# Implementing EconoPhysics to Predict Mixed Migration

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Traditional economic theory relies on assumptions of homogeneous agents reaching equilibrium under ideal conditions; there has been a push away from classical economics toward more real world models incorporating such diverse forums as behavioral psychology, green economics, and econophysics. Econophysics embraces the physics concept of heterogenous agents operating in disequilibrium to more realistically represent economic behaviors. One such behavior is the pattern of human global migration which is in constant flux due to changing governmental policies, natural disasters, and familial ties. Most migrants face a multitude of such push-pull factors; this complex decision-making process is termed mixed migration. This research presents an econophysics approach to mixed migration. A non-parametric physics algorithm was utilized to analyze the degree of system agitation of United States documented permanent residencies granted to migrants. Migration time series data, encompassing the years 1999 through 2016 and representing 207 countries, was compiled into nineteen sub-regions and five larger regions. Agitation within regions and sub-regions was calculated using a regime-sensitive data compression protocol originally proposed to identify magnetic phase transitions of a cobalt ion. This paper advances the research by developing an optimized statistical test of significance. This test indicated that agitation was either unchanged or statistically significantly lower for all regions and 17 of the 19 sub-regions after the recession of 2008. Overall, these results indicate that the degree of stability in the US immigration system has increased since 2008. Applications include government policymakers and the private sector to aid in resource allocation.