basic input for domestic manufacturing and household energy consumption.

Earthquakes, unexpected social unrest or intentional actions could interrupt the service of some of the fundamental pipelines of the grid. One pipeline with three branches connects the upstream to the distribution centers. To take into account the economy wide impact of the interruption of gas supply we built a CGE model considering modifications of relative prices, markets reactions and income effects.

We simulate different scenarios considering the three most important branches of the Camisea pipeline. The results show that those shocks would represent an important decline of GDP in the short run when substitution is limited (about or 0.2% by day) and an abrupt reduction of welfare for households. The estimated daily cost is in the range of 335 million of USD for the worst case scenario.

Keywords: computable general equilibrium, disaster analysis, natural gas

JEL classification: C68, D58, Q54

Integrating renewable energy sources into electricity markets: Power system operation, resource adequacy and market design, by *Umberto Monarca*, *Ernesto Cassetta*, *Alessandro Sarra* and *Cesare Pozzi*

Focusing on the Italian power system, the article examines how the national regulatory framework has been modified to effectively accommodate and further increase the share of renewable energy in the energy mix while preserving system reliability. This paper argues that operational changes and regulatory measures adopted so far, which are mainly directed to create a level playing field between different energy sources, constitute a short-term response, and thus of limited effectiveness while increasing cost for consumers. To intensify the de-carbonization process of the Italian power system a more fundamental revision of the current market design is required. In this view, an essential ingredient is the future expansion of the electricity grid starting from a clear recognition of energy mix that we intend to reach in the mid/long term.

Keywords: renewable energy policy, reliability of supply, resource adequacy, regulation shortcoming, market integration, capacity payment

JEL classification: L52, L94, L98