

## Economic Brief

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# Gender Diversity, Vaccine Allocation, Immigration and More: A Recap of the Spring Research Workshop

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Does gender diversity improve team performance? How should vaccines be allocated to combat a pandemic? How do employers affect how immigration impacts native workers? These were among the questions discussed by researchers during a recent virtual research workshop.

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Economists from the Richmond Fed, University of Virginia and Duke University held a virtual research workshop in April. Seven researchers presented on topics including team diversity, vaccine policy, savings decisions and the effects of immigration. This *Economic Brief* summarizes those presentations.

### Does Gender Diversity Improve Team Performance?

Over the last two decades, organizations have made strides toward greater diversity on their teams. Increased diversity allows organizations to benefit from the different specialized knowledge each member brings to the team. But diversity can also lead to more communication frictions on a team.

Shan Aman-Rana of the University of Virginia presented work on the implications of increasing team diversity. The paper, "Gender, Information Exchange and Choice Over Co-Workers: Experimental Evidence," was co-authored with Clement Minaudier of the University of Vienna, Brais Alvarez Pereira of NOVAFRICA and Shamyla Chaudry of the Lahore School of Economics.

The researchers conducted an experiment with university students studying economics in Pakistan. They asked participants a series of multiple choice questions covering three topics:

- Cooking was selected as a more female-oriented subject.

- Sports was selected as a more male-oriented subject.
- Economics was considered gender neutral.

In the experiment's control group, subjects took the tests individually. In the experimental group, females either selected or were randomly paired with a male helper. Helpers had access to a hint sheet to help test-takers and could also share their own knowledge to help answer questions. Individual test takers in the control group also had access to hint sheets. The researchers wanted to measure the effect of co-worker gender on information exchange and performance and see whether allowing choice over co-workers improved performance by reducing communication frictions.

They found that test-taking women working with a random male helper had lower overall performance compared to women who worked alone. When women were able to choose their male helpers, their performance increased on sports questions, but remained lower for cooking questions relative to women who worked alone. Thus, pairing women with men reduced their performance on the female-oriented category, regardless of whether the women were assigned a partner or chose their partner.

The researchers concluded that organizations wanting more gender-diverse teams can improve productivity by understanding the gender stereotypical nature of tasks and creating gender-diverse teams only where the gender knowledge gap is highest. In these instances, allowing women to choose male co-workers seems to achieve better results.

## **The Impact of Immigration on Native Workers**

How an economy responds to an influx of immigrants has long been debated. One argument is that immigrants reduce employment and wages for native workers. But many empirical studies have actually found that immigration has a small positive effect on natives in terms of higher wages and lower prices for goods and services.

However, the role of employers is important when analyzing the effect of immigration on native workers. Firms benefit from immigrant labor, with companies in many countries sponsoring immigrants through work visas. But despite the key role of firms, most studies of immigration at the regional or sectoral level ignore firm-level data.

Nicolas Morales of the Richmond Fed presented research with Agostina Brinatti of the University of Michigan on this topic. In their paper, "[Firm Heterogeneity, Exports and the Impact of Immigration: Evidence from German Establishments](#)," they used data from Germany to see how different firms affect the overall impact of immigration. In the data, firms had different propensities for hiring immigrants: Immigrants made up a larger share of the wage bill for large firms. Large firms also hired immigrants from a greater variety of countries and expanded more than small firms during influxes of immigrants.

Using these findings, Morales and Brinatti developed a model of firms with different shares of immigrants in their wage bills. They examined what would happen if immigration increased by 20 percent. Overall, native workers and firm owners gained from this immigration as prices and production costs fell.

To estimate the impact of firm heterogeneity, Morales and Brinatti compared their findings to a model where all firms have the same immigrant share regardless of size. This model underestimated the welfare gains from immigration by 11 percent. This is because immigrant-intensive firms in the original model replaced natives with immigrants, but natives then moved on to smaller firms that hired fewer immigrants. Both immigrants and natives benefitted more when firms had different hiring preferences than when all firms hired immigrants with the same intensity. Thus, studies that don't account for firm heterogeneity are likely to understate the benefits from immigration.

### **Solving Problems Intuitively**

Standard economic models often make unrealistic assumptions for simplifying purposes. One such assumption is that decision-makers face no limitations on their reasoning and can therefore always determine their best course of action at any time based on the information available to them.

In reality, social scientists have documented ways in which human reasoning is imperfect. Researchers typically divide reasoning into two categories:

- Intuitive reasoning: Decision-makers compare a situation to similar past experiences to make their choice. This line of thinking is fast but not always accurate.
- Deliberative reasoning: Decision-makers operate in a slower and more analytical fashion. Such thinking potentially yields more accurate conclusions but is more costly in terms of time and effort.

Cosmin Ilut of Duke University presented work with Rosen Valchev of Boston College in which they model this dual reasoning process. In their paper, "[Economic Agents as Imperfect Problem Solvers](#)," decision-makers attempt to minimize the costs of their thinking, relying on intuitive reasoning whenever possible. That is, decision-makers will use their intuition as long as they are sufficiently confident. But when they are confronted with a particularly novel situation and their confidence in their intuition is low, they will employ deliberative reasoning.

Ilut and Valchev used this model to explore two puzzles in economics:

- Why do some individuals seem to perpetually live "hand-to-mouth," meaning they save very little?
- Why don't rich individuals smooth their consumption by consuming more when their income increases?

The researchers concluded that the answer to both puzzles stems from decision-makers defaulting to intuitive reasoning most of the time. The intuition for decision-makers who live hand-to-mouth is to consume unless their assets fall below some threshold. At that point, they engage deliberative reasoning and begin to save. But once their savings rise back into familiar territory, they switch to intuitive reasoning and consume again, meaning they never accumulate significant savings.

For rich decision-makers, their intuition is to save until they accumulate a lot of assets. Then they switch to deliberative reasoning and increase consumption until their assets fall to a level that triggers their saving intuition again.

### **The Short- and Long-Run Effects of Financial Openness**

Over the past 50 years, countries have become increasingly open to foreign capital. This financial openness allows countries to borrow from abroad rather than relying just on domestic savings. Felipe Saffie of the University of Virginia presented work with Liliana Varela of the London School of Economics and Kei-Mu Yi of the University of Houston and the Dallas Fed examining how this openness affects the composition of a country's economy.

In their paper, "[The Micro and Macro Dynamics of Capital Flows](#)," Saffie, Varela and Yi first studied the question empirically using data on economic activity in Hungary from 1992 to 2008. Hungary provides a natural experiment for studying financial liberalization. Prior to 2001, the country had capital controls that restricted access to international credit. In 2001, those restrictions were removed as a condition of Hungary joining the European Union, and net financial inflows into Hungary increased more than three-fold, expanding the local credit supply and decreasing the domestic lending rate.

This reduced the cost of capital, favoring capital-intensive industries like manufacturing. It also fueled domestic consumption by making borrowing cheaper, which favors service-sector firms like restaurants and bars. Saffie, Varela and Yi found that the consumption channel dominated in the short- and medium-term after liberalization, leading to an increase in service-sector firms.

The authors also built a model to examine the long-run effects of financial liberalization. This model confirmed their empirical findings from the Hungary data. It also showed that a country stabilizes its net foreign asset position at a negative level in the long run following large financial liberalization. This negative position is sustained by net trade surpluses, necessitating a shift away from services towards tradable manufacturing.

Thus, while financial openness initially boosts the domestic service sector, eventually there is a reallocation to manufacturing exporters. The size and productivity of the manufacturing sector grows, while the service sector shrinks.

## Optimizing the Market for Capital

Financially constrained firms buy older capital on the secondary market because it is cheaper. That older capital is typically supplied by less financially constrained firms, which invest in new capital and resell older capital as it ages. Because of financial frictions, the price of old capital in a competitive market may not coincide with its socially optimal value.

Andrea Lanteri of Duke University presented work with Adriano Rampini, also of Duke, in which they analyzed the optimal allocation of capital given financial frictions. In their paper, "[Constrained-Efficient Capital Reallocation](#)," financial frictions take the form of two types of externalities in their model: collateral externalities and distributive externalities. The resale price of old capital serves as collateral for firms that purchase new capital. A higher resale price relaxes the capital constraints faced by those firms. On the other hand, a lower resale price for old capital redistributes resources toward more financially constrained firms.

In their analysis, Lanteri and Rampini found that the price of old capital is inefficiently high in a competitive equilibrium. That is, firms that are more financially constrained benefit more from a lower price of old capital than the less-constrained firms benefit from a higher resale price.

But less-constrained firms do not consider the positive externalities of lower resale values for old capital. Lanteri and Rampini propose one possible solution to improve capital allocation: subsidize the cost of new capital.

Since new capital eventually becomes old capital, subsidizing new capital reduces the cost of old capital in the future by encouraging greater investment in new capital in the present. This policy would foster greater capital reallocation toward more financially constrained firms while also improving the welfare of less financially constrained firms.

## How Should We Prioritize Vaccines?

As recent events have highlighted, vaccine policies are crucial to stopping pandemics. Because supplies are limited, determining how to prioritize vaccine allocation is necessary. Some have argued for prioritizing the most vulnerable: those who have the greatest risk of suffering severe symptoms if infected. Others have argued for prioritizing those who are most likely to spread the disease if infected. Assuming that vaccinated individuals cannot spread the disease, focusing on transmitting individuals would help reduce the overall spread of the virus and bring the pandemic under control. Either approach must also account for how different people respond to orders to self-isolate.

Joshua Weiss, a postdoctoral economist at the Richmond Fed, presented research with Nikhil Vellodi of the Paris School of Economics exploring this issue. In their paper, "[Optimal Vaccine Policies: Spillovers and Incentives](#)," they developed a model in which individuals are

classified both by their likelihood of transmitting the virus to others and by their vulnerability to infection. Individuals also faced different costs to isolate. Weiss and Vellodi assumed that vaccinated individuals have total immunity to the disease and also cannot transmit the disease to others.

In a world where not everyone complies with lockdown orders, they found that the best option available to policymakers is to focus on vaccinating individuals with an intermediate vulnerability to the virus. Focusing only on the most vulnerable does not help as much with reducing transmission because the most vulnerable are the most likely to self-isolate. This means their likelihood of spreading the virus to others is low, whether or not they are vaccinated. Vaccinating individuals with the highest probability of transmitting the virus is better for overall welfare but it is not as beneficial for individual welfare, since these individuals are the least vulnerable to the virus.

Weiss and Vellodi found that the most effective policy is to focus on individuals in the middle. These individuals with intermediate vulnerability to the virus interact with others more than is socially optimal, contributing to virus spread. They also suffer more when infected than the least vulnerable, highest transmitters. Thus, allocating scarce vaccines to these individuals improves their welfare and generates positive spillovers for society by reducing the overall spread of the virus.

### **Simulating Games When Players' Choices are Constrained**

Lidia Kosenkova of the University of Virginia presented a paper titled "Inference in Strategic-Interaction Models with Censored Action Spaces" in which she studies strategic interaction in game theory models where the players' potential actions can be "censored." This means that the players in the model are unable to select their best choice. In the context of businesses, this censoring can happen when firms have capacity constraints that inhibit how much they can produce. Individuals may also face censored action space when they have financial constraints or face other frictions that prevent them from adjusting their choices to their optimal levels in the short run.

In Kosenkova's model, the only shape restriction on firms' objective functions is that they are strictly concave, which guarantees the firms will choose the censoring point if the overall best choice is not available. The model allows for known censoring from one side and unknown from the other side. Censoring of the strategy space can be either nonrandom or random, and it can be correlated with observable and unobservable shifters of the payoff function. Kosenkova focused on static games with complete information.

The testable implications of her model involve inequalities of conditional moments that can be analyzed with existing methods. Testable inequalities are applicable for both strategic substitutes and strategic complements cases without need to assume the nature of

competition. This method works in the presence of multiple equilibria and any type of selection mechanism as long as agents in the model use pure Nash equilibrium strategies.

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