

## Econophysical Approach on Predictability of Financial Crisis: The 2001 Crisis of Turkey and Argentina Case

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**Abstract :** Technological developments and the resulting global communication have made the 21st century when large capitals are moved from one end to the other via a button. As a result, the flow of capital inflows has accelerated, and capital inflow has brought with it crisis-related infectiousness. Considering the irrational human behavior, the financial crisis in the world under the influence of the whole world has turned into the basic problem of the countries and increased the interest of the researchers in the reasons of the crisis and the period in which they lived. Therefore, the complex nature of the financial crises and its linearly unexplained structure have also been included in the new discipline, econophysics. As it is known, although financial crises have prediction mechanisms, there is no definite information. In this context, in this study, using the concept of electric field from the electrostatic part of physics, an early econophysical approach for global financial crises was studied. The aim is to define a model that can take place before the financial crises, identify financial fragility at an earlier stage and help public and private sector members, policy makers and economists with an econophysical approach. 2001 Turkey crisis has been assessed with data from Turkish Central Bank which is covered between 1992 to 2007, and for 2001 Argentina crisis, data was taken from IMF and the Central Bank of Argentina from 1997 to 2007. As an econophysical method, an analogy is used between the Gauss's law used in the calculation of the electric field and the forecasting of the financial crisis. The concept of  $\Phi$  (Financial Flux) has been adopted for the pre-warning of the crisis by taking advantage of this analogy, which is based on currency movements and money mobility. For the first time used in this study  $\Phi$  (Financial Flux) calculations obtained by the formula were analyzed by Matlab software, and in this context, in 2001 Turkey and Argentina Crisis for  $\Phi$  (Financial Flux) crisis of values has been confirmed to give pre-warning.

**Keywords :** econophysics, financial crisis, Gauss's Law, physics

**Conference Title :** ICSRD 2020 : International Conference on Scientific Research and Development

**Conference Location :** Chicago, United States

**Conference Dates :** December 12-13, 2020