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Why the Euro Hasn't Become an International Currency of Stature

Launched in 2002 as the sole legal tender in 12 countries, the euro's introduction marked a milestone in a decades-long effort to provide Europe with an international currency of the same stature as the dollar. While now used by 341 million people in 19 of the 27 European Union member countries, use of the euro is largely confined to the euro area itself, to non-euro EU members, and to former French colonies in Africa.

In **Why is the Euro Punching Below Its Weight?** (NBER Working Paper 26760), [Ethan Ilzetzki](#), [Carmen M. Reinhart](#), and [Kenneth S. Rogoff](#) quantify the euro's international role, conclude that this role has fallen far short of what its proponents hoped for, and examine the structural roadblocks that have limited the euro's appeal.

The share of euro-denominated central bank reserves remains slightly over 20 percent, roughly the same as at its introduction. Its use in foreign exchange transactions, as measured by the Bank for International Settlements' worldwide survey of the largest currency dealers, has also held roughly constant, at around 35 percent. It peaked at just below 40 percent in 2010. Its share

of foreign exchange transactions is slightly smaller than the combined share of the British pound sterling and Japanese yen. Given that the combined Japanese and British GDPs are

There is an inadequate supply of high-quality euro-denominated assets that international investors and central banks can use as a store of value, and no eurozone-wide "safe" government-backed asset.

just two thirds of the eurozone's output, and that one quarter of the world's exports originate in the eurozone, the researchers posit that "one might have expected a larger role for the euro."

Several factors have inhibited the euro's

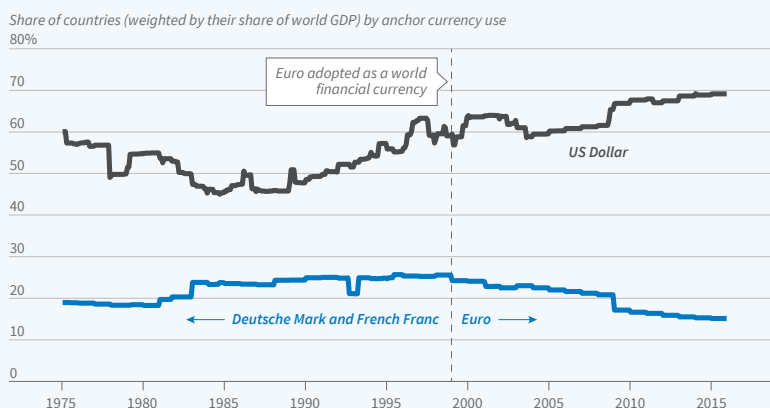
use. Though its utilization as an invoicing currency in international trade is almost on par with that of the dollar (albeit much of this is for intra-eurozone trade), there is an inadequate

supply of high-quality euro-denominated assets that international investors and central banks can use as a store of value. Even though eurozone governments are heavy borrowers, there is no eurozone-wide "safe" government-backed asset. While Greek and German gov-

ernment debt may both be denominated in euros, they have neither the same risk nor the same marketability. Though US GDP is only 50 percent larger than that of the eurozone, over \$14 trillion in dollar-denominated, marketable US government-backed debt was available in 2018, over three times more than the \$4 trillion of marketable sovereign debt that was euro-denominated.

The study finds that the US has a far superior capacity for securitizing assets, given its unified and relatively reliable legal and regulatory sys-

Evolution of the Dollar and Euro as Anchor Currencies, 1975–2015



The blue line represents the Deutsche Mark and French Franc prior to the euro's adoption as a world financial currency in 1999
Source: Researchers' calculations using data from Ilzetzki, Reinhart, and Rogoff (2019)

tem. The combined market capitalization of US equity markets accounts for nearly half of total world equity market capitalization, even though the US accounts for only 20 percent of world GDP. In contrast, companies in the eurozone rely heavily on bank financing. Close to 80 percent of eurozone corporate debt is held as unmarketable assets on bank balance sheets, compared to 30 percent in the US, and the stock of outstanding US nonfinancial corporate debt is almost five times as large as outstanding

eurozone nonfinancial corporate debt.

Limits on the reach of the European Central Bank (ECB) raise questions about whether it can “gain the credibility required to expand its international role,” the researchers argue. After estimating monetary policy reaction functions for all eurozone members and for the eurozone as a whole, they find that, from 1999 to 2011, ECB policies were basically the same policies that the German Bundesbank would have employed. The result was to stabi-

lize inflation in Germany, but not for the currency area as a whole. After the 2008 financial crisis, when the euro’s survival was on the line, the ECB adopted bolder “whatever it takes” policies that may have created new uncertainties about the nature and credibility of the euro anchor, and thereby discouraged reliance on the currency outside the eurozone.

—Linda Gorman

Ed. Note: This working paper was written before the onset of the coronavirus crisis.

Price Guarantee Spurred Vaccine Development for Poor Nations

Advance Market Commitments (AMCs) were proposed in the early 2000s as a way to encourage the development and distribution of vaccines for diseases primarily affecting developing countries. AMC donors pledge that if a firm develops a specified new vaccine and sets the price close to the manufacturing cost, they will “top-up” the price by a certain amount per dose.

AMCs aim to solve several problems in the vaccine market. Firms’ incentives to develop vaccines for low-income countries may be weak because of a limited ability to pay there. The top-up payment strengthens firms’ incentives by increasing the profitability of serving those markets. After a vaccine has been developed, firms often set the price well over the marginal cost, leaving poor people unable to access life-saving vaccines that are cheap to produce. The AMC’s price cap ensures that the vaccine remains affordable.

Advance Market Commitments: Insights from Theory and Experience (NBER Working Paper 26775), by Michael Kremer, Jonathan D. Levin, and Christopher M. Snyder reviews the economic logic behind AMCs and describes a pilot AMC supporting the development and distribution of

an important new vaccine.

In 2007, five countries and the Gates Foundation pledged \$1.5 billion to fund a pilot AMC targeting a pneumococcal conju-

GlaxoSmithKline and Pfizer each committed to supply 30 million doses annually at \$10.50 for a three-dose course.

By 2016, PCV had been distributed in

Five nations and the Gates Foundation committed \$1.5 billion to support development of a pneumococcal conjugate vaccine that is estimated to have saved 700,000 lives in low-income countries.

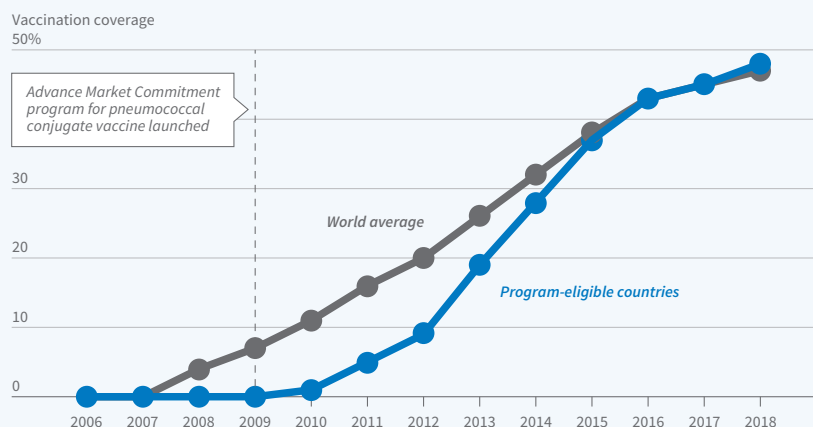
gate vaccine (PCV). At the time, the World Health Organization estimated that pneumococcus killed more than 700,000 children under five in developing countries annually. The AMC was launched in 2009 under the supervision of GAVI (formerly the Global Alliance for Vaccines and Immunizations), covering 73 low-income countries. Responding to GAVI’s initial tender in 2010,

60 of the 73 eligible countries. Annual distribution exceeded 160 million doses, enough to immunize over 50 million children per year. By 2018, nearly half of the target child population in GAVI countries was covered. While PCV coverage is far from full, it is now as high as in non-GAVI countries. The catch up to the rest of the world was nearly five years faster than observed for the rotavirus vaccine intro-

duced in GAVI countries around the same time without an AMC, suggesting that the pilot AMC may have spurred firms’ otherwise lagging investment in capacity to serve low-income countries.

In 2019, a third vaccine developed by the Serum Institute of India qualified for the AMC program. Serum Institute is expected to participate in tenders for the remaining \$262 million of uncommitted AMC funds, report-

Pneumococcal Vaccination Rates among Children in 73 Low-Income Countries



Coverage is defined as the percentage of children receiving their third and final scheduled dose by the nationally recommended age in program-eligible countries. Source: Researchers’ calculations using data from the World Health Organization and The United Nations Children’s Fund

edly pricing its vaccine at \$6 per three-dose course for low-income countries. The best estimates suggest that the development and distribution of PCV has saved approximately 700,000 lives since 2010.

The researchers note that PCV, already far along in development, was a technologically close target. AMC for technologically more distant targets, like a malaria vaccine, may have even greater benefits but may face

greater political hurdles. They also point out that the AMC design could be expanded beyond health targets to the development of new crop varieties and other challenges.
—Lauri Scherer

Lottery Design Principles and H-1B Visa Allocation

Launched as part of the Immigration Act of 1990, the H-1B visa program is intended to satisfy demand for workers with a bachelor's degree or higher in occupations that require specialized technical knowledge. With the H-1B Visa Reform Act of 2004, Congress capped the number of permits at 85,000 a year, with 20,000 reserved for applicants who had earned an advanced degree from a US university. In 2019, the US Department of Homeland Security, which administers the program, altered the rules for allocating H-1B visas in an effort to increase the share that went to advanced-degree recipients.

In **Immigration Lottery Design: Engineered and Coincidental Consequences of H-1B Reforms** (NBER Working Paper 26767), [Parag A. Pathak](#), [Alex Rees-Jones](#), and [Tayfun Sönmez](#) study the visa allocation methods using tools from the field of market design. They point out that there are several different ways to run the H-1B lottery, all of which comply with the 1990 law. These different approaches to lottery implementation can significantly affect the outcome; the researchers demonstrate this by estimating the number of high-skill and not-high-skill applicants who would be admitted under various approaches. They find that while Congress established rigid caps for the total number of H-1B visas, the numbers granted to higher-skilled workers versus those who were less skilled could vary by as much as 14,000 a year, depending on the visa allocation process.

To illustrate the importance of lottery design, the researchers first consider the allocation method that was used in 2005, when the unreserved cap of 65,000 was filled on a first-come, first-served basis among a mix of higher- and lower-skilled workers. At that

point, 20,000 additional slots were allocated exclusively to higher-skilled workers. For fiscal years 2006–08, applications were again processed based on arrival time, but now as higher-skilled workers were accepted, they were not counted against the unreserved cap of 65,000. Once the 20,000 reserved visas were exhausted, higher-skilled workers theoret-

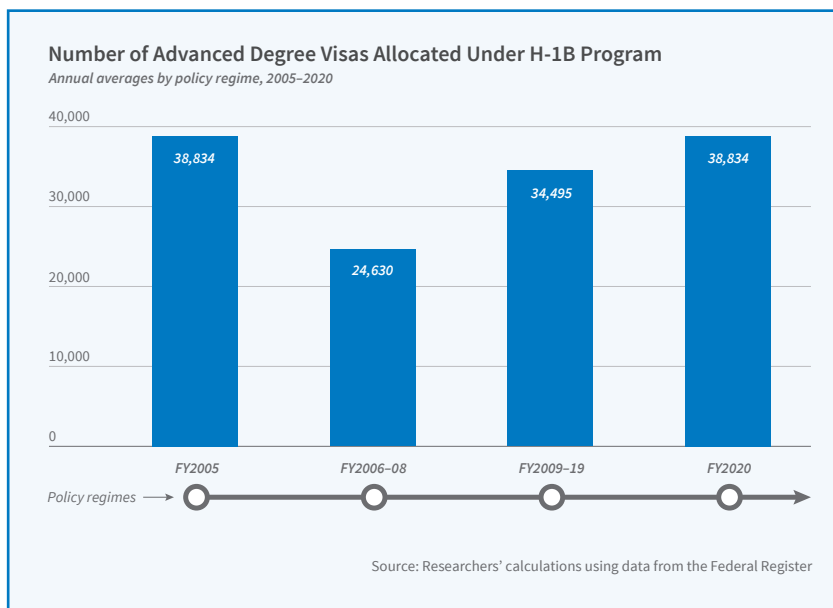
A 2019 reform to the H-1B allocation rules, the fourth change in 15 years, gives high-skill applicants the highest possible chance of securing a visa.

skilled workers would have received visas; under the 2006–08 first-in scenario, the number would have fallen to 24,630.

In 2008, the immigration service changed the allocation process. With 150,000 visa applications being overnighted for the first day of acceptance, there was no way to determine the order of arrival. Instead of basing priority on timing, the service announced it would hold two lotteries to allocate all visa petitions submitted during the first five days of April. In the first lottery, the 20,000 reserved slots were distributed among the higher-skilled workers. In the second lottery, the 65,000 unreserved visas were allocated among the remaining higher-skilled workers and the lower-skilled workers.

The new policy increased the share of higher-skilled workers overall by giving them two opportunities to win a visa: once in competition with only high-skill applicants, and a second time (if they lost the first time) in competition with all applicants. Again using the recent averages, the researchers estimate that this lottery scheme would allocate 33,495 visas to higher-skilled workers, a significant gain over the 2006–08 lottery method.

The 2019 reform tweaked the allocation



ically could still apply for visas under the unreserved cap. However, by that point the unreserved cap had been met, leaving higher-skilled workers no second chance.

To quantify the differences between these two alternative ways to run the lottery, the

system by reversing the order of lotteries. Held first instead of second, the unreserved lottery drew from a pool with a greater representation of highly skilled applicants—20,000 more, to

be precise—than under the previous sequence. That reform produces 38,834 visas for higher-skilled workers, more than 5,300 visas more than in the previous system.

The findings illustrate the importance of market design, such as the design of the H1-B lottery mechanism, in allocating scarce resources. — Steve Maas

It's the Quality of Sleep that Counts for Boosting Productivity

Poor urban residents of developing nations sleep relatively little, and a new study from India suggests why. It's not that they don't spend enough time trying to sleep, but that the quality of the sleep they are getting is surprisingly poor.

Although participants in the study averaged eight hours in bed, they actually slept only 5.6 hours. They woke up 32 times per night. The frequent interruptions meant that their longest undisturbed sleep lasted only 55 minutes on the average night. Both total sleep time and longest undisturbed sleep are substantially lower than the averages for Americans, even for those with sleep disorders.

A three-week program that increased participants' sleep time by 27 minutes per night did nothing to improve their productivity, cognition, psychological well-being, or patience. High-quality naps at the office, however, showed measurable improvements.

"These results suggest that high sleep quality may be essential to unlock the benefits of sleep," Pedro Bessone, Gautam Rao, Frank Schilbach, Heather Schofield, and Mattie Toma write in *The Economic Consequences of Increasing Sleep among the Urban Poor* (NBER Working Paper 26746).

Even in rich countries, many people are not getting the seven to nine hours of sleep per night that experts recommend. In developing nations, the problem may be worse because noise, heat, mosquitoes, and other physical discomforts make it challenging for the urban poor to get the proper rest.

To measure sleep patterns, the researchers recruited 452 low-income residents of

Chennai to work for a month doing data entry while wearing devices called actigraphs that track how much time their wearers are awake. Participants spent a week working and having their sleep monitored at all times. Then

Productivity of workers in Chennai, India benefited less from increased sleep time at home, where sleeping conditions were poor, than from high-quality naps at their workplace.

they were split into several groups. One group was encouraged verbally to spend more time sleeping. They were also given sleep aids, such as loaned eyeshades, ear plugs, mattresses, and fans. A subgroup was paid for each minute of extra sleep they logged.

The inducements were effective in increas-

apnea or the elderly. Healthy people in the US have around 95 percent efficiency.

The net impact of increased sleep on productivity among those given inducements in the Chennai experiment was small: 1.3 per-

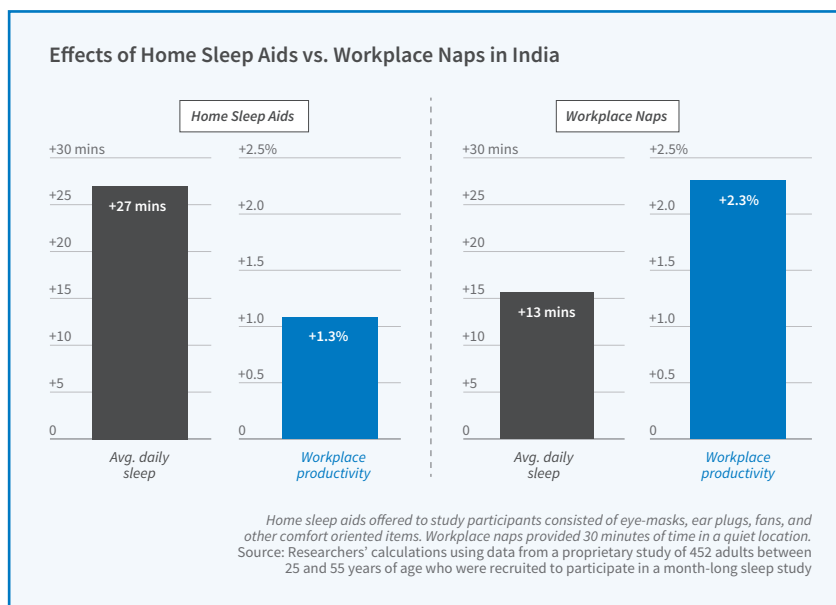
cent. Rather than boosting their work time, the participants in this group cut back their work hours by 4 percent. That reduction in work and earnings negated any productivity increase.

Another group of study participants was encouraged to nap during a half hour of the work day in a quiet office space with beds,

blankets, pillows, and the other items that the night-sleep group was given. The effects for this group were much more positive. This group averaged an added 13 minutes of sleep per day, and this higher-quality sleep boosted productivity by 2.3 percent. Tests also showed that participants demonstrated better attention, improved psychological well-being, increased savings, and more patience.

Members of the nap group earned 4.1 percent

more than a control group of participants who were required to take a 30-minute break, but not a nap, during the work day. But they still ended up working 26 minutes less a day than a control group that was allowed to work during the half-hour nap time. That opportunity cost left their earnings 8.3 percent lower than those of the control group.



ing sleep time: these groups averaged an extra 27 minutes of sleep per night. But the quality of their sleep was poor. To achieve those extra minutes required an extra 38 minutes in bed, an overall sleep efficiency — time asleep divided by time in bed — of only 70 percent. In comparison, such a low number is found in the US only among individuals with severe sleep

If it takes eight hours in bed to get less than six hours of poor-quality night sleep, and the productivity effects are small, workers may

conclude that they are better off economically spending that time working. The high-quality naps show how gains might be made, but

those conditions are unlikely to be replicated at home, the researchers conclude.

—*Laurent Belsie*

The Size of the Prize Affected Technology Innovation Competition

Which is the more cost-effective way to spur innovation: to offer a single large prize, or to offer a set of smaller prizes with the same total value divided among multiple winners? In **The Effects of Prize Structures on Innovative Performance** (NBER Working Paper 26737), [Joshua Graff Zivin](#) and [Elizabeth Lyons](#) find that the winner-takes-all, single prize scheme stimulates greater risk-taking and thus more boundary-pushing ideas. They also find that this effect is more pronounced when the innovations are being developed by teams, which can pool a wide variety of skills and experiences, than by individuals.

The researchers partnered with Thermo Fisher Scientific, a large multinational technology firm, in a randomized control trial that involved a contest to solicit proposals for how small health-care providers and laboratories in Mexico could share access to expensive technological equipment.

The contest was open to non-management employees of the firm and of other technology firms and freelancers in the Baja California region, as well as to STEM students at local universities. The researchers designed the study “to observe differences in effort and performance across prize structures among statistically identical populations.”

Potential contestants were required to complete a survey that asked for demographic information as well as some data on their profes-

sional expertise. It also assessed attitudes toward risk, ranked on a scale from 1 to 5. The contest attracted 184 participants. Each entrant had the choice of competing on a team of up to three people or as an individual. Of the group, 93 decided to go it alone.

Next, the competitors were divided into two equal-sized groups and told to which prize

scheme they had been randomly assigned. Under the first, one winner or winning team would receive \$15,000; under the second, the \$15,000 would be divided among 10 winners, with awards ranging from \$6,000 for first place

Projects submitted under a winner-takes-all structure were more novel, and more team driven, than those submitted under a structure in which multiple winners shared a prize.

to \$600 for tenth. Participants were told that they would be judged relative to others facing the same prize structure.

All submissions were randomly assigned to judges. The judges were not informed of the prize structure under which the submitters were competing. Submissions were ranked on overall quality and project novelty. Quality was assessed in five equally weighted areas: relative novelty

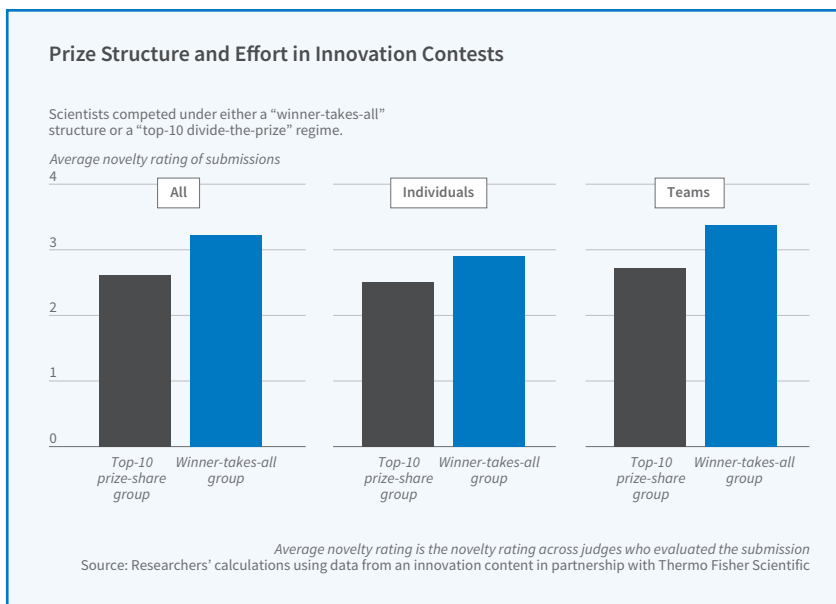
scale with 5 as the maximum. The lowest score was given to proposals viewed as “already available in the target market,” and the highest to those that were “so creative judges are almost sure no one else has thought of a similar idea.” The researchers

found that projects submitted under the winner-takes-all structure “were significantly more novel than those made under the multiple prize structure.” Teams operating under the winner-takes-all program submitted projects that scored 25 percent higher on novelty rankings than those under the multiple-prize structure.

Participants appeared to form teams in ways that maximized skill diversity and experience levels. Teams in both prize structures were two-thirds more likely than individual contestants to have had prior contest experience. The combined level of expertise of teams was 40 percent higher than that of individuals. However, the returns to teamwork were significantly higher in the winner-takes-all prize structure than the multiple prize structure. In particular, teams in the winner-takes-all structure submitted projects that were ranked significantly higher on novelty than did teams assigned the multiple prize structure. Individual partici-

pants in the two structures did not differ significantly in the novelty of their submissions. Together these findings demonstrate that the increased average novelty in response to a winner-takes-all prize structure is driven by the “responsiveness of teams to the incentives for radicality embedded in the single prize structure,” the researchers find.

—*Steve Maas*



compared with existing products; functionality; user friendliness; scope of applicability; and success in fulfilling project requirements. With respect to the overall quality measure, prize structure did not matter: the overall quality of submissions was the same for each prize group, about 2.5 out of a possible 5.

Project novelty was also assessed on a 1–5

Consumers Value Reviews and Prices More Than They Do Licenses

Licensing laws apply to a growing share of the US labor force. They now affect nearly 30 percent of all workers, including electricians, contractors, interior designers, salon specialists, and at least 1,100 other occupations. Licensing is often justified as a way of protecting consumers from poor service outcomes, guaranteeing at least some minimum standards of quality and safety. However, these laws may raise prices for consumers and increase rents for licensed professionals by restricting competition.

Does a professional's licensing status have an effect on whom consumers choose to hire? And do occupational licensing laws protect consumers from poor service outcomes? Chiara Farronato, Andrey Fradkin, Bradley Larsen, and Erik Brynjolfsson explore these questions in **Consumer Protection in an Online World: An Analysis of Occupational Licensing** (NBER Working Paper 26601). They study data collected by a digital platform to better understand the role of occupational licensing laws in consumer choices and market outcomes.

The researchers analyzed data from a large online labor market that facilitates connections between potential consumers and potential providers of home improvement services. Consumers use the platform to post a request for a particular job, to which

professionals can respond with a quote. For each bid, the consumer can see the proposed price, read reviews of the professional in the form of either a starred rating or past-customer

The researchers study transaction-level data on over one million consumer requests in hundreds of distinct service categories throughout the United States over an eight-month period.

More-stringent licensing regulations are associated with less competition and higher prices, but not with better service or higher customer satisfaction.

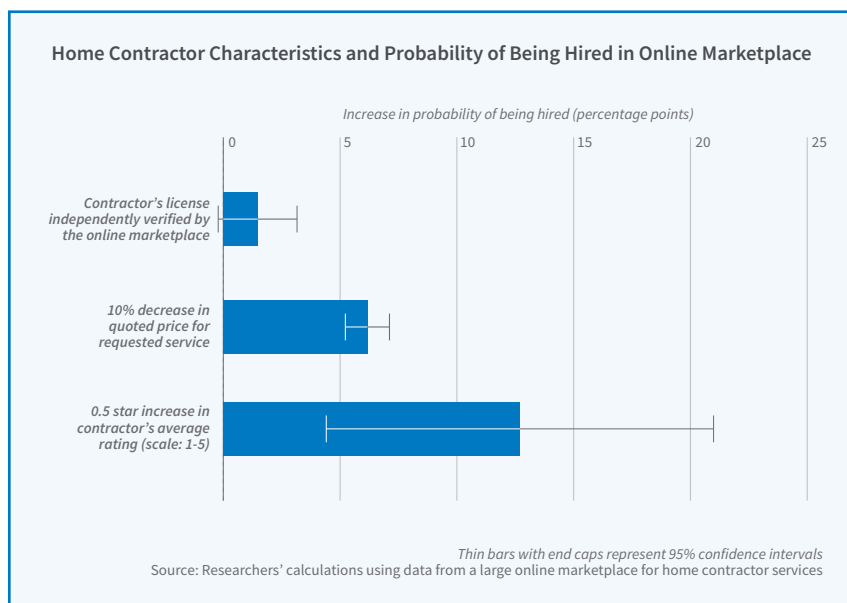
reviews, and learn whether the professional is licensed. A professional is only identified as licensed after the platform has independently verified the licensure.

The platform creates a market for the performance of physical tasks that are often supplied by licensed professionals, and its bidding process makes it suitable for studying whether and how knowledge of occupational licenses matters where reputation and other information about professionals are readily available.

The results suggest that a professional's licensing status is unimportant for consumer decisions, relative to review ratings and prices. The researchers also find that more-stringent licensing regulations are associated with less competition and higher prices, but not with any improvement in customer satisfaction, as measured by review ratings or the propensity to use the platform again.

The finding that consumers appear to care more about online reviews and prices than occupational licensing can be interpreted in several ways. One is that licensing may not be important for consumer decision-making. Another is that consumers may not distinguish between licensed and unlicensed professionals if they believe that all professionals comply with relevant state regulations when bidding for a particular service, either by being licensed or by providing services of comparable quality to those of licensed professionals.

—Lauri Scherer



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