

## Economic fitness: Concepts, methods and applications

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**Economic Fitness and Complexity (EFC)** is the recent economic discipline and methodology which makes use and develops the modern techniques of data analysis to build economic models based on a scientific methodology inspired by the science of Complex Systems with special attention to quantitative tests to provide a sound scientific framework. It consists of a **data based and bottom up** approach that considers specific and concrete problems without economic ideologies and it acquires information from the previous growth data of all countries with methods of **Complex Networks, Algorithms and Machine Learning**. Its main characteristics are the scientific rigor, the precision in the analysis and in the forecasting, transparency and adaptability. The new Fitness algorithm overcomes the conceptual and practical problems of the early attempts in this field and sets the basis for a testable and successful implementation of the field of Economic Complexity. According to **Bloomberg Views**: “New research has demonstrated that the “fitness” technique systematically outperforms standard methods, despite requiring much less data” In addition EFC has provided a detailed understanding and forecasting of the fantastic growth of China in the past thirty years which has been a major mystery for most of the standard economic analysts. The Economic Fitness represents a synthetic measure of the **degree of competitiveness** in terms of the capabilities to produce products and services. Mathematically the Fitness corresponds to the **diversification weighted by the complexity of the products**. The diversification provides stability and resilience while the complexity of the products represents the exclusivity and the relative wealth. **The European Commission (Joint Research Center)** has recently adopted these methods for the study of the 27 EU countries. It will be used to evaluate the best planning and the impact of the recovery fund projects (PNRR) to stimulate the economy of EU in the era post COVID-19 In the WEBSITE: <https://publications.jrc.ec.europa.eu/repository/handle/JRC124939> one can find a general methodological document together with the analysis of the situation for each of the 27 countries performed with EFC methods that identify the present situation together with the possible paths of evolution in relation to the PNRR projects. With these methods it is also possible to extend these analysis in various directions and optimize the projects accordingly. Since a few years it has been used by **IFC-World Bank Group** to define specific economic actions tuned for specific countries, in particular for developing ones. One of the main targets is to identify the products or technologies which will **enable to open new markets**, considering the specific situation of each country. The IFC-WB has also supported the development of these methodology which is now officially adopted for the planning of its interventions. An example for African countries can be found here: <https://www.ifc.org/wps/wcm/connect/fb4761f5-809b-4685-8fd7-24bd23bad6d3/EMCompass-Note-88-West-African-Industrial-Development.pdf?MOD=AJPERES&CVID=ngxrg.e> . In this lecture we present an overview of the field and the present challenge to extend these methods, developed up to now mostly for countries, also to the analysis of **individual companies**.