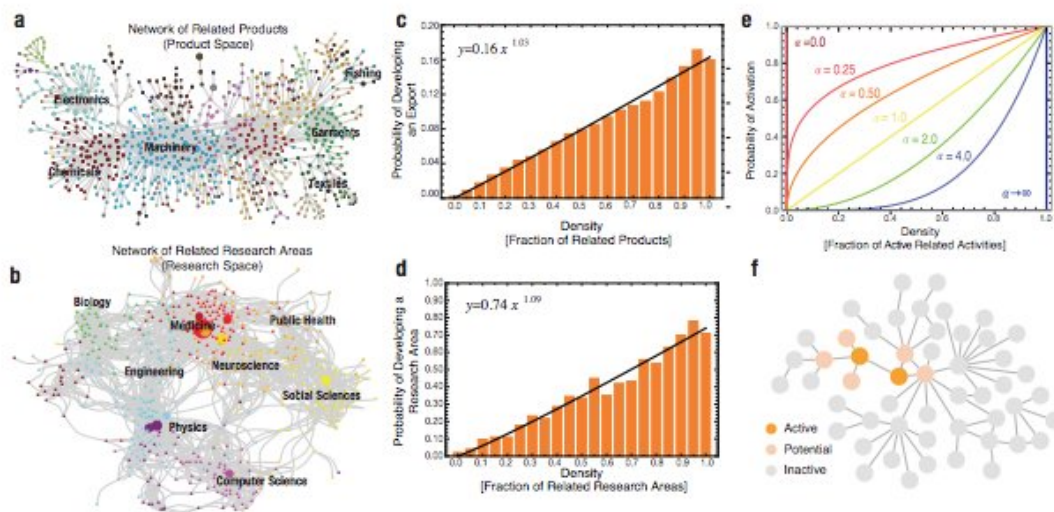


What is the optimal way to diversify an economy?

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Credit: Aamena Alshamsi, Flavio L. Pinheiro, and Cesar A. Hidalgo

One of the eternal challenges of economic development is how to identify the economic activities that a country, city, or region should target. During recent years, a large body of research has shown that countries, regions, and cities, are more likely to enter economic activities that are related to the ones they already have. For instance, a region specialized in the exports of frozen fish and crustaceans can more easily start exporting fresh fish than heavy machinery. This research has illuminated a new chapter in the economic development literature, but

also, it has left an important question unanswered: what is the right strategy for countries wanting to diversify their economy?

Economic [diversification](#) has become an important [development](#) goal among many countries, especially among those relying in the export of commodities, such as Chile, Peru, Saudi Arabia, and Kazakhstan. Given past research, the obvious intuition is to follow a pragmatic [strategy](#) focused only on related activities. Yet, according to a new paper by researchers from MIT and the Masdar Institute in Abu Dhabi, this intuition may be flawed.

The researchers used mathematical models and simulations to compare multiple economic diversification strategies. What they found is that always targeting the "low-hanging fruit" (related activities) is not the optimal choice. Instead, the researchers found that countries can do better by using dynamic strategies, where they target related products at the beginning and the end of the development process but switch to targeting more unrelated activities when they reach an intermediate level of development. At this critical point, the future diversification opportunities—opened by an unrelated activity—compensates for a country's reduced probability of success in it. Although counterintuitive, sometimes, targeting an activity that is not the easiest to develop accelerates the process of economic diversification.

"At low levels of economic development, targeting unrelated activities may be too hopeful," said Professor Cesar Hidalgo, Director of the Collective Learning Group at MIT. "But when economies enter an intermediate level of development, it is optimal to take larger risks and target activities that are relatively unrelated. So the important question for countries is when to switch strategies."

But the idea of dynamic strategies is not only interesting for [economic development](#), it is also a contribution to network science. In the paper,

the authors formalize the problem of identifying optimal economic diversification strategies as a problem of strategic diffusion in networks. "For the most part, researchers working on network diffusion have been using strategies focused on nodes with specific characteristics, like highly connected or central nodes," said Aamena Alshamsi, Professor at Masdar Institute in Abu Dhabi and lead author of the study. "Our results show that in this case, those strategies are far from optimal, since the optimal strategies need to change which nodes to target at each step."

But the research was not limited to only finding the theoretical optimum. It also compared the theoretical strategies with the empirical behavior of countries, as they diversify their products and research activities in the networks of related products and research areas.

"What is interesting is that countries have been behaving in a way that is not too far from the theoretical optimum," said Flavio Pinheiro, a contributing author and postdoctoral researcher at MIT's Collective Learning Group. "Still, countries appear to be a bit too risk averse during the optimal time window, suggesting that there is room to accelerate diversification in the future."

Some researchers in the field of [economic geography](#) are already excited about the results. "The paper provides an important contribution to the field of economic geography, which has for a long time been dealing with questions of economic diversification," said Pierre-Alexandre Balland, a professor of Economic Geography at Utrecht University who did not participate in the study.

More information: Aamena Alshamsi et al. Optimal diversification strategies in the networks of related products and of related research areas, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-03740-9](https://doi.org/10.1038/s41467-018-03740-9)

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