

# FULL PROJECT: PREDICTING IMPACT OF LABOR MARKET POLICIES

DATA DRIVEN COMPUTATIONAL MODELS FOR PREDICTION AND SIMULATION OF PATH DEPENDENCIES IN COMPLEX DYNAMIC LABOR MARKET SYSTEMS

## Abstract

Historically, Saudi Arabia has had a high reliance on foreign labor predominantly engaged in the private sector leading to an imbalance between national and expatriate workers (1.2 million Saudi workers vs. 8.6 million expatriate workers in 2016) affecting economic diversification and growth. Path dependence and multiple equilibriums are especially relevant to the problem of low private sector participation among Saudi nationals. Their effects are difficult to predict due to their complex spatial-temporal (cause-effect) trajectories in dynamic market systems. This research will provide data-driven insight into the composition and nature of the Saudi labor market through capture and analysis of multiple data sources. The data will help to develop novel nature inspired computational intelligence models for understanding and predicting the cause-effect relationships in complex market systems and create new intervention measures that can be evaluated against measurable objectives in simulated market scenarios to estimate market responses to policy interventions.

## Expected Impact

An intelligent tool for constructing virtual labor market models to provide intuitive and accurate insights into market dynamics allowing policymakers to design and simulate policy strategies and predict their effects.

## PRINCIPAL INVESTIGATORS

- **University of Essex**  
Dr. Faiyaz Doctor
- **Coventry University**  
Dr. Rahat Iqbal  
Dr. Kasim Randeree

## PROGRAMS & POLICIES EXAMINED

- Saudization

## POLICY PARTNERS

- Dr. Ahmed Kattan, Deputy Minister of Labor



**HARVARD Kennedy School**  
*Evidence for Policy Design*



Ministry of Labor  
and Social Development  
Kingdom of Saudi Arabia



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