

## ABSTRACT

mgr inż. Magdalena Sikorska-Pastuszka

Dissertation title: Assessment of the degree of integration of the European electricity markets in the context of the European Union's energy policy

The main objective of the dissertation is to assess the degree of integration and the roles played by the European electricity markets in the context of the European Union's energy policy. The study examines the volatility connectedness in 27 European electricity markets in the period between 1 August 2007 and 31 December 2022 using a TVP-VAR extended joint connectedness approach. Rates of return and realised volatility (RV) are used to measure the spillover effect of electricity markets. The analysis is conducted in two distinct periods of electricity demand, namely base load (*BASE*) and peak load (*PEAK*). In addition, the impact of the determinants of electricity prices and Russia's invasion of Ukraine are taken into account. The main hypothesis of the dissertation is that European electricity markets are becoming increasingly integrated.

The dissertation consists of six chapters, an introduction and a conclusion. The first chapter describes the integration of electricity markets in the context of the evolution of the European Union's energy policy, including the main legal acts related to the creation of a single European electricity market.

The second chapter presents a critical assessment of the existing scientific literature dedicated to the integration of the electricity market. The literature review is divided into four main strands, which enables the identification of research gaps.

The third chapter discusses the methodological assumptions used for assessing the degree of the integration of the European electricity markets. It characterises electricity prices, ways of measuring the spillover effect of electricity prices and a TVP-VAR extended joint connectedness approach.

The fourth chapter considers the characteristics of the functioning of the European electricity markets. It describes the specificity of these electricity markets and the characteristics of the data used in the study related to electricity prices, energy commodity prices and EU Allowances. A preliminary data analysis for selected variability measures is also included.

The fifth chapter attempts to determine the degree of integration, regional connections and the roles played by the European electricity markets using the TVP-VAR extended joint connectedness approach (Balcilar et al., 2021). The analysis is conducted in the *BASE* period

using rates of return. In addition, the impact of electricity price determinants and Russia's invasion of Ukraine is analysed.

The sixth chapter follows the same research methods as the fifth but uses realized volatility (RV) instead of rates of return. The analysis is conducted in the *BASE* and *PEAK* periods to compare the behaviour of the markets in different periods of electricity demand.

Finally, the hypothesis is verified in a scientific discussion and the main conclusions are formulated. In summary, it can be concluded that regardless of the economic and geopolitical situation in the years 2007–2022, the European electricity markets are increasingly integrated.